FAO SPECIES IDENTIFICATION FIELD GUIDE FOR FISHERY PURPOSES

FISHES OF THE CAMBODIAN MEKONG

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FISHES OF THE CAMBODIAN MEKONG

by

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PREPARATION OF THIS DOCUMENT

This field guide was prepared under the direction of the Species Identification and Data Programme of the Marine Resources Service, Fishery Resources Division, Fisheries Department, Food and Agriculture Organization of the United Nations (FAO), Rome, Italy. Preparation and field work was supported by the MRC/DOF/DANIDA Project for the Management of the Freshwater Capture Fisheries of Cambodia. The Mekong River Commission and the Cambodia Department of Fisheries administered this DANIDA funded project.

The author, Dr. W.J. Rainboth, has done research on fishes of the Mekong for over twenty years, including extensive field work. He also visited Cambodia specifically in support of the present field guide.

This guide is intended as a practical tool for fishery workers, particularly those who must collect statistics and other data on species encountered on site at fishery operations, at fish landings and in fish markets. Correct identification of species is of paramount importance for improvement of the quality of statistical data and ultimately for any attempt to manage fishery resources. The guide is arranged in a step-by-step order of identification from higher taxonomic categories, down to the species level. The "Pictorial Index to Families" and the "Guide to Orders and Families" are used to identify to a higher taxonomic level but in some cases also to identify species. In most cases the "Guide to Species" should be consulted for correct identification to the species level.

In addition to the information to help with fish identification, other information on biology has been included, such as: species range, habitat, diet, migration and reproduction. Besides the commercially important fishes, this guide includes many small species that may not be common in fish markets, but are utilized in numerous ways by artisanal or subsistence fisheries. Many of the small fishes occasionally make their way into the aquarium trade and can also be subject to overexploitation.

This volume is the second FAO species identification field guide for freshwater fishes, the first being the Field guide to the freshwater fishes of Tanzania (Eccles, 1992). Ultimately, it may be possible to extend the coverage here to include the fishes of the middle and lower Mekong by including species from the other four countries within the basin.

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SUMMARY

This field guide includes approximately 500 species of present or potential interest to, or likely to be encountered in, fisheries in the Cambodian Mekong. This covers all species historically recorded from Cambodian reaches of the Mekong as well as numerous new records by the author. It also includes species expected to occur in Cambodia which have been recorded from, or found by the author, in Vietnam, Thailand and Laos. An overview is given on the factors that have contributed to the diversity of the Mekong along with a basic introduction to taxonomy. A section on technical terms and measurements illustrates the characters used for the identification. As an aid to identification to higher taxonomic levels, an illustrated guide to orders and families is included. The species accounts provide information on synonyms and misidentifications, FAO (English) names, Cambodian names (in Cambodian script), sizes, diagnostic features, one or more illustrations, and notes on fisheries, distribution, habitat and biology. The guide is fully indexed and a list of further literature is appended. Finally, 216 colour photographs of fishes of the Cambodian Mekong are presented.

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INTRODUCTION

The purpose of this guide is to help build a scientific foundation for present and future freshwater capture fisheries research within the Cambodian reaches of the Mekong River. Correct species identification is the basic starting point for any type of biological study, particularly one on wild populations. For research on ecology and applied ecology, important components of fishery science, it is important that each name applies to only a single species, and that each species is known by a single name. This guide should provide help for the goal of taxonomic uniformity.

Historically, surveys of the capture fisheries provided the Cambodian government with assessments of local fish production. These fishery statistics were used to set lower limits on annual bids for fishing lot licenses in the Great Lake and Tonlé Sap as well as other regions, but to a lesser extent. Besides licensing information, fishery surveys provided estimates of total quantity of fish caught and information on the economy and national food consumption. To provide this information, a fairly crude level of species identification was satisfactory, local names being sufficient, even though many local names may apply to numerous similar species. Each species included under a single local name has its own characteristic fecundity, breeding pattern, growth rate, dietary requirements, and preferred habitat. To understand what is happening to important stocks of fish it is necessary to be able to recognize the individual species. Even if a species is unimportant to fisheries it should be identifiable to avoid confusion with closely related, more important species. In years to come, it will be important to find and protect breeding and nursery grounds for important species. Studies of fish larvae require fine-meshed plankton nets that do not discriminate between fishery and non-fishery species. Finally, seemingly unimportant species are often important forage fishes for species that are important to fisheries. Accordingly, changes in the stocks of some forage fishes may alter the food supply for commercially important fishes. Disappearance of one fish species may lead to a decline in numbers of another species.

THE PRESENT-DAY MEKONG

The freshwaters of Cambodia are predominantly those of the Mekong basin, the largest river in Southeast Asia and one of the great rivers of the world. Lesser rivers are the small coastal drainages along the Gulf of Thailand and a group of rivers in southeast Cambodia that flow into the Saigon River. The Indochinese Peninsula, and indeed the entire continental landmass of Southeast Asia, has a fascinating and complex geological and climatic history that is responsible for the fish diversity that we see today (Kottelat, 1989; Rainboth, 1991, 1996). Indeed, the main channel of the Mekong, from its origin to its mouth in the South China Sea, supports variety of different fish assemblages, based on differences in physical characteristics as well as differences in historical configuration.

The source of the Mekong is on the Tibetan Plateau in Quinghai Province of China at an elevation of over 5 000 m. The climate of the region is extreme, with long, harsh winters and chilly summers with 0 to 10°C mean July temperature. Precipitation is low, with annual rainfall of 250 to 500 mm (10 to 20 inches). The vegetation is upland pasture or semi-tundra.

The Mekong passes through Tibet where it comes in close proximity with other great drainages of southern and eastern Asia, forming an extraordinary hydrographic feature. In southeastern Tibet, a circle of 60 km radius includes land drained by the Yangtze (China), Mekong (Southeast Asia), Salween (Burma), Irrawaddy (Burma) and Brahmaputra (India). The steep, forested, parallel river gorges of the Salween, Mekong, and Yangtze have valley floors at elevations between 1 000 and 1 500 m and are separated by mountain ranges of over 5 000 m. These compressed basins, particularly the Mekong and Salween, receive no major tributary streams for great distances (380 km for the Mekong and 480 km for the Salween). The area has a much more moderate climate than is found at the rivers' sources. As the Mekong (Lancang Jiang) descends through Yunnan Province, the climate becomes warmer and wetter with 1 700+ mm annual rainfall coming between the months of May and October in southern Yunnan. The winters in southern Yunnan and throughout the rest of the Mekong drainage are nearly frost-free. Southern Yunnan has a tropical lowland evergreen rain forest similar to that found in Malaysia even though the rainfall is seasonal and the climate is cooler (Whitmore, 1985). There are also scattered patches of tropical evergreen rain forest southward in Laos, Cambodia, and Vietnam, although monsoon (deciduous) forest is the predominant vegetation type. As the Mekong exits from Yunnan it forms the border between Burma and Laos (Fig. 1).

After crossing four parallel valleys that continue southward to the Chao Phrya watershed, the Mekong turns southward and runs a course in Laos parallel to the four valleys in Thailand. As the Mekong reaches 18°N latitude, it veers sharply eastward and enters the Khorat Plateau, which is actually an elevated sedimentary basin (Hutchinson, 1989). The Mekong flows through the northeastern part of the Khorat Plateau and exits near the southeastern corner. Much of the drainage of the Khorat Plateau is effected by the Mun River, which has its confluence with the Mekong near the

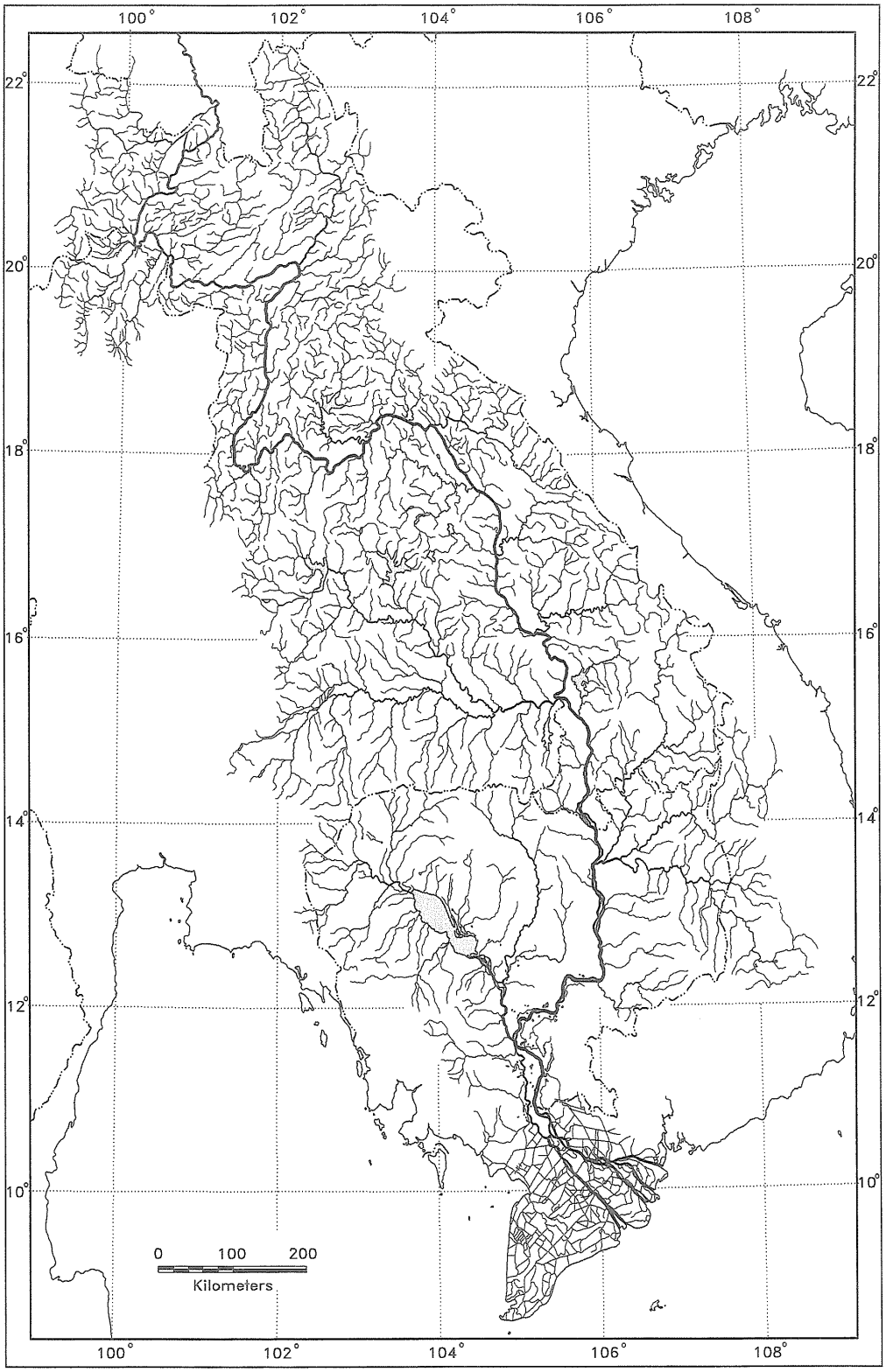


Fig. 1. The lower and middle Mekong, downstream from the Chinese border.

river's exit from the plateau. Nearly all of the river drainages of Laos join the Mekong.

A monsoon rainfall pattern predominates throughout the lower Mekong Basin, causing the river to undergo great cyclical changes in flow. This change in flow and depth follows a predictable cycle (Fig. 2). Unlike many smaller rivers of the perhumid tropics that have fluctuating discharge depending on unpredictable local rainfall patterns, the Mekong experiences a predictable annual onset of flood regime. With the commencement of flood season, water clarity decreases as higher velocity causes increases in suspended particulate matter. The depth increases nearly 15 m at places along the Thai-Lao border, and the current becomes treacherous. The powerful flow has cut several long underwater canyons over a hundred metres deep on the Khorat Plateau. Because of the rapid changes in the Mekong flow, the current slows greatly or even reverses in some small tributary streams, called *preks,* in Cambodia, and water from the Mekong spreads through floodplain forest. As water levels peak, flow velocity increases in the prek and and water levels recede in the forest.

As the Mekong passes into Cambodia it flows over Khoné Falls, experiencing an elevation drop of 21 m. Within Cambodia, the Mekong has a variety of characteristic forms. It enters Cambodia from Laos as a large upland river with alternating rapids, deep pools and scattered sandbars (Fig. 3). At Stung Treng, the Mekong meets with Tonlé San, which carries the water draining from as far away sometimes called the Se San or even Sekong, as southern Laos and the central highlands of Vietnam. Most of the streams in this area flow through relatively intact forest ecosystems and have low silt

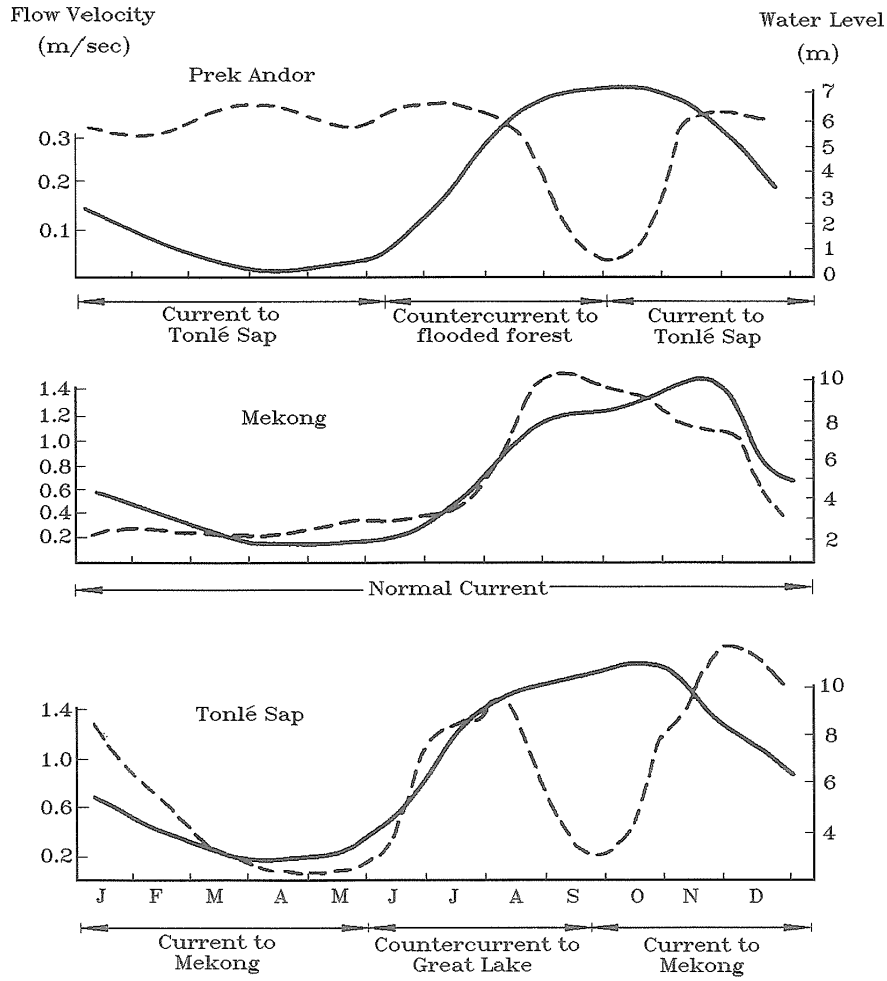


Fig. 2. Annual cycles of water levels (solid lines) and flow speeds (dashed lines) by month for three rivers or streams in Cambodia (after Shiraishi, 1969).

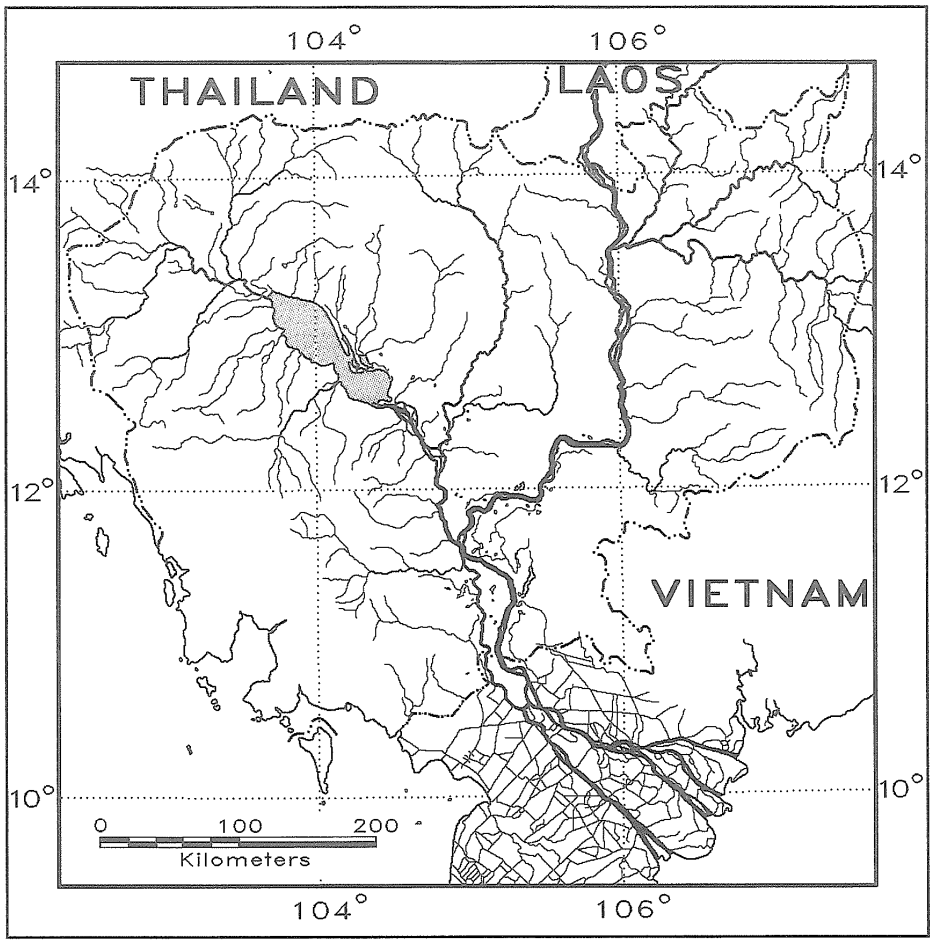


Fig. 3. Cambodian reaches of the Mekong River.

load, resulting in transparent blue water. The Mekong maintains its fast upland form until it reaches Kratié, where it begins to slow. At Kratié, river flow records indicate that the seasonal discharge of the Mekong has a ratio of 53.6 (rainy season maximum / dry season minimum). This seasonal flow change is much more pronounced in the Mekong than in any other great river in the world (Welcomme, 1979).

After passing Kratié the Mekong makes a 90° westward turn and reaches Kompong Cham Province in central Cambodia where the transition to a lowland form is completed. By then, the Mekong has developed a broad meandering channel and numerous oxbows. Although the oxbows and swamps are indicated on maps, the full impact of the meandering nature of the lowland Mekong only becomes apparent from well above the land surface. When flying over the lowland Mekong floodplain, the former channels can easily be recognized by their sharply outlined property lines, tree rows, footpaths, and roads, all indicating former river banks.

In south central Cambodia, the Mekong joins with the Tonlé Sap. The Tonlé Sap is the outlet of the Great Lake, which is situated at the upper end of the huge floodplain (70 000 km^2) of the lower Mekong. During the dry season, the lake has a maximum depth of about 3.6 m whereas during the flood season the depth increases by more than 10 m and the Great Lake expands from 2 520 km^2 to 15 780 km^2, inundating ten times the area that it covers during the dry season. In this period, thousands of square kilometres of floodplain forests are submerged in one of the most productive seasonal aquatic habitats in the world. In some areas the floodplain forest is rapidly being cleared for agriculture, in others it is virtually pristine. For most of the year, the Mekong and the Tonlé Sap flow directly to the sea, but during the period of rapidly rising water the Mekong rises faster

than the Great Lake and Tonlé Sap, causing the flow in the Tonlé Sap to reverse direction towards the Great Lake. Thus the normal outlet of the Great Lake becomes the entry point for the Mekong flow causing the formation of an inland delta as water enters the lake and particulate matter settles out. The Great Lake always has turbid water, even during the dry season when less water is being discharged into the lake by the feeding rivers, largely because of wave action over the shallow bottom of fine-grained sediments. As the Mekong flood crests and water levels begin to decline the direction of flow in the Tonlé Sap changes and the combined Mekong and Tonlé Sap flow out to the South China Sea.

The Mekong meets the Tonlé Sap at Quatre Bras and is immediately separated again into two channels, the Mekong (eastern channel) and the Bassac (western channel). Proceeding from Quatre Bras downstream, much of the area between the Mekong and the Bassac consisted formerly of floodplain forest, which has been converted into farmland within the last two decades. As the Mekong and Bassac near the border of Vietnam they become influenced by tidal fluctuations and begin to take on the characteristics of high estuaries which have purely fresh water, but also have current velocity changes due to the changing tides at the river's mouth.

The lowland floodplain of the Mekong, including the Great Lake, produces a major part of the Mekong fishery harvest estimated at a **minimum** of 500 000 metric tons/year (Lagler, 1976).

BIODIVERSITY

The variety of river, lake and high estuary ecosystems support a rich fish diversity, the true scope of which has only recently begun to be understood. As groups of fishes are taxonomically revised, each group nearly always comprises twice as many recognized species as before, and sometimes even more. The total number of species recorded or expected from the Mekong, as inferred from the known zoogeography of Southeast Asia, includes about 1 200 species. This number will undoubtedly increase as additional taxonomic studies and fish surveys are completed. For Cambodia alone, nearly 500 species have been included in this field guide, but the actual number is certainly greater, and perhaps even much greater.

It is impossible to include all the species that occur in the Cambodian Mekong in a work such as this. Indeed, many rivers and other water bodies have never been visited by an ichthyologist. The degree of endemism is unknown, but is expected to be high in the upland areas of the northeast as well as in the mountains that border Thailand and the Gulf of Thailand. By contrast, much of the Great Lake floodplain is expected to lack localized endemism, although headwaters of tributary streams may have distinctive isolated species. Although doing an exhaustive study on the entire fish fauna of Cambodia is not possible without fielding several research teams on a multi-year survey, it is possible to cover 99% of the species a fishery scientist might be expected to encounter. This would certainly satisfy the main intent for the field guide, which is to give Cambodian fishery scientists a reliable foundation for their studies.

Most species of fishes in Cambodia are exploited in one way or another, except for some of the most diminutive which could easily be exploited for the international aquarium trade. Any species large enough to be caught by standard types of fishing gear are used for food for humans, domesticated animals or cultured fish.

BIOGEOGRAPHY

For more than a hundred years, Southeast Asia has been a focus of great biogeographical interest. Although a similar phenomenon of expansion and compression of ranges of plants and animals occurred on the North Sea shelf of Europe, the great diversity of the tropical Asian fauna makes Sundaland the classic example of continental shelf dispersal of terrestrial forms during sea level retreat. In essence, freshwater aquatic faunas also require exposed land. The extended Pleistocene river basins have been a major source of aquatic faunal exchange in only a few places around the world. This presence of a vast submarine bank encompassing three of the greater islands in the Malay Archipelago was commented on repeatedly by the great naturalist Alfred Russell Wallace (1869, 1880) who compared their biota and concluded that the islands must have been connected to each other and to the Asian mainland in recent times. Although the mechanism Wallace proposed for subsidence of these shallow seas was erroneus (he thought the seas sank because of volcanic activity along the outer Sunda arc), the conclusion that islands had been connected to each other and to the mainland is as correct today as it was when he offered it. Further, Wallace was so impressed with the striking patterns of animal distribution in this area that he considered the process of evolution to provide an explanation. The region contains the classic biogeographic boundary known to this day as Wallace's line. The original line of Wallace was based on biogeographical as well as geographical information and was drawn along the easternmost margin of the Sunda shelf (George, 1981). Later studies by Wallace moved the line eastward to include the Celebes (Wallace, 1910). However, Wallace's first line (Wallace, 1863) is the boundary which has the greatest utility for defining the distribution of primary freshwater fishes in general.

Freshwater Fish Biogeography

The first zoogeographic study to examine freshwater fish faunas in relation to the submerged rivers of Sundaland demonstrated the faunal simi-

larity of rivers belonging to the same Pleistocene basins (Weber, in Molengraaff and Weber, 1921). Weber also commented on the faunal differences between the Mahakkam River of the east coast of Borneo, and the Kapuas River of the west coast of Borneo, noting the similarity of the fish faunas of the Kapuas River and the Moesi River of Sumatra. Other authors, such as Krempf and Chevey (1934) examined the distributions of fishes from the Indochinese Peninsula, which were compared to the fish distributions of Sundaland. An important discussion of fish distribution in Sundaland was given by De Beaufort (1951) in a book that reached a broad audience, and provided many students with their first exposure to the drowned river basins of Southeast Asia. Inger and Chin (1962) provided a biogeographic discussion of the freshwater fishes of North Borneo and of Borneo in general. Banarescu (1972) pointed out the pronounced differences between the East Asian fauna and the Southeast Asian fauna, and mentioned that the fish fauna of the small coastal drainages of Annam Cordillera resembled the fish fauna of East Asia rather than of Southeast Asia.

Taki's (1975, 1978) studies of biogeography of the Mekong River fishes produced some important generalizations about the fish faunas of the middle and lower Mekong, the Chao Phrya and the Greater Sunda Islands. Taki found that the non-ostariophysan fauna of the Mekong was comprised of widespread species of Southeast Asia, and that almost all genera were shared between all four areas. The siluroids and cyprinoids demonstrated two different patterns of distribution, upland and lowland patterns, which were attributed to habitat preferences. The lowland species were found in large rivers and were distributed in the lower Chao Phrya and often in the Greater Sunda Islands. The upland species were found in smaller streams of the middle Mekong and their congeners were more likely to be found in the upper Chao Phrya than in the lower Mekong. Thus, an adjacent river system had greater faunistic similarity to both the lower and middle Mekong than each had to the other.

More recently, Mohsin and Ambak (1983) made a comparative listing of species found on the islands and mainland surrounding peninsular Malaysia. Interestingly, Mohsin and Ambak used the same number of fish distribution zones, but divided peninsular Malaysia into different faunal regions than were proposed by Johnson (1967). Chu (1986) has summarized the zoogeography of China's Yunnan Province, which probably has the greatest fish diversity of any province in China. Chu's diagram of river system relationships among the six major drainages of Yunnan was based on numbers of shared genera. The dendrogram indicated that there were two major units, comprised of three drainages each. One unit was formed by the upper reaches of the Xi Jiang (Nampan Jiang) which was most similar to the upper Song Hong (Yuan Jiang). This pair of drainages associated most closely with the upper Yangtze (Jinsha Jiang). The second group was comprised of the upper Irrawaddy and upper Salween (Nu Jiang) pair, which paired next with the upper Mekong (Lancang Jiang).

Kottelat (1989) examined the freshwater fish composition of Southeast Asia and adjacent regions, coming to the conclusion that there was no single centre of origin for ostariophysan fishes in South, Southeast or East Asia. He included the species of India, the Irrawaddy and Salween in as Indian fauna. In the Southeast Asian fauna were the fishes of the Chao Phrya, Mekong and Sunda Islands. The Chinese fauna included fishes of China and the Red River of the Tonkin Gulf.

The most recent publication on relationships of river basin faunas (Rainboth, 1991) was a faunal similarity study based entirely on cyprinid genera. The study included all the faunas adjacent to Southeast Asia, the East Asian fauna of China and northern Vietnam, the High Asian fauna of the Qinghai-Xizang Plateau, and the South Asian fauna of the Indian Subcontinent, in an effort to determine how the various parts of the Southeast Asian fauna resembled each other and the adjacent faunas. For that study, it turned out that the faunas of the Sittang and Irrawaddy of Burma resembled the greater Gangetic fauna most closely. The faunas of the Salween and the state of Tenasserim were most similar to the Lancang Jiang (upper Mekong of Yunnan) and belonged, in general, to the Southeast Asian fauna rather than South Asian fauna. The results paralleled Taki's (1975, 1978) assessments that the middle Mekong had a fauna that most closely resembled the Chao Phrya and Meklong of central Thailand. The fauna of the lower Mekong and the eastern Malay Peninsula were also part of this group, although less similar to the middle Mekong and central Thailand than those two were to each other. The fauna of the Perak River of the western Malay Peninsula was most closely related to the fauna of north Sumatra. Central Sumatra was most similar to the Kapuas River of Kalimantan (Rainboth, 1991).

The rich diversity of the Mekong is striking, not only for fishes but also in other groups of aquatic organisms such as mollusks. Studying the distribution patterns of organisms that make up this diversity falls into the realm of biogeography. Biogeography has two components, an ecological component of limiting factors in the environment that we can observe in action over a relatively short period of time, and a long term historical component of evolutionary relationships that link a species distribution to the geographical area where it evolved. In recent years, the study of phylogenetic relationships (evolutionary branching patterns) has led to a re-thinking of biogeographical research. In order to produce more careful experimental procedures that yield results with predictive power, procedures have become more formalized with great reliance placed on evolutionary patterns of the constituent organisms. In Southeast Asia, very few

groups of organisms have had their evolutionary patterns studied and so it is not possible to use some of the recent biogeographical methods. However, it is possible to study current geological information for processes and events that influence the configuration of river basins and ultimately the fish distributions.

Climatic and Geological Processes

The most important aspect in an account of geology as related aquatic organisms is the history of river systems, which provides basic background information about Mekong faunal history. Although normal hydrological processes affect river systems in similar ways all over the world, there are two other classes of processes that have caused localized effects on the configuration of river systems in Southeast Asia. These are climatic processes that result in sea-level change, and tectonic processes that result in shifting, tilting, and other relative movements of parts of the earth's crust. Both of these types of process operate in conjunction with erosional and depositional processes, which are included in the discussion of tectonics and sea-level changes.

The development of extended Pleistocene river basins during periods of sea-level retreat has been important in changing river configurations. The cyclical changing of sea levels during the Pleistocene was the local manifestation of global climatic changes. Hydrographic effects of these changes in sea levels have been strongest on the Sunda Shelf, and biogeographic effects have been strongest on rivers that formerly flowed long distances across the currently submerged shelf. These changes have had a profound effect on fish distributions. Several known events would have caused continuous species ranges to become disjunct. Some events would have made new habitat available. All would have affected the Mekong fauna.

The geological record, particularly the changes that occurred in Southeast Asia during the late Tertiary and throughout the Quaternary, indicates locations where currently disjunct rivers were formerly contiguous. Although considerable information relevant to the history of the drainage systems can be found in the geological literature, no complete treatment exists, most likely because of the amount of information still required to produce a coherent synthesis. Reconstruction of previous drainage basins does not receive high emphasis in the geological literature other than for potential relationships to petroleum and mineral deposits. Early studies of river configurations concluded that modern drainages differ considerably from prehistoric drainage patterns (Gordon, 1882; Gregory and Gregory, 1923). The interest in drainage configurations focused around the courses of Tibetan rivers for which Gregory (1925) offered the comprehensive synthesis of possible and probable stream captures, based on his field observations made with the Percy Sladen Memorial Expedition in northern Burma and Yunnan (Fig. 4). Some of these stream captures are now thought to have been likely, and others still require investigation and confirmation. Not much recent geological infor-

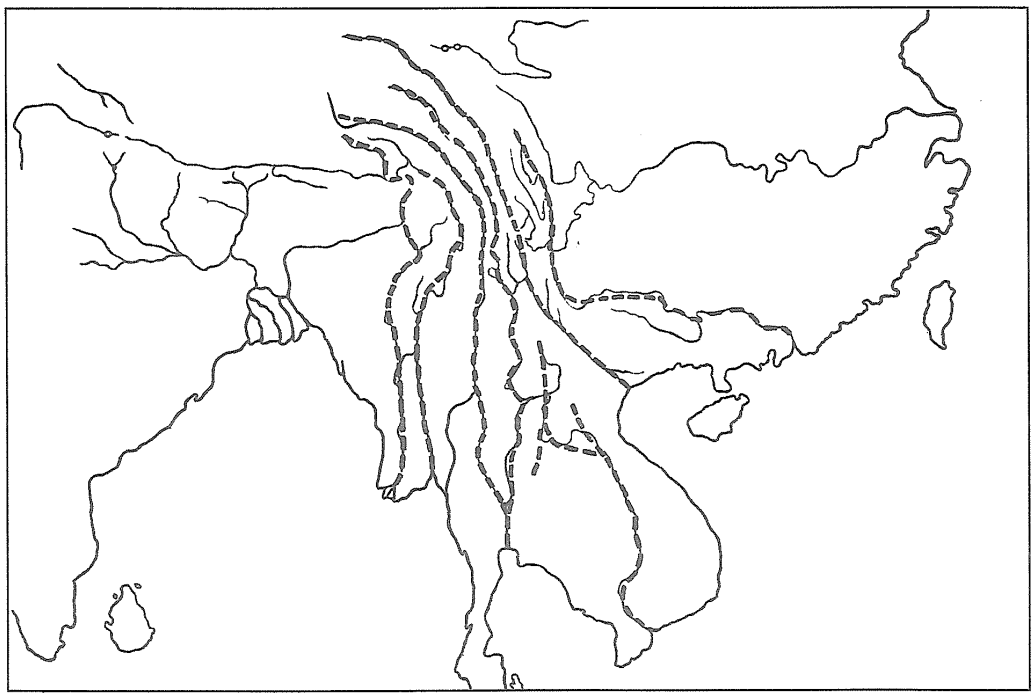


Fig. 4. Prehistoric headwater configurations of Southeast Asian rivers (after Gregory, 1925).

mation has been concerned with river configurations, and remains to be examined in terms of biogeographical significance. Southeast Asia has a complex and fascinating geological history that must be understood before biogeographers can successfully decipher the interplay of historical and ecological components of species distributions. Recent research indicates that changes in drainage configuration have been extensive during the Quaternary alone. Stream captures of various magnitudes have changed river alignments as a result of local tectonic or hydrologic processes. Such events have been very important in Southeast Asia, an area of high tectonic activity during the Cenozoic Era.

Extended River Basins

An extraordinary feature of southeastern Asia is the presence of an extended continental shelf, known as the Sunda Shelf, part of which is currently exposed as a series of large islands, the Greater Sunda Islands, Java (Jawa, Indonesia), Sumatra (Sumatera, Indonesia), and Borneo (Kalimantan, Indonesia; Sarawak and Sabah, Malaysia; Brunei). Molengraaff and Weber (1921) first noted that the entire shelf might have become exposed during Pleistocene glacial periods, and later, Molengraaff (1922) offered a more complete treatise. The extent of continental surface exposure has varied greatly during the Pleistocene, and the shallow sea floor which connects the islands is actually a system of drowned river valleys (Kuenen, 1950; DeBeaufort, 1951). At the present time, sea-levels are 6 or 7 m below their highest levels since the Miocene. The sea has advanced and retreated several times in the Quaternary alone. The most recent rise in sea-levels occurred in the last 17 000 years immediately following the last glacial period and amounts to 120 m (Shackelton and Opdyke, 1973). The extent of change in drainage configurations of Southeast Asia can be demonstrated by examining the present sea-bed topography of the submerged continental shelf, nearly all of which would have been exposed when sea levels were 120 m below the present level (Fig. 5). The most recent cycle of regression and transgression was only one of several, the magnitudes of which have been summarized in detail (Batchelor, 1979). If varying sea levels were the only variable in the shape of the exposed land masses, then attempted reconstructions of past drainage configuration would be fairly simple. However, for Sundaland, much more has occurred. The islands at the outer margin of the Sunda Arc are actively changing in elevation with localized movements such that reconstruction of the exposed surface of Sundaland for increasing lengths of time becomes complicated although attempts have been made (Sibinga, 1947, 1949). This discussion will be confined to the most recent sea-level regression.

The paths of the drowned river basins during the most recent sea regression indicate that rivers on modern islands connected with rivers on other islands. River basins that are discontinuous today were united, not once, but several times, most recently in the Late Pleistocene. The southern side of Borneo and the northern side of Java were drained by the East Sunda River during the Late Pleistocene. The effect of this is very important in terms of distribution of aquatic organisms (Fig. 5). The southern tip of Sumatra shared a drainage with some of the northern Javanese rivers at the easternmost end of the island through the Sunda Strait, which separates Sumatra and Java (Tjia, 1980). The rivers from the western side of Borneo, central Sumatra and the western tip of the Malay Peninsula formed the West Sunda River. In the northern Strait of Malacca, rivers of northern Sumatra and western Malaya took a northwesterly path to debouch into the Indian Ocean.

East of the Malay Peninsula, a great river flowed in the present Gulf of Thailand and South China Sea. This great northern river, here called the extended Chao Phrya, would have drained both the Malay and Indochinese peninsulas (Sawamura and Laming, 1974). During glacial sea-level regressions, the extended Chao Phya flowed over areas with sedimentary deposits of over 12 000 m in depth in the present Gulf of Thailand. Studies of the sedimentation during the glacial sea regressions, have been made (Emery and Niino, 1963; Biswas, 1973; Sawamura and Laming, 1974). These and other studies (Tjia, 1970; Batchelor, 1979) generally relate to Quaternary sea levels in the Gulf of Thailand along the Malay Peninsula. Extended Pleistocene basins of the west coast of Peninsular Malaya may have connected to the extended Rokan or exited independently into the Indian Ocean in the north. Towards the southern part of the same coast the drainage flows instead through the upper reaches of the West Sunda Basin, here connecting to drainages which drain the eastern coast of middle Sumatra. The Muar River which was one of the West Sunda Basin drainages presently has continuous water connection with the Pahang River through Tasek Bera, a swamp drained by headwaters of both rivers (Furtado and Mori, 1982). A detailed description of the history of the Pahang and Muar rivers as well as adjacent rivers which have figured in a series of stream captures has been presented by Morley (1982). Much of the present headwater region of the Pahang River was formerly a part of the Muar River, which would have flowed into the Malacca Strait and possibly would have connected to the Pleistocene Wast Sunda River. Singapore Island and the eastern tip of the peninsula were drained by a river which was eventually confluent with the extended Pahang River, a branch of the North Sunda River.

The present mouths of the Mekong into the South China Sea have recently formed, with the previous mouth being found near Kampot, SSW of Phnom Penh, and its path just east of Phu Quoc Island in the Gulf of Thailand (Fontaine and Work-

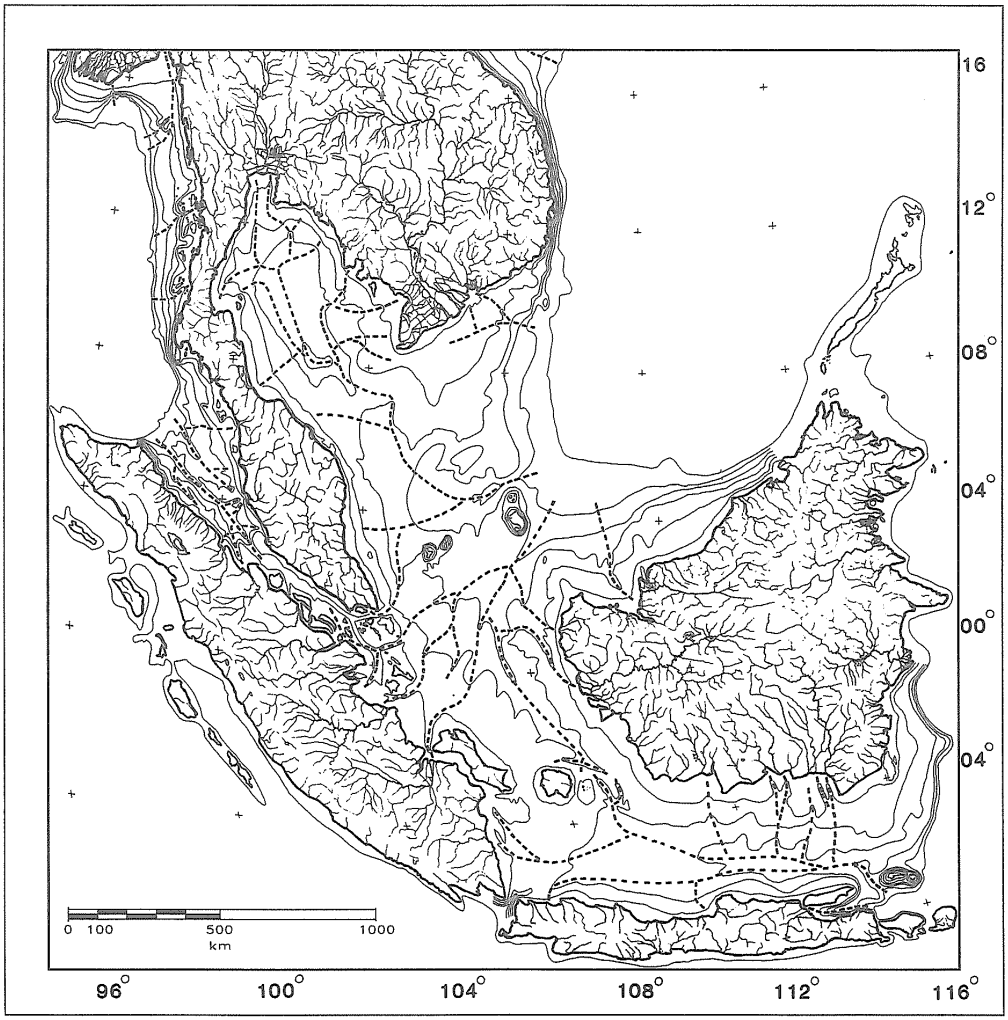


Fig. 5. Extended Pleistocene river basins. Depth contours are plotted at 20, 40, 60, 80, 100 and 200 m. Heavy dashed lines follow the routes of the extended river basins that were exposed when the seas retreated during glacial periods. The dashed lines extend outward to the 120 m isobath, or to the depth of the most recent sea regression. In some places where the shelf margin is abrupt, only a single isobath at 200 m is plotted (after Rainboth, 1996).

man, 1978). Therefore, the close proximity of the Dong Nai and the Mekong deltas is a relatively recent configuration. It is likely that the subsided mountains of the southern tip of the Indochinese Peninsula had river courses independent of the Mekong and the last remnants of their faunas may be found in the Dong Nai or perhaps in the small coastal drainages of the Cardamom Range of Cambodia.

Geological Processes

To cover the middle and lower Mekong, this discussion will begin at the upstream end and move progressively downstream to Cambodia and the Mekong delta.

Thailand is located at the northern end of the Malay Peninsula, and its central part lies at the juncture of the Malay and Indochinese peninsulas. The Chao Phrya, a large river, is the central drainage of Thailand. In its lower course it is a slow river flowing over a broad floodplain. Four major tributary streams converge to form the Chao Phrya after flowing through a series of parallel valleys southward from the low mountains of northern Thailand.

In tectonic history, central and northern Thailand are of Gondwanan origin, with the entire region forming the eastern margin of a plate called Sinoburmalaya (Hutchinson, 1989). Throughout the Paleozoic, Sinoburmalaya was separated from

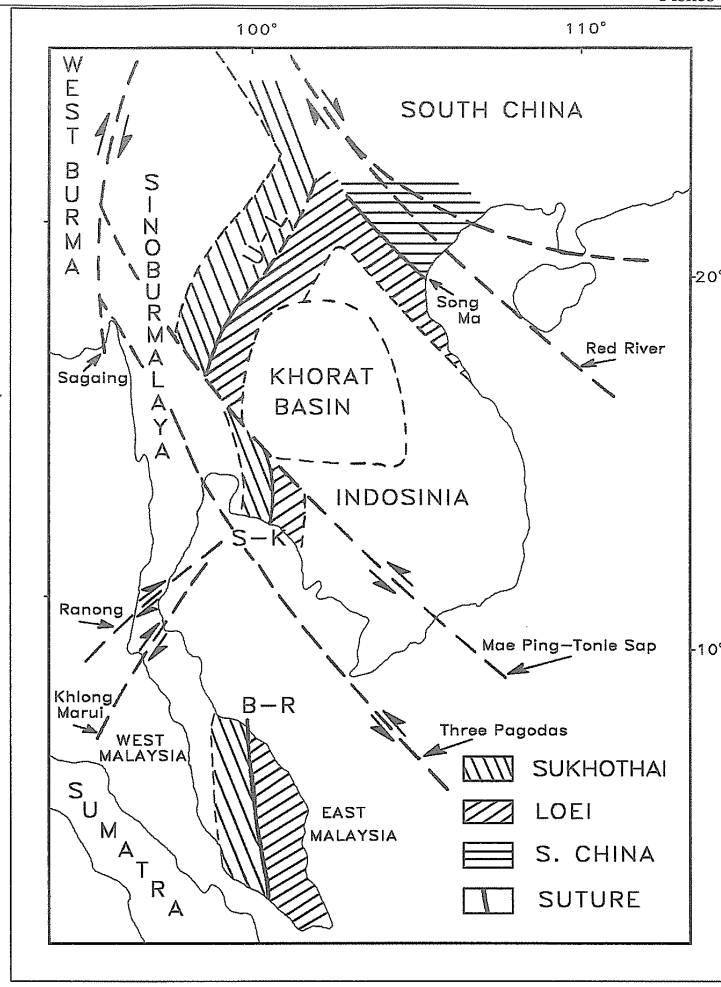


Fig. 6. Tectonic map of mainland Southeast Asia. Arrows on dashed lines show the direction of plate movement along a fault. Heavy solid lines indicate ancient suture zones. Hash marks indicate the different origins of the former plate margins (adapted from Hutchinson, 1989).

Indosinia (now the Indochinese Peninsula) by the Palaeotethys Ocean. The eastern boundary of Sinoburmalaya runs along a line extending from Uttaradit, Thailand to Luang Prabang, Laos (Fig. 6). The collision of Sinoburmalaya with Indosinia during the Lower Mesozoic resulted in the Indosinian Orogeny, a mountain building event that produced the uplifted area extending up the Malay Peninsula through southeastern and central Thailand. The same collision created a suture zone running along the Uttaradit-Luang Prabang line, extending southward through central Thailand and the Cardamom Range of Cambodia. Ancient suture zones that weld continental plates also tend to remain as zones of crustal weakness and can be re-activated to produce various types of faulting if other movements place pressure on them. During the Cenozoic, forces from the uplift of the Himalayas caused movement along these ancient sutures, with the mountain building and block faulting throughout northern Thailand and along the margin of the Khorat Plateau, respectively.

The mountains and hills of northern Thailand and Laos fill the space between the eastern face of the Shan Plateau and the western part of the Indochinese Peninsula. The mountains run on a north-south axis, and the valleys separating them are drained in the north by the Mekong and in the south by four large rivers which converge to form the Chao Phrya in central Thailand. The course of the Mekong in Laos has taken a path in the easternmost of these parallel valleys. The river valleys pass through several major Tertiary-Quaternary sedimentary basins, some of which have sediments of 3 km in depth. There has been considerable movement of these ranges during the Quaternary which has resulted in the tilting of one basin, deposited in the Pliocene, to angles of up to 45° in northern Laos (Workman, 1972), and many of the Thai basins at angles of 10° to 25° (Gibling and Ratanasthien, 1980). Given the recent deposition and subsequent tilting, it is obvious that the area has been very active in relatively recent times. The upper Mekong probably flowed through the

westernmost of these valleys (Hutchinson, 1989), which would have been a linear continuation of its present path along the Burma-Laos border. Whether or not the upper Mekong passed through any of the other N-S directed valleys before assuming its current path in the easternmost valley is not certain, but would not be surprising.

Linearly aligned with the valley of the Mekong in Laos is the valley of the Pasak and Loei rivers of Thailand. The northward flowing Loei River is a tributary of the Mekong whereas the southward flowing Pasak River is a tributary of the Chao Phrya. The headwaters of the Loei and Pasak rivers presently come in close conjunction and are separated by hills of relatively recent (Cainozoic) igneous origin (Fig. 3.3 in Hutchinson, 1989). An early course of the Pre-Mekong drainage may have passed through the present Pasak River valley. Uplift in the region currently separating the two basins may be related to the Late Tertiary-Quaternary tilting of the Khorat Plateau as well as the subsidence of the Chao Phrya valley in central Thailand. The Chao Phrya of central Thailand crosses Tertiary-Quaternary sedimentary basins of 3.5 km to 7 km in depth. These basins occur in the ancient subduction zone between Sinoburmalaya and Indosinia and the process continued during the Quaternary. Further, the Loei-Pasak course is not the only possible path for water to enter the lower Chao Phrya from an earlier Mekong, and additional geological studies would be informative.

The northeast margin of the Mekong Basin is formed by mountains of the Annam Cordillera which form the highlands of Laos and Vietnam. The western margin of these mountains is drained by the Mekong and the southern end by the Dong Nai, which enters the South China Sea through a delta shared with the Mekong.

The geological history of the Indochinese Peninsula has been summarized recently (Workman, 1977; Fontaine and Workman, 1978), and the history of the Indochinese Peninsula has been included in the larger context of Southeast Asia and adjoining regions by Hutchinson (1989). However, a historical summary of river configurations has not been offered, most likely because of the mosaic nature of available geological information. Recent discoveries have added to the knowledge of the region, and all indications show that the history of the Indochinese Peninsula has been complex and fascinating. Changes during and following the Pleistocene have been extensive in the basin of the present Mekong River. An important sequence of stream captures has contributed to the modern configuration of the Mekong, which was not a major river prior to the Pleistocene (Saurin, 1967; Carbonnel, 1972; Workman, 1977). In the middle to upper Pleistocene, the Chao Phrya lost its headwaters to the growing Mekong, and other stream captures occurred near Xieng Khan (Chieng Khan) and Vapi (Fromaget, 1941; Hoffet, 1933). The Khorat Plateau in northeast Thailand changed in elevation and probably inclination during the Pleistocene, and the Cambodian Plain has experienced strong movements accompanied by great lava flows. Consequently, listing documented stream capture sites tells only part of the story.

The Indochinese Peninsula is found on the tectonic unit known as Indosinia (Hutchinson, 1989). This Precambrian cratonic block extends from the continental shelf off the coast of Vietnam westward across Cambodia to the uplifted area along the western margin of the Khorat Plateau. The western boundary is the Uttaradit-Luang Prabang Suture to the north and the Cardamom Range along the western coast of Cambodia to the south.

The oldest exposed parts of Indosinia are found on the Annam Cordillera, extending from upper Cochin China, along the Laos-Vietnam border, and into upper Laos. A large part of the mountain range is a formation known as the Kontum Massif, a Precambrian granite, and one of the first parts of the southeast Asian continental crust to form. The Kontum Massif has been dated as Early Proterozoic and possibly Archean, dating back 2300 Ma. This mountain range, known as the Annam Cordillera, has grown by the subsequent uplift of additional formations to the north and south of the original uplift. To the south, underlying the heavy Quaternary sediments of the Mekong and Dong Nai deltas may be Precambrian basement, as indicated by small exposed inliers projecting through the sediments in Cambodia (Saurin, 1959). Deeply covered areas of the Mekong Delta have sediments 3 to 5 km in depth, and magnetic anomaly maps suggest strong relief of the basement surface. Interestingly, Tertiary sediments have not been found on the shallower basement of more stable areas bordering the delta, indicating that the subsidence of the delta may have occurred during the Neogene (Bosum and Kind, 1971). Deeply subsided areas of the Vung Tau Basin are filled with coarse Eocene sediments (Le, 1986). The continuous subsidence of the deepest parts of the basin, now offshore, shows an alternating pattern of freshwater and marine periods most likely relating to changing sea-levels during the Cenozoic. The subsidence of the delta formed a sedimentary basin that would have had an independent river system prior to its inclusion within the Mekong system (Fig. 5). This independent river system would have had its own exit into the South China Sea during periods of sea retreat, being separated from the subsiding Gulf of Thailand Basin by the Khorat Swell and the Con Son High (Parke et al., 1971).

Another mountain range found on this peninsula forms the eastern margin of Indosinia. This western range is composed of the Luang Prabang, the Petchabun, the Chantaburi, and the Kampot fold-belts. Prior to the opening of the Gulf of Thailand in the Cenozoic, these mountains were contiguous with the mountains of eastern Malaysia on the island of Borneo. They continue southeastward out into the Gulf

of Thailand and South China Sea and have subsided to the point where they form the Khorat Swell covered by shallow sediments, passing through Natuna Island and eventually reaching the northwestern coast of Kalimantan (Parke et al., 1971). The mountain ranges are remnants of folding zones which were most active during the Permian-Jurassic Indosinian Orogeny.

The north-central part of the Indochinese Peninsula is composed of the Khorat Plateau, a large, generally flat plain. The Khorat Plateau has three major sedimentary basins which were originally formed by Mesozoic continental-lagoonal deposits. These deposits were laid down during the change of the land from shallow marine habitat to freshwater. For many years, the Khorat Plateau was thought to be a stable Mesozoic sedimentary basin that had retained its Mesozoic landforms, but recent studies have cast doubt on that interpretation.

There has been a great deal of Quaternary tectonic activity on the Khorat Plateau and the Cambodian Plain, causing an alteration of river drainage patterns. Their movements have been accompanied by great lava flows as internal parts of the Indochinese Peninsula buckled and the southernmost tip of the peninsula sank (Fig. 7). The series of lava flows scattered along the southern margin of the Khorat Plateau, just north of the Dangrek Range separating Thailand from Cambodia, occurred during the lower to middle Pleistocene. The largest flow at this time occurred just off the southeastern corner of the plateau and formed the Bolovens Plateau in southern Laos directly beyond the mouth of the Mun River in the Mekong and along an east-west trending synclinal axis running through the center of the Khorat Basin (Workman, 1977). The Bolovens Plateau rises some 1.2 km above the surrounding valley floor and has a maximum elevation of over 1.7 km. This basalt outcrop has dimensions of 100 km in least diameter by 125 km in greatest diameter.

These lava flows near the present exit of the Mekong from the Khorat Plateau make for some interesting observations about the erosional history of the plateau. The current flat appearance of the Khorat Plateau is due in part to extensive aeolian sedimentation that occurred during particularly dry times in the Quaternary. The flat surface covers complex bedrock topography. The Khorat Plateau has an average elevation of 150 m above sea level. The central part of the Mun River, at an elevation of 120 m, crosses a deeply incised mature river valley that is now filled with of 150 m of Quaternary sediments (Löffler et al., 1983). Other deeply incised valleys covered by recent sediments on the Khorat Plateau indicate that the generally flat appearance of the plateau is a recent feature in an area which had a pronounced relief prior to and during the early Pleistocene. In some instances, deeply cut channels that are now filled with Quaternary sediments may not be evident from current drainage patterns. For instance, a filled channel of a relatively minor, and now intermittent, stream in Khon Kaen Province was cut 140 m below the surface to a depth of just over 18 m above the present sea-level (Dheeradilok et al., 1983). Such valleys, which are not merely narrow gorges, can be cut well below the present sea level during periods of lower sea levels. However, obstructions such as the lava flows across the entire river bed near the mouth of the Mun or the presence of Khoné Falls would prevent the formation of such a valley.

The actual direction of Mun River flow prior to the lower and middle Pleistocene is not known. The present drainage pattern of the Mun River and its tributary streams forms a pattern converging to the southeastern corner of the Khorat Plateau. However, the upper reaches of these same streams form a pattern converging to the southwestern part of the Khorat Plateau, perhaps suggesting a previous drainage configuration. If such a realignment has occurred in the southern part of the Khorat Basin, it would not be surprising to find that the northern part of the Khorat Basin, where the Mekong proper flows was an independent basin flowing into the Chao Phrya through a valley in the Petchabun Range to the west of the Khorat Plateau. At this time the lower and upper basins of the Khorat Plateau may have been independent from each other and the modern lower Mekong.

Downstream from the Khorat Plateau, the present-day Mekong River passes over Khoné Falls and enters the great Cambodian Plain. Several changes in paths of major rivers across the Cambodian Plain during and since the Pleistocene have been noted (Carbonnel, 1972; Carbonnel and Saurin, 1975). The lower and middle Pleistocene was a period of tectonic activity in the Cambodian Plain. A series of lava flows across southeastern Cambodia ending at about 0.6 Ma indicate the presence of a the upper margin of a fan-shaped fault system, which may have been instrumental in allowing the southern part of Cambodia and Vietnam to subside. Although illustrated as a single fault, the Mae Ping-Tonlé Sap Fault (Fig. 6), the system is actually fan-shaped with the illustrated fault at its center (Carbonnel, 1972). The mountains that formerly connected the Annam Cordillera with the central mountain range of the island of Borneo at the end of the Mesozoic have separated and subsided to the extent that only the uppermost tips of some of their peaks form inliers breaking through the surface of the soil of the Mekong floodplain, or form granitic islands such as Hon Con Son off the mouth of the Mekong.

Much of the Mekong below Khoné Falls (Fig. 7) flows through a very young channel, and the river is known to have had major course changes during the Quaternary and only recently assumed its present configuration. The Great Lake of Cambodia is extremely shallow, nearly all of it less than 3 m depth during the dry season. The Great Lake was formed by the most recent subsi-

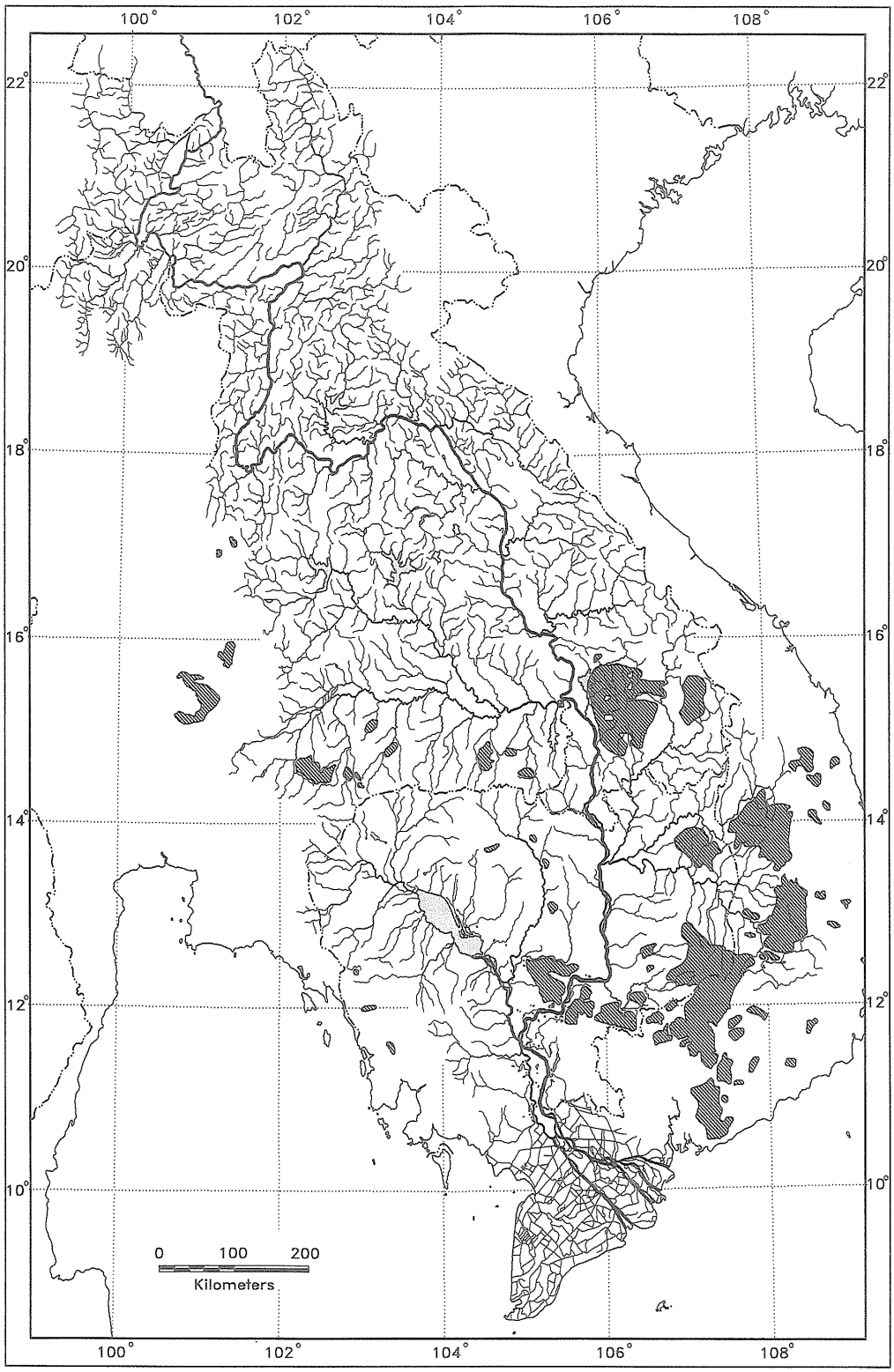


Fig. 7. Quaternary basalt outcrops in the Mekong basin, indicating some of the most recent known lava flows.

dence event of the Cambodian platform 5720 ± 130 years ago (Carbonnel, 1963). That event was relatively minor and was not accompanied by any lava flows. The conformation of the land has changed very much since the early Pleistocene and it is entirely possible that the large prehistoric river which flowed down the Stung Sen may have looped around through the Tonlé Sap (river of the Great Lake) and exited the land through the upper Gulf of Thailand or that a large river may have flowed along the southern face of the Dangrek Range before proceeding to the upper Gulf of Thailand (Carbonnel, 1972). The Khorat Plateau may have had its main drainage pass through the present Great Lake channel or through a separate outlet to the upper Gulf of Thailand without passing through Cambodia at all.

As mentioned earlier, the mouth of the Mekong has shifted to its present position recently from just east of Phu Quoc Island in the Gulf of Thailand (Fontaine and Workman, 1978). This event may have occurred during the warm period known as the "climatic optimum" which occurred after the most recent glaciation. During that period, sea levels rose to their highest levels since the Miocene and would have inundated the entire Mekong delta and much of the lower Mekong downstream from Quatre Bras allowing the river to find a quicker route to the sea. The new route would have been maintained as the river cut new channels and periodic floods deposited sediment to fill in the old channel.

Aquatic Biodiversity

This extensive re-alignment of drainage configurations, much of which has occurred very recently, geologically speaking, has mixed formerly isolated species assemblages repeatedly. This scenario can be expected to produce a high biodiversity. For purposes of comparison, the Mekong has about 1 200 species of fishes compared to the Amazon's 3000, although the Amazon, because of its magnitude, is larger in discharge and is many times the size in the basin area. Thus, the Mekong and other rivers of Southeast Asia have been able to repeatedly incorporate diversity that has evolved in distant areas.

FISH IDENTIFICATION

Cambodia has a particularly rich fishery literature, dating back to the early part of this century (LeClère, 1901; Caillard, 1905; Durand, 1915), no doubt due to the extraordinary importance of fish and fisheries to the Cambodian people, their culture and the economy. Nearly all of the fishery literature relates to the Great Lake and floodplain of the lower Mekong. The most important of these were produced by Chevey and La Poulain (1940), Blache and Goossens (1954) Bardach (1959), Fily and Aubenton (1964), Lloze (1964) Shiraishi (1969), Lagler (1976), the Mekong Secretariat (1992), and Csavas et al. (1994).This fishery literature can provide a great deal of information about the fishes, but relatively few fishery publications will actually help someone identify anything other than the largest and most valuable species.

To help field guide users identify valuable species and their possibly less important relatives, nearly all species of herrings and anchovies, carps and minnows, loaches, catfishes, as well as spiny-rayed fishes, flatfishes and puffers have been included in the present work. Members of all these groups are used commercially. Some groups, such as gobies, are treated in less detail, because their identification has always been so difficult that records are often not trustworthy. However, even with gobies, an attempt has been made to include at least the most important members of most of the genera that are expected from the lower Mekong, and particularly from the Mekong delta.

The present field guide is partly a compilation from published sources, and partly an original contribution by the author. Efforts have been made to use the current taxonomy, where the taxonomy appears reliable. The seminal reference for this region appeared fifty years ago, *The Fresh-Water Fishes of Siam, or Thailand*, by Hugh M. Smith (1945), which is now extremely dated and increasingly obsolete. That monograph had a major shortcoming in the author's unfamiliarity with the early French ichthyological literature and reference specimens housed in French museums. This problem has been alleviated in the past ten years largely through the efforts of Maurice Kottelat, Tyson Roberts and Petru Banarescu. Beyond them, there are numerous other recent contributors as well as works dating back two centuries. For instance, it is not possible to study Southeast Asian fish diversity without becoming familiar with the published works of the great Dutch ichthyologist Pieter Bleeker. These have been reprinted in the last two decades and are now widely available. The massive amount of taxonomic literature written by Bleeker was simplified, re-organized and enhanced in the eleven volume *The Fishes of the Indo-Australian Archipelago*, by Weber and De-Beaufort. More recent information on Indonesian species that have ranges extending into Cambodia appears in Kapuas River study by Roberts (1989). For aspects of the Indochinese Peninsula, several publications by Kottelat (1985, 1989, 1990) have been extremely useful. Many other publications have also been consulted and these are cited at the end of this book. For FAO English names, the American Fisheries Society list of important world fishes has been followed wherever possible. For many small fishes, the aquarium trade literature has furnished a variety of potential names, and some of the better aquarium fish literature (Linke, 1991) was found to include excellent biological information.

Biological information about the species in this guide came from many sources, some already mentioned, with other important sources being Bishop (1973), Heckman (1974, 1979), Taki (1978), and Vaas (1973). Extensive fishery literature from Southeast Asia was also consulted.

The first drafts of the guide utilized exclusively published illustrations, particularly those in Smith (1945), Fowler (six de Schauensee Expedition papers, 1934-1939), Weber and de Beaufort (1911-1962), as well as those used in numerous shorter papers. Several illustrations have subsequently been replaced by figures drawn from photographs from the literature, or from field photos by the author.

A BASIC INTRODUCTION TO TAXONOMY

A **species** is a **population** or **series of populations** of similar organisms that are able to **interbreed**. Failure to interbreed is the property that keeps species separate. This may be because the species live in separate areas and never meet, or it may be due to genetic isolating mechanisms that cause infertility. In some cases, different reproductive behaviour may inhibit mating between individuals of separate species. In other cases, hybrids may be found in wild populations, but they are sterile or have reduced fertility.

At the outset, it is often not possible to determine whether or not individual fishes belong to reproductively distinct populations. In all cases where a taxonomist recognizes distinct species among an array of generally similar fishes, the decision is made on the basis of observed regular differences between the forms coupled with a lack of intermediate individuals. Standard procedure is the search for regular predictable distinguishing **characters** that differ to a greater or lesser degree from those shown by other species. The differences are sometimes very slight, but if they are consistent between populations they indicate that members of the populations probably do not interbreed. If the populations are found together and no physically intermediate individuals can be found, they are probably different species. If they live in different areas it is possible that they are **subspecies** that would interbreed if they had the chance to do so, but we will never really know unless we find them together. In the Cambodian Mekong, there is a large continuous body of water that would allow most species to come into contact at least occasionally, so that populations with a different appearance than other populations will probably turn out to be distinct species unless the differences are due to some sort of local effect of water quality (e.g., water clarity, hardness, or acidity).

Although the practice may seem simple, it can become complex very easily when the problem involves more than two species and one of them appears to be intermediate to the remaining two. Among the Mekong species there are problems involving all levels of difficulty. Some species distinctions can be made only on preserved specimens with the aid of a magnifying lens or even a microscope. Until more is known about potentially subtle color differences on living individuals, it will not be possible to identify them precisely to the species level in the field.

Taxonomy and Species Identification

Taxonomy is the practice of naming things. Whenever a taxonomist gives a name to something he classifies it so that information about it can be passed on to other people. Many biologists, particularly ecologists, fishery scientists, etc., identify fishes every day as they pursue their studies. This practice of identification differs substantially from the practice of classification. Typically, someone who identifies fishes as part of another study is simply using the latest taxonomic information without really attempting to learn and decipher two centuries of often hopelessly confusing and contradictory literature. Although many people identify species, very few actually practice taxonomy; that is, classify species in such a way that it improves the chances for future investigators to identify the same species correctly.

Rules of nomenclature

These rules play a part in every name that is chosen for use in any taxonomic publication. Of course, they also play a part here and will figure in the discussion of choices that have been made here for the use of some generic names, as will be explained later.

The choice of scientific name for an organism follows the **Law of Priority** based on the earliest published description of the species. This is the basic operational procedure for all taxonomic practice. In proper taxonomic works, the scientific name includes the name of the original author of the name following the genus and species, e.g., *Pangasius sanitwongsei* Smith, 1931. If the author's name is in parentheses, then the modern generic name being used is not the one that the original author used. In most publications it is sufficient to include the author's name the first time a species is mentioned. Further, when a scientific name is first mentioned it is given in full but later the generic name can be abbreviated (e.g. to *P. sanitwongsei*), as long as the generic name abbreviation is not used to begin a sentence. Nowdays, there is an increasing trend to include the date of the first publication following the author's name.

Name: The name should be in Latin or Greek, or be a latinised form of a name. No generic name that has already been used for another animal group may be used unless the species being described falls into that group. A name already in use for another group is said to be **preoccupied**. A specific name that has been used in one genus may be used for a species in another genus. A

generic name that has been proposed for a species and later placed in synonymy remains **available** for that species if further revision shows that it does not belong to the newer genus.

Publication: A name is only valid if, when it is first published, it is accompanied by a description and diagnosis that serve to separate it from related forms at the same level of classification. An illustration alone is not sufficient. If this is not done it is a *nomen nudum* and the same combination can never be used again.

Type: When a new species is described, a **type specimen** must be provided and deposited in a recognized collection where it can be kept and properly cared for. If it is difficult to recognize species from their descriptions or diagnoses, the type specimens must be examined since the names are based on these. There are a number of kinds of types, the most important of which are the following:

Holotype: a single specimen selected by the author as the holotype, or the only specimen known when the species was described.

Paratypes: a set of specimens used, with the holotype, in drawing up the original description of the species.

Syntypes or **Cotypes:** a series of specimens used to draw up the description and from which no holotype was selected.

Lectotype: a specimen selected by a later worker from the syntypes or cotypes to become the official type specimen. If a picture was published with the original description the lectotype should, if possible, be the specimen that was illustrated.

When a new generic name is proposed a **type species** must be nominated and the generic name remains with this species in any revision, although it may be replaced by an earlier name and then becomes a **synonym**.

Priority: The name that was first given to a species or genus is the one that is officially recognized unless the species is considered to belong to another genus. Subsequent names are **synonyms**. Sometimes an earlier name is found, even though a more recent name is better known, but the original must still be recognized. This has happened for the rainbow trout, which was first named *Parasalmo mykiss* but this name was overlooked in the western hemisphere where it was known as *Salmo gairdneri*. It is now included in the genus *Onchorhynchus* as *O. mykiss*.

Generic names also have priority and must be unique within the animal kingdom. Each generic name has a type species. It is designated when the generic name is used for the first time and becomes **available** for later use. A genus takes the oldest available name that applies to one of its members. If a group, formerly believed to be a single genus, is later divided among a number of other genera the original generic name should remain available with the type species of the genus.

Taxonomic Problems with Mekong Fishes

Invalid name (*nomen nudum*): In 1975, Paysan published the English translation of his original German text aquarium book (Paysan, 1970). In this publication, he provided a species of loach with the name *Botia pulchripinnis*, listing in the text the characteristic number of barbels, which happens to be the same for all species of the genus *Botia*. Together with the name he published a photograph. Prior to 1931, this indication of species would have constituted a valid description. However, subsequent to 1930, publishing an illustration does not constitute an **indication** that can be used in the absence of a description that will distinguish the species. Therefore the species included in Paysan (1975) cannot constitute a valid description and the name becomes a *nomen nudum*, rendering it permanently unavailable. This is unfortunate, because the species remains undescribed.

Priority: An example of difficulties posed by poorly described genera occurs with the cyprinid genus *Dangila* Valenciennes, 1842. In 1945, Smith applied an older name *Labiobarbus* van Hasselt, 1823, to this genus. Since then, various authors have used one or the other of these two. Kottelat (1987) explained his choice to use *Labiobarbus*, but later Roberts (1989) chose *Dangila*. When van Hasselt (1823) described *Labiobarbus* he simply stated that it had 4 barbels and a non-spinous first ray in the dorsal fin, making it intermediate between *Labio* (sic) and *Barbus*. Therefore, he chose to name it *Labiobarbus*. The two species he included in this genus were *nomina nuda*, so those names were not available. However, the rather simple description presumably would make the generic name available as pointed out by Kottelat (1987). The problem is that van Hasselt clearly misspelled *Labeo* Cuvier, 1816, once while forming the name, and once independently when making the comparison between *Labio* (sic) and *Barbus*. Article 32c, paragraph ii of the International Code of Zoological Nomenclature (ICZN), states that an original spelling is an "incorrect original spelling" if "there is in the original publication itself, without recourse to any external source of information, clear evidence of an inadvertant error, such as a *lapsus calami* or a copyist's or printer's error..." (ICZN, 1985). In this instance, the incorrect spelling was a ***lapsus calami*** based on the fact that van Hasselt believed that Cuvier's genus *Labeo* was spelled *Labio*, which it was not. Van Hasselt attempted to form the generic name correctly, but did not recall the correct spelling. The lapse was in the memory not in the writing. Bleeker (1863) attempted to correct all of van Hasselt's incorrect spellings just as he emended the spellings of *Acantopsis* to *Acanthopsis* and *Acantophthalmus* to *Acanthophthalmus*. With *Labiobarbus* he included the corrected spell-

ing *Labeobarbus* in the synonymy of the species he placed in the genus *Dangila*. According to the Code this would constitute a "justified emendation" therefore the corrected name takes the author and date of original spelling (Art. 33b, paragraph ii). This creates a serious problem on two counts. First, the genus *Labeobarbus* Rüppell, 1836, is a well-known genus of large barbels from Africa and its homonymy with the corrected version of *Labiobarbus* would create problems for a diverse group of species on another continent. Second, the description of *Labiobarbus* was so superficial that it is not possible to be determine that it did not include species we would now place in *Barbichthys*, *Labeo*, or several other of the numerous genera with 4 barbels and a soft first dorsal fin ray. With both of the species included being *nomina nuda*, it is rather difficult to say which Javanese species the names were intended for. Authors have subsequently guessed about the identity of those species, but nobody knows their identity with certainty. In this case, one is inclined to agree with Roberts (1989) to regard the genus as unrecognizable based on the description, making the name a ***nomen dubium***. We then revert to the second potential name applied to this genus, *Dangila* Valenciennes.

HOW TO USE THIS GUIDE

The components of this guide are interrelated and sometimes several sections should be consulted to ensure accurate identifications. It is usually most efficient first to identify a fish to its family level. Often, a quick look at the "Pictorial Index to Families" will be sufficient to identify the family of a fish. Otherwise, the "Guide to Orders and Families" contains the information necessary first to identify a fish to a general category. Once the family is known, in many instances the "Guide to Species" can be consulted to obtain a more accurate identification.

However, for the Cyprinidae and other diverse families the "Guide to Orders and Families" has been enhanced to include lower taxonomic ranks.

These are:

subfamilies, characterized by a

double-lined box

and with names ending in "-inae";

tribes, characterized by a

triple-dotted box

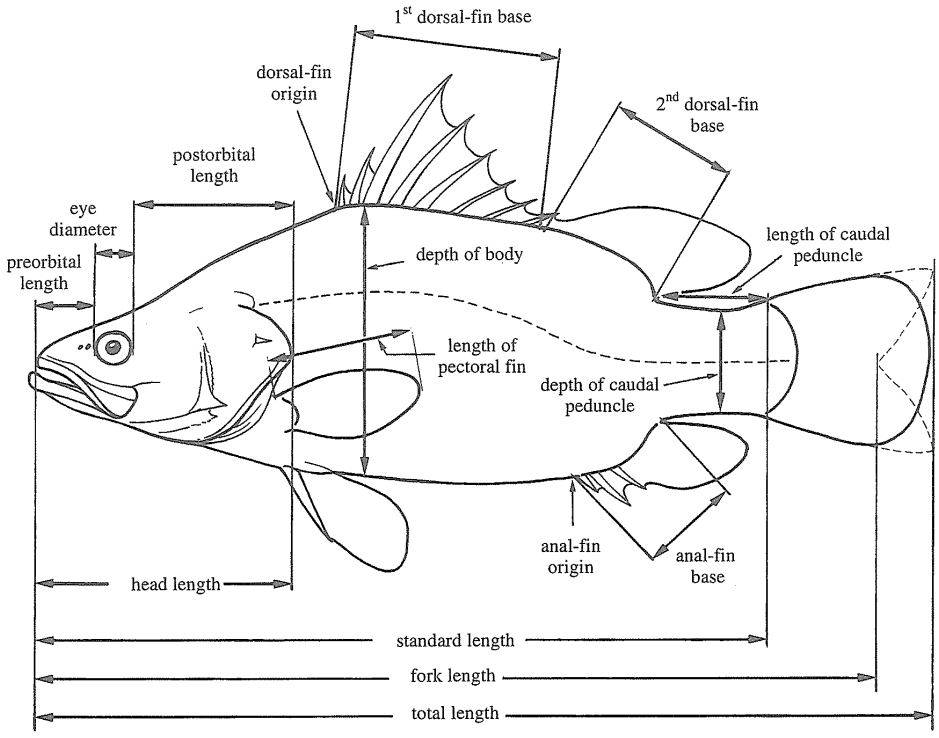
and with named ending in "-ini";

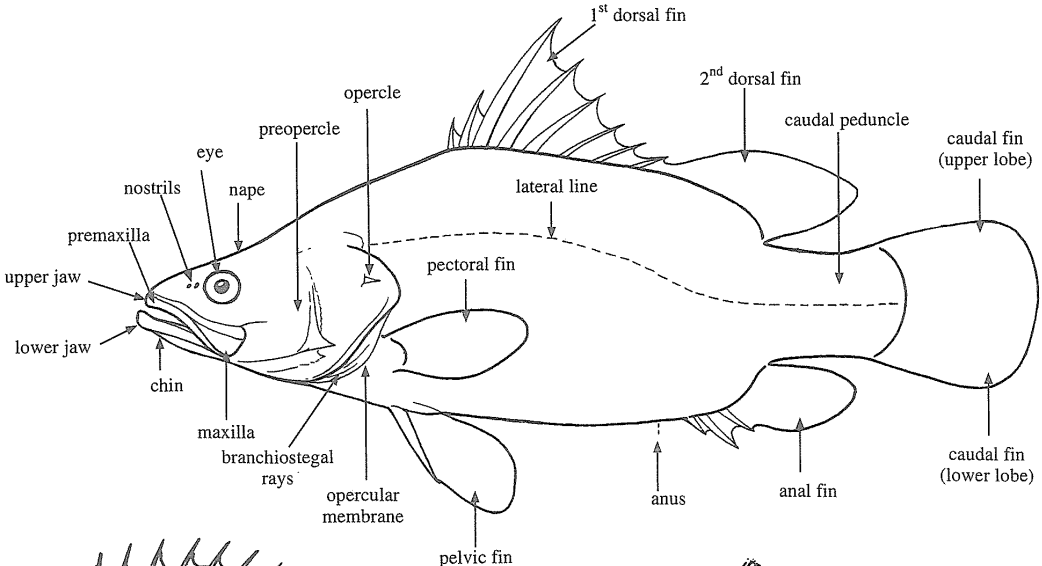
and **subtribes**, characterized by a

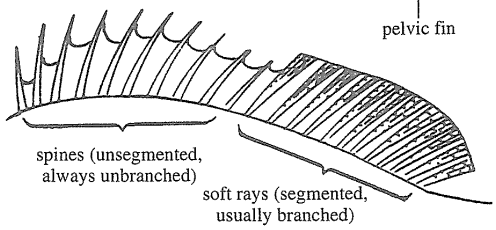
single-dotted box

and with names being the latin plural form of the type genus of the subtribe.

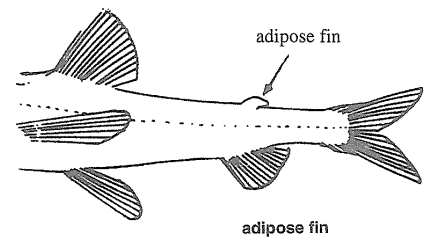
TECHNICAL TERMS AND MEASUREMENTS



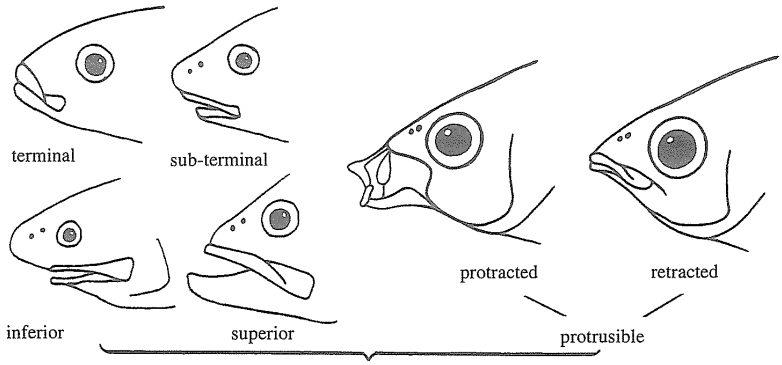




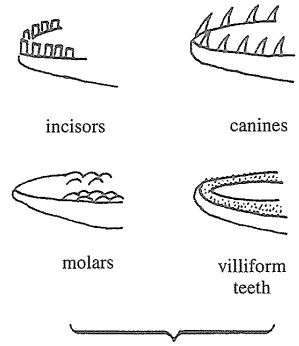
example of a continuous dorsal fin of a spiny-rayed fish



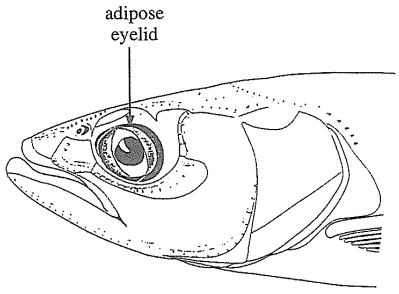
adipose fin (not supported by rays)



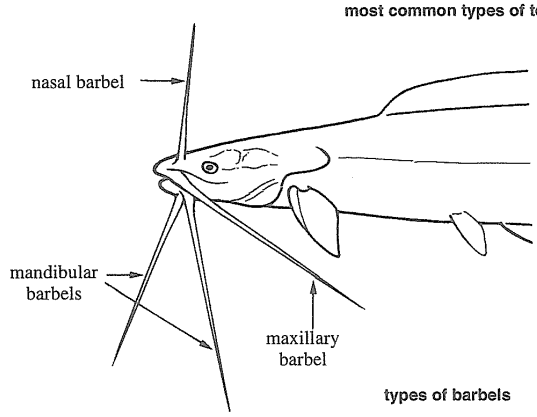
types of mouth



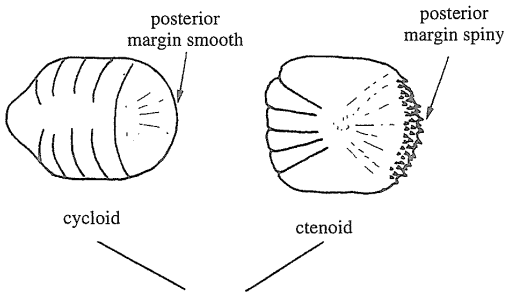
most common types of teeth



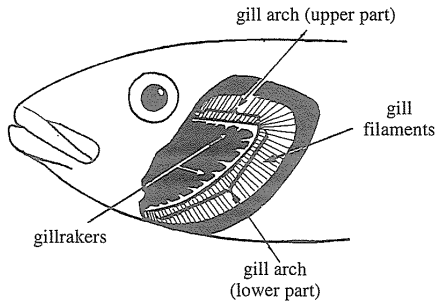
adipose eyelid



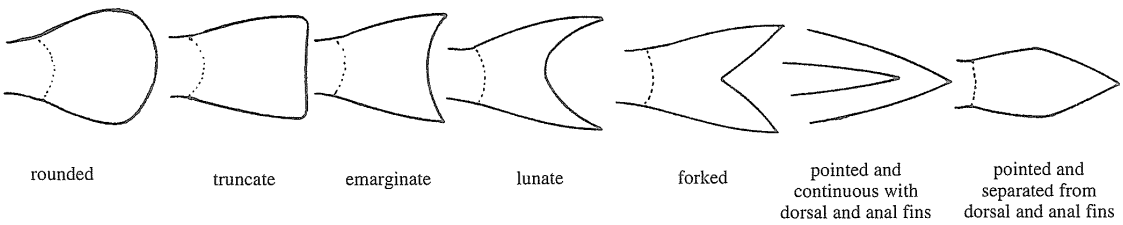
types of barbels



schematic examples of scales



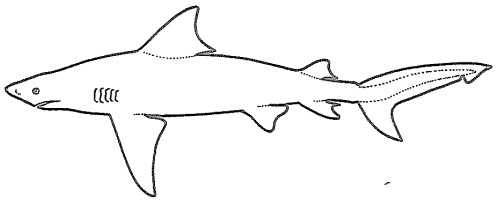
first left gill arch



most common types of caudal fin

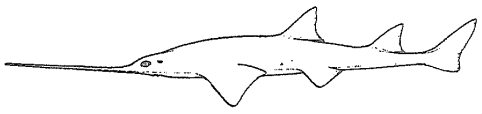
A PICTORAL INDEX TO FAMILIES

SHARKS

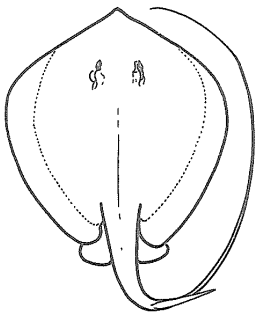


CARCHARHINIDAE p. 51

BATOID FISHES

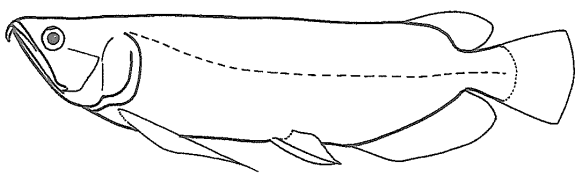


PRISTIDAE p. 52

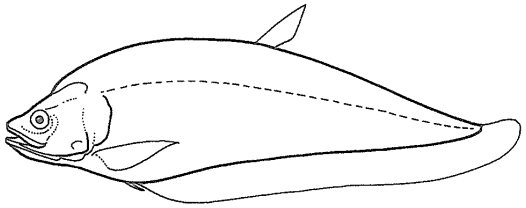


DASYATIDAE p. 52

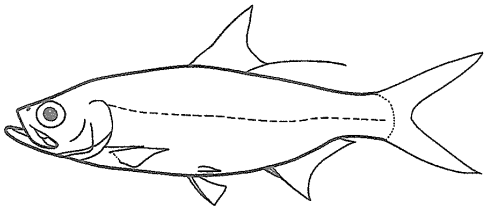
BONY FISHES



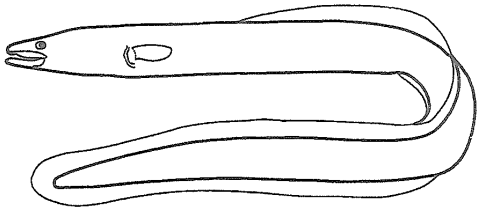
OSTEOGLOSSIDAE p. 55



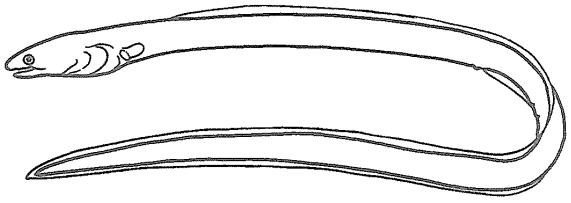
NOTOPTERIDAE p. 55



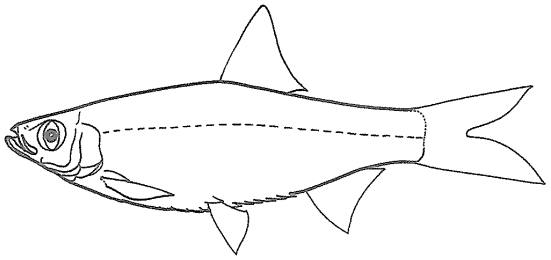
MEGALOPIDAE p. 57



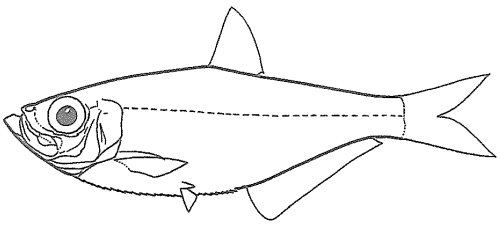
ANGUILLIDAE p. 57



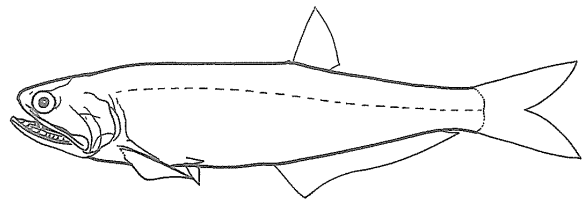
OPHICHTHIDAE p. 58



CLUPEIDAE p. 59



PRISTIGASTERIDAE p. 63



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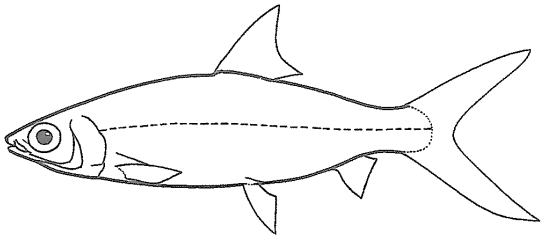
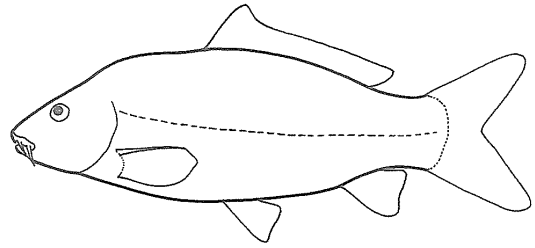
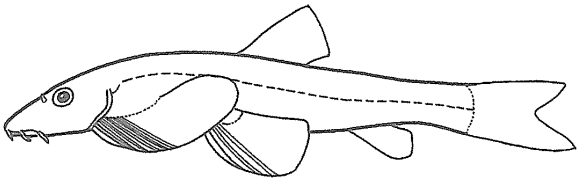


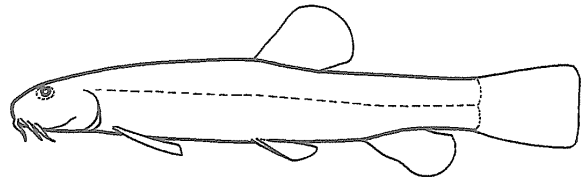
CHANIDAE p. 65



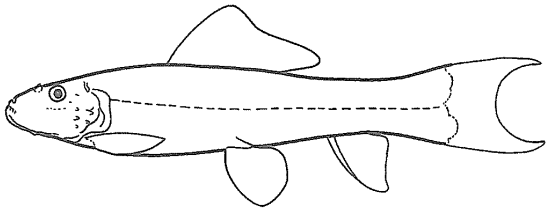
CYPRINIDAE p. 65



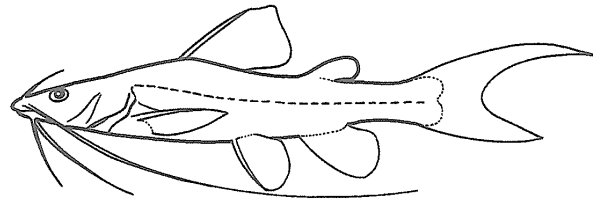
BALITORIDAE p. 123



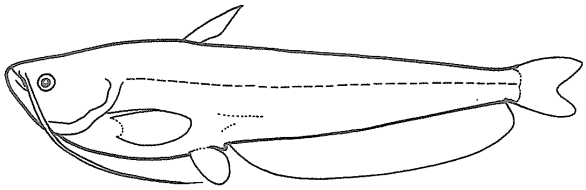
COBITIDAE p. 132



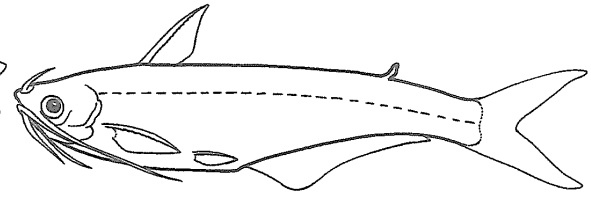
GYRINOCHEILIDAE p. 138



BAGRIDAE p. 139



SILURIDAE p. 145



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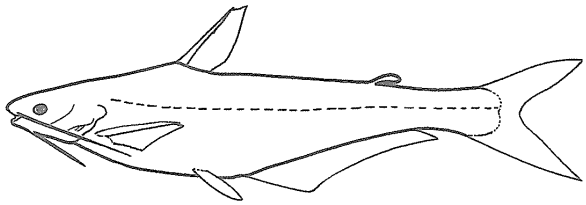
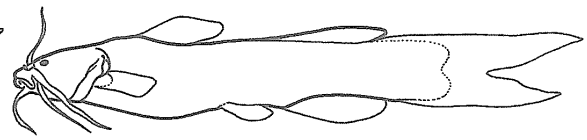
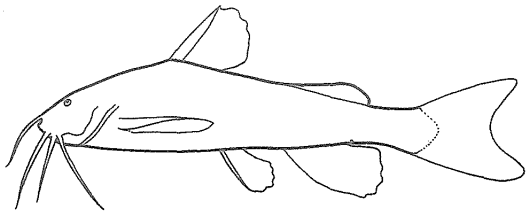


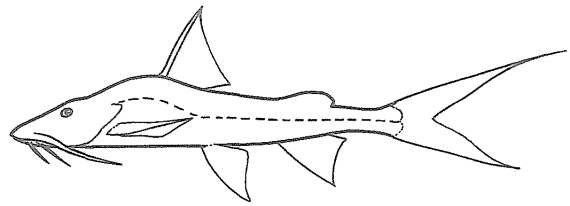
PANGASIIDAE p. 152



AMBLYCIPITIDAE p. 158



AKYSIDAE p. 158



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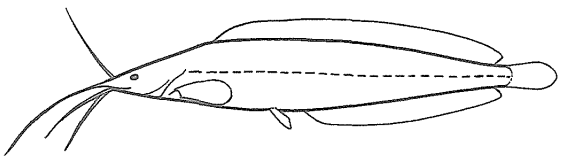
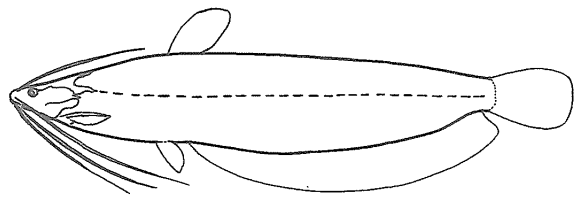
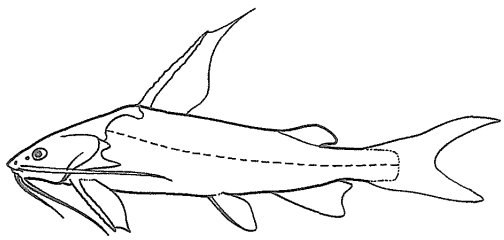


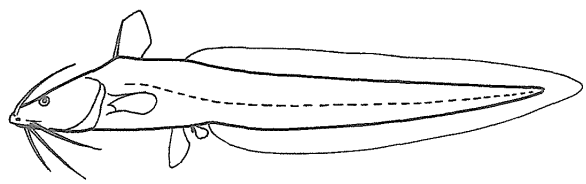
CLARIIDAE p. 162



HETEROPNEUSTIDAE p. 164



ARIIDAE p. 164



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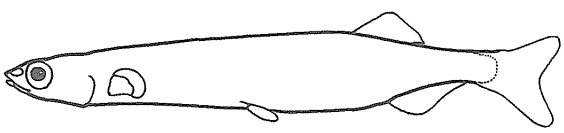
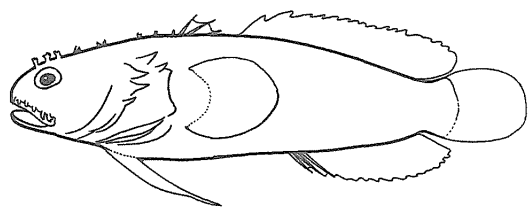
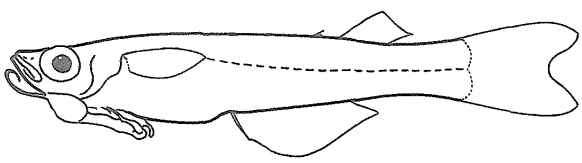


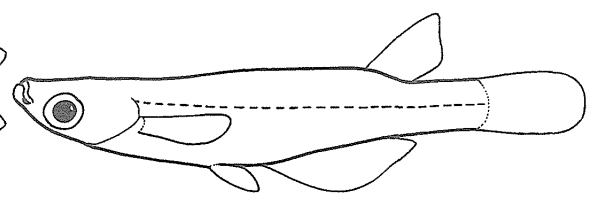
SUNDASALANGIDAE p. 169



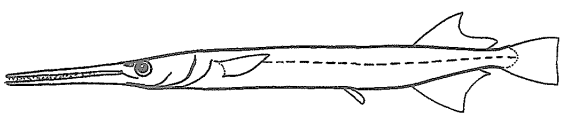
BATRACHOIDIDAE p. 170



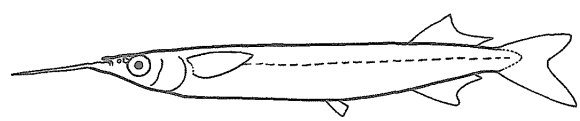
PHALLOSTETHIDAE p. 171



ADRIANICHTHYIDAE p. 171



BELONIDAE p. 172



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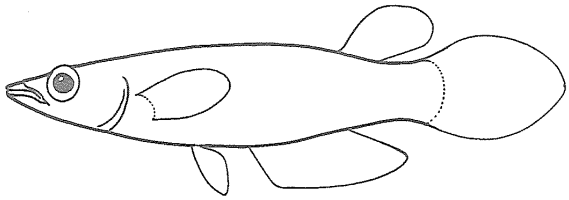
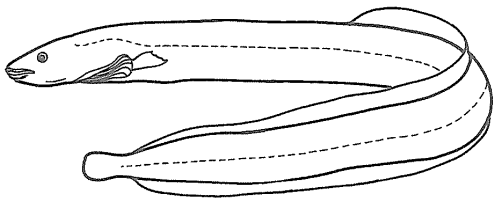
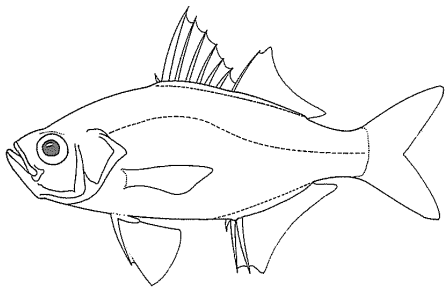


APLOCHEILIDAE p. 174

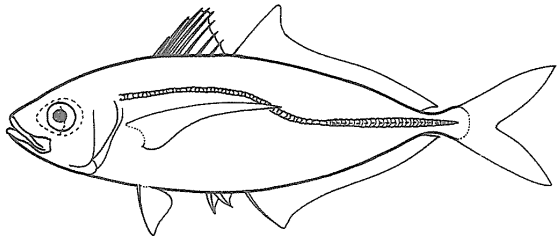
SYNGNATHIDAE p. 175



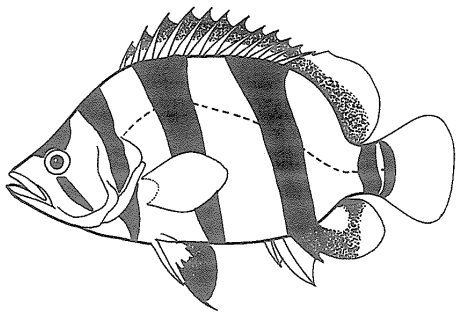
CHAUDHURIIDAE p. 178



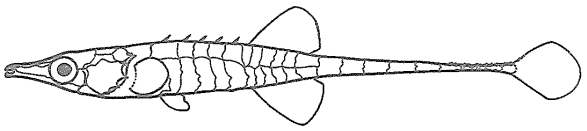
CHANDIDAE p. 181



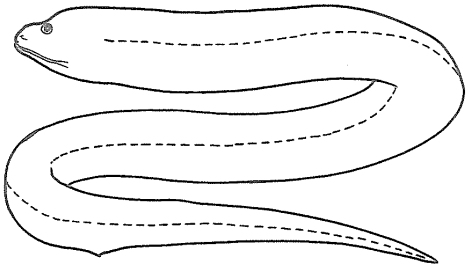
CARANGIDAE p. 184



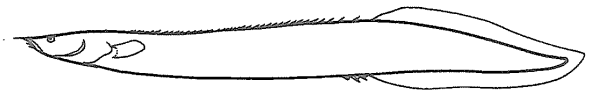
LOBOTIDAE p. 185



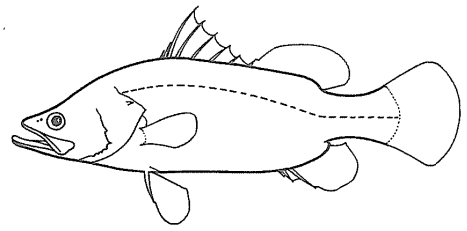
INDOSTOMIDAE p. 175



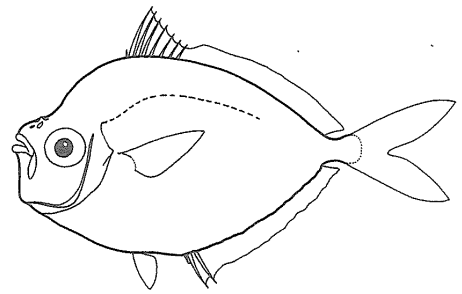
SYNBRANCHIDAE p. 177



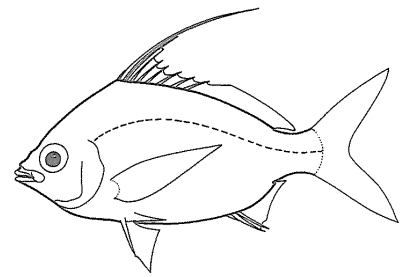
MASTACEMBELIDAE p. 178



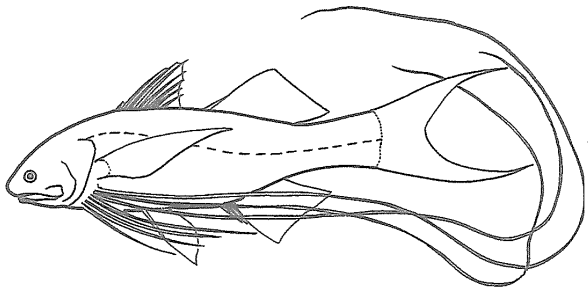
CENTROPOMIDAE p. 183



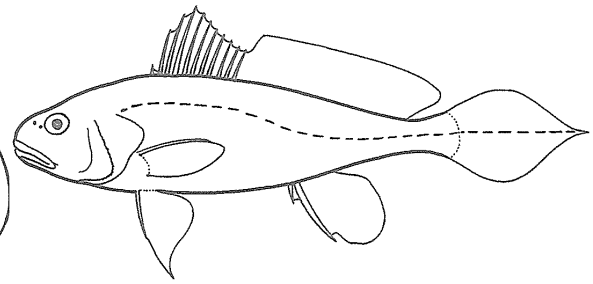
LEIOGNATHIDAE p. 184



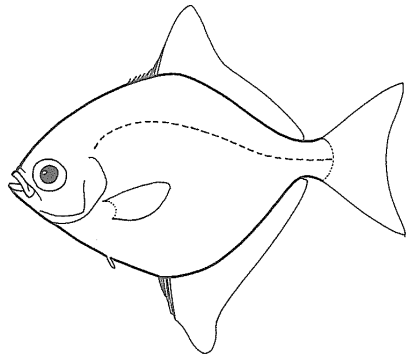
GERREIDAE p. 186



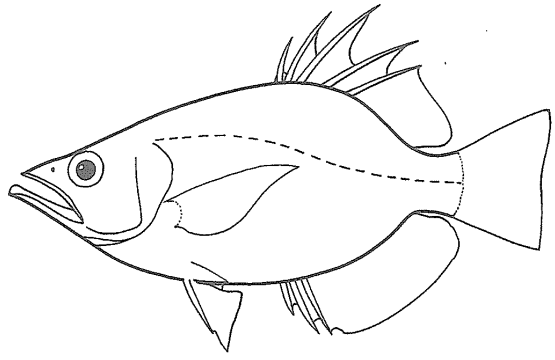
POLYNEMIDAE p. 187



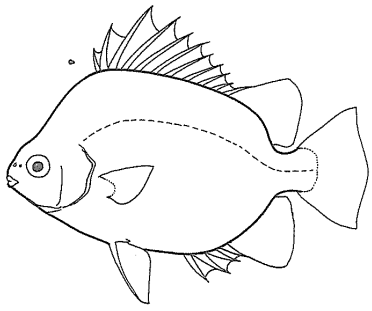
SCIAENIDAE p. 188



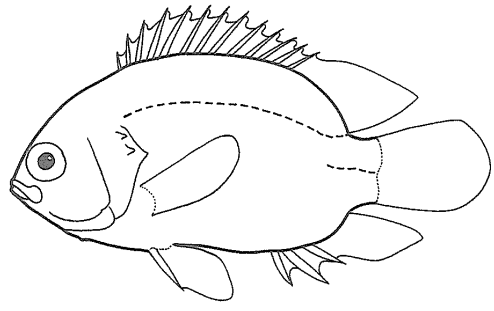
MONODACTYLIDAE p. 189



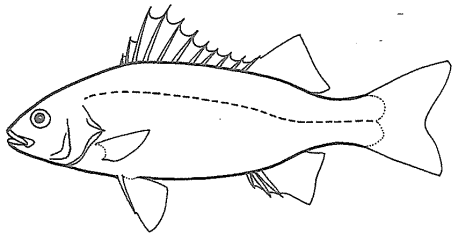
TOXOTIDAE p. 189



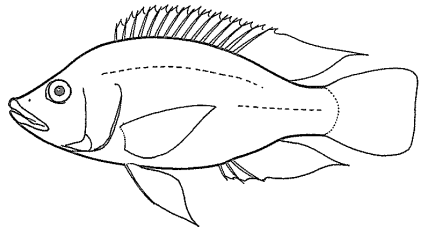
SCATOPHAGIDAE p. 190



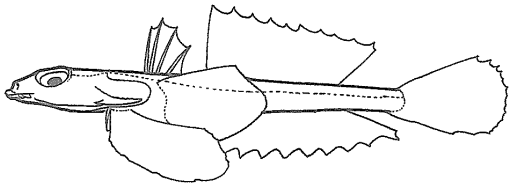
NANDIDAE p. 191



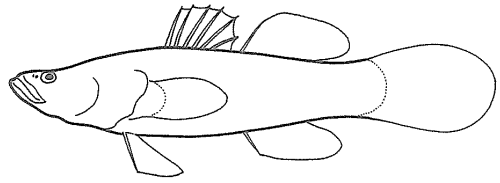
TERAPONTIDAE p. 192



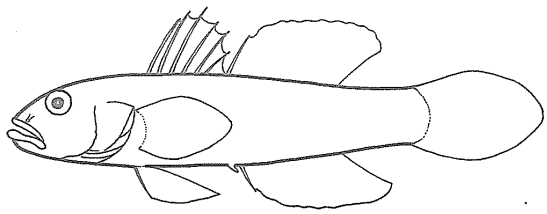
CICHLIDAE p. 192



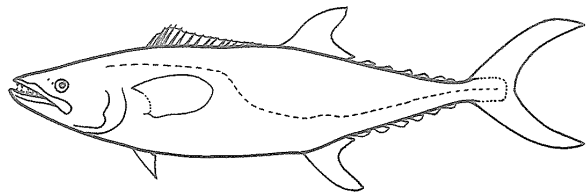
CALLIONYMIDAE p. 193



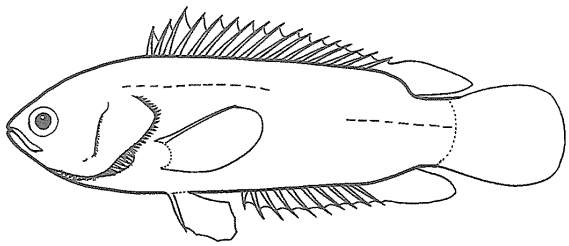
ELEOTRIDAE p. 194



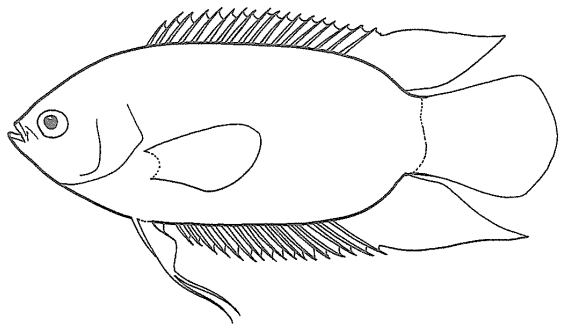
GOBIIDAE p. 197



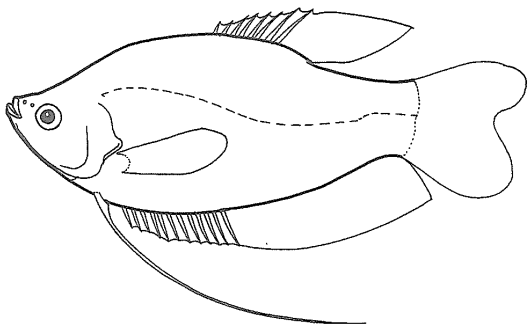
SCOMBRIDAE p. 214



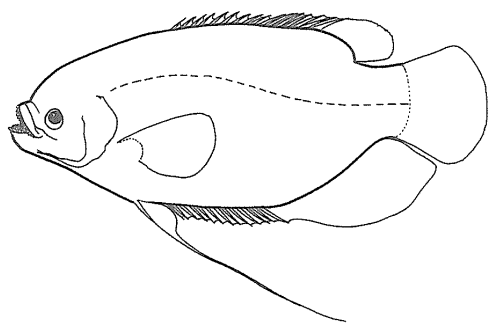
ANABANTIDAE p. 214



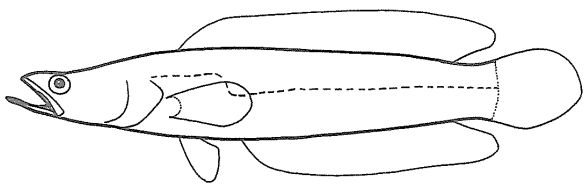
HELOSTOMATIDAE p. 215



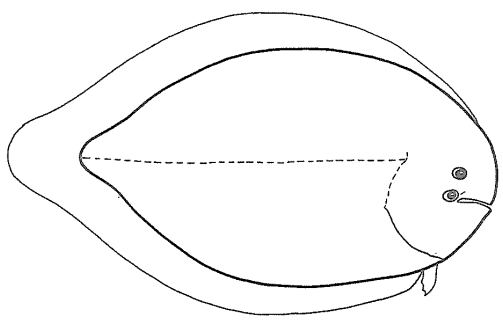
BELONTIIDAE p. 215



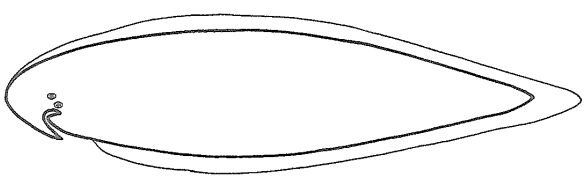
OSPHRONEMIDAE p. 218



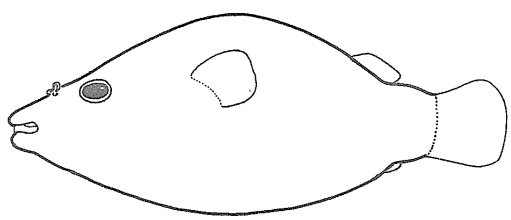
CHANNIDAE p. 219



SOLEIDAE p. 221



CYNOGLOSSIDAE p. 223



TETRAODONTIDAE p. 225

GUIDE TO ORDERS AND FAMILIES

How to use the "Guide to Orders and Families"

If the family name of your fish is not already known, or cannot be determined confidently using the "Pictoral Index to Families" (pages 20 to 25), then it is best to first use this "Guide to Orders and Families" prior to using the "Guide to Species". First, the major taxonomic group or order of your fish should be determined by comparing the appropriate characters on your fish with the order characters listed in the "Order Box" (darkened). Begin with the first order listed and continue comparing the characters on your fish to each successive order until a match is found. The characters that are most useful in determining the major group or order of your fish are the number of gill openings (multiple openings in the first 3 orders and a single opening in all remaining orders), position of the pelvic fins (further back on the body or missing in the early orders given and further forward on the body or missing in the later orders given), presence or absence of adipose fin and barbels. Once the order is known, the family will also be known in a great many instances where the order is represented by a single family. If multiple families are in the order, the family can be determined by comparing the family characters with those on your fish. For large families, such as the Cyprinidae, the classification may be carried down to lower taxonomic ranks (subfamilies, tribes and subtribes; see also page 17) so that you will not be forced to read all descriptions of genera to identify a fish. Common names for each family are given when available and the page number of the family in the "Guide to Species" is also given.

Order CARCHARHINIFORMES

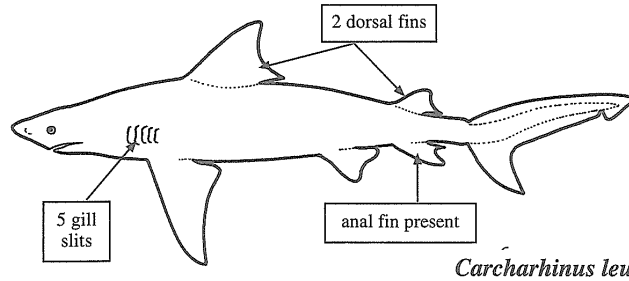
Ground sharks

> Distinguishing characters: Gill openings a series of separate slits on each side above the pectoral-fin base. 2 dorsal fins and 1 anal fin present.

CARCHARHINIDAE Page 51

Requiem sharks

» 2 species entering freshwater reaches of the Mekong.



Carcharhinus leucas

Order RAJIFORMES

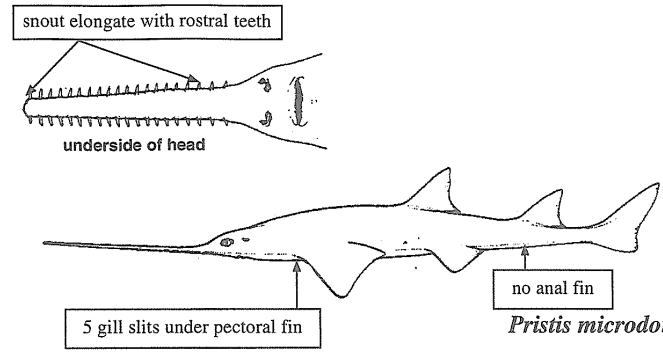
Rays

> Distinguishing characters: Gill openings a series of separate slits below the pectoral fin on the ventral surface of the body.

PRISTIDAE Page 52

Sawfishes

» 2 dorsal fins present, anal fin absent. Snout elongated, with teeth on each side. 1 species and possibly a second found in the Mekong.



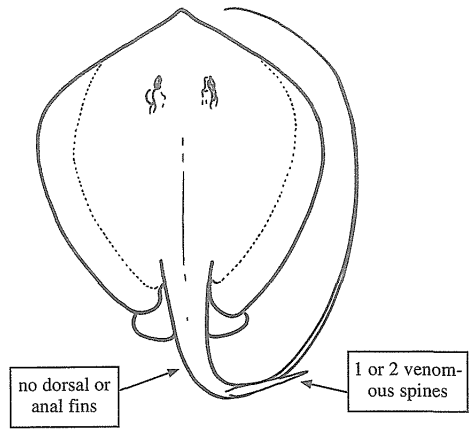
Pristis microdon

DASYATIDAE

Page 52

Stingrays

»No dorsal or anal fin. 1 or 2 venomous spines on the dorsal surface of the tail. At least 3 species and possibly 2 further species found in the Mekong.



Amphotistius laosensis

Order OSTEOGLOSSIFORMES

Bonytongues and Featherbacks

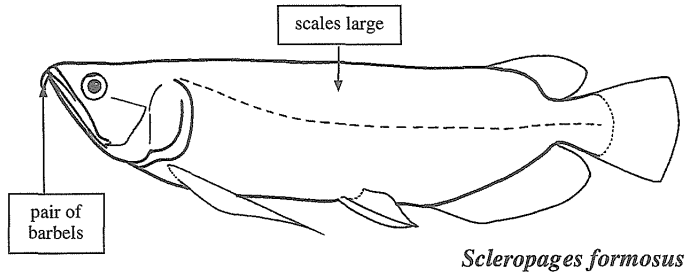
> Distinguishing characters: A single gill opening on each side. Tongue with well-developed teeth. 8 to 16 branchiostegal rays. Either a pair of barbels present at the tip of the lower jaw and scales very large, or barbels absent, scales tiny, and a very long anal fin continuous with caudal fin.

OSTEOGLOSSIDAE

Page 55

Bonytongues

»A pair of barbels present at the tip of the lower jaw. Very large scales. 15 to 16 branchiostegal rays. 1 species on the Southeast Asian mainland.



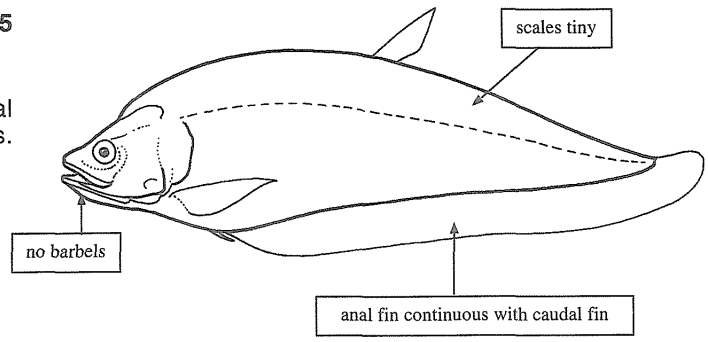
Scleropages formosus

NOTOPTERIDAE

Page 55

Featherbacks

»Long anal fin continuous with caudal fin. Scales tiny. 8 branchiostegal rays. 4 species found in the Mekong.



Notopterus notopterus

Order ELOPIFORMES

Tarpons

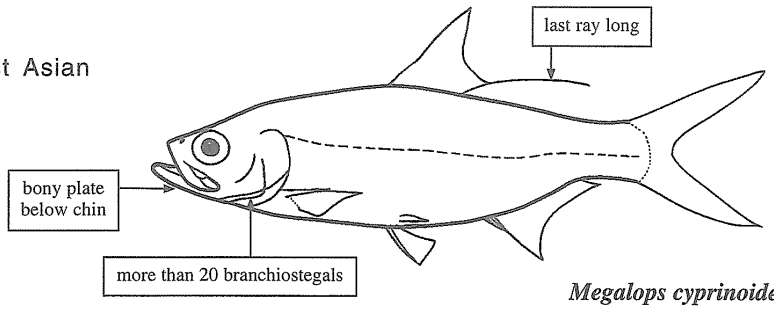
> Distinguishing characters: A single gill opening on each side. Pelvic fin abdominal. More than 20 branchiostegal rays.

MEGALOPIDAE

Page 57

Tarpons

»1 species found in Southeast Asian estuaries.



Megalops cyprinoides

Order ANGUILLIFORMES

Eels

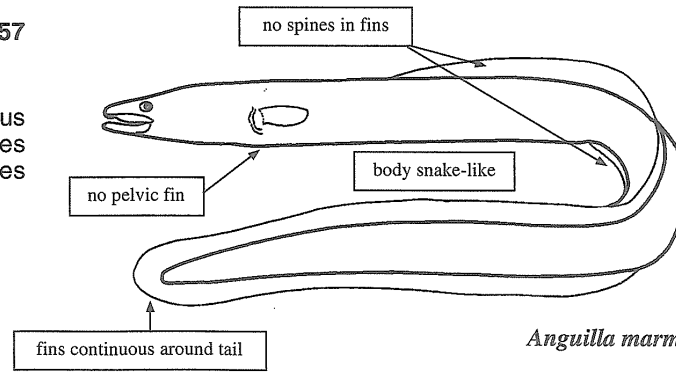
> Distinguishing characters: Gill opening a single slit on each side. Pelvic fin absent. Body very elongate. Gill openings narrow, high on body. No spines in fins.

ANGUILLIDAE

Page 57

Freshwater eels

»Dorsal, caudal and anal fins continuous around tail. Body with very small scales embedded in skin. At least 2 species found in the Mekong.



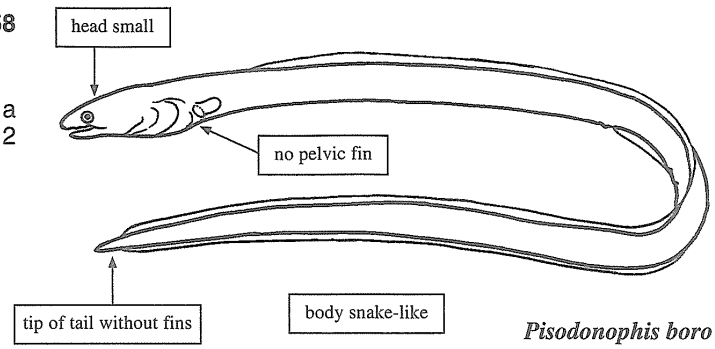
Anguilla marmorata

OPHICHTHIDAE

Page 58

Worm eels

»Tip of tail lacking caudal fin, ending in a naked point. Scales absent. At least 2 species found in the Mekong.



Pisodonophis boro

Order CLUPEIFORMES

Herrings and Anchovies

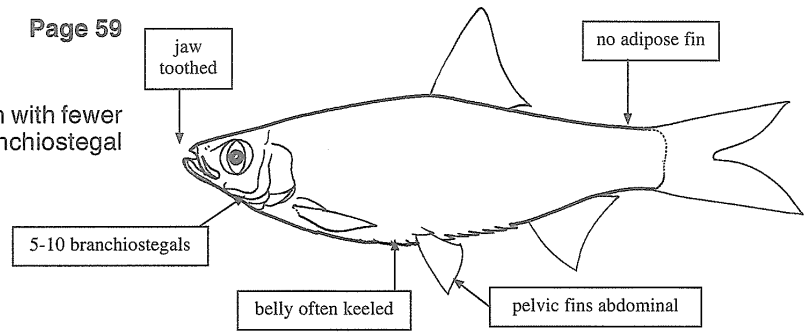
> Distinguishing characters: A single gill opening on each side. Pelvic fin abdominal, 5 to 19 branchiostegal rays. Belly sharply edged with a row of abdominal scutes. Lateral line not extending onto body. Mostly marine and estuarine fishes with many species entering fresh water and several species confined to fresh water.

CLUPEIDAE

Page 59

Herrings and Shads

»Teeth small or absent. Anal fin with fewer than 30 rays. 5 to 10 branchiostegal rays.

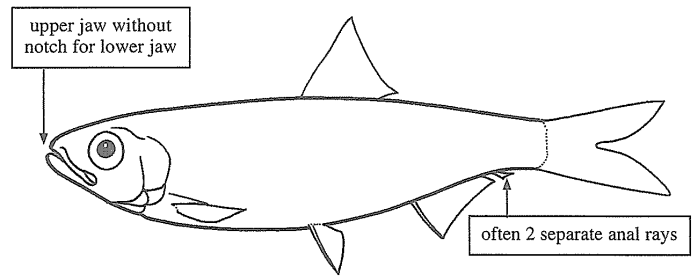


PELLONULINAE

Page 59

Freshwater herrings

»Upper jaw lacking notch for lower jaw occlusion. Anal fin often with last two rays separated from the rest of the fin. At least 4 species found in the Mekong.



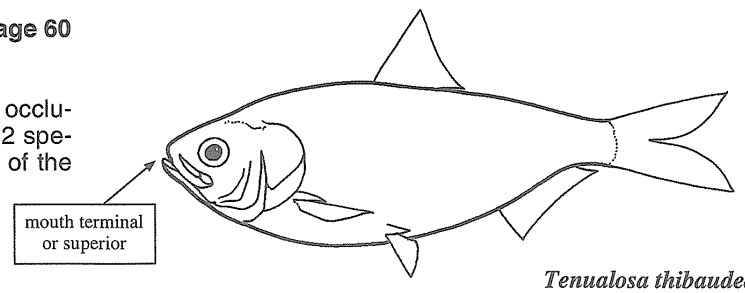
Clupeichthys aesarnensis

ALOSINAE

Page 60

Shads

»Upper jaw with notch for lower jaw occlusion. Mouth terminal or superior. 2 species found in freshwater reaches of the Mekong.



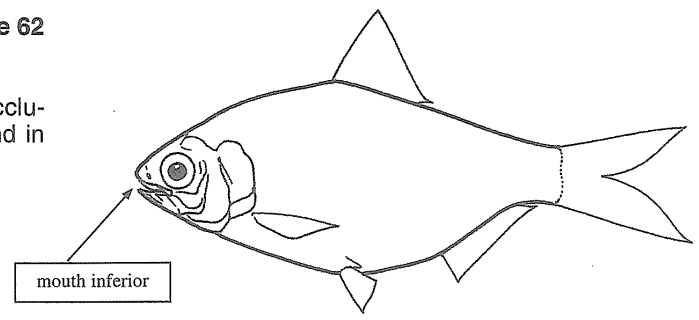
Tenualosa thibaudeaui

DOROSOMATINAE

Page 62

Gizzard-shads

»Upper jaw with notch for lower jaw occlusion. Mouth inferior. 2 species found in freshwater reaches of the Mekong.



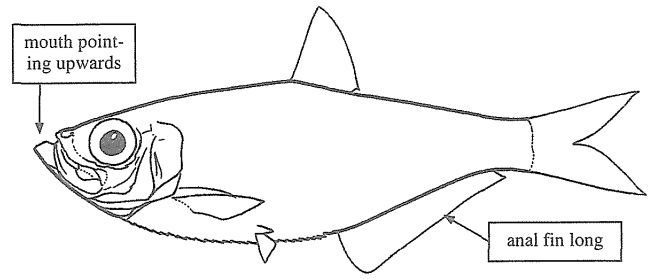
Anodontostoma thailandae

PRISTIGASTERIDAE

Page 63

Herrings

»Anal fin long, with more than 30 rays. Mouth pointed upwards. 6 branchiostegal rays. 2 species entering freshwater reaches of the Mekong.



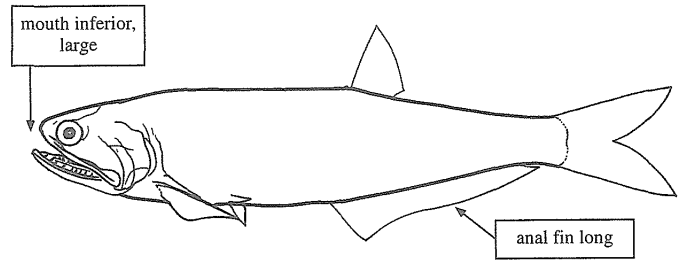
Ilisha megaloptera

ENGRAULIDAE

Page 63

Anchovies

»Mouth inferior and very large. Anal fin long, with more than 40 rays. 7 to 19 branchiostegal rays. 2 species found in the Mekong.



Lycothrissa crocodilus

Order GONORHYNCHIFORMES

Milkfish

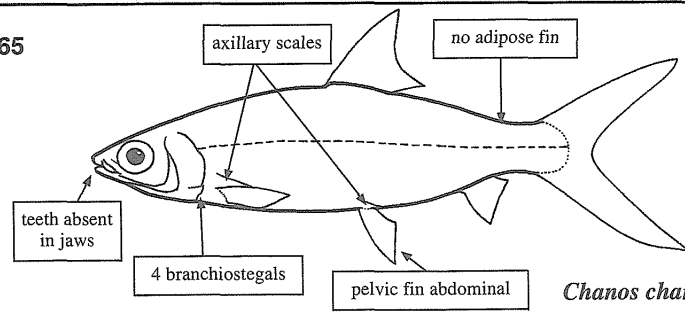
> Distinguishing characters: A single gill slit on each side. Pelvic fin abdominal. 4 branchiostegal rays. Jaws toothless. Axillary scales above and below pectoral and pelvic fins.

CHANIDAE

Page 65

Milkfish

»1 species found in the Mekong.



Chanos chanos

Order CYPRINIFORMES

Minnows and Carps

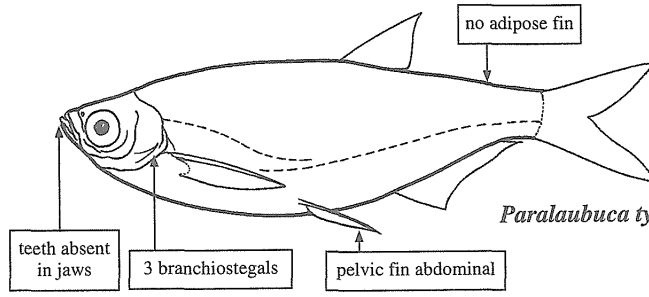
> Distinguishing characters: A single gill opening on each side. Pelvic fin abdominal. Body with scales. 3 branchiostegal rays. Jaws toothless. Last gill arch modified to support one or more rows of pharyngeal teeth.

CYPRINIDAE

Page 65

Minnows and Carps

»Usually more than one row of pharyngeal teeth. 2 or fewer pairs of barbels. No inhalent aperture at gill slit. Many species in several subfamilies.

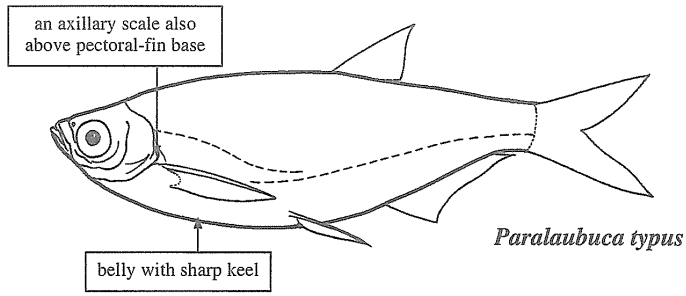


Paralaubuca typus

ALBURNINAE

Page 65

»An axillary scale above the base of both the pelvic and pectoral fins. Belly with a sharp edged fleshy keel. First ray of dorsal fin non-spinous.

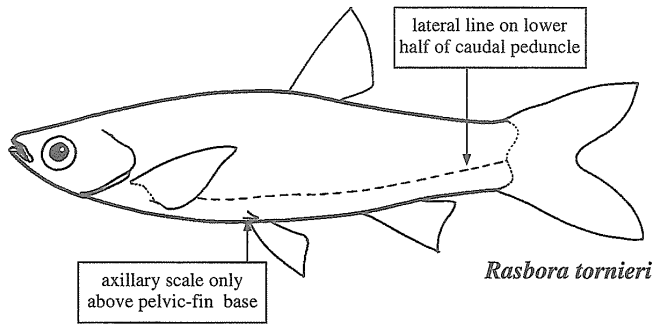


Paralaubuca typus

DANIOINAE

Page 67

»Belly with or without a keel. Axillary scale only at base of pelvic fin. First dorsal ray non-spinous. Lateral line along lower half of caudal peduncle. Many species in 4 tribes.

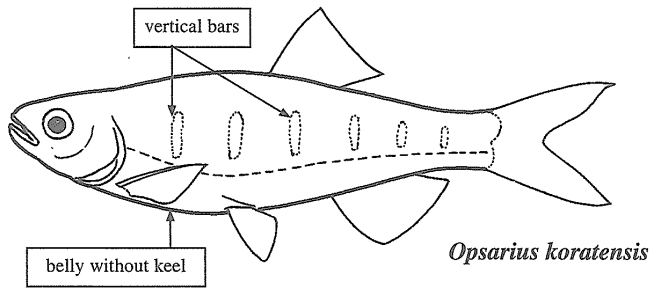


Rasbora tornieri

CHEDRINI

Page 70

»Margin of belly rounded. Barbels present or absent. Colour pattern consisting of vertical bars. At least 2 species found in the Cambodian Mekong.

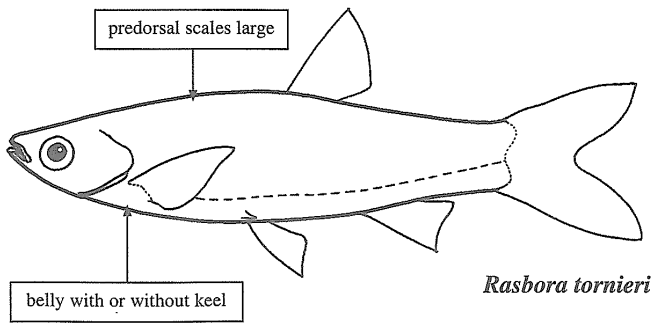


Opsarius koratensis

DANIOINI

Page 71

»Margin of belly rounded or keeled. Barbels present or absent. Epaxial muscles not extending forward beyond preopercle. Predorsal scales large, about the same size as the lateral-line scales. Mouth usually small, but if large, with barbels as long as eye diameter. Many species in several genera.

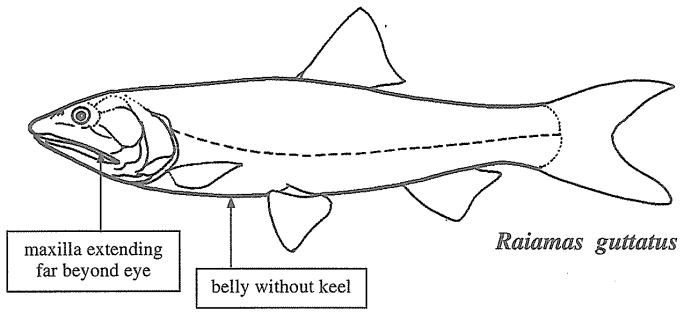


Rasbora tornieri

NEOBOLINI

Page 70

»Margin of belly rounded. Mouth very large, maxilla extending far beyond eye. Barbels tiny if present. 1 species found in the Mekong.

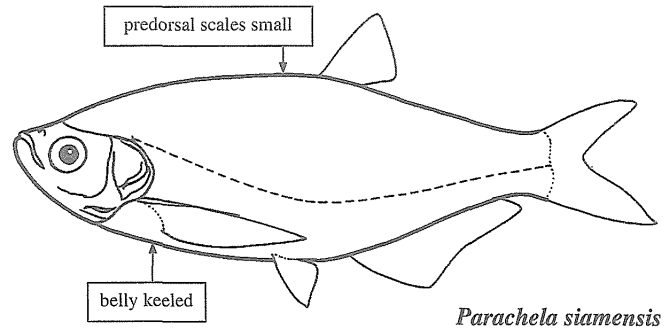


Raiamas guttatus

OXYGASTRINI

Page 67

»Margin of belly keeled. Epaxial muscles extending forward at least to margin of orbit. Predorsal scales much smaller than scales along lateral line.

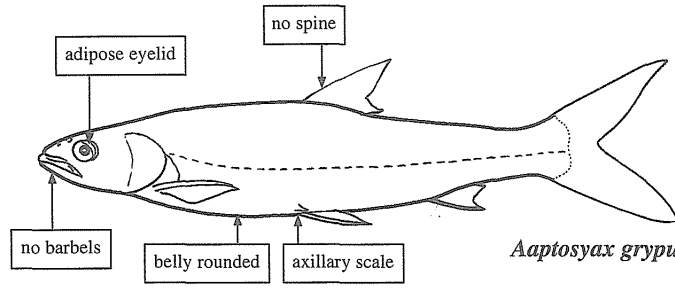


Parachela siamensis

LEUCISCINAE

Page 81

»Margin of belly rounded. Axillary scale only at pelvic-fin base. First dorsal-fin ray non-spinous. Lateral line at centre of caudal peduncle. No barbels. Large symphyseal knob on lower jaw fitting into notch in upper jaw when mouth is closed. Well-developed adipose eyelid. 1 species found in the Mekong.

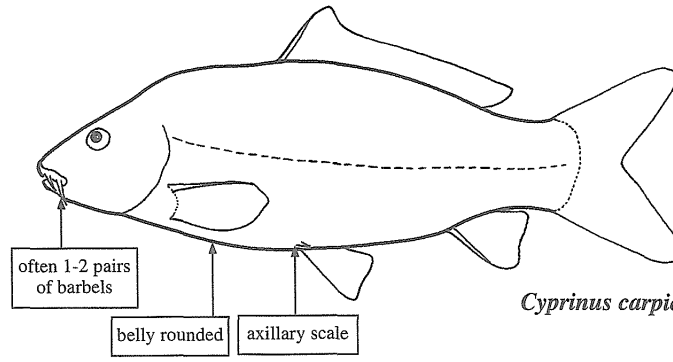


Aaptosyax grypus

CYPRININAE

Page 82

»Margin of belly rounded. Axillary scale only at base of pelvic fin. First dorsal-fin ray spinous or non-spinous. Lateral line at centre of caudal peduncle. Often with 1 or 2 pairs of barbels. No notch on upper jaw or a symphyseal knob on lower jaw. Numerous tribes and many species.

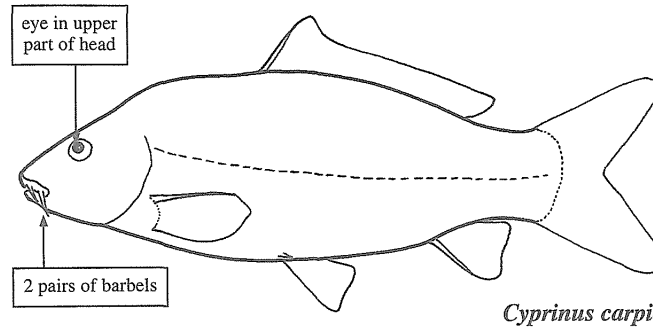


Cyprinus carpio

CYPRININI

Page 82

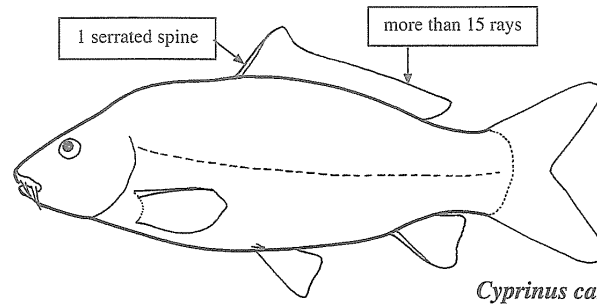
»2 pairs of barbels. Eye in upper part of head. No epibranchial organ. Dorsal fin either with serrated spine and more than 15 branched rays, or with non-serrated spine and 10 or fewer branched rays. 2 subtribes.



Cyprinus carpio

CYPRINI Page 82

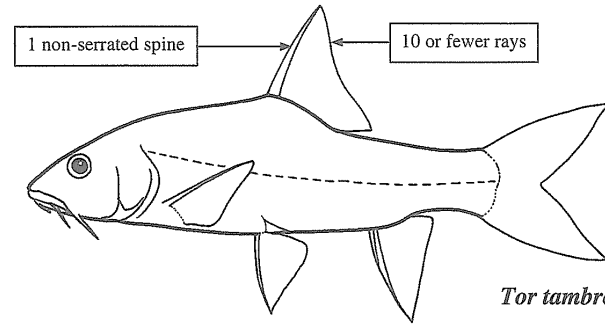
»Dorsal fin with heavy, serrated spine and more than 15 branched rays. Anal fin with heavy, serrated spine. 1 introduced species.



Cyprinus carpio

TORES Page 82

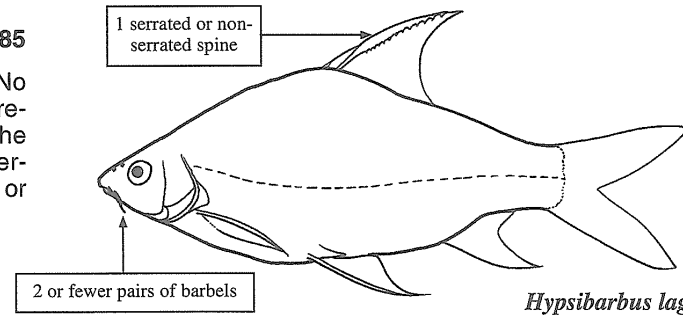
»Dorsal fin with non-serrated spine and 10 or fewer branched rays. 3 genera.



Tor tambroides

SYSTOMINI Page 85

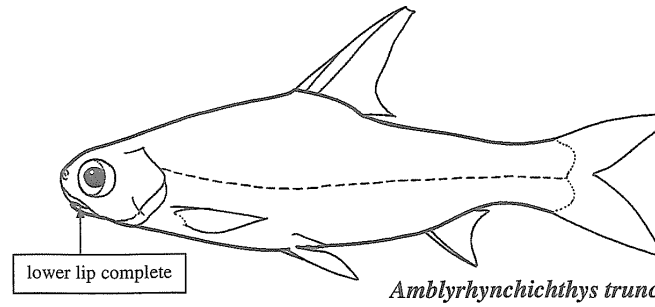
»2 or fewer pairs of barbels present. No epibranchial organ in upper gill arch region. No vomeropalatine organ in the roof of the mouth. Dorsal fin with serrated or smooth spine. Mouth terminal or subterminal.



Hypsibarbus lagleri

OSTEOBRAMAE Page 85

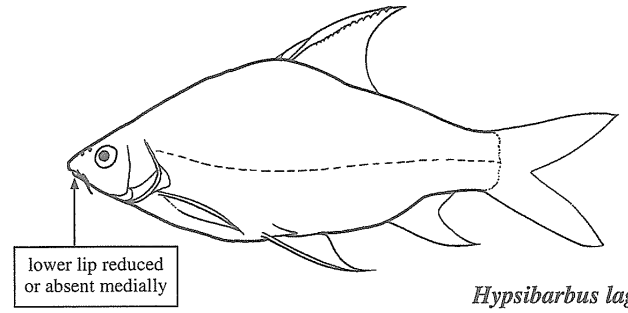
»Scale radii appearing as simple fissures, parallel or diverging, but not reaching the scale focus. Lower lip and lower jaw continuous with no distinct border separating them. Lower lip never reduced medially. Lower jaw never developing a sharp, keratinous edge. Numerous genera.



Amblyrhynchichthys truncatus

SEMIPLOTI Page 94

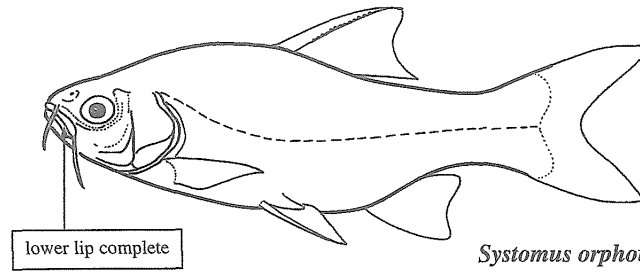
»Scale radii appearing as simple fissures, parallel or diverging, but not reaching the scale focus. Lower lip, when present, separated from lower jaw by well-marked furrow. Lower lip often reduced or absent medially. Some forms with a sharp, keratinous edge on the lower jaw. Several genera.



Hypsibarbus lagleri

SYSTOMI Page 101

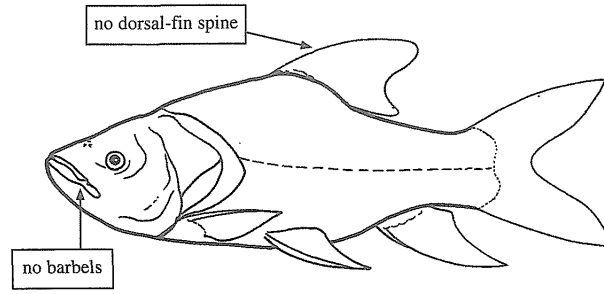
»Scale radii straight, their margins with heavy tissue deposition, diverging spoke-like from the scale focus. Lower lip always complete. Lower jaw never developing a keratinous edge. Several genera.



Systomus orphoides

CATLINI Page 105

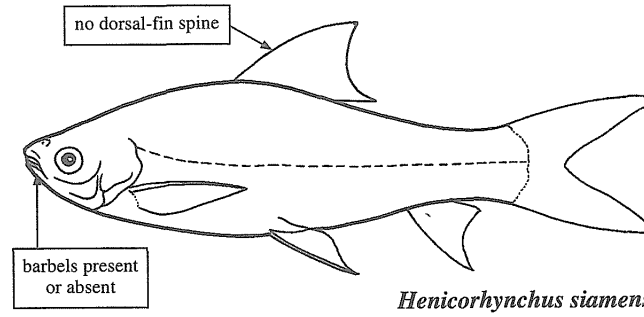
»Eye low, at or below middle of side of head. Epibranchial organ or other specialized tissue at top of gill cavity. Mouth terminal. No spine in dorsal fin. No barbels. A few species.



Catlocarpio siamensis

LABEONINI Page 106

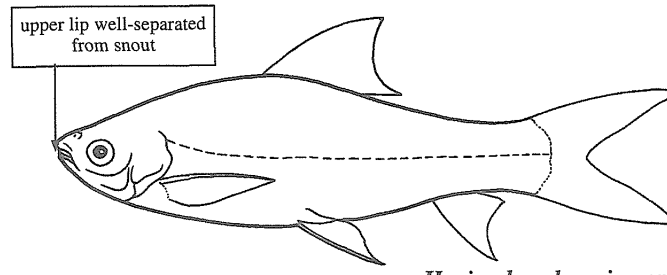
»No epibranchial organ at top of gill cavity. Vomeropalatine organ present in the roof of the mouth. Up to 2 pairs of barbels or barbels absent. Mouth subterminal to inferior. One or both lips may be covered with papillae. No spine in dorsal fin. 2 subtribes.



Henicorhynchus siamensis

LABEONES Page 106

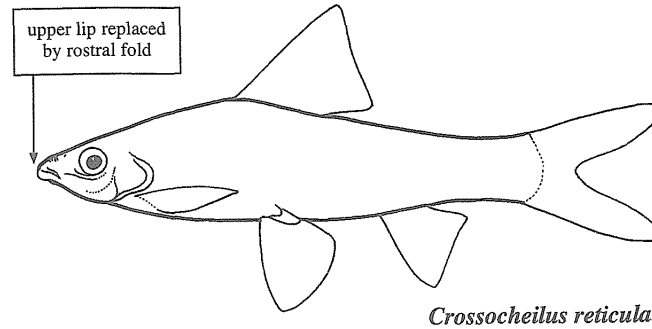
»Upper lip separated from skin of snout by deep groove which is often covered by the rostral fold (fleshy flap of skin of snout in front of mouth). Several genera.



Henicorhynchus siamensis

GARRAE Page 118

»Rostral fold replaces and serves as upper lip, which is otherwise absent. Several genera.



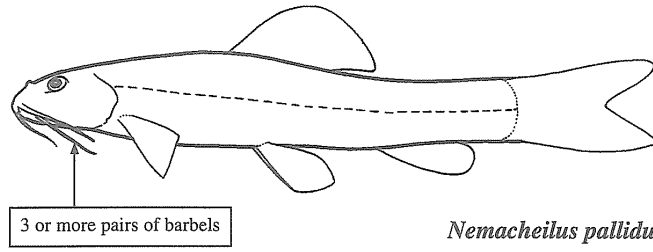
Crossocheilus reticulatus

BALITORIDAE

Page 123

River loaches

»One row of pharyngeal teeth. No erectile spine below eye. 3 or more pairs of barbels. 3 subfamilies.

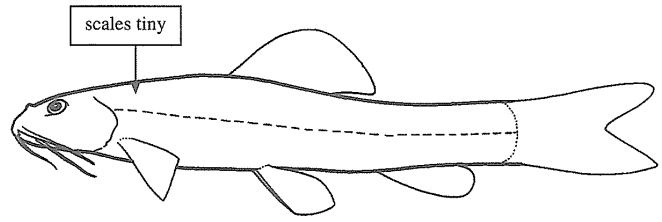


Nemacheilus pallidus

NEMACHEILINAE

Page 127

»Scales tiny, requiring a microscope to see. Many species.

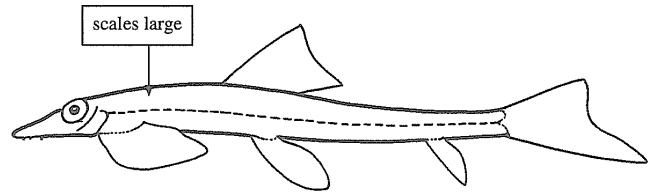


Nemacheilus pallidus

BALITORINAE

Page 123

»Scales larger, obvious to the naked eye. 2 tribes.

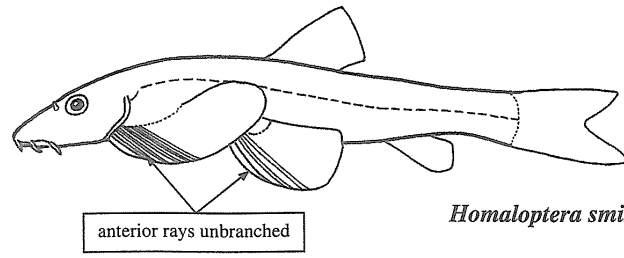


Annamia normani

BALITORINI

Page 123

»Many unbranched anterior rays in pectoral and pelvic fins. Several species.

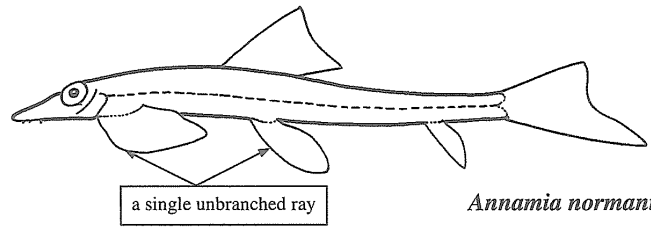


Homaloptera smithi

GASTROMYZONTINI

Page 126

»A single unbranched anterior ray in pectoral and pelvic fins. 1 species.



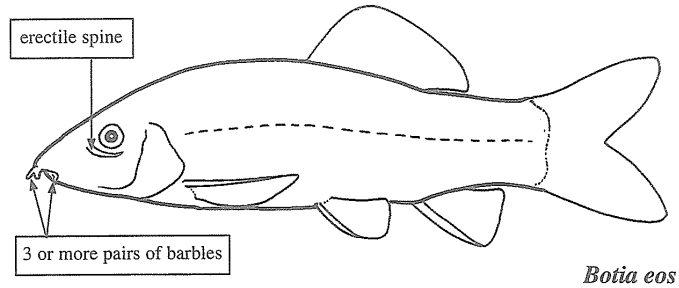
Annamia normani

COBITIDAE

Page 132

Loaches

»One row of pharyngeal teeth. Erectile ethmoid spine below the eye. 3 or more pairs of barbels. 2 subfamilies.

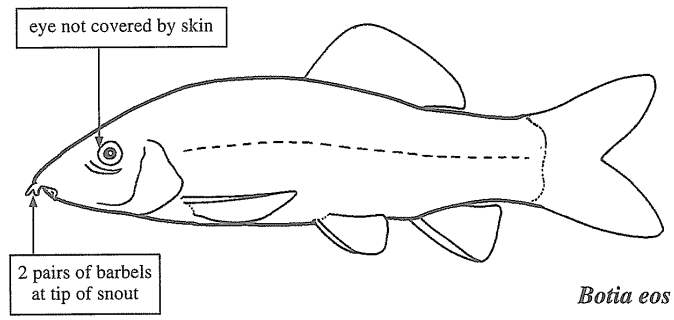


Botia eos

BOTIINAE

Page 132

»Body oblong. Eye not covered by skin. Caudal fin deeply forked. 2 pairs of barbels at tip of snout.

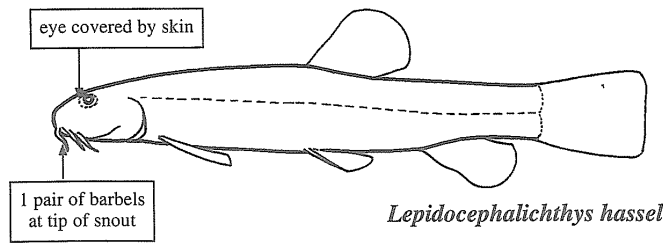


Botia eos

COBITINAE

Page 135

»Body elongate. Eye covered by skin. Caudal fin shallowly forked or truncate. 1 pair of barbels at the tip of the snout.



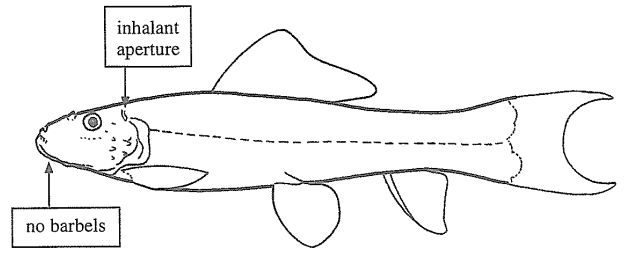
Lepidocephalichthys hasselti

GYRINOCHEILIDAE

Page 138

Algae eaters

»Pharyngeal teeth absent. Gill slit with inhalant aperture opening into gill chamber above exhalant aperture. No barbels.



Gyrinocheilus pennocki

Order SILURIFORMES

Catfishes

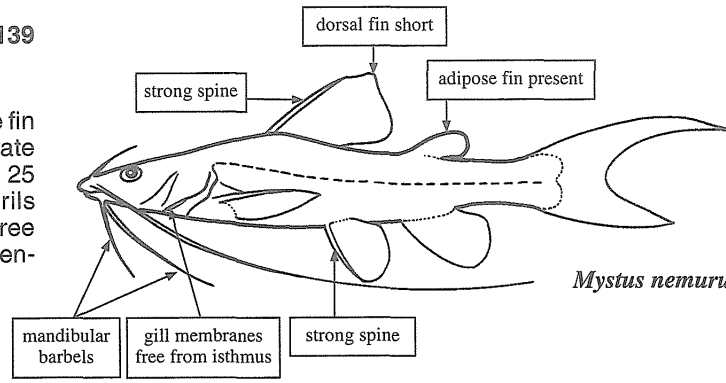
> Distinguishing characters: A single gill opening on each side. Pelvic fins abdominal. Body scaleless. 4 to 20 branchiostegal rays. Jaws with teeth. Mandibular barbels usually present. Pectoral fin often with a spinous first ray.

BAGRIDAE

Page 139

Bagrid catfishes

»Dorsal fin with a strong spine. Adipose fin present. Caudal fin forked and separate from anal fin. Anal fin with fewer than 25 rays. Anterior and posterior nostrils widely separated. Gill membranes free from isthmus. Skin smooth. Several genera.



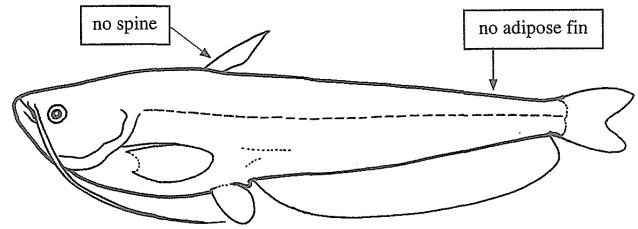
Mystus nemurus

SILURIDAE

Page 145

Sheatfishes

»Dorsal fin present or absent, always lacking a spine. Adipose fin absent. Caudal fin forked and separate from anal fin. Anal fin with more than 40 rays. Skin smooth. Several genera.



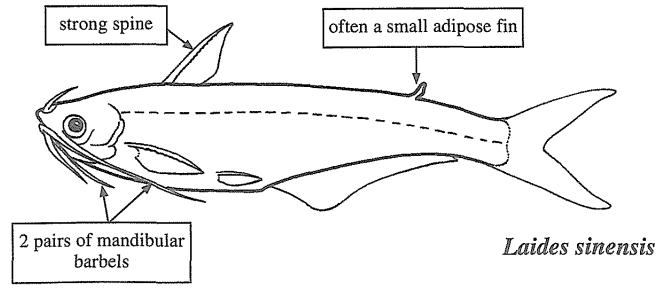
Ompok bimaculatus

SCHILBEIDAE

Page 152

Schilbeid catfishes

»Dorsal fin with a strong spine. Adipose fin small. Caudal fin forked and separate from anal fin. Anal fin with 36 to 49 rays. Nasal barbel usually present. 2 pairs of mandibular barbels. Skin smooth. A few species.



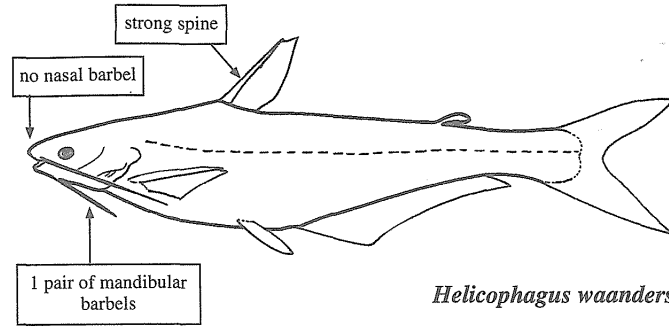
Laides sinensis

PANGASIIDAE

Page 152

River catfishes

»Dorsal fin with a strong spine. Adipose fin small. Caudal fin forked and separate from anal fin. Anal fin with 26 to 46 rays. No nasal barbel. 1 pair of mandibular barbels. Skin smooth. Numerous species.



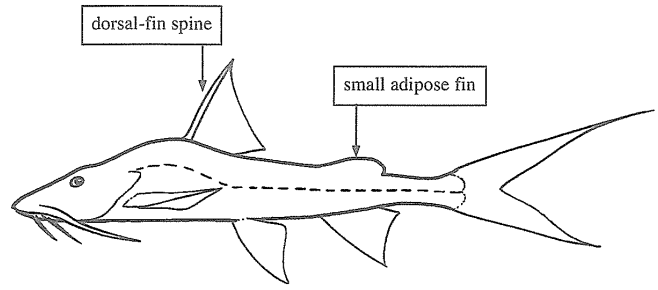
Helicophagus waandersi

SISORIDAE

Page 160

Sisorid catfishes

»Dorsal fin with spine. Adipose fin small. Caudal fin forked and separate from anal fin. Anal fin with fewer than 15 rays. Anterior and posterior nostrils close together, separated by a short nasal barbel. Gill membranes attached to isthmus. Skin tuberculate. Several species.



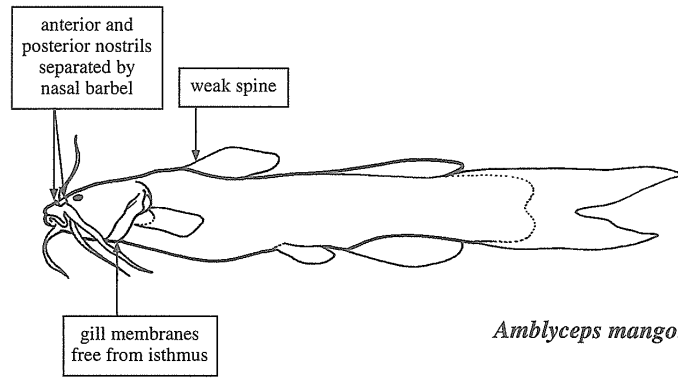
Bagarius yarrelli

AMBLYCIPITIDAE

Page 158

Torrent catfishes

»Base of dorsal fin covered with thick skin. Dorsal-fin spine weak. Anal fin with 11 to 12 total rays. Forked caudal fin separate from anal and adipose fins. Gill membranes united to each other, free from isthmus. Anterior and posterior nostrils close together, separated by a nasal barbel. Skin smooth. A single species, with others possible.



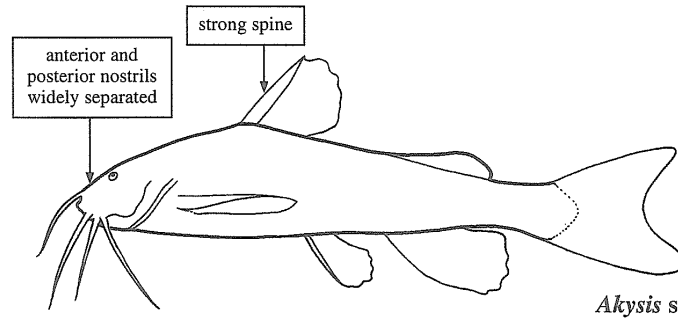
Amblyceps mangois

AKYSIDAE

Page 158

Beaded catfishes

»Dorsal fin with strong spine. Body with longitudinal rows of tubercles. Anal fin with 8 to 10 total rays. Adipose fin present. Gill membranes attached to isthmus. Nostrils widely separated, posterior nostril preceded by a nasal barbel. Several species.



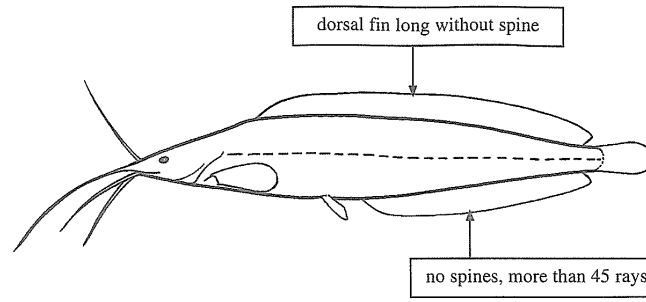
Akysis sp.

CLARIIDAE

Page 162

Airbreathing catfishes

»Dorsal fin long, lacking a spine. Body smooth. Anal fin with more than 45 rays. Caudal fin rounded, may be connected to dorsal and anal fins. Nasal barbels present. Several species.

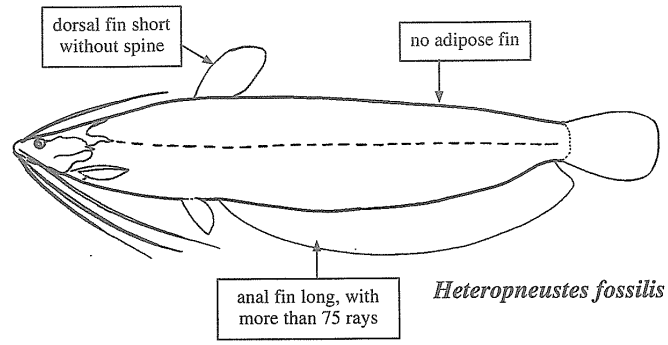


Clarias macrocephalus

HETEROPNEUSTIDAE Page 164

Airsac catfishes

»Dorsal fin short, lacking a spine. Body smooth. Adipose fin absent. Anal fin with more than 75 rays. Caudal fin rounded, separate from anal fin. Gill membranes attached to isthmus. Venom gland at base of pectoral fin. 1 species.

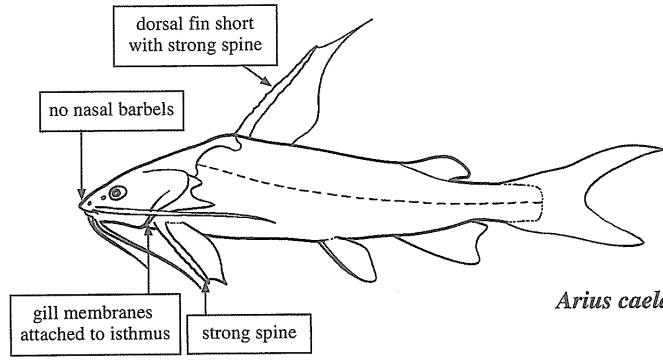


Heteropneustes fossilis

ARIIDAE Page 164

Sea catfishes

»Dorsal fin short, with a strong spine. Body smooth. Adipose fin present. Caudal fin forked. Anal fin with 12 to 22 total rays. Gill membranes attached to isthmus. Numerous species.

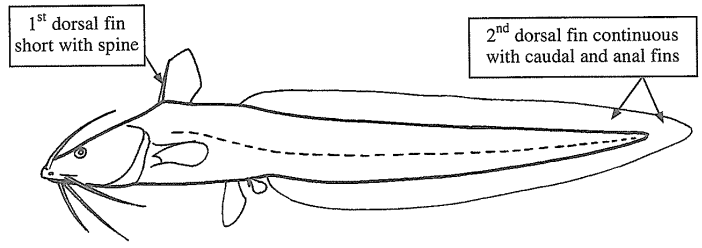


Arius caelatus

PLOTOSIDAE Page 168

Eel-like catfishes

»Dorsal fin short, with a strong spine. Body smooth and eel-like. Second dorsal fin continuous with caudal and anal fins. Tail pointed or rounded. A few species.



Plotosus canius

Order OSMERIFORMES

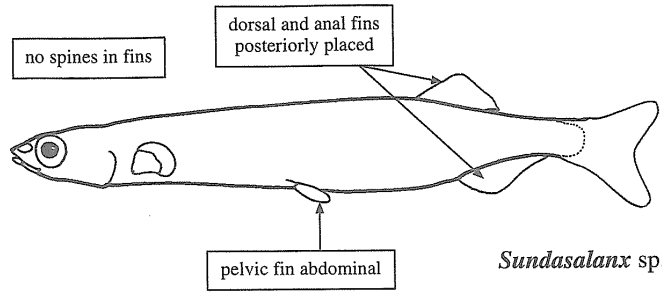
Smelts

> Distinguishing characters: A single gill opening on each side. Pelvic fin abdominal. Body transparent and scaleless. Adipose fin absent. Dorsal and anal fins posteriorly placed. Jaws with teeth. No spines in fins. Size tiny. 1 family found in the Mekong.

SUNDASALANGIDAE Page 169

Sundaland noodlefishes

»Tiny, transparent scaleless fishes. At least 1 species found in the Mekong.



Sundasalanx sp.

Order BATRACHOIDIFORMES

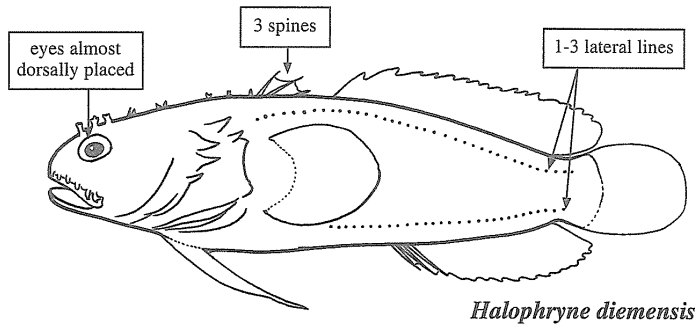
Toadfishes

> Distinguishing characters: A single gill opening on each side. Pelvic fins separate, jugular (in front of pectoral fins). 1 to 3 lateral lines present. 2 dorsal fins. 3 dorsal spines and 1 or more opercular spines. 6 branchiostegal rays. Jaws with teeth. Gill membranes broadly joined to isthmus.

BATRACHOIDIDAE Page 170

Toadfishes

»Head broad, eyes more dorsal than lateral. An axillary pore sometimes at the pectoral-fin base. Coloration mottled. 3 genera.



Halophryne diemensis

Order ATHERINIFORMES

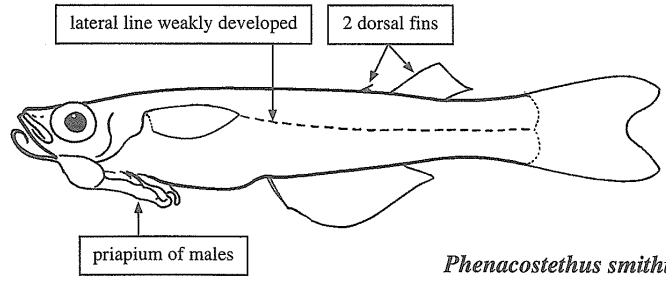
Silversides

> Distinguishing characters: A single gill opening on each side. Pelvic fin abdominal, subabdominal, thoracic or absent. Lateral line weakly developed. Usually 2 dorsal fins. 4 to 7 branchiostegal rays. Jaws with teeth. 1 family in freshwater reaches of the Mekong.

PHALLOSTETHIDAE Page 171

Priapium fishes

»Priapium present under throat of males. Pelvic skeleton absent in females. Tiny transparent fishes. Several species found in the Mekong.



Phenacostethus smithi

Order BELONIFORMES

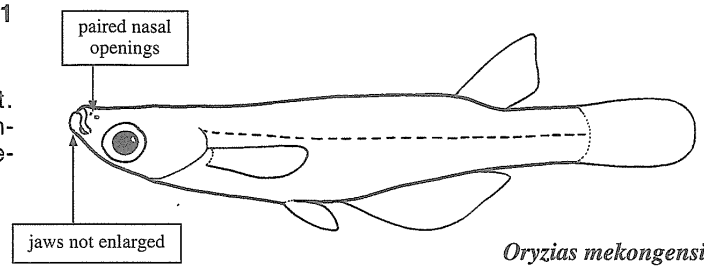
Needlefishes and Halfbeaks

> Distinguishing characters: A single gill opening on each side. Pelvic fin abdominal. Adipose fin absent. Dorsal and anal fins posteriorly placed. Jaws with teeth. Upper jaw non-protractile. Lower lobe of caudal fin with more principal rays than upper lobe. No spines in fins.

ADRIANICHTHYIDAE Page 171

Ricefishes

»Body tiny, whitish or transparent. Paired nasal openings. Jaws not enlarged. A single genus with 1 or 2 species.



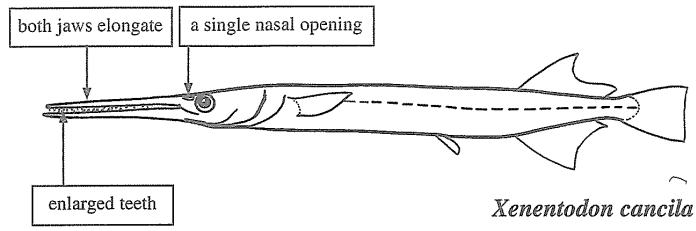
Oryzias mekongensis

BELONIDAE

Page 172

Needlefishes

»Both jaws elongate, with enlarged canine teeth. A single nasal opening. 1 genus.



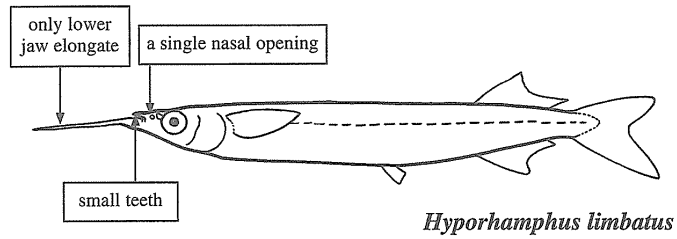
Xenentodon cancila

HEMIRAMPHIDAE

Page 173

Halfbeaks

»Upper jaw short, lower jaw elongate. Teeth small, no enlarged canine teeth. A single nasal opening. 3 genera.



Hyporhamphus limbatus

Order CYPRINODONTIFORMES

Topminnows and Rivulines

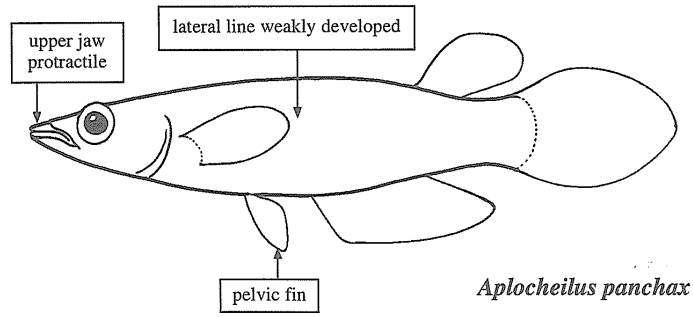
> Distinguishing characters: A single gill opening on each side. Pelvic fin abdominal. Lateral line weakly developed, chiefly on head. Paired nasal openings. A single dorsal fin. Caudal fin rounded and symmetrical. Jaws with teeth. Upper jaw protractile. 1 family in freshwater reaches of the Mekong.

APLOCHEILIDAE

Page 174

Rivulines

»A single species found in the Mekong.



Aplocheilus panchax

Order GASTEROSTEIFORMES

Pipefishes

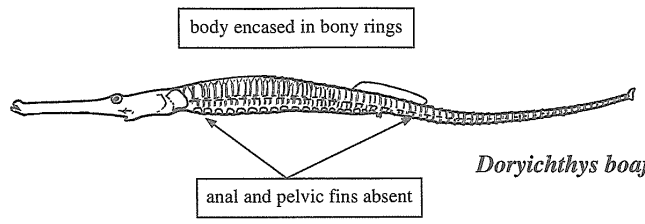
> Distinguishing characters: A single gill opening on each side. Pelvic fin thoracic or absent. Adipose fin absent. Dorsal fin at mid-body. Body with armor of dermal plates. No spines in fins. 2 families found in the Mekong.

SYNGNATHIDAE

Page 175

Pipefishes

»Anal and pelvic fins absent. No spines on back in front of dorsal fin. Body encased in a series of bony rings. Several genera.

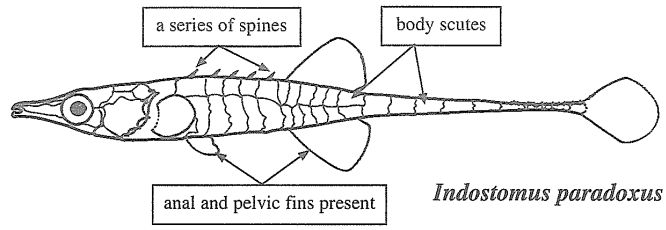


Doryichthys boaja

INDOSTOMIDAE

Page 175

»Anal and pelvic fins present. A series of spines on the back in front of the dorsal fin. Body covered with bony scutes. 1 species.



Indostomus paradoxus

Order SYNBRANCHIFORMES

Swamp eels and Spiny eels

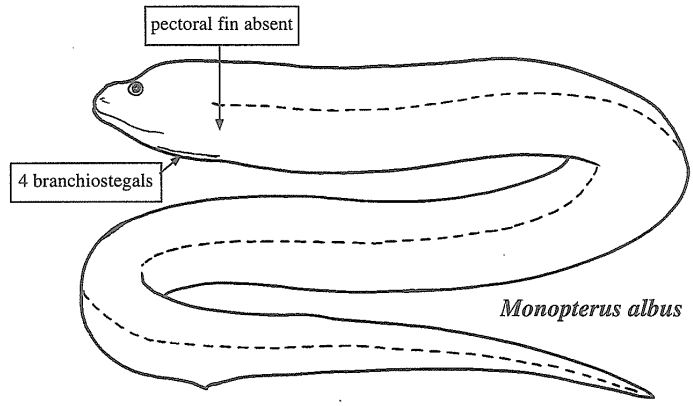
> Distinguishing characters: A single gill opening on each side. Pelvic fins absent. A series of spines sometimes in front of dorsal fin. Gill openings confined to lower half of body. Paired nostrils. Upper jaw non-protrusible.

SYNBRANCHIDAE

Page 177

Swamp eels

»Pectoral fin absent. Dorsal and anal fins vestigial. No spines in anal fin. No rostral appendage. Gill membranes united with a single gill opening under the head. 3 genera.



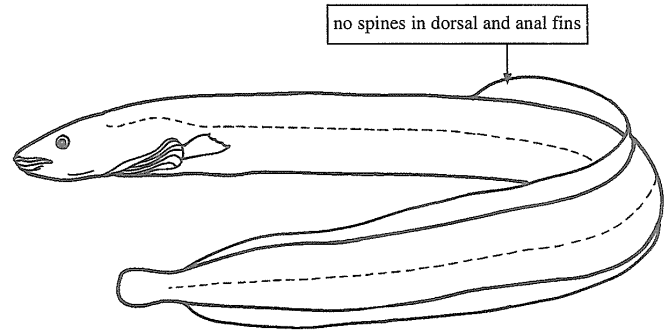
Monopterus albus

CHAUDHURIIDAE

Page 178

Dwarf swamp eels

»Pectoral fins present. Dorsal and anal fins present. No rostral appendage. Size small. 1 species.



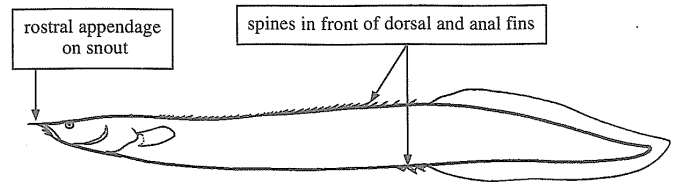
Chaudhuria caudata

MASTACEMBELIDAE

Page 178

Spiny eels

»Pectoral fins present. A series of 9 to 42 spines in front of the long dorsal fin. 2 or 3 spines in front of the long anal fin. Fleshy rostral appendage present. 2 genera present.



Mastacembelus armatus

Order PERCIFORMES

Spiny rayed fishes

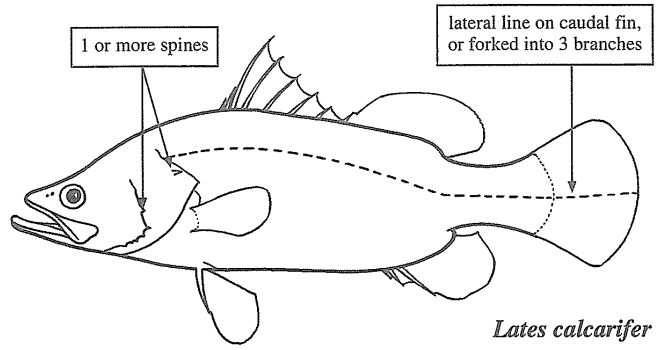
> Distinguishing characters: A single gill opening on each side. Pelvic fin thoracic. Usually 2 dorsal fins, the first comprising a series of non-segmented spines. Also anal and pelvic fins often with spiny rays. No adipose fin. Pectoral-fin base lateral and vertical. Upper jaw protrusible in most families. Caudal fin with maximum of 17 principal rays. Many families. The most diverse order of fishes.

Suborder PERCOIDEI

CENTROPOMIDAE Page 183

Snooks

»Caudal fin rounded. Lateral line to tip of caudal fin, or forked into 3 branches at its base. Dorsal fin with 7 to 8 spines followed by 1 spine and 8 to 11 branched rays. 1 or more spines at rear angle of opercle and preopercle. 2 genera present.

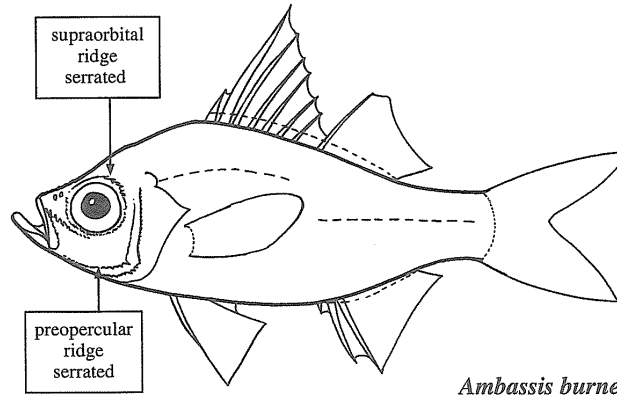


Lates calcarifer

CHANDIDAE Page 181

Asiatic glassfishes

»Caudal fin forked. Lateral line complete to caudal fin. Often a nearly transparent body. Dorsal fin with 6 to 7 spines followed by 1 spine and 9 to 10 branched rays. Preopercular, supraorbital and lacrimal bones serrated. Several genera.

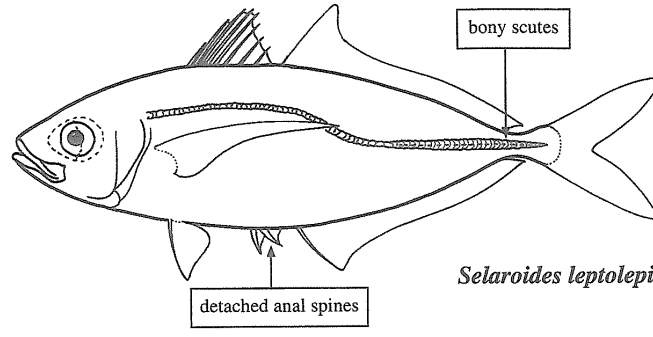


Ambassis burnensis

CARANGIDAE Page 184

Jacks and Pompanos

»Caudal fin forked. Lateral line on caudal peduncle armed with bony scutes.



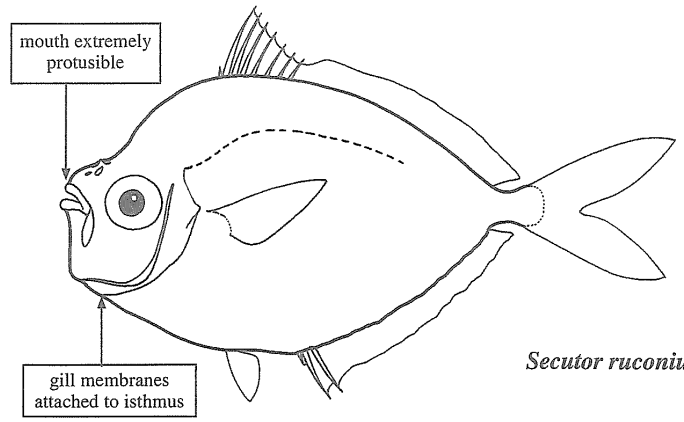
Selaroides leptolepis

LEIOGNATHIDAE

Page 184

Ponyfishes

»Caudal fin forked. Scales tiny. Mouth extremely protrusible. No gap or notch separating spinous portion from soft portion of dorsal fin. Gill membranes attached to isthmus.



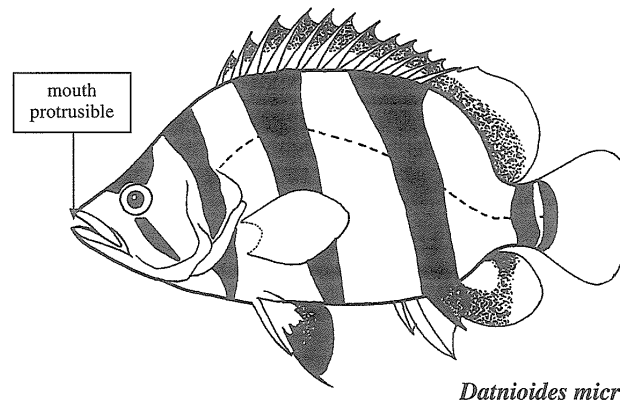
Secutor ruconius

LOBOTIDAE

Page 185

Datnioids

»Caudal fin rounded. Scales tiny. Mouth protrusible. Body with strongly contrasting black bars on a light background.



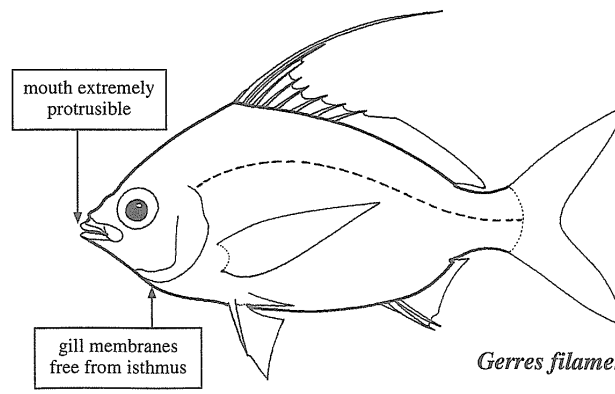
Datnioides microlepis

GERREIDAE

Page 186

Silver biddies

»Caudal fin forked. Scales large. Mouth extremely protrusible. No gap or notch separating spinous portion from soft portion of dorsal fin. Gill membranes free from isthmus.



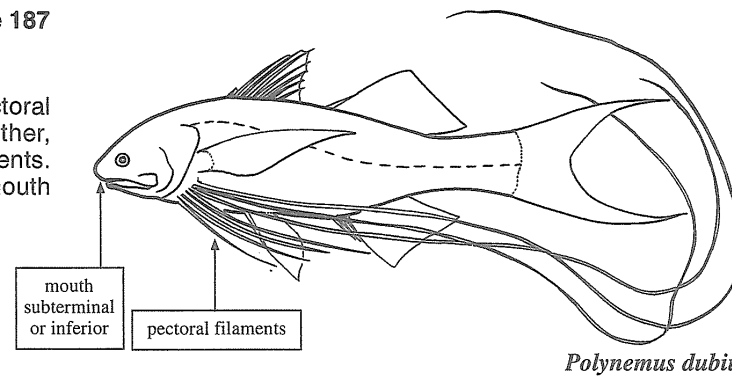
Gerres filamentosus

POLYNEMIDAE

Page 187

Threadfins

»Caudal fin forked. Upper part of pectoral fin with rays attached to each other, lower rays long unattached filaments. 2 widely separated dorsal fins. Mouth subterminal or inferior.



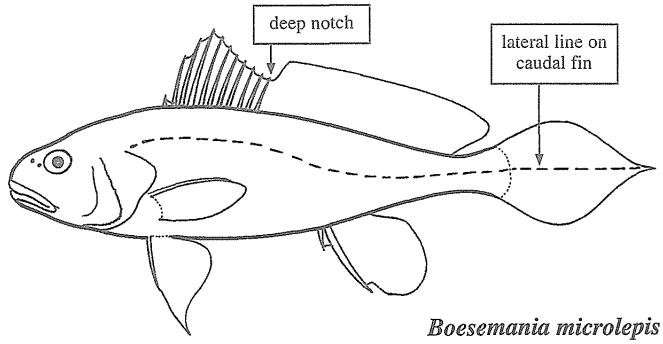
Polynemus dubius

SCIAENIDAE

Page 188

Drums

»Caudal fin rounded. Lateral line extending to tip of caudal fin. Dorsal fin long with deep notch separating spinous portion from soft portion.



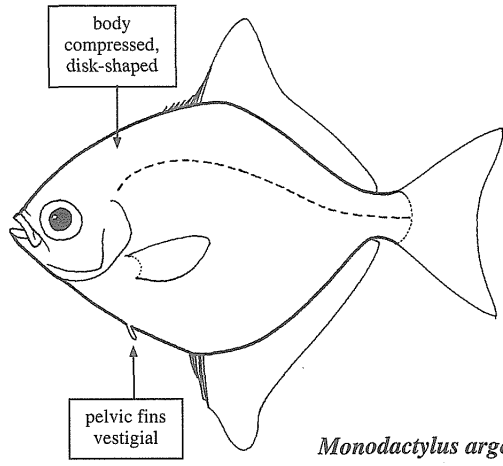
Boesemania microlepis

MONODACTYLIDAE

Page 189

Moonfishes

»Caudal fin shallowly forked. Body strongly compressed, disk-shaped. Pelvic fins vestigial. Body silvery.



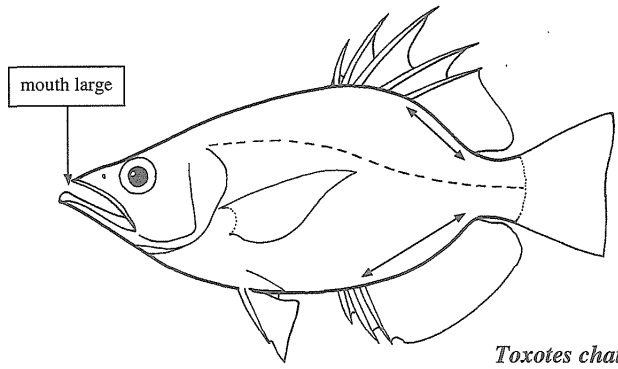
Monodactylus argenteus

TOXOTIDAE

Page 189

Archerfishes

»Caudal fin truncate. Soft dorsal-fin base much shorter than soft anal-fin base. Mouth large and terminal. 1 genus.



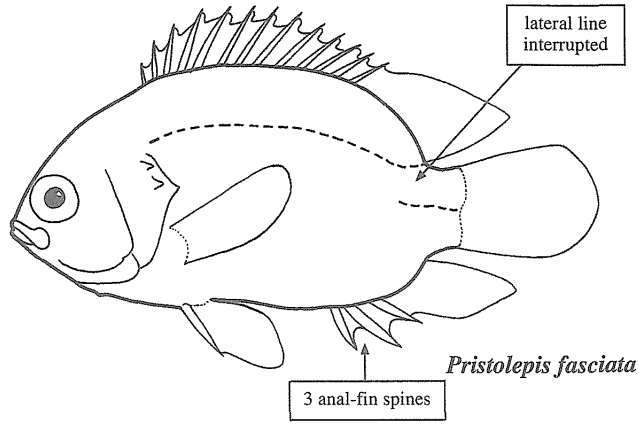
Toxotes chatareus

NANDIDAE

Page 191

Leaffishes

»Caudal fin truncate or rounded. Lateral line interrupted below dorsal fin. Anal fin with 3 large spines. 2 genera.



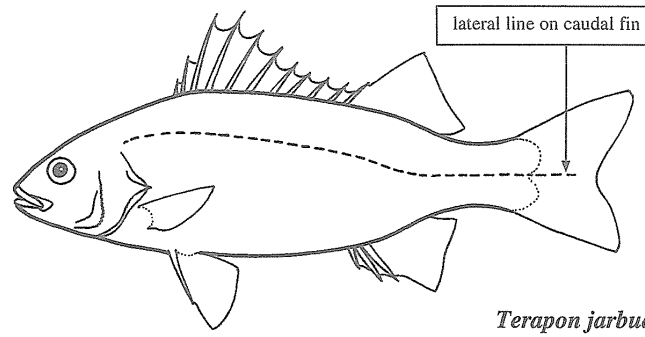
Pristolepis fasciata

TERAPONTIDAE

Page 192

Grunter perches

»Caudal fin truncate or emarginate. Lateral line continuous and extending onto caudal fin. 1 species.



Terapon jarbua

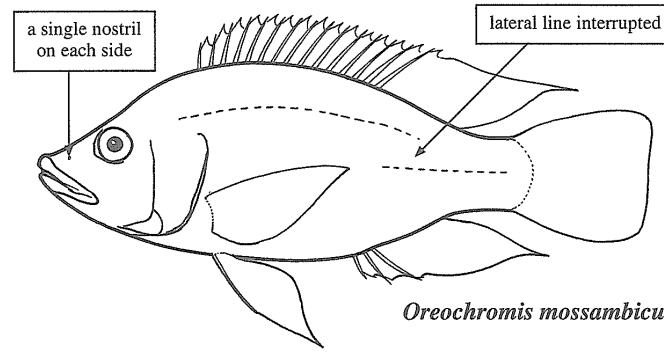
Suborder LABROIDEI

CICHLIDAE

Page 192

Cichlids

»A single nostril on each side. Lateral line interrupted. Caudal fin truncate or rounded. Introduced species.



Oreochromis mossambicus

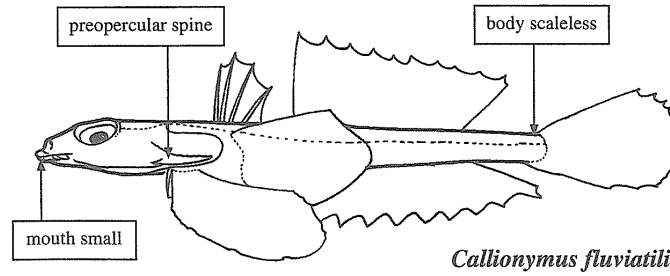
Suborder CALLIONYMOIDEI

CALLIONYMIDAE

Page 193

Dragonets

»Caudal fin rounded. Body scaleless. Mouth small. First dorsal fin with 1 to 4 flexible spines. 2 species.



Callionymus fluviatilis

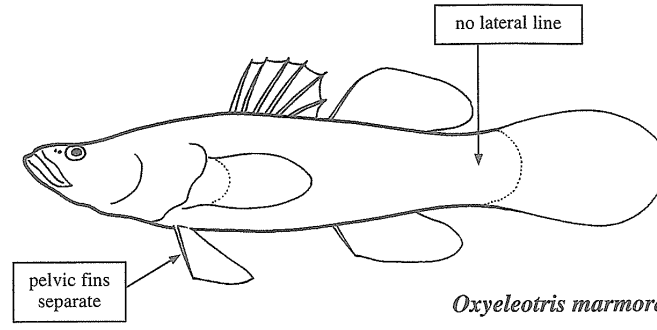
Suborder GOBIOIDEI

ELEOTRIDAE

Page 194

Sleepers

»Pelvic fins separate. Dorsal fins separate. Caudal fin round and separate from anal and dorsal fins. No lateral line on body.



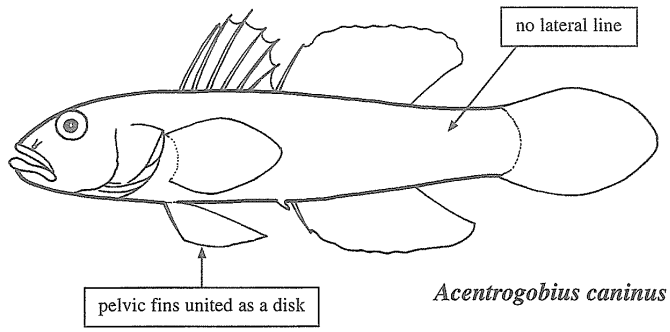
Oxyeleotris marmorata

GOBIIDAE

Page 197

Gobies

»Pelvic fins united, forming an adhesive disk. Dorsal fins separate. Caudal fin round and separate from anal and dorsal fins. No lateral line on body.

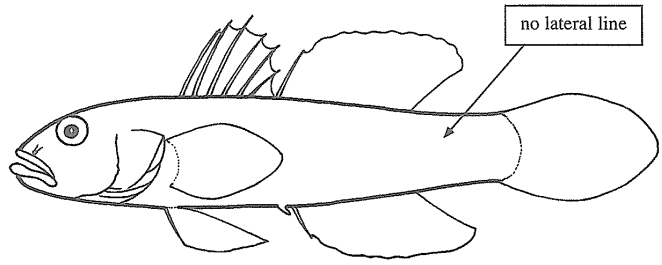


Acentrogobius caninus

GOBIINAE

Page 197

»A single anterior pore in the interorbital canal plus a pair of nasal pores, one on each branch in front of the eye. Interorbital canal branches in front of eye.

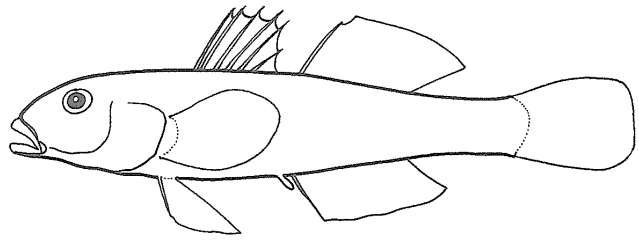


Acentrogobius caninus

GOBIONELLINAE

Page 202

»Paired anterior pores on interorbital canal plus 2 pairs of nasal pores, two on each branch in front of the eye. Interorbital canal branches between or behind eyes.

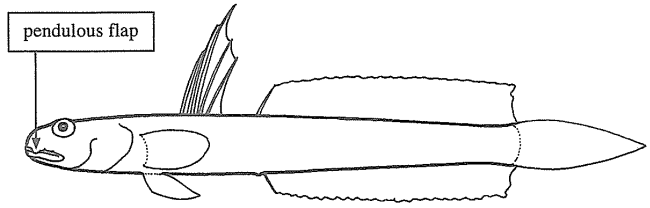


Awaous grammepomus

OXUDERCINAE

Page 209

»Anterior nostril at tip of pendulous flap overhanging the upper lip. A single pore posteriorly in interorbital space.

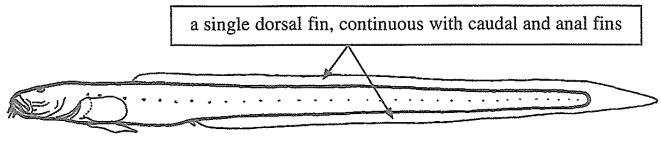


Scartelaos histophorus

AMBLYOPINAE

Page 212

»Body very elongate and eellike. A single long dorsal fin, continuous with caudal and anal fins.



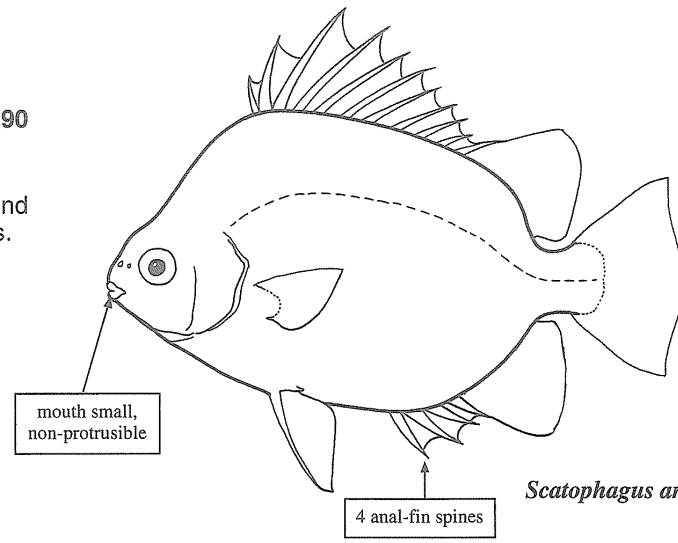
Taenioides gracilis

Suborder ACANTHUROIDEI

SCATOPHAGIDAE Page 190

Scats

»Caudal fin truncate. Mouth small and non-protrusible. Anal fin with 4 spines.



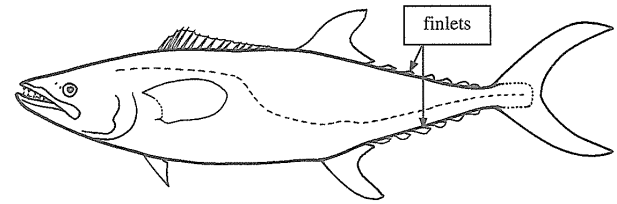
Scatophagus argus

Suborder SCOMBROIDEI

SCOMBRIDAE Page 214

Mackerels and Tunas

»Caudal fin deeply forked. 2 dorsal fins. Series of finlets behind the dorsal and anal fins.



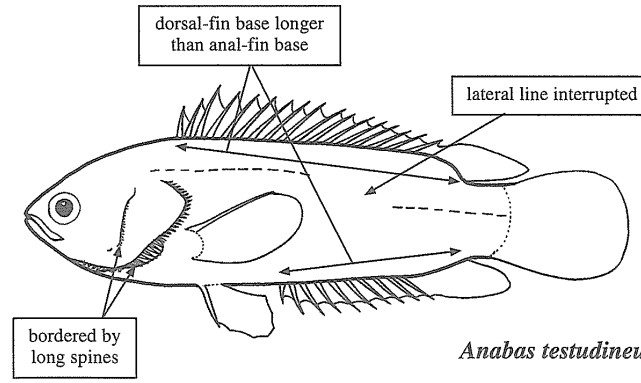
Scomberomorus sinensis

Suborder ANABANTOIDEI

ANABANTIDAE Page 214

Climbing perches

»Caudal fin rounded. Lateral line interrupted below dorsal fin. Dorsal-fin base longer than anal-fin base. Operculum, suboperculum and interoperculum bordered by long, radiating spines. 1 species.

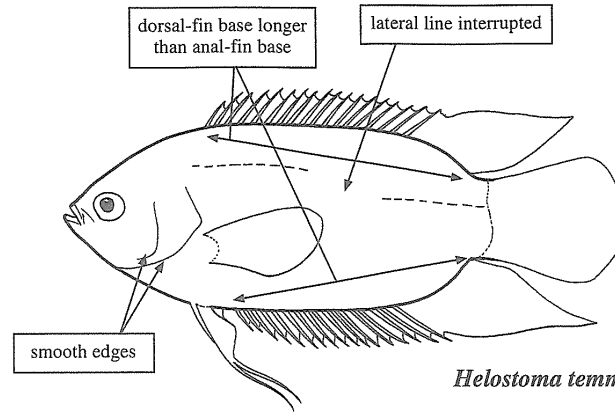


Anabas testudineus

HELOSTOMATIDAE Page 215

Kissing gourami

»Caudal fin rounded. Lateral line interrupted. Dorsal-fin base longer than anal-fin base. Operculum and suboperculum with smooth posterior edge. 1 species.



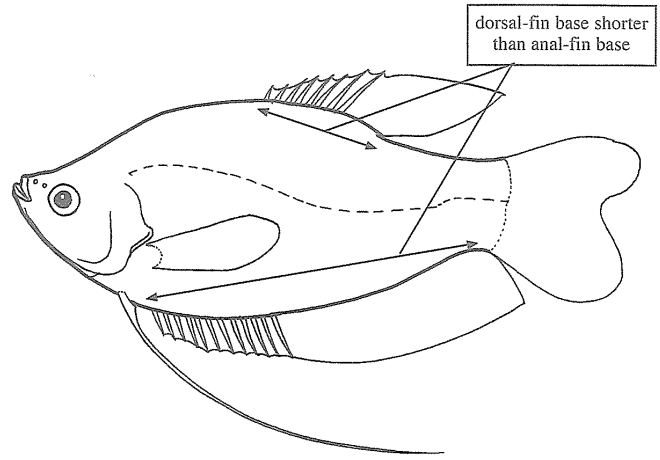
Helostoma temmincki

BELONTIIDAE

Page 215

Gouramies

»Caudal fin truncate, emarginate or rounded. Lateral line vestigial, absent, complete, or interrupted. Dorsal-fin base shorter than anal fin base. Dorsal fin with 10 or fewer soft rays.



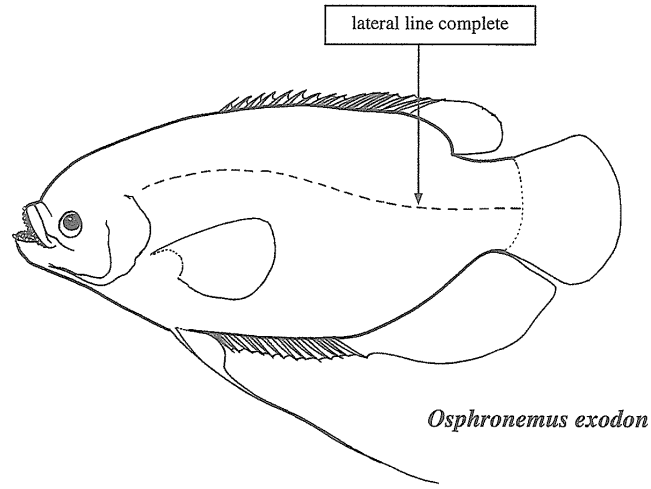
Trichogaster trichopterus

OSPHRONEMIDAE

Page 218

Giant gouramies

»Caudal fin truncate or rounded. Lateral line complete. Dorsal fin with 10 to 14 soft rays.



Osphronemus exodon

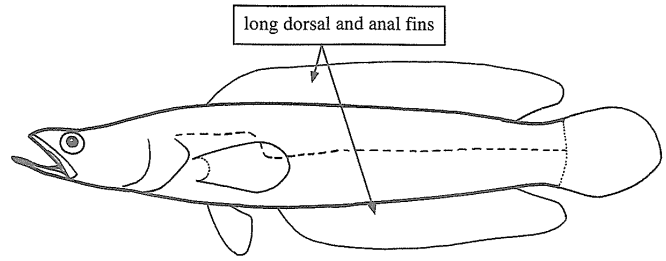
Suborder CHANNOIDEI

CHANNIDAE

Page 219

Snakeheads

»Body elongate. Caudal fin rounded. Long dorsal and anal fins. Lateral line complete, dropping one to several rows above pectoral fin.



Channa lucius

Order PLEURONECTIFORMES

Flounders, Soles and Tonguefishes

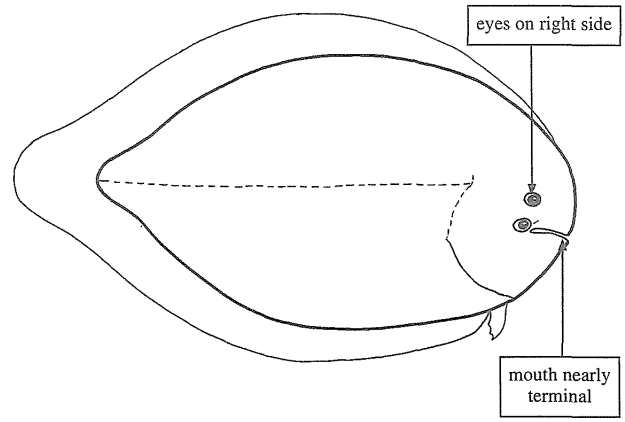
> Distinguishing characters: A single gill opening on each side. Pelvic fin thoracic. Adults not bilaterally symmetrical. Both eyes on one side of the head. Dorsal and anal fins with long bases with dorsal fin originating on the head. Bodies highly compressed. 2 families found in the Mekong.

SOLEIDAE

Page 221

Soles

»Eyes on right side of body. Dorsal and anal fins confluent with caudal fin. Mouth nearly terminal.



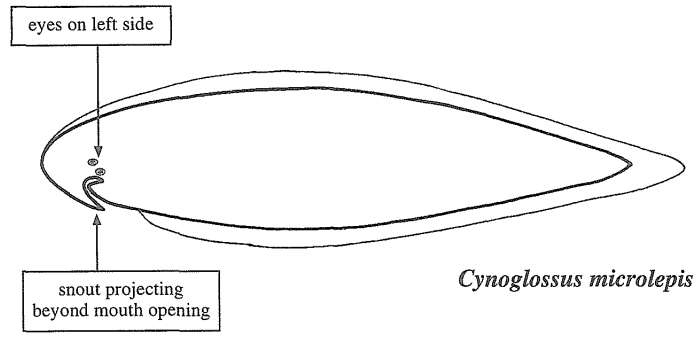
Euryglossa harmandi

CYNOGLOSSIDAE

Page 223

Tonguefishes

»Eyes on left side of body. Dorsal and anal fins confluent with caudal fin. Snout projecting well beyond mouth opening.



Cynoglossus microlepis

Order TETRAODONTIFORMES

Puffers

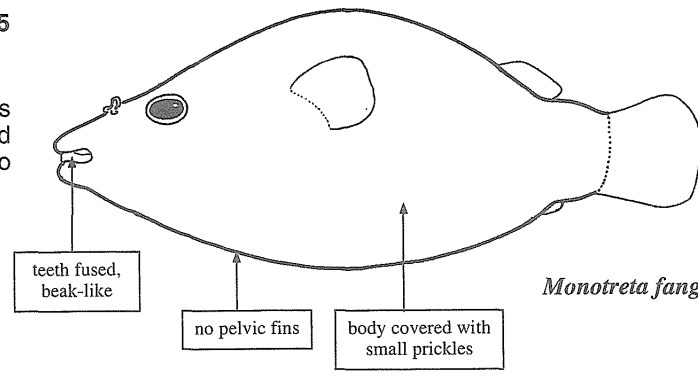
> Distinguishing characters: A single gill opening on each side. Pelvic fins absent. Gill openings small. Scales modified to become prickles. No spines in fins. Teeth fused, beak-like.

TETRAODONTIDAE

Page 225

Puffers

»Body inflatable, skin with small prickles that may be confined to belly. Four fused teeth in jaws. Caudal fin truncate to rounded.



Monotreta fangi

GUIDE TO SPECIES

How to use the "Guide to Species"

After assigning your fish to its family (or subfamily, tribe, subtribe), using either "A Pictorial Index to Families" (pages 20 to 25) or the "Guide to Orders and Families" (pages 26 to 50), locate the family in this "Guide to Species" section. The page numbers for names of families (and subfamilies, tribes, subtribes) are listed in the "Table of Contents" in phylogenetic order, and in the "Index" in alphabetical order. If there is more than one genus of the family represented in the Cambodian Mekong, the next step is to determine which genus the fish belongs. This is accomplished by comparing the generic characters from each genus listed under the family with the corresponding characters on your fish. Generic characters are numbered within the "genus box" and the numbers are repeated as figure captions on the first fish listed under a respective genus. After the genus is discovered the species can be determined by comparing the species characters and figures for each species listed under the genus with the corresponding characters on your fish. Use the section on "Technical Terms and Measurements" (pages 18 and 19) if you do not recognize the characters listed in the guide.

Order CARCHARHINIFORMES

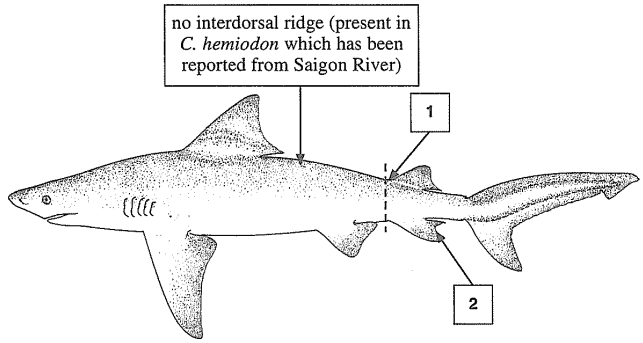
Family CARCHARHINIDAE

Genus *Carcharhinus* — **CARCHARHINIDAE**

(1) ORIGIN OF SECOND DORSAL FIN ABOVE ORIGIN OF ANAL FIN; **(2)** POSTERIOR MARGIN OF ANAL FIN DEEPLY CONCAVE.

1 species likely to occur in Cambodian fresh waters, with others likely in the lower Mekong estuary.

Carcharhinus leucas (Valenciennes, 1839)



FAO name: Bull shark.

Local names: Trey chhlarm, ត្រីឆ្លាម.

Size: To 100 cm in fresh water, up to 300 cm in the sea.

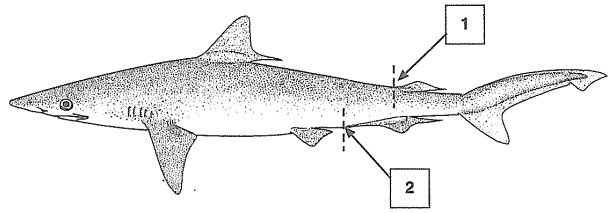
Habitat, biology, and fisheries: Known from large coastal rivers and estuaries, with adults found in estuaries. Young may ascend into rivers up to hundreds of kilometers from the sea. Expected, but not yet recorded from the Mekong. This species is well known for its attacks on humans. Taken by hooks, traps, or gill-nets.

Genus *Rhizoprionodon* — **CARCHARHINIDAE**

(1) ORIGIN OF SECOND DORSAL FIN WELL BEHIND ORIGIN OF ANAL FIN; **(2)** POSTERIOR MARGIN OF ANAL FIN NEARLY STRAIGHT OR ONLY SLIGHTLY INDENTED.

1 species recorded.

Rhizoprionodon acutus (Rüppell, 1837)



Synonyms / misidentifications: *Prionodon sorrakowa, Scoliodon walbeehmi.*

FAO name: Milk shark.

Local names: Trey chhlarm, ត្រីឆ្លាម.

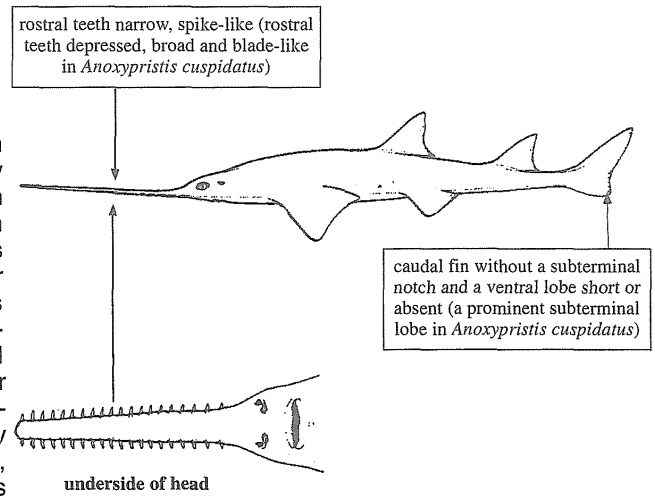
Size: To 175 cm, commonly to about 110 cm.

Habitat, biology, and fisheries: Widespread and abundant from the eastern Atlantic to the western Pacific along coastlines of Africa and Asia. Although primarily found in estuaries and coastlines, it often enters fresh water. Recorded several times from Cambodia as far upstream as the Great Lake. Occurs near the surface in shallow waters. Feeds on small bony fishes and crustaceans. Harmless to people. Taken by hook-and-line, traps, and gill-nets. Utilized fresh for human consumption.

Order RAJIFORMES

Family PRISTIDAE

Pristis microdon (Latham, 1794)



FAO name: Largetooth sawfish.
Local names: Trey thkaw, ត្រី ថ្កូ.
Size: In fresh water to 600 cm.
Habitat, biology, and fisheries: Known from large rivers and estuaries, with adults usually found in estuaries. Young ascend into fresh water. Large adults can also be found in fresh water, but are rarely caught. About ten years ago, sawfishes were regularly seen as far upstream as Khoné Falls, but their numbers have decreased considerably due to extensive drift gill-netting. In the Tonlé Sap and Great Lake no sawfishes have been seen for several decades. They feed on mollusks, crustaceans, and small, schooling species of bony fishes. Caught by hook-and-line, drift gill-nets, and more rarely by cast-nets. Another species of this genus, *Pristis clavatus*, described recently by Last and Stevens (1994), is also likely to be found in freshwater habitats of the Indo-Pacific region, including those of the Mekong basin. It is a small species, with a maximum size of 1.4 m and has the dorsal-fin origin above or slightly in front of the pelvic fin (instead of considerably in front of the pelvic fin in *P. microdon*) and a greenish brown colour (instead of greyish brown in *P. microdon*).

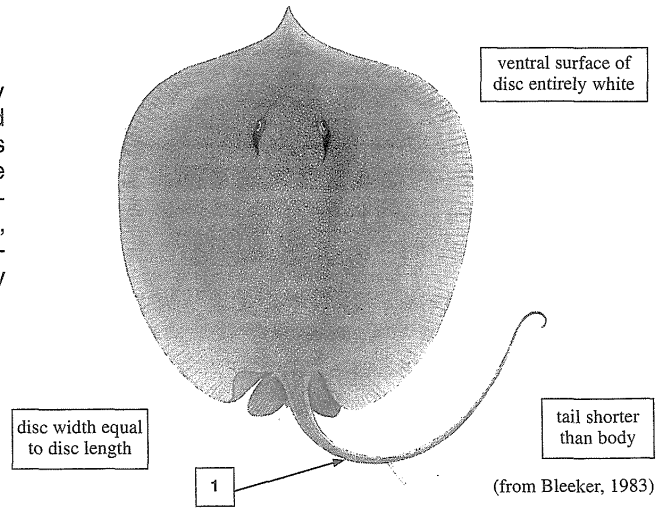
Family DASYATIDAE

Genus *Amphotistius* — **DASYATIDAE**

(1) TAIL WITH 1 DORSAL AND 1 VENTRAL FOLD OF SKIN.
2 species likely.

Amphotistius imbricatus (Schneider, 1801)

Local names: Trey bawbel, ត្រី បាបែល.
Size: Disc width 22 cm.
Habitat, biology, and fisheries: Typically found in estuarine habitats, but also reported from the Great Lake by Chevey (1936). Feeds on bottom-dwelling invertebrates. The single Great Lake record may in fact refer to *Amphotistius laosensis* (Roberts and Karnasuta, 1987). Both species are included here for purposes of comparison. This species is typically caught by seines or trawls.



(from Bleeker, 1983)

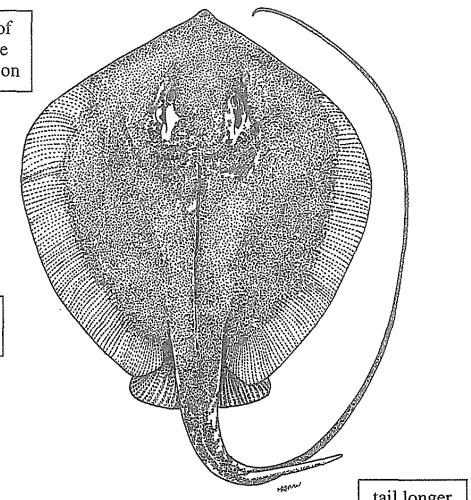
Amphotistius laosensis (Roberts and Karnasuta, 1987) **DASYATIDAE**

Synonyms / misidentifications: *Dasyatis laoensis*.

Local names: Trey bawbel, ត្រី បំបែង.

Size: Disc width to 50 cm.

Habitat, biology, and fisheries: Reported upstream from Khoné Falls, and also commonly seen in the Mekong of Cambodia. A freshwater species that occurs over sandy substrates in large rivers. Feeds on bottom-dwelling invertebrates. Typically caught with seines or with hook-and-line. Rarely seen in markets with the poisonous spine on the tail, because fishermen break it off immediately after capture. Usually marketed fresh for human consumption. Previous records of *Amphotistius imbricatus* from the Mekong may refer to this species.



(after Roberts and Karnasuta, 1987)

Genus *Himantura* **DASYATIDAE**

(1) TAIL LACKING FOLDS OF SKIN ENTIRELY.

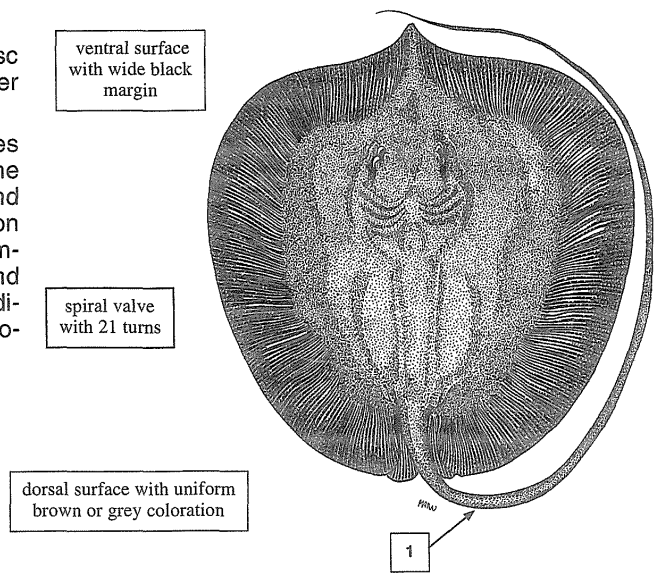
3 species likely.

Himantura chaophraya Monkolprasit and Roberts, 1990

Local names: Trey bawbel, ត្រី បំបែង.

Size: In preserved specimens to 200 cm disc width, larger individuals with weights of over 600 kg have been reported.

Habitat, biology, and fisheries: In estuaries and large rivers, ascending far upstream in the Chao Phrya of Thailand, and found above and below Khoné Falls in the Mekong. Occurs on sandy bottoms where it feeds on bottom-dwelling invertebrates. Taken by seines and hook-and-line. Marketed fresh, with large individuals being sold in cut pieces by the kilogramme.



(after Monkolprasit and Roberts, 1990)

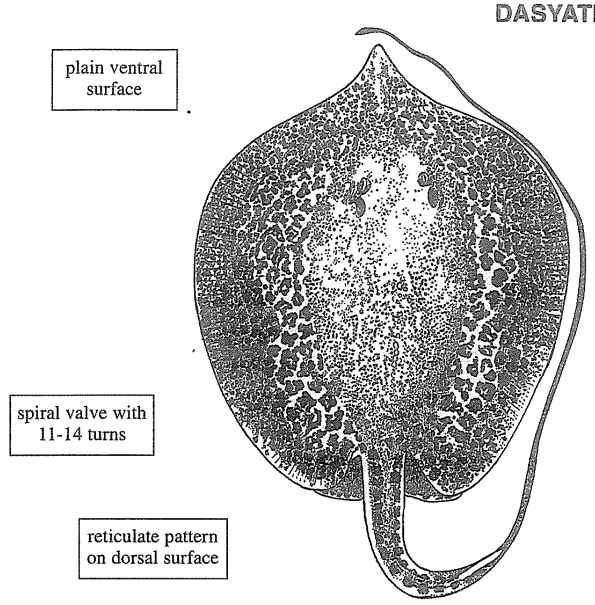
Himantura krempfi (Chabanaud, 1923)

Synonyms / misidentifications: *Dasyatis krempfi.*

Local names: Trey bawbel, ត្រី បាបរ.

Size: Disc width to 35 cm.

Habitat, biology, and fisheries: Found in estuaries and large rivers, often far upstream. Usually occurs over sandy substrates where it feeds on benthic invertebrates. Taken with seines, trawls, or by hook-and-line.



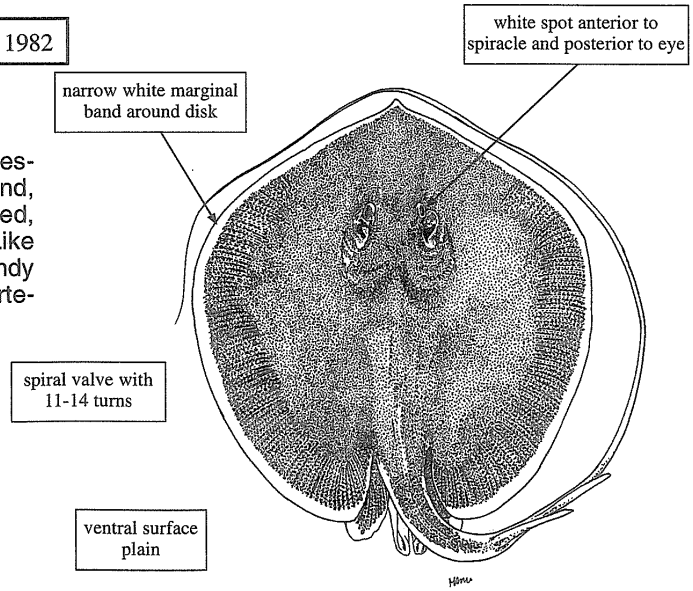
(from Smith, 1945)

Himantura signifer Compagno and Roberts, 1982

Local names: Trey bawbel, ត្រី បាបរ.

Size: Disc width to 40 cm.

Habitat, biology, and fisheries: Found in estuaries and rivers of the Gulf of Thailand, Malacca Straits, and Kalimantan. Expected, but not yet recorded from the Mekong. Like other freshwater stingrays it is found on sandy bottoms where it feeds on benthic invertebrates. Taken with seines and trawls.

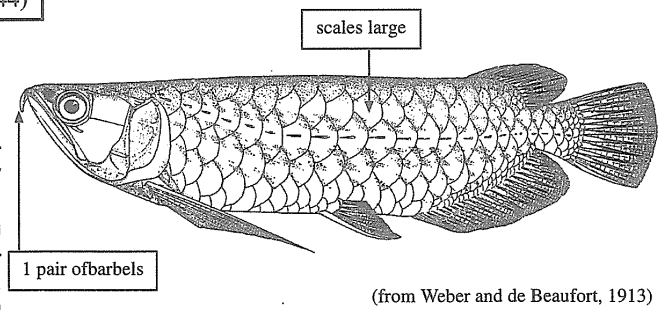


Order OSTEOGLOSSIFORMES

Family OSTEOGLOSSIDAE

Scleropages formosus (Schlegel and Müller, 1844)

FAO name: Asian bonytongue.
Local names: Trey tapawt, ត្រីតាពង.
Size: To 90 cm.



(from Weber and de Beaufort, 1913)

Habitat, biology, and fisheries: Found in tannin stained blackwater streams from the Malay Peninsula, Sumatra, Vietnam, and Cambodia. In Cambodia it is known from the Cardamom mountains southward to Kampot. Young individuals feed on insects at the water surface, adults feed on fishes. The species is a mouth brooder with a few relatively large eggs per spawning. It might be easily overfished by collectors for the aquarium trade. Listed as "K" or insufficiently known in the IUCN Red List (1994). Caught with seines and cast-nets.

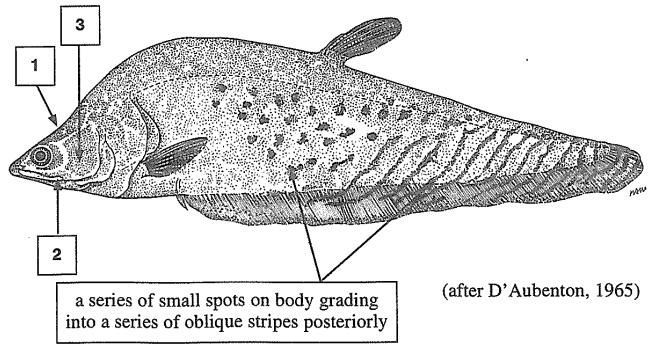
Family NOTOPTERIDAE

Genus *Chitala* — **NOTOPTERIDAE**

(1) CRANIO-DORSAL OUTLINE STRONGLY CONCAVE; **(2)** MAXILLA EXTENDING WELL BEYOND POSTERIOR MARGIN OF EYE; **(3)** HEAD SCALES SMALLER THAN OR EQUAL TO BODY SCALES.
2 species recorded, a third likely.

Chitala blanci (Aubenton, 1965) **(plate I, 1)**

Synonyms / misidentifications: *Notopterus blanci*.
FAO name: Royal featherback.
Local names: Trey krai, ត្រីក្រាយ.
Size: To 90 cm.



(after D'Aubenton, 1965)

Habitat, biology, and fisheries: A Mekong endemic known from large rivers. Found in areas of rocks or boulders in the main channel from Khemerat, Thailand to Kratié, Cambodia. Apparently leaves the river for the inundated forest from July to October (Roberts, 1993). Active during the twilight and night. A predator that feeds on fishes, crustaceans, and insects. Taken by hook-and-line, cast-nets, or gill-nets. Regularly sold in the markets of cities or towns along the Mekong river in northeast Thailand and northern Cambodia. Occasionally seen in the aquarium trade. Due to its restricted range and narrow habitat requirements, this species is listed as "R" or rare in the IUCN Red List (1994).

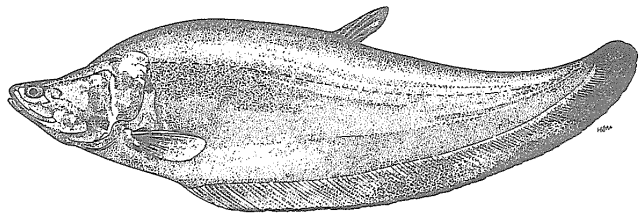
Chitala lopis (Bleeker, 1851) (plate I, 2) **NOTOPTERIDAE**

Synonyms / misidentifications: *Notopterus borneensis, Notopterus lopis.*

FAO name: Giant featherback.

Local names: Trey krai, Trey slat, ត្រីក្រាយ, ត្រីស្លាត.

Size: To 150 cm.



Habitat, biology, and fisheries: This species seems to be found most often in permanent swamps in the upland area from Khoné Falls to Kratié, but is not known from the Great Lake. The largest and rarest member of its genus in Cambodia. Like other featherbacks, it feeds on fishes and probably has a crepuscular or nocturnal activity pattern. Caught by hook-and-line, cast-nets, gill-nets, and seines.

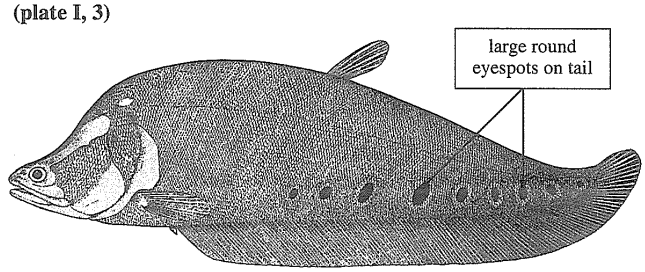
Chitala ornata (Gray, 1831) (plate I, 3)

Synonyms / misidentifications: *Notopterus chitala.*

FAO name: Clown featherback.

Local names: Trey krai, ត្រីក្រាយ.

Size: To 100 cm.



(from Chevey and La Poulain, 1940)

Habitat, biology, and fisheries: Found in mainland Southeast Asia. Usually occurs in flowing waters of large and medium-sized rivers. A predator on surface-feeding fishes, crustaceans, and insects, with a crepuscular or nocturnal activity pattern. Moves into the inundated forest during the high water period from June to October. Spawning occurs in June on stumps or other solid objects as floodwaters begin to rise. After spawning, the female departs and the male guards the eggs (Smith, 1945). Caught by hook-and-line, cast-nets, gill-nets, and in traps (weirs and barrages). Individuals from the Great Lake are shipped on ice to markets in Thailand. Common in the aquarium trade.

Genus *Notopterus* **NOTOPTERIDAE**

(1) CRANIO-DORSAL OUTLINE STRAIGHT; (2) MAXILLA EXTENDING TO PUPIL OR POSTERIOR BORDER OF EYE; (3) HEAD SCALES MUCH LARGER THAN BODY SCALES.

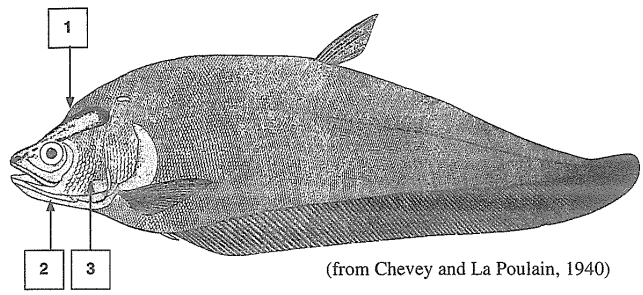
1 species recorded.

Notopterus notopterus (Pallas, 1780) (plate I, 4)

FAO name: Bronze featherback.

Local names: Trey slat, ត្រីស្លាត.

Size: To 40 cm.



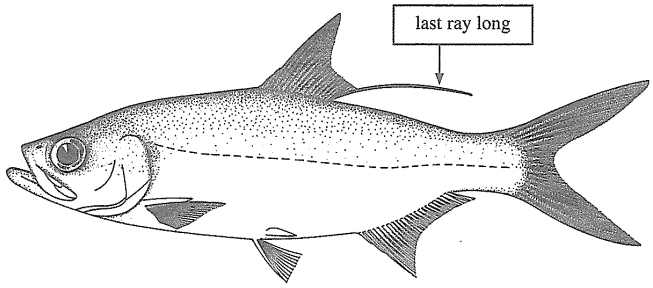
(from Chevey and La Poulain, 1940)

Habitat, biology, and fisheries: Found in fresh waters of south and southeastern Asia. Occurs in standing and sluggish waters of lakes, floodplains, canals, and ponds. An insect and fish predator, it is most active during the twilight and at night. Colonizes and breeds in seasonally inundated areas during the rainy season and migrates back to permanent waters in the dry season. Caught by seines, lift-nets, weirs, and barrages. Large numbers are shipped on ice from fish landings around the Great Lake to markets in Thailand.

Order ELOPIFORMES

Family MEGALOPIDAE

Megalops cyprinoides (Broussonet, 1782) **(plate I, 5)**



FAO name: Indo-Pacific tarpon.

Local names:

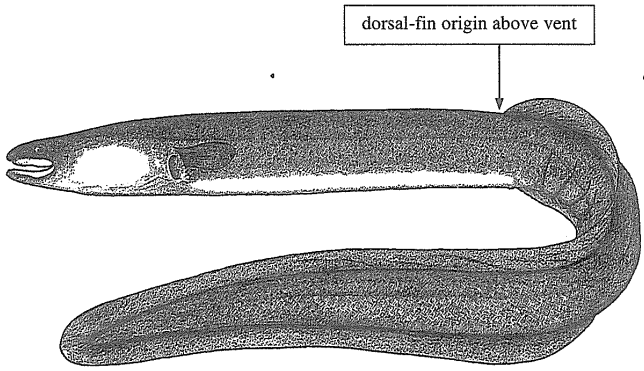
Size: To 55 cm.

Habitat, biology, and fisheries: Wide coastal distribution in the Pacific and Indian Oceans. Found in seas, lagoons, and estuaries, often entering lowland rivers. Dietary preferences include crustaceans and small fishes. Taken most often by gill-nets and occasionally by hook-and-line.

Order ANGUILLIFORMES

Family ANGUILLIDAE

Anguilla bicolor M'Clelland, 1844



Synonyms / misidentifications: *Anguilla australis.*

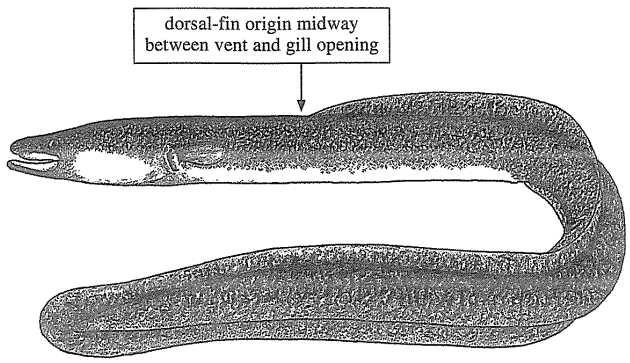
FAO name: Shortfin eel.

Local names: Trey chlok, ត្រី ច្លុក.

Size: To 70 cm.

Habitat, biology, and fisheries: Found in fresh water and estuaries along Indo-Pacific coasts. Lives in freshwater areas as an adult, in estuaries and seas as young. This is apparently the rarer of the two species of *Anguilla* in the Mekong, but both are poorly documented (Roberts and Warren, 1994). An active nocturnal forager, feeding largely on a diet of crustaceans and mollusks. Caught by hooks, seines, traps, and cast-nets.

Anguilla marmorata Quoy and Gaimard, 1824



FAO name: Giant mottled eel.

Local names:

Size: To 150 cm.

Habitat, biology, and fisheries: Found in fresh water and estuaries from China to South Africa. Inhabits freshwater areas as adults, estuaries and seas as young. This species is apparently more common in the Mekong than *Anguilla bicolor,* but records for both are poorly documented (Roberts and Warren, 1994). Recorded from the Mekong as far upstream as Nakhon Phanom (Thailand). Found in the Great Lake when water levels are exceptionally high. Caught with hooks, seines, traps, and cast-nets.

Family OPHICHTHIDAE

Genus *Ophichthus* — OPHICHTHIDAE

(1) VOMERINE TEETH SHARPLY POINTED.

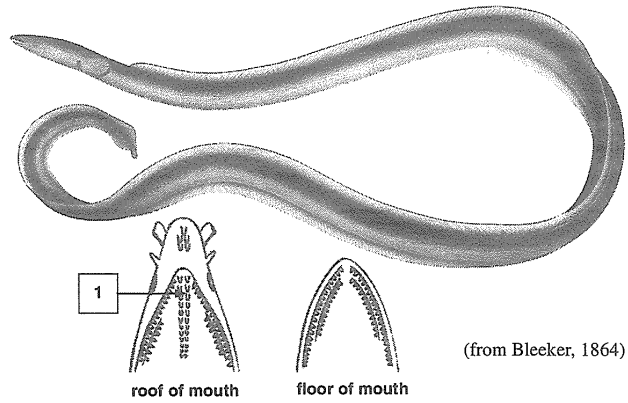
1 species recorded, additional species possible.

Ophichthus rutidoderma (Bleeker, 1852)

Local names: Antong sor, អន្តង សរ.

Size: To 95 cm.

Habitat, biology, and fisheries: Found in estuaries and freshwater areas. Probably spends most of the day in a burrow along the river bank and forages actively at night for small fishes. Recorded several times from Cambodia. At least three additional species of this genus are recorded from Vietnam and may also occur in the Cambodian Mekong. Caught by seines, set-nets, and traps.



(from Bleeker, 1864)

Genus *Pisodonophis* — OPHICHTHIDAE

(1) VOMERINE TEETH BLUNT OR MOLARIFORM.

1 species recorded, a second likely.

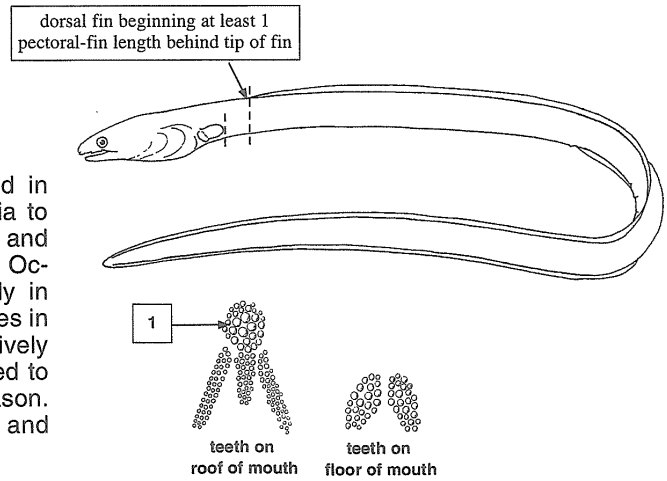
Pisodonophis boro (Hamilton, 1822)

FAO name: Rice-paddy eel.

Local names:

Size: To 100 cm.

Habitat, biology, and fisheries: Found in fresh water and estuaries from Polynesia to southern Africa. Common in tidal reaches and nearby upstream areas of coastal rivers. Occurs in the Mekong delta, and probably in tidally influenced areas of Cambodia. Lives in holes in the river bottom and bank and actively forages for small fishes at night. Reported to spawn in rice-paddies during the rainy season. Caught with seines, spears, set-nets, and traps.



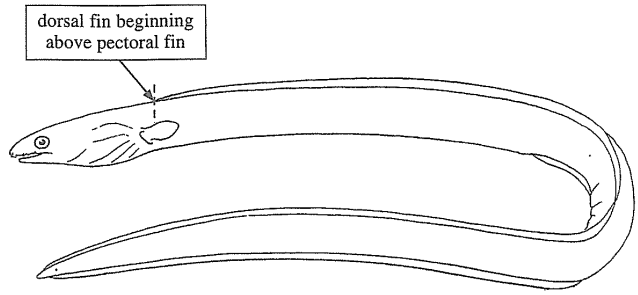
Pisodonophis cancrivorus (Richardson, 1844)

FAO name: Longfin snake eel.

Local names:

Size: To 75 cm.

Habitat, biology, and fisheries: Found in lagoons and estuaries from Polynesia to Madagascar, and also entering fresh water. Caught most often in tidal areas and estuaries. Not yet recorded from Cambodia, but is likely to be found there. Like other eels, it is probably an active nocturnal forager. Caught with seines, set-nets, and traps.



Order CLUPEIFORMES

Family CLUPEIDAE

Subfamily PELLONULINAE

Genus *Clupeoides* — **CLUPEIDAE**

(1) UPPER JAW SYMPHYSIS LACKING NOTCH FOR LOWER JAW OCCLUSION; **(2)** ANAL FIN ENTIRE, LAST 2 RAYS NOT SEPARATED FROM THE REST OF THE FIN.

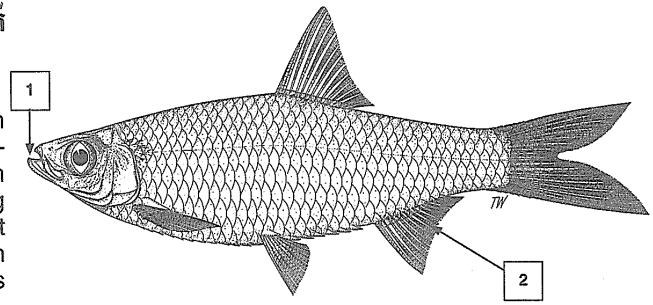
1 species recorded.

Clupeoides borneensis Bleeker, 1851 **(plate I, 6)**

FAO name: Borneo river sprat.

Local names: Trey bawndol ampeou, ត្រីបណ្តូលអំពៅ.

Size: To 8 cm.



Habitat, biology, and fisheries: Known from Indonesia, the lower Mekong, and rivers flowing into the Gulf of Thailand. Usually found in the tidal zone of large rivers. In the Mekong basin, it commonly occurs upstream at least as far as the Great Lake. Feeds primarily on planktonic crustaceans. Although reported as non-migratory (Blache and Goossens, 1954), it may move short distances from the main river channels during high water periods. It seems to maintain fairly uniform numbers in the Tonlé Sap from November to February. Taken in seines, set-nets, weirs, and traps and used to produce prahoc and tuk trey.

Genus *Corica* — **CLUPEIDAE**

(1) UPPER JAW SYMPHYSIS LACKING NOTCH FOR LOWER JAW OCCLUSION; **(2)** TEETH IN JAWS TINY, ABSENT FROM SIDE OF MANDIBLE; **(3)** 19 TO 27 GILL RAKERS ON LOWER ARM OF FIRST ARCH; **(4)** LAST 2 RAYS OF ANAL FIN SEPARATED FROM REST OF FISH.

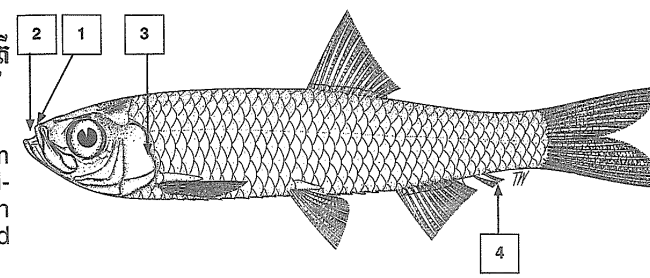
1 species recorded, a second likely.

Corica laciniata Fowler, 1935 **(plate I, 7)**

FAO name: Bangkok river sprat.

Local names: Trey bawndol ampeou, ត្រីបណ្តូលអំពៅ.

Size: To 7 cm.



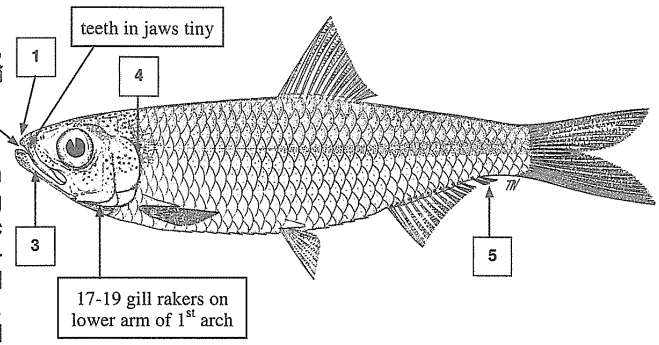
Habitat, biology, and fisheries: Known from tidal zones of large rivers and lowland floodplains of mainland southeastern Asia. Taken with seines, set-nets, weirs, and traps and used to produce prahoc and tuk trey.

Genus *Clupeichthys* **CLUPEIDAE**

(1) UPPER JAW SYMPHYSIS LACKING NOTCH FOR LOWER JAW OCCLUSION; (2) TEETH IN JAWS ENLARGED, ESPECIALLY ON MANDIBLE AND PREMAXILLA; (3) TEETH ON SIDE OF MANDIBLE; (4) 13 TO 19 GILL RAKERS ON LOWER ARM OF FIRST ARCH; (5) LAST 2 RAYS OF ANAL FIN SEPARATED.

2 species recorded, a third possible.

Clupeichthys aesarnensis Wongratana, 1983 (plate I, 8)



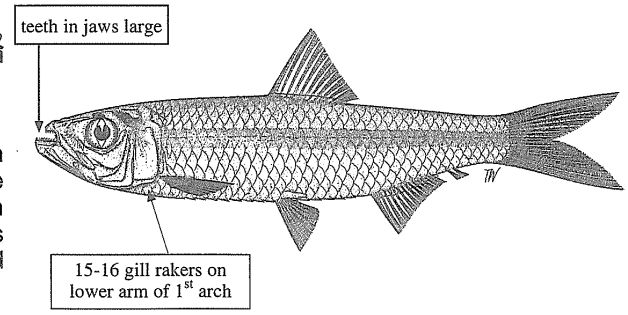
FAO name: Thai river sprat.

Local names: Trey bawndol ampeou, ត្រីបណ្តូលអំពៅ.

Size: To 7 cm.

Habitat, biology, and fisheries: Known from the Mekong basin. Found primarily in standing waters and large rivers. Feeds on planktonic crustaceans. Little is known about its behaviour. A nocturnal species that can be attracted to bright lights, where it is easily dip-netted. Also taken by seines, set-nets, weirs, and traps. Used to produce prahoc and tuk trey.

Clupeichthys goniognathus Bleeker, 1855



FAO name: Sumatran river sprat.

Local names: Trey bawndol ampeou, ត្រីបណ្តូលអំពៅ.

Size: To 9 cm.

Habitat, biology, and fisheries: Known through southeast Asia to Indonesia. Like other similar clupeids, it probably feeds on planktonic crustaceans. Found in large lakes or rivers. Taken by seines, set-nets, weirs, and traps. Used to produce prahoc and tuk trey.

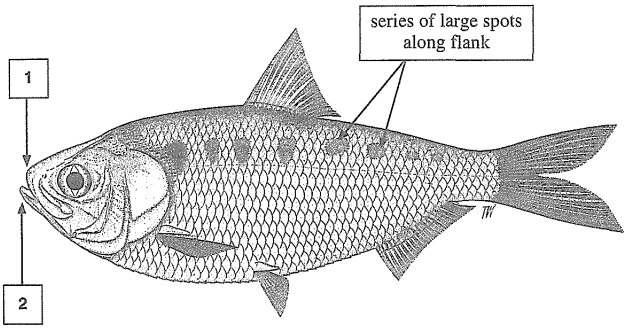
Subfamily ALOSINAE

Genus *Tenualosa* **CLUPEIDAE**

(1) UPPER JAW SYMPHYSIS WITH NOTCH FOR LOWER JAW OCCLUSION; (2) MOUTH TERMINAL OR POINTING OBLIQUELY UPWARDS.

2 species recorded.

Tenualosa thibaudeaui (Durand, 1940) (plate II, 9) CLUPEIDAE



Synonyms / misidentifications: *Hilsa thibaudeaui, Hilsa kanagurta* (non Bleeker).

FAO name: Laotian shad.

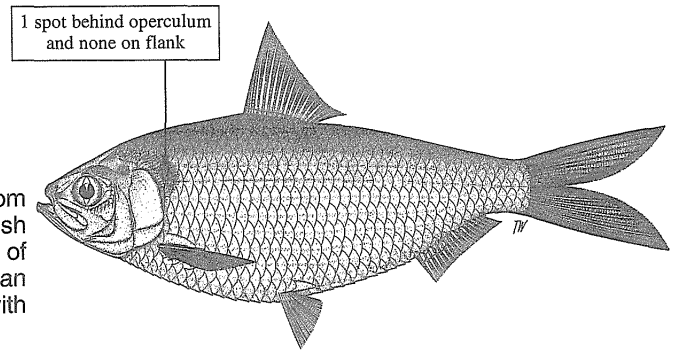
Local names: Trey kbork, ត្រីកប៉ក.

Size: To 30 cm.

Habitat, biology, and fisheries: Endemic to the Mekong. Occurs in large river habitats from Luang Prabang to the lower Mekong and Bassac, and apparently confined to fresh water. The largest individuals are found in the Great Lake and smaller ones in northern Cambodia. Roberts (1993) stated that this species migrates upstream to Thailand and Laos at around Chinese New Year. By contrast, Chanthepha (1972) indicated that this particular migration period extends from November through February. In the middle Mekong along the Thai-Lao border, the Mekong Basin-wide fishery Studies (Rainboth et al., 1975) first encountered small individuals (young of the year) of 40 to 50 mm total length in the middle of April, which by the middle of May had doubled in average size. By early June, the average individuals taken in haul seines had a total length of 140 mm, although the consistent recruitment of smaller individuals half that size indicated that the spawning period may have extended over more than one month. The abundance of young of the year increases during the onset of the rising water levels when the suspended solids increase. This species migrates downstream into Cambodia in July. It may follow the turbid floodwaters all the way to the Tonlé Sap, perhaps moving into the Great Lake as it fills with water from the Mekong. As water levels in the Great Lake fall, it migrates back down the Tonlé Sap to the Mekong. With water flow decreasing, it begins the movement upstream toward Khoné Falls. Whether or not an individual fish would cover this entire distance is unknown, as is the time required for such a journey.

This species has over 250 gill rakers on the first arch and is a filter feeder specializing in microscopic food such as phytoplankton or bacteria found on particulate matter. Taken with seines, set-nets, gill-nets, weirs, and traps. Its numbers seem to be declining drastically but the reason for this is unknown, although it may be due to multiple factors including dam construction and over-fishing. Roberts (1993) noted the decline over the two decades and mentioned the traps used at Khoné Falls. However, the previous government in Laos declared the traps illegal in 1968 and destroyed them, allowing fishing only by net and hook-and-line. Chanthepha (1972) noted that fishing improved all along the middle Mekong from Pakse to Vientiane following the destruction of the traps.

Tenualosa toli (Valenciennes, 1847)



FAO name: Toli shad.

Local names: Trey palung, ត្រីប៉ាលួង.

Size: To 60 cm.

Habitat, biology, and fisheries: Known from Indonesia to India. An anadromous marine fish that spawns just above or in the tidal zone of large rivers and may be found in Cambodian Mekong near the Vietnam border. Taken with seines, set-nets, gill-nets, and traps.

Subfamily DOROSOMATINAE

Genus *Anodontostoma* **CLUPEIDAE**

(1) UPPER JAW SYMPHYSIS WITH NOTCH FOR LOWER JAW OCCLUSION; **(2)** MOUTH POINTED DOWNWARDS; **(3)** LAST RAY OF DORSAL FIN NOT A LONG FILAMENT.

2 species recorded.

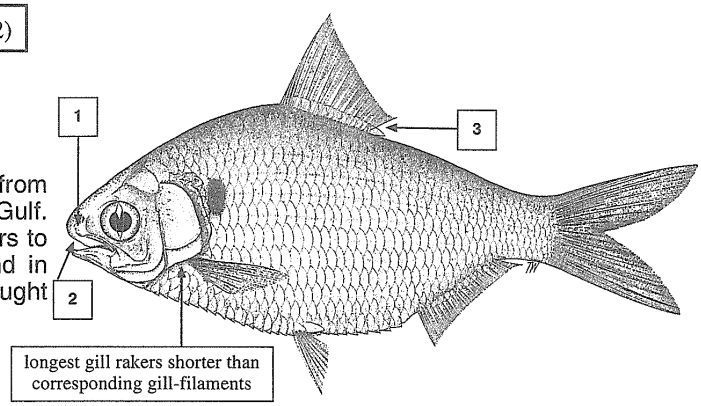
Anodontostoma chacunda (Hamilton, 1822)

FAO name: Chacunda gizzard shad.

Local names: Trey ka moi, ត្រីកាម៉ុយ.

Size: To 17.5 cm.

Habitat, biology, and fisheries: Known from Indonesia and Australia to the Persian Gulf. Usually marine coastal, but ascends rivers to the upper tidal zone, and may be found in Cambodia near the Vietnam border. Caught with seines, set-nets, gill-nets, and traps.



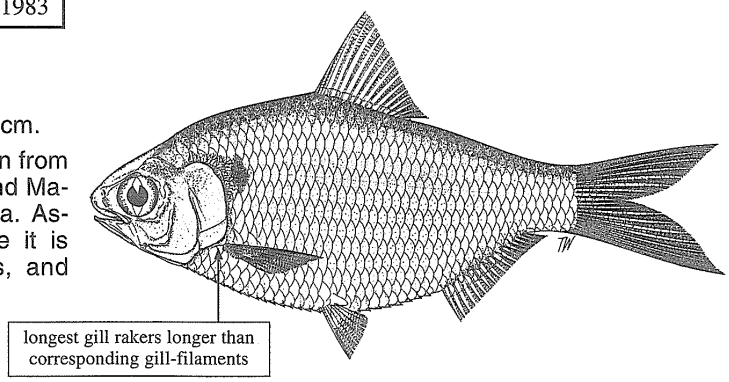
Anodontostoma thailandae Wongratana, 1983

FAO name: Thai gizzard shad.

Local names: Trey ka moi, ត្រីកាម៉ុយ.

Size: To 18 cm, commonly to about 10 cm.

Habitat, biology, and fisheries: Known from estuaries and coastlines of Thailand and Malaysia, and likely to occur in Cambodia. Ascends into upper tidal reaches where it is taken with seines, set-nets, gill-nets, and traps.



Genus *Nematalosa* **CLUPEIDAE**

(1) UPPER JAW SYMPHYSIS WITH NOTCH FOR LOWER JAW OCCLUSION; **(2)** MOUTH POINTED DOWNWARDS; **(3)** LAST RAY OF DORSAL FIN LONG AND FILAMENTOUS.

1 species likely.

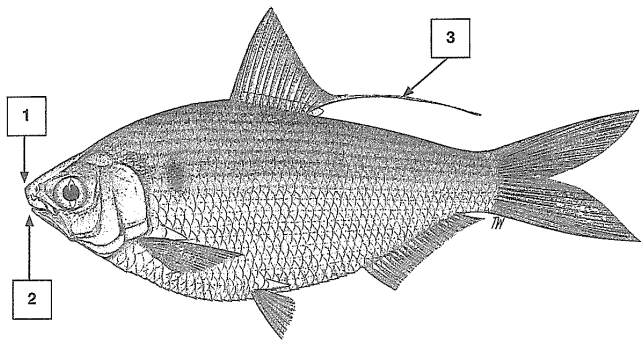
Nematalosa nasus (Bloch, 1795)

FAO name: Bloch's gizzard shad.

Local names:

Size: To 20 cm.

Habitat, biology, and fisheries: Known from estuaries and coastlines of the region, occasionally ascending into the upper reaches of the tidal zone. It may be encountered in the Cambodian Mekong near the Vietnam border. Caught with seines, set-nets, gill-nets, and traps.



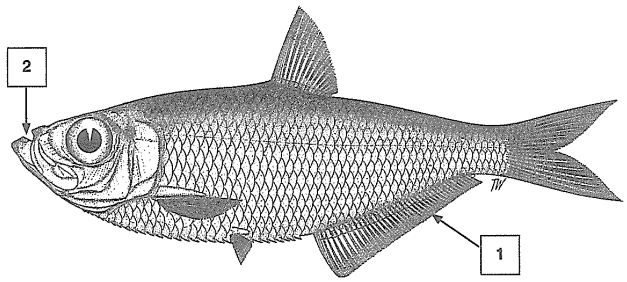
Family PRISTIGASTERIDAE

Genus *Ilisha* — **PRISTIGASTERIDAE**

(1) ANAL FIN LONG WITH WELL OVER 30 RAYS; **(2)** MOUTH OPENING UPWARDS, LOWER JAW PROJECTING WELL BEYOND UPPER JAW.

1 species likely to occur in the Cambodian Mekong with several others entering the estuary.

Ilisha megaloptera (Swainson, 1839)



FAO name: Bigeye ilisha.

Local names: Trey phneik thom, ត្រី ឆ្នែកធំ.

Size: To 28 cm.

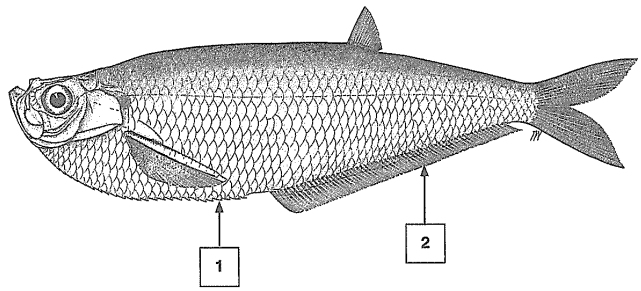
Habitat, biology, and fisheries: Known from Southeast Asia to the Persian Gulf. Most common in coastal waters, but also ascends into the upper end of the tidal zone. Taken by seines, set-nets, gill-nets or trawls.

Genus *Opisthopterus* — **PRISTIGASTERIDAE**

(1) PELVIC FIN ABSENT; **(2)** ANAL FIN LONG, WITH 51 TO 65 RAYS.

1 species recorded.

Opisthopterus tardoore (Cuvier, 1829)



FAO name: Tardoore.

Local names:

Size: To 20 cm.

Habitat, biology, and fisheries: Known from Indonesia to the Persian Gulf. Generally marine, entering estuaries and ascending into the tidal zone. Occurs in the Mekong delta and may be found in Cambodia. Taken by seines, set-nets, or trawls.

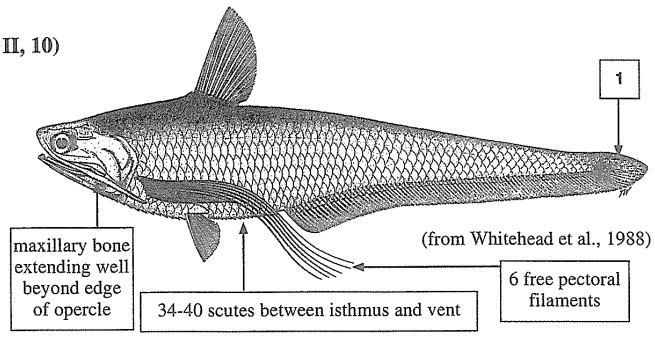
Family ENGRAULIDAE

Genus *Coilia* — **ENGRAULIDAE**

(1) CAUDAL FIN POINTED, CONNECTED TO ANAL FIN.

8 species recorded from the Mekong estuary and plume, 2 of them likely to occur in Cambodia.

Coilia lindmani Bleeker, 1858 **(plate II, 10)**



FAO name: Lindman's grenadier anchovy.

Local names: Trey chonluanh moan, ត្រី ជន្លួញមាន់.

Size: To 20 cm standard length.

Habitat, biology, and fisheries: Found in estuaries and tidal reaches of rivers. In the Mekong it is also found far upstream, above the estuary. The most common grenadier anchovy in the Cambodian Mekong ranging from the delta to the Great Lake and as far upstream as Stung Treng. This species seems to have no discernable migratory pattern in the lower Mekong (Blanche and Goossens, 1954). The Mekong specimens differ somewhat from the characterization and illustration in Whitehead et al. (1988) by having a small but distinct lower lobe on the caudal fin. It may be that this freshwater Mekong species is actually *Coilia aequidentata* Chabanaud (1924) or an undescribed species. Taken with seines, cast-nets, set-nets, and traps.

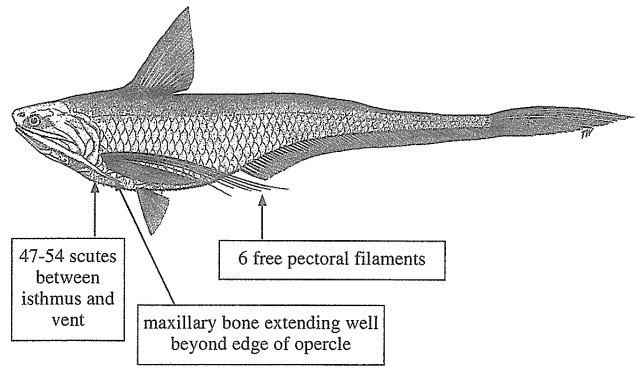
Coilia macrognathos Bleeker, 1852 **ENGRAULIDAE**

FAO name: Longjaw grenadier anchovy.

Local names: Trey chonluanh moan, ត្រីជង្ហួញមាន់.

Size: To 26 cm.

Habitat, biology, and fisheries: Found in estuaries and tidal reaches of rivers. Common in the Mekong delta but less common though still present in the Tonlé Sap and the Great Lake. Like *C. lindmani*, it seems to have no discernable migratory pattern. Taken by seines, cast-nets, set-nets, and traps.



Genus *Lycothrissa* **ENGRAULIDAE**

(1) CAUDAL FIN FORKED, NOT ATTACHED TO ANAL FIN; **(2)** JAWS WITH LARGE CANINE TEETH.

1 species recorded.

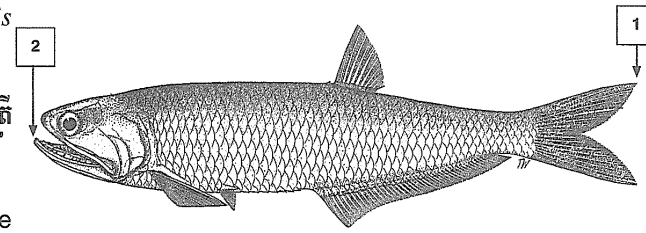
Lycothrissa crocodilus (Bleeker, 1851) **(plate II, 11)**

Synonyms / misidentifications: *Lycengraulis crocodilus.*

FAO name: Sabertooth thryssa.

Local names: Trey chhmar kror poeu, ត្រីឆ្នាក្រពើ.

Size: To 30 cm.



Habitat, biology, and fisheries: Found in the estuaries of large rivers from Indonesia to Thailand, usually in brackish water, but often ascending into fresh water. Common in the Mekong delta up to the Tonlé Sap and in the Great Lake. The species is apparently non-migratory. Its numbers remain uniform in the Tonlé Sap throughout the fishing season. Diet consists of crustaceans, insects, and small fishes (Vaas, 1953). Commonly taken by seines, cast-nets, set-nets, and traps. Used to make prahoc.

Genus *Setipinna* **ENGRAULIDAE**

(1) CAUDAL FIN FORKED, NOT ATTACHED TO ANAL FIN; **(2)** JAWS WITH MINUTE TEETH.

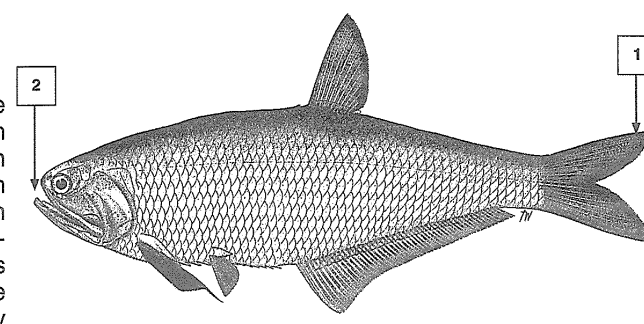
3 species recorded from the Mekong estuary, 1 of them likely to occur in Cambodia.

Setipinna melanochir (Bleeker, 1849) **(plate II, 12)**

FAO name: Dusky hairfin anchovy.

Local names: Trey chhmar, ត្រីឆ្នា.

Size: To 33 cm.



Habitat, biology, and fisheries: Found in large rivers far upstream from the estuary. Common in the Mekong as far upstream as Thailand. Can easily be distinguished by the black coloration in the pectoral fin in some individuals, but even fairly large adults may lack this character. Primarily feeds on insect larvae and small fishes (Vaas, 1953). Becomes abundant in the middle Mekong when the water levels rise and turbidity increases. Taken with seines, cast-nets, set-nets, and traps. Used to make prahoc.

Order GONORHYNCHIFORMES

Family CHANIDAE

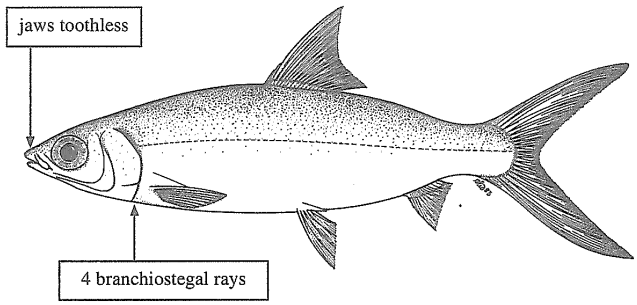
Chanos chanos (Forsskål, 1775)

FAO name: Milkfish.

Local names: Trey nuan chan, ត្រីនួនចាន់.

Size: To 180 cm, commonly to about 100 cm.

Habitat, biology, and fisheries: Found throughout the tropical Indo-Pacific along coastlines, entering estuaries, rivers, and lakes. Probably rare in Cambodia, with Mekong inhabitants occurring mostly in the Vietnam delta. Taken with seines, gill-nets, set-nets, and traps. A very important species in coastal aquaculture for much of Southeast Asia.



Order CYPRINIFORMES

Family CYPRINIDAE

Subfamily ALBURNINAE

Genus *Longiculter* — **CYPRINIDAE**

(1) BELLY WITH A SHARPLY EDGED KEEL; **(2)** EPAXIAL MUSCULATURE NOT EXTENDING BETWEEN EYES; **(3)** 52 TO 85 LATERAL-LINE SCALES; **(4)** OVER 100 GILL RAKERS ON FIRST ARCH.

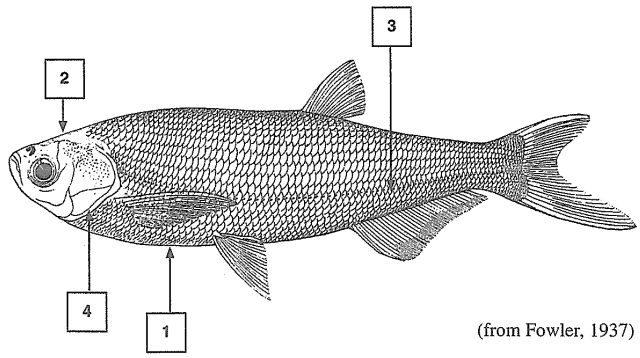
2 species possibly found in Cambodia.

Longiculter siahi Fowler, 1937

Local names: Trey slak russey, ត្រីស្លាក់ឬស្សី.

Size: To 20 cm.

Habitat, biology, and fisheries: Found in middle and upper water levels of large and medium-sized rivers in mainland Southeast Asia. Little is known about this species, but it is apparently uncommon or at least localized in distribution. It has a high number (over 100) of gill rakers on the first arch and is probably a filter-feeder. Caught by seines, cast-nets, gill-nets, weirs, and barrages. The Cambodian species may be distinct from the one recorded from central Thailand (Kottelat, 1989).



(from Fowler, 1937)

Genus *Paralaubuca* **CYPRINIDAE**

(1) BELLY WITH A SHARPLY EDGED KEEL; (2) EPAXIAL MUSCULATURE NOT EXTENDING BETWEEN EYES; (3) 52 TO 85 LATERAL-LINE SCALES.

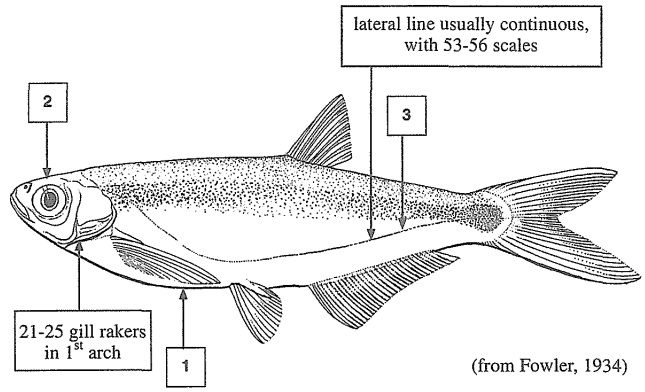
4 species recorded.

Paralaubuca barroni (Fowler, 1934)

Local names: Trey slak russey, ត្រី ស្លឹកឫស្សី.

Size: To 15 cm, commonly to about 10 cm.

Habitat, biology, and fisheries: Found at shallow and medium depths of large rivers of continental Southeast Asia. Little is known about this species, because it resembles *P. typus* so closely that the two are usually not distinguished. Like other members of the genus, it feeds on zooplankton and occasionally insects. Not as common as *P. typus* in the middle Mekong. Caught by seines, cast-nets, set-nets, weirs, and traps. Probably used to make prahoc as done with other members of the genus.



(from Fowler, 1934)

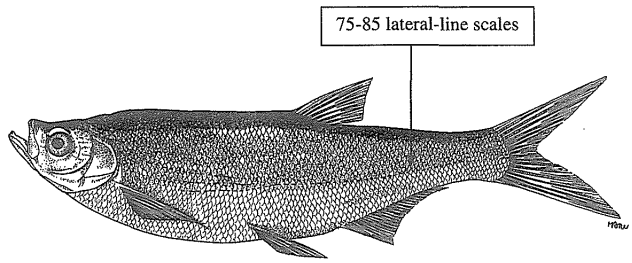
Paralaubuca harmandi Sauvage, 1883

Synonyms / misidentifications: *Cultrops siamensis.*

Local names: Trey slak russey, ត្រី ស្លឹកឫស្សី.

Size: To 20 cm, commonly between 12 and 15 cm.

Habitat, biology, and fisheries: Found in shallow and medium depths of large rivers. Usually found as scattered individuals rather than in large schools like *P. barroni* and *P. typus*. Feeds on zooplankton and insects of larger size than seen in other members of the genus. Most commonly caught in the lower Mekong during November as the water levels distinctly begin to decline. Taken by seines, cast-nets, and traps. Used to make prahoc.



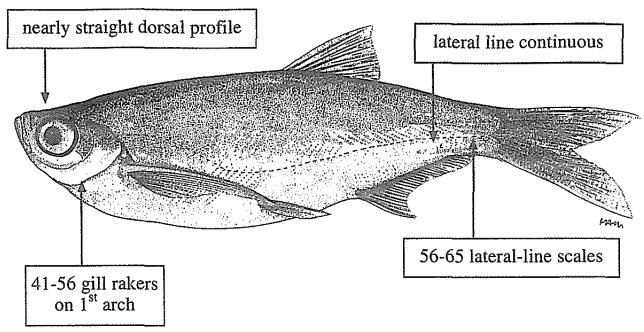
(after Hora, 1923)

Paralaubuca riveroi Fowler, 1935

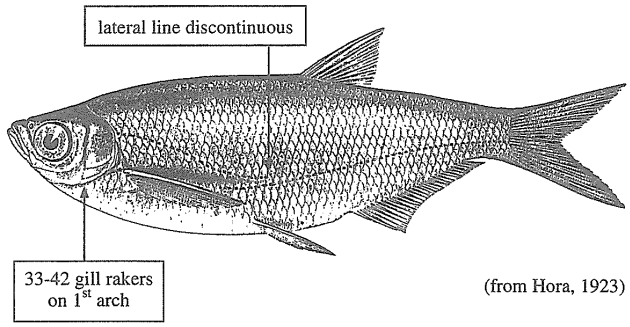
Local names: Trey slak russey, ត្រី ស្លឹកឫស្សី.

Size: To 18 cm, usually smaller.

Habitat, biology, and fisheries: Found in shallow and medium depths of large rivers, usually caught as scattered representatives in schools of the other species in this genus. Feeds mostly on zooplankton and occasionally insects. Very difficult to distinguish from *P. typus*. Taken by seines, cast-nets, and traps. Used to make prahoc.



Paralaubuca typus Bleeker, 1865 (plate II, 13) CYPRINIDAE



(from Hora, 1923)

Synonyms / misidentifications: *Paralaubuca stigmabrachium.*

Local names: Trey slak russey, ត្រី ស្លាកឫស្សី.

Size: To 18 cm, usually smaller.

Habitat, biology, and fisheries: Found at shallow depths in large rivers. A schooling species that is usually harvested in large numbers throughout its range. It is very difficult to distinguish from *P. riveroi* without a dissecting microscope. Feeds on zooplankton and occasionally insects. Moves out into flooded forests during high water levels and returns to the mainstream after the water levels have already considerably declined. Its greatest abundance in the lower Mekong coincides with the peak fishing season of December. Taken by seines, cast-nets, set-nets, weirs, and traps. Sometimes marketed fresh, but usually used to make prahoc.

Subfamily DANIOINAE

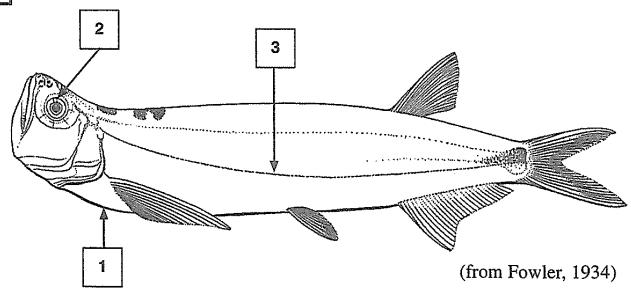
Tribe OXYGASTRINI

Genus *Macrochirichthys* CYPRINIDAE

(1) BELLY WITH A SHARPLY-EDGED KEEL; **(2)** EPAXIAL MUSCLES EXTENDING FORWARD TO ORBIT; **(3)** MORE THAN 100 LATERAL-LINE SCALES.

1 species recorded.

Macrochirichthys macrochirus Valenciennes, 1844 (plate II, 14)



(from Fowler, 1934)

Local names: Trey dangkteng, ត្រី ដង្កែង.

Size: To 70 cm.

Habitat, biology, and fisheries: Found from Indonesia to Thailand at medium to shallow depths in large rivers and lakes. Juveniles feed on insects, and adults on fishes. Moves out into the flooded forest during high water and returns to the river as soon as water levels begin to subside. Most abundant in the lower Mekong in October at the finish of the rainy season and just before the inception of the fishing season. Usually moves on the fourth or fifth day before full moon in October and November. Taken by seines, cast-nets, gill-nets, set-nets, hook-and-line, weirs, and traps. Usually marketed fresh and probably exported to Thailand.

Genus *Oxygaster* **CYPRINIDAE**

(1) BELLY WITH A SHARPLY-EDGED KEEL; (2) EPAXIAL MUSCULATURE BARELY REACHING EYE; (3) 43 TO 60 LATERAL-LINE SCALES; (4) DORSAL-FIN ORIGIN ANTERIOR TO ANAL-FIN ORIGIN.

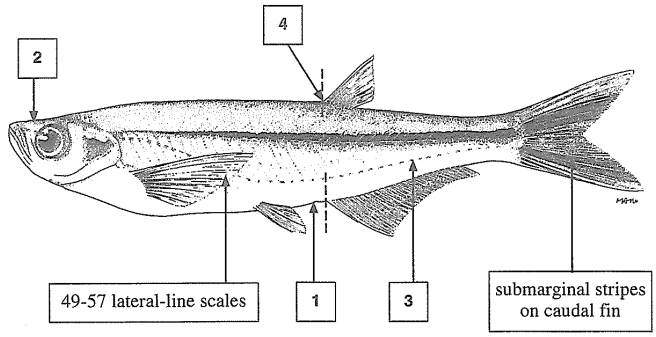
2 species recorded.

Oxygaster anomalura van Hasselt, 1823

Local names: Trey slak russey, ត្រី ស្លឹករុស្សី.

Size: To 20 cm.

Habitat, biology, and fisheries: Found from Indonesia to Thailand at the surface of small mountain rivers with complete or nearly complete forest canopy. Probably with only sporadic occurrence elsewhere. Diet consists largely of exogenous insects and chironomid larvae. Caught by seines, cast-nets, and gill-nets. Very rarely seen at fish markets.

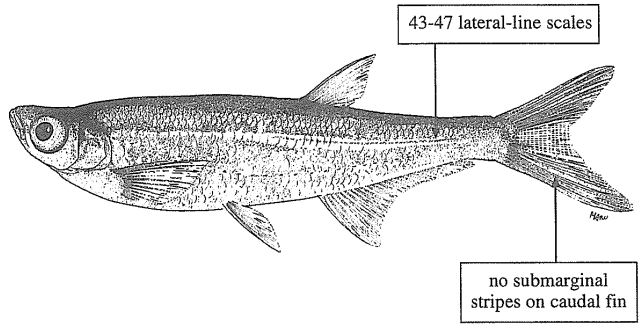


Oxygaster pointoni (Fowler, 1934) **(plate II, 15)**

Local names: Trey slak russey, ត្រី ស្លឹករុស្សី.

Size: To 8 cm, possibly slightly larger.

Habitat, biology, and fisheries: Found at the surface in medium-sized rivers of mainland Southeast Asia. Little is known about this species, the distribution of which may be localized. Diet is probably similar to *O. anomalura* including chironomids and small mollusks. Occurrence seems to be sporadic in the main stem of the Mekong. Caught by seines, cast-nets, and traps. Rarely seen at fish markets.



Genus *Parachela* **CYPRINIDAE**

(1) BELLY WITH A SHARPLY-EDGED KEEL; (2) 42 OR FEWER LATERAL-LINE SCALES; (3) EPAXIAL MUSCULATURE REACHING INTERORBITAL SPACE; (4) DORSAL-FIN ORIGIN POSTERIOR TO OR SLIGHTLY AHEAD OF ANAL-FIN ORIGIN.

4 species recorded, additional species possible.

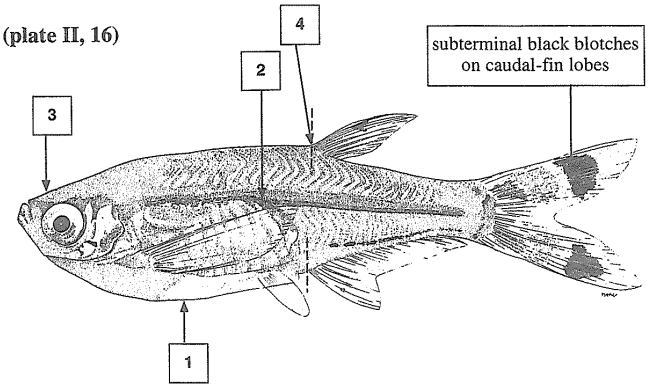
Parachela maculicauda (Smith, 1934) **(plate II, 16)**

Synonyms / misidentifications: *Oxygaster maculicauda.*

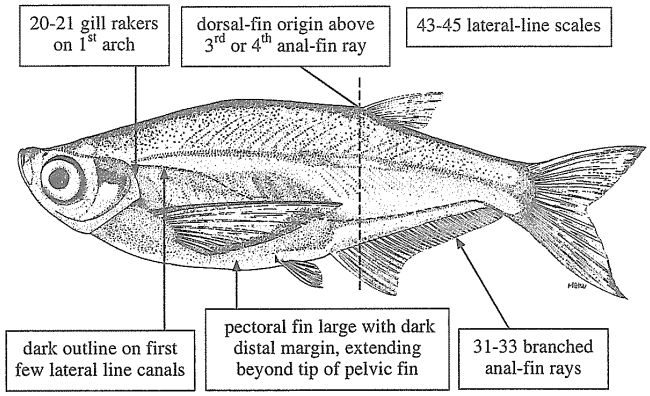
Local names: Trey chanteas phluk, ត្រី ជន្លាសភ្លុក.

Size: To 6 cm, commonly to about 3 cm.

Habitat, biology, and fisheries: Occurs at the water surface in small and medium-sized rivers with nearby areas of floodplain forest. Known from mainland Southeast Asia, and has been recorded in the Mekong basin from near Vientiane to tributaries of the Great Lake. Usually caught by seines or cast-nets. Used to make prahoc.



Parachela oxygastroides (Bleeker, 1852) (plate III, 17) CYPRINIDAE



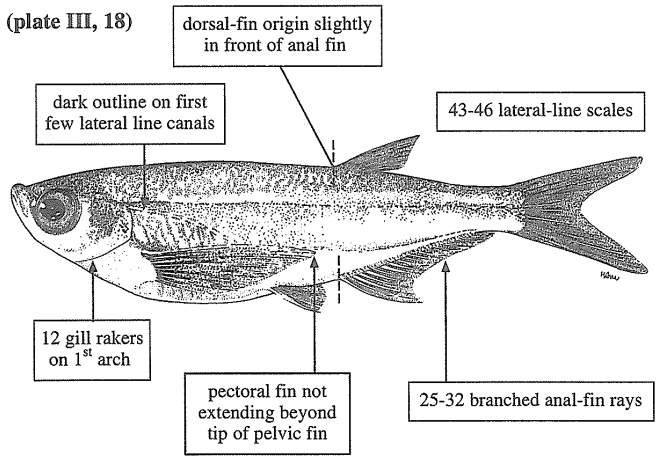
Synonyms / misidentifications: *Oxygaster oxygastroides.*

Local names: Trey chanteas phluk, ត្រីឆ្តោសភ្លុក.

Size: To 15 cm, commonly between 9 and 12 cm.

Habitat, biology, and fisheries: Occurs in medium to large-sized rivers and is a common resident of seasonally flooded forests. This species and *P. siamensis* seem to be more tolerant of high amounts of suspended solids than *P. maculicauda* or *P. williaminae* and are more common in habitats disturbed by farming activities. Found close to the surface where it is easily recognized by the dark distal margin of the large pectoral fin. Leaves the flooded forest in November as the water levels begin to decline substantially. Diet includes zooplankton and insects. Taken by seines, cast-nets, trawls, weirs, and traps. Used to make prahoc.

Parachela siamensis (Günther, 1868) (plate III, 18)



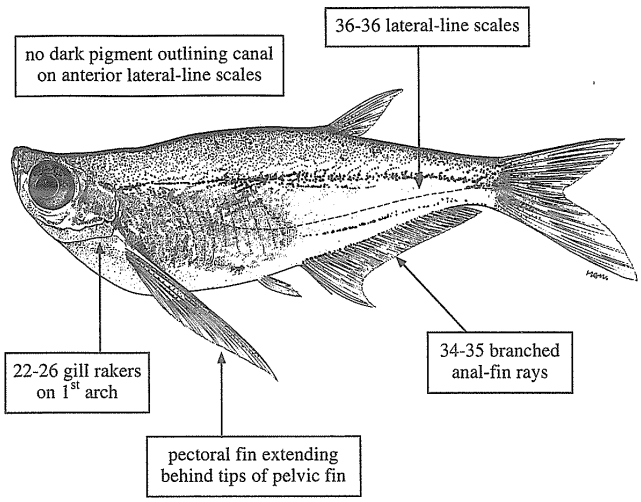
Synonyms / misidentifications: *Oxygaster siamensis, Oxygaster oxygastroides* (non Bleeker).

Local names: Trey chanteas phluk, ត្រីឆ្តោសភ្លុក.

Size: To 12 cm.

Habitat, biology, and fisheries: Found at the surface in large rivers and lakes from Indonesia to Thailand. Locally abundant and common in commercial catches. At high water it moves into the flooded forest, and probably leaves at the same time as *P. oxygastroides.* Commonly occurs together with *P. oxygastroides* and *P. williaminae* with which it can be easily confused. This is the most common species of the genus in the Great Lake. Commonly taken by seines, cast-nets, weirs, and traps. Used to make prahoc.

Parachela williaminae Fowler, 1934



Synonyms / misidentifications: *Oxygaster siamensis, Oxygaster oxygastroides* (non Bleeker)

Local names: Trey chanteas phluk, ត្រីឆ្តោសភ្លុក.

Size: To 12 cm.

Habitat, biology, and fisheries: Found in medium to large-sized rivers with fast current and relatively clear water. An apparently uncommon species, known from the main channel of the Mekong from northern Thailand downstream to the Great Lake. The original specimen described had no pelvic fins although the species ordinarily possesses them. Little is known about its seasonal movements. Taken primarily by seines and cast-nets. Used to make prahoc.

Tribe NEOBOLINI

Genus *Raiamas* — **CYPRINIDAE**

(1) MOUTH LARGE, JAWS EXTENDING BACKWARDS FAR BEHIND EYE; **(2)** BODY WITH SPOTS THAT ARE SLIGHTLY LARGER THAN A SINGLE SCALE.

1 species recorded.

Raiamas guttatus (Day, 1869)

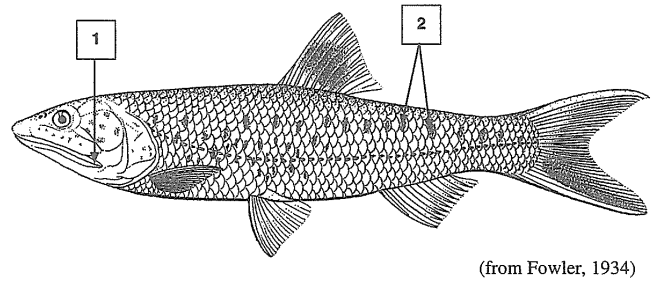
(plate III, 19)

Synonyms / misidentifications: *Barilius guttatus.*

Local names: Trey sawka keo, ត្រី សកាកែវ.

Size: To 30 cm.

Habitat, biology, and fisheries: Found over gravel substrate in clear, swift, small streams up to rapidly flowing stretches of large rivers. Occurs on the Southeast Asian mainland from the Irrawaddy to the Mekong. It has also been recorded from the Great Lake in Cambodia. Diet consists of insects and small fishes. Usually taken with seines, cast-nets, and large individuals can be taken by hook-and-line. Rarely seen in markets.



(from Fowler, 1934)

Tribe CHEDRINI

Genus *Opsarius* — **CYPRINIDAE**

(1) COLOUR PATTERN CONSISTING OF A SERIES OF BARS; **(2)** LATERAL LINE ON LOWER HALF OF CAUDAL PEDUNCLE; **(3)** BARBELS PRESENT, BUT OFTEN TINY.

3 species likely, 2 included here.

Opsarius koratensis (Smith, 1931)

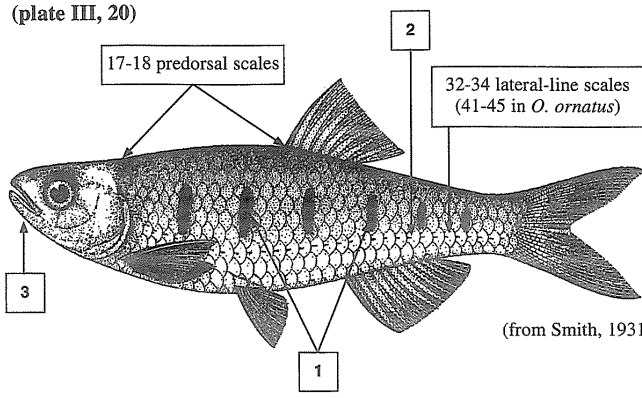
(plate III, 20)

Synonyms / misidentifications: *Barilius koratensis, Barilius nanensis.*

Local names: Trey changwa, ត្រី ចង្វា.

Size: To 10 cm.

Habitat, biology, and fisheries: Found over gravel substrate in clear, swift, small streams on up to rapidly flowing stretches of large rivers from the Chao Phrya to the Mekong. Diet consists of insect larvae, especially trichopterans. Caught using seines and cast-nets. Rarely seen in markets.



(from Smith, 1931)

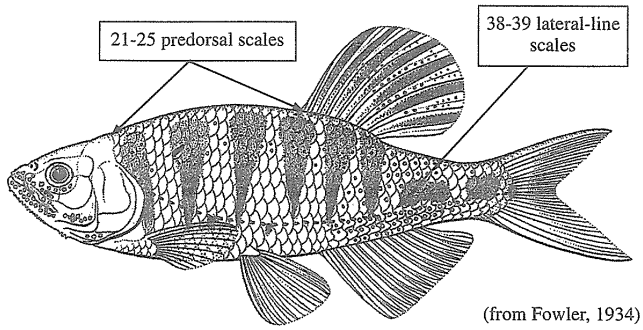
Opsarius pulchellus (Smith, 1931) (plate III, 21) CYPRINIDAE

Synonyms / misidentifications: *Barilius pulchellus.*

Local names: Trey changwa, ត្រី ចង្វា.

Size: To 11 cm.

Habitat, biology, and fisheries: Found over gravel substrate in clear, swift, small streams up to rapidly flowing stretches of large rivers. Known from the Chao Phrya to the Mekong. Diet consists of insect larvae, especially odonatans. Caught with seines and cast-nets. Rarely seen in markets.



(from Fowler, 1934)

Tribe DANIOINI

Genus *Amblypharyngodon* CYPRINIDAE

(1) INCOMPLETE LATERAL LINE WITH 6 TO 7 PERFORATED SCALES; **(2)** NO BARBELS; **(3)** 7 BRANCHED DORSAL-FIN RAYS; **(4)** BELLY LACKING A KEEL; **(5)** 42 TO 50 SCALES IN LATERAL SERIES.

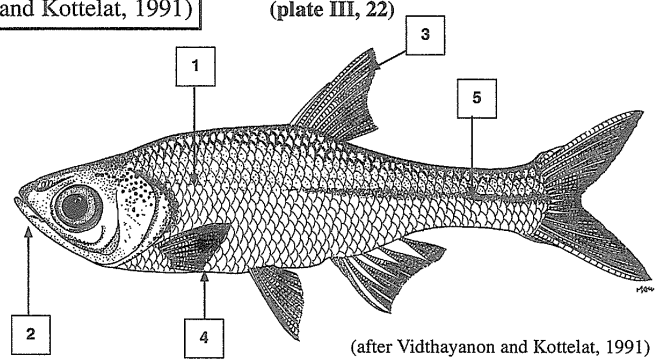
1 species recorded.

Amblypharyngodon chulabornae (Vidthayanon and Kottelat, 1991) (plate III, 22)

Local names:

Size: To 4 cm.

Habitat, biology, and fisheries: A floodplain species found in shallow standing water of paddy fields and ditches in the lower Mekong and Chao Phrya basins. It seems to prefer vegetated areas with floating aquatic vegetation as well as flooded terrestrial grasses. Caught with seines and traps at middle to deeper depths of shallow water. Not seen in markets.



(after Vidthayanon and Kottelat, 1991)

Genus *Brachydanio* CYPRINIDAE

(1) INCOMPLETE LATERAL LINE ABSENT, OR ENDING BEFORE PELVIC FINS; **(2)** 4 WELL-DEVELOPED BARBELS; **(3)** 6 TO 7 BRANCHED DORSAL-FIN RAYS; **(4)** BELLY LACKING A KEEL; **(5)** ABOUT 30 SCALES IN LATERAL SERIES.

1 species recorded.

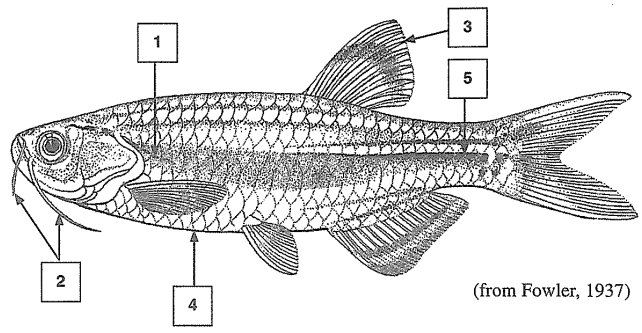
Brachydanio albolineatus (Blyth, 1860)

FAO name: Pearl danio.

Local names:

Size: To 5 cm.

Habitat, biology, and fisheries: Found at the surface of small, clear streams from the Salween River to Malaysia and Cambodia. Feeds on exogenous insects and some zooplankton. Caught with seines, cast-nets, and traps. Not seen in fish markets, but popular in the aquarium trade.



(from Fowler, 1937)

Genus *Chela* **CYPRINIDAE**

(1) BODY DEEP, BELLY STRONGLY COMPRESSED, WITH A VENTRAL KEEL BETWEEN PECTORAL AND PELVIC FINS; (2) LATERAL LINE COMPLETE, WITH 31 TO 37 SCALES.

2 species recorded, a third possible.

Chela caeruleostigmata (Smith, 1931)

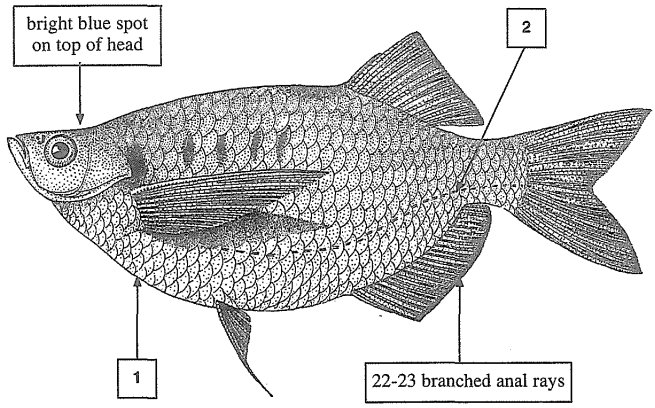
(plate III, 23)

FAO name: Leaping barb.

Local names:

Size: To 7 cm.

Habitat, biology, and fisheries: Found at the surface of large rivers and flooded forests along the main stream of the Mekong. It seems to move back into large rivers in March or April at the very end of the flood cycle. This species can easily be recognized by the bright blue spot on top of the head. It was a common resident of the flooded forest in the lower Mekong in the early 1950s (Blache and Goossens, 1954), but is now listed as "R" or rare by the IUCN. Originally described from the Chao Phrya in Thailand. Diet consists mostly of exogenous insects caught at the surface. Taken with seines and cast-nets. Probably used to make prahoc. Occasionally seen in the aquarium trade.



(from Smith, 1945)

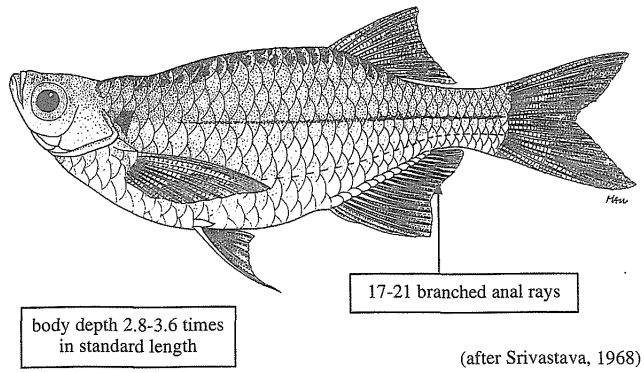
Chela laubuca (Hamilton, 1822)

FAO name: Indian glass barb.

Local names:

Size: To 6 cm.

Habitat, biology, and fisheries: Found at the surface in small streams with clear water from India to Indonesia. Little is known about its movements, but it likely also invades seasonal flooded forests. Probably feeds on exogenous insects. Taken with seines and cast-nets. Rarely seen in markets. Probably used to make prahoc. Occasionally imported in the aquarium trade.



(after Srivastava, 1968)

Genus *Danio* **CYPRINIDAE**

(1) LATERAL LINE COMPLETE; (2) BELLY ROUNDED; (3) RIM OF ORBIT WITH A SPINOUS ANTERIOR PROCESS.

2 species recorded.

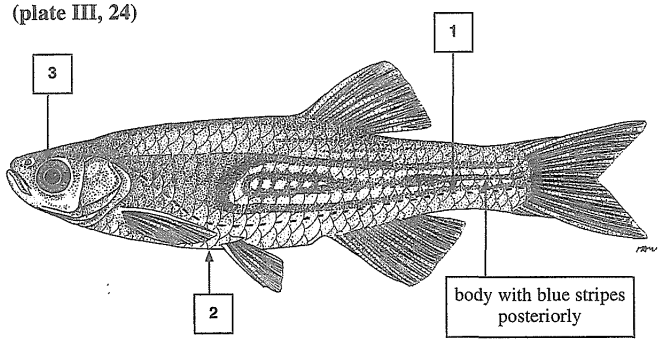
Danio aequipinnatus M'Clelland, 1839 **(plate III, 24)**

Synonyms / misidentifications: *Danio malabaricus, Danio regina* (non Fowler).

Local names: Trey changwa, ត្រីចង្វា.

Size: To 8 cm.

Habitat, biology, and fisheries: Found in schools at the surface in small high-gradient upland streams from India to the Indochinese Peninsula. Feeds primarily on exogenous insects. Taken by seines, cast-nets, and traps. Not seen in markets, but popular in the aquarium trade.



(after Chu et al., 1989)

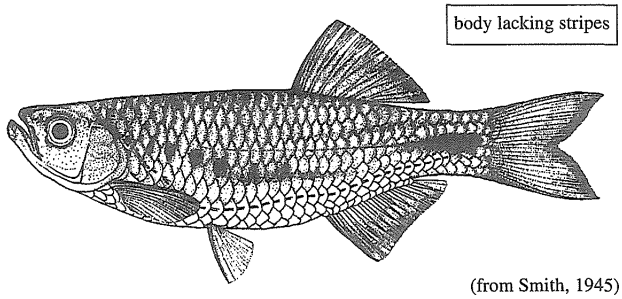
Danio laoensis (Pellegrin and Fang, 1940)

Synonyms / misidentifications: *Daniops myersi.*

Local names:

Size: To 8 cm.

Habitat, biology, and fisheries: Found in clear, rapidly flowing water from the Salween River to the middle Mekong. Feeds on insects and other invertebrates. Caught with seines and cast-nets. Not seen in markets in the lower basin.



(from Smith, 1945)

Genus *Esomus* **CYPRINIDAE**

(1) LATERAL LINE INCOMPLETE; (2) BELLY ROUNDED; (3) EXTREMELY LONG MAXILLARY BARBEL REACHING PAST PELVIC FIN.

2 species recorded.

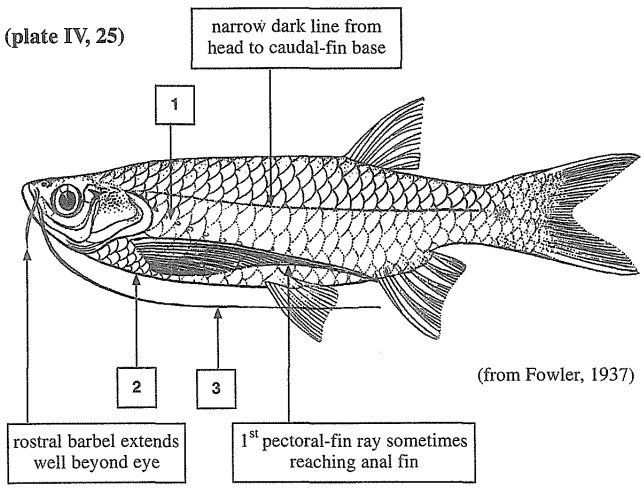
Esomus longimanus (Lunel, 1881) **(plate IV, 25)**

Synonyms / misidentifications: *Esomus goddardi.*

Local names: Trey changwa phlieng, ត្រីចង្វាភ្លើង.

Size: To 1 cm.

Habitat, biology, and fisheries: Found in the Mekong from the Khorat Plateau in Thailand to the Great Lake. A common inhabitant of ditches, canals, and ponds often seen in areas with extensive growth of submerged aquatic plants. Diet consists of zooplankton and occasionally insects. Caught by seines, cast-nets, dip-nets, and traps. Sometimes marketed fresh and used to make prahoc.



(from Fowler, 1937)

Esomus metallicus Ahl, 1924

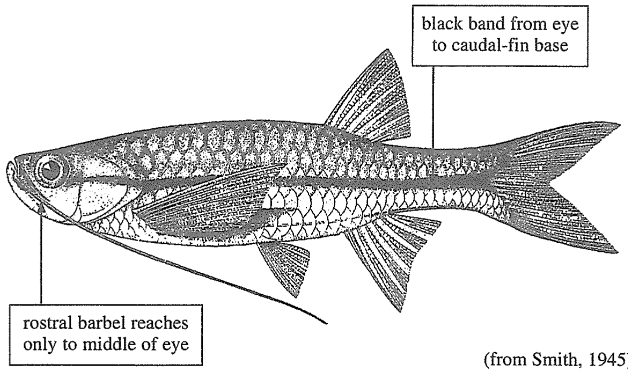
(plate IV, 26) **CYPRINIDAE**

FAO name: Striped flying barb.

Loc al names: Trey changwa phlieng, ត្រី ចង្វាភ្លៀង.

Size: To 7.5 cm.

Habitat, biology, and fisheries: An abundant inhabitant of flooded rice-paddies, canals, ditches, as well as in most streams from northern Thailand to the Mekong delta. Avoids large rivers, and only moves from temporarily inundated habitats if necessitated by seasonal habitat disappearance. Moves into seasonally inundated areas as soon as they are flooded. Diet includes zooplankton, terrestrial insects, and aquatic insect larvae. Taken with seines, cast-nets and traps. Occasionally marketed fresh and used to make prahoc.



(from Smith, 1945)

Genus *Leptobarbus*

CYPRINIDAE

(1) DORSAL FIN WITH AN UNBRANCHED, NON-SPINOUS FIRST RAY AND 7 BRANCHED SOFT RAYS; **(2)** 5 BRANCHED ANAL-FIN RAYS; **(3)** LATERAL LINE PASSING DOWN THE LOWER HALF OF CAUDAL PEDUNCLE; **(4)** 4 WELL-DEVELOPED BARBELS; **(5)** BLACK LATERAL STRIPE OF JUVENILES DISAPPEARING IN ADULTS.

1 species recorded.

Leptobarbus hoeveni (Bleeker, 1851)

(plate IV, 27)

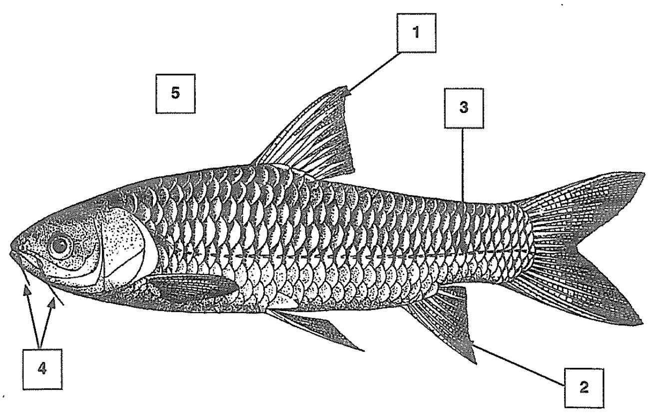
Synonyms / misidentifications: *Filirasbora rubripinna.*

FAO name: Mad barb.

Local names: **Juv.** Trey chrawlang, Trey knuoch, **Ad.** Trey prorlung; តូចៈ ត្រី ច្រឡៀង, ត្រី ក្នួច, ធំៈ ត្រី ព្រលួង.

Size: To 70 cm, commonly to about 50 cm.

Habitat, biology, and fisheries: Found most often in freely flowing rivers and streams and seasonally on floodplains. Although said to be non-migratory by Blache and Goossens (1954), it definitely does participate in local trophic migrations to and from inundated forests. Juveniles feed on terrestrial insects, tubificid worms, and zooplankton. Adults consume more plant matter. Known to feed on toxic fruits in floodplain forests and to behave strangely. Eating flesh of the fish at this time can cause nausea in humans. Of rather low commercial value. Taken by hook-and-line, seines, cast-nets, and traps.



(from Weber and deBeaufort, 1916)

Genus *Luciosoma* **CYPRINIDAE**

(1) DORSAL FIN WITH AN UNBRANCHED, NON-SPINOUS FIRST RAY AND 7 BRANCHED SOFT RAYS; (2) 6 BRANCHED ANAL-FIN RAYS; (3) MOUTH LARGE, EXTENDING BELOW EYE, WITH 4 LARGE BARBELS; (4) DORSAL-FIN ORIGIN IN POSTERIOR HALF OF BODY.

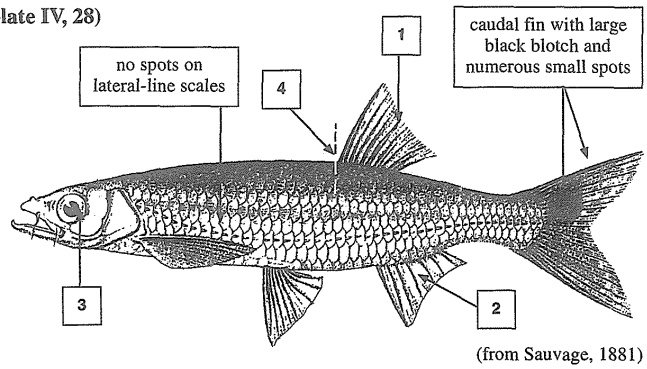
2 species recorded.

Luciosoma bleekeri Steindachner, 1879 **(plate IV, 28)**

Local names: Trey dawng dao, Trey bang kouy, ត្រី ដងដាវ, ត្រី បង្គួយ.

Size: To 26 cm.

Habitat, biology, and fisheries: Found at the surface of flowing waters in the Mekong and Chao Phrya basins. Inhabits flooded forests and moves into permanent water in November and December as flood waters rapidly recede. Diet includes mostly exogenous insects as well as some small crustaceans and fish. Taken with seines, cast-nets, set-nets, and traps. Used to make prahoc.



(from Sauvage, 1881)

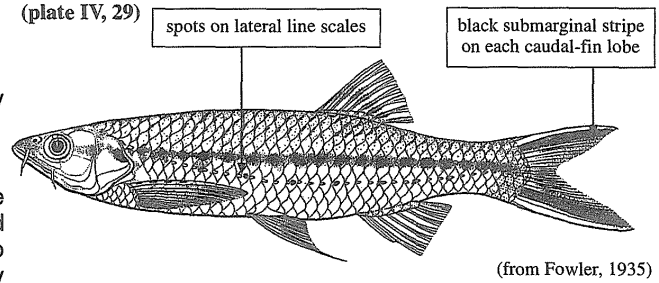
Luciosoma setigerum (Valenciennes, 1842) **(plate IV, 29)**

FAO name: Apollo sharkminnow.

Local names: Trey changwa ronaung, Trey dawng dao, ត្រី ចង្វាឫនោង, ត្រី ដងដាវ.

Size: To 25 cm.

Habitat, biology, and fisheries: Found at the surface of flowing waters from Thailand through Indonesia. Biology probably similar to *L. bleekeri*. Feeds mostly on fish. Taken by seines, cast-nets, set-nets, and traps.



(from Fowler, 1935)

Genus *Rasbora* **CYPRINIDAE**

(1) DORSAL FIN WITH AN UNBRANCHED, NON-SPINOUS FIRST RAY AND 7 SOFT RAYS; (2) 5 BRANCHED ANAL RAYS; (3) MOUTH SMALL, NOT REACHING BELOW EYE; (4) NO BARBELS; (5) DORSAL-FIN ORIGIN AT MIDDLE OF BODY.

16 or more species recorded or likely to occur in the Cambodian Mekong.

Rasbora aurotaenia Tirant, 1885 **(plate IV, 30)**

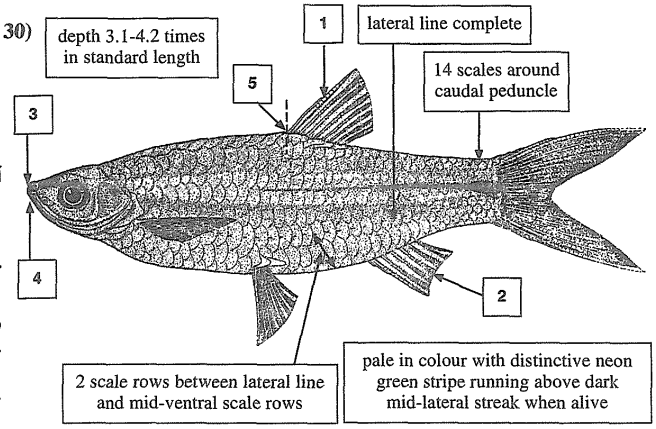
Synonyms / misidentifications: *Rasbora retrodorsalis*.

FAO name: Pale rasbora.

Local names: Trey changwa mool, ត្រី ចង្វាមូល.

Size: To 15 cm.

Habitat, biology, and fisheries: Found near the surface of ponds, canals and streams. Often in turbid waters of the Mekong and Chao Phrya rivers. Probably feeds mostly on exogenous insects and also on some algae. Taken with seines, cast-nets, and traps. Occasionally marketed fresh. Probably used to make prahoc.



(from Smith, 1945)

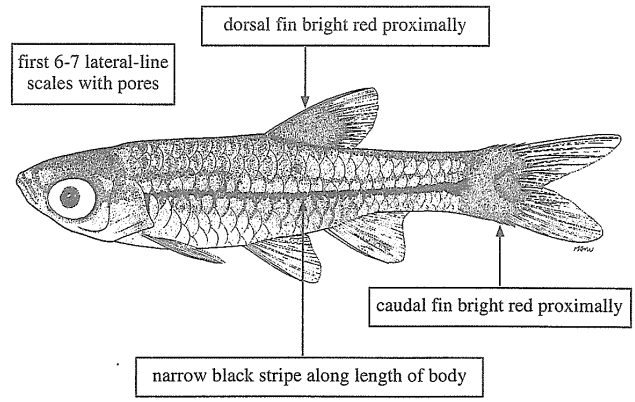
Rasbora sp. cf. *beauforti* (plate IV, 31) CYPRINIDAE

FAO name: Stoplight rasbora.

Local names: Trey changwa srawlung, ត្រីចង្វាស្រឡូង.

Size: To 2 cm.

Habitat, biology, and fisheries: Found from midwater levels to surface in clear, shallow, standing waters of marshes and swamps in densely growing, fine-leaved, submerged aquatic vegetation. Browses on minute zooplankton. Caught by seines and traps. Not yet seen in the aquarium trade, although its attractive coloration would seem to favour it as part of a tank of diminutive species. Has some resemblance to *R. borapetensis*, but is clearly distinguished by the red coloration of its dorsal and caudal fins.



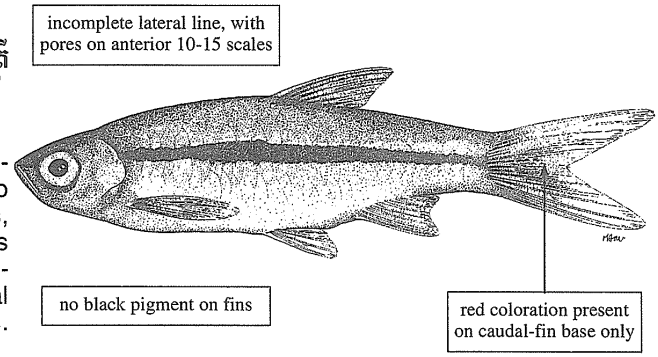
Rasbora borapetensis Smith, 1934 (plate IV, 32)

FAO name: Blackline rasbora.

Local names: Trey changwa srawlung, ត្រីចង្វាស្រឡូង.

Size: To about 4.5 cm.

Habitat, biology, and fisheries: A very common species found from midwater levels to surface in nearly all ponds, ditches, canals, and reservoir margins of 2 m depth or less throughout the Mekong and Chao Phrya basins. Browses on zooplankton and occasional insects. Taken by seines, cast-nets, and traps. Common in the aquarium trade.



(after Sterba, 1966)

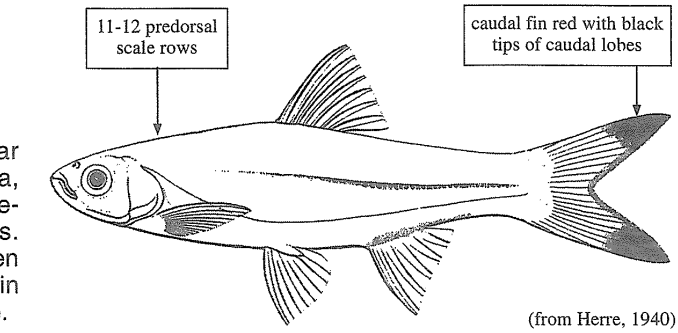
Rasbora caudimaculata Volz, 1903

FAO name: Greater scissortail.

Local names: Trey changwa poht, ត្រីចង្វាពោត.

Size: To 17 cm.

Habitat, biology, and fisheries: Found near the surface of streams in Indonesia, Malaysia, and in the lower Mekong. Not a common species, with apparently localized populations. Feeds primarily on exogenous insects. Taken in seines, cast-nets, and traps. Rarely seen in markets, but common in the aquarium trade.



(from Herre, 1940)

Rasbora daniconius (Hamilton, 1822)

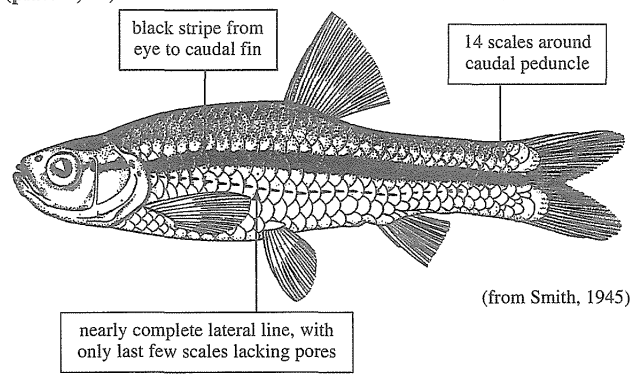
(plate V, 33) CYPRINIDAE

FAO name: Slender rasbora.

Local names: Trey changwa chhnoht, ត្រីចង្វាឆ្នាត.

Size: To 6 cm.

Habitat, biology, and fisheries: Known from India to Thailand and Cambodia. Found near the surface in shallow waters of ditches, rice-paddies, small streams, and reservoirs. Feeds on crustaceans and insects. Caught with seines, cast-nets, and traps. Seen regularly in the aquarium trade.



(from Smith, 1945)

Rasbora dusonensis (Bleeker, 1851)

(plate V, 34)

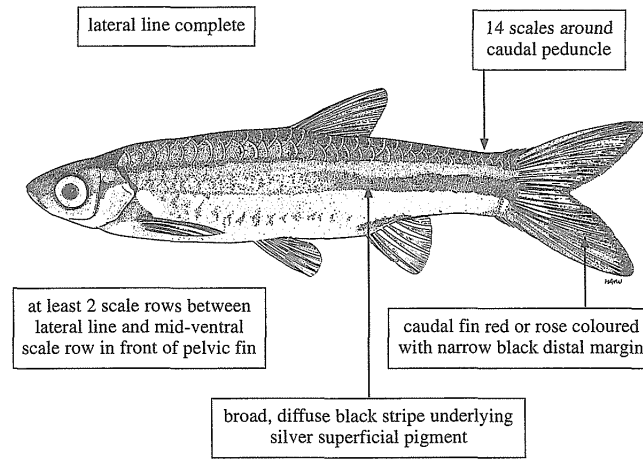
Synonyms / misidentifications: *Rasbora myersi* (non Brittan), *Rasbora argyrotaenia* (non Bleeker).

FAO name: Rosefin rasbora.

Local names: Trey changwa, ត្រី ចង្វា.

Size: To 10 cm.

Habitat, biology, and fisheries: Found at or near the surface in clear waters of rivers and streams from the Mekong River eastwards through Indonesia. Encountered most often in the lower Mekong near Vietnam, close to the upper boundary of the high estuary. Like other medium to large rasboras, it feeds mostly on exogenous insects, some small crustaceans, and algae. Taken with seines, cast-nets, set-nets, and traps.



Rasbora espei Meinken, 1967

(plate V, 35)

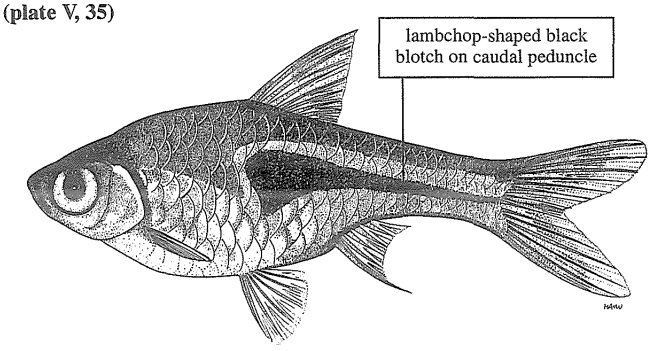
Synonyms / misidentifications: *Rasbora heteromorpha* (non Duncker).

FAO name: Lambchop rasbora.

Local names: Trey changwa chhnoht, ត្រីចង្វាឆ្នូត.

Size: To 2.5 cm.

Habitat, biology, and fisheries: This diminutive species is found in ponds, pools, marshes, and swamps with heavy growth of submerged aquatic plants. Commonly finds its way into the aquarium trade. Usually collected by seines or traps.



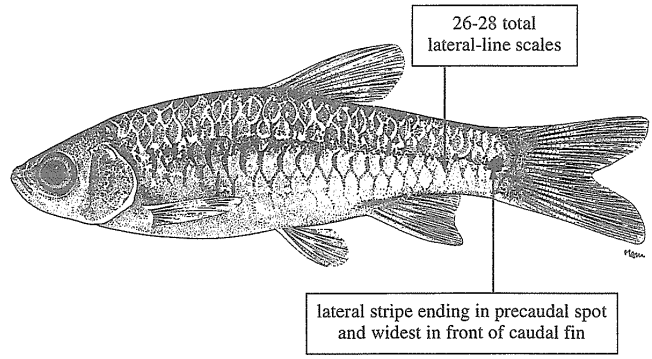
Rasbora hobelmani Kottelat, 1984

CYPRINIDAE

Local names: Trey changwa, ត្រីចង្វា។

Size: To 6 cm.

Habitat, biology, and fisheries: Found from midwater levels to surface in pools of small upland streams from Burma to Cambodia. Probably feeds mostly on exogenous insects. Taken with seines, cast-nets and traps. Not seen in markets. May possibly be used in the aquarium trade.



Rasbora myersi Brittan, 1954

(plate V, 36)

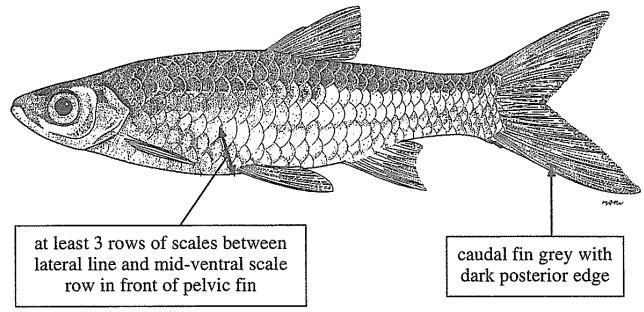
Synonyms / misidentifications: *Rasbora dusonensis* (non Bleeker)

FAO name: Silver rasbora.

Local names: Trey changwa, ត្រីចង្វា។

Size: To 10 cm.

Habitat, biology, and fisheries: Known from clear waters near the surface of upland rivers and streams from Thailand to Indonesia. Feeds mostly on exogenous insects, as well as some crustaceans and algae. Generally prefers a depth of about 5 m, where it is taken by seines, cast-nets, or traps. Rarely seen in markets.



There are 2 different groups of specimens that resemble the original description by Brittan (1954) and which probably represent 2 distinct species. The first form is long and slender and the other one is deeper bodied with a darker melanin outline of the scales on the trunk. The slender species is usually found in pools and backwaters of large rivers whereas the stout species occurs in small clear streams flowing under a complete forest canopy.

Rasbora pauciperforata Weber and deBeaufort, 1916

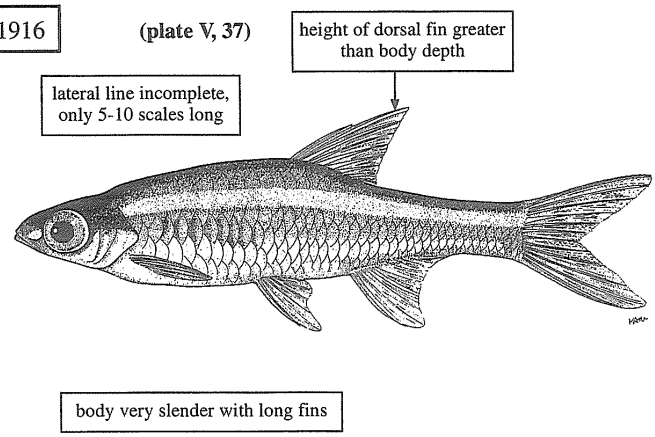
(plate V, 37)

FAO name: Red-line rasbora.

Local names: Trey changwa, ត្រីចង្វា។

Size: To 3.5 cm.

Habitat, biology, and fisheries: Known from midwater levels to surface in shallow sluggish and standing waters, marshes and swamps, usually under forest canopies. Seems to prefer soft acidic water that is often tannin-stained. Found in small openings of generally dense vegetation. Diet consists of zooplankton and some insects. Taken with seines, cast-nets, push-nets, and traps. Not seen in markets, but popular in the aquarium trade.

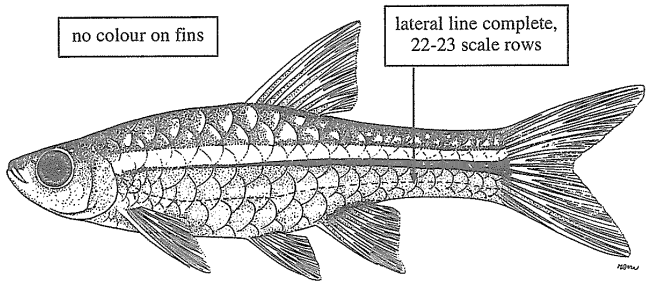


Rasbora paucisquamis Ahl, 1935 (plate V, 38) CYPRINIDAE

Local names: Trey changwa chhnoht, ត្រីចង្វាឆ្នូត.

Size: To 4 cm in Cambodia, slightly larger in Malaysia.

Habitat, biology, and fisheries: Found in pools in clear, swift, forest streams in the upland areas of the Mekong basin. Taken by seines, cast-nets, and traps. Individuals from Cambodia seem to attain a much smaller size than would be expected from Indonesia, based on the type (Kottelat, 1991). Not seen in markets, rarely in the aquarium trade.



Rasbora paviei (Tirant, 1885) (plate V, 39)

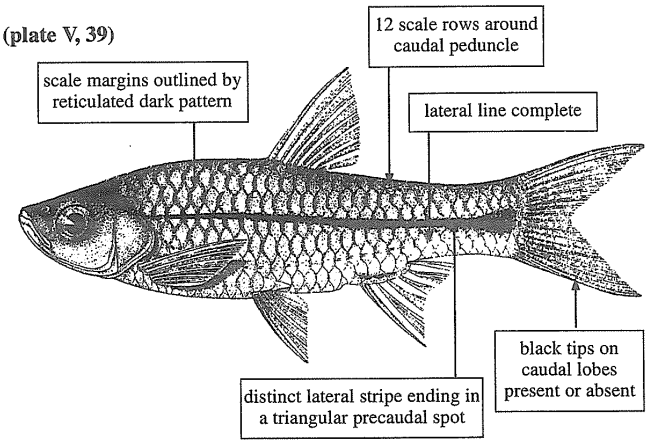
Synonyms / misidentifications: *Rasbora lateristriata* (non van Hasselt), *Rasbora sumatrana* (non Bleeker).

FAO name: Sidestripe rasbora.

Local names: Trey changwa chhnoht, ត្រីចង្វាឆ្នូត.

Size: To 12 cm.

Habitat, biology, and fisheries: Found near the surface in small to medium-sized streams in upland areas of Thailand and Cambodia. Individuals from high-gradient upland streams have a much darker stripe and often black tips on the caudal fin lobes. Diet probably consists of exogenous insects. Taken by seines, cast-nets and traps. Not seen in markets, but occasionally imported in the aquarium trade.



(from Smith, 1945)

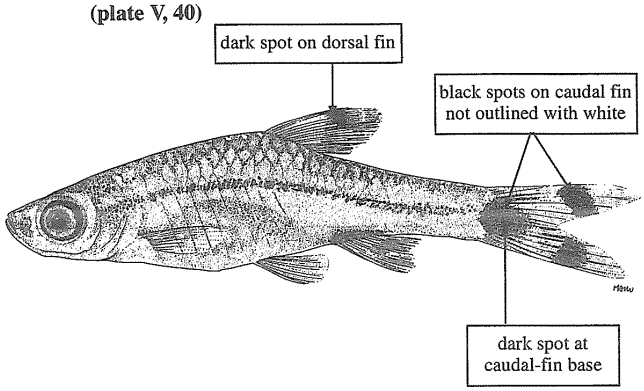
Rasbora spilocerca Rainboth and Kottelat, 1987 (plate V, 40)

FAO name: Dwarf scissortail rasbora.

Local names: Trey changwa poht, ត្រីចង្វាពោត.

Size: To 2.5 cm.

Habitat, biology, and fisheries: Found near the surface in shallow marshes, swamps, and inundated fields. Usually encountered in shallow layers of open water above beds of fine-leaved aquatic macrophytes and submerged grasses. Diet consists of zooplankton and some insects. Taken with seines, cast-nets, push-nets, and traps. Probably too small to be found in fish markets. Rarely seen in the aquarium trade.



Rasbora tornieri Ahl, 1922 (plate VI, 41) CYPRINIDAE

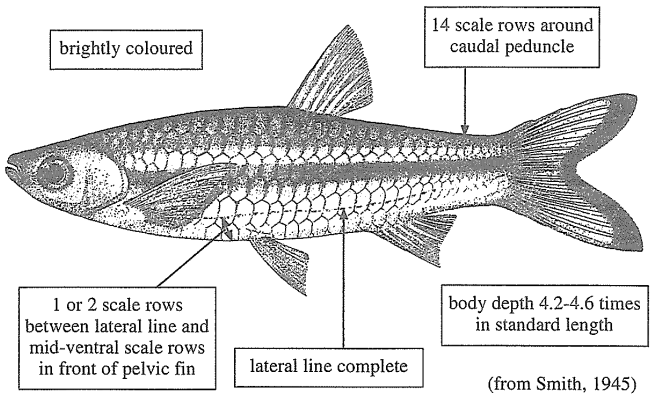
Synonyms / misidentifications: *Rasbora dusonensis* (non Bleeker), *Rasbora argyrotaenia* (non Bleeker).

FAO name: Yellowtail rasbora.

Local names: Trey changwa mool, ត្រីចង្វាមូល.

Size: To 17 cm.

Habitat, biology, and fisheries: Found in streams, canals, and ditches in lowland floodplains of Thailand, Cambodia, and Malaysia. Usually occurs right at the water surface and is easily recognized by the broad black margin on the bright yellow caudal fin. Diet consists of exogenous insects. Reported as non-migratory (Blache and Goossens, 1954), this species seems to be relatively common in the Tonlé Sap during the fishing season. Caught with seines, cast-nets, set-nets, and traps. Occasionally seen in fish markets.



(from Smith, 1945)

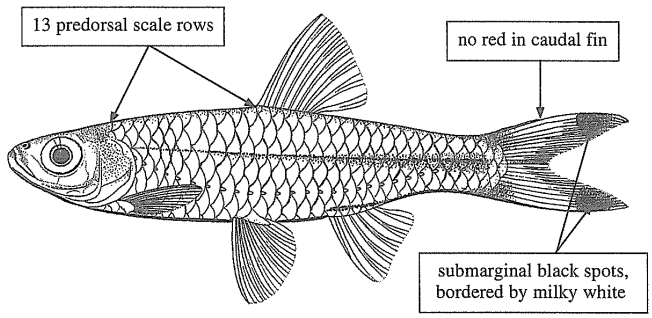
Rasbora trilineata Steindachner, 1870 (plate VI, 42)

FAO name: Scissortail rasbora.

Local names: Trey changwa poht, ត្រីចង្វាពោត.

Size: To 6 cm.

Habitat, biology, and fisheries: A common resident of surface waters in streams, canals, ditches, and occasionally of reservoirs in lowland areas from Thailand to Indonesia. A fast swimmer that prefers open waters. Feeds mostly on exogenous insects. Taken with seines, cast-nets, and traps. Not seen in markets, but very popular in the aquarium trade.



(from Fowler, 1934)

Rasbora urophthalmoides Kottelat, 1991 (plate VI, 43)

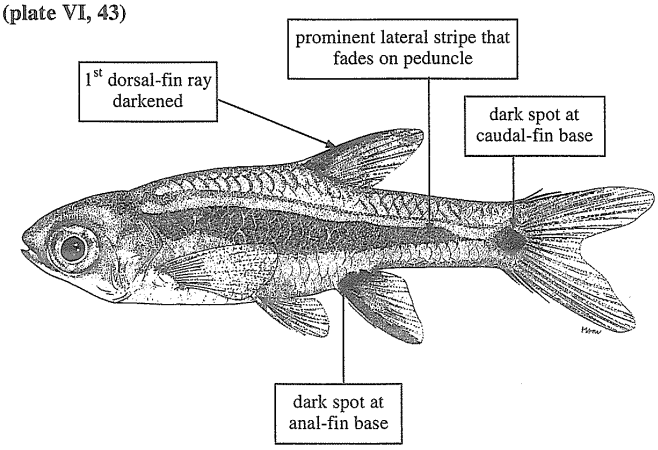
Synonyms / misidentifications: *Rasbora urophthalma.*

FAO name: Least rasbora.

Local names: Trey changwa chhnoht, ត្រីចង្វាឆ្នូត.

Size: Less than 1.5 cm.

Habitat, biology, and fisheries: One of the most diminutive rasboras of Cambodia. Found in marshes, swamps, and ponds amid dense growth of fine-leaved aquatic macrophytes. Does not seem to require large open spaces. Probably browses on zooplankton in the vegetation. Taken with seines and traps. Never seen in markets, but known from the aquarium trade.



Genus *Thryssocypris* **CYPRINIDAE**

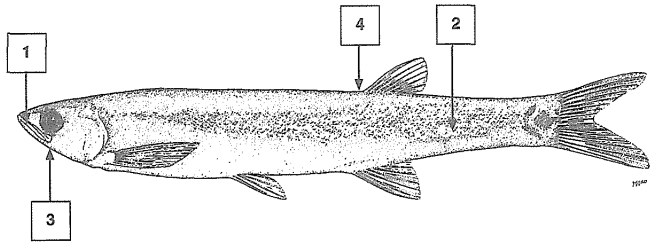
(1) MOUTH LARGE, EXTENDING BACK TO MIDDLE OF EYE; (2) SCALES SMALL, MORE THAN 42 IN LATERAL LINE; (3) NO BARBELS; (4) DORSAL-FIN ORIGIN BEHIND ANAL-FIN ORIGIN.

1 species recorded.

Thryssocypris tonlesapensis Roberts and Kottelat, 1984 **(plate VI, 44)**

Local names: Trey carp, ត្រីឆ្លាំង.

Size: To 7 cm.



Habitat, biology, and fisheries: A Mekong endemic, found near the water surface from the Tonlé Sap to the Mekong delta. Highest numbers primarily in the tidal zone of large deltaic branches of the lower Mekong. Diet consists of insect larvae. Taken by seines, cast-nets, set-nets, and traps. Sometimes seen in markets, but usually used for making prahoc and tuk trey. The local name included here was found on a list at the Cambodian Department of Fisheries. However, due to its shape, size, and bright silvery colour when fresh, it is expected that the local fishermen might call it trey bawndul ampeou. That name is used for small, silvery pellonuline clupeids which this fish superficially resembles.

Subfamily LEUCISCINAE

Tribe ASPIINI

Genus *Aaptosyax* **CYPRINIDAE**

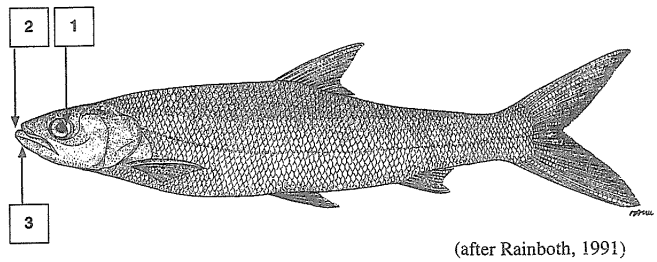
(1) ADIPOSE EYELID COVERING ALL BUT THE PUPIL OF THE EYE IN LARGE INDIVIDUALS, LESS OF THE EYE IN JUVENILES; (2) MEDIAN NOTCH IN UPPER JAW TO ACCOMODATE SYMPHYSEAL KNOB IN LOWER JAW; (3) MOUTH LARGE, LOWER JAW HEAVY.

1 species recorded.

Aaptosyax grypus Rainboth, 1991

Local names:

Size: To 100 cm.



(after Rainboth, 1991)

Habitat, biology, and fisheries: A large fast-swimming predator of middle and upper water levels that is becoming increasingly rare. A Mekong endemic, with a distribution limited to large rivers in the middle Mekong basin. Diet consists of fishes. Taken by seines, hook-and-line, cast-nets, and drift gill-nets. Although most common along the Thai-Lao border at the mouth of the Mun River, its numbers have drastically decreased in recent years. This is perhaps due to dam construction or excessive gill netting, to which active pursuit predators, like this species, are particularly vulnerable. It is now extremely rare in Cambodian waters, and should receive special listing by the IUCN.

Subfamily CYPRININAE

Tribe CYPRININI

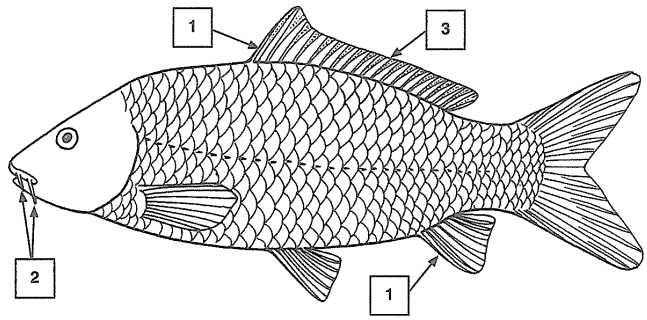
Subtribe CYPRINI

Genus *Cyprinus* — **CYPRINIDAE**

(1) DORSAL AND ANAL FINS BOTH WITH A SHARP, SERRATED SPINE; **(2)** 4 BARBELS; **(3)** LONG DORSAL FIN WITH 18 OR MORE RAYS.

1 species introduced to the lower Mekong.

Cyprinus carpio Linnaeus, 1758



Local names: Trey carp samahn, ត្រី កាបសាមញ្ញ.

Size: To 120 cm, usually smaller.

Habitat, biology, and fisheries: A widely introduced species native to temperate latitudes, which is now beginning to show up as scattered small individuals in fish markets. They seem to be capable of reproducing in cooler waters within the Mekong basin. In cool waters, these fish are extremely tolerant of turbidity and stream contamination. They are omnivorous, consuming a wide variety of plant and animal matter, often uprooting aquatic plants and muddying the water transparency. In developed countries of the western hemisphere they ingest all manner of industrial pollutants, making them inedible. Coupled with their destructive feeding activities, they have earned a reputation as a "trash fish" and millions of dollars have been unsuccessfully spent to eradicate or at least control them. Taken with seines, gill-nets, and hook-and-line. Usually marketed fresh.

Subtribe TORES

Genus *Neolissochilus* — **CYPRINIDAE**

(1) LARGE SCALES, FEWER THAN 30 IN LATERAL LINE; **(2)** 12 SCALES AROUND CAUDAL PEDUNCLE; **(3)** 4 BARBELS; **(4)** FACIAL TUBERCLES, WHEN PRESENT, CONFINED TO SIDES OF SNOUT; **(5)** DORSAL FIN WITH NON-SERRATED SPINE.

4 species likely to occur in the Mekong, 3 of them expected from Cambodia.

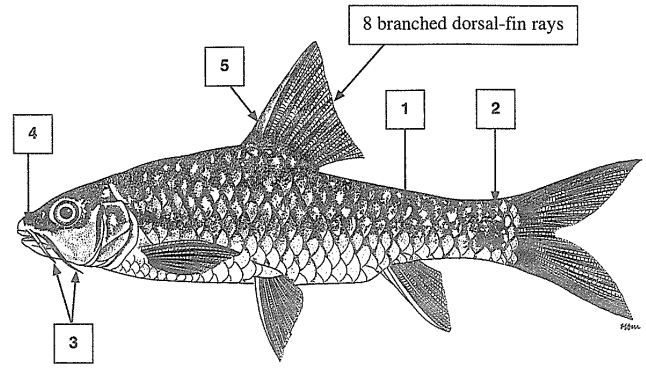
Neolissochilus blanci (Pellegrin and Fang, 1940)

Synonyms / misidentifications: *Tor soro* (non Valenciennes).

Local names:

Size: To 40 cm.

Habitat, biology, and fisheries: Found in pools of clear forest streams and rivers in the middle Mekong, primarily of Laos, and possibly still in extreme northern Thailand. Disappears when forest canopy is cut and suspended solids in streams increase because of human activities. Primarily a predator, but also feeds on some types of plant matter, particularly fruits. Caught by hook-and-line, cast-nets, and gill-nets. Not yet encountered in Cambodia, but expected from the northern part of the country.



(after Wu et al., 1977)

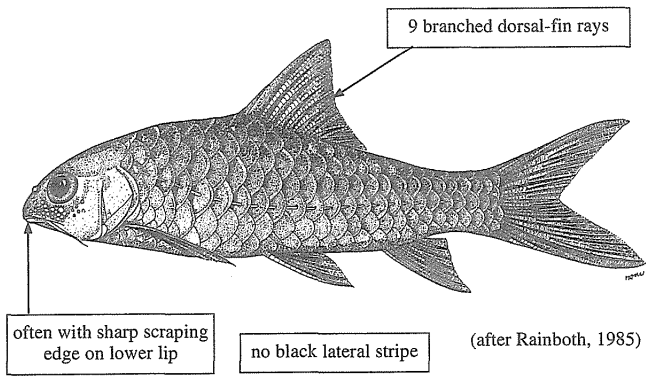
Neolissochilus soroides (Duncker, 1904) **CYPRINIDAE**

Synonyms / misidentifications: *Acrossocheilus sumatranus* (non Weber and deBeaufort).

Local names:

Size: To 45 cm.

Habitat, biology, and fisheries: Known from pools of clear forested streams and rivers from Thailand and Cambodia, south to Malaysia. Found in the Cardamom mountains, but not yet seen in northern Cambodia. Disappears when human activities degrade aquatic habitats, as seen in *N. blanci*. Often develops a sharp edge on the lower jaw, which is used in scraping rocks as it grazes. Taken by seines, hook-and-line, and cast-nets.



(after Rainboth, 1985)

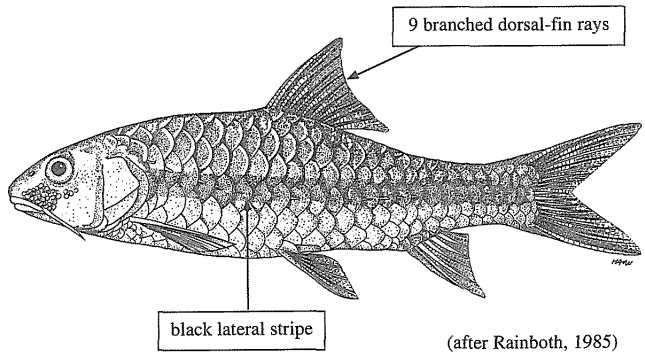
Neolissochilus stracheyi (Day, 1871)

Synonyms / misidentifications: *Tor soro* (non Valenciennes).

Local names:

Size: To 60 cm.

Habitat, biology, and fisheries: Known from clear forested streams and rivers from Burma through Thailand and possibly into the Cardamom Range in Cambodia. Disappears when human activities degrade aquatic habitats, as seen in in other members of the genus. Diet is similar to that of *N. blanci*. Taken by seines, hook-and-line, and cast-nets.



(after Rainboth, 1985)

Genus *Probarbus* **CYPRINIDAE**

(1) DORSAL FIN WITH AN UNSERRATED SPINE AND 9 BRANCHED RAYS; **(2)** A DARK STRIPE FOLLOWING EACH OF THE LONGITUDINAL SCALE ROWS ABOVE THE LATERAL LINE, AND SOME ROWS BELOW; **(3)** LARGE MOLARIFORM PHARYNGEAL TEETH IN A SINGLE ROW.

3 species recorded from the middle Mekong, 2 of them endemic.

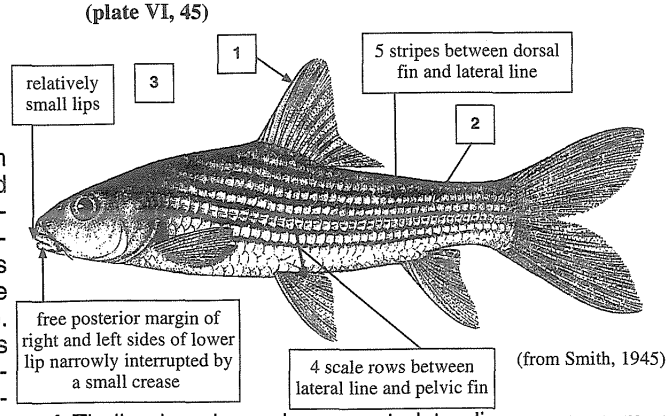
Probarbus jullieni Sauvage, 1880 **(plate VI, 45)**

FAO name: Seven-line barb.

Local names: Trey trawsak, ត្រី ត្រាសក់.

Size: To 100 cm.

Habitat, biology, and fisheries: Known from large rivers with sand or gravel substrates and abundant mollusk populations. Originally distributed from Thailand and Cambodia to Malaysia, although it no longer inhabits much of its former range. In Cambodia, it occurs in the Mekong from the Lao border to the Great Lake. Generally intolerant of habitat alterations, it has disappeared from areas affected by impoundments. Natural populations have been extirpated from the Chao Phrya and other rivers of Thailand and can be expected to disappear as more impoundments are constructed in the Mekong. No longer seen in large numbers, it is an extremely desirable food fish, sold fresh and at high prices in markets. Taken by seines, hook-and-line, drift gill-nets, and occasionally by large mesh cast-nets. Listed as "K" or insufficiently known in the IUCN Red List (1994).



(from Smith, 1945)

Probarbus labeamajor Roberts, 1992 **(plate VI, 46)** **CYPRINIDAE**

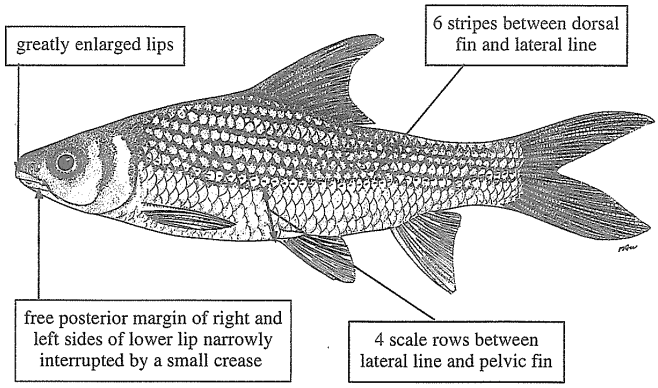
Synonyms / misidentifications: *Probarbus jullieni* (non Sauvage).

FAO name: Thicklip barb.

Local names: Trey trawsak sor, ត្រី ត្រសក់ ស .

Size: To 150 cm.

Habitat, biology, and fisheries: Found in large upland rivers of the middle and lower Mekong basin. Apparently endemic to the Mekong. Due to past confusion with *P. jullieni,* little is known about this species. It likely experiences the same problems with impoundments that are seen with *P. jullieni.* Probably more common than *P. jullieni* in Stung Treng, but apparently not found in the Great Lake. Taken by drift gill-nets, hook-and-line, and towed cast-nets.



Probarbus labeaminor Roberts, 1992

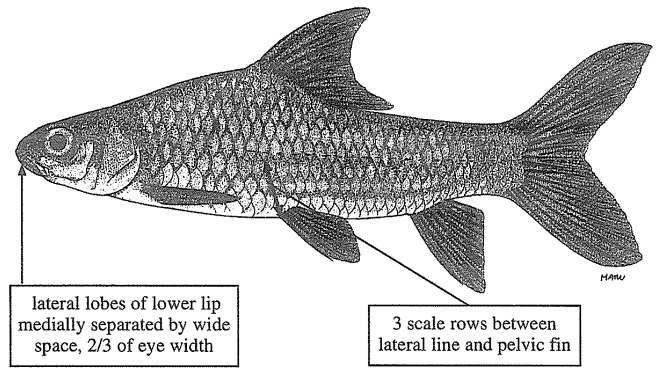
Synonyms / misidentifications: *Probarbus jullieni* (no Sauvage).

FAO name: Thinlip barb.

Local names: Trey trawsak, ត្រី ត្រសក់.

Size: To 70 cm.

Habitat, biology, and fisheries: Found in upland reaches of large and medium sized rivers of the Mekong basin. Apparently endemic to the Mekong. Little is known about this species due to past confusion with *P. jullieni.* It seems to be less common than either *P. jullieni* or *P. labeamajor* in Cambodia. Although commonly encountered at the mouth of the Mun River by the University of Michigan team in 1975, it may already be suffering negative impacts from the Pak Mun dam. Taken by seines, cast-nets, hook-and-line, and drift gill-nets.



Genus *Tor* **CYPRINIDAE**

(1) MEDIUM TO LARGE-SIZED FISHES WITH LARGE SCALES, FEWER THAN 30 IN LATERAL LINE; **(2)** A NON-SERRATED SPINE IN DORSAL FIN; **(3)** MENTAL LOBE IN LOWER LIP AT MANDIBULAR SYMPHYSIS.

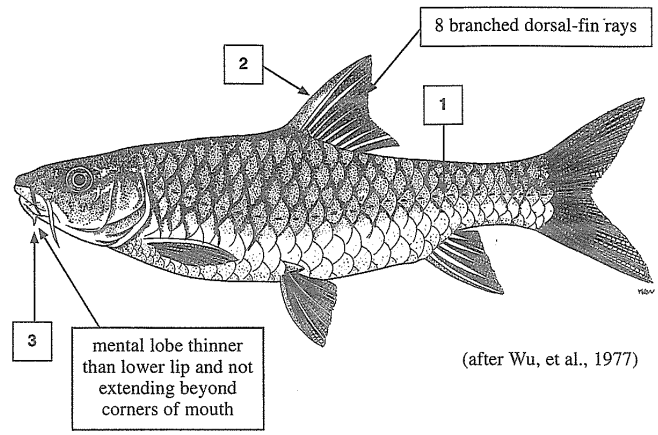
3 species recorded from the Mekong, probably 2 of them in Cambodia.

Tor sinensis Wu, 1977 **(plate VI, 47)**

Local names: Trey khaor, ត្រី ខ្ញោរ.

Size: To 35 cm.

Habitat, biology, and fisheries: Known from pools and runs over gravel and cobble in clear rivers in forest areas of the middle and upper Mekong. Not yet been recorded from Cambodia. An omnivorous species, consuming vegetable matter such as fruits, as well as fish, crustaceans, and other invertebrates. Taken by seines, hook-and-line and cast-nets. Occasionally caught, but never in large numbers. Members of this genus are marketed fresh.



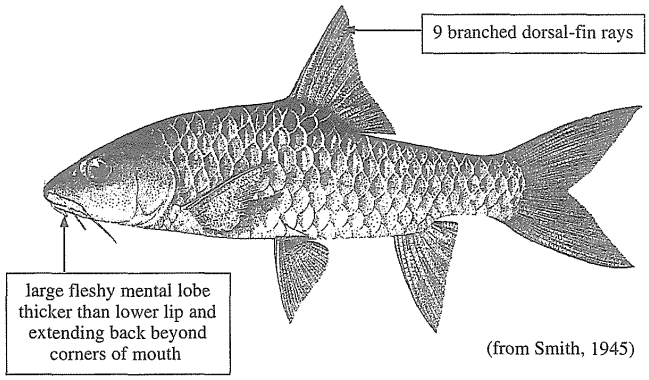
(after Wu, et al., 1977)

Tor tambroides Bleeker, 1854 (plate, VI, 48) CYPRINIDAE

FAO name: Thai mahseer.

Local names: Trey khaor, ត្រី ខ្លារ.

Size: To 70 cm in Indonesia, up to 50 cm in the Mekong.



(from Smith, 1945)

Habitat, biology, and fisheries: Known from pools and runs over gravel and cobble in rivers flowing through undisturbed forests. Found in small rivers and streams during the dry season. Moves downstream at the onset of the rainy season, but generally avoids turbid waters. Migrates upstream after about two months and spawns in July near the mouths of small streams that the young subsequently ascend. Although this pattern has been reported for central Thailand only (Smith, 1945), the timing should be similar in Cambodia. These fishes are omnivorous, consuming both animal and vegetable matter, at times consuming toxic fruits in flooded forests, making them temporarily inedible. Taken by seines, hook-and-line, and cast-nets. Taken in Thailand mostly by hooks baited with dough-balls of rice flour mixed with sugar palm fruit (Smith, 1945). With their large rubbery lips acting to improve suction as they root around in gravel and cobblestones, these fishes are most easily caught when a baited hook is made invisible by burying it under a few small rocks.

Tribe SYSTOMINI

Subtribe OSTEOBRAMAE

Genus *Albulichthys* CYPRINIDAE

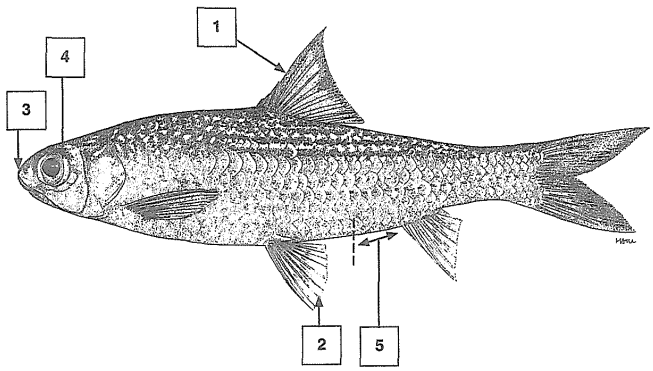
(1) SERRATED DORSAL-FIN SPINE; **(2)** 9 BRANCHED PELVIC-FIN RAYS; **(3)** SNOUT OBTUSE; **(4)** ADIPOSE EYELID; **(5)** 5 SCALE ROWS BETWEEN VENT AND ANAL FIN.

1 species recorded.

Albulichthys albuloides (Bleeker, 1855) (plate VII, 49)

Local names: Trey chhkok tituy, ត្រី ឆ្អែកទីទុយ.

Size: To 36 cm, commonly to about 25 cm.



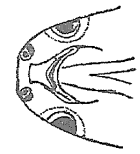
Habitat, biology, and fisheries: Known from midwater to bottom levels of large rivers from Indonesia to Cambodia and Thailand. Adults are common in the Great Lake and are seen sporadically downstream. Juveniles may be found as far downstream as the upper tidal zone of the Mekong delta in Vietnam. Little is known about its seasonal movements. Like many carps, this species is omnivorous (Le van Dang, 1970) but consumes somewhat more plant than animal matter. Taken with large seines and traps, juveniles taken by setnets. Adults are sold fresh in markets around the Great Lake, or are cleaned and sliced in half by a single sagittal cut in preparation for salting and drying. They can be quickly recognized in this state by their golden scales and bright red caudal fin.

Genus *Amblyrhynchichthys* **CYPRINIDAE**

(1) SERRATED DORSAL-FIN SPINE; **(2)** 9 BRANCHED PELVIC-FIN RAYS; **(3)** EXTREMELY BLUNT SNOUT; **(4)** ADIPOSE EYELID; **(5)** 3 SCALE ROWS BETWEEN VENT AND ANAL FIN.

1 species recorded.

Amblyrhynchichthys truncatus (Bleeker, 1850) **(plate VII, 50)**



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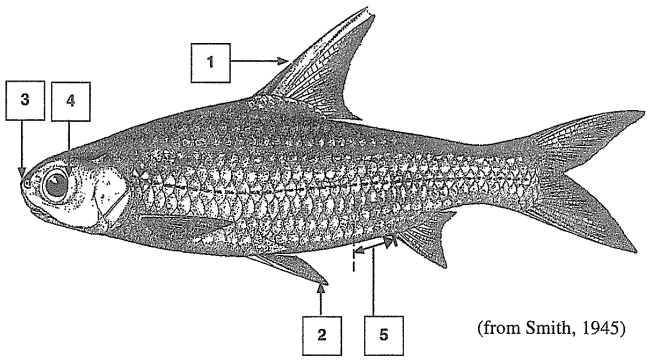
Local names: Trey kambot chramos, ត្រីកំបុតច្រមុះ.

Size: To 40 cm, commonly to about 30 cm.

Habitat, biology, and fisheries: Known from midwater to bottom depths in large and medium-sized rivers from Indonesia to Cambodia and Thailand. Moves into inundated forests during the flood season and returns to the rivers in October and November as floodwaters recede. From then on, its numbers decrease in the rivers of the Tonlé Sap until the end of the fishing season. Primarily microphagous, feeding mostly on periphyton, with some phytoplankton, bottom growing algae, and small zooplankton. Taken by seines, set-nets, and traps. Small individuals are used for prahoc, larger ones marketed fresh.



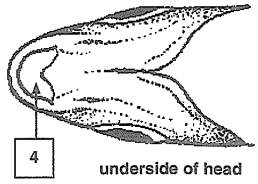
(from Smith, 1945)

Genus *Balantiocheilos* **CYPRINIDAE**

(1) SERRATED DORSAL-FIN SPINE; **(2)** 8 BRANCHED PELVIC-FIN RAYS; **(3)** SNOUT POINTED; **(4)** LOWER LIP A BROAD SMOOTH FOLD OF SKIN WITH FREE POSTERIOR BORDER.

1 species recorded.

Balantiocheilos melanopterus (Bleeker, 1850)



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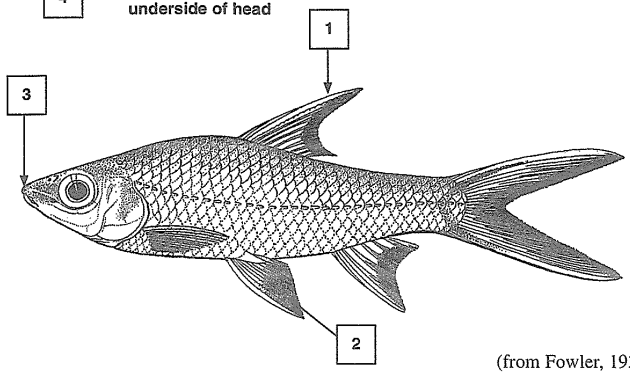
FAO name: Bala sharkminnow.

Local names: Trey kiet srawng, ត្រីកៀតស្រែង.

Size: To 35 cm in Indonesia, usually 20 cm in Thailand and Cambodia.

Habitat, biology, and fisheries: Known from midwater depths in large and medium-sized rivers and lakes ranging from Indonesia to Cambodia and Thailand. Moves into flooded forests during high water levels. Feeds on some phytoplankton, but mostly on small crustaceans and rotifers as well as insects and their larvae (Vaas, 1953). Returns to the rivers in December and is caught with seines and traps. Although it occurred regularly in rivers downstream from the Great Lake in the 1950s, the species has become rare in recent years, perhaps due to human activities. It now occurs in a few rivers flowing through relatively pristine inundated forest at the eastern end of the Great Lake. Generally intolerant of habitat alterations, it has completely disappeared in Thailand and should receive special listing by the IUCN.



(from Fowler, 1937)

Genus *Cosmochilus* **CYPRINIDAE**

(1) SERRATED DORSAL-FIN SPINE; (2) 9 BRANCHED PELVIC-FIN RAYS; (3) SNOUT OBTUSE; (4) MOUTH SMALL, SUBTERMINAL, WITH THICK LIPS COVERED BY LARGE PAPILLAE.

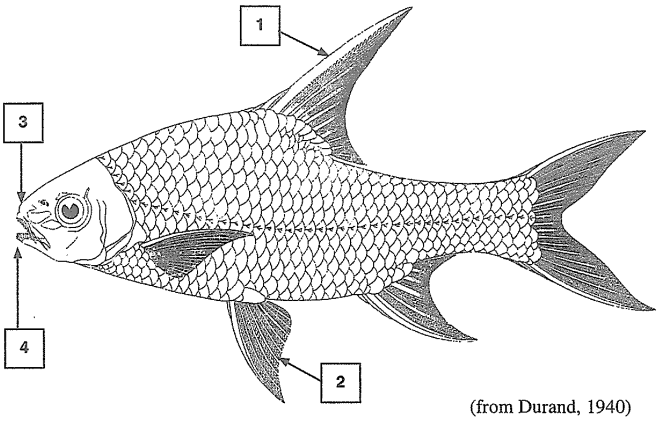
3 species, 2 of them found in the Mekong and 1 in Cambodia.

Cosmochilus harmandi Sauvage, 1878 **(plate VII, 51)**

Local names: Trey kampoul bay, ត្រី កំប្លែបាយ.

Size: To 100 cm, commonly to about 30 cm.

Habitat, biology, and fisheries: Known from midwater to bottom depths in the middle and lower Mekong. Found in the clear waters of the main channels during the dry season and moves to floodplains and riparian forests during the rainy season. Returns to the Tonlé Sap fairly early, usually during October with its numbers decreasing after that. The species is relatively common in the upland river habitat of the middle Mekong until water levels begin to rise. Dietary habits have not yet been studied, but the subterminal mouth and papillate lips indicate that it probably roots around for food in fine-grained sediments. The largest adults are seen in the middle Mekong, with most individuals in the Tonlé Sap being less than half the length of the large adults found at Stung Treng. Taken by seines, gill-nets, set-nets, and traps. Juveniles caught in the dai fishery of the Tonlé Sap are used for prahoc. Adults are sold fresh.



(from Durand, 1940)

Genus *Cyclocheilichthys* **CYPRINIDAE**

(1) SERRATED DORSAL-FIN SPINE; (2) 9 BRANCHED PELVIC-FIN RAYS; (3) SNOUT CONICAL; (4) MOUTH SMALL, SUBTERMINAL, HORSESHOE-SHAPED; (5) NUMEROUS PARALLEL ROWS OF SENSORY FOLDS ON THE SNOUT AND CHEEKS.

8 species recorded or likely to occur in the Cambodian Mekong.

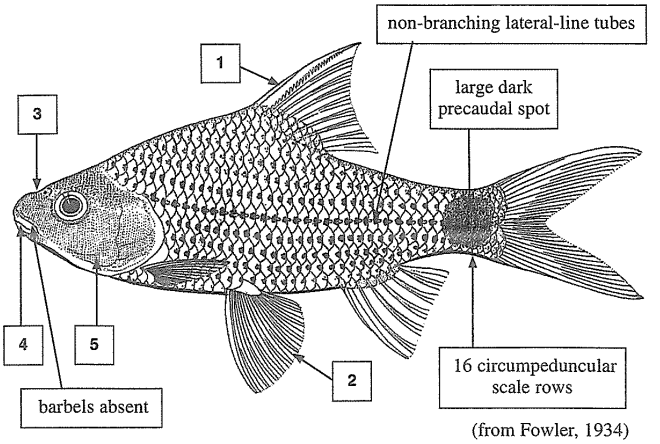
Cyclocheilichthys apogon (Valenciennes, 1842) **(plate VII, 52)**

FAO name: Beardless barb.

Local names: Trey srawka kdam, Trey kros, ត្រី ស្រកាក្តាម, ត្រី ក្រុស.

Size: To 15 cm.

Habitat, biology, and fisheries: Widely distributed, known from Indonesia to Burma. A common midwater species in the Mekong. Occurs in canals, ditches, and generally in habitats with slowly moving or standing water. Typically found around surfaces, such as plant leaves, branches, and tree roots where it browses for small plankton and crustaceans. Moves into flooded forests and non-forested floodplains. Known to breed late in the high-water season from September to October as water levels peak and begin to decline. Perhaps this avoids predation by species that move back to rivers immediately at the onset of falling waters. Often found in impoundments and seems to prosper there. Taken with seines, cast-nets, set-nets, and traps. Sometimes marketed fresh along the Tonlé Sap and used to make prahoc.



(from Fowler, 1934)

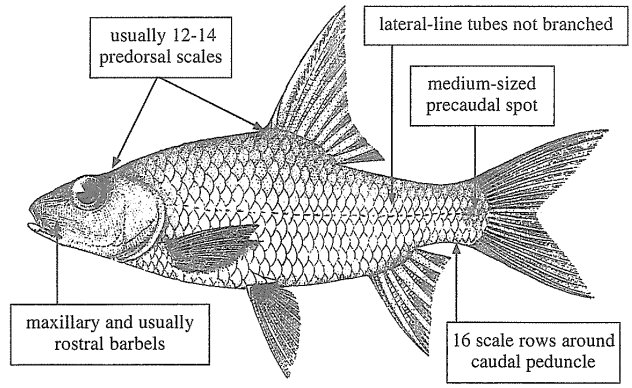
Cyclocheilichthys armatus (Valenciennes, 1842) (plate VII, 53) CYPRINIDAE

Synonyms / misidentifications: *Cyclocheilichthys mekongensis, Cyclocheilichthys tapiensis.*

Local names: Trey pka kor, ត្រី ផ្កាក.

Size: To 23 cm, commonly to about 15 cm.

Habitat, biology, and fisheries: Found at midwater to bottom levels in rivers and streams from Indonesia to Thailand and Cambodia. Common in the Mekong. Individuals are sometimes found in reservoirs, but occur much more often in flowing water. Lives in rivers during the dry season and migrates to floodplains to spawn in the rainy season, with reproduction taking place relatively late in the high-water season during September and October. Diet consists of zooplankton, small crustaceans, chironomids, and other insect larvae. Taken with seines, cast-nets, set-nets, and traps. Large individuals between 15 and 20 cm are marketed fresh, and small ones are used to make prahoc.



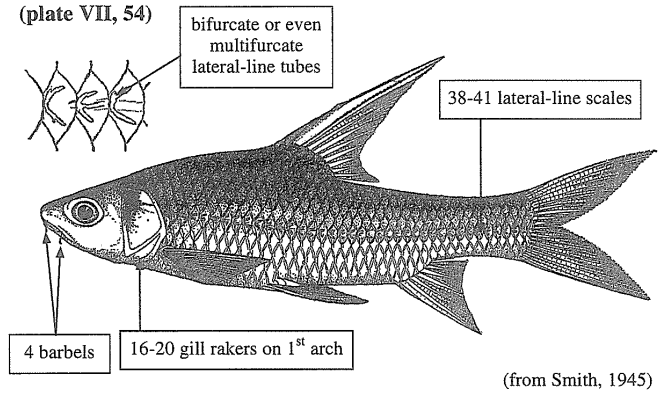
(from Smith, 1945)

Cyclocheilichthys enoplos (Bleeker, 1850) (plate VII, 54)

Local names: Trey chhkok, ត្រី ឆ្កោក.

Size: To 74 cm (in Vietnam), commonly to about 45 cm.

Habitat, biology, and fisheries: Found at midwater to bottom levels of rivers from Indonesia to Thailand. Common in the Mekong. Lives in rivers and spawns in the rainy season, probably on floodplains or inundated riparian forests. Returns to the rivers from October to December with the catch decreasing steadily in size as the fishing season progresses in the Tonlé Sap (Blache and Goossens, 1954). Not found in impoundments. Young feed on zooplankton and adults on insect larvae, crustaceans, and fish. Taken with seines, cast-nets, gill-nets, set-nets, and traps. A desirable food fish, marketed fresh.



(from Smith, 1945)

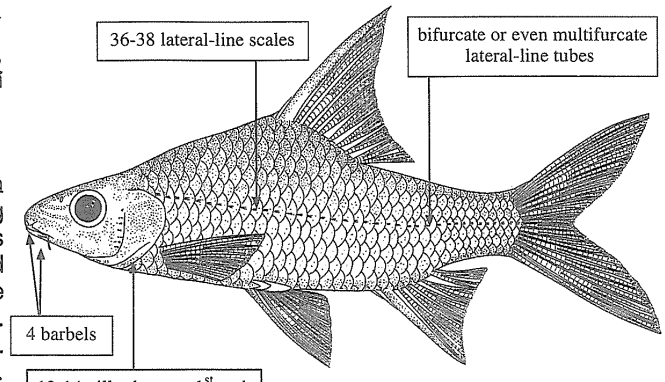
Cyclocheilichthys furcatus Sontirat, 1985 (plate VII, 55)

Synonyms / misidentifications: *Cyclocheilichthys enoplos* (non Bleeker).

Local names: Trey chhkok ploeung, ត្រី ឆ្កោកល្អឹង.

Size: To 60 cm.

Habitat, biology, and fisheries: Apparently a Mekong endemic, known from the middle Mekong along the Thai-Lao border to the Tonlé Sap. Lives in large rivers and probably migrates into flooded riparian forests and smaller streams during the rainy season. Does not occur in impoundments. Little is known about the biology of this species. Probably has feeding habits similar to *C. enoplos*. For many years individuals were simply thought to be deep-bodied specimens of *C. enoplos*, with which it is most easily confused. Taken with seines, cast-nets, gill-nets, and traps. Occasionally seen in markets, but is considerably less common than *C. enoplos*.



(from Sontirat, 1985)

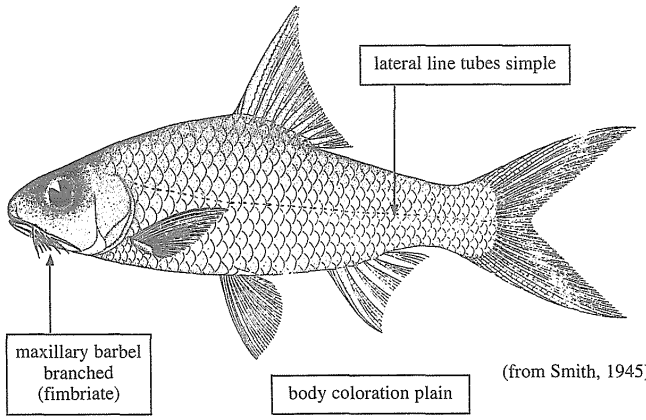
CYPRINIDAE

Cyclocheilichthys heteronema (Bleeker, 1853)

Local names: Trey chhkok pookmawt bai, ត្រីឆ្កោកពុកមាត់ប៊ៃ.

Size: To 12 cm.

Habitat, biology, and fisheries: Found near the bottom in large rivers from Thailand to Borneo. An uncommon fish in the Mekong. Occurs just upstream from Khoné Falls at the mouth of the Mun River. Also recorded from the Great Lake. Typically found in the middle Mekong during the dry season and moves into flooded forests during high water periods. Little is known about its biology. Not seen in markets.



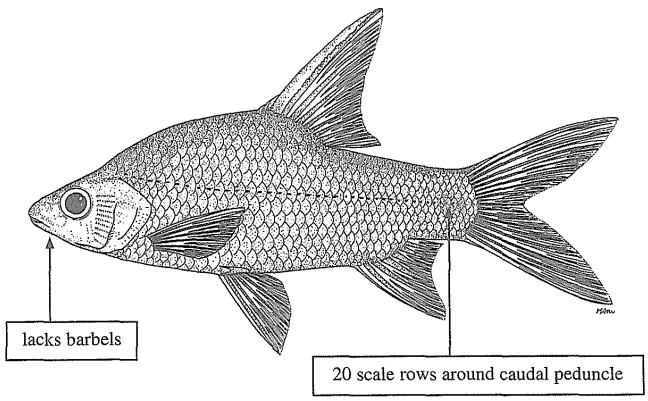
(from Smith, 1945)

Cyclocheilichthys lagleri Sontirat, 1985

Local names: Trey srawka kdam, ត្រីស្រកាក្តាម.

Size: To 15 cm.

Habitat, biology, and fisheries: Known from lowland floodplains in Cambodia and Thailand. Little is known about this recently described species. Expected to have similar dietary and migratory habits to *C. apogon, C. armatus,* and *C. repasson,* the three species it resembles most closely. Most easily confused with *C. repasson,* with which it shares similar scale-counts, but lacks barbels entirely. Taken with seines, cast-nets, and traps. Most likely used to make prahoc.



(after Sontirat, 1985)

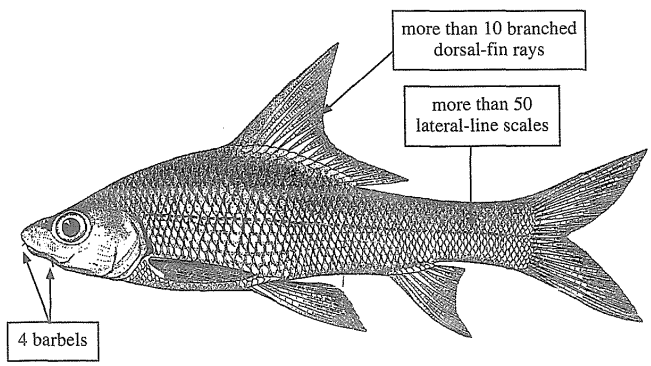
Cyclocheilichthys microlepis (Bleeker, 1851)

Synonyms / misidentifications: *Barynotus microlepis, Neobarynotus microlepis.*

Local names: Trey angkat prak, ត្រីអង្គត ប្រាក់.

Size: To 40 cm.

Habitat, biology, and fisheries: Known from Indonesia (Sumatra, Borneo) and the Mekong. Occurs in large rivers as well as smaller streams during periods of high turbidity. An omnivorous species, with a diet consisting primarily of insects, as well as shrimps, submerged aquatic vegetation, and inundated land vegetation. Apparently uncommon, its known range seems to be confined to rivers and flooded forests of the lower Mekong. Probably taken by seines, gill-nets, and traps.



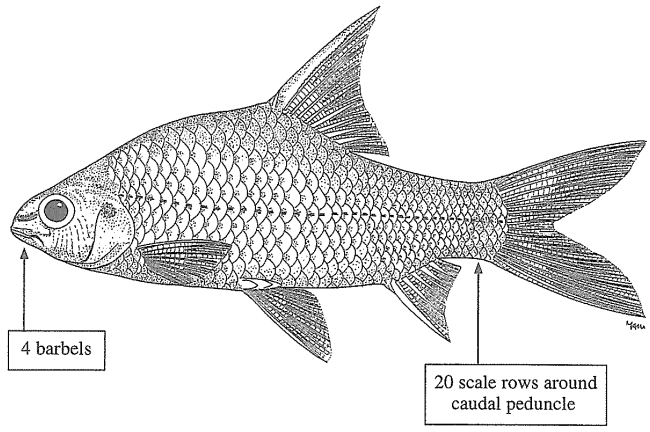
(from Weber and de Beaufort, 1916)

Cyclocheilichthys repasson (Bleeker, 1853) (plate VII, 56) CYPRINIDAE

Local names: Trey srawka kdam, ត្រីស្រកាក្តាម.

Size: To 28 cm in Indonesia, up to16 cm in the Mekong.

Habitat, biology, and fisheries: Occurs at midwater to bottom levels in small rivers, canals, ponds, and reservoirs from Indonesia to Thailand. This species, like other small members of the genus, moves out into the flooded forest during the high-water season. Little is known about the precise timing of its movements. Diet consists primarily of insects with some aquatic macrophytes. Very similar to *C. lagleri*, but clearly distinguished by the four barbels. It is 1 of 2 species in the genus that are known to proliferate in impoundments in the Mekong of Thailand. Taken with seines, cast-nets, and set-nets. Not a major commercial fish, but used to make prahoc.



(after Sontirat, 1976)

Genus *Dischorodontus* CYPRINIDAE

(1) SERRATED DORSAL-FIN SPINE; **(2)** 8 BRANCHED PELVIC-FIN RAYS; **(3)** TIP OF DORSAL FIN DARKENED; **(4)** PHARYNGEAL TEETH IN 2 ROWS.

1 species recorded.

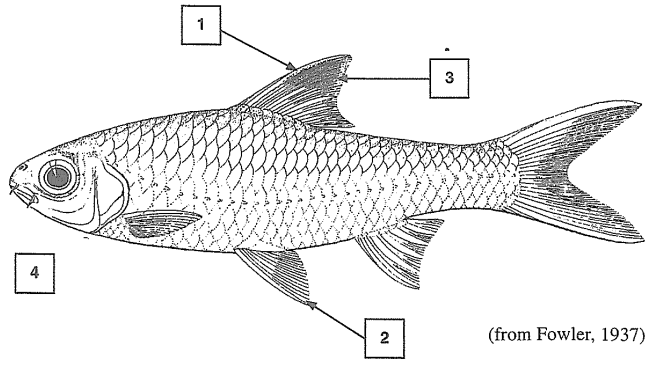
Dischorodontus ashmeadi Fowler, 1937 (plate VIII, 57)

FAO name: Redtail barb.

Local names: Trey kantoei krahawm, ត្រីកន្ទុយក្រហម.

Size: To 11 cm.

Habitat, biology, and fisheries: Endemic to the middle Mekong. Occurs near the bottom in pools of small to medium-sized rivers. Typically found near decaying plant debris where it feeds on insects and other invertebrates. Possibly moves out into flooded forests during high-water periods. Apparently found in localized populations and encountered sporadically. Taken with seines, cast-nets, and small-mesh gill-nets. Rarely seen in markets.



(from Fowler, 1937)

Genus *Mystacoleucus* **CYPRINIDAE**

(1) SERRATED DORSAL-FIN SPINE PRECEDED BY A HORIZONTAL SPINE PROJECTING FROM THE SKIN AT THE DORSAL-FIN ORIGIN; **(2)** 8 BRANCHED PELVIC-FIN RAYS; **(3)** 7 TO 10 BRANCHED ANAL-FIN RAYS.

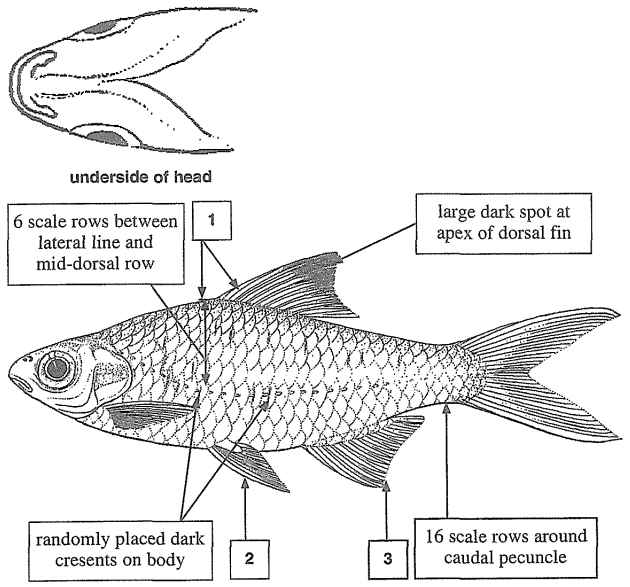
4 species recorded from the Mekong, 3 of them from Cambodia.

Mystacoleucus atridorsalis Fowler, 1937

Local names:

Size: To 7 cm.

Habitat, biology, and fisheries: Apparently a Mekong endemic, occurring at bottom depths over gravel in places with fairly strong currents. Found in the main stream of the middle Mekong with populations in fast flowing forest streams. Feeds on worms, insect larvae, and crustaceans living in bottom sediments, along with algae. Taken with seines, cast-nets, and traps. There is another undescribed species in the middle Mekong that resembles *M. atridorsalis*. The undescribed species has 27 to 29 lateral-line scales, 14 scale rows around the caudal peduncle, and 5 scale rows between the lateral line and the mid-dorsal scale row at the dorsal-fin origin. Fowler's original description of *M. atridorsalis* fits one form and his illustration fits the other. Both are provisionally included here as a single species.



(from Fowler, 1937)

Mystacoleucus marginatus (Valenciennes, 1842)

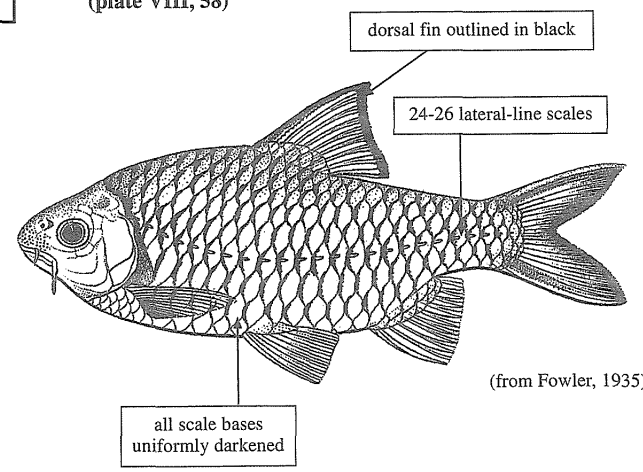
(plate VIII, 58)

Synonyms / misidentifications: *Mystacoleucus chilopterus.*

Local names: Trey tim proek, ត្រីទីមប្រឹក.

Size: To 20 cm, commonly to about 10 cm.

Habitat, biology, and fisheries: Found at bottom depths of rivers and streams from Indonesia to Thailand. Inhabits areas with sand or pea-gravel from small streams to large rivers including the main stream of the Mekong. Apparently, this species breeds when water levels begin to rise (Smith, 1945), but whether it leaves permanent water or not is unknown. Diet is similar to that of *M. atridorsalis*. Taken with seines, cast-nets, and traps, and occasionally seen in markets.



(from Fowler, 1935)

Genus *Puntioplites* **CYPRINIDAE**

(1) SERRATED DORSAL-FIN SPINE; (2) 9 BRANCHED PELVIC-FIN RAYS; (3) SNOUT BLUNT; (4) BODY DEEP AND STRONGLY COMPRESSED; (5) UNBRANCHED ANAL-FIN RAY ENLARGED AND HARDENED INTO A SPINE THAT IS SERRATED IN SOME SPECIES.

4 species recorded, an additional undescribed species possible.

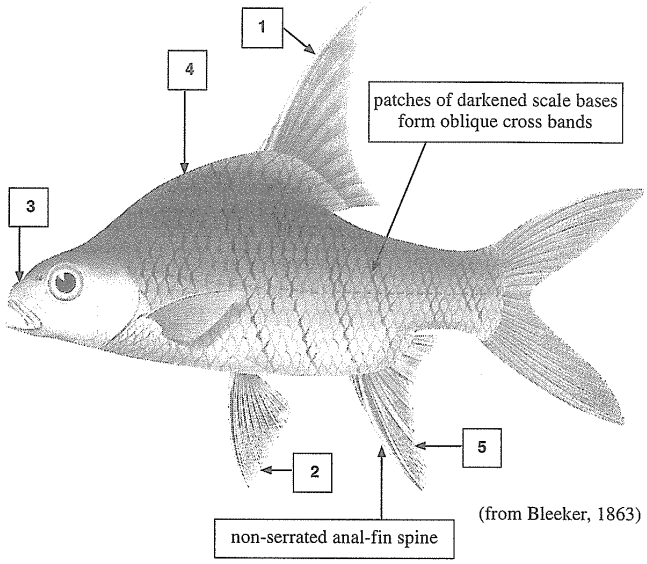
Puntioplites bulu (Bleeker, 1851)

Synonyms / misidentifications: *Puntius bulu.*

Local names: Trey kuch chhrea, Trey kanchrea, ត្រី ឆុចឆ្រៃ, ត្រី កង្រៃ.

Size: To 35 cm in Indonesia, to 30 cm in the Mekong.

Habitat, biology, and fisheries: Found at midwater to bottom depths in large lowland rivers and lakes from Indonesia to Cambodia and peninsular Thailand. Formerly common, but very rare in recent years. Moves into flooded forests when water-levels are high, feeding mostly on submerged plants along with some filamentous algae and insects that occur on the plants. Returns to the Tonlé Sap in October where it formerly was taken in the dai fishery (Blache and Goossens, 1954). Previously also common in the Great Lake (Fily and Aubenton, 1966) where it was an important part of the catch by the large traps. Its precipitous decline makes it a candidate for listing by the IUCN.



(from Bleeker, 1863)

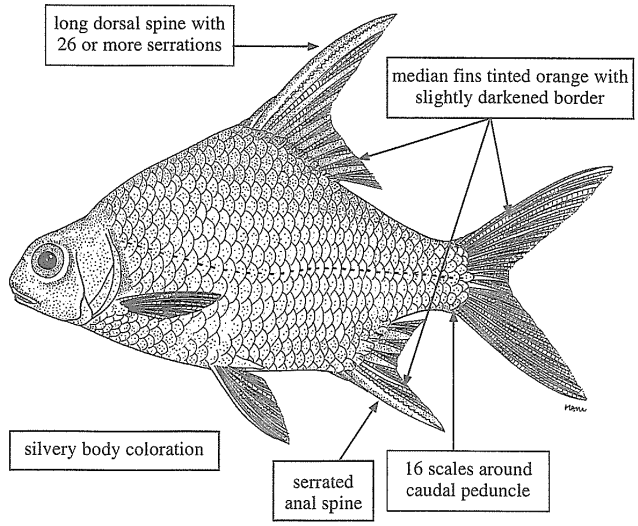
Puntioplites falcifer Smith, 1929 (plate VIII, 60)

Synonyms / misidentifications: *Puntioplites proctozysron* (non Bleeker).

Local names: Trey chrakaing, ត្រី ច្រកែង.

Size: To 35 cm.

Habitat, biology, and fisheries: Described from the Mekong and perhaps endemic to this area where it inhabits large upland rivers. Although common around Stung Treng, it does not seem to occur in the Great Lake, and seems to avoid standing water. Little is known about its biology. Like other members of the genus, it probably feeds mostly on plant matter with occasional insects and insect larvae. Taken with seines and gill-nets, and sold fresh in markets.



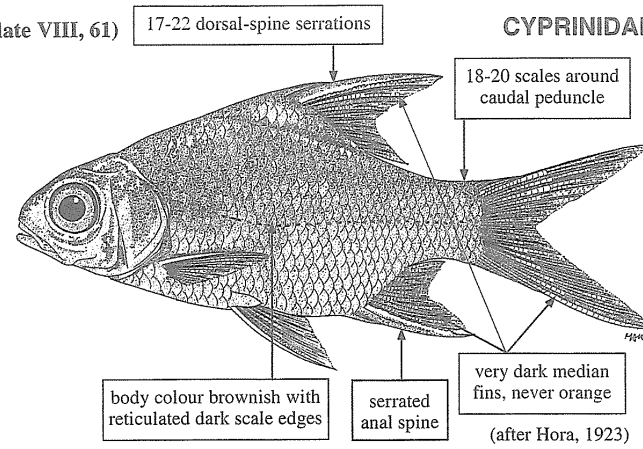
(after Taki and Katsuyama, 1979)

Puntioplites proctozysron (Bleeker, 1865) **(plate VIII, 61)** CYPRINIDAE

Local names: Trey chrakaing, ត្រី ច្រកែង.

Size: To 25 cm.

Habitat, biology, and fisheries: A common species in standing and slowly moving water. Found in streams, canals, ditches, and reservoirs from Malaysia to northern Thailand, including Cambodia and Vietnam. Moves into flooded forests as well as into marshes during high-water periods. Usually found around submerged aquatic or inundated terrestrial vegetation where it consumes some algae, but mostly insects and zooplankton. It begins to return to the Tonlé Sap in October and becomes progressively more abundant until January, when its numbers begin to taper off. Caught with seines, gill-nets, set-nets, and traps. Larger individuals are marketed fresh, smaller ones are used to make prahoc along the Tonlé Sap.



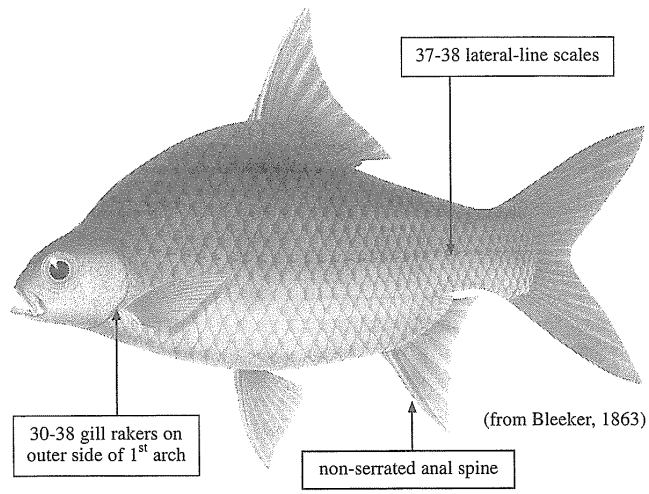
(after Hora, 1923)

Puntioplites waandersi (Bleeker, 1858-59)

Local names: Trey chrakaing, ត្រី ច្រកែង.

Size: To 30 cm in Indonesia, up to 25 cm in the lower Mekong.

Habitat, biology, and fisheries: Known in the lower Mekong from large river habitats, but generally rare. Ranges from the Great Lake of Cambodia downstream to Vietnam, and on to Indonesia. The specimens from the lower Mekong have characteristics identical to those from Indonesia, but appear to be distinct from a similar undiscribed species known only from the middle Mekong. Only a few specimens of this species were encountered during the surveys in support of the present field guide. A primarily hervbivorous species, feeding on aquatic macrophytes, inundated terrestrial vegetation, and filamentous algae along with some insects (Vaas, 1953). Nothing is known about its migratory habits or breeding behaviour in the Mekong. Its biology is probably similar to other members of the genus. Unlike *P. bulu* which has declined seriously, there is no information available if this species is experiencing any similar trends in the Mekong. Taken by seines, set-nets, or traps.



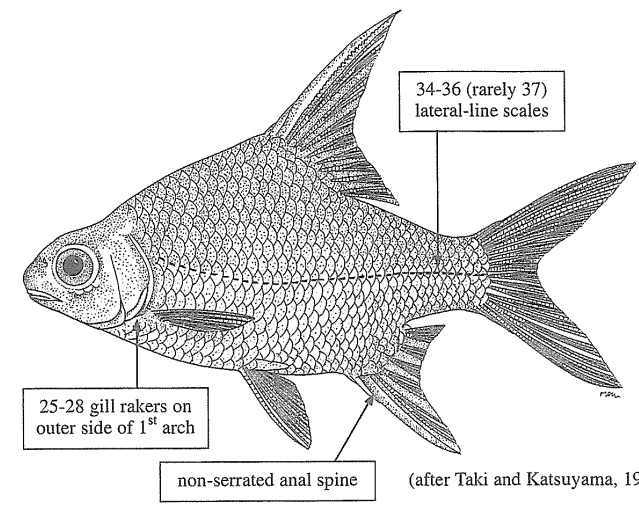
(from Bleeker, 1863)

Puntioplites* sp. cf. *waandersi

Local names: Trey chrakaing, ត្រី ច្រកែង.

Size: To 15 cm.

Habitat, biology, and fisheries: Possibly a Mekong endemic, known so far only from the middle Mekong, and likely occurs in upland river habitats of eastern Cambodia. Differing in several characteristics noted on the illustration from the most similar species, *P. waandersi,* and is likewise uncommon. Its biology is probably similar to other members of the genus, which are primarily herbivorous, but occasionally feed on insects. Usually taken by seines, cast-nets, or traps.



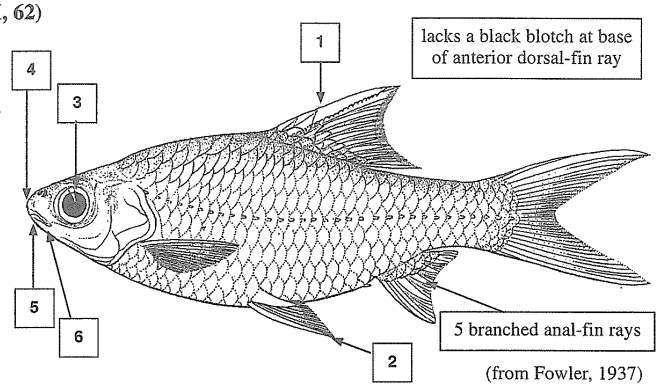
(after Taki and Katsuyama, 1979)

Genus *Sikukia* **CYPRINIDAE**

(1) SERRATED DORSAL-FIN SPINE; (2) 8 BRANCHED PELVIC-FIN RAYS; (3) ADIPOSE EYELID PRESENT, BUT WEAKLY DEVELOPED; (4) SHORT BLUNT SNOUT; (5) MOUTH SMALL AND SUBTERMINAL, WITH A SYMPHYSEAL TUBERCLE ON LOWER JAW; (6) NO BARBELS.

2 species recorded.

Sikukia gudgeri (Smith, 1934) **(plate VIII, 62)**



(from Fowler, 1937)

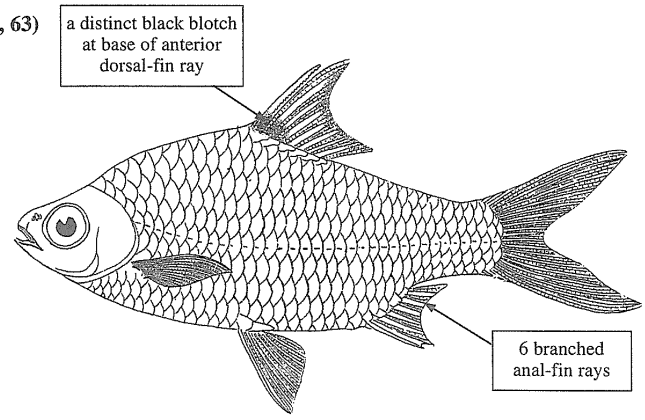
Synonyms / misidentifications: *Xenocheilichthys gudgeri.*

Local names: Trey kambot chramos, ត្រីកបុតច្រមុះ.

Size: To 18 cm.

Habitat, biology, and fisheries: Found in large upland rivers of the Mekong and Chao Phrya basins, usually occurring near the bottom of the channel over sand substrate. Although often quite abundant, it is frequently overlooked and rarely recorded because of its rather nondescript appearance and its occurrence along the very bottom of the river over sand substrate. Taken in large numbers by trawls and haul seines in the middle Mekong along the Thai-Lao border. All specimens examined had mouths full of sand which is strained for detritus, diatoms, algae, worms, and other organisms. The gut often contains sand that may be swallowed inadvertantly. This species is always found in flowing water and little is known about its migratory habitats. It is apparently replaced in the lower Mekong by *S. stejnegeri*. Usually sold fresh in the market at Stung Treng.

Sikukia stejnegeri Smith, 1931 **(plate VIII, 63)**



(from Durand, 1940)

Synonyms / misidentifications: *Xenocheilichthys loppei.*

Local names:

Size: To 12 cm.

Habitat, biology, and fisheries: Found in lowland rivers of the Mekong and Chao Phrya basins. Rarely occurring in large numbers like *S. gudgeri,* but much easier to recognize. Little is known about the biology of this species. Reported to be herbivorous by Taki (1978). Taken most often in traps and set-nets. Used to make prahoc along the Tonlé Sap.

Subtribe SEMIPLOTI

Genus *Barbodes* **CYPRINIDAE**

(1) SERRATED DORSAL-FIN SPINE; (2) 8 BRANCHED PELVIC-FIN RAYS; (3) SKIN OF LOWER LIP SEPARATED FROM LOWER JAW BY A SHALLOW GROOVE; (4) ANAL-FIN BASE LONG, 90% OF HEAD LENGTH; (5) NO TUBERCLES ON SNOUT.

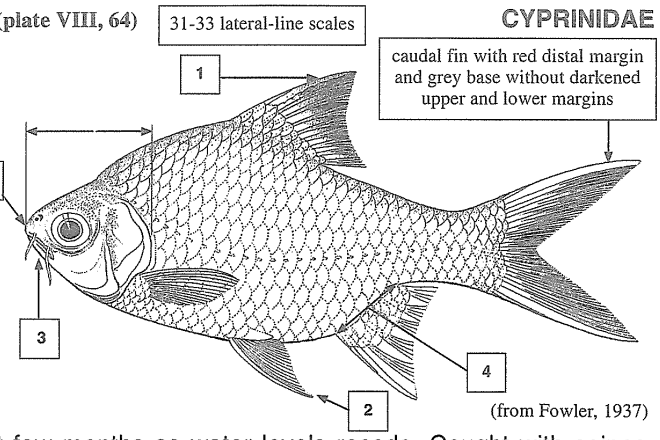
3 species recorded.

Barbodes altus (Günther, 1868) (plate VIII, 64) CYPRINIDAE

Synonyms / misidentifications: *Puntius altus, Puntius foxi.*

Local names: Trey kahe, Trey kahe kror horm, ត្រី កាហែ, ត្រី កាហែក្រហម.

Size: To 20 cm, commonly to about 15 cm.



(from Fowler, 1937)

Habitat, biology, and fisheries: Known only from the Mekong and Chao Phrya. Found at midwater depths in large and medium-sized rivers and floodplains. Feeds on a wide variety of animal and plant matter. Particularly common near villages where it feeds on organic detritus disposed of by humans. Colonizes inundated forest and adults migrate back to the river in October. Young of the year follow in the next few months as water levels recede. Caught with seines, set-nets, and traps. An important food-fish, cultured in floating cages in Vietnam. Large individuals are marketed fresh, smaller ones are used to make prahoc and nuoc mam. Also a popular fish in the aquarium trade where it is sold under the name of "tinfoil barb", the same name that is applied to *B. schwanefeldi.*

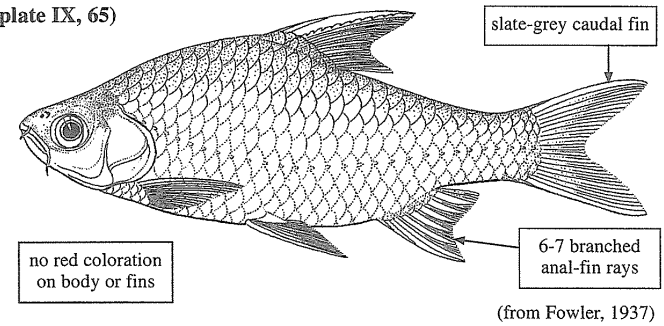
Barbodes gonionotus (Bleeker, 1850) (plate IX, 65)

Synonyms / misidentifications: *Puntius gonionotus, Puntius javanicus, Puntius jolamarki, Puntius viehoeveri.*

FAO name: Tawes.

Local names: Trey chhpin, Trey chhpin brak, ត្រី ឆ្ពិន, ត្រី ឆ្ពិនប្រាក.

Size: To 33 cm.



(from Fowler, 1937)

Habitat, biology, and fisheries: Commonly occurring from Thailand through Indonesia. Found at midwater to bottom depths in rivers, streams, floodplains, and occasionally in reservoirs. Seems to prefer standing water habitats instead of flowing waters. Not commonly taken in the dai nets of the Tonlé Sap, but much more likely to be caught in the large traps of the Great Lake. Feeds on both plant and animal matter, and inhabits the flooded forest during periods of high water. Taken with seines, gill-nets, set-nets, and traps. Usually marketed fresh. Occasionally seen in the aquarium trade, but its nondescript coloration and lethargic habits have limited its popularity.

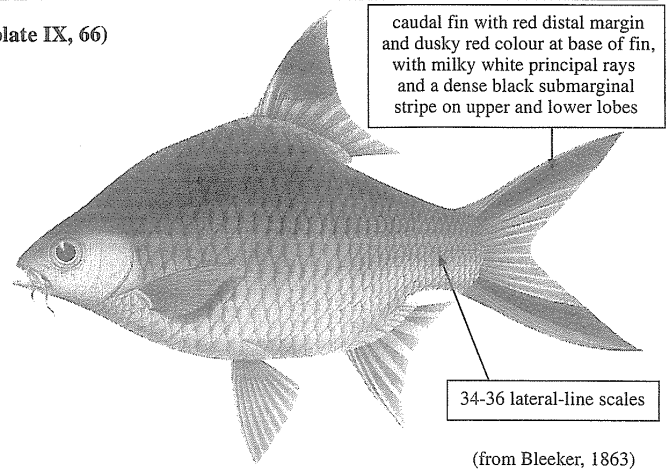
Barbodes schwanefeldi (Bleeker, 1853) (plate IX, 66)

Synonyms / misidentifications: *Puntius schwanefeldi.*

FAO name: Tinfoil barb.

Local names: Trey kahe, Trey kahe loeung, ត្រី កាហែ, ត្រីកាហែឈ្មើង.

Size: To 35 cm, commonly to about 25 cm.



(from Bleeker, 1863)

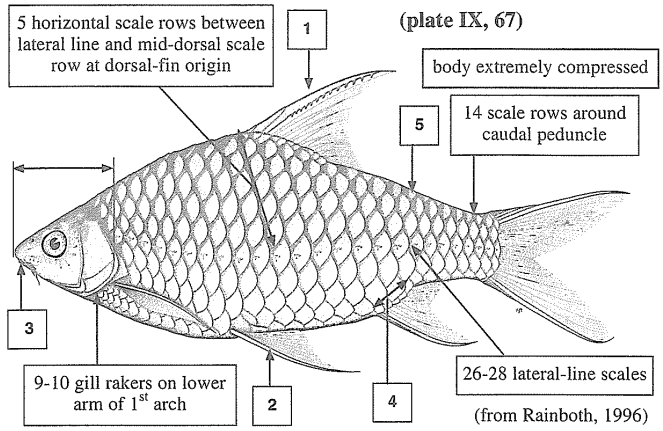
Habitat, biology, and fisheries: Known from Thailand through Indonesia. Found in rivers, streams, canals, and ditches. Seems to be slightly less common than *B. altus,* and is found in the same habitats. Largely herbivorous, consuming aquatic macrophytes and submerged land plants, as well as filamentous algae and occasionally insects. Also feeds on small fishes. Usually marketed fresh. The latin name for this species is sometimes spelled "*schwanenfeldi*" based on Bleeker's mis-spelling of Dr. Schwanefeld's name in the original description, a mistake Bleeker subsequently corrected.

Genus *Hypsibarbus* **CYPRINIDAE**

(1) SERRATED DORSAL-FIN SPINE; (2) 8 BRANCHED PELVIC-FIN RAYS; (3) SKIN OF LOWER LIP DISCONTINUOUS WITH LOWER JAW, SEPARATED BY A SHALLOW GROOVE; (4) ANAL-FIN BASE 60% OF HEAD LENGTH; (5) BLACK SCALE MARGINS GIVE A RETICULATED COLOUR PATTERN.

7 species possibly found in the Mekong, 5 of them likely to occur in Cambodia.

Hypsibarbus lagleri Rainboth, 1996



(from Rainboth, 1996)

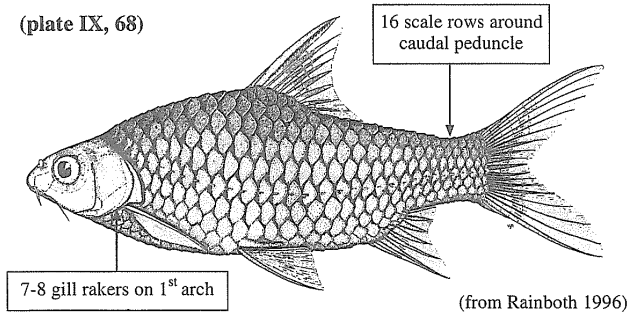
Synonyms / misidentifications: *Puntius pierrei* (non Sauvage), *Puntius huguenini* (non Bleeker).

Local names: Trey chhpin, ត្រីឆ្ពិន.

Size: To 40 cm.

Habitat, biology, and fisheries: Endemic to the middle Mekong, occurring in large rivers in the dry season and moving to medium-sized rivers in the wet season. Found at midwater to bottom depths in clear water. May move into flooded forest habitats immediately adjacent to rivers, but does not occur over fine-grained sediments, preferring rocks instead. Not known to persist in impoundments. Not found in the Tonlé Sap or the Great Lake. Diet consists of zooplankton, worms, and algae. Caught with seines, gill-nets, traps, and hook-and-line. Marketed fresh.

Hypsibarbus malcolmi (Smith, 1945)



(from Rainboth 1996)

Synonyms / misidentifications: *Puntius daruphani* (non Smith), *Puntius bramoides* (non Valenciennes).

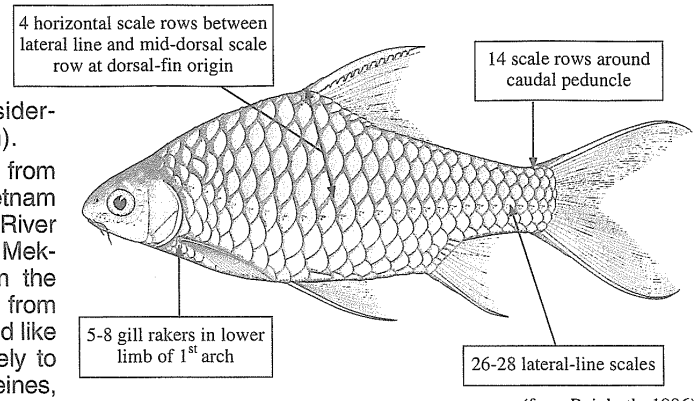
FAO name: Goldfin tinfoil barb.

Local names: Trey chhpin, ត្រីឆ្ពិន.

Size: To 50 cm.

Habitat, biology, and fisheries: Known from midwater to bottom depths in large and medium-sized rivers from Cambodia, Thailand, and Malaysia. Found in large rivers in the dry season and moves to medium-sized rivers in the wet season. Breeds at the end of the rainy season, as the water levels fall, young of the year 2 cm length appear in February to March. Usually absent from the lowland parts of the Mekong, although it can be found in rapidly flowing tributaries to the lower Mekong. Usually found over coarse substrate. Its gut is usually full of fine matter with occasional insect exoskeleta. Most common species of the genus. Has not persisted in any impoundments. Taken with seines, gill-nets, and traps. Marketed fresh, and also seen in the aquarium trade.

Hypsibarbus pierrei (Sauvage, 1880)



(from Rainboth, 1996)

Local names: Trey chhpin, ត្រីឆ្ពិន.

Size: To at least 30 cm, may grow considerably larger (only 5 specimens are known).

Habitat, biology, and fisheries: Known from the Dong Ngai River (Saigon River) in Vietnam and eastern Cambodia, and the Kelantan River in Malaysia. Possibly occurs in the middle Mekong of Cambodia or rivers coming from the Vietnam highlands, but not yet recorded from there. Occurs in medium to large rivers and like other members of the genus it is not likely to persist in impoundments. Taken with seines, gill-nets, and traps.

CYPRINIDAE

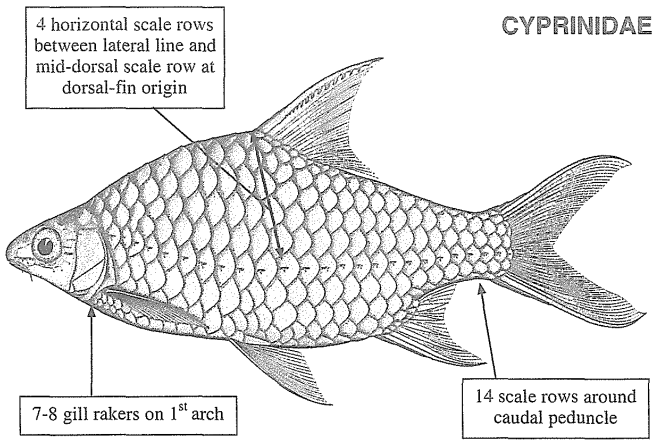
Hypsibarbus suvattii Rainboth, 1996

Synonyms / misidentifications: *Puntius daruphani* (non Smith).

Local names: Trey chhpin, ត្រីឆ្ពិន.

Size: To 35 cm.

Habitat, biology, and fisheries: Known from the Meklong of Thailand as well as coastal rivers of the Cardamom mountains in Cambodia and the Dong Ngai River of Vietnam. Possibly occurs in the Mekong but has not yet been recorded from there. Occurs in medium to large upland rivers and does not persist in impoundments. Like other members of the genus, it probably migrates into smaller streams during the rainy season.



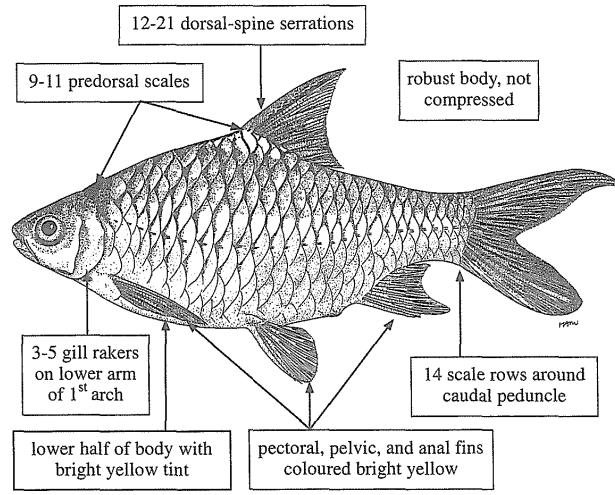
(from Rainboth, 1996)

Hypsibarbus sp. cf. *vernayi*

Local names: Trey chhpin meas, ត្រីឆ្ពិនមាស.

Size: To 25 cm.

Habitat, biology, and fisheries: Occurs in the upland Mekong of Cambodia and Vietnam in medium-sized rivers. Expected from the Cardamom mountains and may also be found in rivers draining the highlands of Vietnam. Like other members of this genus it probably would not persist in impoundments. This species has characteristics intermediate to *H. vernayi* of the upper Mekong, Chao Phrya, and Meklong of Thailand and *H. wetmorei* of the middle Mekong, Chao Phrya, and Meklong and the Pahang of Malaysia. It is not known if this species is found in the middle Mekong with *H. wetmorei*. During a recent revision of this genus (Rainboth, 1996), two small juveniles of this species were encountered in European museums. It was not possible to identify these specimens as a known species, and additional material is needed to describe this species. Caught with traps, gill-nets, and by hook-and-line. Marketed fresh in northern Cambodia.



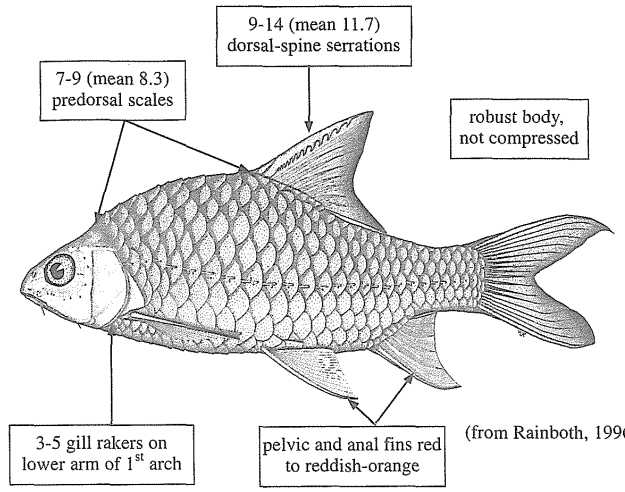
Hypsibarbus wetmorei (Smith, 1931)

Synonyms / misidentifications: *Puntius daruphani, Puntius beasleyi.*

Local names: Trey chhpin krahorn, ត្រីឆ្ពិនក្រហម.

Size: To 25 cm.

Habitat, biology, and fisheries: Found at midwater to bottom depths of medium-sized streams in forests and occasionally in the main stream of the Mekong. Not known to migrate, but may move upstream during periods of high water levels. Does not tolerate impoundments. Taken by seines, gill-nets, and traps. Most likely sold fresh like other members of the genus.



(from Rainboth, 1996)

Genus *Onychostoma* **CYPRINIDAE**

(1) SERRATED DORSAL-FIN SPINE; (2) 8 BRANCHED PELVIC-FIN RAYS; (3) 8 BRANCHED DORSAL-FIN RAYS; (4) LOWER JAW WITH A SHARP, FINGERNAIL-LIKE EDGE; (5) LOWER LIP ABSENT OR PRESENT ONLY AT CORNERS OF MOUTH; (6) BARBELS ABSENT.

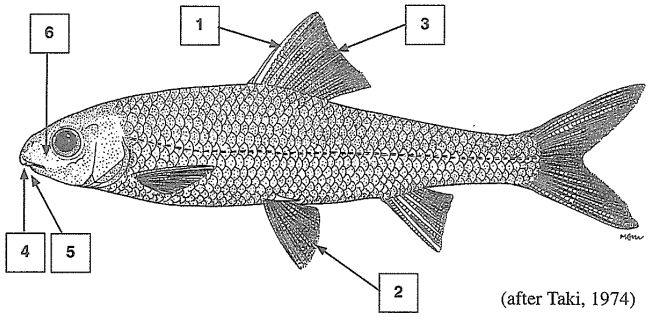
1 species recorded from the middle Mekong.

Onychostoma sp. cf. *elongatum* (Fang, 1940)

Synonyms / misidentifications: *Onychostoma gerlachi* (non Günther).

Local names:

Size: To 17 cm.



(after Taki, 1974)

Habitat, biology, and fisheries: Found in clear mountain streams in forested areas of the middle and upper Mekong and perhaps north to China. It is not certain that the Mekong specimens belong to the same species as the one found in China, but they resemble this Chinese species most closely. The Mekong species is possibly undescribed. It does not persist in impounded waters. It has been recorded from Mondulkiri Province. Diet consists of phytoplankton and small zooplankton, which it scrapes off rocks. Taken with seines, gill-nets, cast-nets, and traps.

Genus *Poropuntius* **CYPRINIDAE**

(1) SERRATED DORSAL-FIN SPINE; (2) 8 BRANCHED PELVIC-FIN RAYS; (3) LOWER JAW OCCASIONALLY SHARP AT ITS TIP, BUT LIPS ARE PRESENT AND JUST SLIGHTLY REDUCED AT THE SYMPHYSIS; (4) TIP AND SIDES OF SNOUT USUALLY COVERED WITH TUBERCLES; (5) 4 WELL-DEVELOPED BARBELS PRESENT.

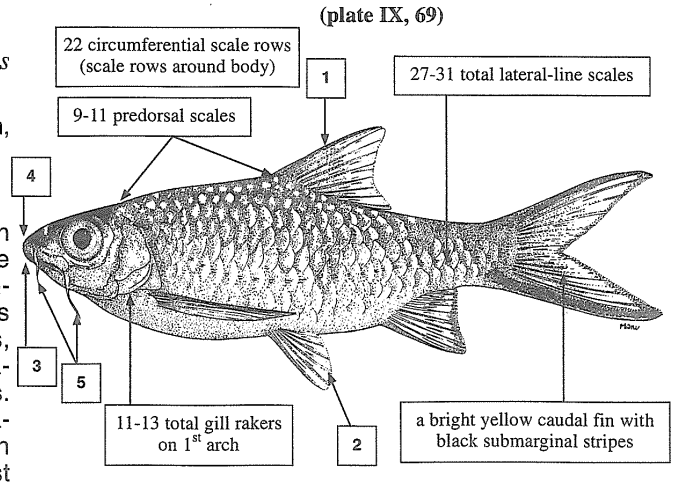
At least 8 species found in the Mekong, 4 of them in Cambodia.

Poropuntius deauratus (Valenciennes, 1842) **(plate IX, 69)**

Synonyms / misidentifications: *Poropuntius normani, Acrossocheilus deauratus.*

Local names: Trey lolok saw, Trey kros phnom, ត្រី លលកសរ, ត្រី ក្រុសភ្នំ.

Size: To 15 cm.



Habitat, biology, and fisheries: Found in clear forest streams, and sometimes large clear rivers from Thailand, Cambodia, and Vietnam. Does not persist in impoundments. Its long gut is usually packed with fine debris, mostly detritus, algae and diatoms, with occasional insect exoskeleta, mainly chironomids. Taken with seines, cast-nets, and traps. Occasionally marketed fresh and sometimes seen in the aquarium trade. *P. deauratus* is most similar to an undescribed species that occurs in the coastal drainages of the Cardamom Mountains, and probably also on the Mekong side. The undescribed species has 14 to 18 total gill rakers on the first arch, 25 to 28 total lateral-line scales, 20 to 22 circumferential scale rows, 10 to 12 predorsal scales, and a dark grey caudal fin with black submarginal stripes. At this time, the colour of caudal fin is undocumented in the undescribed species.

Poropuntius kontumensis (Chevey, 1934)

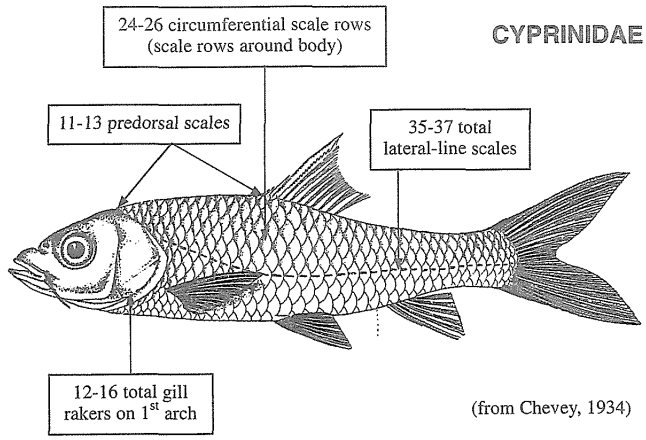
CYPRINIDAE

Synonyms / misidentifications: *Cyclocheilichthys kontumensis.*

Local names:

Size: To 20 cm.

Habitat, biology, and fisheries: Found in clear mountain brooks and streams in forested areas of Cambodia and Vietnam. Diet consists of insect larvae. Not known to migrate and does not persist in impoundments. Taken with seines, cast-nets, and traps. Not seen in markets.



(from Chevey, 1934)

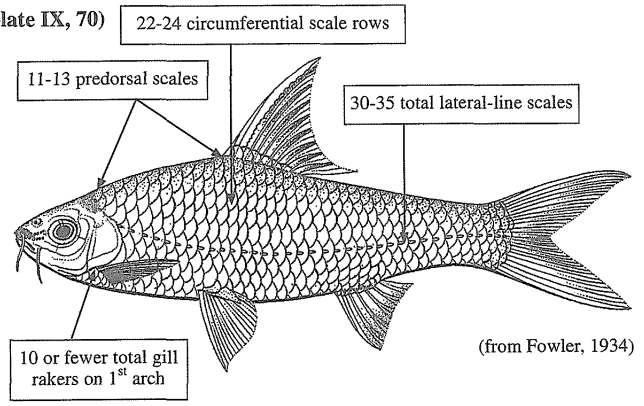
Poropuntius laoensis (Günther, 1868) **(plate IX, 70)**

Synonyms / misidentifications: *Acrossocheilus bantamensis.*

Local names:

Size: To 20 cm.

Habitat, biology, and fisheries: Found in clear forested streams of Myanmar, Laos, Thailand, and Cambodia. Not encountered in large rivers and does not persist in impounded waters. Not known to migrate. Feeds primarily on insect larvae. Taken with seines, cast-nets, and traps. Not seen in markets.



(from Fowler, 1934)

Genus *Scaphiodonichthys*

CYPRINIDAE

(1) SERRATED DORSAL-FIN SPINE; **(2)** 8 BRANCHED PELVIC-FIN RAYS; **(3)** 11 TO 12 BRANCHED DORSAL-FIN RAYS; **(4)** LOWER JAW WITH A SHARP, FINGERNAIL-LIKE EDGE; **(5)** SNOUT BLUNT, COVERED BY TUBERCLES; **(6)** MOUTH VERY WIDE.

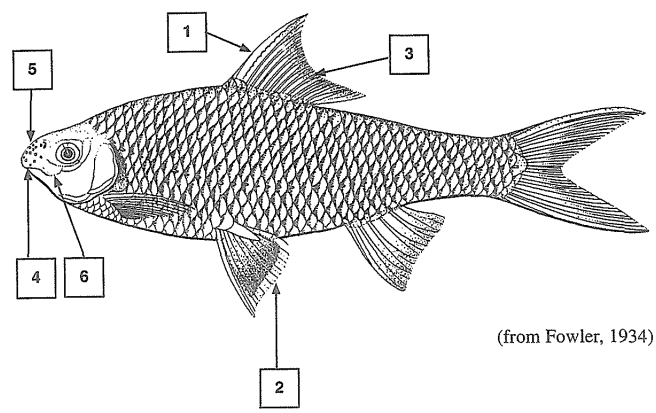
1 species recorded from the middle and lower Mekong.

Scaphiodonichthys acanthopterus (Fowler, 1934)

Local names:

Size: To 22 cm.

Habitat, biology, and fisheries: Found in clear mountain streams usually under complete forest canopy from northern Thailand to Cambodia and southern Vietnam. Not known to migrate. Apparently breeds after the end of the rainy season after water levels in upland areas have declined, and juveniles appear in catches during April (Taki, 1978). Feeds primarily on insect larvae along with small amounts of detritus and periphyton. Caught with seines, cast-nets and traps. Not seen in markets.



(from Fowler, 1934)

Genus *Scaphognathops* **CYPRINIDAE**

(1) SERRATED DORSAL-FIN SPINE; (2) 8 BRANCHED PELVIC-FIN RAYS; (3) 9 TO 15 BRANCHED DORSAL-FIN RAYS; (4) LOWER JAW SHARP AT TIP, LOWER LIP PRESENT AT CORNERS OF THE MOUTH; (5) NO BARBELS.

2 species recorded from the middle Mekong.

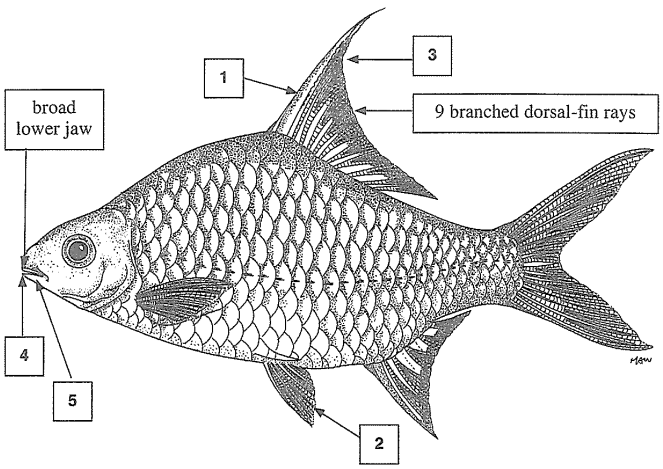
Scaphognathops bandanensis Boonyaratpalin and Srirungroj, 1971 (plate IX, 71)

Synonyms / misidentifications: *Scaphognathops mekongensis.*

Local names: Trey papak, ត្រី ប៉ាផាក់.

Size: To 20 cm.

Habitat, biology, and fisheries: Endemic to the middle Mekong where it lives in the main stream during the dry season. Migrates to smaller streams or floodplains during the rainy season. It has not been found in any impoundments. Omnivorous, feeding on detritus, periphyton, worms, and insects. Breeds at the end of the rainy season, as water levels fall, young of the year reaching about 2 cm by late February. Taken with seines, cast-nets, gill-nets and traps. Marketed fresh.



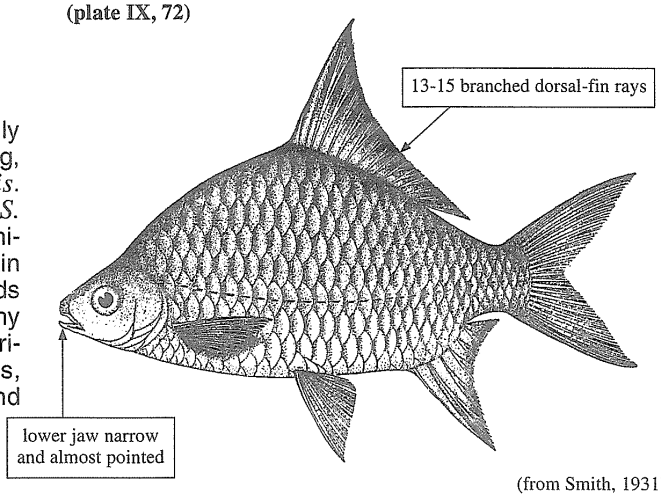
(after Boonyaratpalin and Srirungroj, 1971)

Scaphognathops stejnegeri (Smith, 1931) (plate IX, 72)

Local names: Trey chrakaing, ត្រី ច្រកែង.

Size: To 25 cm.

Habitat, biology, and fisheries: Known only from large river habitats in the middle Mekong, where it is much rarer than *S. bandanensis*. Apparently breeds a couple of months after *S. bandanensis* (Taki, 1978). Not known to migrate, although it probably leaves the main stream for flooded forests during the periods of high-water. It has not been found in any impoundments. Omnivorous, feeding on detritus and algae along with worms, crustaceans, and insects. Taken with seines, cast-nets, and gill-nets. Marketed fresh.



(from Smith, 1931)

Subtribe SYSTOMI

Genus *Hampala* **CYPRINIDAE**

(1) SERRATED DORSAL-FIN SPINE; (2) 12 SCALE ROWS AROUND THE CAUDAL PEDUNCLE; (3) 2 LARGE MAXILLARY BARBELS (1 PER SIDE); (4) MOUTH LARGE, EXTENDING BACK PAST THE ANTERIOR MARGIN OF THE EYE; (5) A SINGLE BLACK BAR OR A LARGE SPOT BELOW THE DORSAL-FIN ORIGIN.

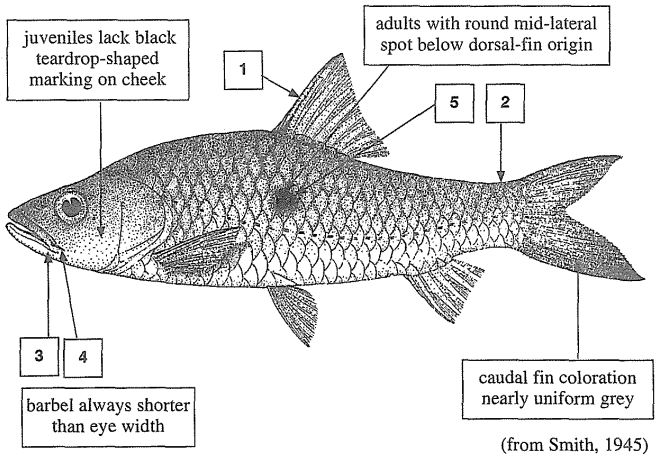
2 species recorded.

Hampala dispar Smith, 1934

Local names: Trey khmann, ត្រីខ្នាន់.

Size: To 35 cm.

Habitat, biology, and fisheries: Apparently a Mekong endemic, found in slowly moving or standing water habitats of Thailand and Cambodia. Common in impoundments, with small individuals frequenting areas of dense vegetation. Breeds at the beginning of the rainy season and the young are found in seasonally flooded habitats in June. Feeds on some fishes, but mostly prawns, crabs, and shrimps, along with some insect larvae. Taken with seines, cast-nets, gill-nets and traps. Marketed fresh.



(from Smith, 1945)

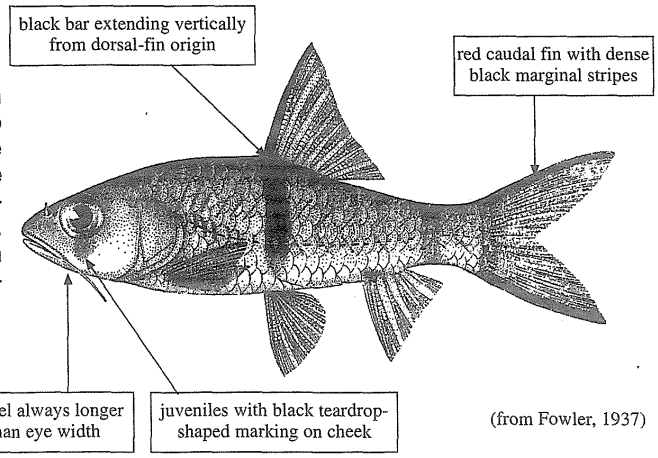
Hampala macrolepidota (Valenciennes, 1842)

(plate X, 73)

Local names: Trey khmann, ត្រីខ្នាន់.

Size: To 70 cm, commonly to about 35 cm.

Habitat, biology, and fisheries: Found in flowing and standing waters from Thailand to Indonesia. Not as common as *H. dispar* in the middle Mekong, but more common in the lower Mekong. Frequently found in impoundments. Breeds throughout the rainy season. Adults feed almost exclusively on fish. Taken with seines, cast-nets, gill-nets, and hook-and-line. Marketed fresh.



(from Fowler, 1937)

Genus *Puntius* **CYPRINIDAE**

(1) SMOOTH DORSAL-FIN SPINE; (2) 2 MAXILLARY BARBELS (1 PER SIDE); (3) GILL RAKERS 12 TO 20 ON FIRST ARCH.

At least 2 species found in the middle Mekong, one of them possibly comprising more than a single species.

Puntius brevis (Bleeker, 1860) (plate X, 74)

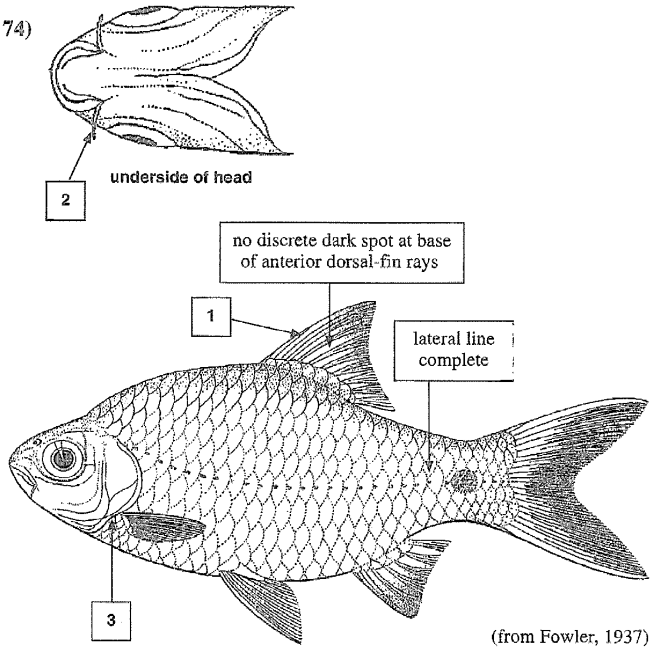
Synonyms / misidentifications: *Puntius leiacanthus, Puntius sophoroides* (non Günther), *Puntius puntio* (non Hamilton).

FAO name: Swamp barb.

Local names: Trey angkat prak, ត្រី អង្គត ប្រាក់.

Size: To 12 cm.

Habitat, biology, and fisheries: Found in floodplains, canals, ditches, and small sluggish streams from Indonesia to Thailand. Proliferates in impoundments, and inhabits areas with abundant aquatic vegetation. Eats crustaceans, tubuficid worms, algae, and zooplankton. Moves onto newly inundated land at flood season, and spawns there. Caught with seines, cast-nets, and traps. *Puntius leiacanthus*, listed here as a synonym, is possibly a distinct species. Further studies are needed to ascertain its status. The variation in circumpeduncular scale counts noted by Smith (1945) is not known for any other species of the genus *Puntius*, which usually show constant vertical scale counts.



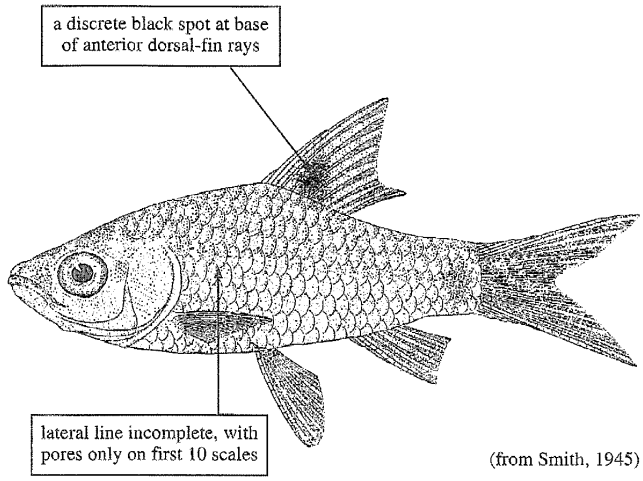
(from Fowler, 1937)

Puntius masyai Smith, 1945

Local names: Trey angkat prak, ត្រី អង្គត ប្រាក់.

Size: To 2.5 cm.

Habitat, biology, and fisheries: Known from small streams and weedy lakes in the Mekong of Thailand, and probably also of Cambodia. Lives from midwater to bottom levels in shallow water, and feeds on small crustaceans, worms, and zooplankton. Caught with seines, cast-nets, and traps.



(from Smith, 1945)

Genus *Systomus*	**CYPRINIDAE**

(1) FINELY SERRATED DORSAL-FIN SPINE; (2) 2 OR 4 BARBELS; (3) GILL RAKERS FEWER THAN 12 ON FIRST ARCH.

6 species recorded, additional species possible.

Systomus aurotaeniatus (Tirant, 1885)

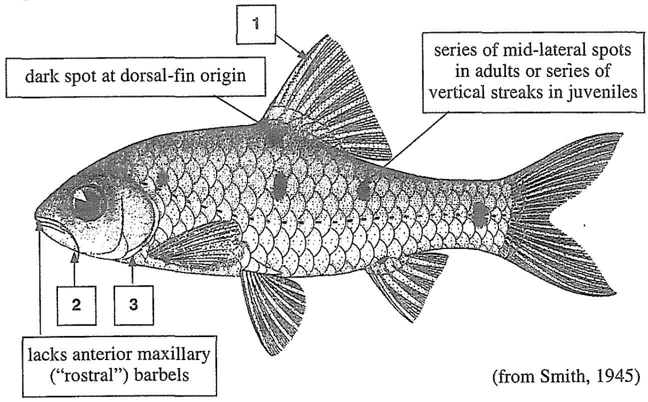
(plate X, 75)

Synonyms / misidentifications: *Puntius stigmatosomus, Puntius pessuliferus, Puntius sametensis.*

Local names: Trey angkat prak, ត្រី អង្កត់ ប្រាក់

Size: To 6 cm.

Habitat, biology, and fisheries: Found in small flowing streams, canals, ditches, and occasionally impoundments. Known from the middle and lower Mekong, the Chao Phrya, and the small coastal drainages of the Gulf of Thailand. Feeds primarily on zooplankton and insect larvae. Spawns during the rainy season. Half-grown young are caught in March. Taken with seines, cast-nets, and traps.



(from Smith, 1945)

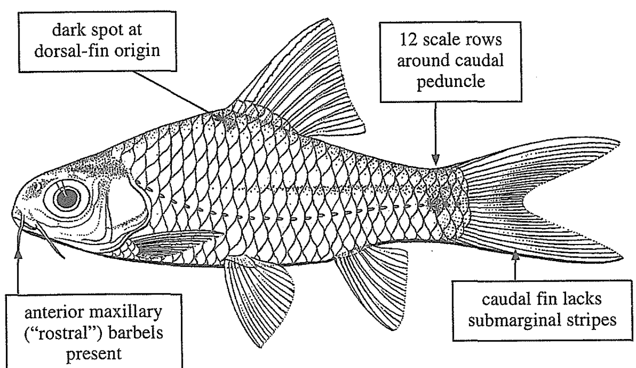
Systomus binotatus (Valenciennes, 1842)

(plate X, 76)

Local names:

Size: To 20 cm, but usually about 10 cm.

Habitat, biology, and fisheries: Found in small flowing streams, often in uplands and on islands from the middle Mekong of Thailand through Indonesia. Lives in stream headwaters, and is most often found in isolated freshwater habitats on islands of the continental shelf. Probably does not migrate. Found in middle to bottom depths in fairly shallow waters where it feeds on zooplankton, insect larvae, and some vascular plants. Taken with seines, cast-nets, and traps.



(from Fowler, 1934)

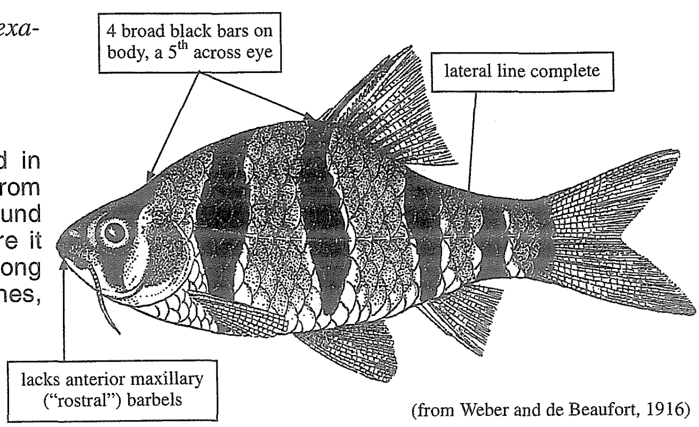
Systomus johorensis (Duncker, 1904)

Synonyms / misidentifications: *Puntius hexazona, Puntius pentazona* (non Boulenger).

Local names:

Size: To 5.5 cm.

Habitat, biology, and fisheries: Found in small forest streams, ditches, and rivers from the lower Mekong to Sumatra. Usually found near the bottom in shallow waters, where it feeds on zooplankton and insect larvae along with some plant material. Caught with seines, cast-nets, and traps.



(from Weber and de Beaufort, 1916)

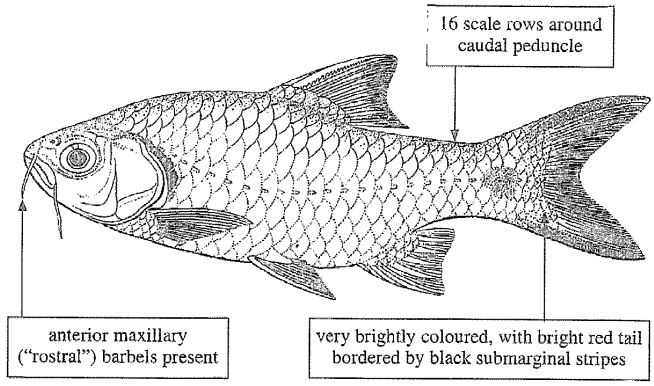
Systomus orphoides (Valenciennes, 1842) (plate X, 77) CYPRINIDAE

Synonyms / misidentifications: *Puntius sarana* (non Hamilton), *Puntius caudimarginatus, Puntius simus, Puntius jacobusboehlkei.*

Local names: Trey ampil tum, ត្រី អំពិលធំ.

Size: To 25 cm.

Habitat, biology, and fisheries: Found in rivers of all sizes, but primarily in smaller streams, canals, and on floodplains from Thailand to Indonesia. Occasionally found in impoundments, but usually stays in the flowing streams leading to the impoundment. Moves into seasonally inundated areas and breeds at the onset of the rainy season with the young of the year appearing in streams in July and August. Adults leave the floodplains as the water disappears in December or January. Taken in seines, cast-nets, and traps. Marketed fresh or made into prahoc along the Tonlé Sap.



(from Fowler, 1937)

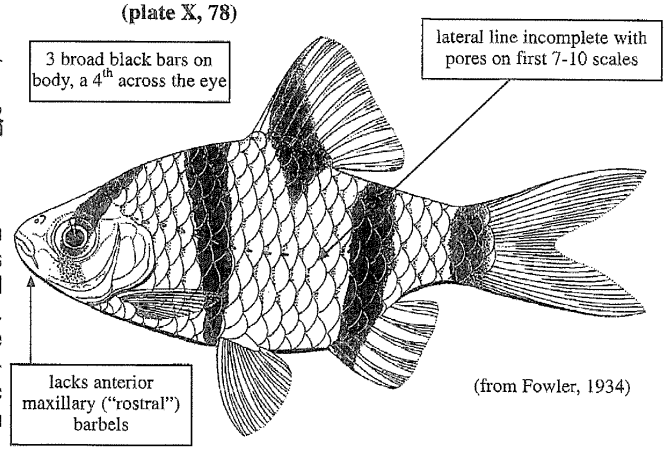
Systomus partipentazona (Fowler, 1934) (plate X, 78)

Synonyms / misidentifications: *Puntius partipentazona, Puntius tetrazona* (non Bleeker).

Local names: Trey bai kamnat, trey khla, ត្រី បាំណាត់, ត្រី ខ្លា.

Size: To 4 cm.

Habitat, biology, and fisheries: Known from midwater to bottom depths of small streams and weedy impoundments in the middle and lower Mekong where it is locally common. Most abundant in impoundments with dense growth of aquatic macrophytes. Feeds primarily on zooplankton, along with some aquatic insect larvae and plant matter. Taken with seines and cast-nets.



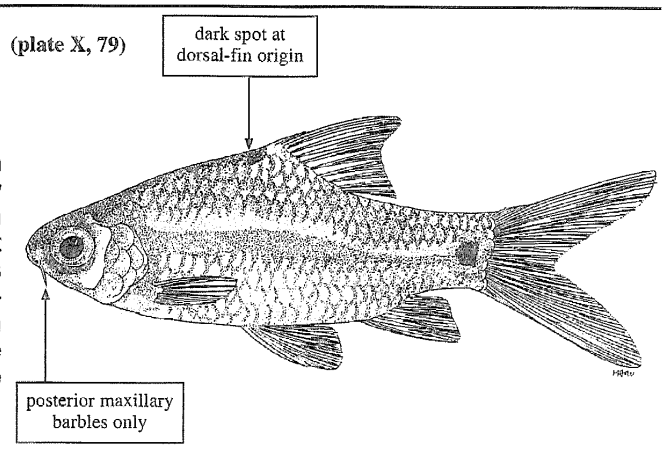
(from Fowler, 1934)

Systomus n. sp. (plate X, 79)

Local names:

Size: To 5 cm.

Habitat, biology, and fisheries: Found in shallow flowing streams as well as shallow standing waters of lowland floodplains in both the Mekong and Chao Phrya rivers. Moves out into seasonally inundated areas in floodplains and returns to the rivers in October. Diet consists of zooplankton and some algae. Taken with seines, cast-nets and traps. Used to make prahoc along the Tonlé Sap. Not seen in the aquarium trade.



Tribe CATLINI

Genus *Catlocarpio* — CYPRINIDAE

(1) NO DORSAL-FIN SPINE; **(2)** LARGE HEAD, COMPRISING OVER ONE THIRD OF STANDARD LENGTH; **(3)** NO BARBELS; **(4)** GILL RAKERS LONG AND NUMEROUS, 90 TO 110 ON FIRST ARCH.

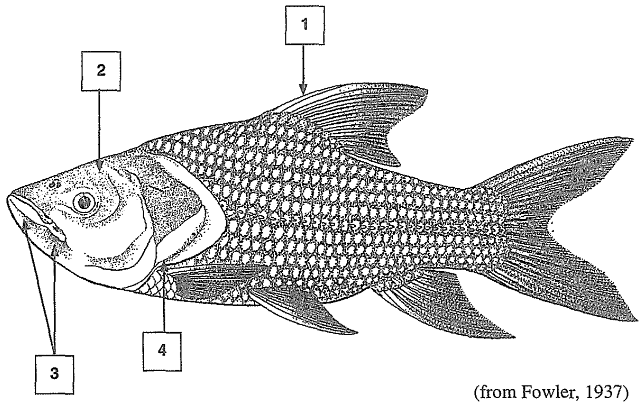
1 species recorded.

Catlocarpio siamensis Boulenger, 1898 — **(plate X, 80)**

FAO name: Giant barb.

Local names: Trey kahao (juveniles), Trey kol-reang (adults), តូចៈ ត្រីកាហោ, ធំៈ ត្រី គល់ រ រាំង.

Size: To 300 cm, rarely more than 200 cm in recent times.



(from Fowler, 1937)

Habitat, biology, and fisheries: Known from large rivers and seasonally in canals and floodplains in the Chao Phrya and Mekong. Diet consists of algae, phytoplankton, and fruits of inundated terrestrial plants. Its numbers have declined seriously during this century, except for a brief period during the Pol Pot regime when large-scale fishing operations were curtailed. It is now almost never seen in the Great Lake, and has become quite rare throughout Cambodia. Individual fishes rarely survive to reach reproductive maturity. Its catch should be strictly regulated by size. Taken with seines, traps, gill-nets and by hooks baited with compacted balls of rice. A very desirable food fish, sometimes eaten fresh, sometimes pickled.

Genus *Thynnichthys* — CYPRINIDAE

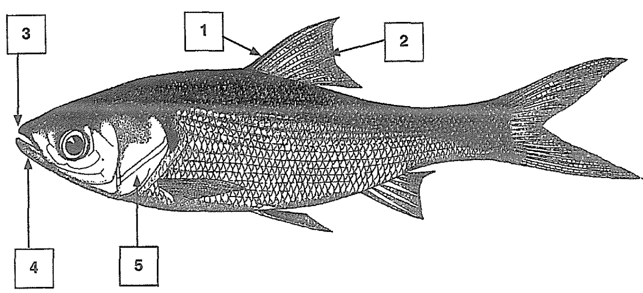
(1) NO DORSAL-FIN SPINE; **(2)** 8 BRANCHED DORSAL-FIN RAYS; **(3)** UPPER LIP ABSENT; **(4)** BARBELS ABSENT; **(5)** GILL RAKERS ABSENT.

1 species recorded.

Thynnichthys thynnoides (Bleeker, 1852) — **(plate XI, 81)**

Local names: Trey linh, ត្រី លិញ.

Size: To 25 cm, commonly between 10 and 12 cm.



(from Weber and de Beaufort, 1916)

Habitat, biology, and fisheries: Found in large rivers canals, oxbows, and floodplains from Thailand to Indonesia. Microphagous, feeding mostly on phytoplankton and periphyton with lesser amounts of bottom algae and small zooplankton. Migrates for spawning onto floodplains during high water levels. Young of the year are caught as they begin to return to rivers in October. In the Tonlé Sap, large adults make up nearly all of the October catch, with larger and larger proportions of young in subsequent months. Taken with seines, cast-nets, gill-nets, and traps. Used to make prahoc and nuoc mam.

Tribe LABEONINI

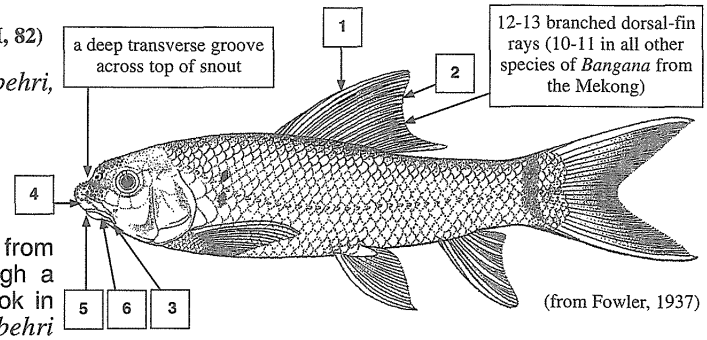
Subtribe LABEONES

Genus *Bangana* — **CYPRINIDAE**

(1) NO DORSAL-FIN SPINE; **(2)** 10 TO 13 BRANCHED DORSAL-FIN RAYS; **(3)** ANTERIOR AND POSTERIOR BARBELS OF APPROXIMATELY EQUAL SIZE; **(4)** UPPER LIP SMOOTH AND ENTIRE, SEPARATED FROM SNOUT BY DEEP GROOVE; **(5)** LOWER LIP THIN, PRESENT AT SIDES OF LOWER JAW; **(6)** POSTLABIAL GROOVE BROADLY INTERRUPTED AND PRESENT ONLY AT SIDES OF JAW.

7 species recorded from the Mekong (mostly from upper Laos, Myanmar and China), 1 of them known so far from Cambodia.

Bangana behri (Fowler, 1937) **(plate XI, 82)**



Synonyms / misidentifications: *Labeo behri, Osteochilus tatumi.*

Local names: Trey pava mook pee, ត្រីពាវាមុខពីរ.

Size: To 40 cm.

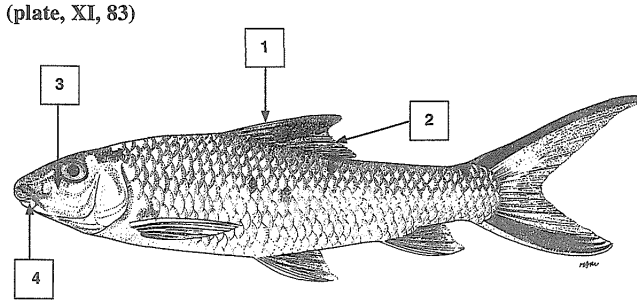
Habitat, biology, and fisheries: Known from upland reaches of the Mekong. Although a single specimen was listed from Bangkok in Fowler's original description of *Labeo behri* (1937), many of the species recorded from Bangkok were market specimens. This species is not otherwise known from the Chao Phrya, and may be endemic to the Mekong. Occurs in rocky stretches of the main stem during the dry season, and moves into tributary streams during high waters. Herbivorous, feeding on algae, phytoplankton, and periphyton. Not known to persist in impoundments. Taken with seines, gill-nets, and cast-nets. Marketed fresh. Several other species of this genus are known from the Mekong, all inhabiting upland rivers. Other species of this genus probably occur in Cambodia, but have not yet been recorded.

Genus *Barbichthys* — **CYPRINIDAE**

(1) NO DORSAL-FIN SPINE; **(2)** 8 BRANCHED DORSAL-FIN RAYS; **(3)** BROAD SUBORBITAL BONES COVERING MOST OF CHEEK; **(4)** LOWER JAW WITH SMALL SYMPHYSEAL KNOB, FOLLOWED BY A PAIR OF RIDGES ON FLOOR OF MOUTH THAT PROJECT WELL UP INTO MOUTH CAVITY.

1 species recorded.

Barbichthys nitidus (Sauvage, 1878) **(plate, XI, 83)**



Synonyms / misidentifications: *Barbichthys laevis* (non Valenciennes).

Local names: Trey andat pee, Trey pruol thmawr, Trey phkar kor, ត្រីអណ្តាតពីរ, ត្រីព្រួលធំ, ត្រីផ្កាគ.

Size: To 25 cm.

Habitat, biology, and fisheries: Known from large and medium-sized rivers of Thailand and Cambodia. Occurs in large rivers during the dry season and in floodplain streams and canals during the wet season. Feeds on algae and phytoplankton. Most often seen in the Tonlé Sap from October through December as flood waters recede. Formerly common in the Tonlé Sap as reported by Blache and Goossens (1954), but fishermen now report it as rare. Not known to persist in impoundments. Taken with seines, gill-nets, and traps. Not seen in markets. Another species of this genus, *Barbichthys laevis*, adapts well to aquaria and is occasionally seen in the aquarium trade.

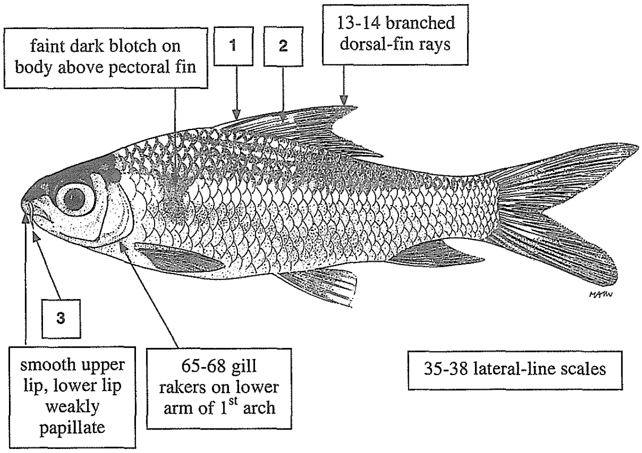
Genus *Cirrhinus* **CYPRINIDAE**

(1) NO DORSAL-FIN SPINE; (2) 10 TO 13 BRANCHED DORSAL-FIN RAYS; (3) ROSTRAL BARBEL WELL DEVELOPED, MUCH LARGER THAN MAXILLARY BARBEL, WHICH MAY BE GREATLY REDUCED OR ABSENT IN SOME INDIVIDUALS.

5 species recorded from the Mekong, all of them possibly found in Cambodia.

Cirrhinus jullieni Sauvage, 1878

(plate XI, 84)



Synonyms / misidentifications: *Osteochilus simus*. Note: nearly all literature references to this name actually refer to the species *Henicorhynchus siamensis* (deBeaufort).

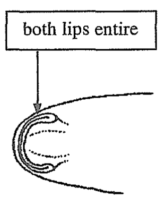
Local names: Trey phkar cha, ត្រី ផ្កាចា.

Size: To 20 cm seen in Mekong delta, probably grows larger.

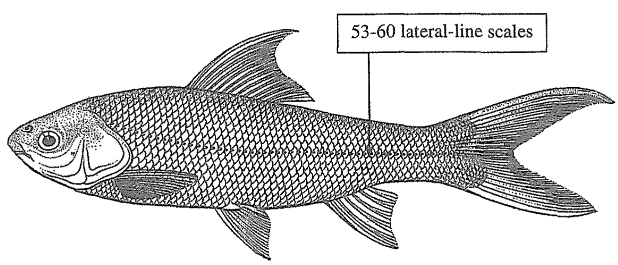
Habitat, biology, and fisheries: Known from midwater to bottom depths of the lower Mekong, occurring in the main stem and on the floodplains, including freshwater areas that undergo tidal fluctuation in Vietnam. Due to taxonomic confusion, there is little reliable information that pertains to this species. Feeds on algae, detritus, and occasional benthic invertebrates. Taken with seines, gill-nets, and traps. Often marketed fresh and used to make prahoc.

Cirrhinus microlepis Sauvage, 1878

(plate XI, 85)



underside of head



(from Fowler, 1935)

Synonyms / misidentifications: *Cirrhinus auratus, Labeo pruol.*

Local names: Trey krawlang (juvenile), Trey pruol (adult), តូចៈ ត្រី ក្រឡាំង, ធំៈ ត្រី ព្រលួ.

Size: To 65 cm.

Habitat, biology, and fisheries: An important fishery species found in large rivers and lowland floodplains of Thailand, Cambodia, and Vietnam. Moves out into the flooded forest where it feeds on leafy plant matter, phytoplankton, and insects. Returns in large numbers to the Tonlé Sap in December, with catch steadily declining as the fishing season progresses. Individuals taken in dais or traps are often immediately dropped into fish cages and kept alive for future sale. Caught with seines, gill-nets, traps, and hook-and-line. Marketed fresh and sometimes dried and salted in markets. Not known to persist in impoundments.

CYPRINIDAE

Cirrhinus molitorella (Valenciennes, 1844)

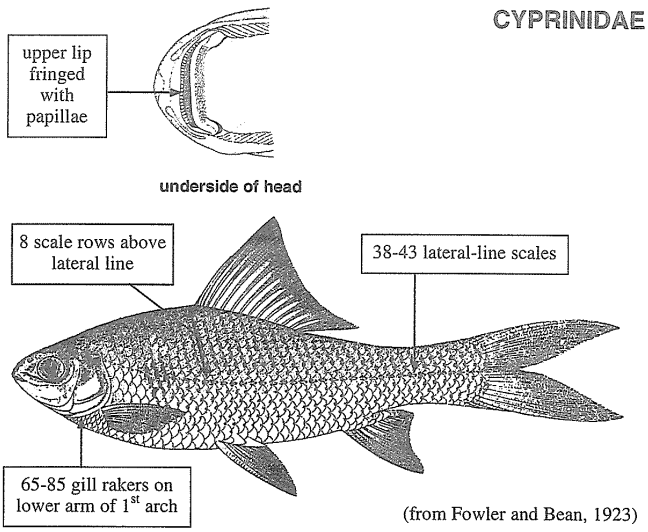
Synonyms / misidentifications: *Cirrhinus chinensis.*

FAO name: Mud carp.

Local names: Trey phkar kor, ត្រីផ្គាកំ.

Size: To 50 cm.

Habitat, biology, and fisheries: Occurs in middle and upper Mekong, as well as the Tonkin gulf drainages where it is an important fishery species. Possibly not routine to Mekong, it does occur in Cambodia. Found in flowing water and not known to persist in impoundments.



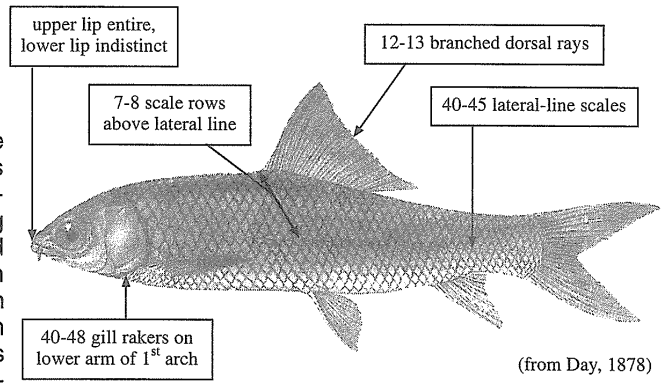
(from Fowler and Bean, 1923)

Cirrhinus mrigala (Hamilton, 1822)

Local names: Trey krawlang, ត្រីក្រឡង.

Size: To 99 cm.

Habitat, biology, and fisheries: Native to large rivers in the Indian subcontinent, this species has been introduced into the Mekong. Wild-caught juveniles and subadults are beginning to appear in markets where they are sold fresh. A detritus eater, subsisting mostly on decaying vegetation. A great deal is known about the breeding habits of this fish in the Indian subcontinent, where a fish-seed industry has grown up around the predictable breeding activities of this and other major carps (Jhingran, 1975; Patra and Azadi, 1985).



(from Day, 1878)

Cirrhinus prosemion Fowler, 1934

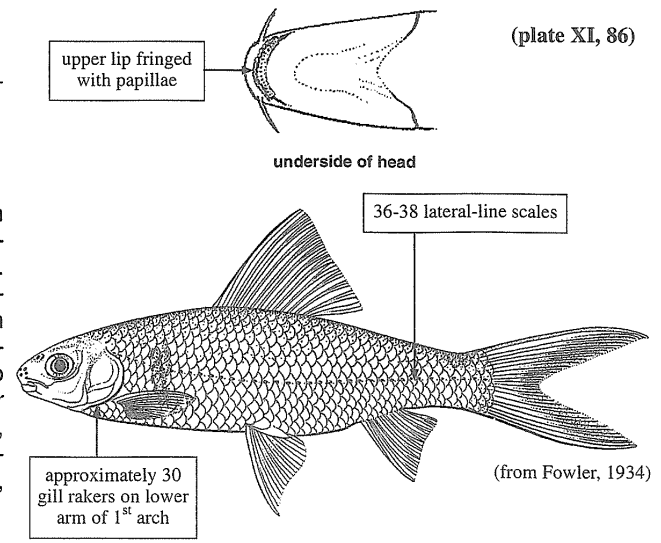
(plate XI, 86)

Synonyms / misidentifications: *Labeo stigmapleura.*

Local names: Trey phkar kor, ត្រីផ្គាកំ.

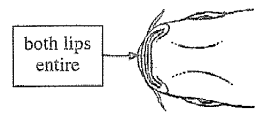
Size: To 18 cm.

Habitat, biology, and fisheries: Known from midwater to bottom depths in the middle Mekong and the Chao Phrya basins in Thailand. Also found in the upland stretch of the Mekong in Cambodia. Occurs in pools of high gradient upland streams in forests and in rivers of larger size and less gradient. Moves into flooded forests during periods of high water levels and grazes on algae, phytoplankton, and detritus. Not known to persist in impoundments. Taken with seines, gill-nets, cast-nets, and traps. Sold fresh in markets.



(from Fowler, 1934)

Cirrhinus spilopleura (Fowler, 1935) CYPRINIDAE

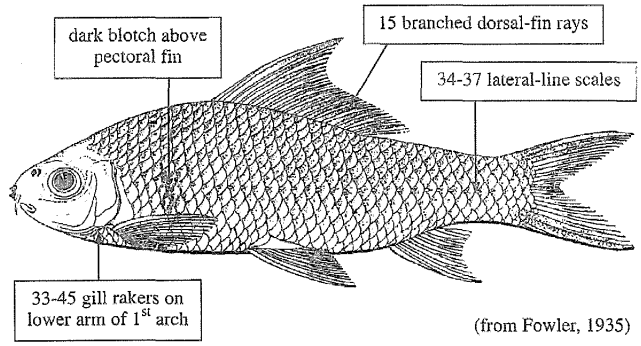


Synonyms / misidentifications: *Osteochilus macrosemion, Osteochilus simus* (non Sauvage).

Local names: Trey phkar kor, ត្រីផ្កាឃ.

Size: To 25 cm.

Habitat, biology, and fisheries: Known from midwater to bottom depths of large and medium-sized rivers of south-central Thailand and the lower Mekong of Cambodia. Found as far upstream in Cambodia as Stung Treng and probably Khoné Falls. Moves into flooded forests during the rainy season and grazes on algae, phytoplankton and detritus. Does not proliferate in impoundments. Taken with seines, gill-nets, and traps. Large individuals are marketed fresh, smaller ones are used to make prahoc.



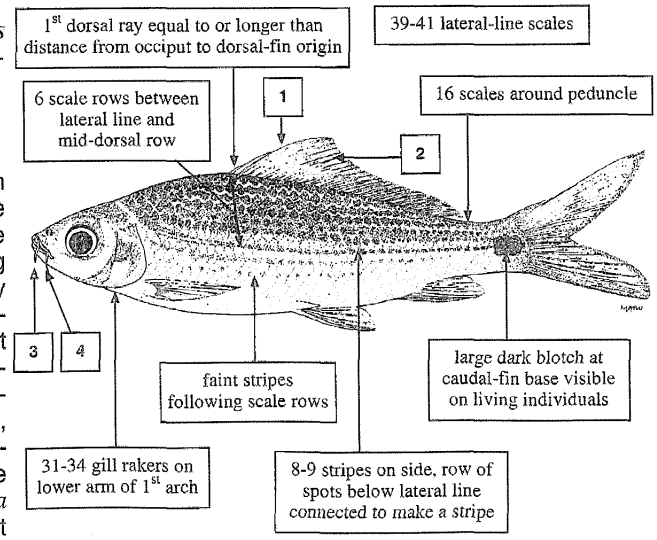
(from Fowler, 1935)

Genus *Dangila* CYPRINIDAE

(1) NO DORSAL-FIN SPINE; **(2)** DORSAL FIN LONG, WITH 21 TO 30 BRANCHED RAYS; **(3)** ROSTRAL AND MAXILLARY BARBELS; **(4)** BOTH LIPS FRINGED WITH PAPILLAE.

Several species recorded, most of them of uncertain identity.

Dangila sp. cf. *cuvieri* Valenciennes, 1842 **(plate XI, 87)**



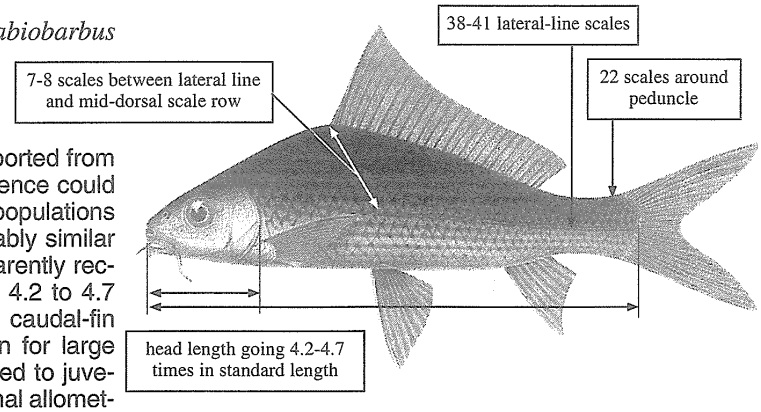
Synonyms / misidentifications: *Labiobarbus leptocheilus* (nomen nudum), *Dangila leptocheilus.*

Local names: Trey khnawng veng, ត្រីខ្នងវែង.

Size: To 12 cm.

Habitat, biology, and fisheries: Known from midwater to bottom depths in medium to large rivers in the lower Mekong. Also found in the Great Lake. Moves into flooded forests during the periods of high water where it feeds mostly on phytoplankton along with periphyton, bottom algae, and small zooplankton. Spawns at the beginning of the flooding and juveniles appear in July. Returns to the Tonlé Sap in December. Caught with seines, cast-nets, set-nets, and traps. Large individuals are marketed fresh, smaller ones are used to make prahoc. Resembles the description of *Dangila cuvieri* by Weber and de Beaufort (1916), not Smith (1945), both works differing from Bleeker (1863). It is probably undescribed. A collection of 5 individuals of this species and 6 individuals of *D. lineata* was obtained by the author in February 1995 from a single dai-net catch on the Tonlé Sap. All specimens were about the same length but this species is more slender than *D. lineata.*

Dangila kuhli Valenciennes, 1842 **CYPRINIDAE**



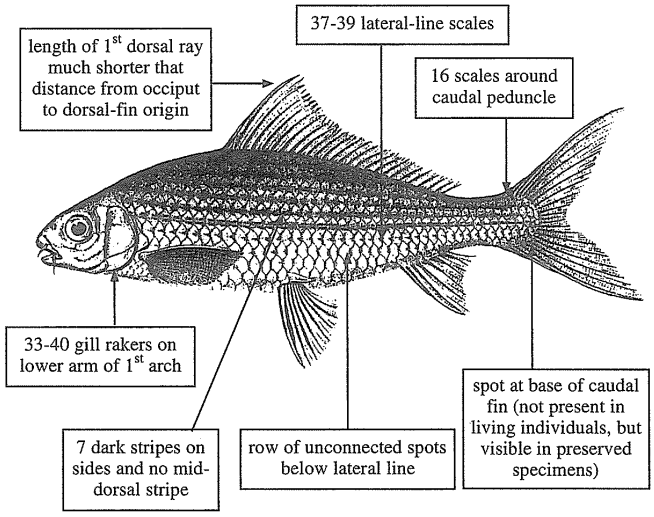
Synonyms / misidentifications: *Labiobarbus kuhlii.*

Local names:

Size: To 20 cm.

Habitat, biology, and fisheries: Reported from the Cambodian Mekong, but its presence could not be confirmed by the author. Its populations may be localized. Its biology is probably similar to other members of the genus. Apparently recognized by the larger head which is 4.2 to 4.7 times in standard length (snout to caudal-fin base). This characteristic holds even for large individuals and seems not to be limited to juveniles as would be expected from normal allometric growth in other species of *Dangila* (Smith, 1945).

Dangila lineata (Sauvage, 1878) **(plate XI, 88)**



(from Sauvage, 1881)

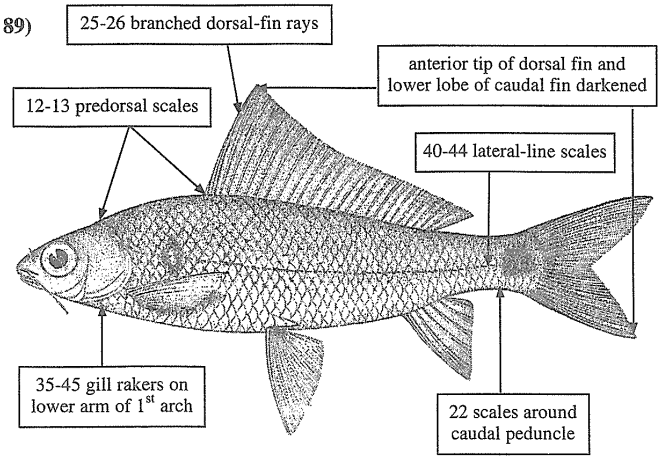
Synonyms / misidentifications: *Labiobarbus lineatus.*

Local names: Trey khnawng veng, ត្រី ខ្នងវែង.

Size: To 18 cm.

Habitat, biology, and fisheries: Known from midwater to bottom depths in rivers and streams in the Chao Phrya and Mekong basins as well as rivers of the Malay Peninsula and Borneo. Moves into floodplains during periods of high water where it feeds on phytoplankton and periphyton along with lesser amounts of bottom algae and zooplankton. Spawns at the beginning of the flood season, juveniles appear in July. Returns to the Tonlé Sap in December. Caught with seines, cast-nets, set-nets and traps. Large individuals are occasionally sold in markets, smaller ones are used to make prahoc.

Dangila spilopleura Smith, 1934 **(plate XII, 89)**



(from Smith, 1945)

Synonyms / misidentifications: *Labiobarbus spilopleura, Labiobarbus siamensis, Dangila siamensis* Bleeker (nomen nudum, therefore unavailable), *Labiobarbus siamensis, Labiobarbus leptocheilus* (non Bleeker).

Local names: Trey ach kok, ត្រី អាចម៏កុក.

Size: To 22 cm.

Habitat, biology, and fisheries: Found at midwater to bottom levels of rivers and streams from Indonesia to Thailand. Migrates out into flooded forests during high water periods where it feeds on phytoplankton, periphyton, bottom algae, and some zooplankton. Returns to rivers near the end of the flood season in November, where it is caught with seines, cast-nets, set-nets, and traps. Usually used to make prahoc, although large individuals are sometimes marketed fresh. May actually include more than one distinct species.

Genus *Henicorhynchus* **CYPRINIDAE**

(1) NO DORSAL-FIN SPINE; **(2)** 8 BRANCHED DORSAL-FIN RAYS; **(3)** SUBORBITAL BONES NARROW; **(4)** LOWER JAW WITH A SMALL SYMPHYSEAL KNOB; **(5)** LOWER LIP THIN AND TIGHTLY ATTACHED TO LOWER JAW.

Possibly 5 species found in the Mekong, 3 included here.

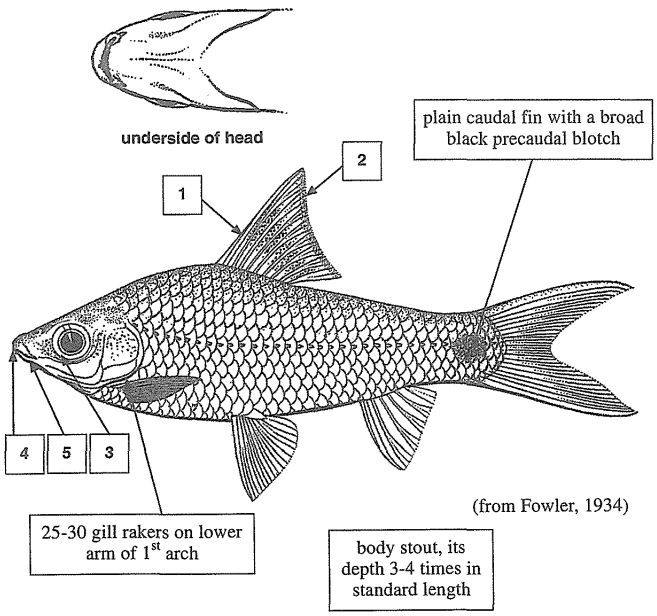
Henicorhynchus caudimaculatus (Fowler, 1934)

Synonyms / misidentifications: *Cirrhinus jullieni* (non Sauvage), *Tylognathus entema.*

Local names: Trey riel, ត្រីរៀល.

Size: To 13 cm.

Habitat, biology, and fisheries: Found at bottom depths in canals, ditches, and small streams in large river floodplains. Extremely common in central Thailand and expected from the lower Mekong. Most likely to occur in Cambodian rivers that flow into the western end of the Great Lake. Migrations up small rivers and streams and out onto floodplains are well-known in Thailand. Begins to return to permanent waters in October with migration peaking in November and December. Herbivorous, with a diet consisting of phytoplankton, periphyton, bottom algae, detritus, and some zooplankton. Caught with seines, cast-nets, set-nets, and traps. Most likely used to make prahoc.



(from Fowler, 1934)

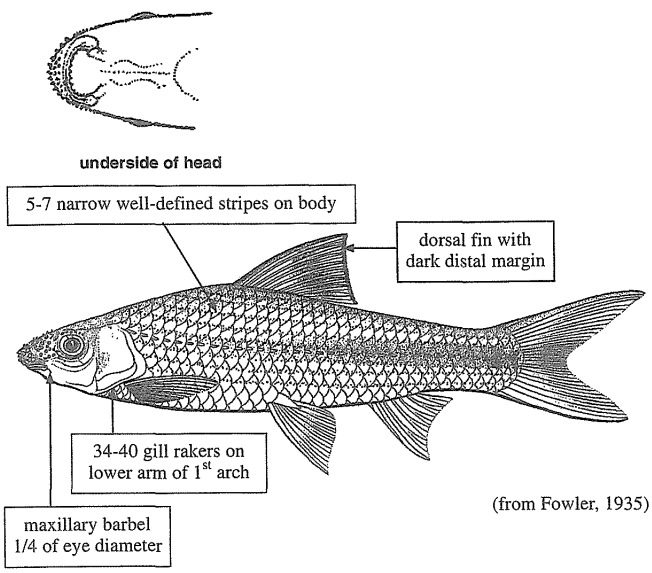
Henicorhynchus cryptopogon Fowler, 1935 (plate XII, 90)

Synonyms / misidentifications: *Cirrhinus lineatus.*

Local names: Trey riel awng kam, ត្រីរៀលអង្គាម.

Siz e: To 15 cm.

Habitat, biology, and fisheries: Found at midwater to bottom depths in canals, ditches, and small streams of floodplains, and more commonly in larger rivers as the temporary water bodies dry up. Occurs in the Chao Phrya and the middle Mekong, and is likely to be found in Cambodia. Migrates onto seasonally inundated land during the rainy season, where it feeds on algae, periphyton and phytoplankton. Much less timid than *H. siamensis* when kept in aquaria, and grazes on algae farther off the bottom. Taken with seines, cast-nets, and traps. Most likely used to make prahoc.



(from Fowler, 1935)

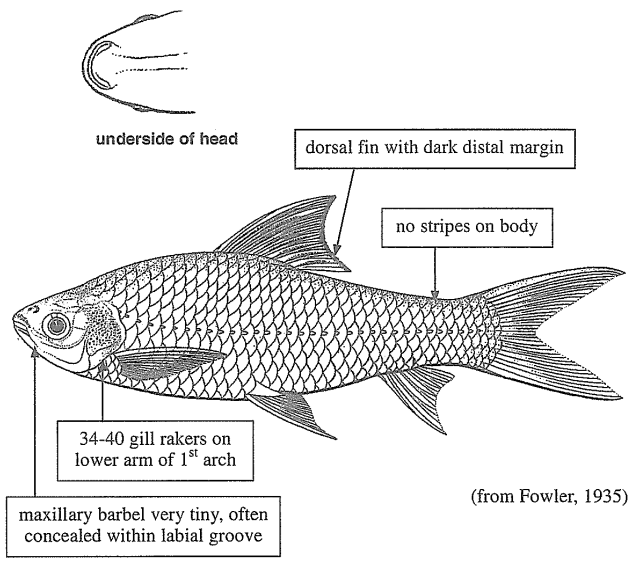
Henicorhynchus siamensis (deBeaufort, 1927) (plate XII, 91) **CYPRINIDAE**

Synonyms / misidentifications: *Henicorhynchus lobatus, Cirrhinus jullieni* (non Sauvage), *?Crossocheilus thai, ?Cirrhinus marginipinnis.*

Local names: Trey riel (small individuals), Trey riel tob (large individuals), ត្រីរៀល, ត្រីរៀលតូប.

Size: To 20 cm.

Habitat, biology, and fisheries: Found often in great abundance at midwater to bottom depths in large and small rivers in the Mekong and Chao Phrya basins. Well known for its annual trophic migrations out to the floodplains in the wet season. Returns to the rivers as water levels begin to fall in October with numbers increasing through December and then slowly declining. Feeds on algae, periphyton and phytoplankton. Gill rakers are often coated with a thick layer of mucous and specimens are sometimes found with mouths full of fish scales. This is the most important fish in the annual dai (= set-net) fishery on the Tonlé Sap, and quite appropriately, shares its name with the basic unit of Cambodian currency (riel). Not known to prosper in impoundments. Caught with seines, cast-nets, set-nets and traps. Used to make prahoc along the Tonlé Sap. Individuals are often seen in the aquarium trade as juveniles shipped with collections of *Gyrinocheilus* spp.



(from Fowler, 1935)

Genus *Labeo* **CYPRINIDAE**

(1) NO DORSAL-FIN SPINE; **(2)** 10 TO 12 BRANCHED DORSAL-FIN RAYS; **(3)** MAXILLARY BARBELS LARGER THAN ROSTRAL BARBELS; **(4)** LOWER LIP THICK WITH DEEP POSTLABIAL GROOVE NARROWLY INTERRUPTED AT ISTHMUS; **(5)** UPPER LIP SMOOTH OR CRENULATE, BUT NOT PAPILLATE.

2 species recorded.

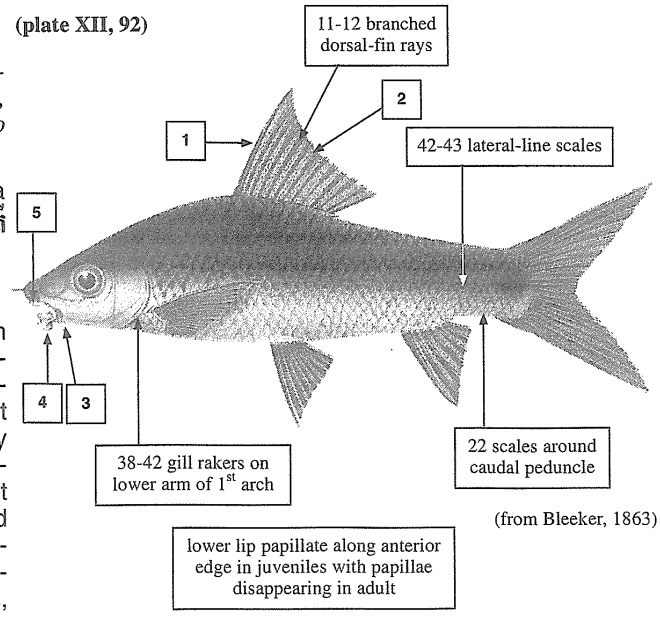
Labeo erythropterus Valenciennes, 1842 (plate XII, 92)

Synonyms / misidentifications: *Labeo dyocheilus* (non M'Clelland), *Labeo yunnanensis, Osteochilus ochrus, Labeo devdevi, Labeo cheveyi, Labeo pierrei.*

Local names: Trey kuol chek, Trey pawa mook moi, Trey pruol thmor, ត្រីគល ចេក, ត្រីពាវាមុខមួយ, ត្រីព្រួលធ្ងំ.

Size: To 45 cm.

Habitat, biology, and fisheries: Known from bottom depths of large rivers in the lower Mekong basin, including the upper edge of the freshwater tidal zone. Typically found in fairly fast currents, although it is found in the seasonally sluggish Tonlé Sap. Enters flooded forests, preferring areas with at least some current. Most common in the Tonlé Sap during November and December, when the current is strongest. Herbivorous, consuming bottom algae, phytoplankton, periphyton, and detritus.Taken with seines, cast-nets, set-nets, and traps. Large individuals are marketed fresh, smaller ones are used to make prahoc. Known to proliferate in impoundments. This species has been the source of considerable taxonomic confusion, being described numerous times and identified with a wide variety of names.



(from Bleeker, 1863)

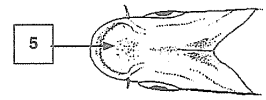
Genus *Lobocheilos* **CYPRINIDAE**

(1) NO DORSAL-FIN SPINE; (2) 8 TO 9 BRANCHED DORSAL-FIN RAYS; (3) ROSTRAL AND MAXILLARY BARBELS; (4) LIPS ENTIRE; (5) LOWER LIP ENLARGED TO FORM A THICK FLESHY PAD THAT COVERS THE LOWER JAW, BUT IS SEPARATED FROM IT BY A DEEP POST-LABIAL GROOVE.

6 species recorded, an additional species possible.

Lobocheilos davisi (Fowler, 1937)

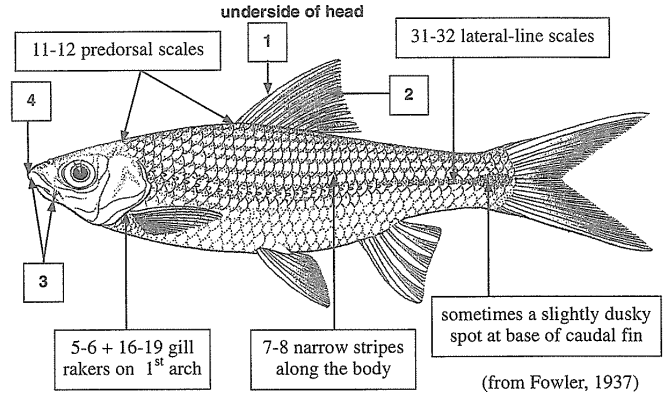
(plate XII, 93)



Local names:

Size: To 9 cm.

Habitat, biology, and fisheries: Found at bottom depths in large and medium-sized streams of the middle Mekong basin. Apparently uncommon, it probably feeds on periphyton and phytoplankton like other species of this genus. Occasionally observed in captivity to feed on the scales of its tankmates. Caught with seines, cast-nets, and traps. Probably used to make prahoc. One of the smaller species of the genus. Occasionally seen in the aquarium trade when small juveniles are confused with algae-eaters of the genus *Gyrinocheilus*.



(from Fowler, 1937)

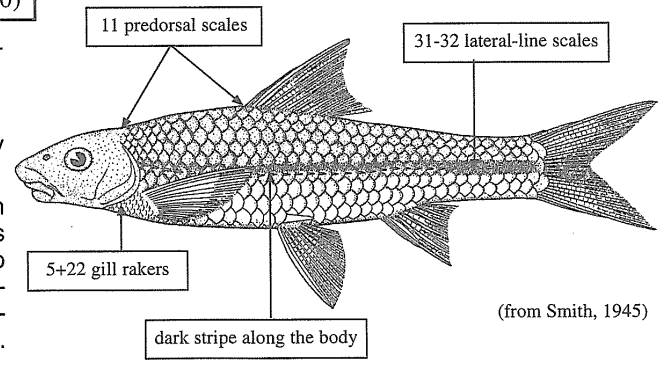
Lobocheilos delacouri (Pellegrin and Fang, 1940)

Synonyms / misidentifications: *Lobocheilus cheveyi.*

Local names:

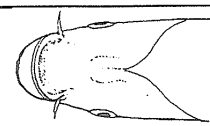
Size: To 12 cm known, probably grows slightly larger.

Habitat, biology, and fisheries: Known from small to medium-sized high-gradient streams of the upper to middle Mekong basin. Likely to be found in similar streams in northern Cambodiao. Diet consists of periphyton and phytoplankton as in other members of the genus. Caught with seines, cast-nets, and traps.



(from Smith, 1945)

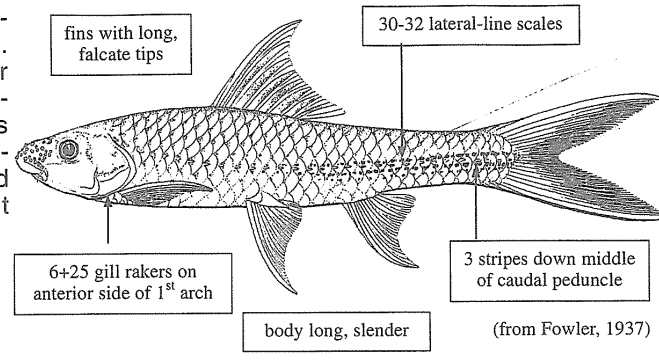
Lobocheilos gracilis (Fowler, 1937)



Local names:

Size: To 24 cm.

Habitat, biology, and fisheries: Found at bottom depths in large and medium-sized rivers of the Chao Phrya and Mekong basins. Although more commonly found in the upper Mekong of Northern Thailand and Laos, probably also occurs in northern Cambodia. Its preferred diet consists of periphyton and phytoplankton. Caught with seines, cast-nets, and traps. Large enough to be marketed fresh, but not yet recorded from Cambodian markets.



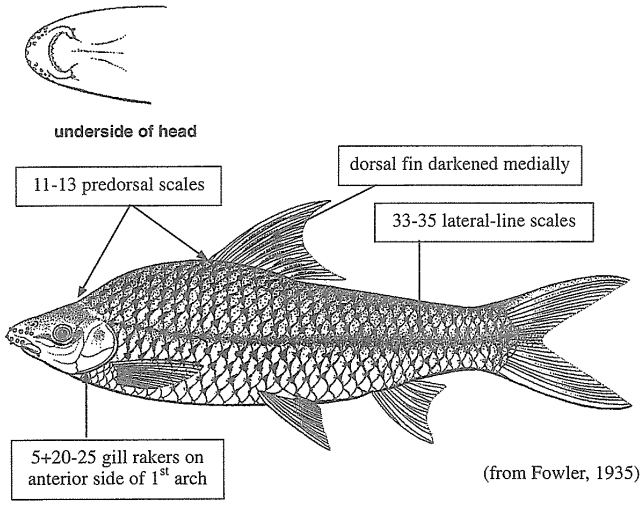
(from Fowler, 1937)

Lobocheilos melanotaenia (Fowler, 1935) (plate XII, 94) CYPRINIDAE

Synonyms / misidentifications: *Lobocheilus nigrovittatus.*

Local names: Trey changwa ronoung, ត្រីចង្វារតូច.

Size: To 16 cm.

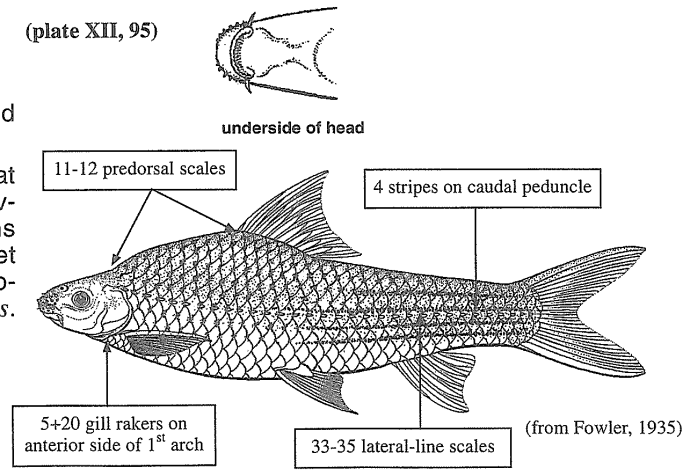


Habitat, biology, and fisheries: Found along the bottom in large and medium-sized rivers of the Chao Phrya and Mekong basins. Returns to the Tonlé Sap from the floodplains beginning in November with numbers peaking in December. Based on the size of the young of the year found in January, the species probably spawns at the onset of the rainy season. Feeds on periphyton and phytoplankton which it scrapes from rocks. In the Mekong of northern Cambodia schools of this species were observed to make scrape marks on rocks about 1 cm wide and 7 or 8 cm long. These marks begin at about a depth of 20 cm and become more and more dense on deeper surfaces. In captivity it sometimes feeds on scales of its tankmates. Taken with seines, cast-nets, set-nets, and traps. Used to make nuoc mam. Occasionally seen in the aquarium trade.

Lobocheilos quadrilineatus (Fowler, 1935) (plate XII, 95)

Local names:

Size: To 28 cm; a large species, usually found at sizes greater than 15 cm.

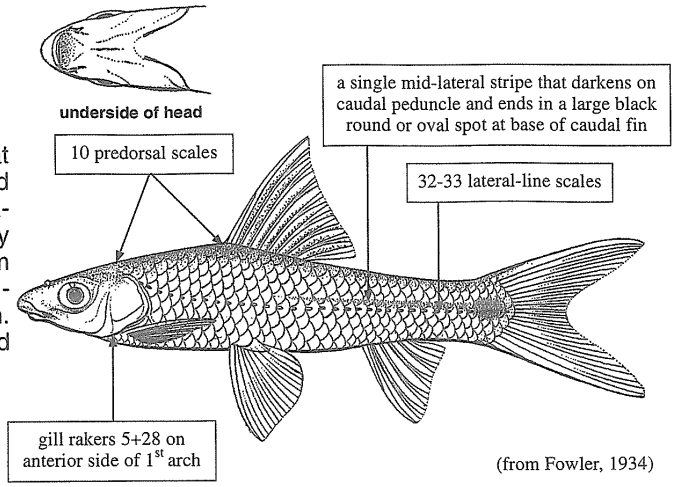


Habitat, biology, and fisheries: Found at bottom depths in large and medium-sized rivers of the Chao Phrya basin as well as streams of the Gulf of Thailand. Expected, but not yet recorded from the lower Mekong. Diet is probably similar to other species of *Lobocheilos*. Caught with seines, cast-nets, and traps.

Lobocheilos rhabdoura (Fowler, 1934)

Local names:

Size: To at least 7 cm.



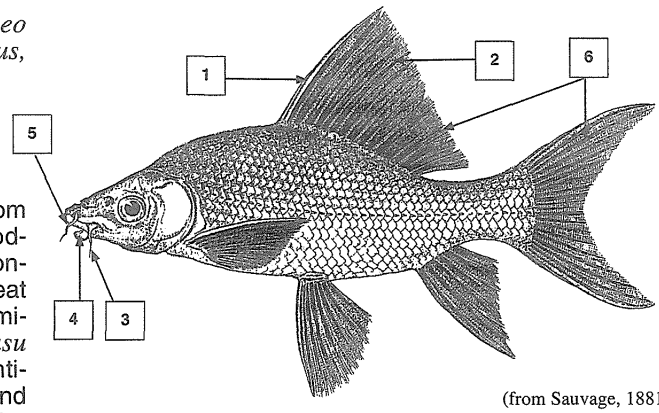
Habitat, biology, and fisheries: Found at bottom depths in large and medium-sized streams in the Chao Phrya and Mekong basins. Probably spawns at the onset of the rainy season, and individuals with a length of 6 cm appear in streams in November and December. Feeds on periphyton and phytoplankton. Taken with seines, cast-nets, set-nets, and traps. Used to make nuoc mam.

Genus *Morulius* **CYPRINIDAE**

(1) NO DORSAL-FIN SPINE; **(2)** 16 TO 17 BRANCHED DORSAL-FIN RAYS; **(3)** LARGE ROSTRAL AND MAXILLARY BARBELS; **(4)** BOTH LIPS FRINGED WITH PAPILLAE; **(5)** LOWER LIP SEPARATED FROM ISTHMUS BY DEEP POSTLABIAL GROOVE; **(6)** FINS BLACK.

1 species recorded.

Morulius chrysophekadion (Bleeker, 1850) **(plate XII, 96)**



(from Sauvage, 1881)

Synonyms / misidentifications: *Labeo chrysophekadion, Morulius erythrostictus, Morulius pectoralis.*

FAO name: Black sharkminnow.

Local names: Trey kaek, ត្រីកែក.

Size: To 60 cm.

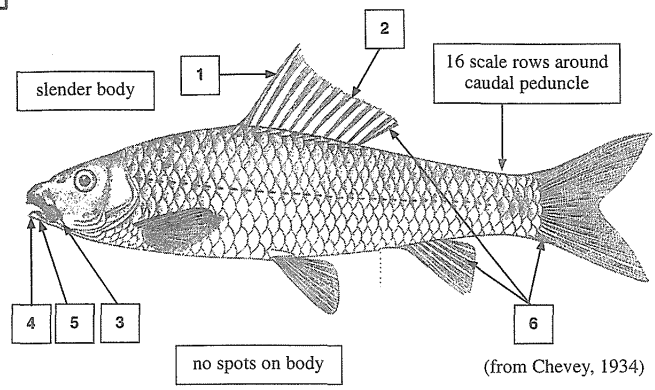
Habitat, biology, and fisheries: Known from rivers, streams, canals, and inundated floodplains from Thailand to Indonesia. Occasionally seen in impoundments, but not in great numbers. It may have a breeding pattern similar to its closest relative, *Morulius calbasu* (Hamilton) of Burma and the Indian subcontinent. Like in other large planktivorous and detritivorous carps, spawning begins after the first thunderstorms of the coming rainy season. It spawns just upstream from shallow sandbars that line long river bends. The eggs settle out in the shallow water and hatch just as water levels begin to rise following the initiation of seasonal rains. The fry immediately move into inundated grasses along the bank and continue to follow the leading edge of the advancing water as floodwaters spread over the land. Adults also migrate out into seasonally flooded areas where they feed on algae, periphyton and phytoplankton and detritus. They to return to rivers, including the Tonlé Sap, from October to December. By this time the young of the year have attained a length of about 10 cm. Caught with seines, gill-nets, set-nets, and traps. A desirable food fish, marketed fresh or dried and salted. Imported in the aquarium trade, but grows extremely fast, quickly outgrowing its tank.

Genus *Osteochilus* **CYPRINIDAE**

(1) NO DORSAL FIN SPINE; **(2)** 11 TO 18 BRANCHED DORSAL-FIN RAYS; **(3)** LARGE ROSTRAL AND MAXILLARY BARBELS; **(4)** BOTH LIPS FRINGED WITH PAPILLAE; **(5)** LOWER LIP NOT SEPARATED FROM ISTHMUS BY DEEP POST-LABIAL GROOVE; **(6)** MEDIAN FINS DARKENED BUT NOT BLACK.

8 species recorded from the middle and lower Mekong.

Osteochilus brachynotopteroides Chevey, 1934



(from Chevey, 1934)

Local names:

Size: To 15 cm.

Habitat, biology, and fisheries: Known from Kontum Lake in the central highlands of Vietnam, and probably occurs in the branches of the Mekong that enter Cambodia from Vietnam. Like other members of this genus, it probably feeds on periphyton, algae, phytoplankton as well as leafy plants such as aquatic macrophytes. With the only recorded specimens coming from a lake, it may be well imagined that this species would proliferate in impoundments. Most likely caught with seines, cast-nets and traps.

Osteochilus enneaporos (Bleeker, 1852)

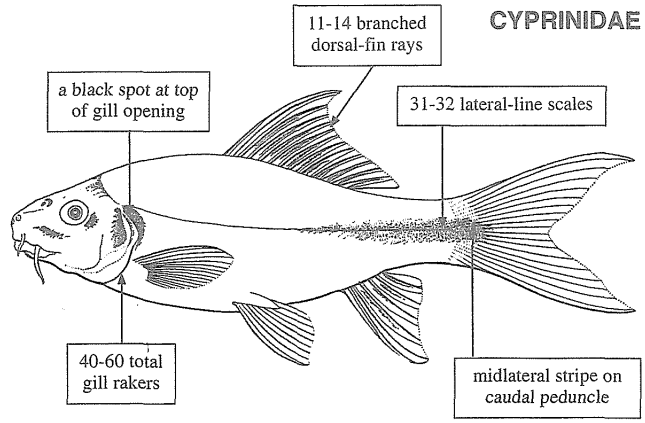
CYPRINIDAE

Synonyms / misidentifications: *Osteochilus scapularis.*

Local names: Trey chhang vote, ត្រី អង្គួត.

Size: To 23 cm.

Habitat, biology, and fisheries: Previously known from southern Thailand to Indonesia, and recently recorded from northern Cambodia by Roberts and Warren (1994). Feeds on periphyton, phytoplankton and algae, and probably migrates into seasonally flooded forests. Like other species of *Osteochilus* in northern Cambodia it is caught with seines, gill-nets, cast-nets, and traps that block return passage to the river.



(from Fowler, 1939)

Osteochilus hasselti (Valenciennes, 1842) **(plate XIII, 97)**

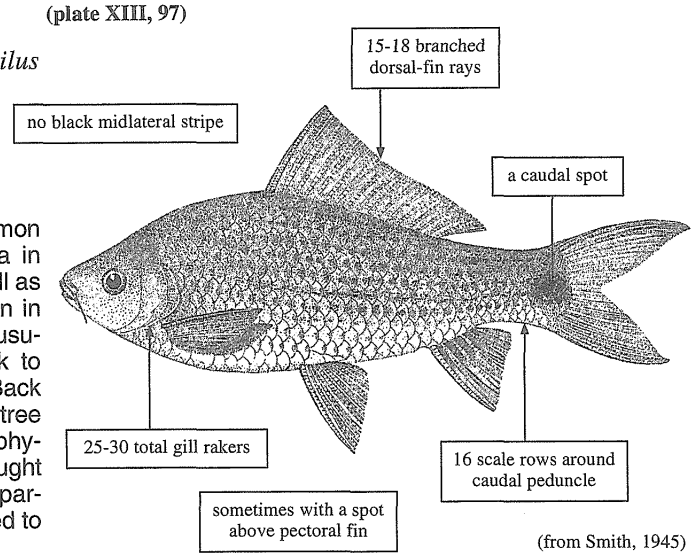
Synonyms / misidentifications: *Osteochilus duostigma, Osteochilus vittatus.*

FAO name: Silver sharkminnow.

Local names: Trey kros, ត្រី ក្រុស.

Size: To 30 cm.

Habitat, biology, and fisheries: A common species, found from Thailand to Indonesia in rivers, streams, canals and swamps, as well as in impoundments. Spends the flood season in seasonally inundated areas. Juveniles are usually seen first in August, they move back to permanent water as flooded lands dry up. Back in the rivers they are attracted to brush piles, tree roots, and other solid objects. Feeds on periphyton, phytoplankton, and bottom algae. Caught with seines, cast-nets, gill-nets, and traps, particularly samra traps. Marketed fresh or used to make prahoc.



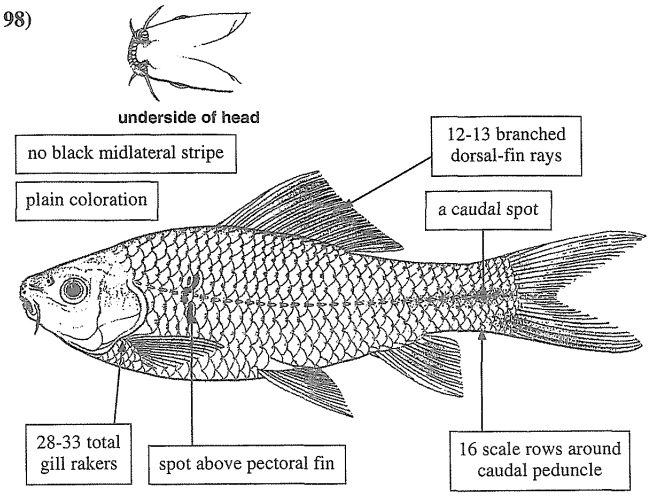
(from Smith, 1945)

Osteochilus lini Fowler, 1935 **(plate XIII, 98)**

Local names: Trey kros, ត្រី ក្រុស.

Size: To 15 cm.

Habitat, biology, and fisheries: Known from midwater to bottom depths in large and medium-sized streams in the Chao Phrya and Mekong basins. Moves into flooded forests or open fields, and begins to re-enter rivers in October. Young of the year are first seen in August. Herbivorous, feeding on periphyton, phytoplankton algae, and some detritus. Taken with seines, cast-nets, gill-nets, and traps. Usually used to make prahoc.



(from Fowler, 1935)

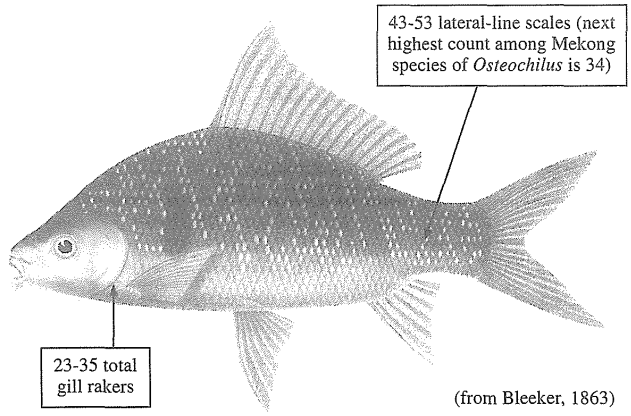
CYPRINIDAE

Osteochilus melanopleurus (Bleeker, 1852) **(plate XIII, 99)**

Local names: Trey krum, ត្រីក្រុំ.

Size: To 40 cm.

Habitat, biology, and fisheries: A common species, found at midwater to bottom depths in rivers, streams, canals, and swamps from Thailand to Indonesia. Large individuals are also found in impoundments. Moves into seasonally flooded habitats that supply its preferred diet of mostly periphyton as well as leafy plants such as aquatic macrophytes and inundated land plants. Feeds also on phytoplankton, filamentous algae, and bottom algae. Begins to return to the river in October, with numbers steadily increasing until January, when they begin to decline again. Caught with seines, cast-nets, set-nets, and traps. Large individuals are sold fresh or dried and salted, smaller ones are made into prahoc.



(from Bleeker, 1863)

Osteochilus microcephalus (Valenciennes, 1842) **(plate XIII, 100)**

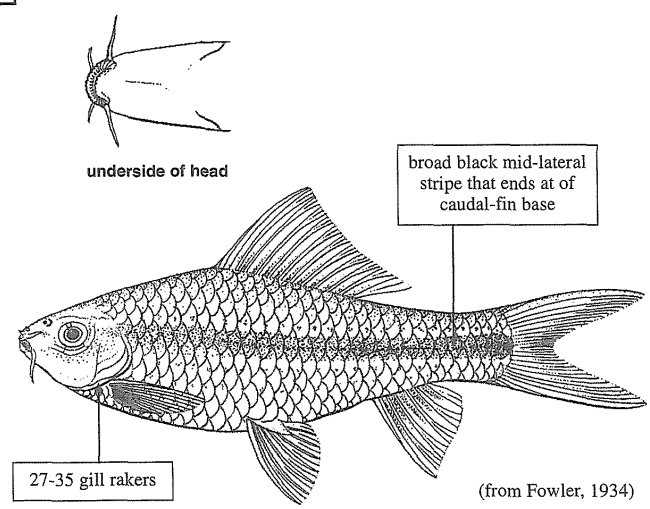
Synonyms / misidentifications: *Osteochilus vittatus*.

FAO name: Bonylip barb.

Local names: Trey kros, ត្រីក្រុស.

Size: To 24 cm.

Habitat, biology, and fisheries: A common species, found at midwater to bottom depths in rivers, streams, canals, and swamps from Thailand to Indonesia. Dietary habits are similar to *O. melanopleurus*. Also moves into flooded forests and grasslands during the flood season. A smaller species than *O. melanopleurus*, it returns to the rivers later, with highest numbers appearing from December to February. Caught with seines, cast-nets, gill-nets, set-nets, and traps. Mostly used to make nuoc mam and prahoc.



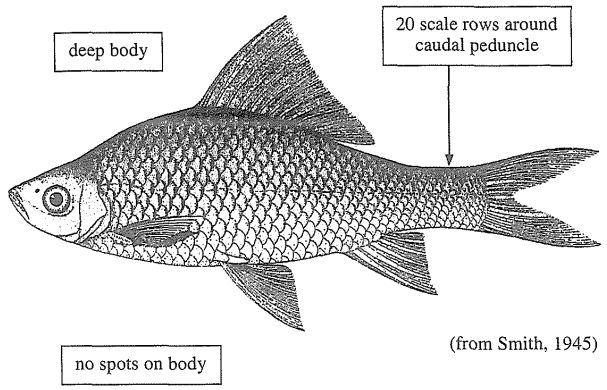
(from Fowler, 1934)

Osteochilus schlegeli (Bleeker, 1851) **(plate XIII, 101)**

Local names: Trey lolok sor, ត្រីលលកស.

Size: To 40 cm, usually less in the Mekong.

Habitat, biology, and fisheries: Known from midwater to bottom depths in large and medium-sized rivers from Thailand to Indonesia. Found in the Great Lake, but apparently not persisting in impoundments. Dietary preferences are similar to *O. melanopleurus* and its seasonal movements are like those of *O. microcephalus*. Not as common as the three most important commercial species of *Osteochilus* (*O. hasselti, O. melanopleurus* and *O. microcephalus*), but does occur regularly in fisheries of the middle and lower Mekong. Caught mostly with seines, set-nets, and traps. Usually used to make prahoc.



(from Smith, 1945)

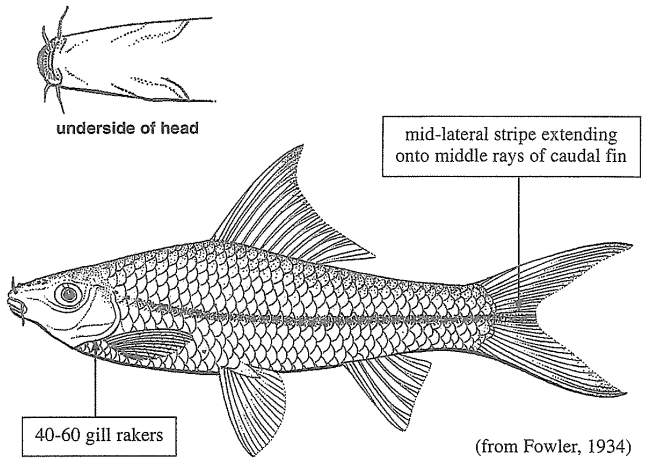
Osteochilus waandersi (Bleeker, 1852) (plate XIII, 102) **CYPRINIDAE**

Synonyms / misidentifications: *Labeo soplaoensis.*

Local names: Trey kros, ត្រីក្រុស.

Size: To 20 cm.

Habitat, biology, and fisheries: Found at midwater to bottom depths in medium to small streams from the upper Mekong to Indonesia. Moves into flooded forests adjacent to upland streams during periods of elevated water levels. Dietary habits similar to *O. melanopleurus*. Caught with seines, cast-nets, and traps.



(from Fowler, 1934)

Subtribe GARRAE

Genus *Crossocheilus* **CYPRINIDAE**

(1) NO DORSAL-FIN SPINE; **(2)** 8 BRANCHED DORSAL-FIN RAYS; **(3)** UPPER LIP NOT CONNECTED WITH LOWER LIP, CONNECTED BY THIN MEMBRANE TO LOWER JAW; **(4)** IMMOVABLE ROSTRAL LOBES.

5 species likely to occur in Cambodia.

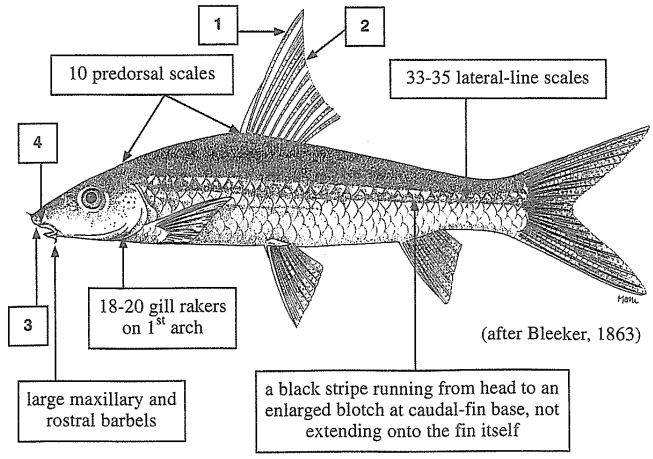
Crossocheilus cobitis (Bleeker, 1853)

Synonyms / misidentifications: *Crossocheilus pseudobagroides, Epalzeorhynchos kalliurus* (non Smith).

Local names:

Size: To 9 cm.

Habitat, biology, and fisheries: Occurs at bottom depths of rivers from the Mekong to rivers of Malaysia and Indonesia. Probably moves into the floodplains during high water periods, and may spawn there. Specimens of this species were found by the author in dai catches (= set-nets) in the Bassac of Vietnam during October and November. By this time the young of the year had attained a total length of about 2.5 cm. Feeds on algae, periphyton, phytoplankton, and some zooplankton. Caught in set-nets and probably also by cast-nets. Used for prahoc or nuoc mam.



(after Bleeker, 1863)

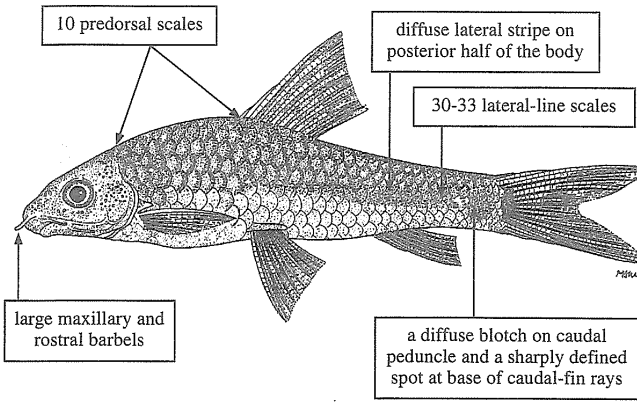
Crossocheilus kalliurus (Smith, 1945) **CYPRINIDAE**

Synonyms / misidentifications: *Epalzeorhynchus kalliurus.*

Local names:

Size: To 7 cm.

Habitat, biology, and fisheries: Found at bottom depths in the middle and upper Mekong. May also occur in northern Cambodia, but has not yet been recorded from there. Like other members of the genus, it is probably microphagous, feeding on algae, periphyton, and phytoplankton. Most likely caught with seines, cast-nets, or traps. This species was placed in synonymy with *C. cobitis* by Banarescu (1986), but is probably distinct, based on the different colour pattern and lateral-line scale counts.



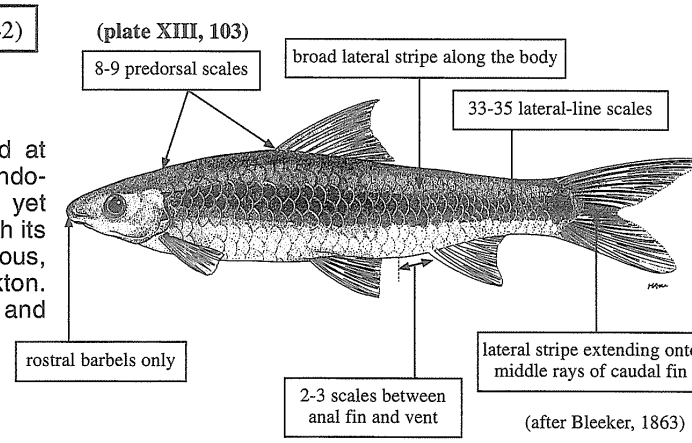
(from Smith, 1945)

Crossocheilus oblongus (Valenciennes, 1842) **(plate XIII, 103)**

Local names:

Size: To 15 cm.

Habitat, biology, and fisheries: Found at bottom depths of rivers and streams in Indonesia and on the Malay peninsula. Not yet recorded from the lower Mekong, although its occurrence is highly probable. Microphagous, feeding on periphyton, and phytoplankton. Most likely caught with seines, cast-nets, and traps.



(after Bleeker, 1863)

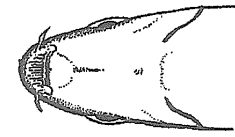
Crossocheilus reticulatus (Fowler, 1934) **(plate XIII, 104)**

Synonyms / misidentifications: *Holotylognathus reticulatus, Tylognathus coatesi, Epalzeorhynchos coatesi, Crossocheilus tchangi.*

Local names: Trey changwa chuhn chuak, ត្រីចង្វាចំញ្ជក់.

Size: To 17 cm.

Habitat, biology, and fisheries: Found at bottom depths in streams and rivers of the Chao Phrya and Mekong basins as well as streams entering the northern Gulf of Thailand. Moves out onto the floodplain during high water where it feeds on algae, periphyton, phytoplankton, and some zooplankton. Caught with seines, cast-nets, set-nets, and traps. Used to make prahoc on the Tonlé Sap. Occasionally imported in the aquarium trade.



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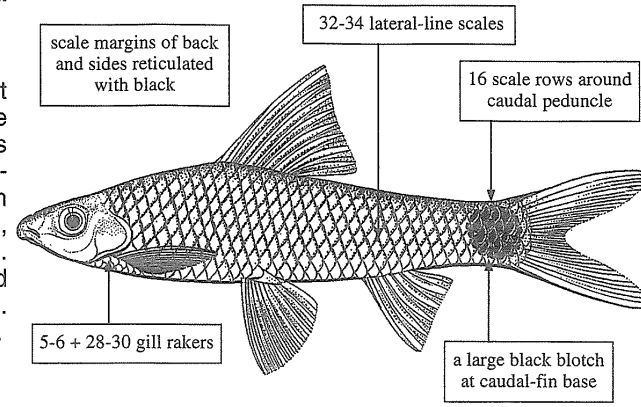


(from Fowler, 1934)

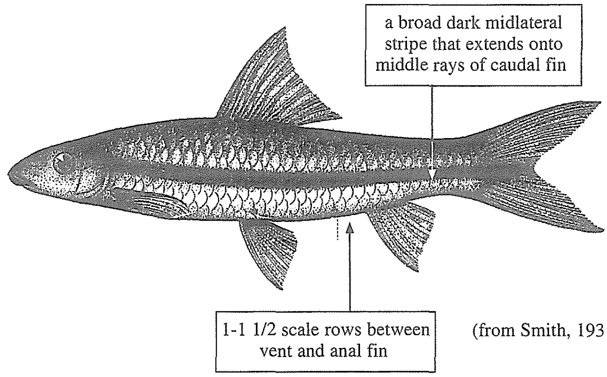
Crossocheilus siamensis (Smith 1931) **(plate XIV, 105)** **CYPRINIDAE**

Synonyms / misidentifications: *Epalzeorhynchos siamensis.*

Local names:

Size: To 16 cm.

Habitat, biology, and fisheries: Found at bottom depths in streams and rivers of the Chao Phrya and Mekong basins. Moves into flooded forests during periods of high water and may spawn there. Dietary preferences as in other members of the genus, feeding on algae, periphyton, and phytoplankton. Caught with seines, cast-nets, and traps. Most likely used to make prahoc.



(from Smith, 1931)

Genus *Epalzeorhynchos* **CYPRINIDAE**

(1) NO DORSAL-FIN SPINE; **(2)** 10 TO 13 BRANCHED DORSAL-FIN RAYS; **(3)** UPPER LIP CONNECTED TO LOWER LIP BY A THIN MEMBRANE; **(4)** ROSTRAL LOBES RIGID AND FREELY MOVABLE.

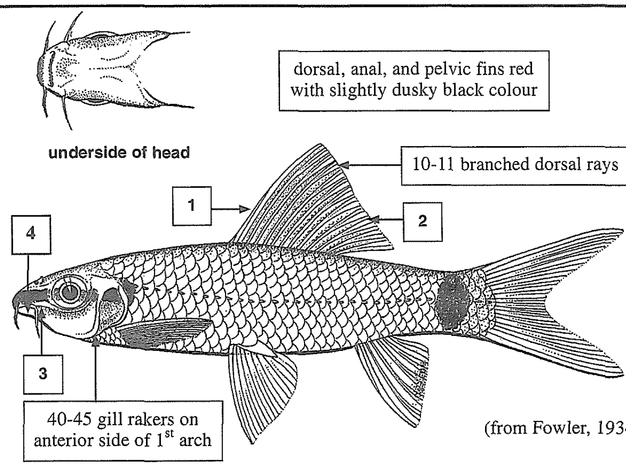
2 species recorded, a third possible.

Epalzeorhynchos frenatum (Fowler, 1934)

Local names: Trey kuol chek, ត្រី កល់ ចេក.

Size: To 12 cm.

Habitat, biology, and fisheries: Found near any type of solid surface at midwater and bottom depths in streams and rivers of the Chao Phrya and possibly the Mekong basin. Moves into seasonally flooded habitats and returns to the rivers as floodwaters recede. Feeds on algae, periphyton, phytoplankton, and some zooplankton. Caught with seines, cast-nets, and set-nets. Popular in the aquarium trade.



(from Fowler, 1934)

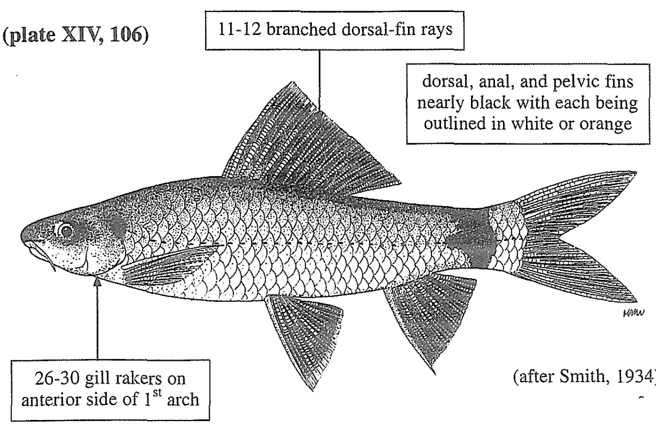
Epalzeorhynchos munense (Smith, 1934) **(plate XIV, 106)**

Synonyms / misidentifications: *Labeo erythrurus, Labeo bicolor* (non Smith).

Local names: Trey andat pee, ត្រី អណ្ដាតពីរ.

Size: To 12 cm.

Habitat and remarks: Known from midwater to bottom levels of streams and rivers in the Mekong basin. During the flood season, it moves into inundated forests and returns to the river as water levels recede. Diet consists of phytoplankton and zooplankton. Caught with seines, cast-nets, and set-nets. Along the Tonlé Sap, it is used to make prahoc. May possibly be used in the aquarium trade. This species has not been recorded since its original description, probably because it was described to have a white caudal fin (Smith, 1934). It seems that specimens loose the red pigment in the caudal fin within three months after preservation, with the caudal fin subsequently becoming white. The holotype, however, was collected by a forest officer eight years prior to Smith's description. Due to its darkly pigmented dorsal, anal, and pelvic fins, this Mekong species has been confused with *Epalzeorhynchos bicolor* (Smith, 1931) of the Chao Phrya.



(after Smith, 1934)

Genus *Garra* **CYPRINIDAE**

(1) NO DORSAL-FIN SPINE; (2) 8 BRANCHED DORSAL-FIN RAYS; (3) 1 OR 2 PAIRS OF BARBELS; (4) LOWER LIP FORMING A MENTAL DISK, ENLARGED, REFLECTED BACKWARDS AND DISK-SHAPED.

5 species recorded or likely to occur in Cambodia.

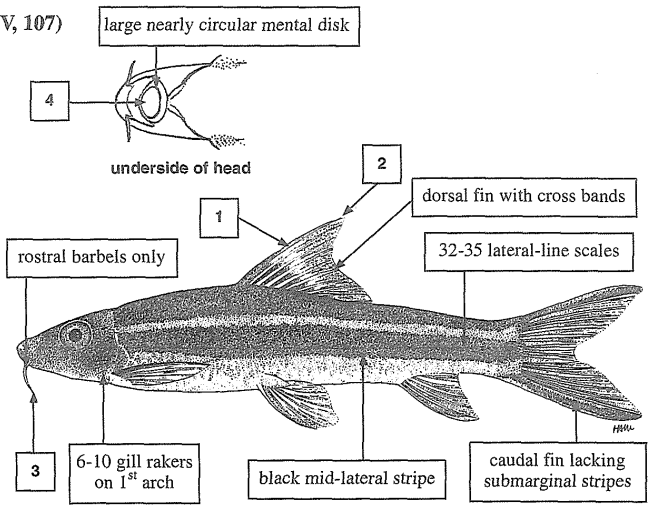
Garra cambodgiensis (Tirant, 1884) (plate XIV, 107)

Synonyms / misidentifications: *Garra taeniata, Garra taeniatops, Garra parvifilum.*

Local names:

Size: To 15 cm.

Habitat, biology, and fisheries: Found on rocky bottoms in swiftly moving water of small and medium sized streams of the Chao Phrya and Mekong basins. Feeds on periphyton, phytoplankton, and some insects. Occasionally taken with seines over a gravel bottom, or among boulders in fast water. Not fished commercially, but occasionally seen in the aquarium trade.



(from Fowler, 1934)

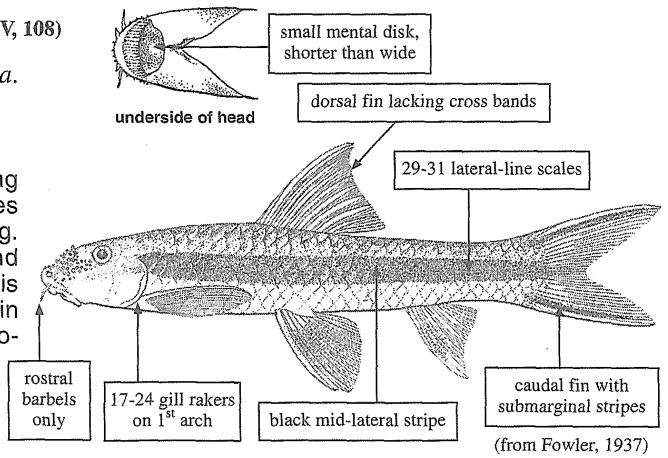
Garra fasciacauda Fowler, 1937 (plate XIV, 108)

Synonyms / misidentifications: *Garra spinosa.*

Local names:

Size: To 11 cm.

Habitat, biology, and fisheries: Found along rocky bottoms in fast flowing water of all sizes of rivers and streams in the middle Mekong. Feeds on periphyton, phytoplankton, and some insects. Can be taken with trawls and is caught with large haul seines in the main stream of the Mekong in Thailand and Cambodia.



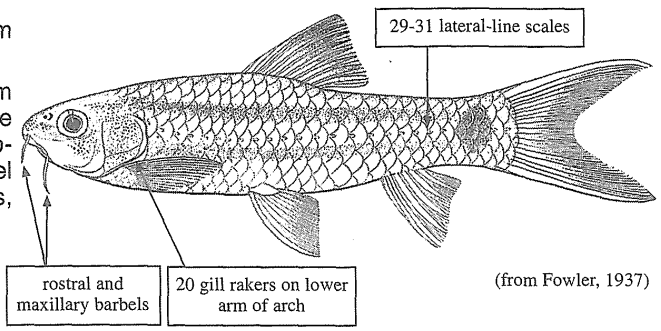
(from Fowler, 1937)

Garra fisheri (Fowler, 1937)

Local names:

Size: Known only from juveniles of 5 cm length.

Habitat, biology, and fisheries: Known from central Thailand and likely to occur in the Mekong. Like other species of *Garra*, it probably occurs in fast water over rocky or gravel substrates. Little is known about this species, for which adults have never been seen.



(from Fowler, 1937)

Garra fuliginosa Fowler, 1934

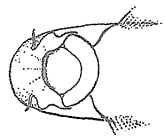
CYPRINIDAE

Synonyms / misidentifications: *Garra nasuta* (non M'Clelland).

Local names:

Size: To 18 cm.

Habitat, biology, and fisheries: Found in swiftly flowing water over rocky bottoms in the Chao Phrya and Mekong basins. Feeds on periphyton, phytoplankton, and insects. An uncommon fish in larger rivers and rarely caught by commercial fishermen. Can be taken with trawls over gravel substrate. This species was placed in synonymy with *Garra nasuta* (M'Clelland) by Menon (1964), along with several other species that appear to be distinct. Its present name may prove to be a synonym of one of those names.



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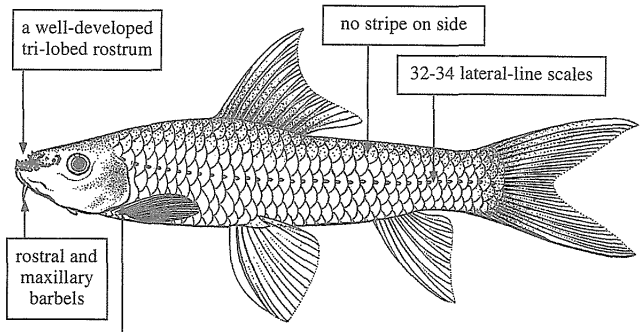


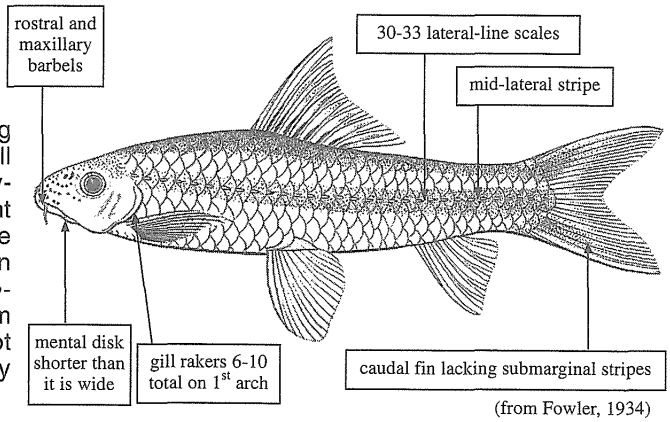
(from Fowler, 1934)

Garra sp.

Local names:

Size: To 10 cm.

Habitat, biology, and fisheries: Found along rocky bottoms in fast flowing water in small and medium-sized rivers. Feeds on periphyton, phytoplankton, and insects. Not caught commercially for food. Frequently seen in the aquarium trade, where individuals are found in mixed shipments with *Gyrinocheilus, Crossocheilus* or even *Henicorhynchus*. Museum specimens with reliable locality data were not encountered by the author, but it is not unlikely that this species occurs in the Mekong.



(from Fowler, 1934)

Genus *Mekongina*

CYPRINIDAE

(1) NO DORSAL-FIN SPINE; **(2)** 10 BRANCHED DORSAL-FIN RAYS; **(3)** NO BARBELS; **(4)** UPPER LIP CONTINUOUS WITH SKIN OF SNOUT.

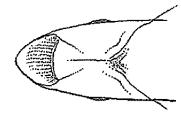
1 species recorded.

Mekongina erythrospila Fowler, 1937 **(plate XIV, 109)**

Local names: Trey pase ee, ត្រី បាសេអ៊ី.

Size: To 45 cm.

Habitat, biology, and fisheries: A Mekong endemic, inhabiting rapidly flowing water in medium and large sized rivers. Feeds on periphyton and phytoplankton. A valuable and highly desired food fish in northern Cambodia. Taken with seines, gill-nets, cast-nets, and traps. Sold fresh and is sometimes dried and salted.



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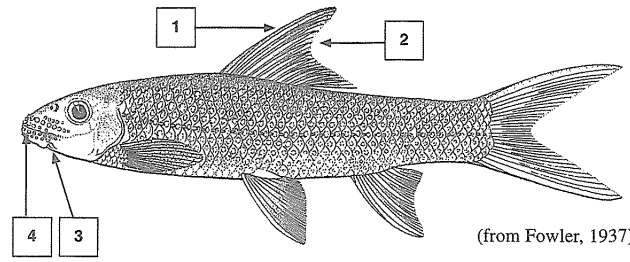


(from Fowler, 1937)

Family BALITORIDAE

Subfamily BALITORINAE

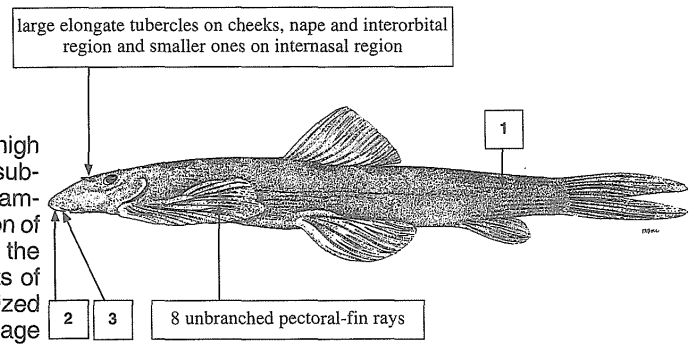
Tribe BALITORINI

Genus *Balitora* **BALITORIDAE**

(1) SCALES LARGE, NOT REQUIRING MAGNIFICATION TO SEE; **(2)** A DEEP PREORAL GROOVE EXTENDING AROUND THE CORNERS OF THE MOUTH; **(3)** LIPS PAPILLATE.

Possibly 3 species present, 2 of them included here.

Balitora annamitica Kottelat, 1988

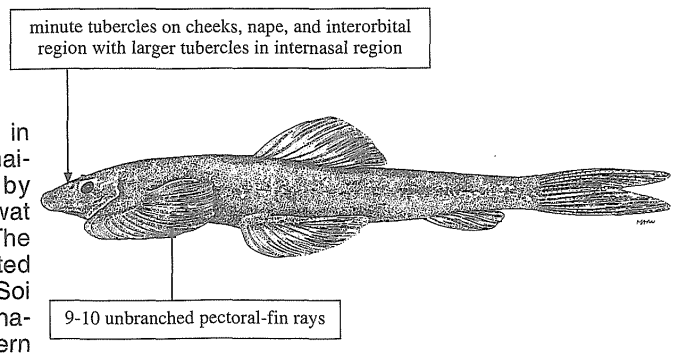


Local names:

Size: To 12 cm.

Habitat, biology, and fisheries: Found in high gradient streams with boulder or bedrock substrates in the Srépok River of northeastern Cambodia. Kottelat (1988) published an illustration of the Grand Cascade of Boun Long, which is the type locality. Little is known about the habits of these species. Migration is probably localized with individuals seeking better places to forage as water levels and flow rates change. Members of this genus are carnivorous on benthic insects, and may ingest small amounts of phytoplankton and periphyton. Not fished commercially, but can probably be taken with dip-nets and traps. Also utilized by the aquarium trade.

Balitora meridionalis Kottelat, 1988



Local names:

Size: To 9 cm.

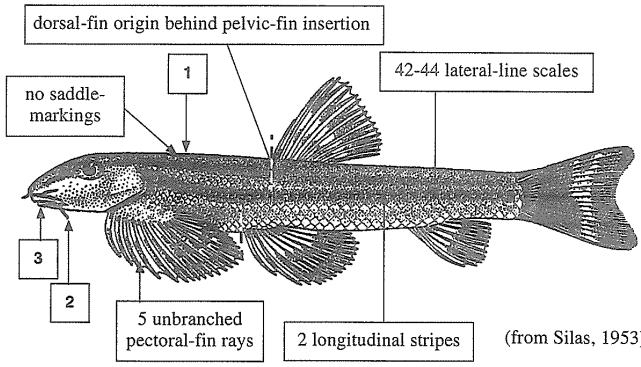
Habitat, biology, and fisheries: Found in high gradient streams in southeastern Thailand. The type series was obtained by Dr. Rainboth and Mr. Sompote Uk-katewewat at Somphong's Aquarium in Bangkok. The owner believed that the specimens originated in the Chan River headwaters on Kao Soi Dao, because the collector regularly sent material from these waters. However, the eastern face of Kao Soi Dao has Thai headwaters for streams in the Mekong basin, and the specimens may actually be from there. The biological information given for *B. annamitica* applies also to this species.

Genus *Homaloptera* **BALITORIDAE**

(1) SCALES LARGE, NOT REQUIRING MAGNIFICATION TO SEE; (2) NO DEEP PREORAL GROOVE EXTENDING AROUND THE CORNERS OF THE MOUTH; (3) LIPS NOT PAPILLATE.

8 species present or likely to occur in the Cambodian Mekong, 6 of them included here.

Homaloptera indochinensis Silas, 1953



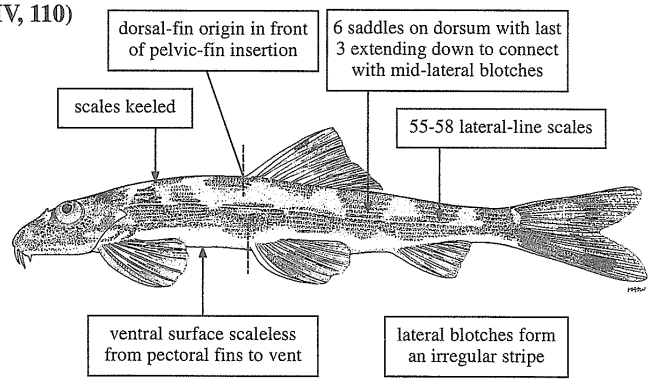
(from Silas, 1953)

Local names:

Size: To 4 cm.

Habitat, biology, and fisheries: Found in high gradient streams in the southern highlands of Vietnam and possibly Cambodia. This species was described from Annam with little further information. It seems not to have been collected since its original description. Probably non-migratory or perhaps may have short local movements as water levels change. Like other members of the genus, it probably feeds on benthic insects. Little is known about this species. Probably caught with seines, dip-nets, or cast-nets.

Homaloptera leonardi Hora, 1941 **(plate XIV, 110)**

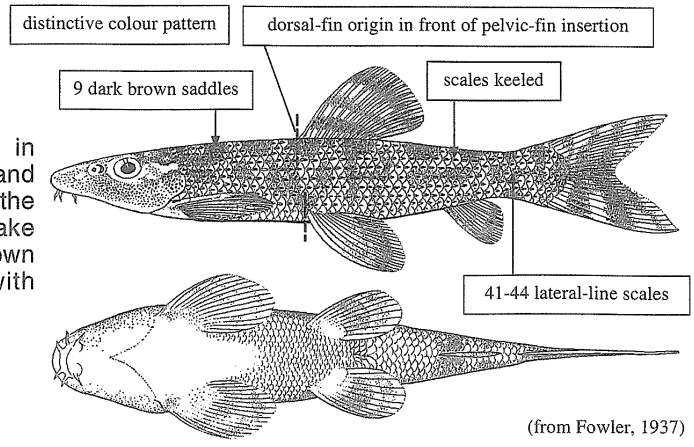


Local names:

Size: To 6.5 cm.

Habitat, biology, and fisheries: Found in high gradient streams of northern Cambodia. Originally described from rivers on the eastern slope of the Malay Peninsula. Prefers local stretches of fast water over bedrock, boulder, or cobble substrate. Probably makes limited local movements if its habitat becomes unsuitable. Alfred (1969) indicated its preference for rocky bottoms and fast local currents of about 1.5 m/sec. The species was encountered by the author of the present field guide in crevices among cobbles with the current slightly over 1 m/sec, approaching the local maximum. These individuals were found in small streams as well as in the main stream of the Tonlé San. Can be caught with seines.

Homaloptera maxinae Fowler, 1937



(from Fowler, 1937)

Local names:

Size: To 5 cm.

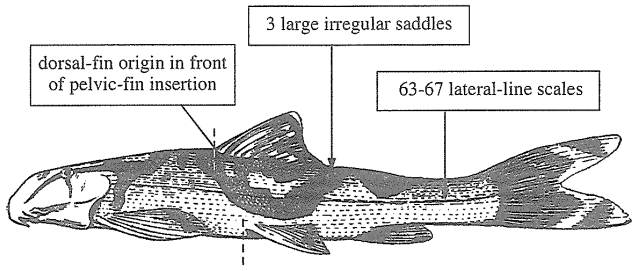
Habitat, biology, and fisheries: Found in high gradient streams of the Chao Phrya and upper Gulf of Thailand, and expected from the Mekong basin rivers entering the Great Lake in western Cambodia. Not much is known about this species. Probably taken with seines, dip-nets, or cast-nets.

Homaloptera sp. cf. *orthogoniata* Vaillant, 1902 (plate XIV, 111) BALITORIDAE

Local names:

Size: To 13 cm.

Habitat, biology, and fisheries: Found in high-gradient streams of Cambodia from the Cardamom Range to the Tonlé San in northern Cambodia. Lives along rocky edges of fast runs. When caught, it often remains motionless in the net and may be mistaken for decomposing vegetation. Can also be found on overhanging branches that are submerged in fast water. Feeds on aquatic insects and may make limited seasonal movements. Caught with seines and dip-nets. Not caught commercially, although its attractive coloration would make it a likely candidate for the aquarium trade. Occasionally exported from Bangkok for that purpose. Specimens caught by the author look rather different from the illustration in Vaillant (1902) and Weber and de Beaufort (1916). Alfred (1969) stated that the specimen illustrated by Vaillant had an abnormally shaped snout. The species usually shows a more depressed snout, like the specimen photographed for this field guide.



(from Weber and de Beaufort, 1916)

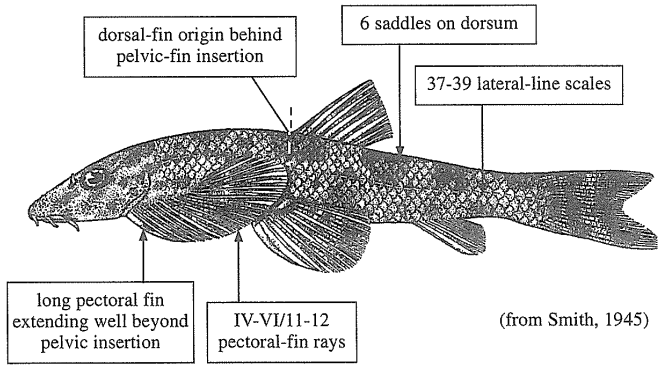
Homaloptera smithi Hora, 1932 (plate XIV, 112)

Synonyms / misidentifications: *Homaloptera lineata.*

Local names:

Size: To 6 cm.

Habitat, biology, and fisheries: Probably the most common member of the genus in the Mekong. Adults are found in high gradient streams over fast bedrock, cobble runs, and rapids, and juveniles occur in slower stretches of gravel and exposed tree roots. Feeds on aquatic insect larvae, particularly odonatans, and probably makes relatively limited seasonal movements. Caught with seines, dip nets, and possibly cast-nets. Not fished commercially, but has some potential for the aquarium trade.



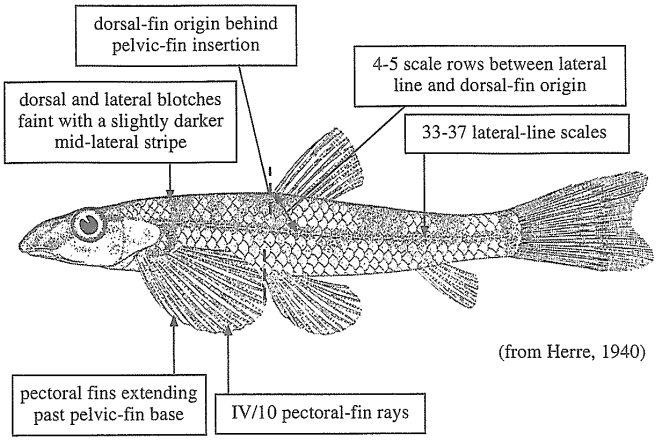
(from Smith, 1945)

Homaloptera tweediei Herre, 1940 (plate XV, 113)

Local names:

Size: To 3 cm.

Habitat, biology, and fisheries: Most likely the smallest species of the genus found in Cambodia, reaching maturity at about 2 cm. Compared to other members of this genus, it is more likely to be found in moderate currents with living and dead vegetation than in fast currents over rocks. Probably feeds on small aquatic insects and zooplankton, and may move into seasonally flooded areas with moderate currents. Not fished commercially, but can be caught with seines and dipnets.



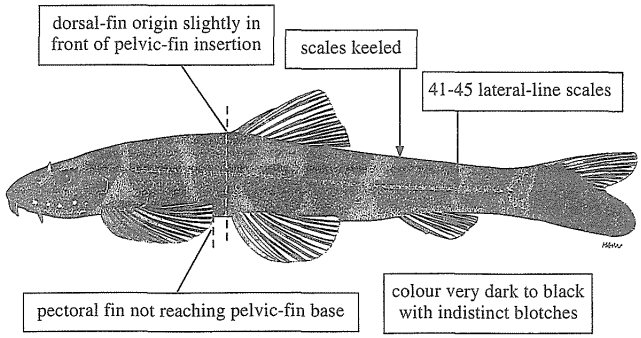
(from Herre, 1940)

Homaloptera zollingeri Bleeker, 1853 (plate XV, 114) BALITORIDAE

Synonyms / misidentifications: *Homaloptera nigra.*

Local names:

Size: To 10 cm.



Habitat, biology, and fisheries: Occurs in high gradient streams over rocky substrates from Indonesia and Malaysia to northern Cambodia. Typically found on rocky bottoms in fast waters. The species was found by the author under boulders in fast water of a small stream just south of Stung Treng. Probably makes seasonal movements only if its habitat becomes unsuitable, such as when small fast streams become swamped by rising backwaters from large rivers. Feeds on insect larvae. Not fished commercially, but has some potential for the aquarium trade.

Tribe GASTROMYZONTINI

Genus *Annamia* BALITORIDAE

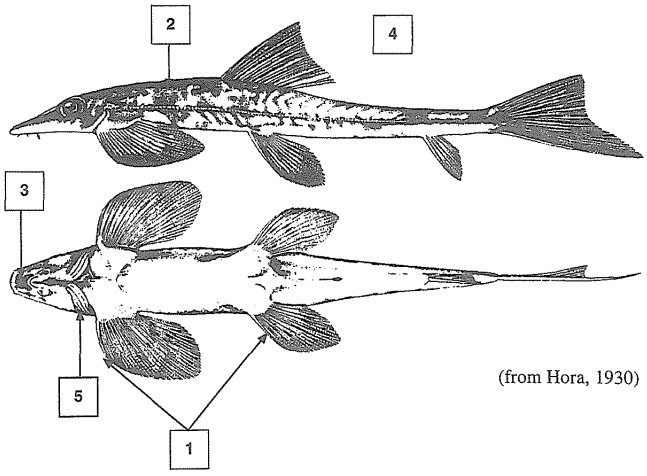
(1) A SINGLE UNDIVIDED RAY IN PECTORAL AND PELVIC FINS; **(2)** SCALES LARGE, OBVIOUS TO NAKED EYE; **(3)** SNOUT AND MOUTH NARROW AND MOUTH STRONGLY ARCHED, **(4)** BODY VERY SLENDER; **(5)** GILL OPENINGS MODERATELY LARGE, EXTENDING TO VENTRAL SURFACE.

1 species recorded.

Annamia normani (Hora, 1930) (plate XV, 115)

Local names:

Size: To 6 cm.



(from Hora, 1930)

Habitat, biology, and fisheries: Found in high gradient streams and rivers, including the main channel of the Mekong upstream from Khoné Falls and in other rivers and streams of northern Cambodia. Typically found in shallow fast water over bedrock and cobble substrates. Feeds on small benthic animals, primarily insect larvae. Probably non-migratory or may have limited local migrations to better habitats. Not fished commercially, but can be caught with dip-nets.

Genus *Sewellia* **BALITORIDAE**

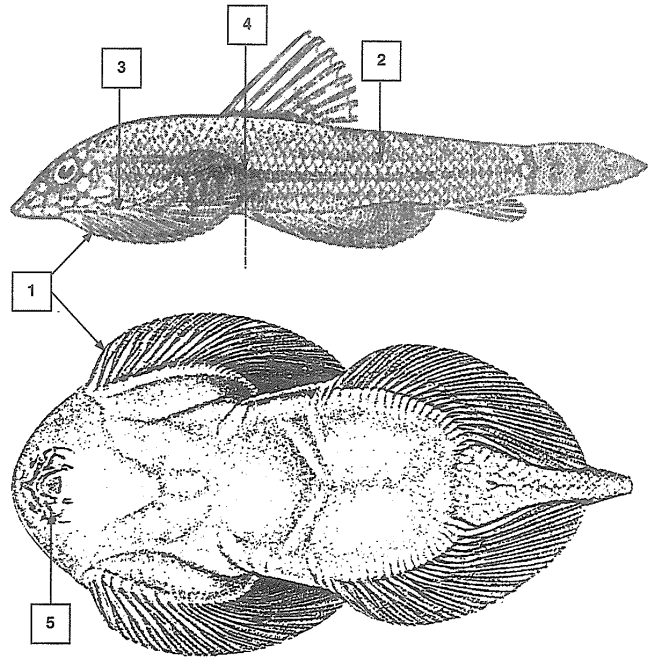
(1) A SINGLE UNDIVIDED RAY IN PECTORAL AND PELVIC FINS **(2)** SCALES LARGE, NOT REQUIRING MAGNIFICATION TO SEE; **(3)** GILL OPENINGS SMALL, NOT EXTENDING TO VENTRAL SURFACE; **(4)** PECTORAL FINS EXTENDING BEYOND BASE OF PELVIC FINS; **(5)** BARBELS FRINGED.

1 species recorded from Cambodia.

Sewellia lineolata Valenciennes, 1842

Local names:

Habitat, biology, and fisheries: Described from Cochin China, this species may occur in mountain streams of the central highlands of Vietnam as well as the rivers they feed in Cambodia. It occurs in Khoné Falls just upstream from the Cambodian border. Little is known about this species, but its habits are probably like those of other members of the subfamily Balitorinae.



Subfamily NEMACHEILINAE

Genus *Nemacheilus* **BALITORIDAE**

(1) SCALES TINY, REQUIRING MAGNIFICATION TO SEE; **(2)** 8 TO 10 BRANCHED DORSAL-FIN RAYS; **(3)** VENT CLOSER TO ANAL FIN THAN TO PELVIC-FIN ORIGIN; **(4)** CAUDAL FIN STRONGLY FORKED; **(5)** LOWER LIP CONTINUOUS OR WITH SLIGHT INCISION AT ITS TIP.

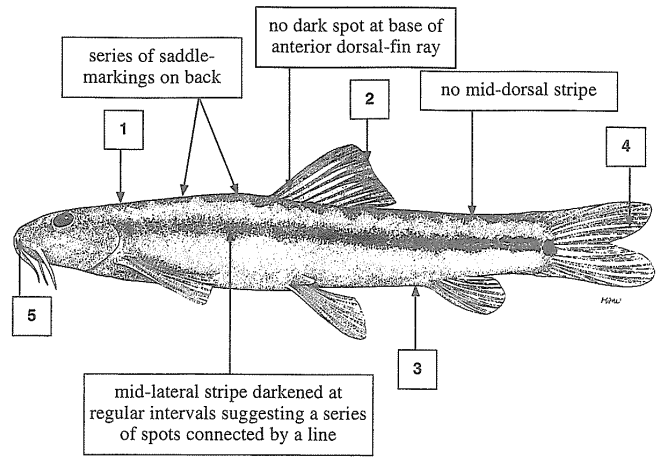
9 species likely to occur in the Mekong.

Nemacheilus longistriatus Kottelat, 1990

Local names:

Size: To 12.5 cm.

Habitat, biology, and fisheries: Found in the main stream of the Mekong or in the river backwaters from northernmost Thailand to the Khorat Plateau and also downstream from Khoné Falls. Usually found only at the driest time of the year. It is not known if it moves to inundated habitats during the flood season, but some lateral movement into areas immediately adjacent to the river is likely. Like most members if this genus, it is found in backwaters or on sandy bottoms. Most nemacheilines feed primarily on insect larvae, worms, and some algae. Not caught commercially, but can be taken with seines or cast-nets.

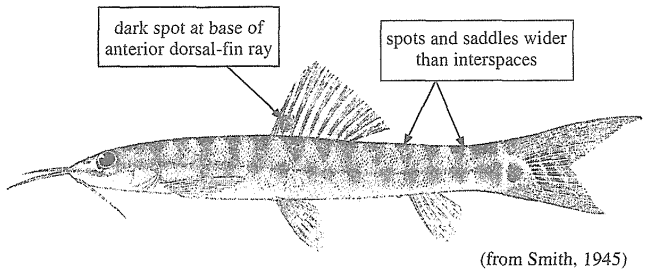


Nemacheilus masyae Smith, 1933

BALITORIDAE

Local names:

Size: To 13.5 cm.



(from Smith, 1945)

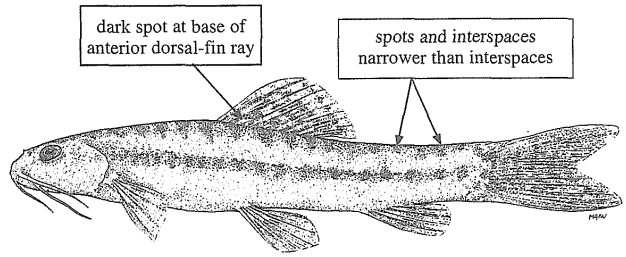
Habitat, biology, and fisheries: Found at shallow depths of 2 m or less in rivers and streams with moderate current and muddy to sandy bottoms, from the Malay Peninsula and the coastal drainages of the Cardamom Range. May also be found on the Mekong side of the Cardamom mountains in northwest Cambodia, an area that has not yet been studied. It may be slightly more tolerant of turbidity than most balitorids. Seasonal movements are unknown. Like other members of the genus, its diet probably consists of insect larvae and worms. Not caught commercially, but can be taken with seines and cast-nets.

Nemacheilus pallidus Kottelat, 1990 **(plate XV, 116)**

Synonyms / misidentifications: *Nemacheilus masyae* (non Smith).

Local names:

Size: To 14 cm.

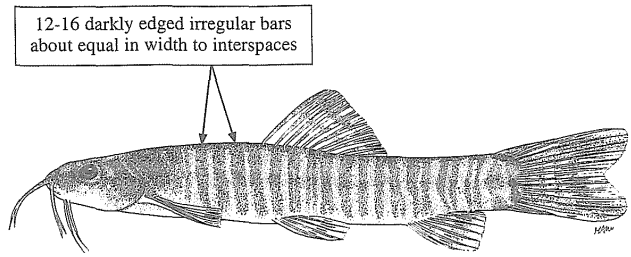


Habitat, biology, and fisheries: Found at shallow depths in small streams and rivers with sandy to muddy bottoms, from northern Thailand to Cambodia in the Mekong basin and also the Chao Phrya basin in Thailand. It was collected by the author in the Siem Reap River in a shallow backwater area over sandy bottoms. The fishes congregated in a small area that was receiving direct sunlight. Feeds primarily on insects and some algae. The algae may have been accidentally ingested along with the insect larvae. Not commercially harvested, but easily caught with seines and cast-nets.

Nemacheilus platiceps Kottelat, 1990 **(plate XV, 117)**

Local names:

Size: To 5 cm.



Habitat, biology, and fisheries: Known from clear shallow waters in slow-flowing pools with decaying terrestrial vegetation in upland rivers and streams of the lower Mekong basin of Cambodia and Vietnam. It has been found in the Srepok and Se San in northern Cambodia and also between Phnom Penh and Sihanoukville. Little is known about its biology.

Genus *Schistura* **BALITORIDAE**

(1) SCALES TINY, REQUIRING MAGNIFICATION TO SEE; (2) 8 BRANCHED DORSAL-FIN RAYS; (3) VENT CLOSER TO ANAL FIN THAN TO PELVIC FIN ORIGIN; (4) CAUDAL FIN WEAKLY FORKED TO EMARGINATE; (5) LOWER LIP INTERRUPTED MEDIALLY.

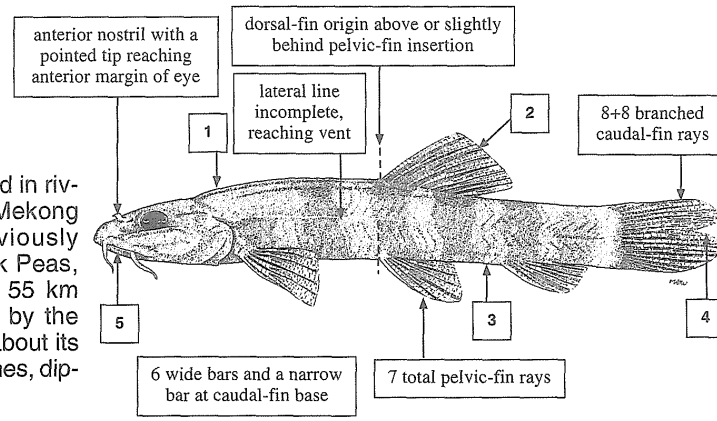
25 or more species present or likely to occur in the Mekong, 7 of them included here.

Schistura daubentoni Kottelat, 1990

Local names:

Size: To 3.5 cm.

Habitat, biology, and fisheries: Found in rivers with sand or gravel bottoms in the Mekong basin of northern Cambodia. Previously known only from a single locality, Prek Peas, a stream entering the Mekong some 55 km south of Stung Treng, but also found by the author in the Se San. Little is known about its distribution and biology. Caught with seines, dip-nets, or traps.



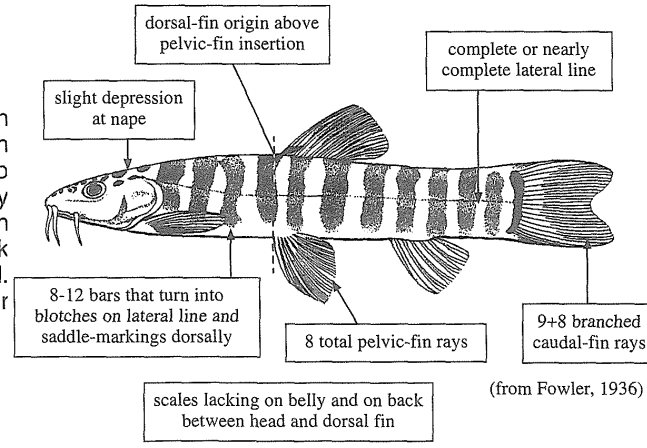
(after Kottelat, 1990)

Schistura kengtungensis (Fowler, 1936)

Local names:

Size: To 11 cm.

Habitat, biology, and fisheries: Found in small, shallow, high-gradient streams with cobble or boulder substrates from Myanmar to the Khorat Plateau in the Mekong basin. Likely to be encountered downstream in northern Cambodia, particularly along the Dangrek Range, an area that has not yet been studied. Probably non-migratory. Caught with seines or dip-nets.



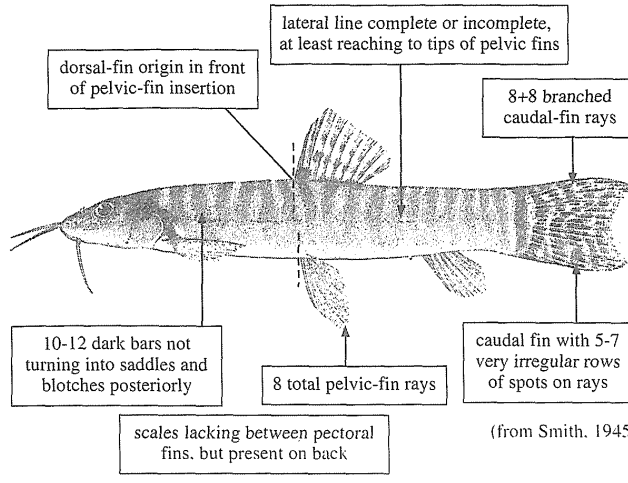
(from Fowler, 1936)

Schistura kohchangensis (Smith, 1933)

Local names:

Size: To 7.5 cm.

Habitat, biology, and fisheries: Found in small, shallow, high-gradient streams with gravel and boulder substrates in forests at the northern end of the Cardamom Range. So far, only known from small coastal streams, but may possibly be found all along the mountain range, including the Mekong basin. Probably non-migratory. Its diet probably consists of insect larvae, and some algae, as seen in other nemacheilines. Caught with seines.



(from Smith, 1945)

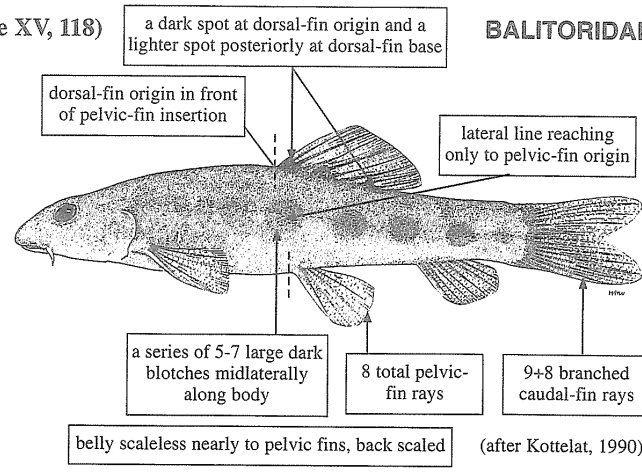
Schistura laterimaculata Kottelat, 1990 (plate XV, 118)

BALITORIDAE

Local names:

Size: To 5.5 cm.

Habitat, biology, and fisheries: Known from 6 specimens originating in Chaiyaphum Province on the Khorat Plateau in the Thai Mekong basin. If found in Cambodia, it most likely occurs along the Dangrek Range. Caught with seines.



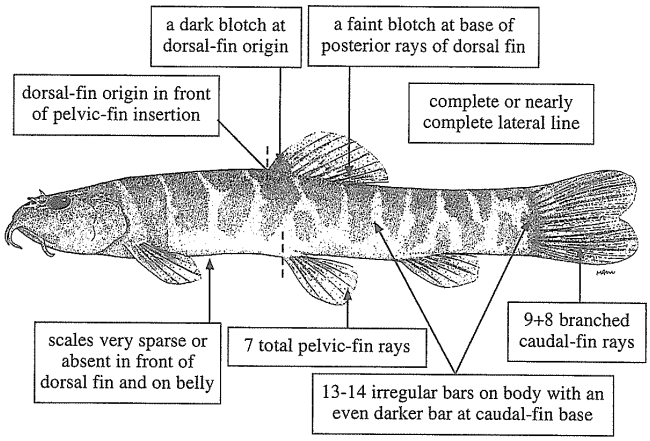
(after Kottelat, 1990)

Schistura magnifluvis Kottelat, 1990

Local names:

Size: To 8.5 cm.

Habitat, biology, and fisheries: Known so far only from the mainstream Mekong at the northern edge of the Khorat Plateau. Probably found in other localities of the middle Mekong, including the upland stretch in eastern Cambodia. Little or nothing is known about its preferred substrate, diet, or seasonal movements. Not caught commercially, but can be caught with seines.



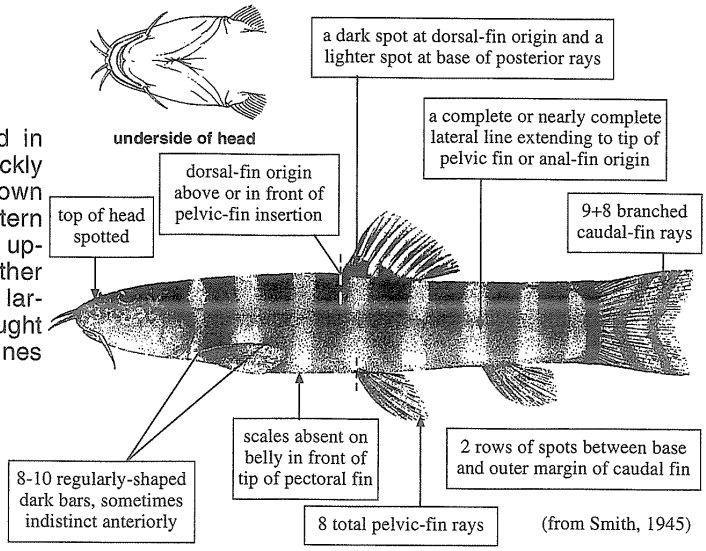
(after Kottelat, 1990)

Schistura nicholsi (Smith, 1933)

Local names:

Size: To 7 cm.

Habitat, biology, and fisheries: Found in shallow riffles in small streams with quickly flowing current over a pebble bottom. Known only from the Mekong basin in northeastern Thailand, and probably also occurs in the upland areas of eastern Cambodia. Like other nemacheilines, it probably feeds on insect larvae and small amounts of algae. Not caught commercially, but can be taken with seines and other small fishing gear.



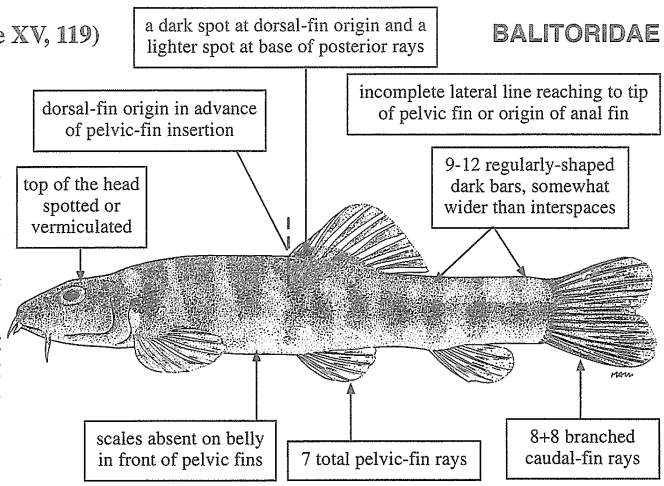
(from Smith, 1945)

Schistura pellegrini (Rendahl, 1944) (plate XV, 119) BALITORIDAE

Local names:

Size: To 6.5 cm.

Habitat, biology, and fisheries: Found in shallow, clear, fast-flowing water over rocky bottoms in upland streams of Cambodia and Vietnam. Specimens were collected in the Tonlé San and several tributaries, in 20 to 25 cm depth water with moderate current of less than 1 m/sec. Seasonal movements slight, if they occur at all. Diet consists of insect larvae, some algae, and phytoplankton. Not caught commercially, but might have possibilities in the aquarium trade. Caught with seines, dip-nets, or traps.



Genus *Tuberoschistura* BALITORIDAE

(1) SCALES TINY, REQUIRING MAGNIFICATION TO SEE; **(2)** 9 TO 12 BRANCHED DORSAL-FIN RAYS; **(3)** VENT CLOSER TO PELVIC-FIN BASE THAN TO ANAL FIN.

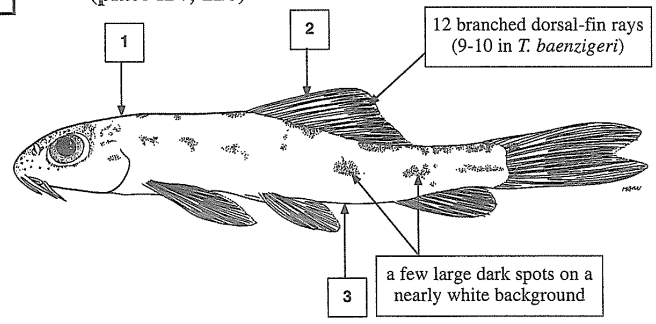
2 species possibly found in the Cambodian Mekong, 1 species included here.

Tuberoschistura cambodgiensis (Kottelat, 1983) (plate XV, 120)

Local names:

Size: Probably to 4 cm.

Habitat, biology, and fisheries: Known prior to this only from the holotype specimen. Previously found in a flowing stream with sandy bottom between Siem Reap and Kompong Thom near the Great Lake. Also found by the author in sandy bottomed streams south of Phnom Penh. Little is known about this species. Caught with seines and dip-nets.



(after Kottelat, 1990)

Genus *Vaillantella* BALITORIDAE

(1) SCALES TINY, REQUIRING MAGNIFICATION TO SEE; **(2)** LONG DORSAL FIN WITH MORE THAN 30 RAYS.

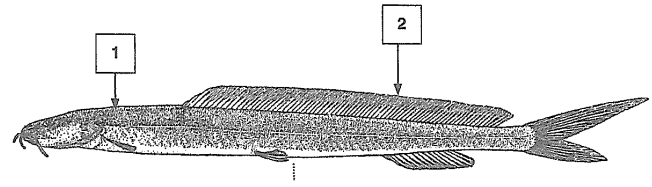
1 undescribed species recorded.

Vaillantella sp.

Local names:

Size: To 6 cm.

Habitat, biology, and fisheries: Found in flowing coastal streams of the Cardamom Range and probably also found on the Mekong side of the range. Little is known about this undescribed species. The illustration used here is of *Vaillantella maasi* from Borneo which gives an idea of the general body shape and fin conformation of the genus.



(from Weber and de Beaufort, 1916)

Family COBITIDAE

Subfamily BOTIINAE

Genus *Botia* **COBITIDAE**

(1) BODY OBLONG; (2) FREE ORBITAL RIM, EYES NOT COVERED WITH SKIN; (3) CAUDAL FIN DEEPLY FORKED; (4) 2 PAIRS OF BARBELS AT THE TIP OF THE SNOUT.

At least 11 species recorded from the Mekong, 8 of them included here.

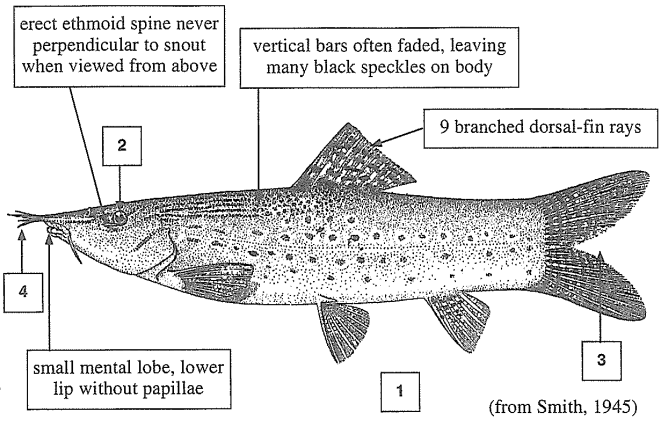
Botia beauforti Smith, 1931

Synonyms / misidentifications: *Botia lucasbahi, Botia berdmorei* (non Blyth).

FAO name: Chameleon botia.

Local names: Trey kanchrouk, ត្រី កង្កែក.

Size: To 25 cm.



(from Smith, 1945)

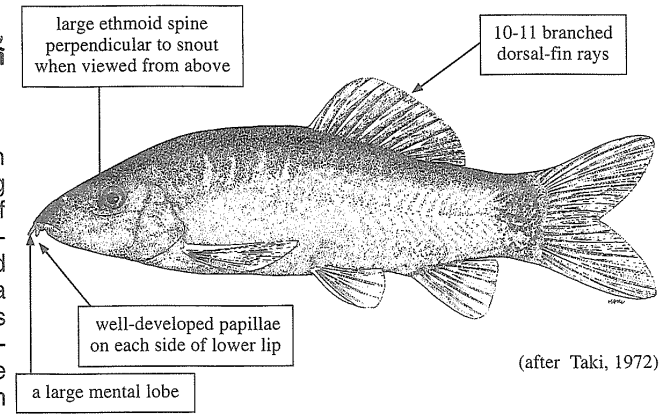
Habitat, biology, and fisheries: Found in small and medium-sized rivers, including those in the Mekong basin, from northern Thailand to Malaysia. Borrows in sand or digs holes under rocks. Diet consists of mollusks and crustaceans. Enters the flooded forest during the high-water periods and returns to the rivers during November and December in the lower Mekong. This species is much rarer than the somewhat similar looking *Botia helodes*. Intolerant of nitrates, it rapidly disappears from areas where fertilizers are applied to crops. Caught with seines, traps, and set-nets. Occasionally seen in fish markets. A regular component of the aquarium trade.

Botia eos Taki, 1972 (plate XVI, 121)

FAO name: Sun loach.

Local names: Trey kanchrouk krawhorm, ត្រី កង្កែកក្រហម.

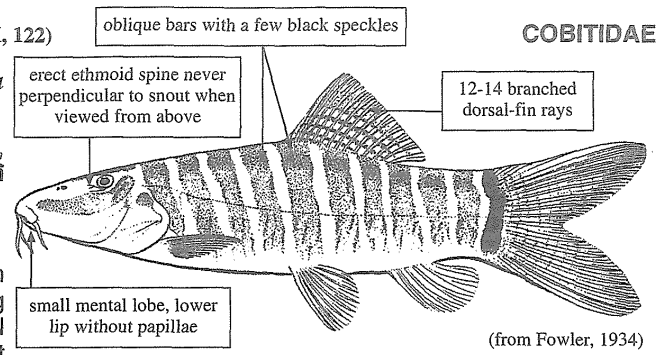
Size: To 11 cm.



(after Taki, 1972)

Habitat, biology, and fisheries: Found in areas of boulders or cobble in rapidly flowing stretches of large and medium-sized rivers of the middle Mekong basin. Probably non-migratory. Diet consists primarily of mollusks and occasionally other benthic invertebrates. Not a major commercial fish, but taken with seines and traps. Occasionally seen in markets during the dry season. An extremely aggressive species that is often seen in the aquarium trade, when individuals are imported together with the more peaceful *Botia morleti*. High breeding colours for males consist of navy blue on the body and fins with a red fringe on the dorsal fin.

Botia helodes Sauvage, 1876 (plate XVI, 122) COBITIDAE



Synonyms / misidentifications: *Botia hymenophysa* (non Bleeker).

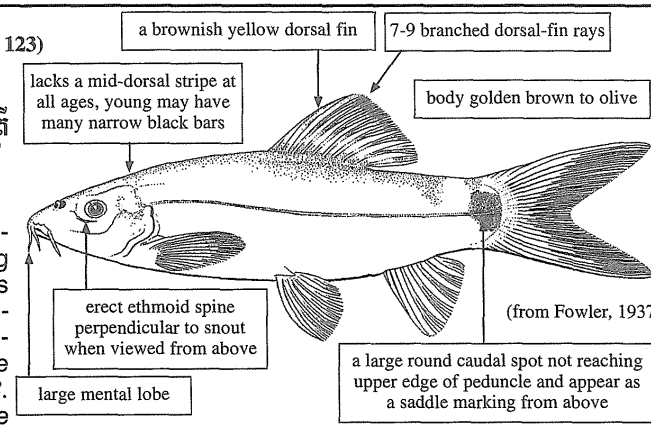
FAO name: Tiger botia.

Local names: Trey kanchrouk chhnoht, ត្រីកង្រែកឆ្នូត.

Size: To 25 cm.

Habitat, biology, and fisheries: Found at bottom depths in flowing rivers of all sizes in the Mekong and Chao Phrya basins. Can be taken in small upland streams with fast currents, as well as at bottom depths in the Great Lake. Shows a distinct preference for bottom cover of rocks, logs, or even brush piles. A nocturnal or crepuscular fish, feeding on mollusks, benthic insect larvae, and worms. Moves into flooded areas during the rainy season and returns to rivers during November and December, where it is a common element of the dai-net catch in the Tonlé Sap. Easily taken by seines, set-nets, cast-nets, and traps. Sometimes marketed fresh. Made into prahoc along the Tonlé Sap. Commonly seen in the aquarium trade.

Botia lecontei Fowler, 1937 (plate XVI, 123)



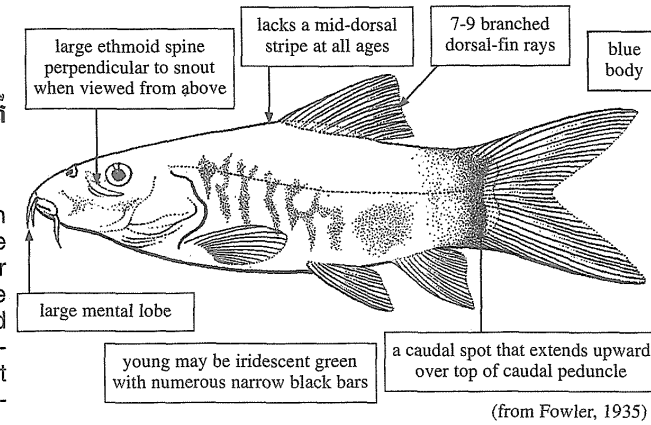
FAO name: Silver botia.

Local names: Trey kanchrouk loeung, ត្រីកង្រែកឈើង.

Size: To 15 cm.

Habitat, biology, and fisheries: Found at bottom depths in flowing rivers of the Mekong basin. Like other members of the genus, this species takes shelter during the day in crevices and under bottom cover of rocks, tree-limbs, or other objects and comes out to forage during dusk and night. Less common than *B. helodes* or *B. modesta*, but usually found in the same places. Feeds on mollusks and other benthic invertebrates. Caught with seines, set-nets, and traps. Made into prahoc on the Tonlé Sap. When the young of the year return to the river in November and December, this species along with *B. helodes, B. morleti* and *B. modesta* is often used as food for fish reared in cage culture. Commonly seen in the aquarium trade.

Botia modesta Bleeker, 1865 (plate XVI, 124)



FAO name: Redtail botia.

Local names: Trey kanchrouk krawhorm, ត្រីកង្រែកក្រហម.

Size: To 25 cm.

Habitat, biology, and fisheries: Found in flowing waters of all sizes in most rivers of the Chao Phrya and Mekong basins. Takes cover in holes under rocks or in crevices under tree limbs or other objects during the day and comes out to forage at night. Primarily a mollusk eater, but also feeds on benthic insect larvae and worms. Probably the most common member of the genus. It moves into temporarily inundated areas during high water periods and returns to rivers as water levels decline. Most common in the Tonlé Sap during November and December when it forms a substantial part of the dai-net catch. Known to participate in large migrations during January in upland areas of the Mekong. Taken by seines, traps, and push-nets that are primarily used for shrimp. Used to make prahoc and also as food for cage cultured fishes. Commonly seen in the aquarium trade.

COBITIDAE

Botia morleti Tirant, 1885 **(plate XVI, 125)**

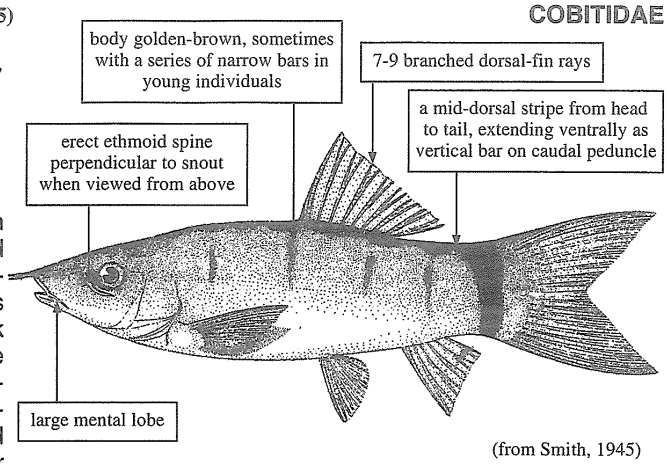
Synonyms / misidentifications: *Botia horae, Botia modesta* (non Bleeker).

FAO name: Skunk botia.

Local names: Trey kanchrouk, ត្រីកង្រួក.

Size: To 9.5 cm, usually smaller.

Habitat, biology, and fisheries: Found in standing and flowing waters of the Mekong and Chao Phrya basins. This species lives in crevices in rocks or excavates burrows under rocks or logs. It was seen by the author near rock outcrops in Thai reservoirs and found to be unaffected or mildly affected at most by rotenone. Feeds on mollusks and benthic invertebrates. Probably moves into temporarily flooded areas during high water levels. Young of the year return to rivers in November and December in the lower Mekong basin. Can be collected by seines, set-nets, or traps, but is only a small part of the commercial fish catch. Commonly seen in the aquarium trade.



(from Smith, 1945)

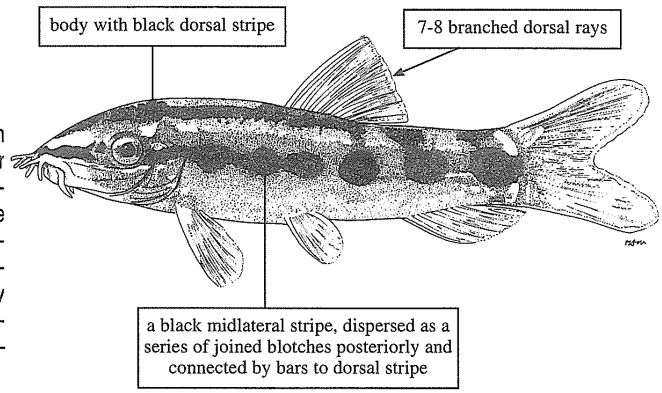
Botia sidthimunki Klausewitz, 1959

FAO name: Dwarf botia.

Local name:

Size: To 5.5 cm.

Habitat, biology, and fisheries: Found in small muddy lakes and other standing water habitats in the Chao Phrya and Mekong basins. Active by day and often schools in some distance above the bottom. Apparently becoming less common. Feeds on aquatic invertebrates and probably utilizes seasonally flooded habitats. Caught with seines and set-nets. Not fished commercially, but highly regarded as aquarium fish.



Botia sp. **(plate XVI, 126 and 127)**

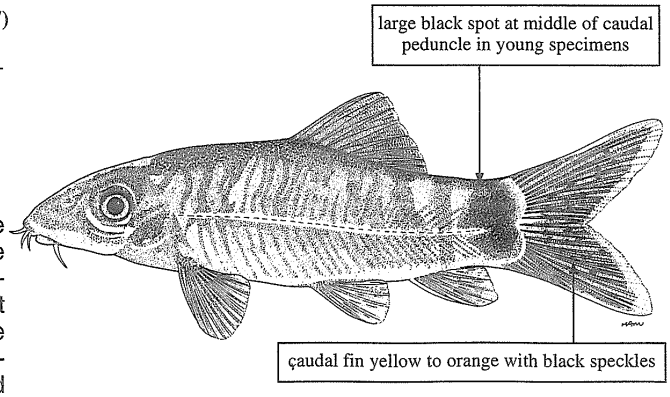
Synonyms / misidentifications: *Botia modesta* (non Bleeker).

FAO names: Speckletail botia.

Local names: Trey kanchrouk, ត្រីកង្រួក.

Size: To at least 20 cm.

Habitat, biology, and fisheries: Found in the middle Mekong, most commonly along the part that forms the Thai-Lao border, and probably downstream in Cambodia, although not yet recorded from there. Specimens were seen in fish markets along the river in Khemerat and Mukdahan between February and March, but these may have been caught in streams in Laos. Feeds on mollusks and benthic invertebrates like other species of the genus, and may move into flooded forests during the high water periods. It may be a participant in the January *Botia* migrations of the middle Mekong. This undescribed species is probably the closest relative of another undescribed species of *Botia* from the Meklong River of Thailand which has a yellow tail and grey dorsal fin and which has also occasionally been misidentified as *Botia modesta*. In contrast to the yellowtail botia it is not seen in the aquarium trade.



Subfamily COBITINAE

Genus *Acanthopsoides* **COBITIDAE**

(1) BODY ELONGATE; (2) EYES LACKING FREE ORBITAL RIM; (3) CAUDAL FIN SHALLOWLY FORKED OR TRUNCATE; (4) A SINGLE PAIR OF BARBELS AT TIP OF SNOUT; (5) 7 BRANCHED DORSAL-FIN RAYS; (6) SUPRAORBITAL BONE ON THE ANTERIOR RIM OF ORBIT.

4 or 5 species possibly present, 3 of them included here.

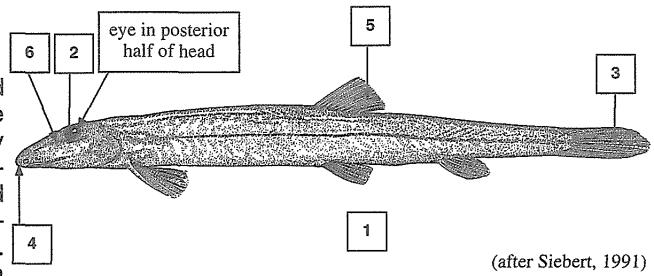
Acanthopsoides delphax Siebert, 1991

(plate XVI, 128)

Local names:

Size: To 6 cm.

Habitat, biology, and fisheries: Recorded from large river habitats in upland areas of the Mekong basin on the Khorat Plateau and may be found in Cambodia. Found over sand substrate, which it probably burrows into to avoid predation. Diet consists of benthic invertebrates. Little else is known about its habits. Not caught commerically, but can be taken with seines and trawls.



(after Siebert, 1991)

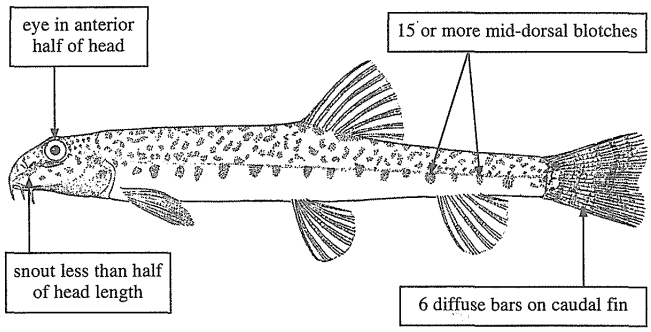
Acanthopsoides gracilentus (Smith, 1945)

Synonyms / misidentifications: *Neacanthopsis gracilentus.*

Local names:

Size: To 6 cm.

Habitat, biology, and fisheries: Found over sandy bottoms in medium to large rivers of the Chao Phrya and Mekong basins. Occurs in the northern part of the Khorat Plateau and is possibly found as far downstream as northern Cambodia. Feeds on benthic invertebrates. Little or nothing is known about its seasonal movements. Not fished commercially, but can be taken with seines or trawls.



(from Smith, 1945)

Acanthopsoides hapalias Siebert, 1991

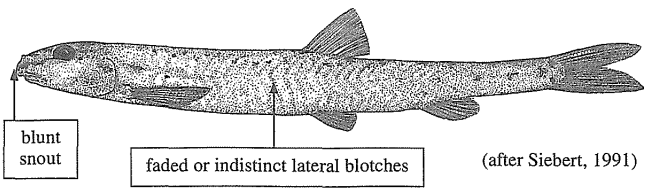
(plate XVII, 129)

Synonyms / misidentifications: *Acanthopsoides gracilis* (non Fowler), ?*Acanthopsoides molobrion.*

Local names:

Size: To 6 cm.

Habitat, biology, and fisheries: Found in shallow sandy backwater areas of the Chao Phrya and Mekong basins, including the lower Mekong basin in Cambodia. Specimens were collected by the author in the Siem Reap River near Angkor Thom. Feeds on benthic invertebrates, particularly chironomid larvae, and some algae. Its seasonal movements are not known. Not fished commercially, but can be caught with seines or trawls. Another species, *Acanthopsoides molobrion* Siebert, 1991, was described in the same paper as *A. hapalias*, but both possibly represent the same species. They are distinguished in Siebert's key by geographical distribution, which is obviously unsatisfactory (see the introduction to this field guide). The illustrated differences in head shape (Siebert, 1991) may be due to allometric growth. This is all the more likely as the illustrated specimens are apparently not adults. Larger specimens to about 6 cm were reported by Taki (1974), who listed and illustrated this species as *A. gracilis*. Unless better distinguishing characters are found, *A. hapalias* and *A. molobrion* should be regarded as the same species.



(after Siebert, 1991)

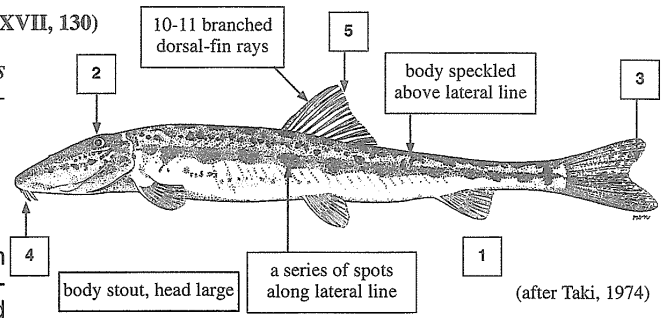
Genus *Acantopsis* **COBITIDAE**

(1) BODY ELONGATE; (2) EYES LACKING FREE ORBITAL RIM; (3) CAUDAL FIN SHALLOWLY FORKED; (4) A SINGLE PAIR OF BARBELS AT TIP OF SNOUT; (5) 9 TO 11 BRANCHED DORSAL-FIN RAYS.

At least 3 species recorded from the Mekong.

Acantopsis sp. 1

(plate XVII, 130)



(after Taki, 1974)

Synonyms / misidentifications: *Acanthopsis dialuzona* (non Bleeker), *Acanthopsis choirorhynchos* (non Bleeker).

FAO name: Speckled horseface loach.

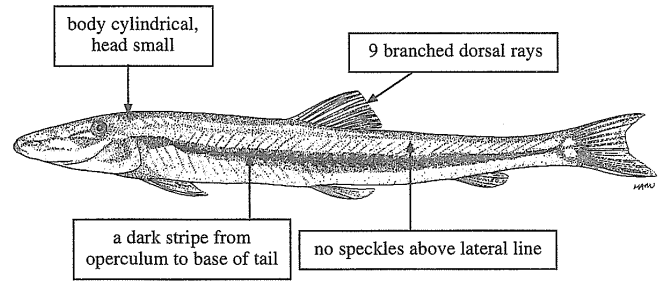
Local names: Trey ruschek, ត្រីរួសរ៉ែក.

Size: To 23 cm.

Habitat, biology, and fisheries: Lives on sandy bottoms of large and medium-sized rivers from Chao Phrya and Mekong of Thailand and possibly Cambodia. Stays in river channels and is always found on sand or fine pea-gravel, which it dives into to escape predation. Lips and mouth cavity are densely covered with papillae which aid the sense of taste. Feeds on benthic and burrowing invertebrates and detritus by taking sand into its mouth, flushing the sand through the mouth and out the gill openings while removing and swallowing food. Commonly marketed fresh, and also a desirable fish in the aquarium trade. A member of a diverse genus, with at least 4 members in the Chao Phrya and at least 3 members in the Mekong. Neither *A. choirorhynchos* nor *A. dialuzona* are found in the Mekong or the Chao Phrya although every previous record used these names. This genus is currently being revised taxonomically.

Acantopsis sp. 2

(plate XVII, 131)



Synonyms / misidentifications: *Acanthopsis choirorhynchos* (non Bleeker)

FAO name: Striped horseface loach.

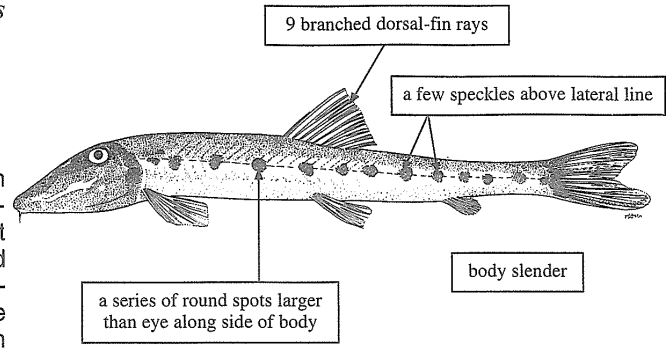
Local names: Trey ruschek, ត្រីរួសរ៉ែក.

Size: To 13 cm.

Habitat, biology, and fisheries: Lives on sandy bottoms of large and medium-sized rivers from the middle and lower Mekong basin of Thailand to Vietnam. Habits are probably similar to the previous species. Can be taken with trawls, seines, and set-nets. Harvested by dai-nets on the Tonlé Sap where it is made into prahoc. Not seen in the aquarium trade.

Acantopsis sp. 3

(plate XVII, 132)



Synonyms / misidentifications: *Acanthopsis choirorhynchos* (non Bleeker).

FAO name: Spotted horseface loach.

Local names: Trey ruschek, ត្រីរួសរ៉ែក.

Size: To 12 cm.

Habitat, biology, and fisheries: Lives on sandy bottoms of large and medium-sized rivers in the upland Mekong of Cambodia. Not common in the middle Mekong of Thailand and Laos and not yet reported from the lower Mekong of the Great Lake to Vietnam. Habits are probably similar to the previous 2 species. Can be taken with seines. Not seen in markets.

Genus *Lepidocephalichthys* **COBITIDAE**

(1) BODY ELONGATE; (2) EYES LACKING FREE ORBITAL MARGIN; (3) CAUDAL FIN TRUNCATE; (4) A SINGLE PAIR OF BARBELS AT TIP OF SNOUT; (5) DORSAL-FIN ORIGIN OVER PELVIC FIN WITH 6 BRANCHED RAYS; (6) HEAD SCALED ON CHEEKS AND OPERCULUM.

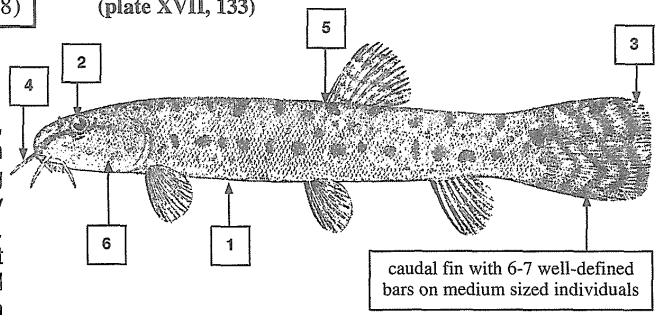
At least 2 species recorded in the Cambodian Mekong.

Lepidocephalichthys birmanicus (Rendahl, 1948) **(plate XVII, 133)**

Local names:

Size: To 11 cm, possibly up to 14 cm.

Habitat, biology, and fisheries: Found in small, clear, swift streams with sandy bottoms from Myanmar to Malaysia, including the Mekong basin on the Khorat Plateau. It was collected by the author in a small tributary of the Se San. Based on its preferred habitat, it is unlikely that this species migrates. Diet includes worms and insect larvae along with some algae. Taken with seines, trawls, and traps.



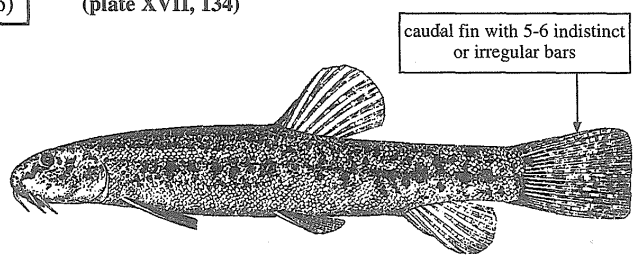
(from Smith, 1945)

Lepidocephalichthys hasselti (Valenciennes, 1846) **(plate XVII, 134)**

Local names:

Size: To about 4.5 cm.

Habitat, biology, and fisheries: Found in slow-moving, shallow, waters of canals and inundated floodplains from Thailand to Indonesia. It has prospered in some impoundments in Thailand. Probably moves to shallow waters of about 10 cm on flooded grasslands. Preferred food is zooplakton but occasionally feeds on some algae. Not seen in markets. Caught with seines and traps.



(from Weber and de Beaufort, 1916)

Genus *Pangio* **COBITIDAE**

(1) BODY ELONGATE TO EEL-LIKE; (2) EYES LACKING FREE ORBITAL MARGIN; (3) CAUDAL FIN TRUNCATE OR EMARGINATE; (4) A SINGLE PAIR OF BARBELS AT TIP OF SNOUT; (5) DORSAL-FIN ORIGIN DISPLACED POSTERIORLY, ABOVE ANAL FIN WITH 6 BRANCHED RAYS; (6) HEAD LACKING SCALES ENTIRELY.

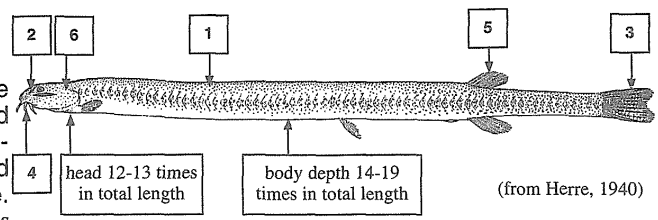
2 species recorded from the Mekong, 4 additional species possible.

Pangio anguillaris (Vaillant, 1892) **(plate XVII, 135)**

Local names:

Size: To 9 cm.

Habitat, biology, and fisheries: Found near the bottom over sand or silt substrates in debris and decaying vegetation flowing in waters from Thailand to Indonesia. Spends much of its time buried in the sand or slowly foraging across the surface. Most species of the genus *Acanthophthalmus* breed in very shallow water with a lot of vegetation, most commonly in flooded forests or grasslands along the water edge. Members of this genus feed mostly on benthic invertebrates. Not fished commercially. Taken with fine-meshed seines or even trawls. Occasionally seen in the aquarium trade.



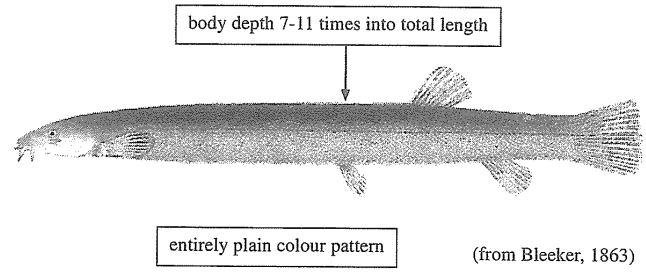
(from Herre, 1940)

Pangio oblonga (Valenciennes, 1846) (plate XVII, 136) COBITIDAE

Local names:

Size: To 8 cm.

Habitat, biology, and fisheries: Found near the bottom in sluggish parts of rapidly flowing streams water from Thailand to Indonesia. Usually occurs as scattered individuals over sand substrates in fairly shallow water. Probably spawns in flooded forests in very shallow water. Feeds primarily on benthic invertebrates. Not fished commercially. Caught in seines or other fine-meshed nets.



(from Bleeker, 1863)

Family GYRINOCHEILIDAE

Genus *Gyrinocheilus* GYRINOCHEILIDAE

(1) GILL CHAMBER WITH AN INCURRENT OPENING (SPIRACLE) ABOVE THE EXCURRENT OPENING OF THE GILL CLEFT; (2) NO BARBELS; (3) SNOUT AND UPPER LIP CONTINUOUS.

2 species recorded.

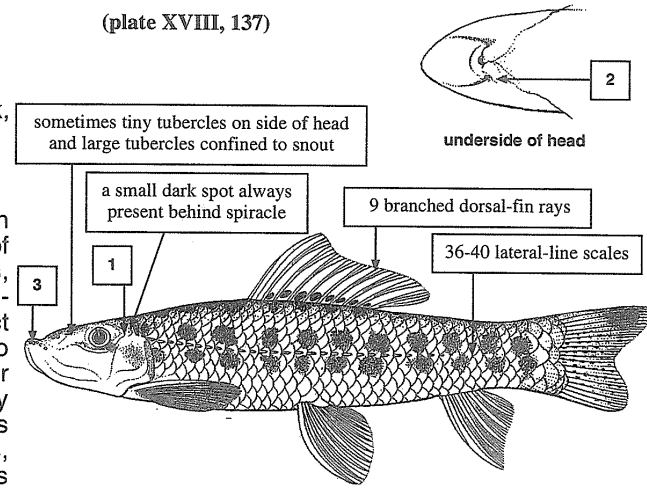
Gyrinocheilus aymonieri (Tirant, 1884) (plate XVIII, 137)

FAO name: Siamese algae eater.

Local names: Trey bandaul sok, Trey smok, ត្រី បណ្ដូលសុក. ត្រី ស្មុក.

Size: To 20 cm.

Habitat, biology, and fisheries: Found on solid surfaces in flowing waters over much of mainland Southeast Asia. Mostly herbivorous, with a diet consisting largely of algae, periphyton, and phytoplankton. Feeds also on insect larvae or zooplankton. In current, it holds onto fixed objects with its sucker-like mouth. For breathing it pumps water into the gill cavity through a small spiracle and across the gills for gas exchange. Caught with seines, trawls, set-nets, traps, or gill nets. Large individuals are sold in markets, smaller ones are used to make prahoc.



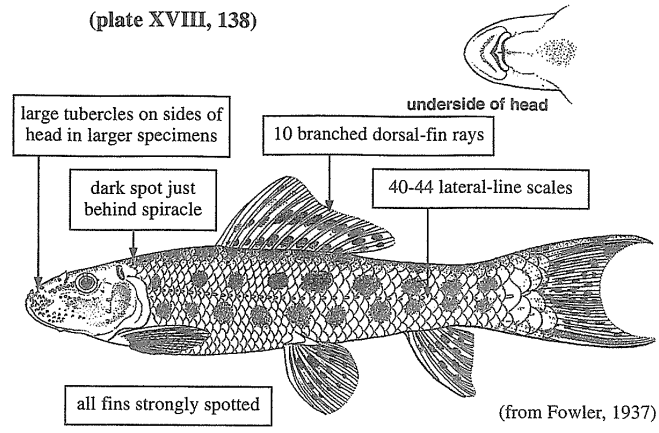
Gyrinocheilus pennocki (Fowler, 1937) (plate XVIII, 138)

FAO name: Spotted algae eater.

Local names: Trey smok, ត្រី ស្មុក.

Size: To 28 cm.

Habitat, biology, and fisheries: Found on solid surfaces in flowing waters of the Mekong basin. Habits and biology are similar to *G. aymonieri*, but grows considerably larger. Large adults are often seen in the markets of the upland Mekong. Taken with seines, trawls, gill-nets, set-nets, and traps.



(from Fowler, 1937)

Order SILURIFORMES

Family BAGRIDAE

Genus *Bagrichthys* **BAGRIDAE**

(1) EYE SUBCUTAEOUS, ORBITAL RIM CONTINUOUS WITH SKIN COVERING EYE; (2) GILL MEMBRANES UNITED ACROSS ISTHMUS; (3) DORSAL-FIN SPINE SERRATED POSTERIORLY WITH TEETH DIRECTED UPWARD.

2 species recorded.

Bagrichthys macracanthus (Bleeker, 1854)

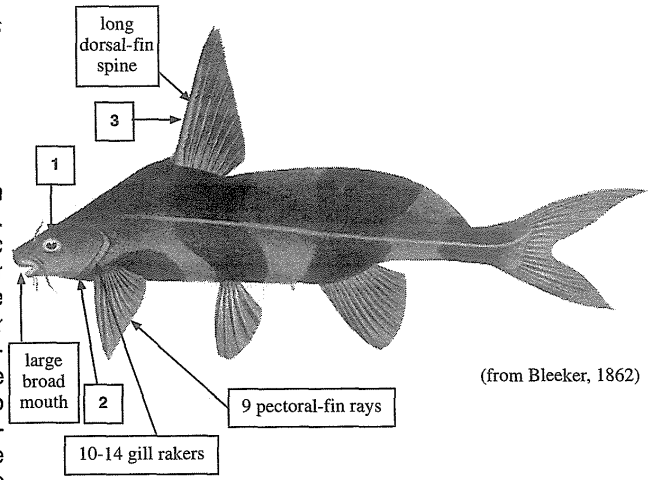
Synonyms / misidentifications: *Bagroides macracanthus.*

FAO name: Black lancer catfish.

Local names: Trey chek tum, ត្រីចិត ធំ.

Size: To 25 cm.

Habitat, biology, and fisheries: Occurs in large muddy rivers from Thailand to Indonesia. Feeds on crustaceans, other small benthic animals (Taki, 1978), and on detritus of higher plants (Roberts, 1989) which is much more slowly digested and remains in the gut for longer periods of time. Spawns at the beginning of the rainy season and utilizes the flooded riparian forests. Juveniles begin to appear in August. Caught with seines, gill-nets, and traps. Marketed fresh. There may be more than one long-spined species of this genus in the Mekong.



(from Bleeker, 1862)

Bagrichthys macropterus Bleeker, 1853

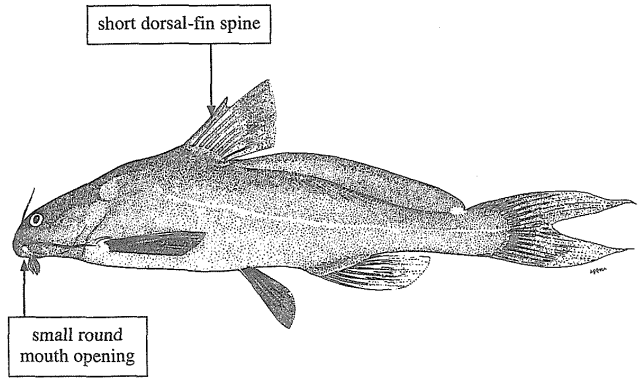
Synonyms / misidentifications: *Bagroides macropterus.*

FAO name: False black lancer catfish.

Local names: Trey chek tum, ត្រីចិត ធំ.

Size: To 26 cm.

Habitat, biology, and fisheries: Occurs in large muddy rivers from Thailand to Indonesia. Feeds on small fishes, benthic invertebrates, and large amounts of plant detritus. Spawns at the beginning of the rainy season and utilizes flooded forests along the river edge. Juveniles appear in August. Caught with seines, gill-nets, and traps. Sold fresh in markets. The Mekong specimens lack the narrow white mid-lateral stripe that is found in Indonesian specimens and may represent an undescribed species.



Genus *Heterobagrus* **BAGRIDAE**

(1) EYE NOT SUBCUTANEOUS, ORBITAL RIM FREE; **(2)** GILL MEMBRANES ALMOST TOTALLY SEPARATED; **(3)** DORSAL FIN SPINE EXTREMELY LONG AND UNSERRATED.

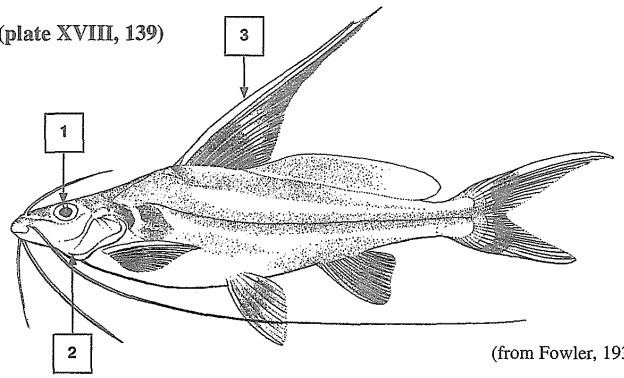
1 species recorded.

Heterobagrus bocourti Bleeker, 1854 **(plate XVIII, 139)**

Local names: Trey kanchos kdaung, ត្រីកណ្តុះក្តោង.

Size: To 24 cm.

Habitat, biology, and fisheries: Common in the Tonlé Sap near the Great Lake. Feeds on crustaceans and benthic invertebrates. Little is known about its breeding or migratory habits. Caught with seines, cast-nets, and gill-nets. Usually marketed fresh.



(from Fowler, 1937)

Genus *Leiocassis* **BAGRIDAE**

(1) EYE SUBCUTANEOUS, ORBITAL RIM CONTINUOUS WITH SKIN COVERING EYE; **(2)** GILL MEMBRANES ALMOST TOTALLY SEPARATED FROM EACH OTHER; **(3)** DORSAL-FIN SPINE SERRATIONS DIRECTED DOWNWARD.

2 species recorded, with 5 additional species from the Malay Peninsula likely to occur in the Mekong.

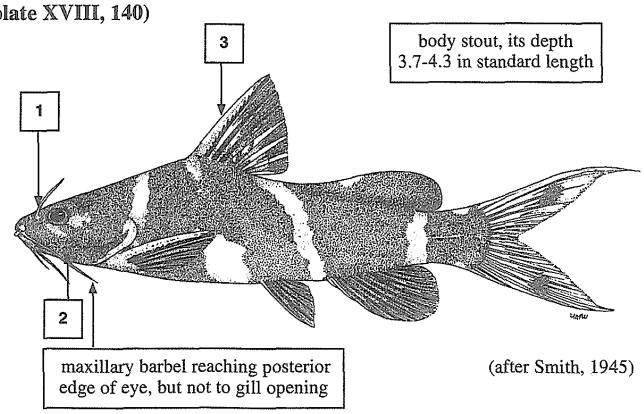
Leiocassis siamensis Regan, 1913 **(plate XVIII, 140)**

FAO name: Asian bumblebee catfish.

Local names: Trey kanchos thmor, ត្រីកណ្តុះធ្មៃ.

Size: To 17 cm.

Habitat, biology, and fisheries: Found in rivers and streams of the Mekong and Chao Phrya basins along with the rivers that empty into the Gulf of Thailand. Diet consists of aquatic insect larvae, including odonatans. Adult females captured in February had well-developed ova, and spawning takes place at the beginning of the rainy season, with the young appearing in fishing nets during August. Taken with seines, gill-nets and, traps and marketed fresh.



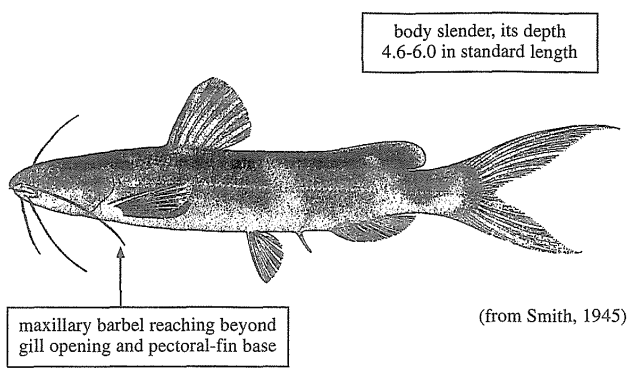
(after Smith, 1945)

Leiocassis stenomus (Valenciennes, 1839)

Local names: Trey chhlang, ត្រីឆ្លាំង.

Size: To 12 cm.

Habitat, biology, and fisheries: Found in rivers and streams from Thailand to Indonesia. Not much is known about the biology of this species, but its feeding habits and breeding patterns are probably similar to *L. siamensis*. Caught with seines and gill-nets.

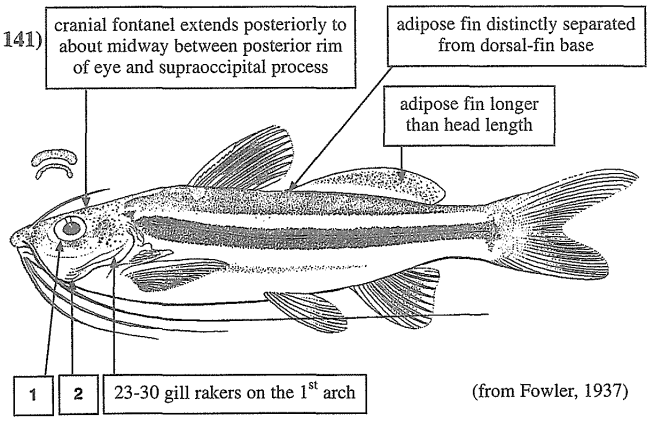


(from Smith, 1945)

Genus *Mystus* **BAGRIDAE**

(1) EYE NOT SUBCUTANEOUS, ORBITAL RIM FREE; (2) GILL MEMBRANES ALMOST TOTALLY SEPARATED.
13 species recorded.

Mystus atrifasciatus Fowler, 1937 (plate XVIII, 141)



(from Fowler, 1937)

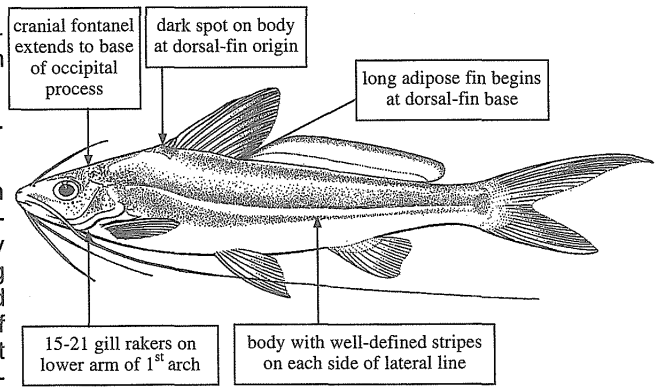
Synonyms / misidentifications: *Mystus vittatus* (non Bloch); *Mystus rhegma* (non Fowler).

Local names: Trey kanchos chhnoht, ត្រីកណ្ដុះឆ្នូត.

Size: To 15 cm.

Habitat, biology, and fisheries: Known from rivers, streams, and reservoirs of the Chao Phrya, Mekong, and Meklong basins. Mostly carnivorous, feeding primarily on crustaceans and zooplankton along with small bits of algae and fish scales. May forage in schools like the other small striped species of *Mystus*. Moves into floodplains during periods of high water and is often found in places with submerged woody vegetation. Caught with seines, gill-nets, and cast-nets. Usually marketed fresh, and may also be sold smoked on skewers.

Mystus albolineatus Roberts, 1994



(from Fowler, 1935)

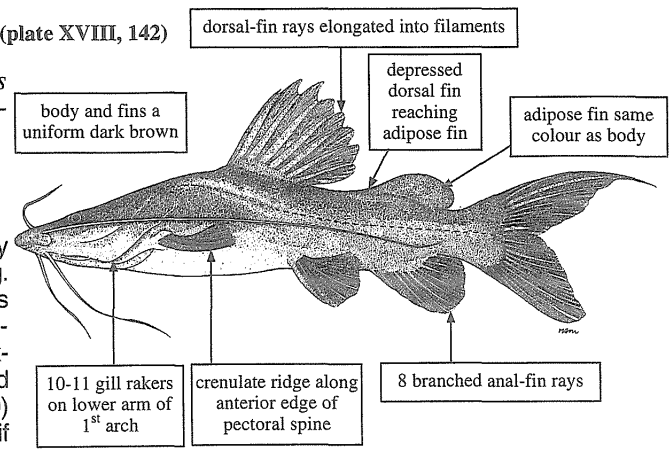
Synonyms / misidentifications: *Mystus nigriceps* (non Valenciennes); *Mystus cavasius* (non Hamilton).

Local names: Trey kanchos bay, ត្រីកណ្ដុះបាយ.

Size: To 35 cm.

Habitat, biology, and fisheries: Known from flowing and standing waters in the lower Mekong, especially around submerged woody vegetation. Feeds on insect larvae, including chironomids, as well as zooplankton and fishes. Spawns just prior to, or at the onset of the rainy season and its young are first caught in July and August. Taken with seines, cast-nets, gill-nets, and traps. Marketed fresh or smoked on a skewer.

Mystus filamentus (Fang and Chaux, 1949) (plate XVIII, 142)



Synonyms / misidentifications: *Mystus planiceps* (non Valenciennes); *Mystus nemurus* (non Bleeker); ?*Mystus johorensis*.

Local names: Trey tanel, ត្រីតានេល.

Size: To 50 cm.

Habitat, biology, and fisheries: Occurs in slowly flowing or standing waters of the lower Mekong. Common in the Great Lake. Feeds on crustaceans and fishes. Moves into flooded forests during periods of high water levels. Caught by seines, hook-and-line, gill-nets, set-nets, and traps. Marketed fresh. The name *Mystus johorensis* (Herre, 1940) may be a senior synonym of this species and if so, would have priority.

BAGRIDAE

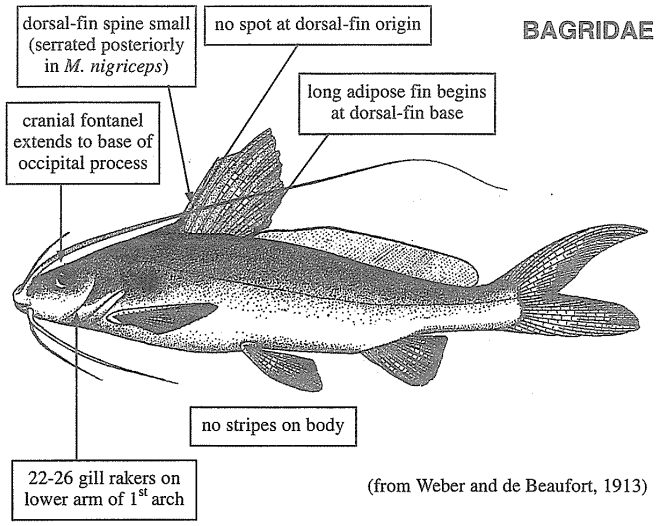
Mystus singaringan (Bleeker, 1846)

Synonyms / misidentifications: *Mystus nigriceps* (non Valenciennes); *Mystus macronema*; *Mystus cavasius* (non Hamilton).

Local names: Trey kanchos, ត្រីកញ្ជុះ.

Size: To 20 cm.

Habitat, biology, and fisheries: Found in flowing and standing fresh waters in the middle Mekong, where it may replace *M. albolineatus* which seems to occur only in the lowland floodplain rivers. Feeds on insect larvae, zooplankton, and small fishes. Moves into the flooded riparian forests during periods of high water, and returns to the rivers during November and December. Caught with seines, gill-nets, cast-nets, and traps. Usually marketed fresh. The illustration used here is of *M. nigriceps*, which has not yet been recorded from the Mekong, but shows a similar coloration.



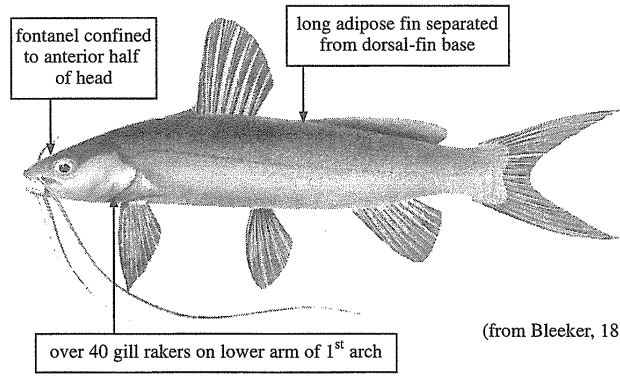
(from Weber and de Beaufort, 1913)

Mystus micracanthus (Bleeker, 1846)

Local names: Trey kanchos, ត្រីកញ្ជុះ.

Size: To 15 cm.

Habitat, biology, and fisheries: Found in large rivers of the lower Mekong as well as in Malaysia and Indonesia. Its presence in Cambodia is based on the report by Desoutter (1975), but further records are not known. Feeds on insect larvae and zooplankton. Caught with seines and gill-nets.



(from Bleeker, 1862)

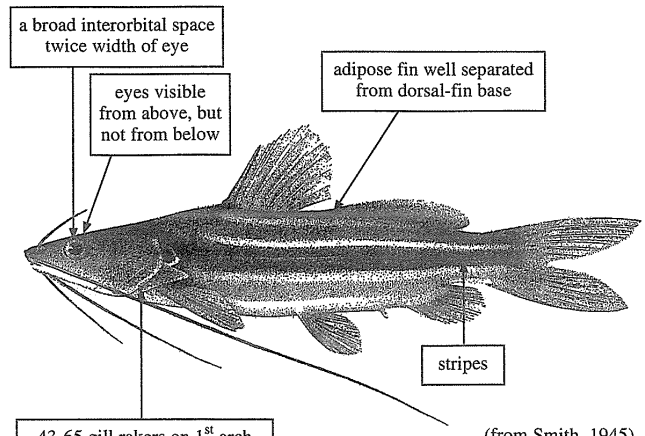
Mystus multiradiatus Roberts, 1992 **(plate XVIII, 143)**

Synonyms / misidentifications: *Mystus vittatus* (non Bloch).

Local names: Trey kanchos chhnoht, ត្រីកញ្ជុះឆ្នុត.

Size: To 14 cm.

Habitat, biology, and fisheries: Known from rivers and streams in the Chao Phrya and Mekong basins of Thailand. Often found in mixed schools with *M. mysticetus* which congregate around tree limbs and other solid objects, browsing the hard surfaces for zooplankton, crustaceans, aquatic insects, and some plant debris. Moves into the flooded forest during the flood season. Caught with seines, cast-nets, gill-nets, and traps. May be sold fresh or smoked on a skewer.



(from Smith, 1945)

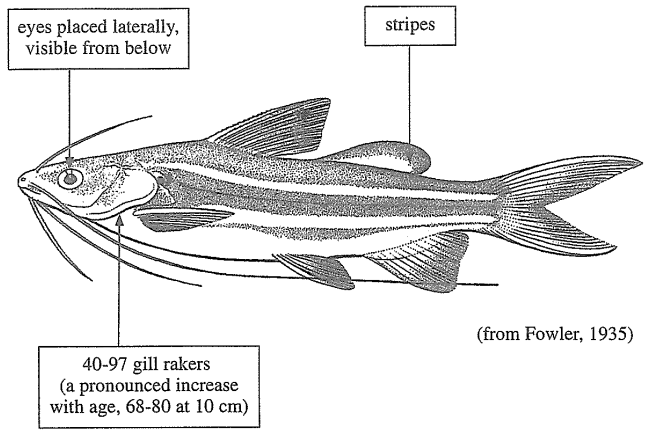
Mystus mysticetus Roberts, 1992 (plate XVIII, 144) BAGRIDAE

Synonyms / misidentifications: *Mystus vittatus* (non Bloch).

Local names: Trey kanchos chhnoht, ត្រីកញ្ជុះឆ្នូត.

Size: To 13 cm.

Habitat, biology, and fisheries: Common in fresh waters of the Chao Phrya and Mekong basins. Often found in mixed schools with *M. multiradiatus* which congregate around tree limbs and other solid objects, browsing the hard surfaces for zooplankton, aquatic insects, crustaceans, and rotifers. Moves into flooded forests during the rainy season and returns to rivers in November and December in the lower Mekong. Taken with seines, cast-nets, gill-nets, set-nets, and traps. Marketed fresh or smoked on a skewer.



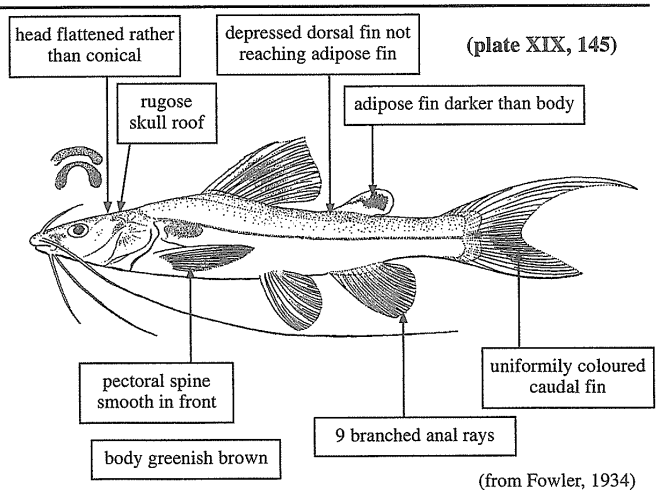
(from Fowler, 1935)

Mystus nemurus (Valenciennes, 1839) (plate XIX, 145)

Local names: Trey chhlang, ត្រីឆ្លាំង.

Size: To 65 cm.

Habitat, biology, and fisheries: Common from Thailand to Indonesia occurring in streams, canals, and reservoirs from upland areas down to the estuary. Diet includes exogenous insects, aquatic insect larvae, shrimps, and other crustaceans, as well as fishes. Moves into flooded forests to spawn and the young are usually first seen in August. In the Tonlé Sap, maximum numbers are found as it returns to rivers in November and December. Caught by seines, hook-and-line, gill-nets, cast-nets, set-nets and traps. Usually marketed fresh.



(from Fowler, 1934)

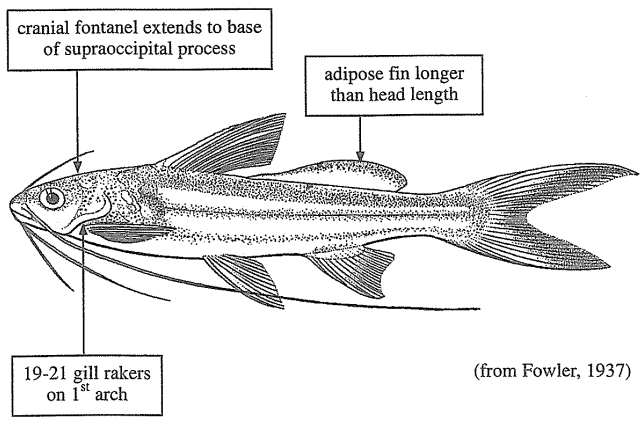
Mystus rhegma Fowler, 1935

Synonyms / misidentifications: *Mystus cavasius* (non Hamilton).

Local names: Trey kanchos, ត្រីកញ្ជុះ.

Size: To 12 cm.

Habitat, biology, and fisheries: Found in the middle Mekong. Diet consists of insect larve, fish scales, and other fish body parts, as well as plant debris. It is not known if it schools with the other small striped species of *Mystus*. Breeding habits and seasonal movements are unknown. Caught with seines, cast-nets, gill-nets, and set-nets.



(from Fowler, 1937)

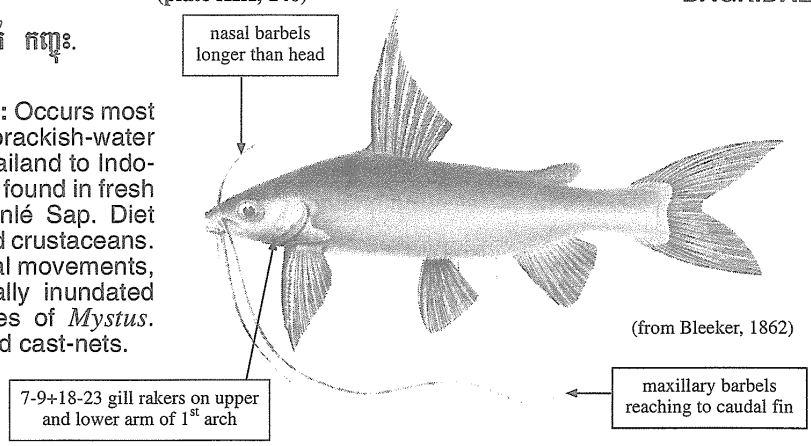
BAGRIDAE

Mystus wolffi (Bleeker, 1851) **(plate XIX, 146)**

Local names: Trey kanchos, ត្រី កន្ទុះ.

Size: To 20 cm.

Habitat, biology, and fisheries: Occurs most commonly in the tidal zone and brackish-water reaches of large rivers from Thailand to Indonesia. In the Mekong basin, it is found in fresh water well upstream in the Tonlé Sap. Diet consists primarily on insects and crustaceans. Little is known about its seasonal movements, but it may utilize the seasonally inundated areas as seen in other species of *Mystus*. Caught with seines, gill-nets and cast-nets.



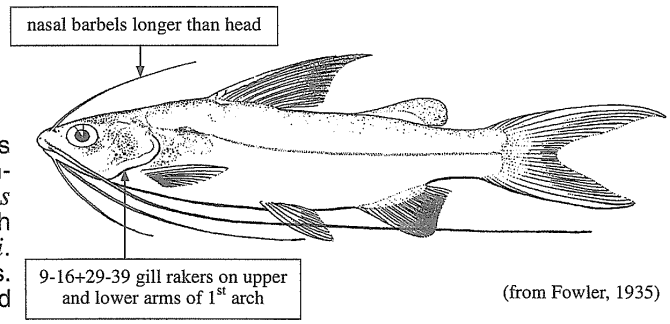
(from Bleeker, 1862)

Mystus sp. cf. *wolffi*

Local names: Trey kanchos, ត្រី កន្ទុះ.

Size: To 15 cm.

Habitat, biology, and fisheries: So far this species is known only from mainland Southeast Asia, in the same habitat as *Mystus wolffi*. Little is known about its habits which are probably similar to those of *M. wolffi*. Caught with seines, cast-nets, and gill-nets. Sometimes marketed fresh, but usually smoked on a skewer.



(from Fowler, 1935)

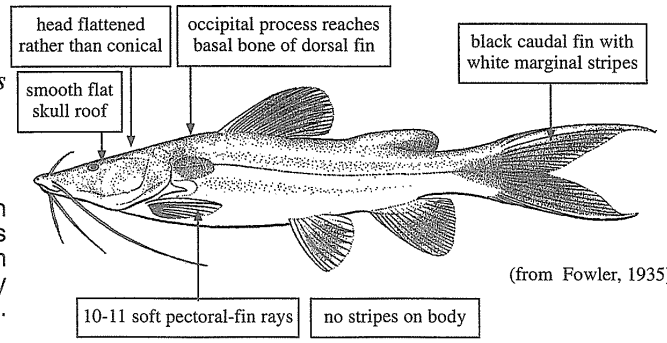
Mystus wycki (Bleeker, 1858)

Synonyms / misidentifications: *Mystus planiceps* (non Valenciennes).

Local names: Trey chhlang thmor, ត្រី ឆ្លាំងធំ.

Size: To 40 cm.

Habitat, biology, and fisheries: Occurs in large rivers from Thailand to Indonesia. Feeds on insects, prawns, and fishes. Little is known about its seasonal movements. Taken by seines, gill-nets, traps, and hook-and-line. Sold fresh in markets.



(from Fowler, 1935)

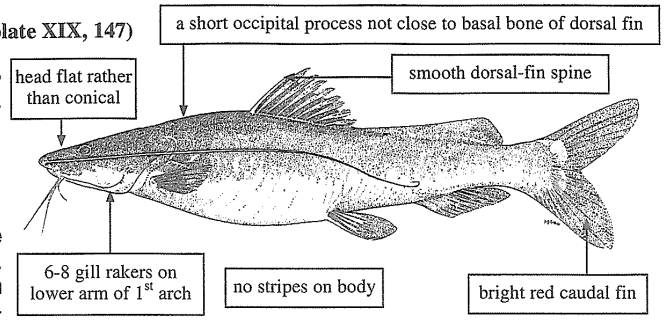
Mystus wyckioides Chaux and Fang, 1949 **(plate XIX, 147)**

Synonyms / misidentifications: *Mystus aubentoni, Mystus rubicauda, Mystus microphthalmus* (non Day).

Local names: Trey khya, ត្រី ខ្យា.

Size: To 70 cm, commonly to about 50 cm.

Habitat, biology, and fisheries: Found in large upland rivers in the Salween and Mekong basins. Sometimes found in the Tonlé Sap and floodplain rivers of the lower Mekong. Occurs most commonly in areas with rocky bottoms and irregular depths. Usually caught by hook-and-line, less often by drift gill-nets and seines. Marketed fresh. Although recently identified as *Mystus microphthalmus*, a species from the Irrawaddy, it differs in numerous ways from the original description in Day (1878) and the recent redescription of Irrawaddy specimens by Viswanath and Singh (1986).



Family SILURIDAE

Genus *Belodontichthys* — **SILURIDAE**

(1) HEAD STRONGLY UPTURNED, WITH MOUTH AT AN ANGLE OF 60° ABOVE HORIZONTAL; **(2)** SNOUT-TIP ABOVE DORSAL CONTOUR OF FISH.

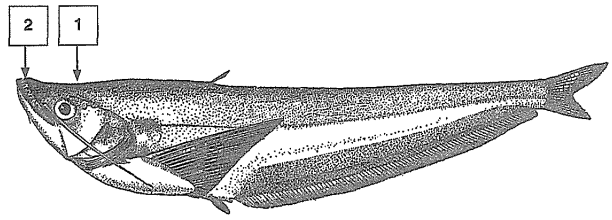
1 species recorded.

Belodontichthys dinema (Bleeker, 1851) (plate XIX, 148)

Synonyms / misidentifications: *Wallago dinema.*

Local names: Trey klang hay, ត្រីត្លាំងហាយ.

Size: To 70 cm.



(from Weber and de Beaufort, 1913)

Habitat, biology, and fisheries: Found from middle depths to the surface in deeper parts of large rivers from Thailand to Indonesia. Feeds on smaller fishes near the water surface. An excellent game fish that can be taken by hook-and-line, but is usually caught by cast-nets, gill-nets, or seines. Presently large numbers are being taken near Stung Treng by explosives. Marketed fresh or dried and salted. Around the Great Lake it is put on ice for export to Thailand.

Genus *Hemisilurus* — **SILURIDAE**

(1) MOUTH INFERIOR; **(2)** SNOUT ABRUPTLY TRUNCATE; **(3)** ANTERIOR NOSTRIL AT SNOUT TIP, POSTERIOR NOSTRIL ABOVE AND POSTERIOR TO EYE.

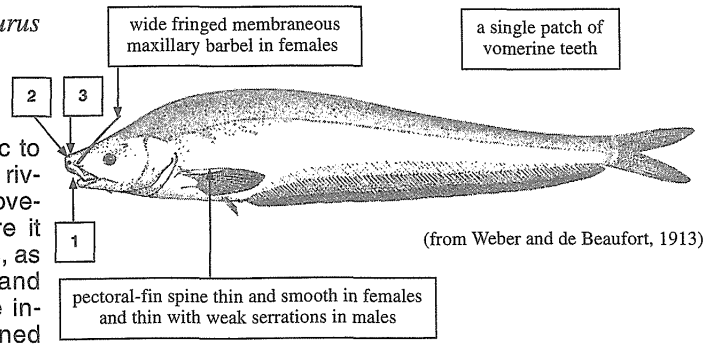
1 species recorded.

Hemisilurus mekongensis Bornbusch and Lundberg, 1989 (plate XIV, 149)

Synonyms / misidentifications: *Hemisilurus heterorhynchus* (non Bleeker).

Local names: Trey krormorm, ត្រីក្រម៉ម.

Size: To 80 cm.



(from Weber and de Beaufort, 1913)

Habitat, biology, and fisheries: Endemic to the Mekong basin, found in large upland rivers. Little is known about its seasonal movements. Browses along the bottom, where it feeds on worms, plants, and animal debris, as well as occasional insects. The mouth and gill cavity usually contain sand, and the intestine from several specimens examined contained mostly compacted lumps of fine sediment. A similar closely related species, *H. heterorhynchus* from Borneo is known to feed on fishes, prawns, crabs, some cladocerans, and rotifers (Vaas, 1952). Caught by seines, traps, gill-nets and hook-and-line. Marketed fresh.

Genus *Kryptopterus* **SILURIDAE**

(1) EYE SUBCUTANEOUS, ORBITAL RIM CONTINUOUS WITH SKIN COVERING EYE; (2) MOUTH SHORT, NOT EXTENDING TO EYE; (3) DORSAL FIN WITH 1 TO 2 RAYS, OR ABSENT; (4) 4 TO 8 PELVIC-FIN RAYS; (5) MAXILLARY BARBEL EXTENDING PAST GILL OPENING.

7 species present or likely to occur in the Cambodian Mekong.

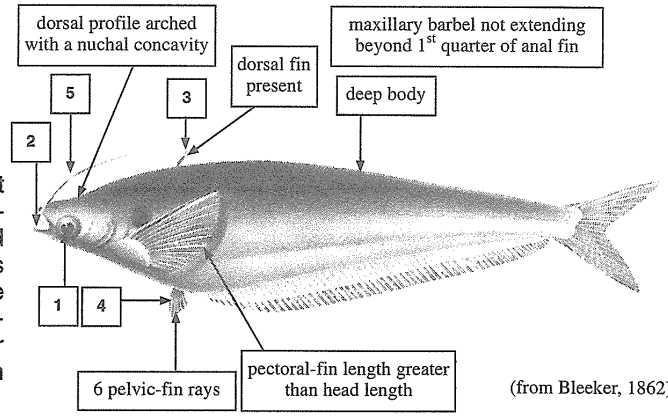
Kryptopterus bicirrhis (Valenciennes, 1839)

FAO name: Glass catfish.

Local names: Trey kes prak, ត្រីកេសប្រាក់.

Size: To 15 cm.

Habitat, biology, and fisheries: Found most commonly in lowland floodplains from Thailand to Indonesia. Also occurs in the upland river habitat of the middle Mekong. Feeds mostly on pelagic hemipterans and some small fishes. Caught by seines, cast-nets, set-nets, and push nets. Used to make prahoc or fish sauce, and regularly seen in the aquarium trade.



(from Bleeker, 1862)

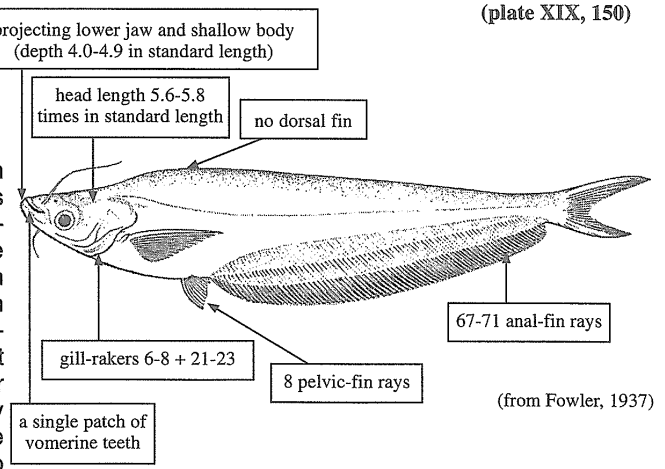
Kryptopterus cheveyi Durand, 1940

(plate XIX, 150)

Local names: Trey kamplieu snoeung, ត្រីកំភ្លៀវស្នែង.

Size: To 35 cm.

Habitat, biology, and fisheries: Found in rivers and canals of the Mekong basin. Feeds on larvae of chironomids and ephemeropterans as well as zooplankton and fishes. The mouth and gill cavity often contain sand when the fish is removed from the water. Caught with seines, cast-nets, and gill-nets. Several individuals sampled from the Stung Treng market had their stomachs projecting into their mouths caused by explosives being used by fishermen. Sold fresh or smoked and large individuals may be put on ice and shipped to Thailand.



(from Fowler, 1937)

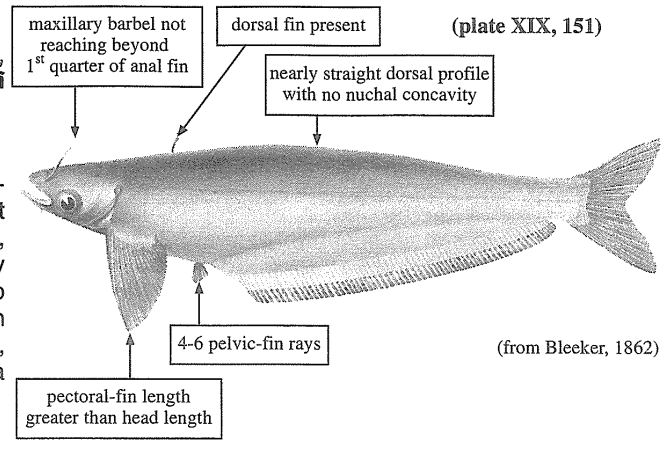
Kryptopterus cryptopterus (Bleeker, 1851)

(plate XIX, 151)

Local names: Trey kamplieu khlanh, ត្រីកំភ្លៀវខ្លាញ់.

Size: To 20 cm.

Habitat, biology, and fisheries: Found in rivers, streams, and canals and also in the Great Lake. Feeds mostly on fish, along with prawns, insects, and their larvae. Spawns at the early part of the rainy season. The young move into seasonally flooded habitats and are first seen in August. Caught with seines, cast-nets, set-nets, and traps. Marketed fresh or smoked on a skewer. Regularly seen in the aquarium trade.



(from Bleeker, 1862)

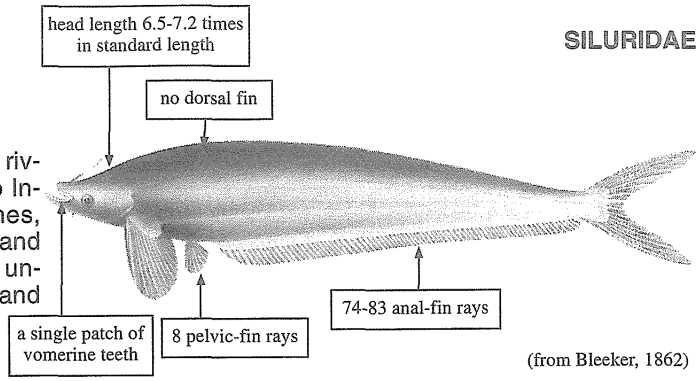
SILURIDAE

Kryptopterus hexapterus (Bleeker, 1851)

Local names: Trey kamplieu, ត្រី កំភ្លើរ.

Size: To 24 cm.

Habitat, biology, and fisheries: Found in rivers, streams, and canals from Thailand to Indonesia. Feeds primarily on small fishes, along with prawns and insect larvae. Type and extent of its seasonal movements are unknown. Caught with seines, cast-nets, and set-nets. Marketed fresh.



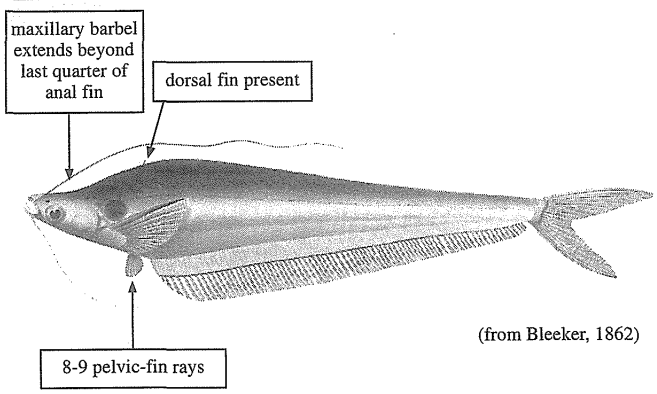
(from Bleeker, 1862)

Kryptopterus limpok (Bleeker, 1852)

Local names: Trey kes prak, ត្រី កេសប្រាក់.

Size: To 30 cm in Indonesia, 20 cm on the mainland.

Habitat, biology, and fisheries: Found in rivers and streams from northernmost Thailand to Indonesia. Feeds mostly on small fishes, along with prawns, and insect larvae. No information is available on its seasonal movements or breeding season. Caught with seines, cast-nets, gill-nets, and hook-and-line. Marketed fresh.



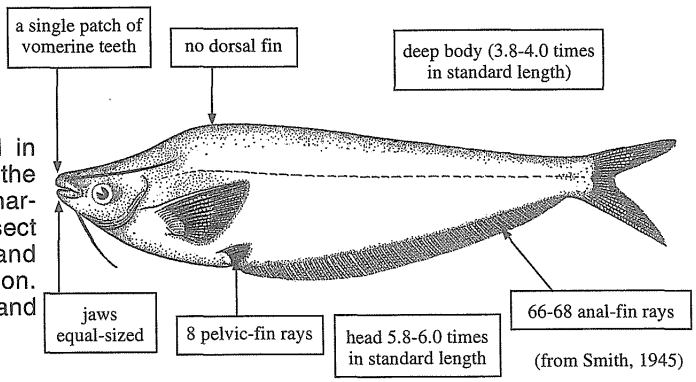
(from Bleeker, 1862)

Kryptopterus moorei Smith, 1945

Local names: Trey kamplieu, ត្រី កំភ្លើរ.

Size: To 24 cm.

Habitat, biology, and fisheries: Found in streams and canals in the floodplain of the Chao Phrya and lower Mekong. Feeds primarily on small fishes as well as prawns and insect larvae. Moves into inundated forests and floodplains during the high water season. Taken with seines, cast-nets, gill-nets, and set-nets. Marketed fresh.



(from Smith, 1945)

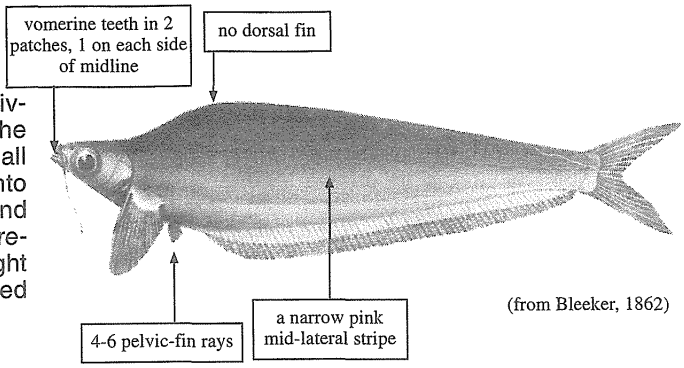
Kryptopterus schilbeides (Bleeker, 1858)

(plate XIX, 152)

Local names: Trey kamplieu, ត្រី កំភ្លើរ.

Size: To 12 cm.

Habitat, biology, and fisheries: Found in rivers, canals, ditches, and swamps from the lower Mekong to Indonesia. Feeds on small fishes, prawns, and insect larvae. Moves into flooded forests during high water periods and returns to rivers in November, where they remain common at least until March. Caught with seines, cast-nets, and set-nets. Marketed fresh or smoked on skewers.



(from Bleeker, 1862)

Genus *Micronema* **SILURIDAE**

(1) EYE SUBCUTANEOUS, ORBITAL RIM CONTINUOUS WITH SKIN COVERING EYE; **(2)** MOUTH SHORT, NOT EXTENDING TO EYE; **(3)** DORSAL FIN ABSENT; **(4)** 9 TO 10 PELVIC-FIN RAYS; **(5)** MAXILLARY BARBEL NOT EXTENDING TO GILL OPENING.

3 species recorded.

Micronema apogon (Bleeker, 1851)

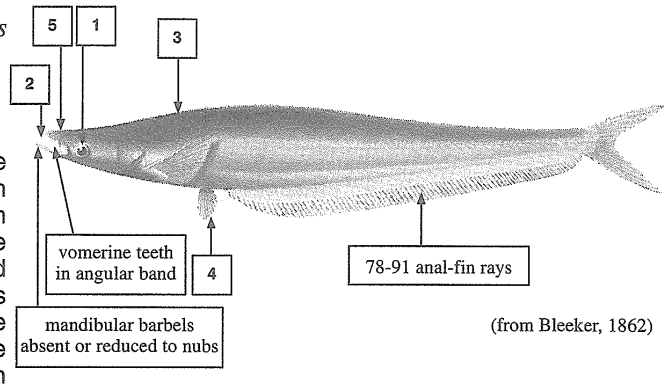
(plate XX, 153)

Synonyms / misidentifications: *Kryptopterus apogon.*

Local names: Trey kes, ត្រីកេស.

Size: To 77 cm.

Habitat, biology, and fisheries: Found in large rivers and adjacent streams and canals from Thailand to Indonesia. Feeds on pelagic fishes in midwater to upper depths. Spawns just before water levels begin to rise and moves into flooded riparian forests and probably out into floodplains during high water levels. Young of the year are first seen in July and begin to move back into the rivers in October, where they remain common until January. Caught with seines, gill-nets, and hook-and-line. Sold fresh, dried and salted, or placed on ice for shipment to Thailand.



(from Bleeker, 1862)

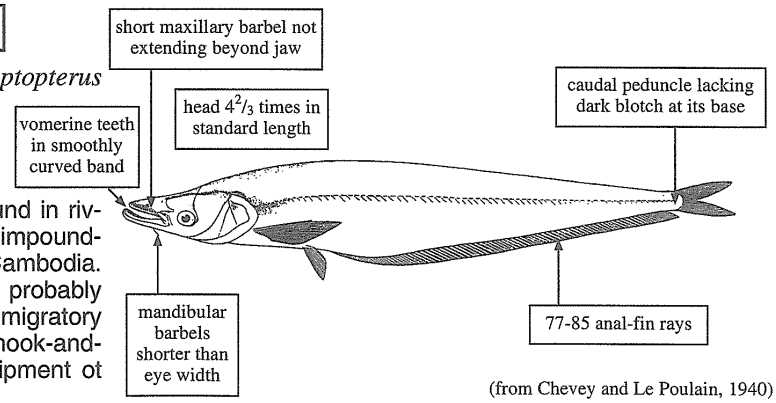
Micronema bleekeri (Günther, 1864)

Synonyms / misidentifications: *Kryptopterus bleekeri.*

Local names: Trey kes, ត្រីកេស.

Size: To 60 cm.

Habitat, biology, and fisheries: Found in rivers, streams, and lakes as well as impoundments from Malaysia to Thailand and Cambodia. Strongly resembles *M. apogon,* and probably has similar feeding, breeding, and migratory habits. Taken by seines, gill-nets, or hook-and-line. Sold fresh or put on ice for shipment ot Thailand.



(from Chevey and Le Poulain, 1940)

Micronema micronema (Bleeker, 1846)

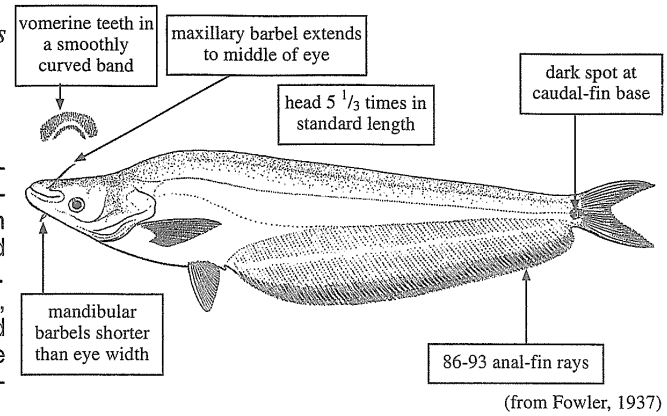
(plate XX, 154)

Synonyms / misidentifications: *Kryptopterus micronema.*

Local names: Trey kes, ត្រីកេស.

Size: To 33 cm.

Habitat, biology, and fisheries: Found in rivers, streams, and lakes as well as impoundments from Thailand to Indonesia. Feeds on pelagic fishes and shrimps. Its breeding and migratory habits are probably similar to to *M. apogon* and *M. micronema*. Taken with seines, gill-nets, cast-nets, and hook-and-line. Sold fresh or smoked on a skewer. Put on ice around the Great Lake for shipment to Thailand.



(from Fowler, 1937)

Genus *Ompok* **SILURIDAE**

(1) EYE SUBCUTANEOUS, ORBITAL RIM CONTINUOUS WITH SKIN COVERING EYE; (2) MOUTH SHORT, NOT EXTENDING TO EYE; (3) MOUTH CLEFT SHARPLY OBLIQUE; (4) 3 TO 4 DORSAL-FIN RAYS.

3 species recorded.

Ompok bimaculatus (Bloch, 1797)

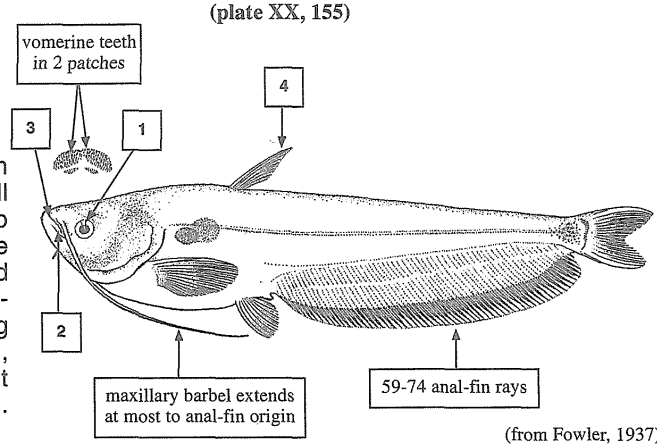
(plate XX, 155)

FAO name: Butter catfish.

Local names: Trey krormorm, ត្រី ក្រម៉ម.

Size: To 45 cm.

Habitat, biology, and fisheries: Found from India to Indonesia in streams and rivers of all sizes with currents ranging from sluggish to moderate. Also found in impoundments in the Mekong basin. Often found near submerged brush piles. Moves into freshly inundated habitats during the flood season. A slow-moving and stealthy predator, it feeds on crustaceans, fishes, and occasionally on mollusks. Caught with seines, cast-nets, set-nets, and traps. Sold fresh or smoked on skewers.



(from Fowler, 1937)

Ompok hypophthalmus (Bleeker, 1846)

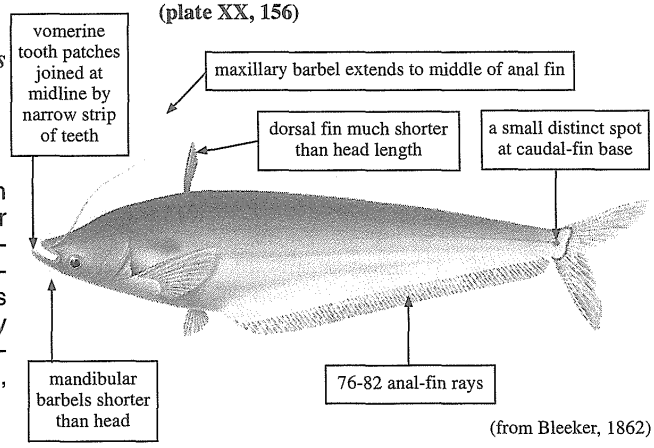
(plate XX, 156)

Synonyms / misidentifications: *Silurodes hypophthalmus*; *Cryptopterus urbaini.*

Local names: Trey ta aun, ត្រី តាអោន.

Size: To 30 cm.

Habitat, biology, and fisheries: Occurs in slowly moving waters and lakes from the lower Mekong and central Thailand through Indonesia. Feeds on fishes, prawns, and crustaceans. Moves into seasonally flooded habitats during periods of high water and can usually be found around submerged woody vegetation. Taken with seines, cast-nets, set-nets, and traps. Marketed fresh.



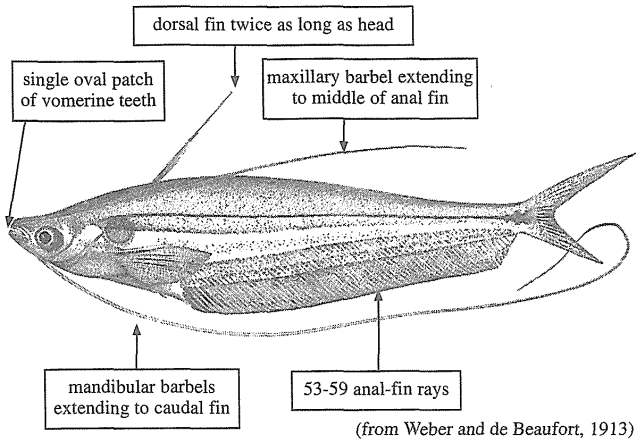
(from Bleeker, 1862)

Ompok sp. cf. *eugeneiatus*

Local names: Trey ta aun, ត្រី តាអោន.

Size: To 20 cm.

Habitat, biology, and fisheries: Found in slowly moving large and medium-sized rivers from the lower Mekong to Indonesia. Feeds on fishes and crustaceans. Migratory habits are unknown. Taken with seines, cast-nets, and set-nets. Not seen in markets.



(from Weber and de Beaufort, 1913)

Genus *Silurichthys* **SILURIDAE**

(1) RAYS AT MIDDLE OF ANAL FIN LONGER THAN BODY DEPTH WHERE THEY ATTACH; (2) ANAL FIN COMPLETELY CONFLUENT WITH CAUDAL FIN; (3) GILL RAKERS REDUCED TO SMALL NUBS.

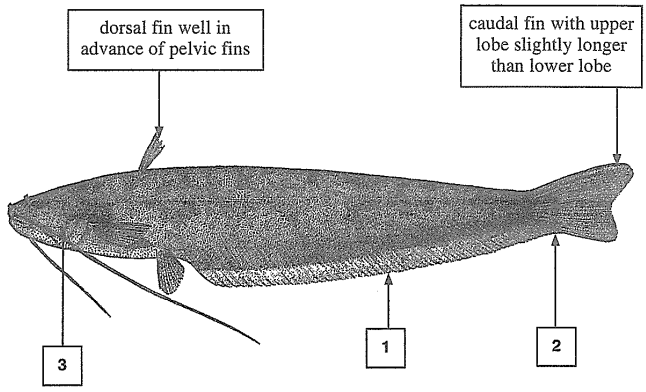
3 species recorded, 2 of them included here.

Silurichthys hasselti Bleeker, 1858

Local names:

Size: To 11 cm.

Habitat, biology, and fisheries: Found in small upland streams with coarse substrate from the Cardamom mountains of southern Cambodia to Indonesia. Feeds primarily on insect larvae and not known to make seasonal migrations. Caught with seines and cast-nets. Another species from the Cardamom mountains, *Silurichthys leucopodus* was described by Fowler (1939), and may also occur in Cambodia. It is distinguished by having a rounded caudal fin fully connected to the anal fin without markings on the body.



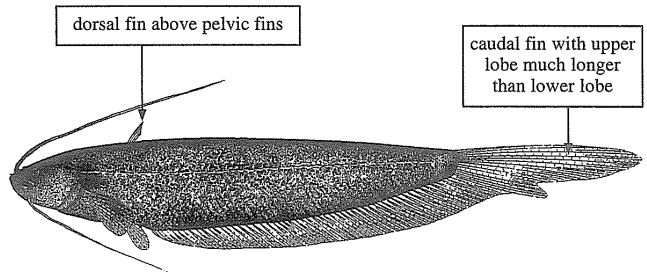
(from Smith, 1945)

Silurichthys phaiosoma (Bleeker, 1851)

Local names:

Size: To 14 cm.

Habitat, biology, and fisheries: Found in small upland streams with acidic water and decomposing vegetation on the bottom from the Cardamom mountains of southern Cambodia to Indonesia. Feeds primarily on insect larvae. Probably non-migratory. Caught with seines and cast-nets. Not seen in markets.



(from Weber and de Beaufort, 1916)

Genus *Silurus* **SILURIDAE**

(1) RAYS AT MIDDLE OF ANAL FIN SHORTER THAN DEPTH OF BODY WHERE THEY ATTACH; (2) ANAL FIN FREE FROM CAUDAL FIN, OR NARROWLY CONNECTED AT THE FIN BASE; (3) CAUDAL FIN TRUNCATE OR SLIGHTLY EMARGINATE; (4) GILL RAKERS FULLY FORMED, NOT REDUCED TO NUBS.

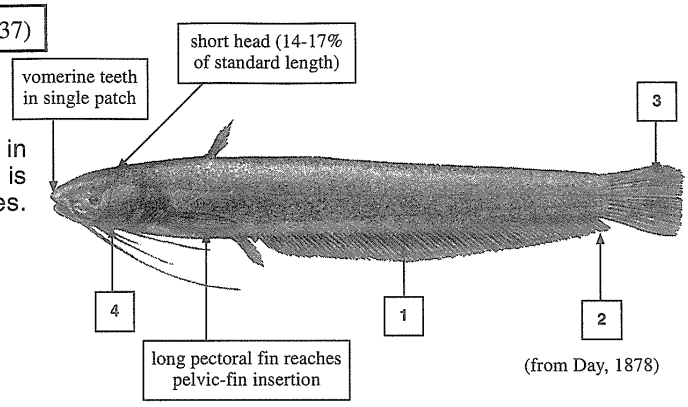
2 species recorded, a third possible.

Silurus bokorensis (Pellegrin and Chevey, 1937)

Local names:

Size: To 15 cm.

Habitat, biology, and fisheries: Found in small upland streams in Cambodia. Little is known about the biology of this species. Caught with seines and cast-nets.



(from Day, 1878)

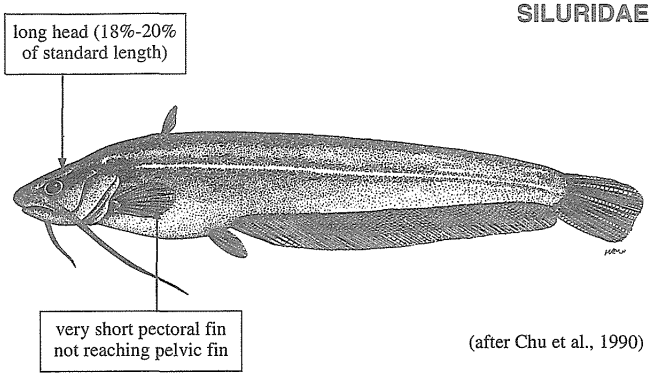
Silurus torrentis Kobayakawa, 1989

SILURIDAE

Local names:

Size: To 20 cm.

Habitat, biology, and fisheries: Known thus far from the Cardamom Mountains in southern Cambodia. Found in small fast flowing upland streams. Little else is known about the biology of this species. Caught with seines and cast-nets.



(after Chu et al., 1990)

Genus *Wallago*

SILURIDAE

(1) EYE WITH A FREE ORBITAL MARGIN; **(2)** CAUDAL FIN PLAINLY FORKED; **(3)** MOUTH LARGE, EXTENDING BACK AS FAR AS EYE; **(4)** 5 DORSAL-FIN RAYS.

2 species recorded.

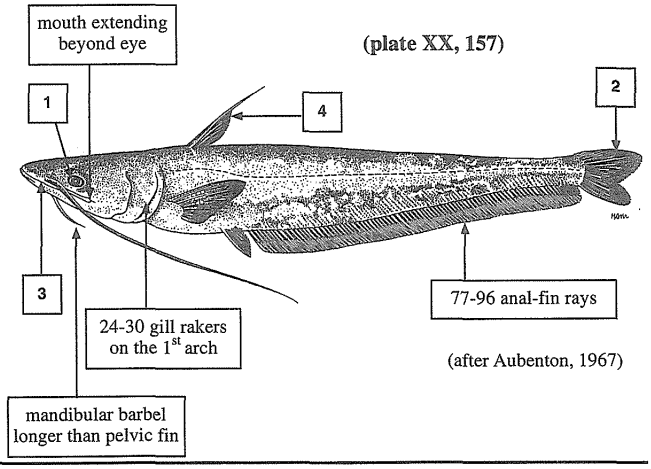
Wallago attu (Schneider, 1801)

Synonyms / misidentifications: *Wallagonia attu.*

Local names: Trey sanday, ត្រីសណ្ដាយ.

Size: To 200 cm, commonly to about 80 cm.

Habitat, biology, and fisheries: Found all over Cambodia with the exception of highland streams. Particularly common in large rivers and on the lower Mekong floodplain. Readily adapts to impoundments. A nocturnal predator on fishes. Known to be an excellent game fish. Taken by large seines, gill-nets, and hooks. Marketed fresh and sometimes put on ice for shipment to Thailand.



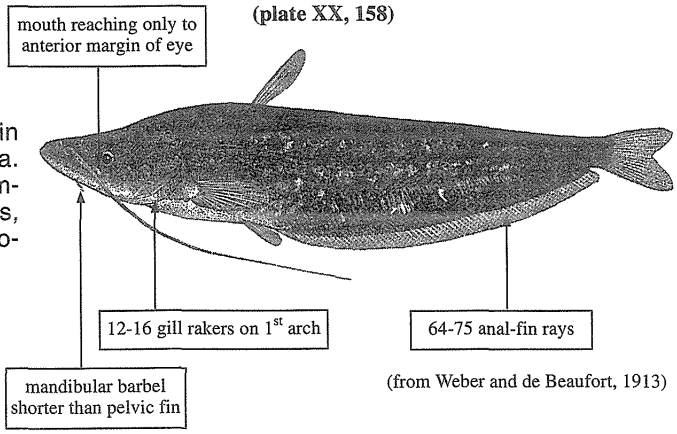
(after Aubenton, 1967)

Wallago leeri (Bleeker, 1851)

Local names: Trey stuak, ត្រីស្ដុក.

Size: To 145 cm.

Habitat, biology, and fisheries: Found in large upland rivers from Thailand to Indonesia. A nocturnal predator on fishes. Not as common as *W. attu.* Caught with seines, gill-nets, and hooks. Frequently taken with by explosives in northern Cambodia.



(from Weber and de Beaufort, 1913)

Family SCHILBEIDAE

Genus *Laides* — **SCHILBEIDAE**

(1) POSTERIOR NOSTRIL LOCATED NEAR ANTERIOR NOSTRIL; **(2)** BARBELS RIBBON-SHAPED, WITH A MANDIBULARY AND A MENTAL PAIR ON LOWER JAW; **(3)** 6 PELVIC-FIN RAYS.

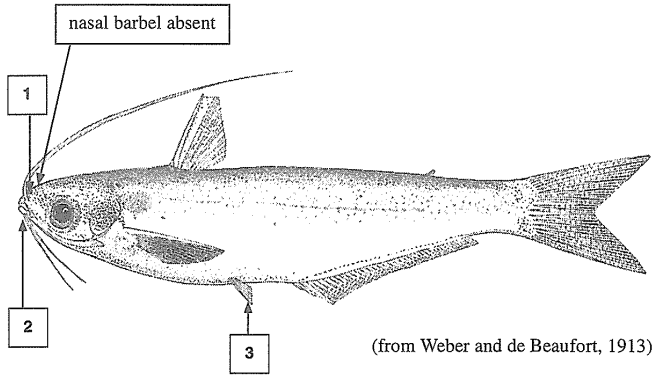
2 species recorded.

Laides hexanema (Bleeker, 1852)

Local names: Trey chhwiet prak, ត្រីឆ្វៀតប្រាក់.

Size: To 17 cm.

Habitat, biology, and fisheries: Found in large rivers from Thailand to Indonesia. A common species in some parts of the Mekong. Feeds on fishes and zooplankton. A possible migrant that can be found in medium-sized rivers and may be found in flooded riparian forests where the water has a pronounced current. Caught with seines, cast-nets, and traps. Usually marketed fresh.



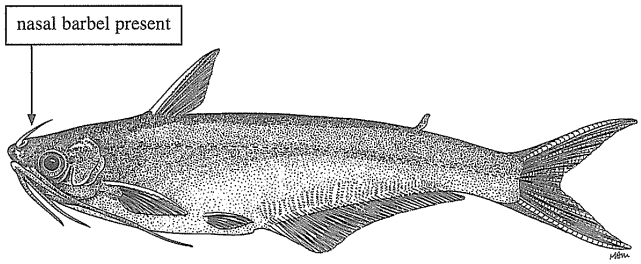
(from Weber and de Beaufort, 1913)

Laides sinensis (Huang, 1981)

Local names: Trey chhwiet prak, ត្រីឆ្វៀតប្រាក់.

Size: To 31 cm.

Habitat, biology, and fisheries: Occurring in the main stem of the Mekong as far upstream as Yunnan Province, China, as well as in the Pahang River, Malaysia (Roberts and Vidthyanon, 1991). Little is known about the biology of this species which is apparently less common than *L. hexanema*. Caught with the same methods as *L. hexanema*. Marketed fresh.



(after Chu et al., 1989)

Family PANGASIIDAE

Genus *Helicophagus* — **PANGASIIDAE**

(1) POSTERIOR NOSTRIL LOCATED MIDWAY BETWEEN ANTERIOR NOSTRIL AND EYE; **(2)** VOMERINE TEETH ONLY, NO PALATINE TEETH; **(3)** 6 PELVIC-FIN RAYS.

1 species recorded.

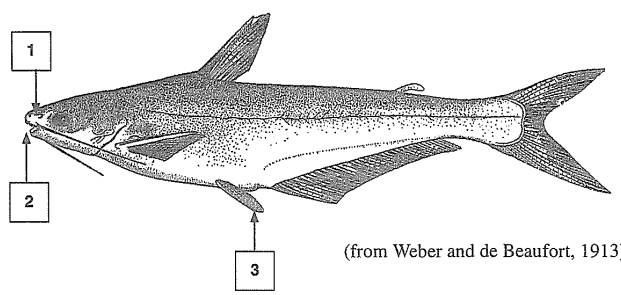
Helicophagus waandersi Bleeker, 1858

(plate XX, 159)

Local names: Trey pra kandor, ត្រីប្រាកណ្តុរ.

Size: To 50 cm.

Habitat, biology, and fisheries: Found in large rivers of the Mekong and Chao Phrya basins, as well as the island of Sumatra. Feeds almost entirely on bivalve mollusks. Migrates upstream when water levels begin to rise at the beginning of the flood season and moves downstream as water clears at the end of the flood season. Stays in permanent river channels and does not move into flooded forests. Caught with seines, gillnets, cast-nets, and traps. Marketed fresh.



(from Weber and de Beaufort, 1913)

Genus *Pangasianodon* **PANGASIIDAE**

(1) POSTERIOR NOSTRIL LOCATED NEAR ANTERIOR NOSTRIL; (2) BARBELS VERY SMALL OR EVEN ABSENT ON LARGE INDIVIDUALS; (3) 8 TO 9 PELVIC-FIN RAYS.

2 species recorded.

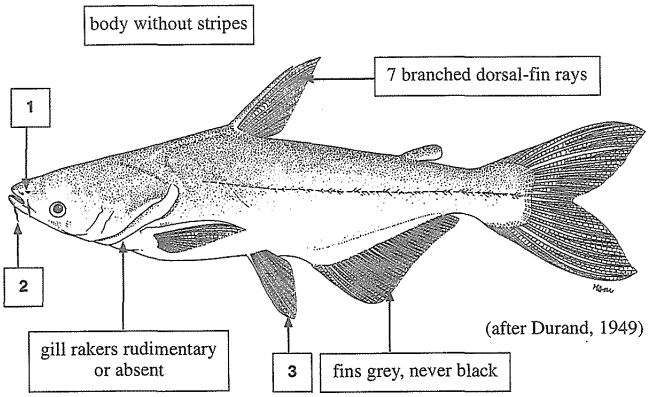
Pangasianodon gigas Chevey, 1930

FAO name: Mekong giant catfish.

Local names: Trey reach, ត្រីរាជ.

Size: To 300 cm.

Habitat, biology, and fisheries: A Mekong endemic, growing to colossal size, now bred in captivity and widely introduced through Thailand. Shows one of the fastest growth rates of any fish in the world, reaching 150 to 200 kg in 6 years. Known to feed on algae and occasionally swallows algae-covered stones inadvertantly. Probably also eats insect larvae and periphyton attached to the stones. A migratory species, but the actual distances and destinations of individuals moving through different parts of the river are unknown. Caught with seines and gill-nets. Marketed fresh.



(after Durand, 1949)

Pangasianodon hypophthalmus (Sauvage, 1878)

(plate XX, 160)

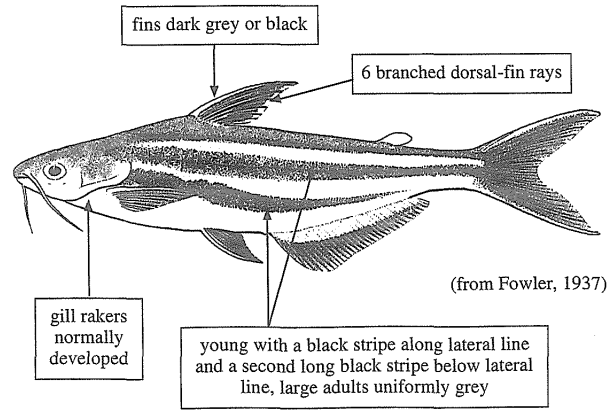
Synonyms / misidentifications: *Pangasius sutchi.*

FAO name: Iridescent shark-catfish.

Local names: Trey pra, ត្រីប្រា.

Size: To at least 120 cm.

Habitat, biology, and fisheries: Found in large rivers of the Mekong and Chao Phrya basins, and now widely introduced for aquaculture. Common in the lower Mekong, where the young are collected for rearing in floating fish cages. In the middle Mekong it is represented by large individuals that lose the dark coloration of the juveniles and subadults and become grey without stripes. Easily distinguished from similar species by the high number of pelvic-fin rays. Feeds on fishes and crustaceans as well as vegetable debris. Taken by seines, gill-nets, set-nets, and traps. Excessively fished by explosives in northern Cambodia. Marketed fresh. This species has been brought into the aquarium trade where its generally non-aggressive behaviour is valued in community tanks. It requires a great deal of space and is not suited to small privately owned tanks.



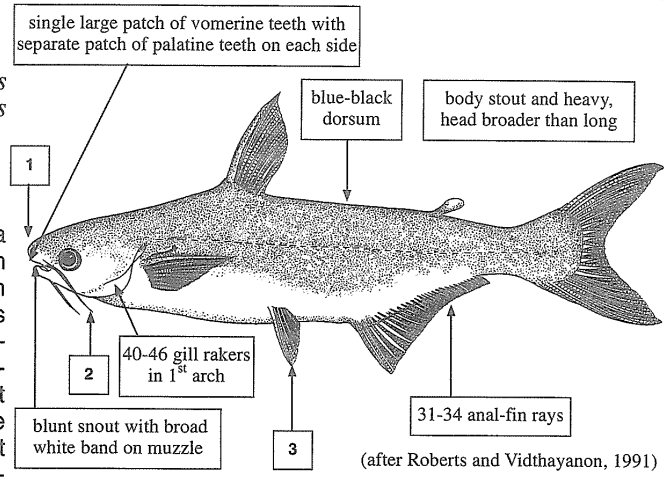
(from Fowler, 1937)

Genus *Pangasius* **PANGASIIDAE**

(1) POSTERIOR NOSTRIL LOCATED NEAR ANTERIOR NOSTRIL; (2) BARBELS ALWAYS PRESENT, ONLY 2 BARBELS ON THE LOWER JAW; (3) 6 BRANCHED PELVIC-FIN RAYS.

12 species recorded.

Pangasius bocourti Sauvage, 1880



(after Roberts and Vidthayanon, 1991)

Synonyms / misidentifications: *Pangasius taeniurus* (non Fowler), *Pangasius nasutus* (non Bleeker).

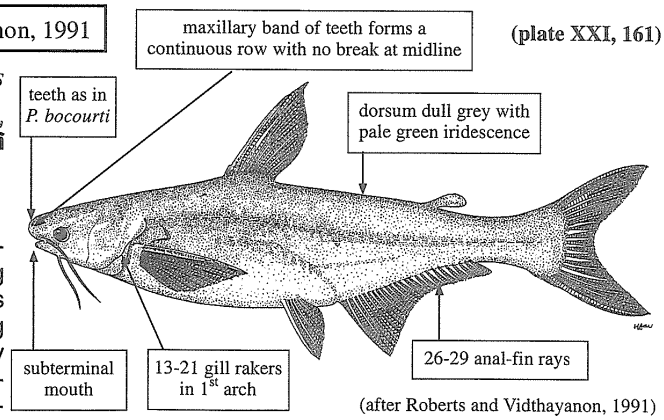
Local names: Trey pra kchau, ត្រី ក្រាខ្មៅ.

Size: To 50 cm.

Habitat, biology, and fisheries: Apparently a Mekong endemic, known from large rivers in the lower Mekong basin and has also been reported from the middle Mekong (Roberts and Vidthayanon, 1991). Adults migrate upstream to the middle Mekong along the Thai-Lao border as soon as turbidity increases at the onset of the flood season. Spawns at the onset of flood season and the young are first seen in June, averaging about 5 cm by mid-June. Taken with seines, gill-nets, hook-and-line, and trawls. Marketed fresh.

Pangasius conchophilus Roberts and Vidthayanon, 1991

(plate XXI, 161)



(after Roberts and Vidthayanon, 1991)

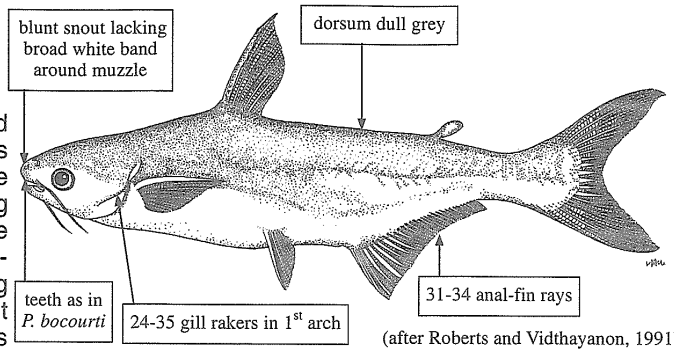
Synonyms / misidentifications: *Pangasius nasutus* (non Bleeker).

Local names: Trey ke, Trey pra ke, ត្រី កែ, ត្រី ក្រាកែ.

Size: To 60 cm.

Habitat, biology, and fisheries: A mollusk eating species, found in large rivers of the Mekong and Chao Phrya basins. Like *P. bocourti*, this species migrates into the middle Mekong along the Thai-Lao border as water levels and turbidity begin to increase. Feeds primarily on gastropods, and some bivalves and insects. Reproduces early in the flood season and juveniles of 6 to 7 cm are taken by late June. Caught by seines, gill-nets, traps, and trawls. Marketed fresh.

Pangasius djambal Bleeker, 1846



(after Roberts and Vidthayanon, 1991)

Local names: Trey pra, ត្រី ក្រា.

Size: To 50 cm.

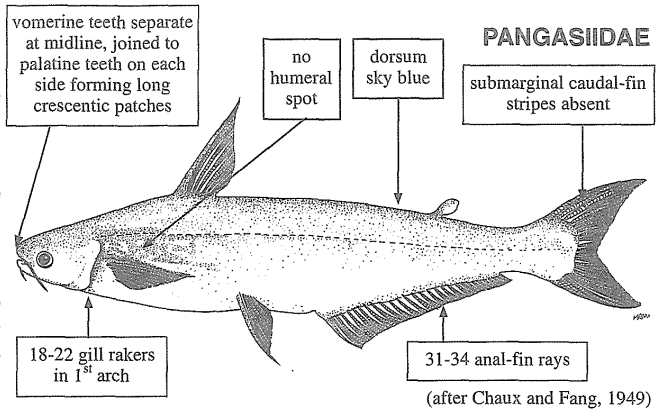
Habitat, biology, and fisheries: Recorded only from Indonesia and Malaysia by Roberts and Vidthayanon (1991). Was found by the author in the Mun River of the middle Mekong in northeast Thailand during the early part of the rainy season in 1975, but not seen in the floodplain rivers of the lower Mekong. Bears strong resemblance to *P. bocourti*, but has different gill-raker counts and coloration. Diet consists mostly of benthic insect larvae and worms, with some free swimming insects, submerged plants, and seeds according to Vaas (1952). Can be caught with an otter trawl, and is taken by fishermen using seines and gill-nets. Marketed fresh in northeast Thailand, but was not found by the author during a visit to Stung Treng in 1995.

Pangasius krempfi Fang and Chaux, 1949

Local names: Trey pra, Trey bong lao, ត្រីប្រា, ត្រីបុងឡាវ.

Size: To 80 cm.

Habitat, biology, and fisheries: Found in the Mekong and in rivers along the Vietnam coast. Adults with ripening gonads have been reported as fairly common in the middle Mekong along the Thai-Lao border from January to April (Roberts and Vidthayanon, 1991). Specimens seen there were apparently migrating but the direction was unknown. Dietary habits have not been studied. Taken with seines and gill-nets. Marketed fresh.



(after Chaux and Fang, 1949)

Reported to originate from the sea at Bong Lao, but probably the tag in the collecting jar merely contained one of the Cambodian local names rather than the locality of origin. It is unclear which part of the life cycle is spent in the sea. The taxonomy of this species may be problematic, as the shape of the tooth patch on the roof of mouth of the Nong Khai specimen illustrated by Roberts and Vidthayanon (1991) does not correspond to their own description or that of Chaux and Fang (1949). Perhaps 2 species are involved.

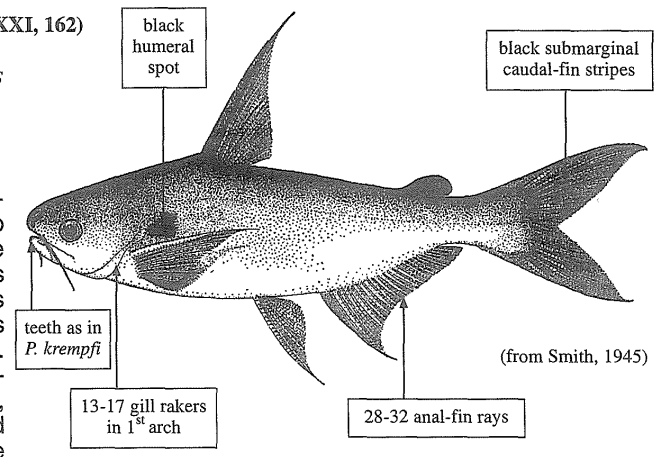
Pangasius larnaudiei Bocourt, 1866 (plate XXI, 162)

Synonyms / misidentifications: *Pangasius larnaudii, Pangasius taeniurus.*

Local names: Trey po, ត្រីប៉ោ.

Size: To 130 cm.

Habitat, biology, and fisheries: Known to occur in large rivers and floodplains of the Chao Phrya and Mekong basins, where it is one of the most esteemed food fishes. Reared in ponds as well as in weirs around the Great Lake. Feeds on small fishes and some crustaceans as well as a wide variety of vegetable matter and fruits. Migrates into floodplains and spawns at the beginning of the flood season. Taken with seines, gill-nets, hook-and-line, and traps. Marketed fresh. May be put on ice around the Great Lake for shipment to Thailand.



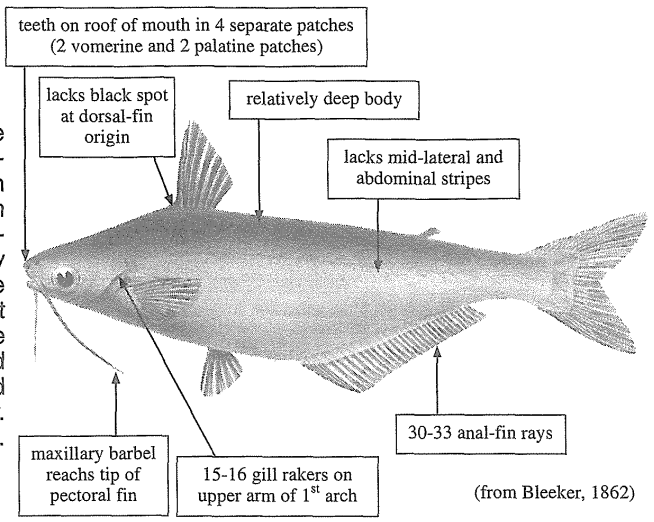
(from Smith, 1945)

Pangasius macronema Bleeker, 1851

Local names: Trey chhwiet, ត្រីឈ្វៀត.

Size: To 18 cm.

Habitat, biology, and fisheries: Found in large and medium-sized rivers from Borneo to Thailand. In their revision, Roberts and Vidthayanon (1991) placed *P. macronema* and *P. siamensis* in synonymy. However, there appear to be 2 species, with this one being the rarer of the two. They differ in coloration, body depth, and in the number of gill rakers on the upper arm of the first arch. If these 2 names really refer to a single species, then this one may be undescribed and the species listed below as *P. siamensis* should be renamed as *P. macronema*, due to priority. Both species probably have a similar biology. Taken by seines, cast-nets, or gill-nets.



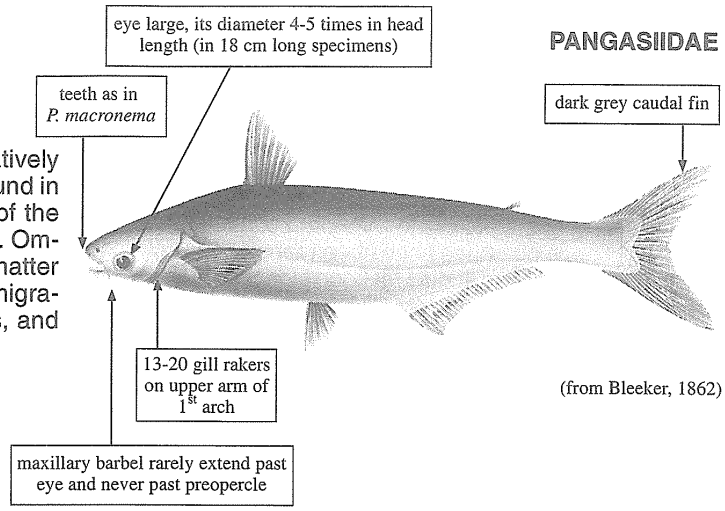
(from Bleeker, 1862)

Pangasius micronema Bleeker, 1847

Local names: Trey pra, ត្រីប្រា.

Size: To 100 cm.

Habitat, biology, and fisheries: Relatively uncommon in the Mekong, where it is found in large and medium-sized rivers of most of the major basins from Indonesia to Thailand. Omnivorous, feeding on animal and plant matter including detritus. Little is known of its migratory habits. Caught with seines, gill-nets, and hook-and-line. Sold fresh in markets.



(from Bleeker, 1862)

Pangasius pangasius (Hamilton, 1822)

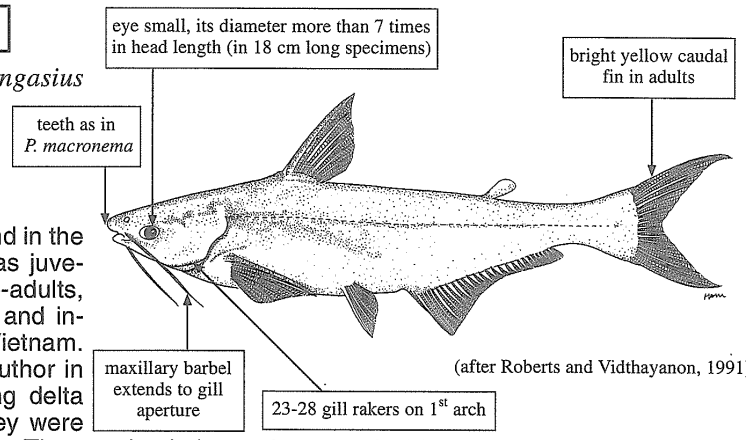
Synonyms / misidentifications: ?*Pangasius krempfi* (in part).

FAO name: Yellowtail catfish.

Local names:

Size: To 80 cm.

Habitat, biology, and fisheries: Found in the high estuary (freshwater tidal zone) as juveniles, moving to brackish water as sub-adults, and finally as adults to river mouths and inshore areas. Found from India to Vietnam. Large individuals were seen by the author in the market at My Tho in the Mekong delta during 1974. Based on their size, they were presumably taken from brackish water. The species is instantly recognizable by its bright yellow caudal fin. Taken with seines, trawls, gill-nets, and hook-and-line. Marketed fresh. The dentition on the roof of mouth illustrated by Roberts and Vidthayanon (1991) does not resemble the dentition found in *P. pangasius* and does not conform to the description given in the same paper.



(after Roberts and Vidthayanon, 1991)

Pangasius pleurotaenia (Sauvage, 1878)

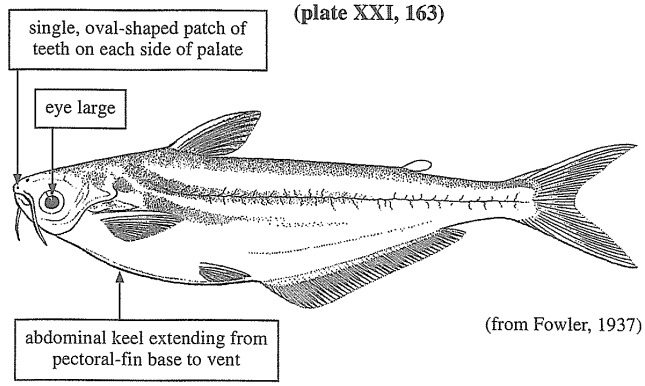
(plate XXI, 163)

Synonyms / misidentifications: *Pteropangasius cultratus.*

Local names: Trey chhwiet, ត្រីឈ្វៀត.

Size: To 35 cm.

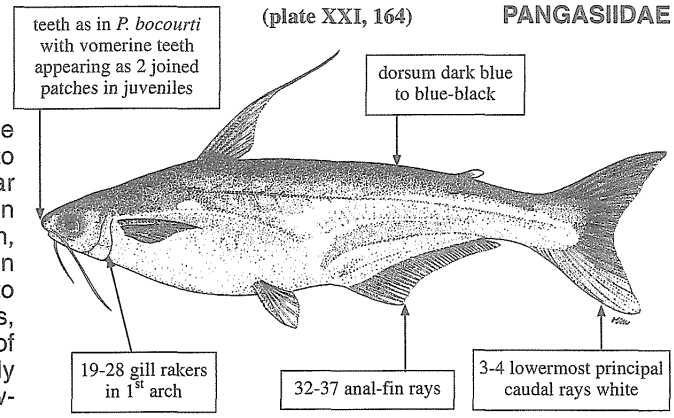
Habitat, biology, and fisheries: Found in large and medium-sized rivers of the Mekong and Chao Phrya basins as well as in rivers of peninsular Thailand. This species and *P. siamensis* prefer greater water clarity than most species of *Pangasius*. Common in the middle Mekong before the flood season where it is found in the lower reaches of tributary streams along with most of the cyprinids that would be found in the main stream of the Mekong when the water is clear. Possibly also inhabits flooded forests. Diet consists of terrestrial and aquatic insects along with small amounts of plant matter. Caught with seines, gill-nets, and cast-nets. Marketed fresh.



(from Fowler, 1937)

Pangasius polyuranodon Bleeker, 1852

(plate XXI, 164) PANGASIIDAE

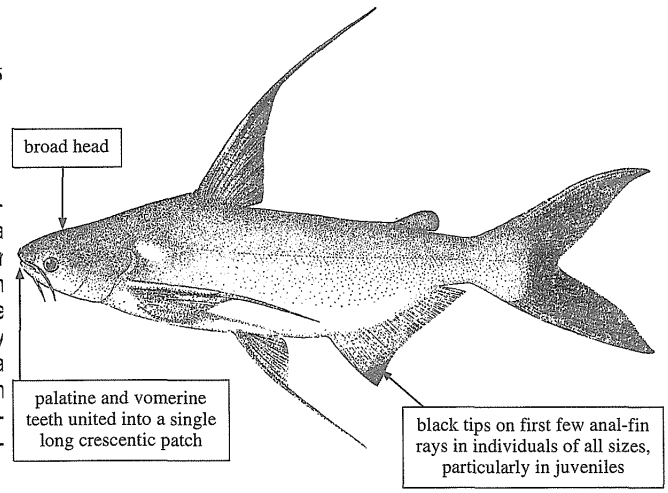


Local names: Trey chhwiet, ត្រីឈ្វៀត.

Size: To 100 cm.

Habitat, biology, and fisheries: Found in the lower courses of major rivers from Thailand to Indonesia. In the Mekong, it occurs as far upstream as Stung Treng, where it was seen in the market. Migratory habits are little known, but it probably moves out onto the floodplain during high water. In Borneo, it is known to feed on insect larvae, bottom dwelling worms, and submerged land plants. The stomach of several specimens from the Mekong primarily contained pieces of vegetation, including flowers and fruits. Several specimens found in the market had been caught by hook-and-line, but it was not possible to determine the bait. Caught with seines, cast-nets, and gill-nets. Marketed fresh.

Pangasius sanitwongsei Smith, 1931



(from Smith, 1945)

Synonyms / misidentifications: *Pangasius pangasius* (non Hamilton).

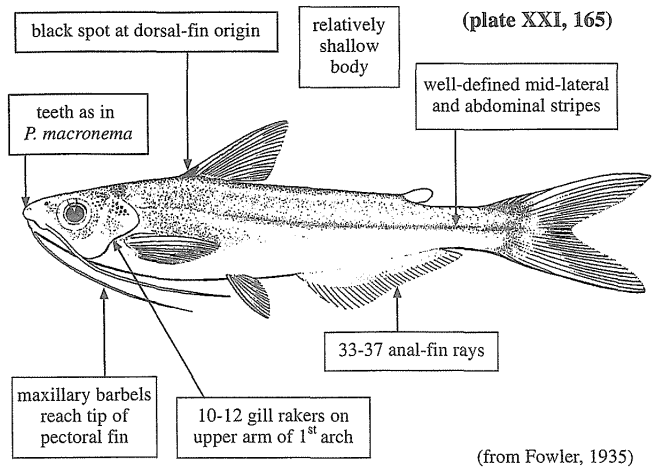
Local names: Trey po pruy, ត្រីពោព្រួយ.

Size: To 250 cm.

Habitat, biology, and fisheries: A large species found in large rivers of the Chao Phrya and Mekong basins. It was seen by the author in Stung Treng, and is common upstream from Khoné Falls in the middle Mekong along the Thai-Lao border. Spawns just before the rainy season and the young of the year reach a length of about 10 cm by mid-June. Both young and adults feed on fishes and crustaceans. Taken with seines, gill-nets, and hook-and-line. Marketed fresh.

Pangasius siamensis Steindachner, 1879

(plate XXI, 165)



(from Fowler, 1935)

Local names: Trey chhwiet, ត្រីឈ្វៀត.

Size: To 26 cm.

Habitat, biology, and fisheries: Found in large and medium-sized rivers of the Mekong and Chao Phrya basins. Often found in large schools and remains common in the middle Mekong along the Thai-Lao border during the dry season. During the period from late April to early May its number increases substantially by migrants coming from downstream. As the water transparency decreases it moves into tributary streams and flooded forests along with many species of cyprinids and other species of visually oriented catfishes such as *P. pleurotaenia*. Feeds on aquatic insect larvae. Caught with seines, cast-nets, and gill-nets. Marketed fresh.

Family AMBLYCIPITIDAE

Genus *Amblyceps* — **AMBLYCIPITIDAE**

(1) NOSTRILS CLOSE TOGETHER, SEPARATED ONLY BY NASAL BARBEL; **(2)** ADIPOSE FIN PRESENT; **(3)** SPINE IN DORSAL AND PECTORAL FINS SOFT AND ENCLOSED IN THICK SKIN; **(4)** EYES SMALL, COVERED WITH SKIN.

1 species recorded.

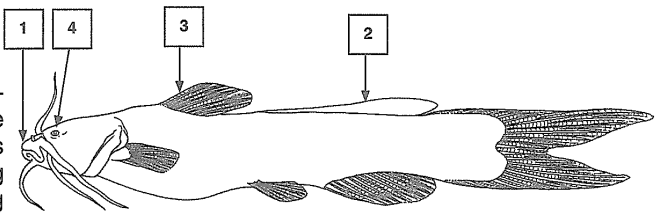
Amblyceps mangois (Hamilton, 1822)

(plate XXI, 166)

Local names:

Size: To 12 cm.

Habitat, biology, and fisheries: A small species found among rocks and boulders on the bottom of fast flowing upland streams. It was seen by the author in a shallow, fast-flowing channel of the Mekong upstream from Stung Treng. Apparently capable of moving about from pool to pool as its stream bed dries up (Hora, 1933). Diet consists of aquatic insects. Not seen in markets.



(after Hora, 1933)

Family AKYSIDAE

Genus *Acrochordonichthys* — **AKYSIDAE**

(1) PARALLEL LONGITUDINAL ROWS OF TUBERCLES RUNNING LENGTH OF BODY; **(2)** ADIPOSE FIN PRESENT; **(3)** GILL OPENING NOT EXTENDING ABOVE PECTORAL-FIN BASE; **(4)** CAUDAL FIN TRUNCATE.

1 species recorded, additional species likely.

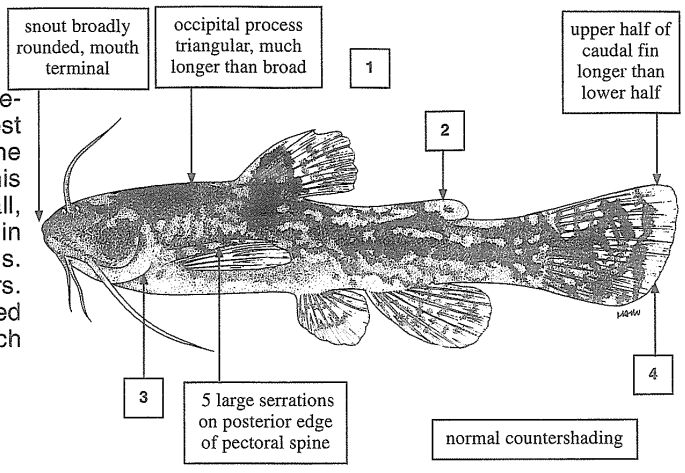
Acrochordonichthys sp. cf. *rugosus*

(plate XXI, 167)

Local names:

Size: To 2 cm.

Habitat, biology, and fisheries: A tiny species found along the bottom of small forest streams. A single specimen was found in the Siem Reap River. Little is known about this species other than the fact that these small, secretive, cryptically coloured fishes hide in decomposing vegetation at stream bottoms. Apparently feeds on zooplankton and rotifers. Migratory habits are unknown. The illustrated specimen was collected with a small beach seine. Not seen in markets.



Genus *Akysis* **AKYSIDAE**

(1) PARALLEL LONGITUDINAL ROWS OF TUBERCLES RUNNING LENGTH OF BODY; (2) ADIPOSE FIN PRESENT; (3) GILL OPENING EXTENDING DORSALLY WELL ABOVE PECTORAL-FIN BASE; (4) CAUDAL FIN FORKED.

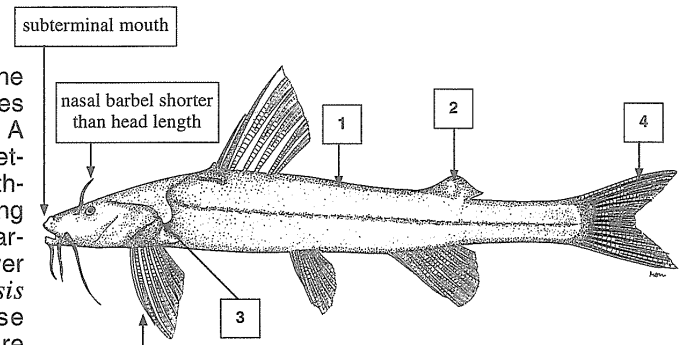
Several species possibly found in the Mekong, 3 shown here.

Akysis sp. cf. *macronema*

Local names:

Size: To 4 cm.

Habitat, biology, and fisheries: Found on the bottom of main channels in the lower courses of large rivers from Thailand to Indonesia. A common species in the high estuary of Vietnam, near Cambodia, but rarely caught without trawling gear. Usually taken in trawls along with decaying vegetation. Not seen in markets. Although the species found in the lower Mekong is probably not identical to *Akysis macronema*, it is similar enough to use Bleeker's illustration for a diagnosis. There are more than 2 undescribed species of *Akysis* in the Mekong. Three species of this genus are included here to draw attention to the fact that there are several very small species in the Mekong that can easily be confused with juvenile specimens of the genus *Bagarius*.



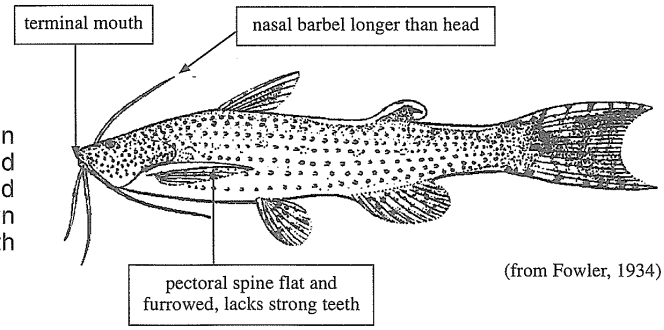
(after Bleeker, 1862)

Akysis maculipinnis Fowler, 1934

Local names:

Size: To 4 cm.

Habitat, biology, and fisheries: Found in large muddy river channels of the Mekong and Chao Phrya basins as well as basins around the upper Gulf of Thailand. Little is known about this species. Most likely caught with seines and trawls. Not seen in markets.



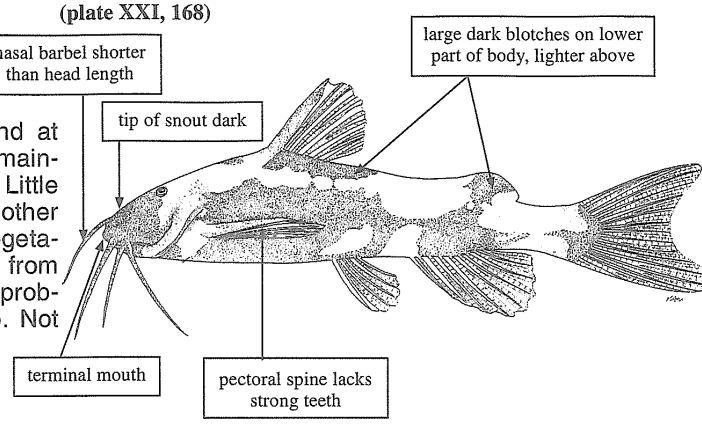
(from Fowler, 1934)

Akysis variegatus (Bleeker, 1846) **(plate XXI, 168)**

Local names:

Size: To 3 cm.

Habitat, biology, and fisheries: Found at bottom depths in the middle Mekong mainstream and in smaller tributary streams. Little is known about this species. Like the other akysids it may be found in decaying vegetation. Collected by dip-nets and lift-nets from the Mekong on the Thai-Lao border and probably occurs in northern Cambodia also. Not seen in markets.



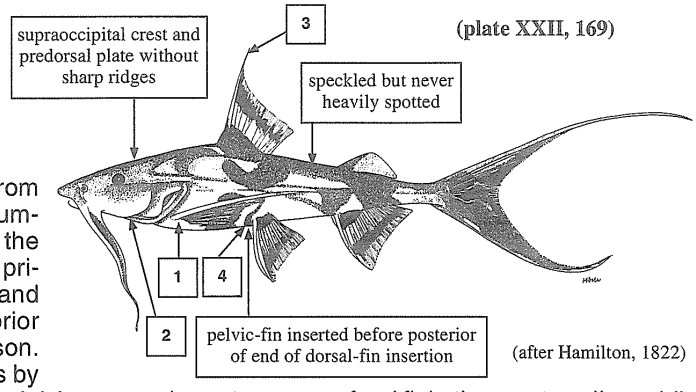
Family SISORIDAE

Genus *Bagarius* — **SISORIDAE**

(1) NO CUTANEOUS RIDGES OF AN ADHESIVE APPARATUS ON BREAST; **(2)** GILL OPENINGS WIDE, EXTENDING TO VENTRAL SURFACE; **(3)** STRONG DORSAL-FIN SPINE; **(4)** PECTORAL AND PELVIC FINS NOT MODIFIED AS AN ADHESIVE APPARATUS.

3 species recorded.

Bagarius bagarius (Hamilton, 1822)



(plate XXII, 169)

(after Hamilton, 1822)

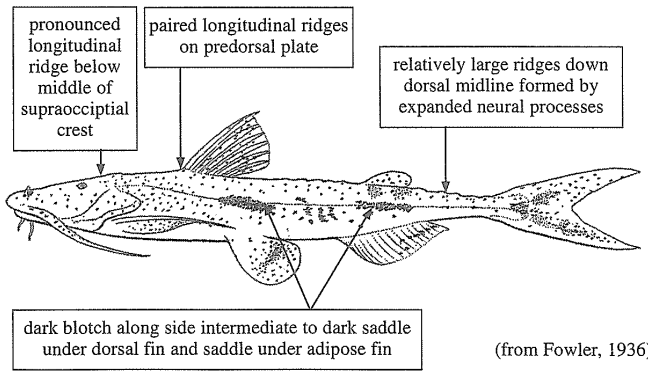
FAO name: Dwarf goonch.

Local names: Trey krawbey, ត្រីក្រាបី.

Size: To 25 cm.

Habitat, biology, and fisheries: Known from rapids and rocky pools of large and medium-sized rivers ranging from the Ganges to the Mekong basin. A small species that feeds primarily on insects and occasionally fish and prawns (Roberts, 1983). Breeds in rivers prior to the beginning of the annual flood season. Caught mostly by hook-and-line, as well as by gill-nets and seines. Marketed fresh. Although it has some importance as a food fish, the meat spoils rapidly and can cause illness.

Bagarius suchus Roberts, 1983



(from Fowler, 1936)

Synonyms / misidentifications: *Bagarius bagarius* (non Hamilton).

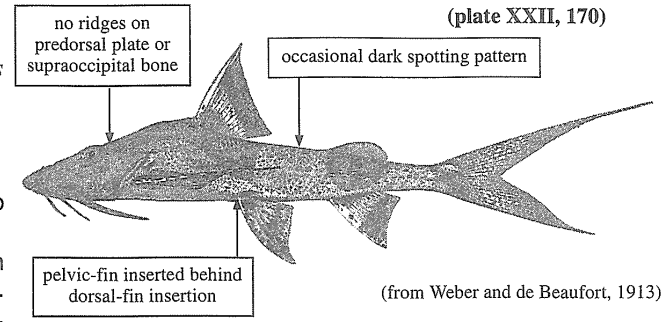
FAO name: Crocodile catfish.

Local names: Trey krawbey, ត្រីក្រាបី.

Size: To 60 cm.

Habitat, biology, and fisheries: Endemic to large rivers of the Mekong basin. So far known only from the middle Mekong along the Thai-Lao border, but probably also occurs in the upland Mekong of northern Cambodia. Feeds on fishes (Roberts, 1983). Little is known of its breeding or migratory habits. Caught by hook-and-line, seines, or gill-nets. Marketed fresh, although the value of its meat is limited for the same reason as in *B. bagarius*.

Bagarius yarrelli Sykes, 1838



(plate XXII, 170)

(from Weber and de Beaufort, 1913)

Synonyms / misidentifications: *Bagarius bagarius* (non Hamilton).

FAO name: Goonch.

Local names: Trey krawbey, ត្រីក្រាបី.

Size: The largest member of the genus, up to 200 cm.

Habitat, biology, and fisheries: Found in large rivers from peninsular India to Indonesia. Rests on the bottom, even in swift currents. Feeds mostly on prawns and some fishes with lesser amounts of insects or detritus (Roberts, 1983). Spawns in rivers before the rainy season. Taken by hook-and-line as well as by seines or gill-nets. In some parts of its range it is taken incidentally by sport fishermen who consider it a nuisance because of its tendency to break tackle. Sold fresh in markets. Not a highly esteemed food fish, because its stiff and fibrous flesh is untrustworthy, as mentioned for *B. bagarius* and *B. suchus*.

Genus *Glyptothorax* **SISORIDAE**

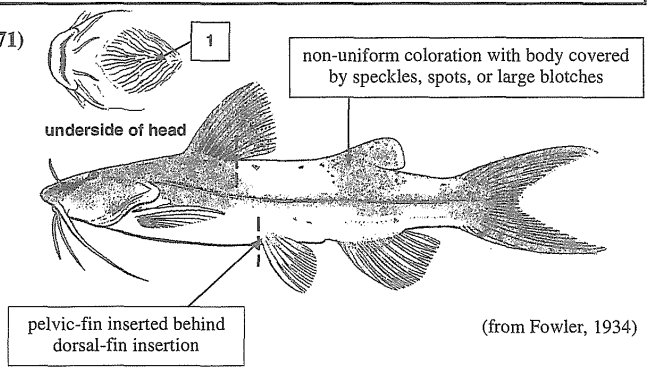
(1) OBLIQUE CUTANEOUS RIDGES ACROSS BREAST MEETING FROM EACH SIDE ANTERIORLY.
10 or more species likely to occur in the Mekong.

Glyptothorax fuscus Fowler, 1934 **(plate XXII, 171)**

Local names: Trey kanchos krawbey, ត្រីកញ្ជុះក្របី.

Size: To 8 cm.

Habitat, biology, and fisheries: Lives under rocks and logs in fairly strong currents in medium and large-sized rivers of the Mekong and Chao Phrya basins. Diet consists of aquatic insect larvae. Migratory tendencies unknown. Taken with seines and trawls. Not seen in markets.



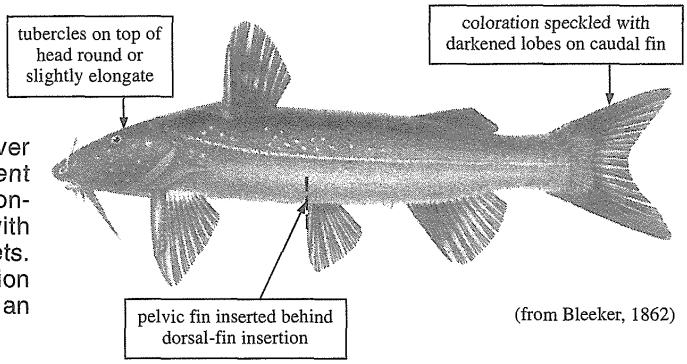
(from Fowler, 1934)

Glyptothorax sp. cf. ***fuscus***

Local names: Trey krawbey, ត្រី ក្របី.

Size: To 8 cm.

Habitat, biology, and fisheries: Found over coarse substrates in small high-gradient streams from Burma to Indonesia. Diet consists of aquatic insect larvae. Taken with seines and cast-nets. Not seen in markets. The species resembles Bleeker's illustration of *G. platypogon* which is used here to give an idea of its general appearance.



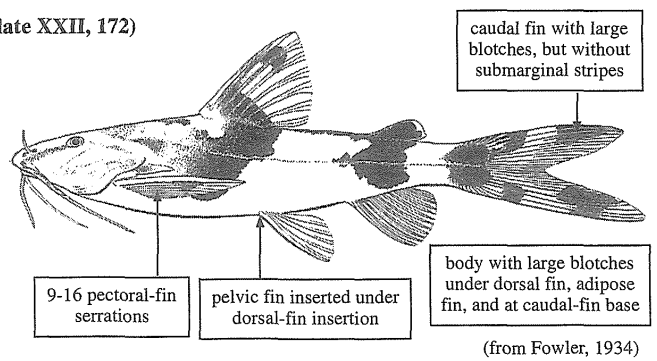
(from Bleeker, 1862)

Glyptothorax lampris Fowler, 1934 **(plate XXII, 172)**

Local names: Trey krawbey, ត្រី ក្របី.

Size: To 7 cm.

Habitat, biology, and fisheries: Found over coarse substrates in medium-sized upland rivers of the Mekong and Chao Phrya basins. Like other members of the genus, its diet consists of aquatic insect larvae. Caught with seines, trawls, and cast-nets. Not seen in markets.



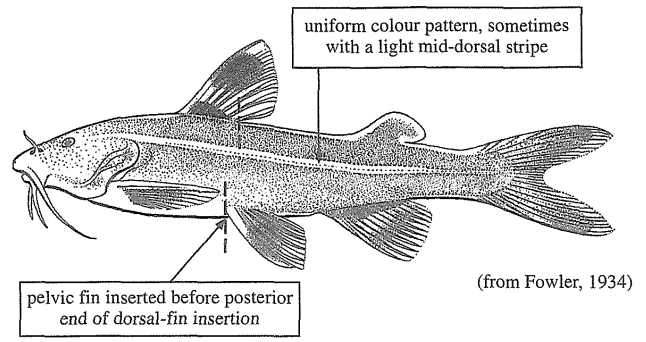
(from Fowler, 1934)

Glyptothorax laosensis Fowler, 1934

Local names:

Size: To 8 cm.

Habitat, biology, and fisheries: Found in flowing waters of small and medium-sized streams of the Mekong basin. It was encountered in the main stream of the Mekong over coarse substrates and in small upland streams with alternating pools, waterfalls, and rapids. Feeds on aquatic insect larvae. Caught with trawls, seines, and cast-nets. Not seen in markets.



(from Fowler, 1934)

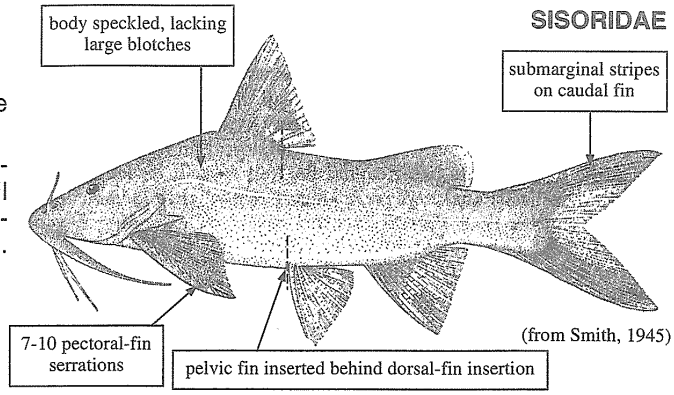
Glyptothorax major (Boulenger, 1894)

SISORIDAE

Local names:

Size: To 13 cm in Borneo, smaller in the Mekong.

Habitat, biology, and fisheries: Found in upland and montane brooks as well as small streams. Diet consists primarily of aquatic insect larvae. Caught with seines and cast-nets. Not seen in markets.



(from Smith, 1945)

Genus *Oreoglanis*

SISORIDAE

(1) NO CUTANEOUS RIDGES OF AN ADHESIVE APPARATUS ON BREAST; **(2)** GILL OPENINGS NARROW, RESTRICTED TO SIDE ABOVE PECTORAL-FIN INSERTION; **(3)** ADIPOSE-FIN BASE LONG; **(4)** PECTORAL AND PELVIC FINS MODIFIED TO ACT AS ADHESIVE APPARATUS.

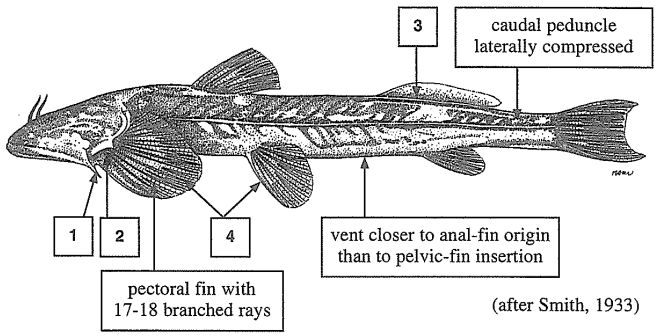
2 species recorded, 1 included here.

Oreoglanis siamensis Smith, 1933

Local names:

Size: To 14 cm.

Habitat, biology, and fisheries: Found in montane brooks and small high-gradient streams in the Chao Phrya and Mekong basins. Attaches itself to hard surfaces using its mouth. Feeding habits and other aspects of its biology are unknown. Can possibly be caught with seines and cast-nets. Not seen in markets.



(after Smith, 1933)

Family CLARIIDAE

Genus *Clarias*

CLARIIDAE

(1) LONG DORSAL AND ANAL FINS; **(2)** NO DORSAL-FIN SPINE; **(3)** NO ADIPOSE FIN; **(4)** HEAD DEPRESSED.

8 species recorded or possibly found in the Mekong, 4 of them likely to occur in Cambodia.

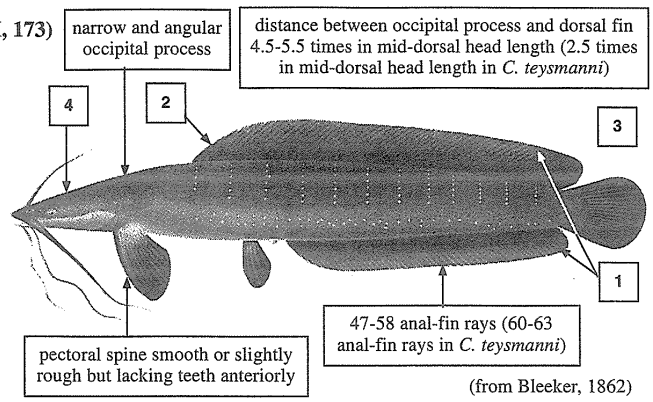
Clarias batrachus (Linnaeus, 1758) **(plate XXII, 173)**

FAO name: Walking catfish.

Local names: Trey andaing roueng, ត្រីអណ្តង៉ឹងង.

Size: To 40 cm.

Habitat, biology, and fisheries: A common species found in standing water or sluggish flowing water habitats, from Sri Lanka to Indonesia and the Philippines. Usually found in floodplains and in flooded forests. Capable of moving on land by wriggling from side to side on its erect pectoral fins. Feeds on fishes and mollusks. Taken by seines, cast-nets, gill-nets, push-nets. Can be caught by bare hands when in water, and can be snagged on land at night by gill-nets strung along elevated margins of rice paddies. Sold fresh in markets where it can remain alive for long periods of time if it is kept moist. Potentially important for aquaculture.



(from Bleeker, 1862)

CLARIIDAE

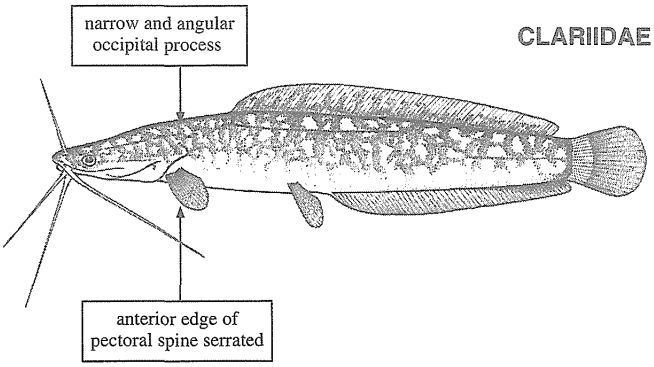
Clarias gariepinus (Burchell, 1815)

Synonyms / misidentifications: *Clarias lazera.*

Local names: Trey andaing afrik, ត្រី អណ្តែងអាហ្វ្រិក.

Size: To 150 cm.

Habitat, biology, and fisheries: One of the commercially most important freshwater fishes in Africa. Has been imported for purposes of aquaculture. Escapees are expected to form naturalized populations. Sold live in markets.



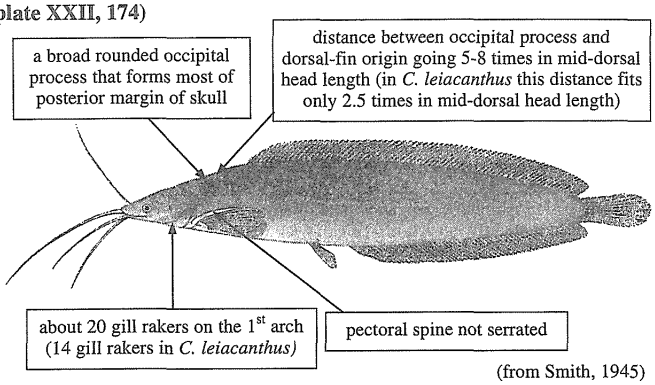
Clarias macrocephalus Günther, 1864 (plate XXII, 174)

FAO name: Broadhead catfish.

Local names: Trey andaing toun, ត្រី អណ្តែងទន់.

Size: To 35 cm.

Habitat, biology, and fisheries: Found in standing water habitats from Thailand to the Philippines. Nearly as common as *C. batrachus*. Diet consists primarily of fishes. Frequents shallow waters and can be caught with seines, cast-nets, gill-nets, and by bare hands. Marketed fresh. As a food fish, it is considered better tasting than *C. batrachus*.



(from Smith, 1945)

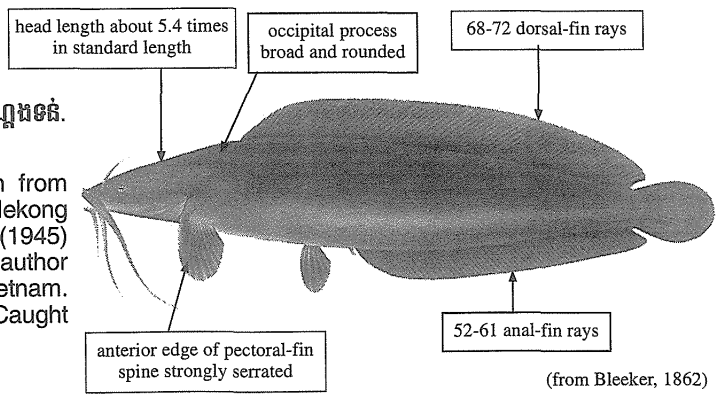
Clarias meladerma Bleeker, 1847

FAO name: Blackskin catfish.

Local names: Trey andaing toun, ត្រី អណ្តែងទន់.

Size: To 34 cm.

Habitat, biology, and fisheries: Known from standing water habitats from the lower Mekong to Indonesia and the Philippines. Smith (1945) listed it as doubtful from Thailand, but the author collected it in the Mekong delta of Vietnam. Predatory, like other species of *Clarias*. Caught by seines and cast-nets. Marketed fresh.



(from Bleeker, 1862)

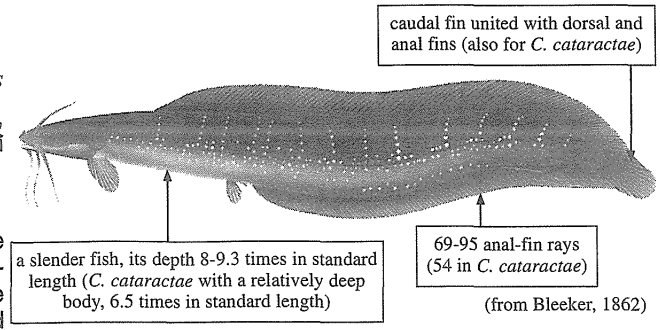
Clarias nieuhofi Valenciennes, 1840

Synonyms / misidentifications: *Prophagorus nieuhofi.*

Local names: Trey andaing ngaing, ត្រី អណ្តែងង៉ាង.

Size: To 50 cm.

Habitat, biology, and fisheries: Known from the coastal side of the Cardamom range, and probably also from the Mekong side. A predator, like other species of *Clarias*. Found in lakes and streams and caught with seines, cast-nets, and gill-nets. Not seen in markets, but if available, probably sold fresh. *C. cataractae* from peninsular Thailand also has the dorsal and anal fins connected to the caudal fin and possibly occurs in Cambodia.



(from Bleeker, 1862)

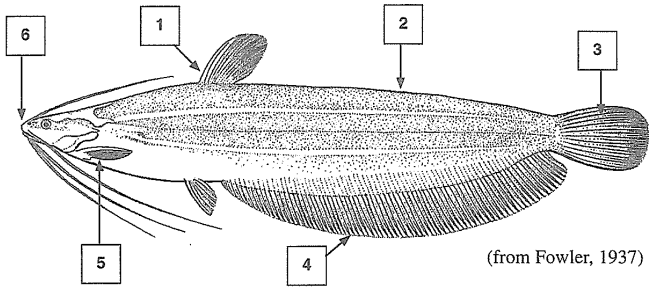
Family HETEROPNEUSTIDAE

Genus *Heteropneustes* — **HETEROPNEUSTIDAE**

(1) SHORT DORSAL FIN WITH FIRST RAY FLEXIBLE AND NON-SPINOUS; **(2)** ADIPOSE FIN ABSENT; **(3)** CAUDAL FIN ROUNDED; **(4)** LONG ANAL FIN; **(5)** STRONG PECTORAL SPINE WITH POISON GLAND AT ITS BASE; **(6)** HEAD DEPRESSED, SNOUT ROUNDED.

1 species recorded.

Heteropneustes fossilis (Bloch, 1797)



(from Fowler, 1937)

FAO name: Stinging catfish.

Local names: Trey andaing toun pouk mawth bun, ត្រី អណ្តែងទន ពពុកមាត់ ប៊ុន.

Size: To 30 cm.

Habitat, biology, and fisheries: Occurs in stagnant and sometimes slightly brackish water habitats from Sri Lanka through Southeast Asia. Its breathing apparatus allows it to exist in semiliquid to semi-dry mud. A predator of small fishes and insects. Rarely seen in markets in Southeast Asia. It can be kept alive out of water for long periods of time as long as the skin is kept damp. An important food fish in India where it is much more common. Caught by cast-nets and by draining ponds and swamps. The name, stinging catfish, is originally used in India, where the species is known to have an extremely powerful poison, and is never handled without some sort of tool by fishermen. Specimens from Southeast Asia look somewhat different from those found elsewhere in its range and may represent a distinct species.

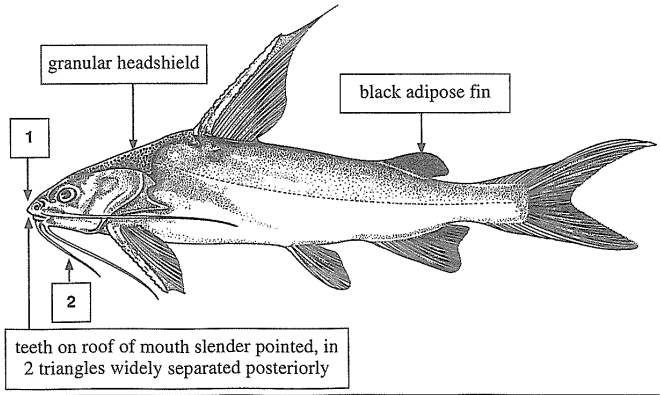
Family ARIIDAE

Genus *Arius* — **ARIIDAE**

(1) TEETH PRESENT ON PALATE; **(2)** 3 PAIRS OF BARBELS.

17 to 19 species possibly found in the Mekong and its estuary, 8 of them included here.

Arius caelatus Valenciennes, 1840



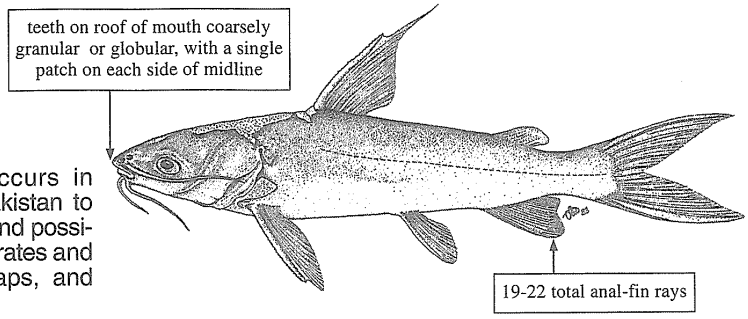
FAO name: Engraved sea catfish.

Local names: Trey kaok, ត្រីកោក.

Size: To 45 cm, but usually smaller.

Habitat, biology, and fisheries: Mostly marine, but occurs in coastal waters from Pakistan to Indonesia. Regularly ascends into fresh water in the Mekong delta and may occasionally be found in Cambodia. Feeds mainly on invertebrates and small fishes. Caught with seines, traps, and by hook-and-line. Mainly marketed fresh.

Arius maculatus (Thunberg, 1792)



FAO name: Spotted sea catfish.

Local names: Trey kaok, ត្រីកោក.

Size: To 60 cm.

Habitat, biology, and fisheries: Occurs in coastal and estuarine waters from Pakistan to Indonesia, including the Mekong delta and possibly Cambodia. Feeds mainly on invertebrates and small fishes. Caught with seines, traps, and hook-and-line. Mostly marketed fresh.

ARIIDAE

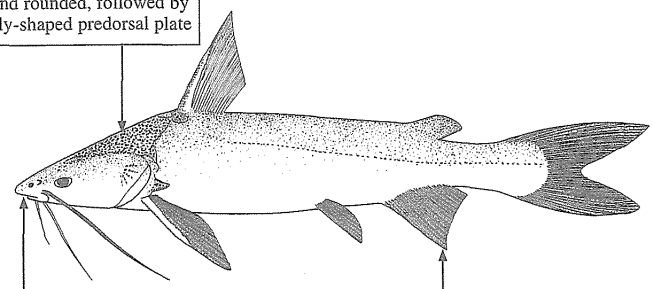
Arius sagor (Hamilton, 1822)

FAO name: Sagor sea catfish.

Local names: Trey kaok, ត្រីកោក.

Size: To 45 cm.

Habitat, biology, and fisheries: Occurs in coastal and estuarine waters, ascending into fresh water of the upper tidal zone from Pakistan to Indonesia. Found in the Mekong delta and possibly upstream in Cambodia. Feeds mainly on invertebrates and small fishes. Caught with seines, traps, and hook-and-line. Marketed fresh.



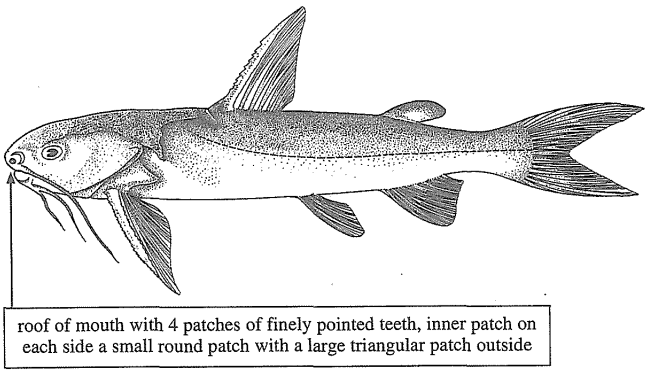
Arius sona (Hamilton, 1822)

FAO name: Sona sea catfish.

Local names: Trey kaok, ត្រីកោក.

Size: To 92 cm.

Habitat, biology, and fisheries: Found in marine coastal waters and estuaries, often ascending through the tidal reaches of large rivers from Pakistan to Polynesia. Found in the Mekong delta and may possibly be found in Cambodia. Feeds on invertebrates and small fishes. Caught with seines, trawls, traps, and hook-and-line. Usually marketed fresh.



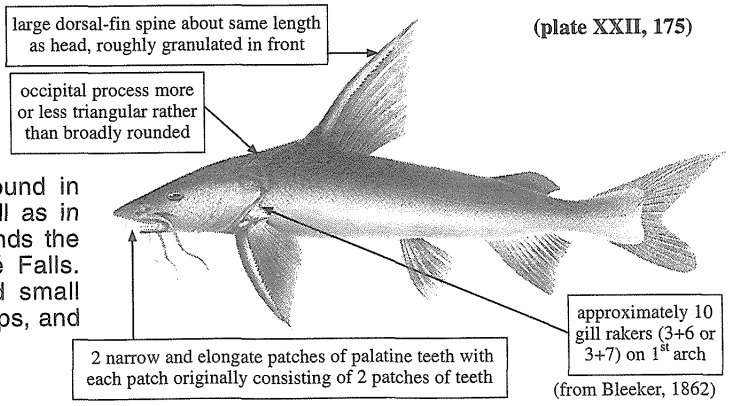
Arius stormi (Bleeker, 1858) **(plate XXII, 175)**

FAO name: Armoured sea catfish.

Local names: Trey kaok, ត្រីកោក.

Size: To 45 cm.

Habitat, biology, and fisheries: Found in lower courses of the Mekong as well as in rivers of Borneo and Sumatra. Ascends the Mekong as far upstream as Khoné Falls. Feeds mainly on invertebrates and small fishes. Caught with seines, trawls, traps, and hook-and-line. Marketed fresh.



(from Bleeker, 1862)

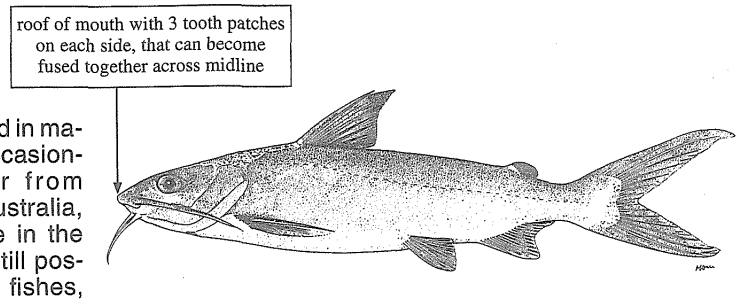
Arius thalassinus (Rüppell, 1837) **(plate XXII, 176)**

FAO name: Giant sea catfish.

Local names: Trey kaok, ត្រីកោក.

Size: To 185 cm.

Habitat, biology, and fisheries: Found in marine coastal waters and estuaries, occasionally ascending into fresh water from Madagascar and the Red Sea to Australia, Polynesia, and north to Japan. Rare in the Mekong delta, but its occurrence is still possible for Cambodia. Feeds on crabs, fishes, and mollusks. Caught with trawls, traps, and by hook-and-line. Usually marketed fresh.



Arius truncatus Valenciennes, 1840

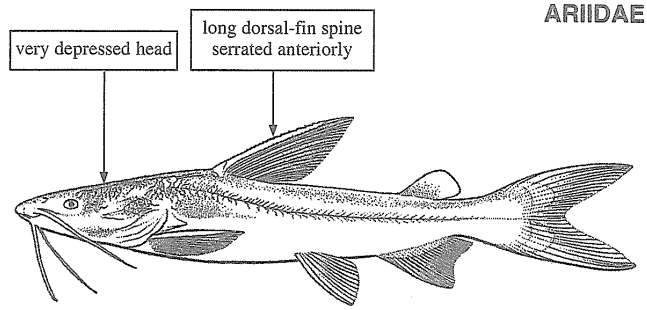
ARIIDAE

Synonyms / misidentifications: *Hemipimelodus cochlearis.*

Local names: Trey kaok, ត្រីកោក.

Size: To 42 cm.

Habitat, biology, and fisheries: Found in estuaries and lower courses of rivers from the Chao Phrya to Sumatra and Java, including the lower Mekong. The species can be quite abundant at times. Feeds on fishes and crustaceans. Caught with trawls, seines, traps, and hook-and-line. Marketed fresh.



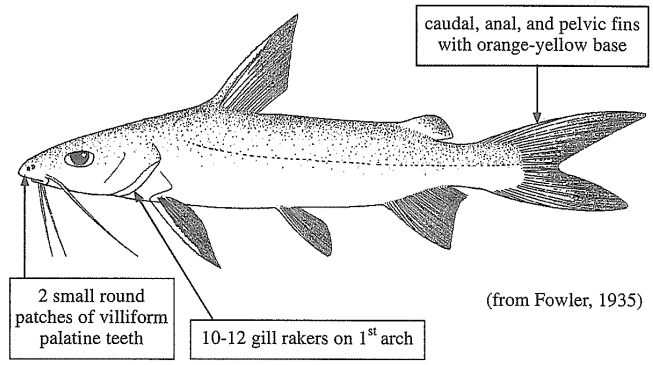
Arius venosus Valenciennes, 1840

FAO name: Veined catfish.

Local names: Trey kaok, ត្រីកោក.

Size: To 30 cm.

Habitat, biology, and fisheries: Occurs in shallow coastal waters and sometimes in estuaries from Sri Lanka to Indonesia, with a disjunct population in the Mozambique channel. It was found by the author at the mouth of the Mekong in 1974 and possibly ascends into fresh water. Feeds on crustaceans and fishes. Caught with seines, trawls, traps, and hook-and-line. Marketed fresh.



(from Fowler, 1935)

Genus *Batrachocephalus*

ARIIDAE

(1) TEETH PRESENT ON PALATE; **(2)** MAXILLARY BARBEL ABSENT; **(3)** ONLY A SMALL PAIR OF MANDIBULARY BARBELS PRESENT.

1 species recorded.

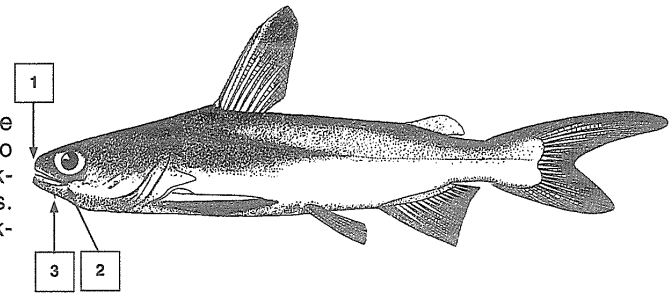
Batrachocephalus mino (Hamilton, 1822)

FAO name: Froghead sea catfish.

Local names: Trey kaok, ត្រីកោក.

Size: To 25 cm.

Habitat, biology, and fisheries: Found in the sea, estuaries, and tidal rivers from India to Indonesia, including the tidal zone of the Mekong. Feeds on crustaceans and small fishes. Caught with seines, trawls, traps, and hook-and-line. Marketed fresh.



Genus *Hemipimelodus* **ARIIDAE**

(1) TEETH ABSENT FROM ROOF OF MOUTH; **(2)** MOUTH SMALL, GAPE NOT EXTENDING AS FAR BACK AS EYE.

4 species recorded, 1 or 2 additional species possible.

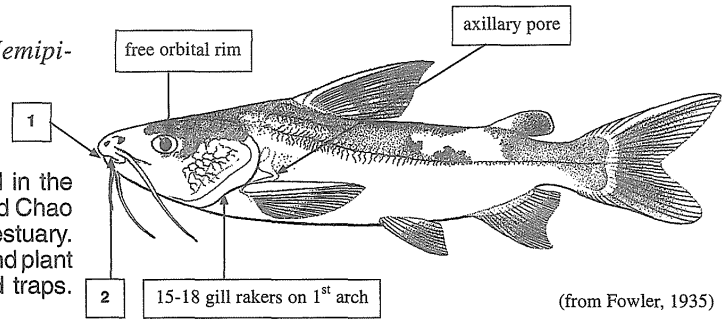
Hemipimelodus bicolor Fowler, 1935

Synonyms / misidentifications: *Hemipimelodus velutinus* (non Weber).

Local names: Trey kaok, ត្រីខ្ទុក.

Size: To 35 cm.

Habitat, biology, and fisheries: Found in the lower courses of rivers in the Mekong and Chao Phrya basins. Common in the Mekong estuary. Diet consists of mollusks, crustaceans, and plant detritus. Caught with trawls, seines, and traps. Not seen in markets.



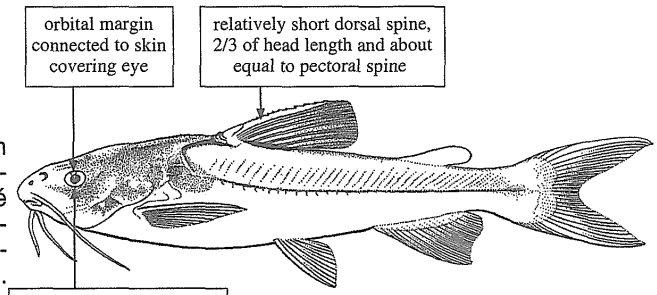
(from Fowler, 1935)

Hemipimelodus borneensis (Bleeker, 1851)

Local names: Trey kaok, ត្រីខ្ទុក.

Size: To 25 cm.

Habitat, biology, and fisheries: Found in large lowland rivers from Thailand to Indonesia, and ascends the Mekong as far as Khoné Falls. Diet consists of bivalve mollusks, crustaceans, aquatic macrophytes, and plant detritus. Caught with trawls, seines, and traps. Marketed fresh.



(from Fowler, 1935)

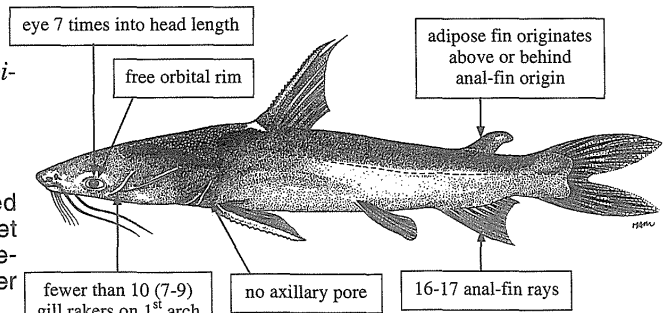
Hemipimelodus daugeti Chevey, 1932

Synonyms / misidentifications: *Hemipimelodus siamensis*.

Local names: Trey kaok, ត្រីខ្ទុក.

Size: To 26 cm.

Habitat, biology, and fisheries: Recorded from the large rivers of Cambodia, but not yet seen by the author. Not yet recorded elsewhere. Habits are probably similar to other species of this genus.



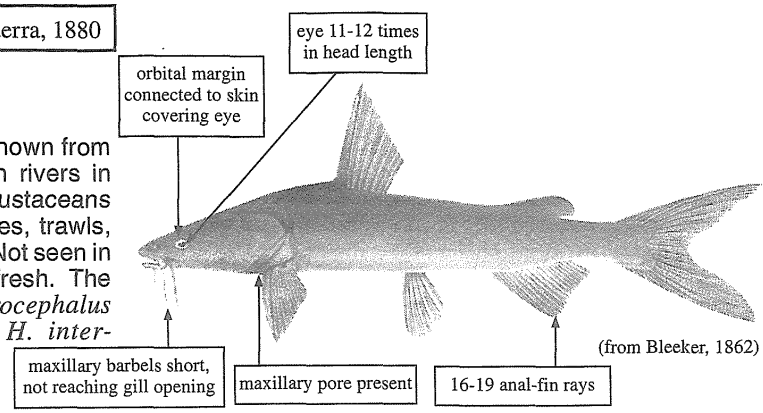
(after Chevey, 1932)

Hemipimelodus intermedius Vinciguerra, 1880

Local names: Trey kaok, ត្រីខ្ទុក.

Size: To 15 cm.

Habitat, biology, and fisheries: Known from the lower Mekong as well as from rivers in Borneo and Sumatra. Feeds on crustaceans and small fishes. Caught with seines, trawls, set-nets, traps, and hook-and-line. Not seen in markets, but probably marketed fresh. The illustration used here is of *H. macrocephalus* Bleeker, 1858 which resembles *H. intermedius*.



(from Bleeker, 1862)

Genus *Ketengus* **ARIIDAE**

(1) TEETH ABSENT FROM ROOF OF MOUTH; (2) MOUTH OPENING WIDE, EXTENDING FAR BEYOND EYE.

1 species recorded.

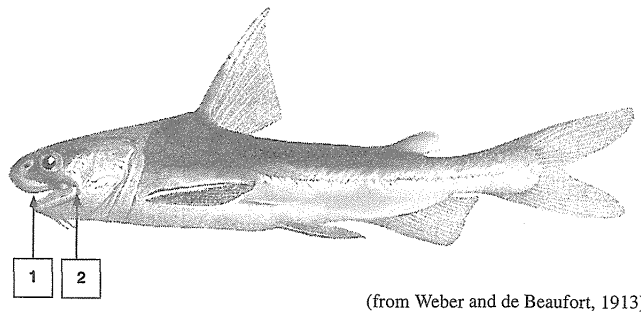
Ketengus typus Bleeker, 1847

FAO name: Bigmouth sea catfish.

Local names: Trey kaok, ត្រីកុក.

Size: To 25 cm.

Habitat, biology, and fisheries: Found in the lower parts of rivers in either fresh or brackish water. Occurs in coastal waters from Thailand to Indonesia and westward to the Andaman Islands. Feeds on invertebrates and small fishes. Caught with trawls, seines, and traps. Not seen in markets.



(from Weber and de Beaufort, 1913)

Genus *Osteogeneiosus* **ARIIDAE**

(1) TEETH PRESENT ON ROOF OF MOUTH; (2) BARBELS RESTRICTED TO A PAIR OF LONG MAXILLARY BARBELS.

1 species recorded.

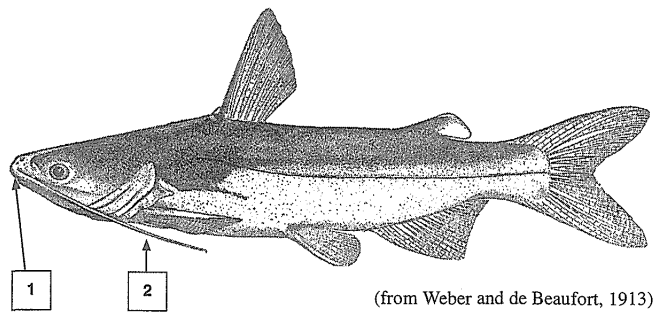
Osteogeneiosus militaris (Linnaeus, 1758)

FAO name: Soldier catfish.

Local names: Trey kaok, ត្រីកុក.

Size: To 30 cm.

Habitat, biology, and fisheries: Found in lower parts of rivers in either fresh or brackish water and in coastal waters from India to Indonesia. Feeds mainly on invertebrates and small fishes. Caught with seines, set-nets, traps, or trawls. Usually marketed fresh.



(from Weber and de Beaufort, 1913)

Family PLOTOSIDAE

Genus *Cnidoglanis* **PLOTOSIDAE**

(1) GILL MEMBRANES UNITED TO ISTHMUS; (2) SECOND DORSAL-FIN ORIGIN BEFORE OR ABOVE PELVIC-FIN INSERTION; (3) CONICAL TEETH IN JAWS, WITH SOME MOLAR-LIKE TEETH ON MANDIBLE AND VOMER.

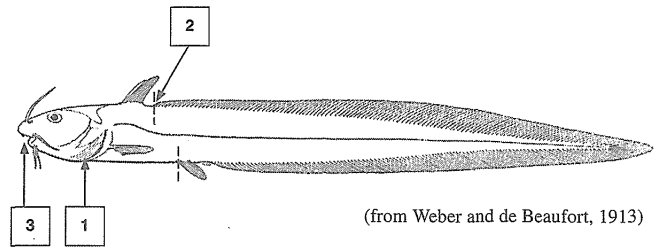
1 species recorded.

Cnidoglanis nudiceps Weber and deBeaufort, 1913

Local names: Trey andaing tonlay, ត្រីអណ្តែងទន្លេ.

Size: To 24 cm.

Habitat, biology, and fisheries: Found along coastlines and in estuaries, including freshwater reaches of the Mekong estuary. Diet consists of crustaceans, mollusks, and fishes. Caught with trawls, seines, traps, and set-nets. Not seen in markets.



(from Weber and de Beaufort, 1913)

Genus *Plotosus* **PLOTOSIDAE**

(1) GILL MEMBRANES FREE FROM ISTHMUS; (2) SECOND DORSAL-FIN ORIGIN ABOVE OR BEHIND PELVIC-FIN INSERTION .

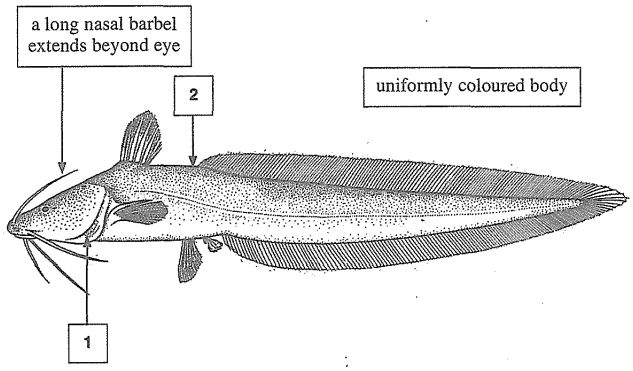
2 species recorded.

Plotosus canius Hamilton, 1822

Local names: Trey andaing tonlay, ត្រីអណ្តែងទន្លេ.

Size: To 90 cm, usually much smaller.

Habitat, biology, and fisheries: Found in lower parts of rivers in fresh or brackish water and in coastal seas from Sri Lanka to New Guinea. Feeds on mollusks, crustaceans, and small fishes. Caught with seines, set-nets, traps, and trawls. Marketed fresh.

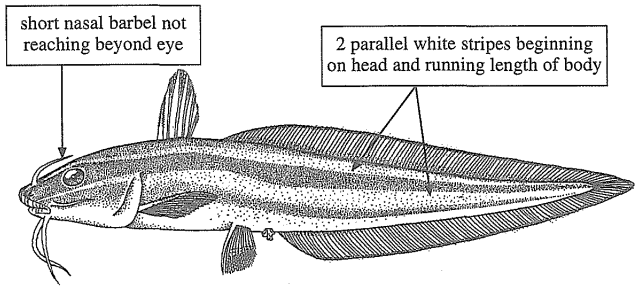


Plotosus lineatus (Thunberg, 1787)

Local names: Trey andaing tonlay, ត្រីអណ្តែងទន្លេ.

Size: To 30 cm.

Habitat, biology, and fisheries: Found in the lower parts of rivers, estuaries and in the sea from Madagascar and the Red Sea eastward to Australia, Fiji, and north to Japan. Feeds on mollusks, crustaceans, and fishes. Caught with seines, trawls, set-nets, and traps. Marketed fresh.



Order OSMERIFORMES

Family SUNDASALANGIDAE

Genus *Sundasalanx* **SUNDASALANGIDAE**

(1) BODY TRANSPARENT AND SCALELESS; (2) DORSAL AND ANAL FINS POSTERIORLY PLACED; (3) PELVIC FINS ABDOMINAL.

1 species recorded.

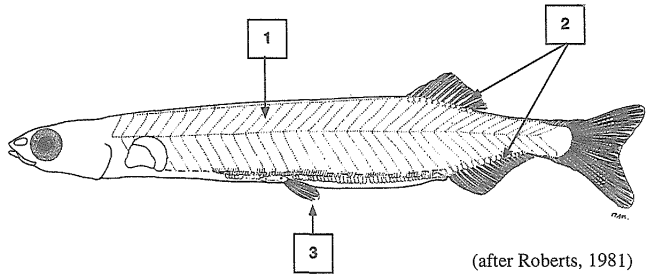
Sundasalanx praecox Roberts, 1981

FAO name: Dwarf noodlefish.

Local names:

Size: To 2 cm.

Habitat, biology, and fisheries: Found in the main stream of the middle Mekong. Usually taken incidentally in haul seines and trap catches. Bears some resemblance to larval clupeiods and is included here for that reason. Little is known about its life history. Not seen in markets.



(after Roberts, 1981)

Order BATRACHOIDIFORMES

Family BATRACHOIDIDAE

Genus *Batrachomoeus* — **BATRACHOIDIDAE**

(1) AN AXILLARY PORE AT BASE OF PECTORAL FIN; **(2)** 22 TO 23 RAYS IN SECOND DORSAL FIN.

1 species recorded.

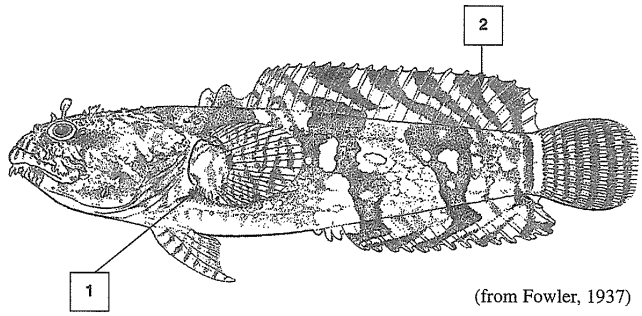
Batrachomoeus trispinosus (Günther, 1861)

FAO name: Threespine toadfish.

Local names:

Size: To 30 cm.

Habitat, biology, and fisheries: Found over muddy bottoms in shallow estuaries and along coasts in Southeast Asia. Caught with seines, trawls, and set-nets. Marketed fresh. Not as common in the Mekong delta as *Halophryne diemensis*.



(from Fowler, 1937)

Genus *Batrichthys* — **BATRACHOIDIDAE**

(1) NO AXILLARY PORE AT PECTORAL-FIN BASE; **(2)** 18 TO 20 RAYS IN SECOND DORSAL FIN; **(3)** STRONG CONICAL TEETH IN A SINGLE ROW, WITH ABOUT 3 ROWS AT SYMPHYSIS OF EACH JAW; **(4)** MAXILLA REACHING BEYOND OR BELOW POSTERIOR BORDER OF EYE.

1 species recorded.

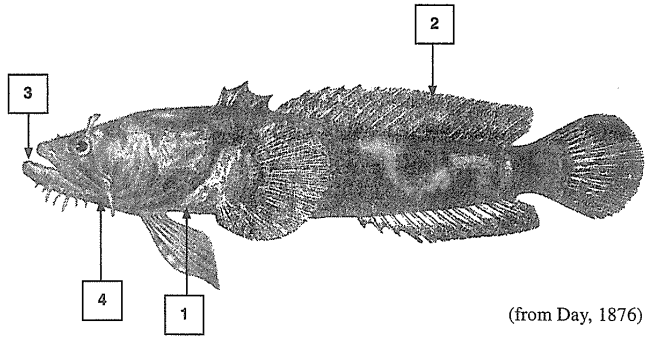
Batrichthys grunniens (Linnaeus, 1758)

FAO name: Grunting toadfish.

Local names:

Size: To 20 cm.

Habitat, biology, and fisheries: Found in estuaries over muddy bottoms and along coasts from India to the Philippines. Makes croaking noises when taken out of the water. Caught with seines, trawls, and sometimes with set-nets. Marketed fresh. Not as common in the Mekong delta as *Halophryne diemensis*.



(from Day, 1876)

Genus *Halophryne* — **BATRACHOIDIDAE**

(1) NO AXILLARY PORE AT PECTORAL-FIN BASE; **(2)** 18 TO 20 RAYS IN SECOND DORSAL FIN; **(3)** JAWS WITH VILLIFORM BANDS OF SMALL CONICAL TEETH; **(4)** MAXILLA REACHING ONLY TO POSTERIOR BORDER OF PUPIL.

1 species recorded.

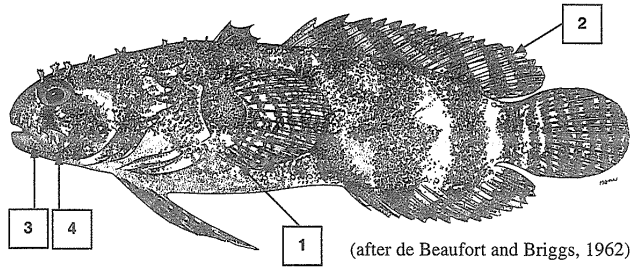
Halophryne diemensis (Leseuer, 1823)

FAO name: Banded toadfish.

Local names:

Size: To 26 cm.

Habitat, biology, and fisheries: Found in estuaries and along coasts from China to Australia. Fairly common in the tidally influenced part of the lower Mekong. The opercular spine is not venomous in this species. Conceals itself in mud or debris and waits for prey to come by. Feeds primarily on mollusks, crustaceans, and occasionally on fish. Taken by seines, trawls, and sometimes set-nets. Marketed fresh in the Mekong delta.



(after de Beaufort and Briggs, 1962)

Order ATHERINIFORMES

Family PHALLOSTETHIDAE

Genus *Phenacostethus* **PHALLOSTETHIDAE**

(1) FIRST DORSAL FIN REDUCED TO A SINGLE RAY; **(2)** 14 TO 15 ANAL-FIN RAYS; **(3)** LOWER JAW PROJECTING BEYOND UPPER JAW.

1 or 2 species found in the Cambodian Mekong.

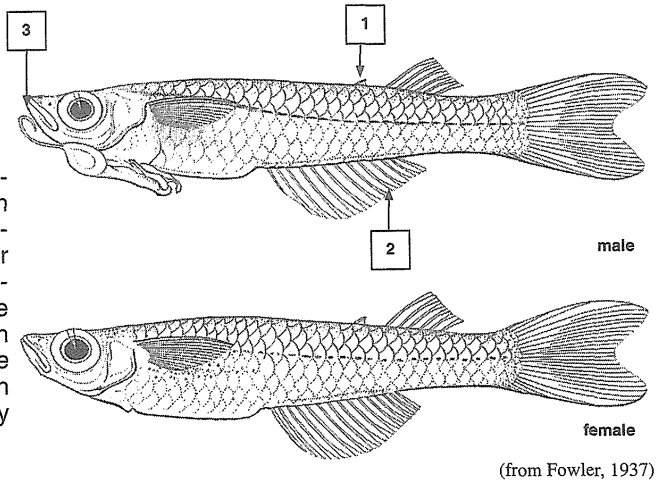
Phenacostethus smithi Myers, 1928

FAO name: Smith's priapium fish.

Local names:

Size: To 2 cm.

Habitat, biology, and fisheries: Occurs in freshwater habitats of inland floodplains. Found in marshes and swamps with plenty of aquatic submerged and floating vegetation with the latter being the most important. Feeds on minute crustaceans and protozoans. Caught only with the most finely meshed nets. Taken incidentally in some fishing operations, but is unlikely to be noticed. Other species of this family have been taken in the Mekong delta, particularly in tidally influenced areas or in brackish water.



(from Fowler, 1937)

Order BELONIFORMES

Family ADRIANICHTHYIDAE

Genus *Oryzias* **ADRIANICHTHYIDAE**

(1) UPPER JAW NON-PROTRACTILE; **(2)** PECTORAL-FIN BASE PARTIALLY ABOVE THE MID-LATERAL AXIS OF BODY; **(3)** BODY TYPICALLY TRANSPARENT ABOVE OR WHITE WHEN PRESERVED.

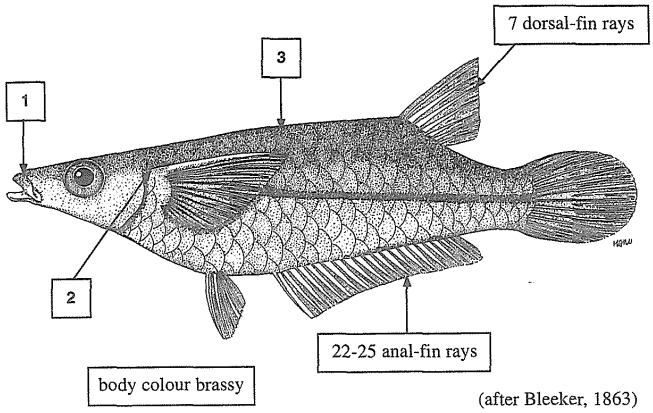
3 species found in the lower Mekong, 2 species included here.

Oryzias javanicus Bleeker, 1854

Local names:

Size: To 3.5 cm.

Habitat, biology, and fisheries: Occurs in ditches, canals, and ponds throughout the tidal zone from Thailand to Indonesia. Found at the surface in habitats with dense growth of aquatic plants. Feeds on small crustaceans, insects, and protozoans. The inclusion of this species is based on field records from Vietnam in 1974, although the identification was not verified. Caught with seines and cast nets and forms part of the subsistence fisheries. Not seen in markets.



(after Bleeker, 1863)

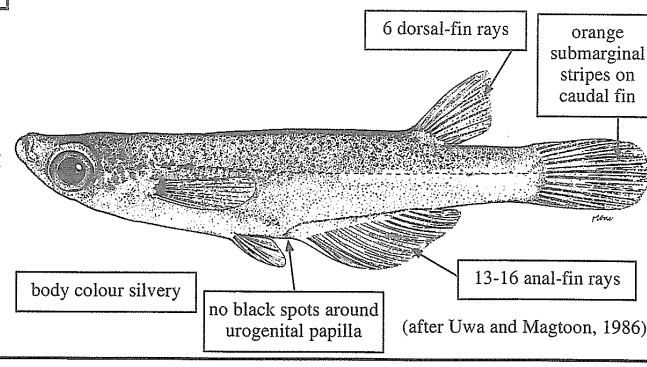
Oryzias mekongensis Uwa and Magtoon, 1986

ADRIANICHTHYIDAE

Local names:

Size: To 1.8 cm.

Habitat, biology, and fisheries: Found in shallow permanent standing water of ditches, canals, and ponds in the Mekong basin. Most commonly found in water that has dense growth of submerged aquatic macrophytes with finely divided leaves. Feeds on plankton. Caught only with fine-meshed nets or when larger nets pull out large amounts of plants, trapping the fishes in them. Not seen in markets.



(after Uwa and Magtoon, 1986)

Family BELONIDAE

Genus *Xenentodon*

BELONIDAE

(1) BODY TERETE OR ROUNDED IN CROSS-SECTION; **(2)** CAUDAL FIN TRUNCATE OR ROUNDED; **(3)** NO KEEL ON CAUDAL PEDUNCLE; **(4)** OPERCULUM SCALELESS; **(5)** DORSAL-FIN ORIGIN ABOVE ANAL-FIN ORIGIN.

3 species recorded, including an undescribed species.

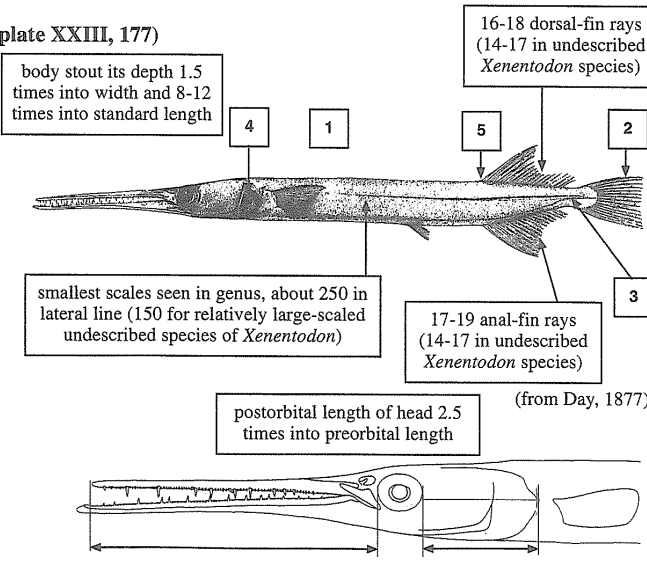
Xenentodon cancila (Hamilton, 1822)

(plate XXIII, 177)

Local names: Trey phtoung, ត្រីផ្ទោង.

Size: To 40 cm.

Habitat, biology, and fisheries: Found most commonly at the surface in sluggish or standing waters over a range from Sri Lanka and India eastward to the Mekong. Also inhabits large and medium-sized rivers with adults occurring in areas that lack floating vegetation. A common inhabitant of open waters on the floodplain. Feeds on small fishes and insects. Caught with seines, set-nets, and cast-nets. Marketed fresh.



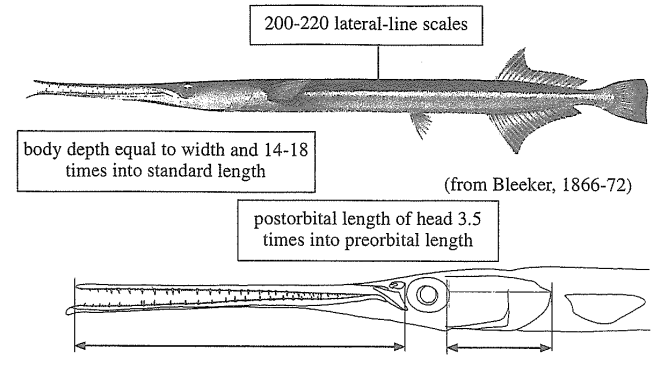
(from Day, 1877)

Xenentodon canciloides (Bleeker, 1853)

Local names: Trey phtoung, ត្រីផ្ទោង.

Size: To 30 cm.

Habitat, biology, and fisheries: Found at the surface in flowing and non-flowing waters from Thailand and the Mekong to Indonesia. Its biology is probably similar to *X. cancila*, but the species is apparently rarer. Not seen in Cambodian markets, but probably caught and marketed in the same way as *X. cancila*.



(from Bleeker, 1866-72)

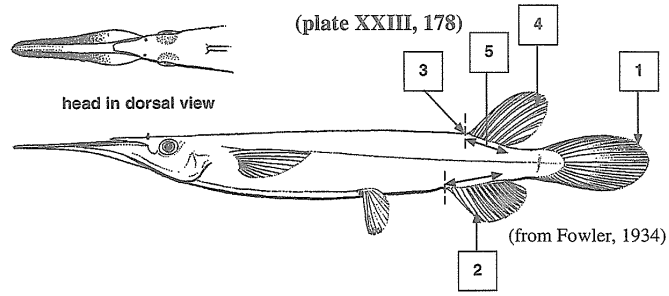
Family HEMIRAMPHIDAE

Genus *Dermogenys* — **HEMIRAMPHIDAE**

(1) CAUDAL FIN TRUNCATE OR ROUNDED; **(2)** ANAL FIN MODIFIED IN MALES; **(3)** DORSAL-FIN ORIGIN BEHIND ANAL-FIN ORIGIN; **(4)** DORSAL FIN WITH FEWER BRANCHED RAYS THAN ANAL FIN; **(5)** DORSAL-FIN BASE SHORTER THAN ANAL-FIN BASE.

1 species recorded.

Dermogenys pusilla van Hasselt, 1823



Local names: Trey phtoung, ត្រីផ្ទោង.

Size: To 7 cm.

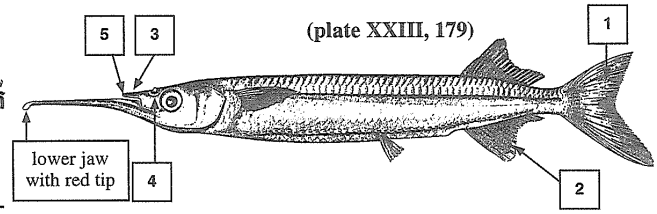
Habitat, biology, and fisheries: Known from surface levels of quiet waters from Thailand to Indonesia. Most common in areas with floating plants or rooted aquatics that reach the surface. Feeds on aquatic insects and crustaceans. Rarely taken in commercial catches, although it may be found in subsistence catches made by seines, dip-nets, or cast-nets. Not seen in markets.

Genus *Hyporhamphus* — **HEMIRAMPHIDAE**

(1) CAUDAL FIN FORKED; **(2)** ANAL FIN UNMODIFIED IN MALES; **(3)** SCALES PRESENT ON SNOUT; **(4)** NASAL PAPILLA NOT FIMBRIATE; **(5)** UPPER JAW FLAT IN CROSS SECTION.

9 species found in the Mekong freshwaters, estuary and plume, 1 species included here.

Hyporhamphus limbatus (Valenciennes, 1846)



Local names: Trey phtoung, Trey phtinh, ត្រីផ្ទោង. ត្រីផ្ទិញ។.

Size: To 25 cm.

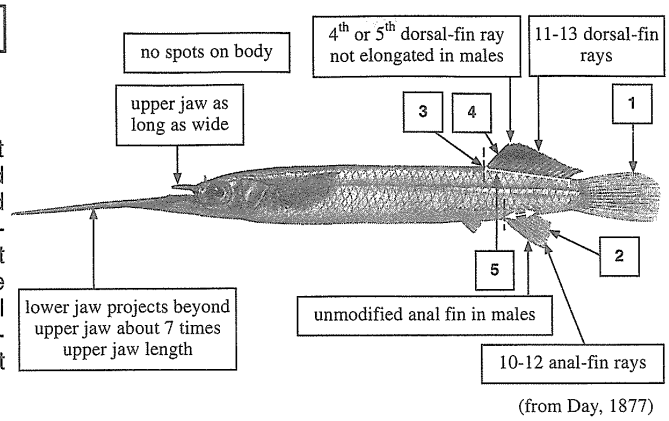
Habitat, biology, and fisheries: Found at surface levels in tidal freshwaters and brackish estuaries from India to Southeast Asia. Seen in the Mekong as far upstream as Stung Treng, and also found in the Great Lake. Feeds primarily on insects. Caught with seines, cast-nets, and dip-nets. A small number is also taken in the set-nets of the Tonlé Sap. Marketed fresh.

Genus *Zenarchopterus* — **HEMIRAMPHIDAE**

(1) CAUDAL FIN ROUNDED OR TRUNCATE; **(2)** ANAL FIN USUALLY MODIFIED IN MALES; **(3)** DORSAL-FIN ORIGIN IN FRONT OF ANAL-FIN ORIGIN; **(4)** DORSAL FIN WITH MORE RAYS THAN ANAL FIN; **(5)** DORSAL-FIN BASE LONGER THAN ANAL-FIN BASE.

10 species likely to occur in the lower Mekong, 3 of them included here.

Zenarchopterus buffonis (Valenciennes, 1845)



Local names: Trey phtoung, ត្រីផ្ទោង.

Size: To 23 cm.

Habitat, biology, and fisheries: Found at surface levels in coastal waters, estuaries and rivers from peninsular India to Indonesia and the Philippines. This is one of the larger species of the genus reported from Cambodia, but it is rare and more likely to be found in the Mekong delta of Vietnam. Feeds on terrestrial insects. Caught by seines, cast-nets, and dip-nets. May also be taken in large set-nets. Not seen in markets.

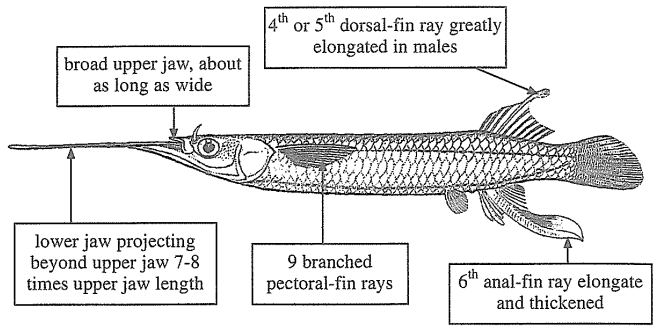
Zenarchopterus dunckeri Mohr, 1926

HEMIRAMPHIDAE

Local names: Trey phtoung, ត្រីផ្ទោង.

Size: To 14 cm.

Habitat, biology, and fisheries: Occurs at surface levels in estuaries from Thailand to Indonesia. Its habitat may be confined to brackish water. Known from estuaries along the Cambodian coast. It is unclear if it penetrates to the upper edge of the tidal zone of the Cambodian Mekong. Diet consists of terrestrial insects. Taken with seines, dip-nets, and cast-nets. Not seen in markets.



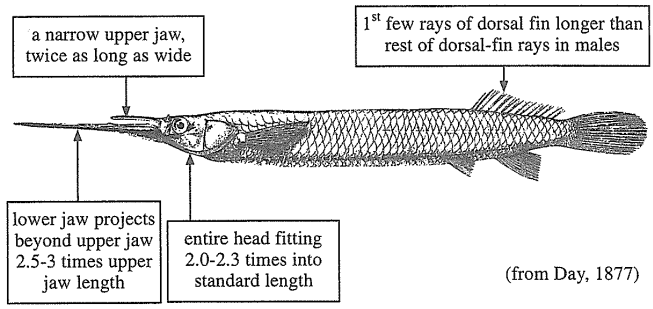
(from Fowler, 1937)

Zenarchopterus ectuntio (Hamilton, 1822)

Local names: Trey phtoung, ត្រីផ្ទោង.

Size: To 18 cm.

Habitat, biology, and fisheries: Found at surface levels in estuaries and rivers well upstream from the tidal zone in the lower Mekong. Widely distributed from India to Australia and north to Hong Kong. Feeds on terrestrial insects. Taken with seines, dip-nets and cast-nets. Marketed fresh.



(from Day, 1877)

Family APLOCHEILIDAE

Genus *Aplocheilus*

APLOCHEILIDAE

(1) UPPER JAW PROTRACTILE; **(2)** PECTORAL-FIN BASE ENTIRELY BELOW MID-LATERAL AXIS OF BODY; **(3)** BODY COLOURED, WITH DARK BLOTCH AT DORSAL-FIN BASE AND SCALE BASES DARKENED ON THE BODY.

1 species recorded.

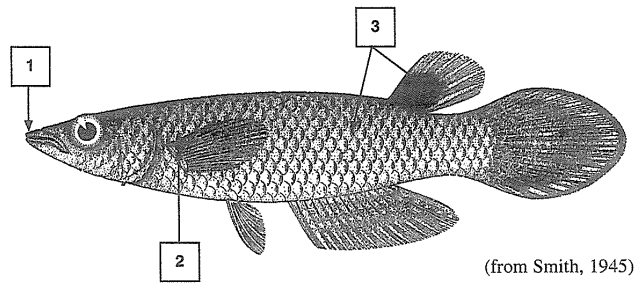
Aplocheilus panchax (Hamilton, 1822)

FAO name: Blue panchax.

Local names: Trey changwa ronoung, ត្រីចង្វារធោង.

Size: To 6 cm.

Habitat, biology, and fisheries: Found near the surface in standing waters of ditches, canals, and ponds from India to Indonesia. Prefers clear water in areas with dense growth of rooted or floating macrophytes. Easily recognized in turbid waters by the reflection of the silvery spot on the top of the head. Diet consists primarily of insects, especially mosquito larvae. A small fish, taken by seines, dip-nets, lift-nets, and cast-nets. Rarely caught by commercial fishermen and not seen in markets.



(from Smith, 1945)

Order GASTEROSTEIFORMES

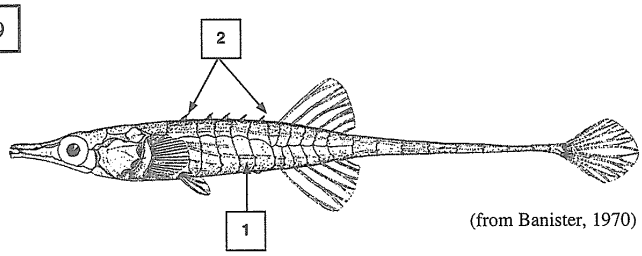
Family INDOSTOMIDAE

Genus *Indostomus* — **INDOSTOMIDAE**

(1) BODY COVERED WITH BONY PLATES; **(2)** A SERIES OF INDEPENDENT DORSAL-FIN SPINES, NOT CONNECTED BY A FIN MEMBRANE.

1 species recorded.

Indostomus paradoxus Prashad and Mukerji, 1929



(from Banister, 1970)

FAO name: Armoured stickleback.

Local names:

Size: To 3 cm.

Habitat, biology, and fisheries: Found along the bottom in stagnant waters of canals, ditches, and swamps from northern Burma to Cambodia. A sedentary, slowly moving species that spends most of its time resting on the bottom. Feeds on worms and other slowly moving benthic invertebrates. Taken by seines and push-nets, but is rarely, if ever, observed in commercial catches. Relatively inedible, due to its small size and strong body armour. Does not appear in markets.

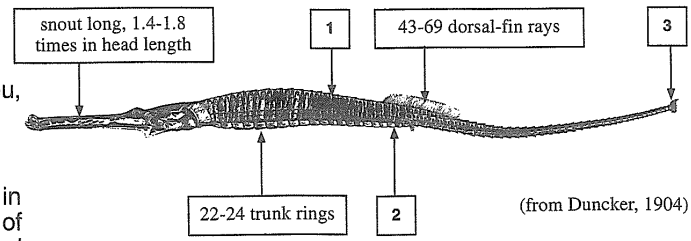
Family SYNGNATHIDAE

Genus *Doryichthys* — **SYNGNATHIDAE**

(1) SUPERIOR TRUNK AND TAIL RIDGES DISCONTINUOUS; **(2)** INFERIOR TRUNK AND TAIL RIDGES CONTINUOUS; **(3)** TYPICALLY 9 CAUDAL-FIN RAYS.

4 species found in the lower Mekong, 1 species included here.

Doryichthys boaja (Bleeker, 1851)



(from Duncker, 1904)

FAO name: Long-snouted pipefish.

Local names: Trey kabo, Trey chay krawpoeu, ត្រី កាប៉ូ, ត្រីឆៅក្រពើ.

Size: To 40 cm.

Habitat, biology, and fisheries: Occurs in large rivers and streams in the lower courses of rivers from Thailand to Indonesia. *D. boaja* and three other species of the genus are found in the lower Mekong or nearby parts of the Thailand and the Malay Peninsula. This species was seen as far upstream as the Great Lake. Moves about in bottom debris, eating small crustaceans, worms, and insects. Taken incidentally with seines, cast-nets, set-nets, and traps, but of little food value. Not seen in markets.

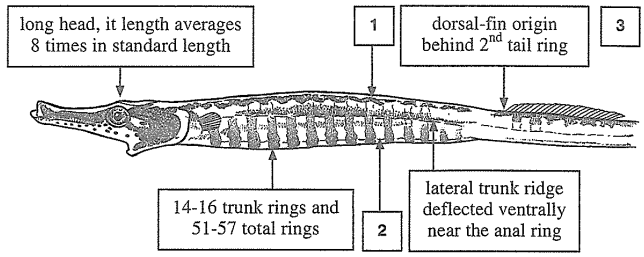
Genus *Hippichthys* **SYNGNATHIDAE**

(1) SUPERIOR TRUNK AND TAIL RIDGES DISCONTINUOUS; (2) INFERIOR TRUNK AND TAIL RIDGES CONTINUOUS; (3) TYPICALLY 10 CAUDAL-FIN RAYS (NOT DEPICTED IN FIGURE).

4 species expected from fresh and brackish waters of the lower Mekong, 1 species included here.

Hippichthys spicifer (Rüppell, 1838)

FAO name: Bellybarred pipefish.
Local names: Trey krawpoeu, ត្រីក្រពើ.
Size: To 18 cm.



Habitat, biology, and fisheries: Found most commonly among mangroves and in brackish water from the east coast of Africa to Samoa. Recorded upstream in freshwater of the Mekong, but this record may represent another species of this genus or another genus among the fifteen genera of pipefishes expected in the Mekong estuary and plume. Taken with seines, cast-nets, and set-nets, but of little or no food value. Not seen in markets.

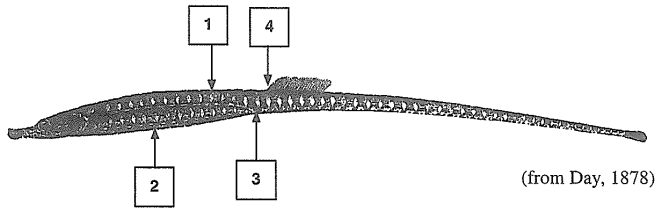
Genus *Ichthyocampus* **SYNGNATHIDAE**

(1) SUPERIOR TRUNK AND TAIL RIDGES CONTINUOUS; (2) INFERIOR TRUNK AND TAIL RIDGES CONTINUOUS; (3) LATERAL TRUNK RIDGE VENTRALLY DEFLECTED AT VENT; (4) DORSAL-FIN ORIGIN AT OR BEHIND VENT.

1 species recorded in Mekong.

Ichthyocampus carce (Hamilton, 1822)

FAO name: Freshwater pipefish.
Local names: Trey krawpoeu, ត្រីក្រពើ.
Size: To 15 cm.



(from Day, 1878)

Habitat, biology, and fisheries: Found in relatively still waters of rivers, streams, and estuaries from the west coast of India to the Celebes. Feeds on worms, crustaceans, and small zooplankton. Caught with seines and cast-nets, but of no commercial value. Not seen in markets.

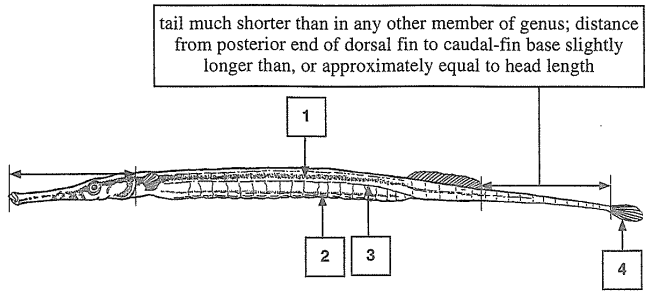
Genus *Microphis* **SYNGNATHIDAE**

(1) SUPERIOR TRUNK AND TAIL RIDGES DISCONTINUOUS; (2) INFERIOR TRUNK AND TAIL RIDGES DISCONTINUOUS; (3) LATERAL-TRUNK RIDGE CONTINUOUS WITH INFERIOR TAIL RIDGE; (4) TYPICALLY 9 CAUDAL-FIN RAYS.

At least 1 species found in the Mekong. Numerous species ascend rivers in Indonesia and the Philippines and probably have not been recorded from the lower Mekong due to lack of collecting.

Microphis brachyurus (Bleeker, 1853)

FAO name: Short-tailed pipefish.
Local names: Trey krawpoeu, ត្រីក្រពើ.
Size: To 21 cm.



Habitat, biology, and fisheries: Found in freshwater streams, rivers, and estuaries from Africa to Japan and the Society Islands. Juveniles and subadults are usually found in estuaries and adults are found upstream in freshwater areas. Feeds on worms, crustaceans, and zooplankton. Caught with seines, cast-nets, and set-nets, but of no commercial value. Not seen in markets.

Order SYNBRANCHIFORMES

Family SYNBRANCHIDAE

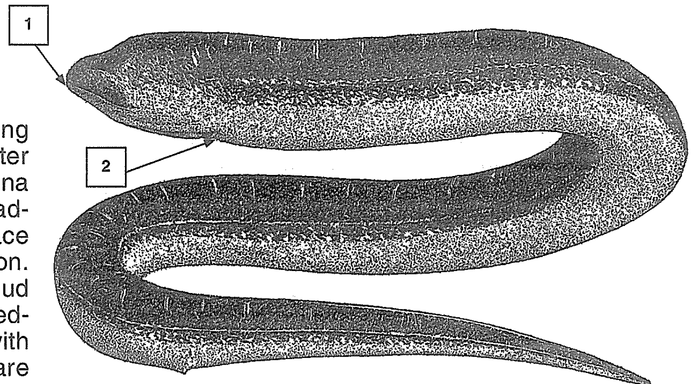
Genus *Monopterus* **SYNBRANCHIDAE**

(1) JAW AND PALATINE TEETH IN BANDS; **(2)** CONFLUENT GILL MEMBRANES ATTACHED TO ISTHMUS BY MEDIAN SEPTUM THAT ALSO DIVIDES THE GILL OPENINGS.

1 species recorded.

Monopterus albus (Zuiew, 1793)

(plate XXIII, 180)



(from Weber and de Beaufort, 1916)

FAO name: Swamp eel.

Local names: Antong, អន្ទង់.

Size: To 70 cm.

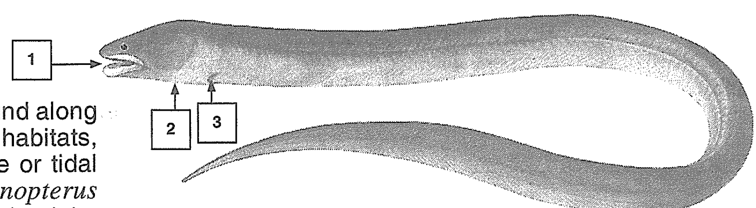
Habitat, biology, and fisheries: Found along the bottom, often in holes, in standing water habitats of all types from Myanmar and China to Indonesia. Particularly common in rice paddies. A bubble nest builder at the water surface near the shoreline during the rainy season. Can burrow up to 1.5 m down into the mud where it survives dry periods. A predator, feeding on crustaceans, and mollusks. Taken with hook-and-line, traps, dry-pumping, or bare hands in the rainy season. During the dry season the deepest parts of swamps are excavated to find them. Marketed fresh and can be kept alive for long periods of time as long as the skin is kept moist.

Genus *Ophisternon* **SYNBRANCHIDAE**

(1) JAW AND PALATINE TEETH IN A SINGLE SERIES; **(2)** CONFLUENT GILL MEMBRANES FREE FROM ISTHMUS AND WITH SINGLE UNDIVIDED GILL OPENING; **(3)** GILL OPENING CONFINED TO BOTTOM OF HEAD.

1 species recorded.

Ophisternon bengalense (M'Clelland, 1845)



(from Day, 1878)

FAO name: Bengal mudeel.

Local names: Antong, អន្ទង់.

Size: To at least 100 cm.

Habitat, biology, and fisheries: Found along the bottom of shallow standing water habitats, usually in burrows. Prefers estuarine or tidal areas. Much less common than *Monopterus albus*, and may be confined mostly to the delta in Vietnam. May be collected with traps, hook-and-line, or by dry-pumping. Marketed fresh, but usually not kept alive for long periods of time.

Family CHAUDHURIIDAE

Genus *Chaudhuria* **CHAUDHURIIDAE**

(1) CAUDAL FIN PRESENT, NOT ATTACHED TO DORSAL OR ANAL FINS; **(2)** SIZE ALWAYS QUITE SMALL.

1 species recorded.

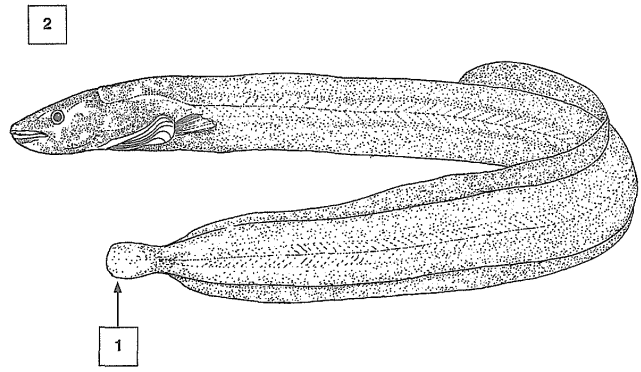
Chaudhuria caudata Annandale, 1918 **(plate XXIII, 181)**

FAO name: Burmese spineless eel.

Local names:

Size: To 6 cm.

Habitat, biology, and fisheries: Found on the bottom of shallow standing waters from Burma to Cambodia. Most common on grassy floodplains, often in water only a few centimetres deep. Little is known about its biology. Can be caught with fine-meshed seines, and by dry-pumping, but not fished commercially. The species may superficially resemble tiny juveniles of *Monopterus albus*, but is easily recognized by the presence of a well-developed caudal fin.



Family MASTACEMBELIDAE

Genus *Macrognathus* **MASTACEMBELIDAE**

(1) 12 TO 31 DORSAL-FIN SPINES; **(2)** RIM OF ANTERIOR NOSTRIL WITH 4 OR 6 FIMBRIAE; **(3)** SMALL SPECIES WITH ADULT SIZE OF 12 TO 30 CM.

7 species possibly found in the Cambodian Mekong.

Macrognathus maculatus Cuvier, 1831

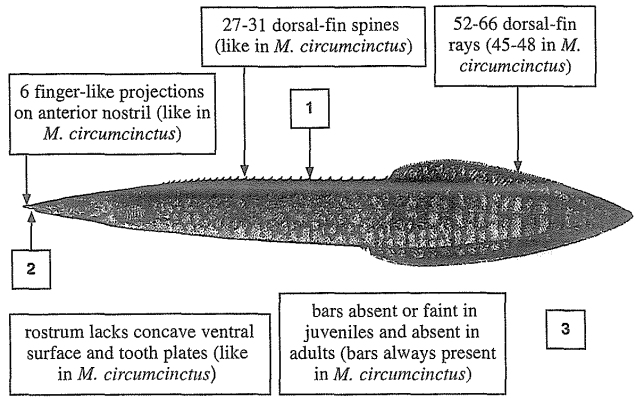
Synonyms / misidentifications: *Mastacembelus maculatus.*

FAO name: Frecklefin eel.

Local names: Trey kchoeung, ត្រី ខ្ជឹង.

Size: To 26 cm.

Habitat, biology, and fisheries: Known from Malaysia and Vietnam to Indonesia, and likely to be found in the lower Mekong of Cambodia. Usually occurs in clear water over rocky bottom in flowing streams. Feeds on bottom dwelling insect larvae, worms, and possibly some crustaceans. Caught by seines, push-nets, and cast-nets. Uncommon, but probably marketed fresh.



(from Fowler, 1905)

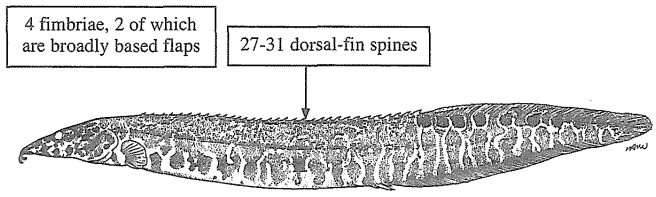
Macrognathus taeniagaster (Fowler 1935) (plate XXIII, 182) MASTACEMBELIDAE

Synonyms / misidentifications: *Mastacembelus circumcinctus* (non Hora); *Macrognathus semiocellatus.*

Local names: Trey kchoeung, ត្រី ខ្ជឹង.

Size: To 16 cm.

Habitat, biology, and fisheries: Found at bottom depths in flowing and standing water habitats of the Chao Phrya, Meklong, and Mekong basins. Very common in the Mekong and often seen in impoundments. During the daytime, it spends much of its time mostly buried in silt, sand, or fine gravel. Usually only the snout and eyes protrude from the bottom. Emerges at night to forage for benthic insect larvae, crustaceans, and worms. Caught with seines, push-nets, set-nets, and traps. Marketed fresh and often seen in the aquarium trade.



(after Roberts, 1986)

Macrognathus siamensis (Günther, 1861) (plate XXIII, 183)

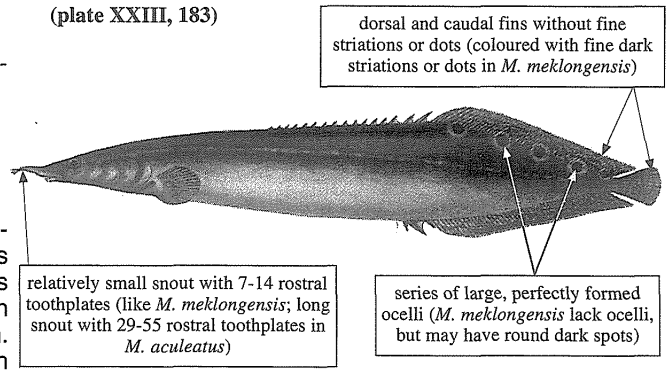
Synonyms / misidentifications: *Macrognathus aculeatus* (non Bloch).

FAO name: Peacock eel.

Local names: Trey chhlonh chhnoht, ត្រី ឆ្លុងឆ្នូត.

Size: To 30 cm.

Habitat, biology, and fisheries: Found at bottom depths in slow-moving or standing waters on mainland Southeast Asia. Spends much of its time buried in the silt, sand, or fine gravel with only a part of its head protruding from the bottom. Emerges at dusk to forage for food. Feeds on benthic insect larvae, crustaceans, and worms. Caught with seines, push-nets, and traps. Marketed fresh and often seen in the aquarium trade.



(from Bleeker, 1983)

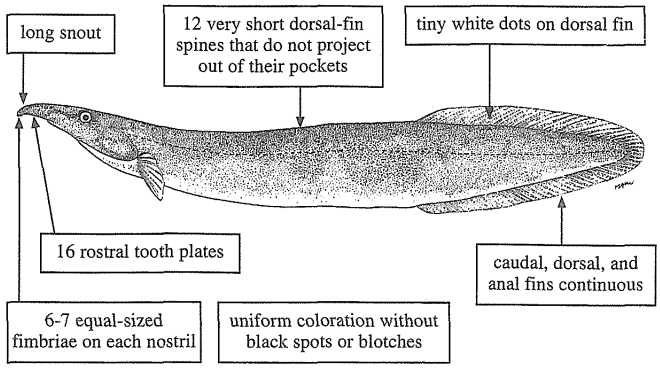
Macrognathus sp. (plate XXIII, 184)

Fao name: Shortspine eel.

Local names: Trey kchoeung, ត្រី ខ្ជឹង.

Size: To 45 cm.

Habitat, biology, and fisheries: Found at bottom depths over gravel or rock substrate in flowing waters in northern Cambodia. Like other species of this genus, it probably prefers to rest concealed by loose fine-grained substrate. Individuals resting in bedrock crevices or under large rocks often show numerous bites along their fins from puffer fishes. Feeds on benthic insect larvae, crustaceans, and worms. Probably comes out and forages at night as seen in other species of *Macrognathus*. Caught with seines, cast-nets, and pushnets. Marketed fresh. An apparently undescribed species.



Genus *Mastacembelus* **MASTACEMBELIDAE**

(1) 33 TO 40 DORSAL-FIN SPINES; **(2)** RIM OF ANTERIOR NOSTRIL WITH 2 FIMBRIAE AND 2 BROAD-BASED FLAPS (NEVER 6 EQUAL FIMBRIAE); **(3)** LARGER SPECIES, WITH ADULTS COMMONLY OVER 30 CM AND OFTEN GREATER THAN 50 CM.

4 species possibly found in the Cambodian Mekong, 3 of them included here.

Mastacembelus armatus (Lacepède, 1800)

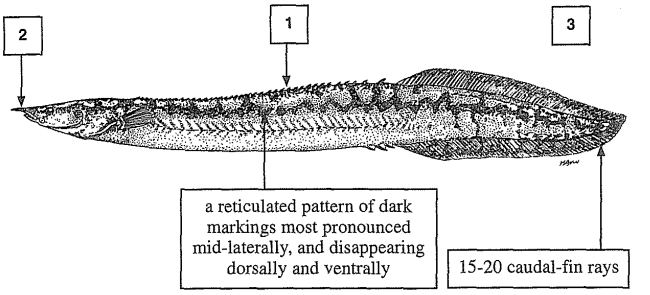
(plate XXIV, 185)

FAO name: Zig-zag eel.

Local names: Trey kchoeung, ត្រីខ្ជឹង.

Size: To 80 cm.

Habitat, biology, and fisheries: Found along the bottom usually in flowing water over coarse substrates, and occasionally in reservoirs from Sri Lanka to Indonesia. Sometimes rests partially buried in fine substrates, and forages at night. Feeds on benthic insect larvae, worms, and some submerged plant material. Caught with seines, traps, and by hook-and-line. Marketed fresh and frequently seen in the aquarium trade.



(after Sufi, 1956)

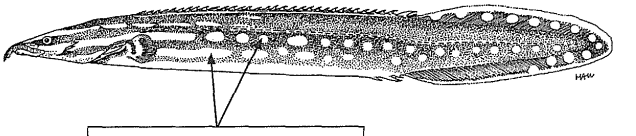
Mastacembelus erythrotaenia Bleeker, 1870

FAO name: Fire eel.

Local names: Trey kchoeung phka, ត្រីខ្ជឹងផ្កា.

Size: To 90 cm.

Habitat, biology, and fisheries: A large lowland floodplain species found in slow moving rivers and inundated plains from Thailand to Indonesia. Known from the lower Mekong floodplain but not yet recorded from upland areas of the middle Mekong. Feeds on benthic insect larvae, worms, and some plant material. Caught with seines, traps, hook-and-line, and by dry pumping bodies of standing water. Marketed fresh and often seen in the aquarium trade. This species has apparently become rare in recent years.



(after Sufi, 1956)

Mastacembelus favus Hora, 1923

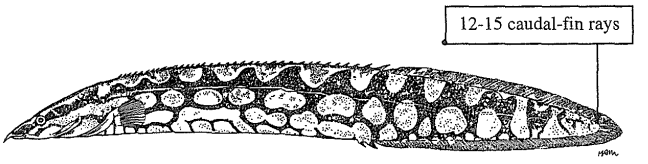
Synonyms / misidentifications: *Mastacembelus armatus* (non Lacepède).

FAO name: Tire track eel.

Local names: Trey kchoeung, ត្រីខ្ជឹង.

Size: To 70 cm.

Habitat, biology, and fisheries: Found along the bottom in flowing waters from Thailand to the Malay Peninsula. Commonly found in the Mekong. Most often seen over gravel substrates where it may buries itself during the day. Active at night, it feeds on benthic insect larvae, worms, and some submerged plant matter. Caught with seines, traps, and hook-and-line.



(after Sufi, 1956)

Order PERCIFORMES

Suborder PERCOIDEI

Family CHANDIDAE

Genus *Ambassis* **CHANDIDAE**

(1) 25 TO 30 LARGE SCALES IN LATERAL SERIES; **(2)** 1 TO 2 ROWS OF SCALES ON CHEEK; **(3)** TEETH PRESENT ON TONGUE.

9 species likely to occur in the Mekong estuary, 3 of them included here.

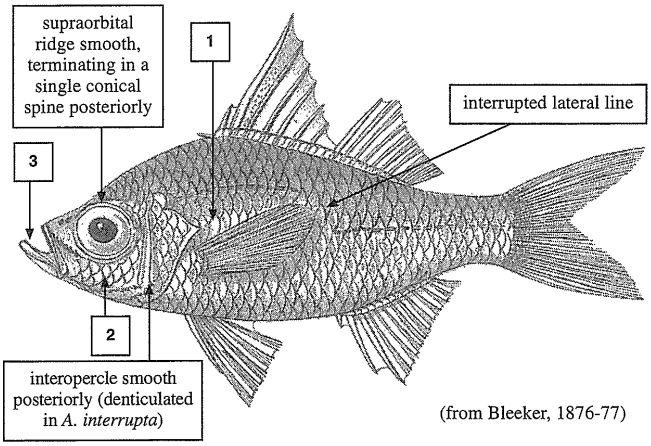
Ambassis buruensis Bleeker, 1856

Synonyms / misidentifications: *Chanda buruensis.*

Local names:

Size: To 8 cm.

Habitat, biology, and fisheries: Found along coasts and in coastal rivers from Thailand to Indonesia and the Philippines. More likely to be found in the Mekong delta of Vietnam than in Cambodia. Not much is known about the biology of this species. Probably feeds on small insects, crustaceans, and other invertebrates. Caught with seines, cast-nets, and set-nets. Not seen in markets.



(from Bleeker, 1876-77)

Ambassis gymnocephalus (Lacepède, 1802)

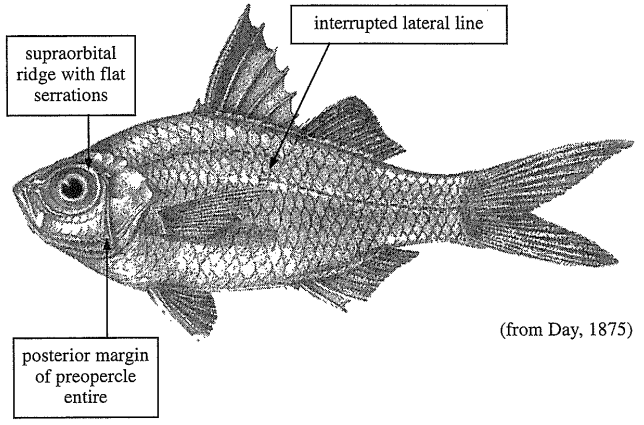
Synonyms / misidentifications: *Chanda gymnocephala.*

FAO name: Bald glassy perchlet.

Local names:

Size: To 10 cm.

Habitat, biology, and fisheries: Found along coasts and entering coastal areas from Africa to Australia and China. More common in the Mekong delta of Vietnam than in Cambodia. Little is known about this species. Probably feeds on invertebrates. Caught with seines, cast-nets, and set-nets. In some parts of its range it is marketed dried and salted.



(from Day, 1875)

Ambassis kopsi Bleeker, 1851

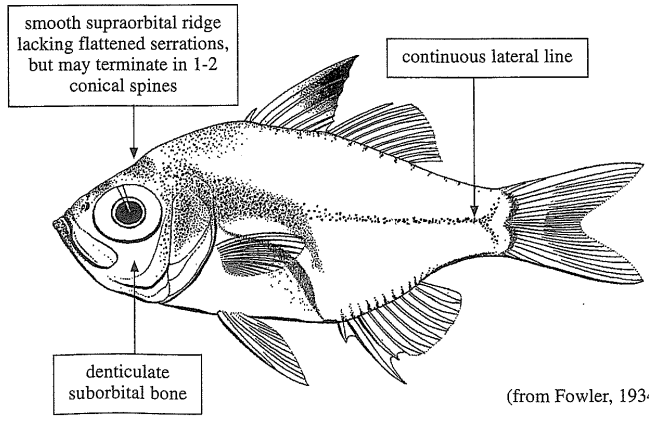
Synonyms / misidentifications: *Chanda kopsi.*

FAO name: Singapore glassy perchlet.

Local names:

Size: To 10 cm.

Habitat, biology, and fisheries: Found along coasts and entering coastal rivers from Thailand to Indonesia and the Philippines. More common in the Mekong delta of Vietnam than in Cambodia. Feeds on invertebrates. Caught with seines, cast-nets, and set-nets. Marketed fresh or dried and salted.



(from Fowler, 1934)

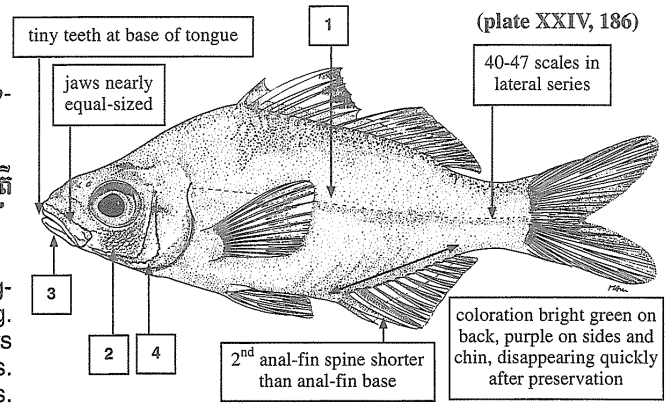
Genus *Parambassis* **CHANDIDAE**

(1) 40 TO 60 MEDIUM SCALES IN LATERAL SERIES; **(2)** 4 TO 7 ROWS OF SCALES ON CHEEK; **(3)** NO TEETH ON TONGUE, OR TEETH ONLY ON ITS BASE; **(4)** INTEROPERCLE DENTICULATE POSTERIORLY.

Several species likely to occur in the Mekong.

Parambassis apogonoides (Bleeker, 1851)

(plate XXIV, 186)



Synonyms / misidentifications: *Chanda apogonoides, Ambassis apogonoides.*

FAO name: Iridescent glassy perchlet.

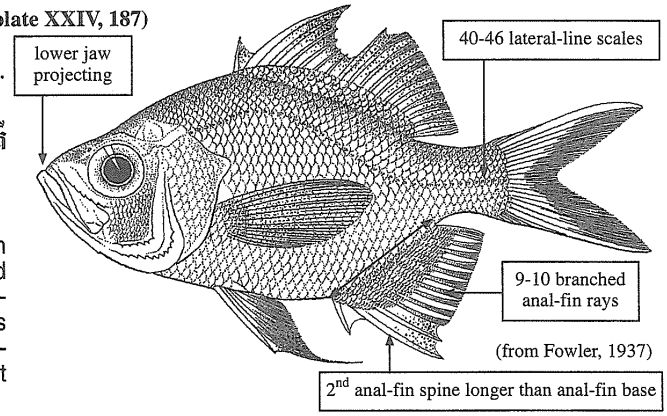
Local names: Trey kanchanh chras thom, ត្រីកញ្ឆាញ្ជ្រាសធំ.

Size: To 10 cm.

Habitat, biology, and fisheries: Found in sluggish rivers and floodplains of the lower Mekong. Reported to be a mouth brooder by Roberts (1989). Diet consists of aquatic invertebrates. Caught by seines, set-nets, cast-nets, and traps. Occasionally seen in markets. Its bright coloration would likely make it a desirable aquarium fish.

Parambassis wolffi (Bleeker, 1850)

(plate XXIV, 187)



Synonyms / misidentifications: *Chanda wolffi.*

FAO name: Duskyfin glassy perchlet.

Local names: Trey kantrang preng, ត្រីកន្ត្រងប្រេង.

Size: To 20 cm.

Habitat, biology, and fisheries: Found in sluggish rivers and floodplains from Thailand to Indonesia. Grows fairly large for an ambassid, and is probably the most common species of this family seen in markets. Feeds on insects, crustaceans, and small fish. Caught with seines, traps, set-nets, and cast-nets.

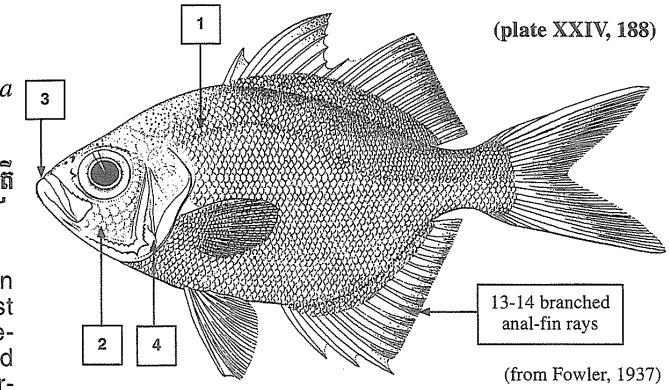
Genus *Pseudambassis* **CHANDIDAE**

(1) 50 OR MORE TINY SCALES IN LATERAL SERIES; **(2)** 3 TO 4 ROWS OF SCALES ON CHEEK; **(3)** NO TEETH ON TONGUE; **(4)** INTEROPERCLE NON-SERRATED.

1 species recorded.

Pseudambassis notatus (Blyth, 1860)

(plate XXIV, 188)



Synonyms / misidentifications: *Chanda siamensis, Chanda notata.*

FAO name: Siamese glassfish.

Local names: Trey kanchanh chras touch, ត្រីកញ្ឆាញ្ជ្រាសតូច.

Size: To 6 cm.

Habitat, biology, and fisheries: Found in sluggish and standing water throughout most of mainland Southeast Asia. A common species proliferating in impoundments and used mostly by artisanal and subsistence fishermen. Feeds on invertebrates. Caught with seines, traps, lift-nets, cast-nets, and set-nets. Occasionally seen in markets and often found in the aquarium trade.

Family CENTROPOMIDAE

Genus *Lates* — **CENTROPOMIDAE**

(1) MAXILLARY BONE REACHING BEHIND EYE; **(2)** VENTRAL MARGIN OF PREOPERCLE SPINOUS; **(3)** TEETH ON TONGUE RUDIMENTARY OR ABSENT; **(4)** 16 TO 17 LOWER GILL RAKERS.

1 species recorded.

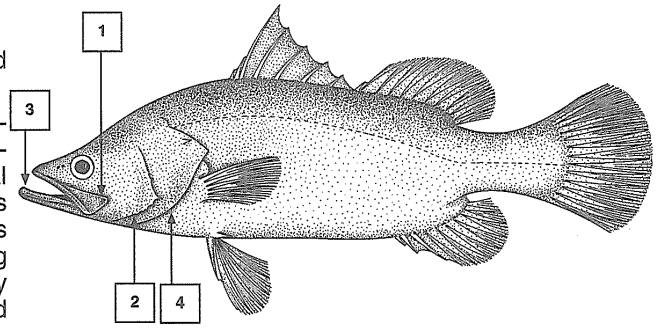
Lates calcarifer (Bloch, 1790)

FAO names: Barramundi.

Local names: Trey spong, ត្រី ស្ពង.

Size: To 200 cm, commonly between 25 and 100 cm.

Habitat, biology, and fisheries: Found seasonally in coastal waters, estuaries, and lagoons including the Mekong delta and tidal reaches of the Mekong. Frequents estuaries for feeding during the dry season and returns to marine environments for spawning during the rainy season. Juveniles are frequently found in tidal areas because of abundant food supplies. Feeds on fishes and crustaceans. Caught by hook-and-line, seines, trawls, gill-nets, and traps. Marketed mostly fresh.



Genus *Psammoperca* — **CENTROPOMIDAE**

(1) MAXILLARY BONE REACHING TO OR BELOW EYE; **(2)** VENTRAL MARGIN OF PREOPERCLE SMOOTH; **(3)** TEETH PRESENT ON TONGUE; **(4)** 11 TO 13 LOWER GILL RAKERS.

1 species recorded.

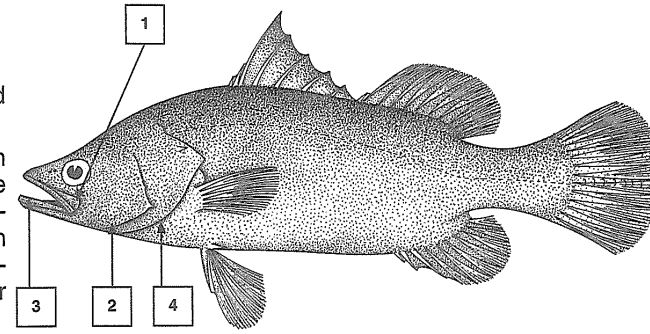
Psammoperca waigensis (Cuvier, 1828)

FAO name: Waigeu sea perch.

Local names:

Size: To 35 cm, commonly between 25 and 30 cm.

Habitat, biology, and fisheries: Found in coastal waters and estuaries, including the Mekong delta. Not as common as the barramundi, and rarely ascending above brackish water areas. Feeds on fishes and crustaceans. Usually taken with hook-and-line or gill-nets. Marketed fresh.



Family CARANGIDAE

Genus *Selaroides* — **CARANGIDAE**

(1) LATERAL LINE ARMED WITH ENLARGED SCUTES POSTERIORLY; **(2)** ANAL FIN ABOUT AS LONG AS DORSAL FIN; **(3)** UPPER JAW LACKING TEETH; **(4)** A SINGLE SERIES OF TINY TEETH ON LOWER JAW.

1 species recorded.

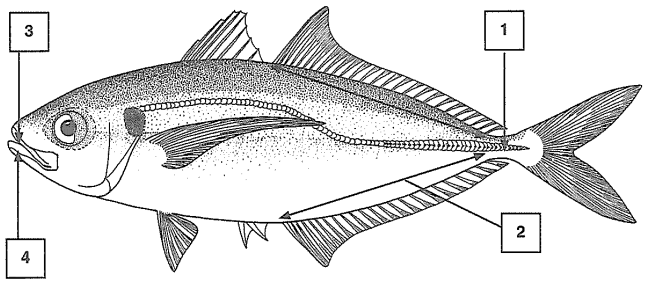
Selaroides leptolepis (Cuvier, 1833)

FAO name: Yellowstripe scad.

Local names: Trey chhnot loeung, ត្រីឆ្នូតលឿង.

Size: To 18 cm.

Habitat, biology, and fisheries: Found over soft-bottomed habitats in coastal waters and estuaries. Sometimes ascends into freshwater reaches from the Persian Gulf to Australia and China. It was seen by the author in the freshwater tidal zone in the Mekong delta, and may occasionally be found in Cambodia. Active by day, it feeds on crustaceans, gastropods, and fishes. Caught with trawls, seines, and gill-nets. Marketed fresh or dried and salted.



Family LEIOGNATHIDAE

Genus *Leiognathus* — **LEIOGNATHIDAE**

(1) MOUTH FORMING A FORWARD DIRECTED TUBE WHEN PROTRACTED.

About a dozen species found at the mouth of the Mekong, apparently only a few of these ascending into fresh waters.

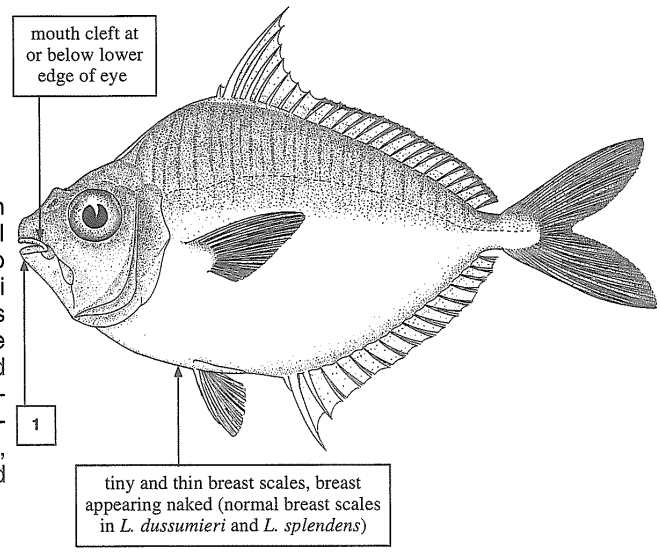
Leiognathus equulus (Forsskål, 1775)

FAO name: Common ponyfish.

Local name: Trey sambow hear, ត្រីសំបោរហៀរ.

Size: To 22 cm.

Habitat, biology, and fisheries: Found in shallow water over soft bottoms in coastal waters and estuaries. Frequently ascends into freshwater reaches of rivers from Africa to Fiji and Australia to the Ryukyu Islands. It was seen by the author in the freshwater tidal zone of the Mekong delta and is likely to be found at the upper edge of the tidal zone in Cambodia. Active by day, it feeds on worms, crustaceans and small fishes. Caught with trawls, gill-nets, and set-nets. Marketed fresh or dried and salted.



Genus *Secutor* **LEIOGNATHIDAE**

(1) MOUTH FORMING AN UPWARD DIRECTED TUBE WHEN PROTRACTED.

2 species found at the mouth of the Mekong, 1 of them ascending into fresh water.

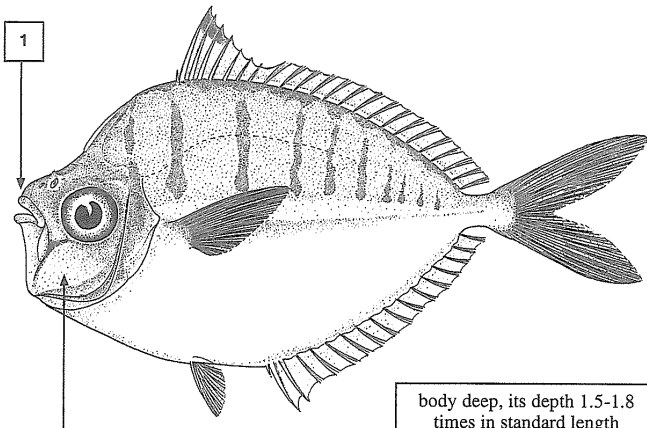
Secutor ruconius (Hamilton, 1822)

FAO name: Deep pugnose ponyfish.

Local name:

Size: To 8 cm.

Habitat, biology, and fisheries: Found in shallow water over fine substrates in coastal waters and estuaries. Frequently ascends into freshwater reaches of rivers from the Arabian Peninsula to Australia and China. The species was seen by the author in the freshwater tidal zone of the Mekong delta and is likely to occur in the tidal zone in Cambodia. Active by day, it feeds on crustaceans. Caught with trawls, seines, gill-nets, and set-nets. Marketed fresh or dried and salted.



Family LOBOTIDAE

Genus *Datnioides* **LOBOTIDAE**

(1) BODY WITH SHARPLY CONTRASTING BLACK BARS ON A LIGHT BACKGROUND; **(2)** SECOND ANAL SPINE LONGEST; **(3)** PREOPERCULUM FINELY SERRATED; **(4)** EYE IN ANTERIOR HALF OF HEAD.

2 species recorded.

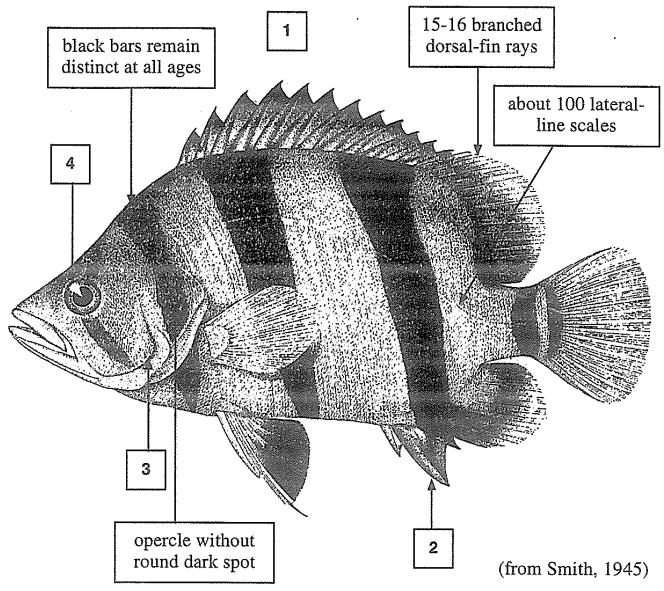
Datnioides microlepis Bleeker, 1853

FAO name: Finescale tigerfish.

Local names: Trey khlar, ត្រីខ្លារ.

Size: To 40 cm.

Habitat, biology, and fisheries: Found in freshwater rivers, lakes and reservoirs from Thailand to Indonesia. Common as single individuals in freshwaters throughout Cambodia. Frequents areas with a lot of submerged branches, such as flooded forests. A voracious predator, feeds on prawns, crabs, worms, insect larvae, and fishes. Caught by seines, gill-nets, traps, and hook-and-line. An esteemed foodfish that is marketed fresh. Due to its attractive coloration it is often seen in the aquarium trade.



(from Smith, 1945)

Datnioides quadrifasciatus (Sevastianov, 1809)

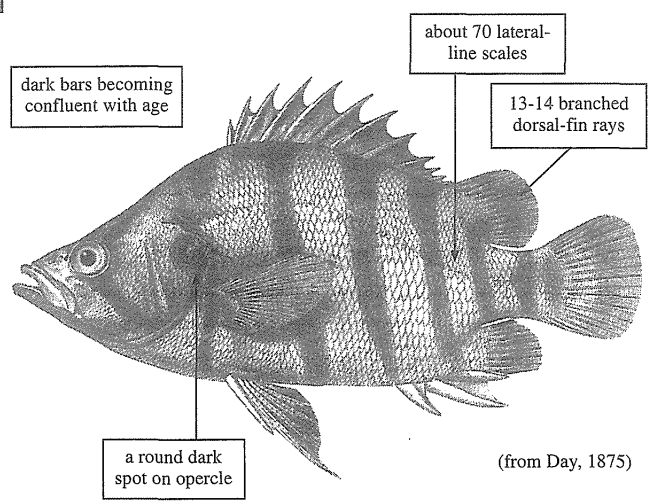
LOBOTIDAE

FAO name: Barred tigerfish.

Local names: Trey khlar, ត្រីខ្លារ.

Size: To 30 cm.

Habitat, biology, and fisheries: Found most commonly in estuaries from India to Indonesia, extending upstream to the upper edge of tidal influence. Like *D. microlepis*, it is a predator which feeds on fishes, prawns, crabs, and some insect larvae. Caught with seines, gill-nets, and by hook-and-line. Marketed fresh.



(from Day, 1875)

Family GERREIDAE

Genus *Gerres*

GERREIDAE

(1) MOUTH HIGHLY PROTRACTILE; **(2)** SCALES LARGE; **(3)** 3 ANAL-FIN SPINES AND 7 SOFT RAYS; **(4)** 9 DORSAL-FIN SPINES.

Several species found near the mouth of the Mekong, 1 of them ascending into fresh water.

Gerres filamentosus Cuvier, 1829

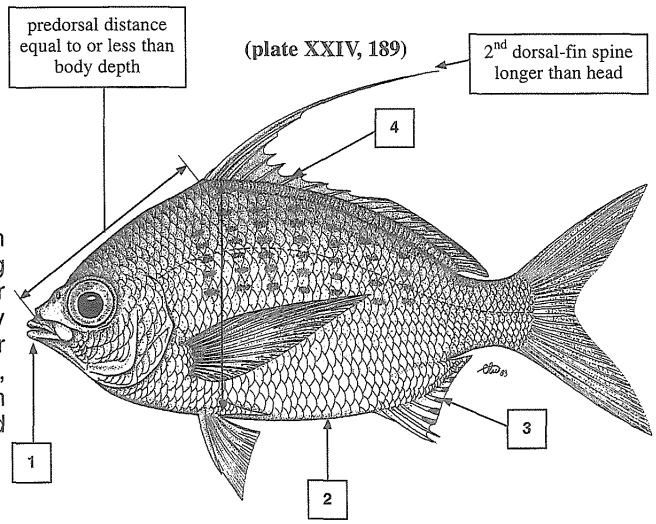
FAO name: Whipfin silver-biddy.

Local names: Trey doh angkor, ត្រីដូរអង្គរ.

Size: To 26 cm.

Local names:

Habitat, biology, and fisheries: Found in shallow water over sandy substrates along coasts and in estuaries. Ascends the lower courses of rivers from India to the Admirality Islands. Occasionally found in the freshwater tidal zone of the Mekong. Feeds on worms, crustaceans, and insect larvae. Caught with trawls, seines, and gill-nets. Usually marketed fresh.



Family POLYNEMIDAE

Genus *Eleuthronema* — **POLYNEMIDAE**

(1) 3 TO 4 PECTORAL FILAMENTS, SHORTER THAN BODY LENGTH; **(2)** FREE LOWER LIP RESTRICTED TO POSTERIOR THIRD OF LOWER JAW.

2 species known from the Mekong estuary, 1 species included here.

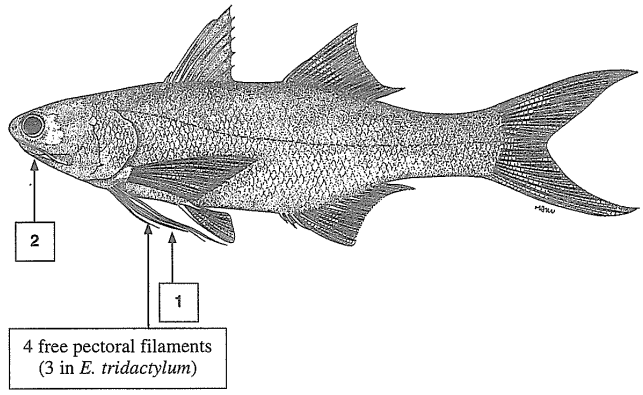
Eleuthronema tetradactylum (Shaw, 1804)

FAO name: Fourfinger threadfin.

Local names: Trey pream, ត្រី ព្រាម.

Size: To 200 cm.

Habitat, biology, and fisheries: Lives over shallow muddy bottoms along coastlines and estuaries from India to Indonesia. Most commonly found at the mouth of the Mekong. Occasionally seen upriver in the Mekong delta, and possibly enters Cambodia. Feeds mainly on small crustaceans and fishes. Caught with trawls, seines, gill-nets, and by hook-and-line. Marketed fresh or salted and dried.



Genus *Polynemus* — **POLYNEMIDAE**

(1) PECTORAL FILAMENTS MUCH LONGER THAN BODY.

5 species found in the lower Mekong River and estuary, 4 of them included here.

Polynemus borneensis Bleeker, 1852

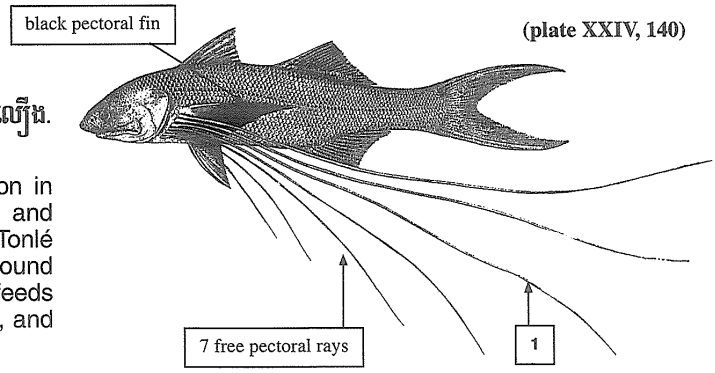
(plate XXIV, 140)

FAO name: Borneo threadfin.

Local names: Trey pream loeung, ត្រី ព្រាមឈើង.

Size: To 25 cm.

Habitat, biology, and fisheries: Common in muddy waters of the Mekong tidal zone and upstream in freshwater reaches of the Tonlé Sap. Known also from Indonesia. Usually found in open waters of the river courses where it feeds on crustaceans. Caught by seines, trawls, and set-nets. Marketed fresh.



(from Fowler, 1905)

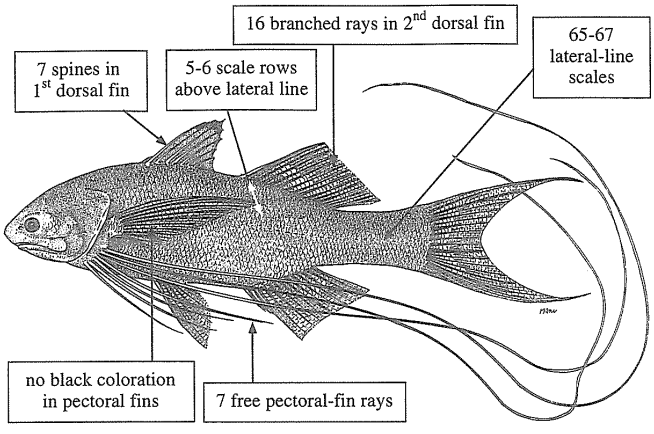
Polynemus dubius Bleeker, 1851

FAO name: Mimic threadfin.

Local names: Trey pream sor, ត្រី ព្រាមស.

Size: To 17 cm.

Habitat, biology, and fisheries: Found in muddy waters of the lower parts of rivers from the Mekong through Indonesia. Collected often in the delta by the Mekong Basinwide Fishery Studies (Rainboth et al., 1975), and probably also occurs upstream in Cambodia. Lives in open waters of river courses where it feeds on shrimps and prawns. Caught with seines, trawls, and set-nets. Marketed fresh.



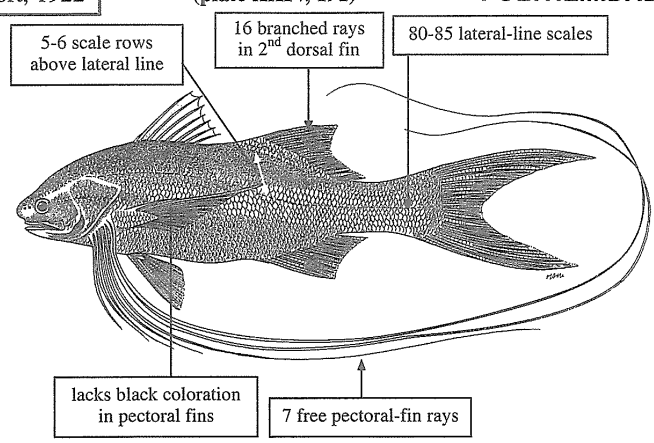
Polynemus longipectoralis Weber and de Beaufort, 1922 (plate XXIV, 191) **POLYNEMIDAE**

FAO name: Longwhip threadfin.

Local names: Trey pream sor, ត្រី ព្រាមស.

Size: To 20 cm.

Habitat, biology, and fisheries: Found in muddy waters of the Mekong from the estuary to Khoné Falls. Also known from the Ganges to the Kapuas River of Borneo. Stays in river courses where it lives on a diet of shrimps and prawns. Caught with seines, trawls, gill-nets and set-nets. Marketed fresh.



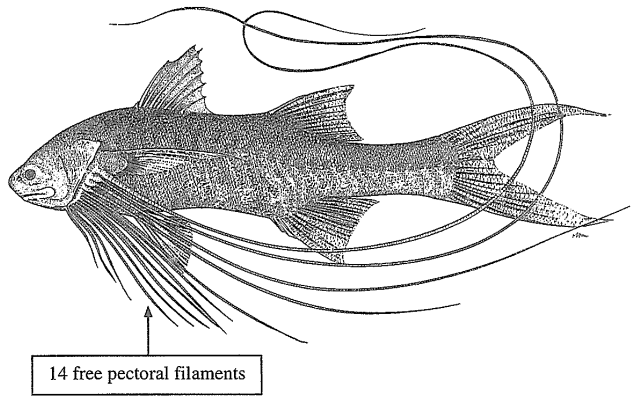
Polynemus multifilis Schlegel, 1845

FAO name: Fringed threadfin.

Local names: Trey pream, Trey kam pream, ត្រី ប្រាម, ត្រី កំប្រាម.

Size: To 27 cm.

Habitat, biology, and fisheries: Found in muddy waters of estuaries and the lower courses of rivers from Thailand to Indonesia. Occurs in the Mekong delta and probably also in Cambodia. Feeds on shrimps and prawns in open flowing waters. Caught with seines, trawls and set-nets. Marketed fresh.



Family SCIAENIDAE

Genus ***Boesemania*** **SCIAENIDAE**

(1) MOUTH TERMINAL, OBLIQUE; **(2)** 5 PORES BELOW MANDIBULAR SYMPHYSIS; **(3)** SCALES SMALL, APPROXIMATELY 90 IN LATERAL LINE.

1 species recorded.

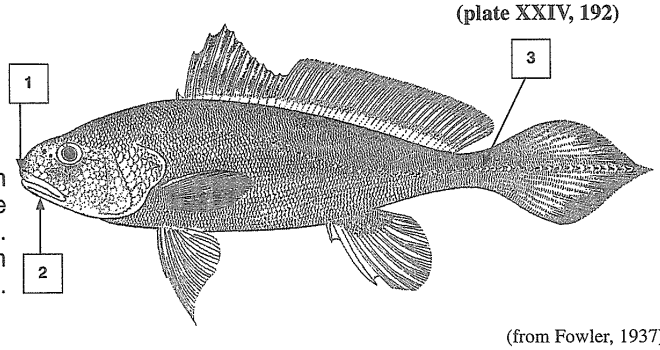
Boesemania microlepis (Bleeker, 1858-59) (plate XXIV, 192)

FAO name: Smallscale croaker.

Local names: Trey promah, ត្រី ប្រម៉ា.

Size: To 28 cm.

Habitat, biology, and fisheries: Found in flowing waters of large rivers in the middle Mekong basin above and below Khoné Falls. Feeds on crustaceans and small fishes. Taken with seines, trawls, gill-nets, and set-nets. Marketed fresh.



(from Fowler, 1937)

Family MONODACTYLIDAE

Genus *Monodactylus* — **MONODACTYLIDAE**

(1) BODY STRONGLY COMPRESSED AND DISK-SHAPED, SOMETIMES DEEPER THAN LONG; **(2)** MOUTH SMALL, WITH FEEBLE TEETH; **(3)** PELVIC FIN SMALL OR VESTIGIAL; **(4)** BODY SILVERY.

1 species recorded.

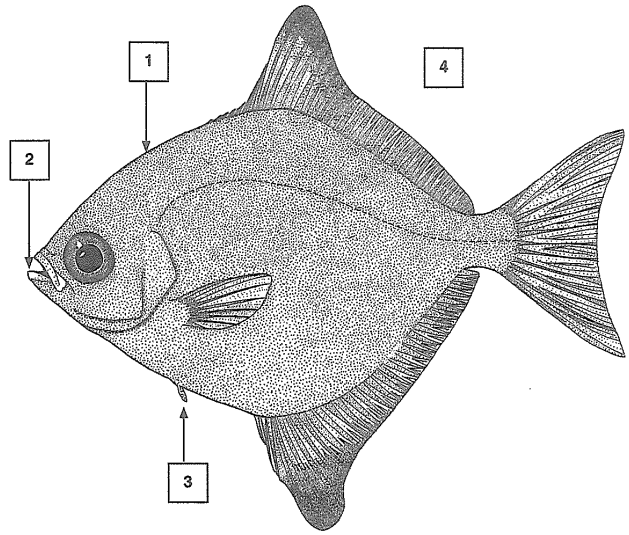
Monodactylus argenteus (Linnaeus, 1758)

FAO name: Silver moonfish.

Local names:

Size: To 25 cm.

Habitat, biology, and fisheries: Found in shallow estuaries and the lower courses of rivers from Africa to Australia. Occurs in the freshwater tidal zone of the Mekong delta and probably also sporadically in Cambodia. Feeds on plankton and detritus. Caught with beach seines, cast-nets, and gill-nets. Sold fresh in markets.



Family TOXOTIDAE

Genus *Toxotes* — **TOXOTIDAE**

(1) EYES LARGE; **(2)** MOUTH LARGE WITH LOWER JAW PROJECTING; **(3)** DORSAL FIN DISPLACED POSTERIORLY; **(4)** COLOUR PATTERN CONSISTING OF A SERIES OF LARGE BLOTCHES.

3 species recorded, 2 of them included here.

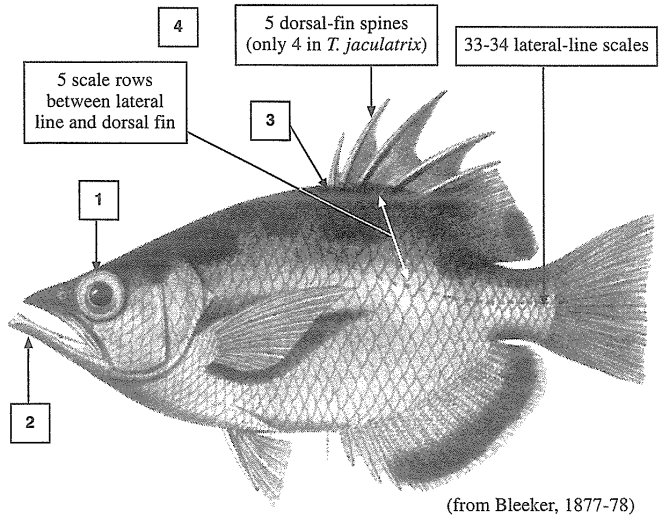
Toxotes chatareus (Hamilton, 1822)

FAO name: Largescale archerfish.

Local names: Trey kancheak sla, ត្រីកង្ហែកស្លា.

Size: To 27 cm, commonly between 15 and 20 cm.

Habitat, biology, and fisheries: Found along the shores of flowing and standing waters from India to Indonesia. Occurs in shaded areas with overhanging vegetation. In the Mekong it is found from the estuary up to Thailand and Laos. The species is less common upstream than *T. microlepis*. Diet consists of terrestrial insects, zooplankton, rotifers, cladocerans, and aquatic insect larvae. Taken with seines, dip-nets, and set-nets. Marketed fresh.



(from Bleeker, 1877-78)

Toxotes microlepis Günther, 1860 **(plate XXV, 193)**

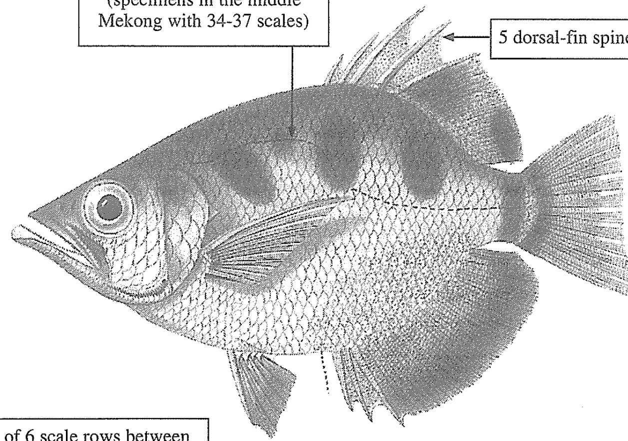
TOXOTIDAE

FAO name: Smallscale archerfish.

Local names: Trey kancheak sla, ត្រី កញ្ជាក ស្លា.

Size: To 15 cm.

Habitat, biology, and fisheries: Found along the shores of flowing and standing waters from Thailand to Indonesia. Occurs in areas with overhanging vegetation. This is the more common species of the genus found well upstream from the estuary. Diet consists of terrestrial insects, zooplankton, crustaceans, and aquatic insect larvae. Taken with seines, dip-nets, and set-nets. Marketed fresh.



(from Bleeker, 1877-78)

Family SCATOPHAGIDAE

Genus *Scatophagus* **SCATOPHAGIDAE**

(1) BODY DEEP AND COMPRESSED, ALMOST SQUARISH IN OUTLINE; **(2)** MOUTH SMALL AND NON-PROTRACTILE; **(3)** 4 ANAL-FIN SPINES.

2 species recorded.

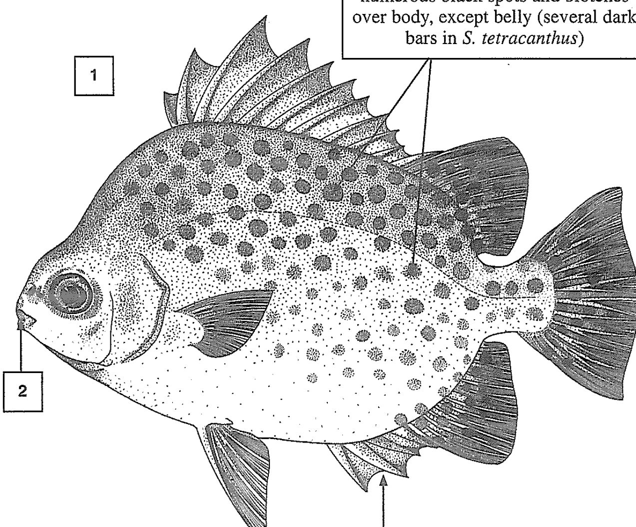
Scatophagus argus (Linnaeus, 1766) **(plate XXV, 194)**

FAO name: Spotted scat.

Local names:

Size: To 30 cm.

Habitat, biology, and fisheries: Found in estuaries and the lower courses of rivers from India to Polynesia and Australia to China. Common in the Mekong delta of Vietnam and probably occurs at the upper end of the tidal zone in Cambodia. Feeds on bottom detritus and small benthic invertebrates. Caught with gill-nets, seines, and traps. Marketed fresh.



Family NANDIDAE

Genus *Nandus* — **NANDIDAE**

(1) MOUTH LARGE, UPPER JAW REACHING BEYOND POSTERIOR EDGE OF EYE; **(2)** GILL MEMBRANES NOT UNITED; **(3)** OPERCLE WITH A SINGLE FLAT SPINE.

1 species recorded.

Nandus nandus (Hamilton, 1822)

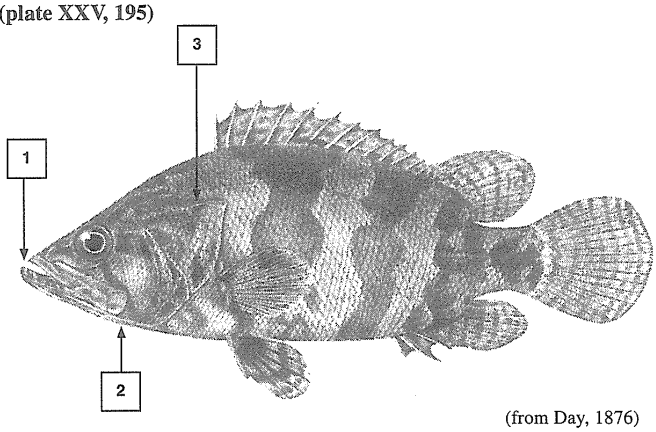
(plate XXV, 195)

FAO name: Gangetic leaffish.

Local names: Trey khlar, ត្រីខ្លារ.

Size: To 10 cm.

Habitat, biology, and fisheries: Found most commonly in standing or sluggish waters of lakes, reservoirs, or canals from India to mainland Southeast Asia. Feeds on aquatic insects and fishes. Caught with seines, lift-nets, push-nets, and traps. Marketed fresh. The Mekong specimens appear to be intermediate between *N. nandus* and *N. nebulosus*. Following Taki (1974), they were identified here as *Nandus nandus* rather than *N. nebulosus*, which is reported from Malaysia and Indonesia.



(from Day, 1876)

Genus *Pristolepis* — **NANDIDAE**

(1) MOUTH SMALL, UPPER JAW REACHING AS FAR AS ANTERIOR EDGE OF EYE; **(2)** GILL MEMBRANES BROADLY UNITED; **(3)** OPERCLE WITH TWO FLAT SPINES.

1 species recorded.

Pristolepis fasciata (Bleeker, 1851)

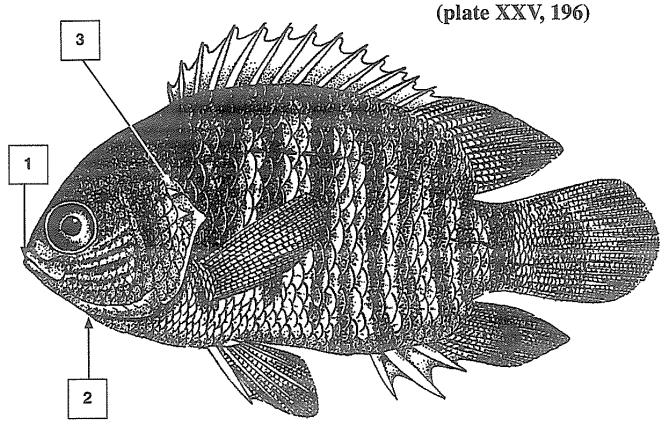
(plate XXV, 196)

FAO name: Catopra.

Local names: Trey kantrawb, ត្រីកន្ត្រៀប.

Size: To 20 cm.

Habitat, biology, and fisheries: Found in sluggish or standing waters, including reservoirs, from Burma to Indonesia. Frequently seen in areas with a lot of aquatic vegetation or submerged tree limbs. Feeds on filamentous algae, submerged land plants, fruits, and seeds with some aquatic insects and crustaceans. Caught with seines, lift-nets, dip-nets, gill-nets, and set-nets. Marketed fresh.



(from Weber and de Beaufort, 1936)

Family TERAPONTIDAE

Genus *Terapon* — **TERAPONTIDAE**

(1) POST-TEMPORAL BONE EXPOSED AND SERRATED POSTERIORLY; **(2)** PENULTIMATE DORSAL SPINE SHORTER THAN ULTIMATE DORSAL SPINE; **(3)** LOWER OPERCULAR SPINE STRONG AND ENLARGED, PROJECTING BEYOND OPERCULAR LOBE; **(4)** LOBES OF CAUDAL FIN WITH 2 OBLIQUE DARK BARS; **(5)** SPINOUS DORSAL WITH A LARGE DARK BLOTCH.

3 species found in the Mekong estuary, 1 species included here .

Terapon jarbua (Forrskål, 1775)

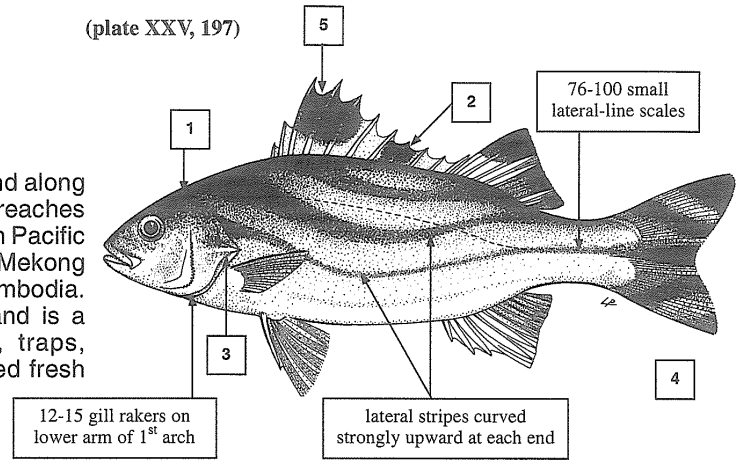
(plate XXV, 197)

FAO name: Jarbua terapon.

Local names:

Size: To 27 cm.

Habitat, biology, and fisheries: Found along coastlines and in estuaries and tidal reaches of rivers from east Africa to the western Pacific northward to Japan. Occurs in the Mekong delta and may sporadically enter Cambodia. Feeds on fishes and invertebrates and is a scale eater. Caught with gill-nets, traps, trawls, and by hook-and-line. Marketed fresh or dried and salted.



Suborder LABROIDEI

Family CICHLIDAE

Genus *Oreochromis* — **CICHLIDAE**

(1) ONE NOSTRIL ON EACH SIDE OF SNOUT; **(2)** 3 ANAL-FIN SPINES; **(3)** SCALES CYCLOID.

2 species, both introduced from Africa.

Oreochromis mossambicus (Peters, 1852)

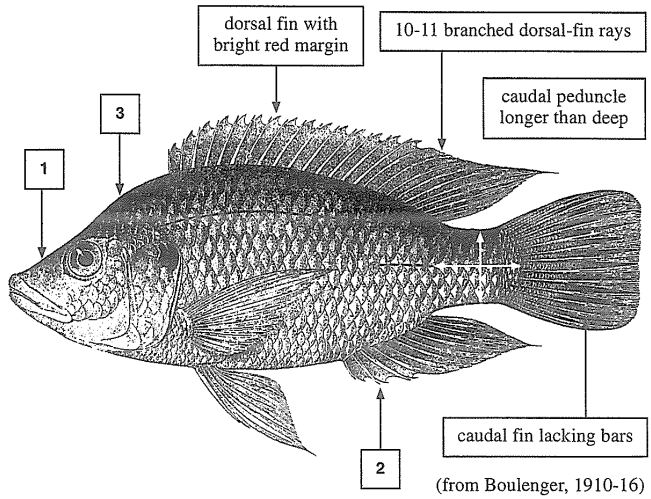
Synonyms / misidentifications: *Tilipia mossambica.*

FAO name: Mozambique cichlid.

Local names: Trey tilapia khmao, ត្រី ទីឡាព៉ាខ្មៅ.

Size: To 36 cm.

Habitat, biology, and fisheries: Imported for the purposes of fish culture and now forms wild populations. Most common in brackish waters, with some individuals founds in fresh water reaches of the Mekong. Feeds on a variety of plant matter as well as on insects, crustaceans, and fishes. Caught with seines, set-nets, traps, and gill-nets. Marketed fresh.



(from Boulenger, 1910-16)

Oreochromis niloticus (Linnaeus, 1757)

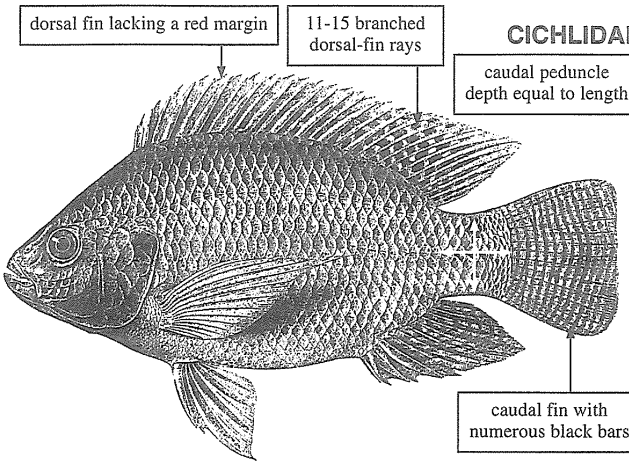
Synonyms / misidentifications: *Tilapia nilotica.*

FAO name: Nile tilapia.

Local names: Trey tilapia chhnoht, ត្រី ទីឡាព្យាឆ្នូត.

Size: To 46 cm.

Habitat, biology, and fisheries: Introduced into Thailand for fish culture and now forms wild populations. Found in the Mekong along the Thai-Lao border. Feeds primarily on phytoplankton, including diatoms as well as bacteria in sediments. Caught with seines, gill-nets and trawls. Marketed fresh.



(from Boulenger, 1910-16)

Suborder CALLIONYMOIDEI

Family CALLIONYMIDAE

Genus *Callionymus* — **CALLIONYMIDAE**

(1) A FLAP OF SKIN ALONG THE POSTERIOR MARGIN OF THE OPERCLE; **(2)** GILL OPENING A SMALL DORSAL PORE.

2 species likely to occur in the Cambodian Mekong.

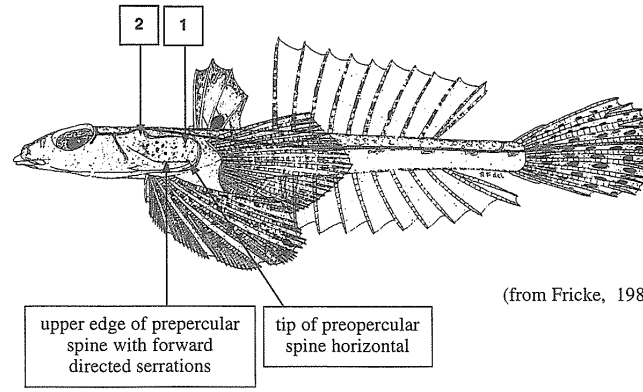
Callionymus fluviatilis Day, 1876

FAO name: River dragonet.

Local names:

Size: To 7 cm.

Habitat, biology, and fisheries: Found on the bottom in the lower courses of rivers from the Indian subcontinent to Vietnam. Common in the Mekong delta and probably also found in Cambodia. Feeds on worms, zooplankton, and some phytoplankton. Caught with seines, trawls, and sometimes by set-nets. Occasionally marketed fresh.



(from Fricke, 1983)

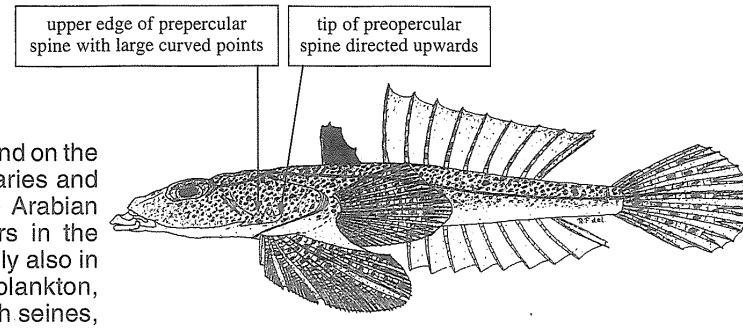
Callionymus sagitta Pallas, 1770

FAO name: Arrow dragonet.

Local names:

Size: To 11 cm.

Habitat, biology, and fisheries: Found on the bottom along coastlines and in estuaries and the lower courses of rivers from the Arabian Peninsula to the Philippines. Occurs in the Mekong delta of Vietnam and probably also in Cambodia. Feeds on worms, zooplankton, and some phytoplankton. Caught with seines, trawls, and sometimes by set-nets. Not seen in markets.



(from Fricke, 1983)

Suborder GOBIOIDEI

Family ELEOTRIDAE

Genus *Bostrychus* — **ELEOTRIDAE**

(1) NO SPINE AT ANGLE OF PREOPRECLE; **(2)** SMALL CYCLOID SCALES, 90 OR MORE IN LATERAL SERIES.

1 species recorded.

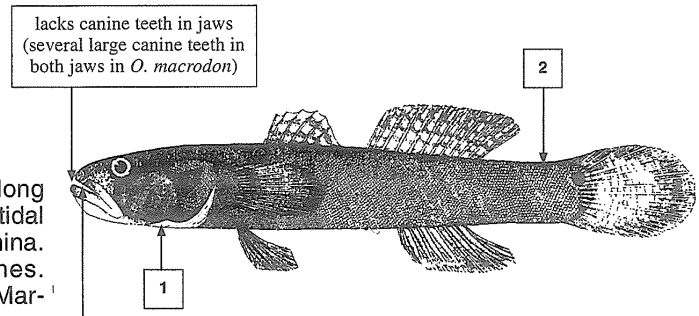
Bostrychus sinensis (Lacepède, 1801)

FAO name: Four-eyed sleeper.

Local names:

Size: To 22 cm.

Habitat, biology, and fisheries: Found along the bottom in estuaries and freshwaters of tidal rivers from India to Fiji and Australia to China. Feeds on crustaceans and small fishes. Caught with seines, trawls, and set-nets. Marketed fresh.



(from Herre, 1927)

Genus *Butis* — **ELEOTRIDAE**

(1) NO SPINE AT ANGLE OF PREOPERCLE; **(2)** SCALES CTENOID ON POSTERIOR PART OF BODY; **(3)** HEAD WITH WELL-DEVELOPED BONY CRESTS IN INTERORBITAL SPACE; **(4)** ABOUT 30 SCALES IN LATERAL SERIES; **(5)** HEAD FLAT, SNOUT POINTED, LOWER JAW PROJECTING BEYOND SNOUT.

4 species recorded.

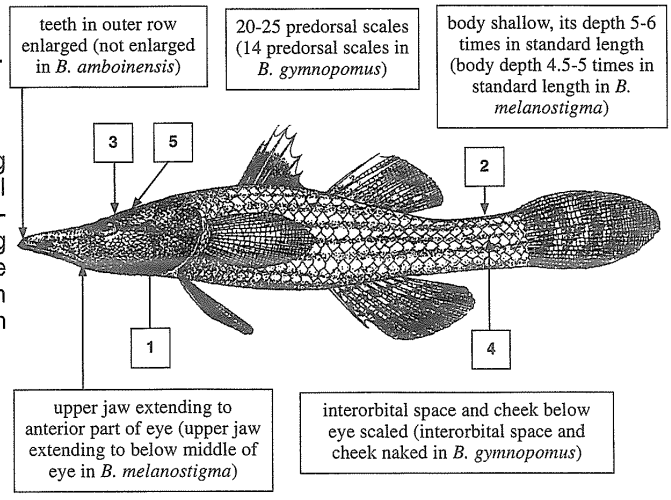
Butis butis (Hamilton, 1822)

FAO name: Crimson-tipped flathead-sleeper.

Local names:

Size: To 15 cm.

Habitat, biology, and fisheries: Found along the bottom in estuaries and freshwaters of tidal rivers from India to Australia and the Philippines. A fairly common species in the Mekong delta that is probably found upstream to the edge of the tidal zone in Cambodia. Feeds on crustaceans and small fishes. Caught with seines, trawls and set-nets. Marketed fresh.



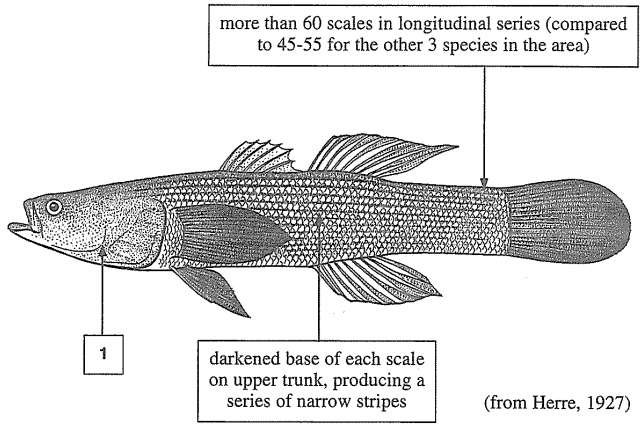
(from Herre, 1927)

Genus *Eleotris* **ELEOTRIDAE**

(1) A LARGE DOWNWARD-CURVED SPINE AT ANGLE OF PREOPERCLE, SOMETIMES HIDDEN UNDER SKIN.
4 species recorded.

Eleotris fusca (Schneider, 1801)

FAO name: Brown sleeper.
Local names: Trey damrey khman, ត្រី ដំរីខ្មៅ.
Size: To 16 cm.
Habitat, biology, and fisheries: Found along the bottom in brackish and fresh waters of the tidal zone from Africa to Polynesia and north to China. Several species of this genus are found in the Mekong delta of Vietnam and probably also occur in Cambodia. Feeds on crustaceans and small fishes. Caught with seines, trawls, and set-nets. Marketed fresh.



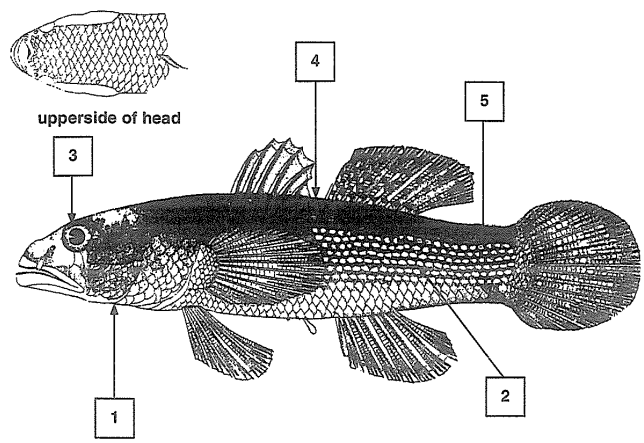
(from Herre, 1927)

Genus *Ophiocara* **ELEOTRIDAE**

(1) NO SPINE AT ANGLE OF PREOPERCLE; **(2)** SCALES CTENOID, AT LEAST POSTERIORLY; **(3)** NO BONY CRESTS IN INTEROBITAL SPACE; **(4)** BODY STOUT, NOT LATERALLY COMPRESSED ON TRUNK; **(5)** 28 TO 40 SCALES IN LATERAL SERIES.
1 species recorded.

Ophiocara porocephala (Valenciennes, 1837)

FAO name: Spangled sleeper.
Local names:
Size: To 32 cm.
Habitat, biology, and fisheries: Found along the bottom in estuaries and the lower courses of rivers, often upstream from the tidal zone, from India to Australia and the Philippines. A predator on crustaceans and small fishes. Caught with seines, trawls, gill-nets, set-nets, and by hook-and-line. Marketed fresh.



(from Herre, 1927)

Genus *Oxyeleotris* **ELEOTRIDAE**

(1) NO SPINE AT ANGLE OF PREOPERCLE; **(2)** SCALES CTENOID, AT LEAST POSTERIORLY; **(3)** NO BONY CRESTS IN INTERORBITAL SPACE; **(4)** BODY STOUT, NOT LATERALLY COMPRESSED; **(5)** 60 OR MORE LATERAL-LINE SCALES; **(6)** TEETH IN OUTER ROW ENLARGED.

4 species recorded.

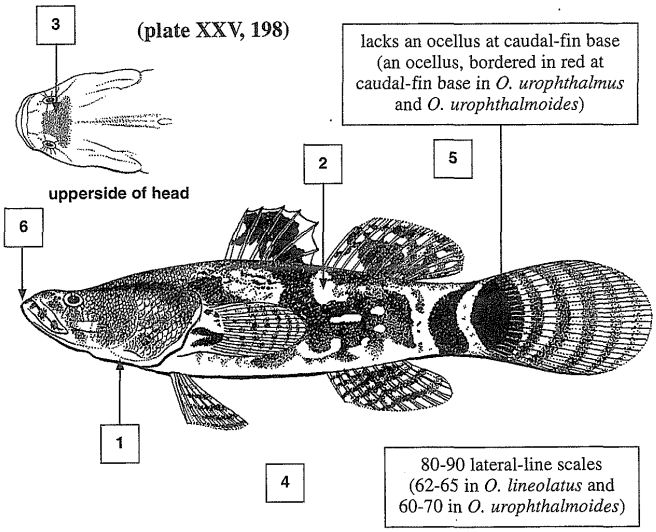
Oxyeleotris marmorata (Bleeker, 1852)

FAO name: Marbled sleeper.

Local names: Trey damrey, ត្រីដំរី.

Size: Maximum to 50 cm rarely seen, more commonly to 30 cm.

Habitat, biology, and fisheries: Found in sluggish or standing fresh and estuarine waters from Thailand to Indonesia. A very common species in the middle Mekong and often proliferates in reservoirs. A slow moving predator that feeds primarily on fishes. Caught with seines, trawls, and gill-nets. Often marketed fresh in northern Cambodia, less commonly so near Phnom Penh. Considered a delicacy over much of eastern Asia and exported fishes command a high price.



(from Fowler, 1934)

Genus *Prionobutis* **ELEOTRIDAE**

(1) NO SPINE AT ANGLE OF PREOPERCLE; **(2)** SCALES CTENOID ON POSTERIOR PART OF BODY; **(3)** HEAD WITH WELL-DEVELOPED BONY CRESTS IN INTERORBITAL SPACE; **(4)** ABOUT 30 SCALES IN LATERAL SERIES; **(5)** HEAD SHORT, SNOUT BLUNT; **(6)** JAWS SUBEQUAL.

1 species recorded.

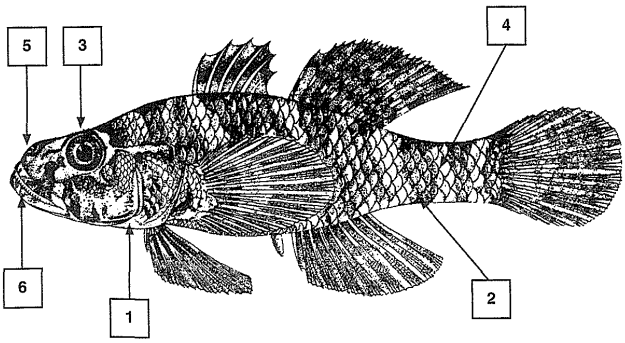
Prionobutis koilomatodon (Bleeker, 1849)

FAO name: Marblecheek sleeper.

Local names:

Size: To 8 cm.

Habitat, biology, and fisheries: Found along the bottom in estuaries and the lower courses of rivers from India to the Philippines and China. Common in the Mekong delta of Vietnam and probably found upstream to the edge of the tidal zone in Cambodia. Feeds on crustaceans and small fishes. Caught with seines, trawls, and set-nets. Marketed fresh.



(from Herre, 1927)

Family GOBIIDAE

Subfamily GOBIINAE

Genus *Acentrogobius* **GOBIIDAE**

(1) 25 TO 40 SCALES IN LONGITUDINAL SERIES; **(2)** GILL-OPENING RESTRICTED TO AREA DIRECTLY IN FRONT OF PECTORAL-FIN BASE; **(3)** MOUTH OBLIQUE, SNOUT SLOPING, NOT BROADLY CURVED; **(4)** SECOND DORSAL FIN WITH 10 TO 16 TOTAL ELEMENTS; **(5)** HEAD PAPILLA PATTERN TRANSVERSE; **(6)** 16 TO 30 PREDORSAL SCALES.

8 species found in the Mekong estuary, 3 of them included here.

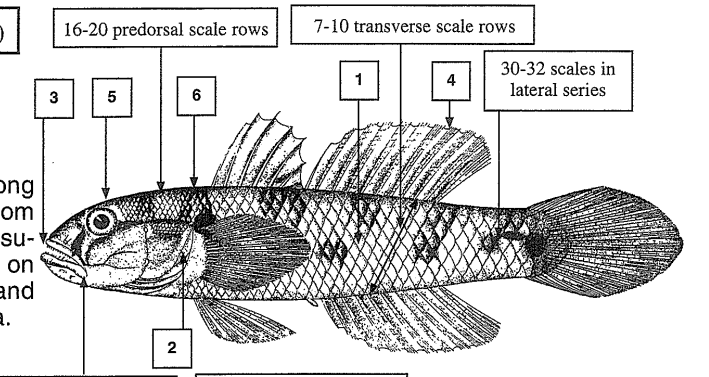
Acentrogobius caninus (Valenciennes, 1837)

FAO name: Dog-toothed goby.

Local names:

Size: To 13 cm.

Habitat, biology, and fisheries: Found along coastlines and in estuaries and harbours from Sri Lanka to Japan and eastward to Fiji. Usually found in brackish tidal waters. Feeds on invertebrates. Taken in seines, set-nets, and trawls. Marketed fresh in the Mekong delta.



(from Herre, 1927)

Acentrogobius chlorostigmatoides (Bleeker, 1849)

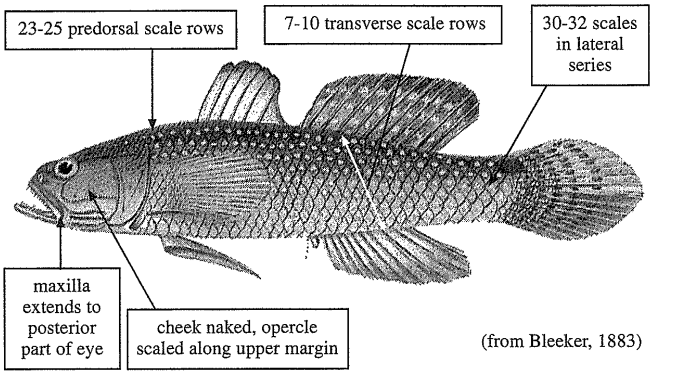
Synonyms / misidentifications: *Rhinogobius atripinnatus, Acentrogobius atripinnatus.*

FAO name: Greenspot goby.

Local names:

Size: To 11 cm.

Habitat, biology, and fisheries: Found in estuaries and the freshwater tidal zone of rivers from Indonesia to China. Occurs in the Mekong delta and may be found as far upstream as the tidal zone in Cambodia. Caught with seines, trawls, and set-nets. Not seen in markets.



(from Bleeker, 1883)

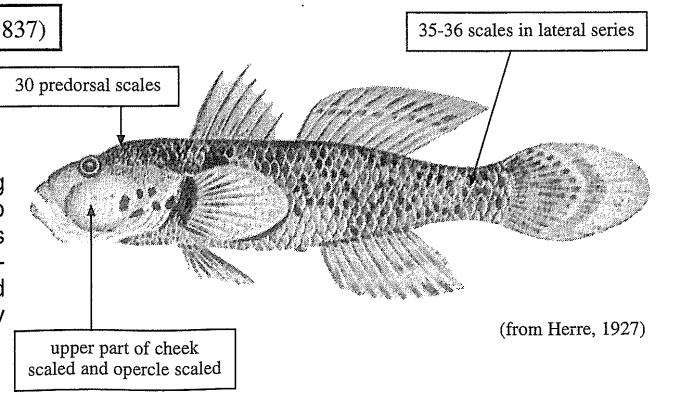
Acentrogobius viridipunctatus (Valenciennes, 1837)

FAO name: Spotted green goby.

Local names:

Size: To 7.5 cm.

Habitat, biology, and fisheries: Found along coastlines and in estuaries from East Africa to Japan and eastward to New Guinea. Occurs primarily in brackish tidal waters of the Mekong delta. Taken in seines, set-nets, and trawls. A fairly small species, occasionally marketed fresh.



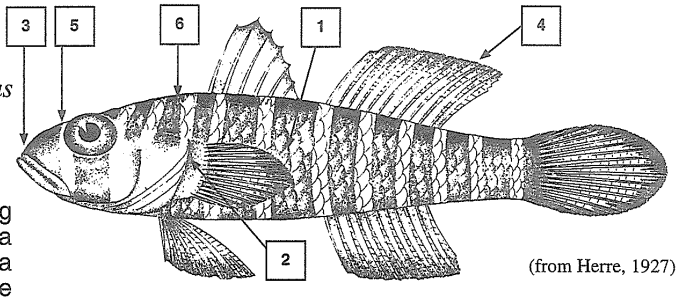
(from Herre, 1927)

Genus *Amoya* **GOBIIDAE**

(1) 35 TO 37 SCALES IN LONGITUDINAL SERIES; **(2)** GILL-OPENING RESTRICTED TO AREA DIRECTLY IN FRONT OF PECTORAL-FIN BASE; **(3)** MOUTH OBLIQUE, SNOUT SLOPING, NOT BROADLY CURVED; **(4)** SECOND DORSAL FIN WITH 10 TO 16 TOTAL ELEMENTS; **(5)** HEAD PAPILLA PATTERN TRANSVERSE; **(6)** PREDORSUM NAKED.

1 species recorded.

Amoya moloanus (Herre, 1927)



(from Herre, 1927)

Synonyms / misidentifications: *Acentrogobius moloanus, Acentrogobius bontii* (non Bleeker).

Local names:

Size: To 6 cm.

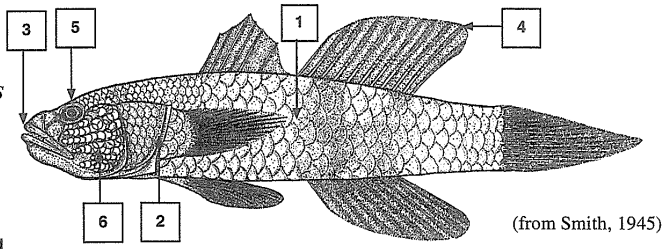
Habitat, biology, and fisheries: Found along tidal rivers and along coastlines from Malaysia to the Philippines. Occurs in the Mekong delta and probably ascends to the upper edge of the tidal zone in Cambodia. Feeds on small fishes and invertebrates. Taken with seines, trawls, and set-nets.

Genus *Aulopareia* **GOBIIDAE**

(1) 28 TO 30 SCALES IN LONGITUDINAL SERIES; **(2)** GILL-OPENING EXTENDING BELOW AREA DIRECTLY IN FRONT OF PECTORAL-FIN BASE; **(3)** MOUTH OBLIQUE, SNOUT SLOPING, NOT BROADLY CURVED; **(4)** SECOND DORSAL FIN WITH 10 TO 11 TOTAL ELEMENTS; **(5)** HEAD PAPILLA PATTERN LONGITUDINAL; **(6)** CHEEKS DENSELY SCALED WITH A SCALE ROW BETWEEN THE ROWS OF PAPILLAE.

1 species recorded.

Aulopareia janetae Smith, 1945



(from Smith, 1945)

Synonyms / misidentifications: *Acentrogobius janetae.*

FAO name: Scalycheek goby.

Local names:

Size: To 8 cm.

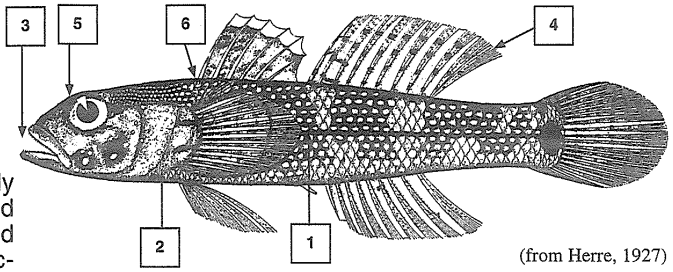
Habitat, biology, and fisheries: Found along coastlines, bays and estuaries from the Gulf of Thailand to Vietnam. Known to occur in brackish water and may also be found in freshwater. Recorded from the Mekong delta and may possibly occur in the tidal zone as far upstream as Cambodia. Feeds on small fishes and invertebrates. Caught with seines, cast-nets, trawls, and set-nets. Not seen in markets.

Genus *Bathygobius* **GOBIIDAE**

(1) 30 TO 43 SCALES IN LONGITUDINAL SERIES; **(2)** GILL-OPENING RESTRICTED TO AREA DIRECTLY IN FRONT OF PECTORAL-FIN BASE; **(3)** MOUTH OBLIQUE, SNOUT SLOPING, NOT BROADLY CURVED; **(4)** SECOND DORSAL FIN WITH 10 TO 12 TOTAL ELEMENTS; **(5)** HEAD PAPILLA PATTERN LONGITUDINAL; **(6)** UPPER PECTORAL-FIN RAYS FREE, SILK-LIKE.

1 species recorded.

Bathygobius fuscus (Rüppell, 1828)



(from Herre, 1927)

FAO name: Frill goby.

Local names:

Size: To 9 cm.

Habitat, biology, and fisheries: Known mostly from coastal areas from Africa to Samoa and Hawaii. Also found in estuaries, tidal zones, and often ascending into freshwater streams. Occurs in the Mekong delta, where it can be found in mixed catches of trawls, seines, and set-nets. Sometimes seen in fresh catches at markets.

Genus *Exyrias* **GOBIIDAE**

(1) ABOUT 30 SCALES IN LONGITUDINAL SERIES; **(2)** GILL-OPENING RESTRICTED TO AREA DIRECTLY IN FRONT OF PECTORAL-FIN BASE; **(3)** MOUTH OBLIQUE, SNOUT SLOPING, NOT BROADLY CURVED; **(4)** SECOND DORSAL FIN WITH 11 TOTAL ELEMENTS; **(5)** HEAD PAPILLA PATTERN TRANSVERSE; **(6)** 10 PREDORSAL SCALES.

1 species recorded.

Exyrias puntang (Bleeker, 1851)

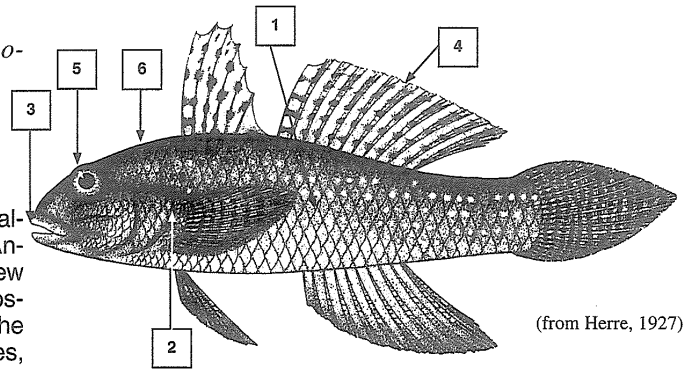
Synonyms / misidentifications: *Acentrogobius puntang.*

FAO name: Silver spotted goby.

Local names:

Size: To 16 cm.

Habitat, biology, and fisheries: Found in shallow, brackish, and turbid waters from the Andaman Islands to Japan and eastward to New Caledonia. Occurs in the Mekong delta, but possibly may not be found as far upstream as the tidal zone. Taken along the coast with seines, trawls, and set-nets.



(from Herre, 1927)

Genus *Favonigobius* **GOBIIDAE**

(1) 26 TO 30 SCALES IN LONGITUDINAL SERIES; **(2)** GILL-OPENING DIRECTLY IN FRONT OF PECTORAL-FIN BASE; **(3)** MOUTH OBLIQUE, SNOUT SLOPING, NOT BROADLY CURVED; **(4)** SECOND DORSAL FIN WITH 9 TO 10 ELEMENTS; **(5)** HEAD PAPILLA PATTERN LONGITUDINAL; **(6)** SCALES ABSENT FROM CHEEK AND OPERCLE.

At least 2 species present, 1 species included here.

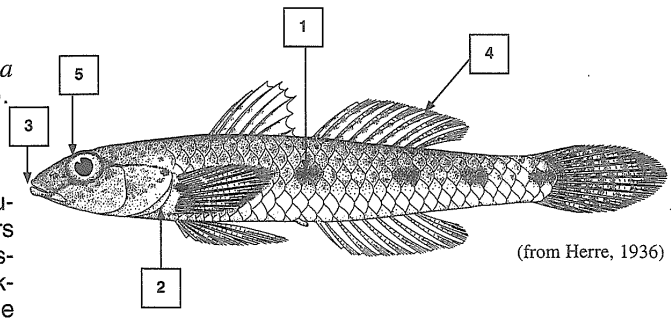
Favonigobius aliceae (Herre, 1936)

Synonyms / misidentifications: *Aboma aliciae, Acentrogobius reichei* (non Bleeker).

Local names:

Size: To 5 cm.

Habitat, biology, and fisheries: Found in estuaries and in the freshwater tidal zone of rivers from the Malay and Indochinese peninsulas, possibly also from Indonesia. Known from the Mekong delta and may also be found in the tidal zone of Cambodia. Feeds on small fishes, crustaceans, and insects. Caught with seines, trawls, set-nets, and cast-nets. Not seen in markets.



(from Herre, 1936)

Genus *Glossogobius* **GOBIIDAE**

(1) 25 TO 40 SCALES IN LONGITUDINAL SERIES; (2) GILL OPENING EXTENDING FORWARD TO MARGIN OF PREOPERCLE; (3) NO BARBELS OR FLAP-LIKE PAPILLAE ON HEAD; (4) TINY PAPILLAE (PIT ORGANS) PRESENT IN LONGITUDINAL ROWS.

6 species recorded, 4 of them included here.

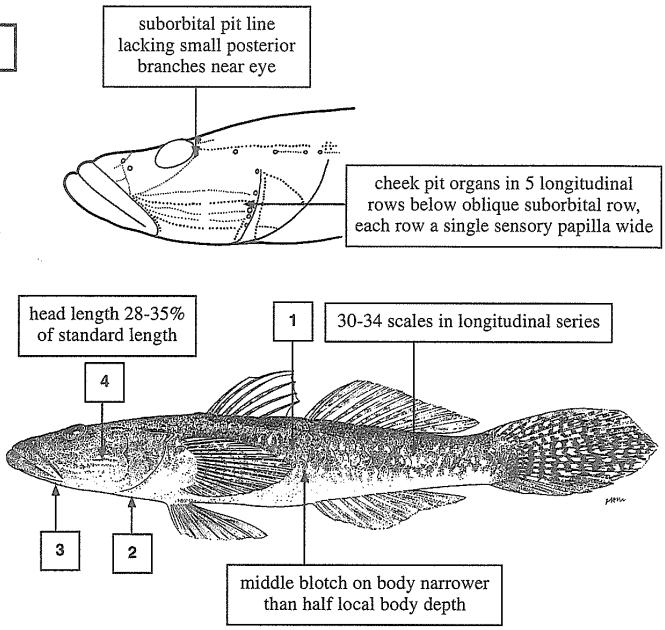
Glossogobius aureus Akihito and Meguro, 1975

FAO name: Golden tank goby.

Local names: Trey ksan, ត្រីខ្សាន.

Size: To 24 cm.

Habitat, biology, and fisheries: Found at bottom depths in large tidal rivers and floodplain canals. Ascends upstream well above the tidal zone in the Mekong. Feeds on small fishes and crustaceans. Taken with gear that sample the bottom such as trawls, seines, and set-nets. Marketed fresh. Identification of this species requires detailed examination of the pit organ system on the head until enough information on living coloration becomes available.



(after Akihito and Meguro, 1975)

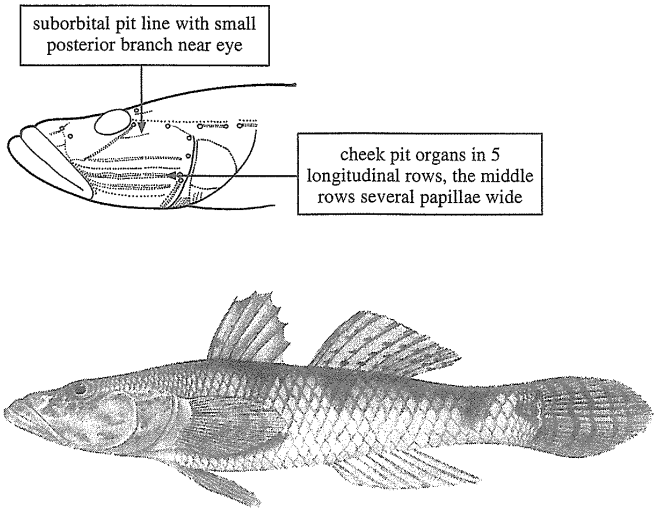
Glossogobius giuris (Hamilton, 1822)

FAO name: Gangetic tank goby.

Local names: Trey ksan, ត្រីខ្សាន.

Size: To 30 cm.

Habitat, biology, and fisheries: Found at bottom depths in estuaries and the lower courses of rivers from Africa to China and eastwards to Polynesia. Also occurs in canals, ditches, and ponds. Feeds on small fishes and crustaceans. Caught with seines, trawls, set-nets. and traps. Marketed fresh.



(from Day, 1987)

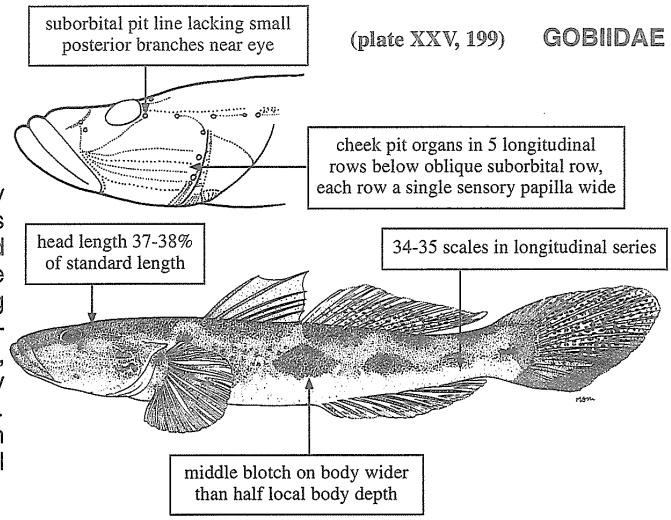
Glossogobius koragensis Herre, 1935 (plate XXV, 199) GOBIIDAE

FAO name: Koragu tank goby.

Local names: Trey ksan, ត្រីខ្សាន.

Size: To 25 cm.

Habitat, biology, and fisheries: Previously known only from New Guinea, this species is relatively common in the lower Mekong and occurs upstream as far as Khoné Falls. The specimen illustrated here came from Stung Treng. A predator on small fishes and crustaceans. Caught with seines, trawls, cast-nets, set-nets, and traps. Marketed fresh. Possibly all the Mekong specimens identified as *G. koragensis* actually belong to *G. aureus*, from which it is best distinguished by longitudinal scale counts.



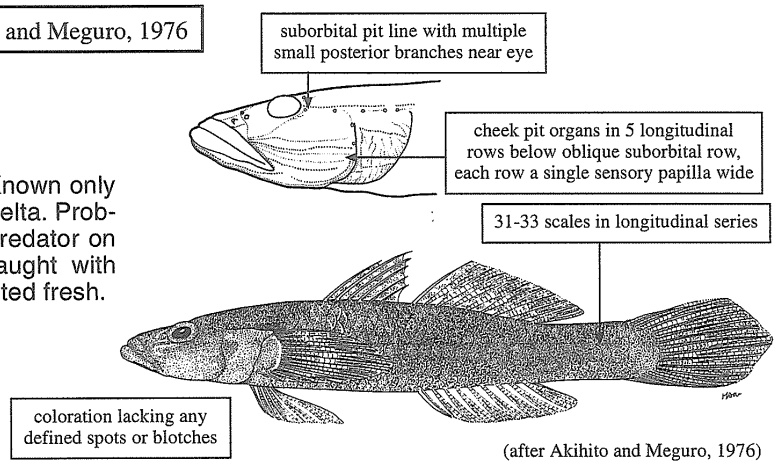
Glossogobius sparsipapillus Akihito and Meguro, 1976

FAO name: Linecheek tank goby.

Local names: Trey ksan, ត្រីខ្សាន.

Size: To 12 cm.

Habitat, biology, and fisheries: Known only from the tidal zone in the Mekong delta. Probably also occurs in Cambodia. A predator on small fishes and crustaceans. Caught with seines, trawls, and set-nets. Marketed fresh.



(after Akihito and Meguro, 1976)

Genus *Gobiopsis* GOBIIDAE

(1) 36 TO 60 SCALES IN LONGITUDINAL SERIES; **(2)** GILL-OPENING EXTENDING TO SLIGHTLY BELOW PECTORAL-FIN BASE; **(3)** MOUTH OBLIQUE, SNOUT SLOPING, BROADLY CURVED WHEN VIEWED FROM ABOVE; **(4)** SECOND DORSAL FIN WITH 10 TO 11 TOTAL ELEMENTS; **(5)** HEAD WITH SMALL BARBELS ON LOWER SURFACE AND SIDES

4 species possibly present.

Gobiopsis macrostoma Steindachner, 1861

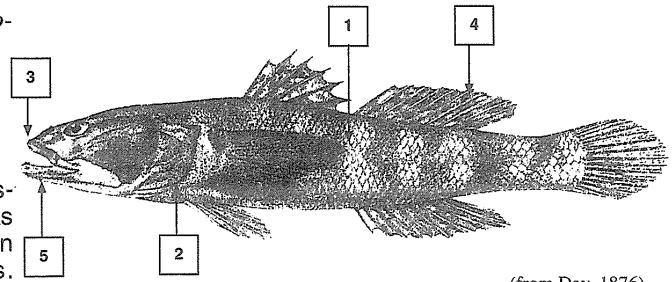
Synonyms / misidentifications: *Pogonogobius planifrons, Barbatogobius asanai.*

FAO name: Longjaw goby.

Local names:

Size: To 10 cm.

Habitat, biology, and fisheries: Found in estuaries and tidal rivers, canals, and creeks from western India to the Mekong. Feeds on small fishes, crustaceans, and insects. Caught with seines, cast-nets, set-nets, and trawls. Not seen in markets.



(from Day, 1876)

Genus *Istiogobius* **GOBIIDAE**

(1) ABOUT 26 TO 30 SCALES IN LONGITUDINAL SERIES; **(2)** GILL-OPENING RESTRICTED TO AREA DIRECTLY IN FRONT OF PECTORAL-FIN BASE; **(3)** MOUTH HORIZONTAL, SNOUT BROADLY ROUNDED, ENDING IN FRONT OF UPPER LIP.

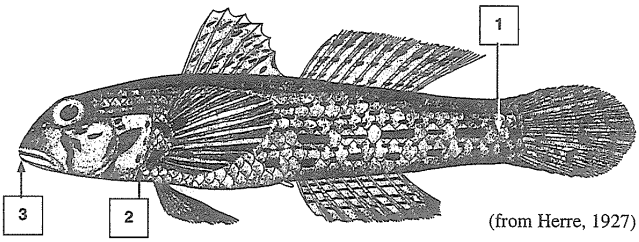
5 species likely to occur in the lower estuary of the Mekong.

Istigobius ornatus (Rüppell, 1828)

Local names:

Size: To 10 cm.

Habitat, biology, and fisheries: Found primarily in lower estuaries, usually in mangroves, from Africa to Japan. This is the species of the genus that is found farthest inland. Feeds on small invertebrates. Most likely be caught with seines, cast-nets, or trawls. Not seen in markets.



(from Herre, 1927)

Genus *Mahidolia* **GOBIIDAE**

(1) 35 TO 40 SCALES IN LONGITUDINAL SERIES; **(2)** UPPER JAW TEETH IN MULITPLE ROWS; **(3)** CAUDAL FIN ROUNDED AND SHORTER THAN HEAD; **(4)** SECOND DORSAL FIN WITH 10 TO 11 ELEMENTS; **(5)** MAXILLA PROLONGED POSTERIORLY BEYOND EYE; **(6)** CHEEK, OPERCLE AND AT LEAST ANTERIOR PART OF NAPE NAKED; **(7)** HEAD STRONGLY COMPRESSED.

1 species recorded.

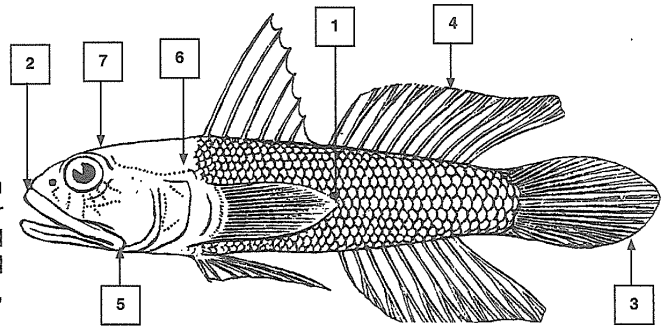
Mahidolia mystacina (Valenciennes, 1837)

FAO name: Smiling goby.

Local names:

Size: To 8 cm.

Habitat, biology, and fisheries: Known from bottom depths of estuarine and freshwater tidal zone habitats from Africa to Australia and the Philippines. Feeds primarily on fishes and some crustaceans. Caught with seines, trawls, and set-nets.



(from Koumans, 1953)

Subfamily GOBIONELLINAE

Genus *Awaous* **GOBIIDAE**

(1) 50 TO 60 SCALES IN LATERAL SERIES; **(2)** FLESHY FLAPS PRESENT ON INNER EDGE OF PECTORAL GIRDLE, EASILY VISIBLE WHEN LOOKING INTO OPERCULAR CAVITY; **(3)** SNOUT POINTED, MUCH LONGER THAN EYE WIDTH; **(4)** CAUDAL FIN ROUNDED, SHORTER THAN HEAD LENGTH.

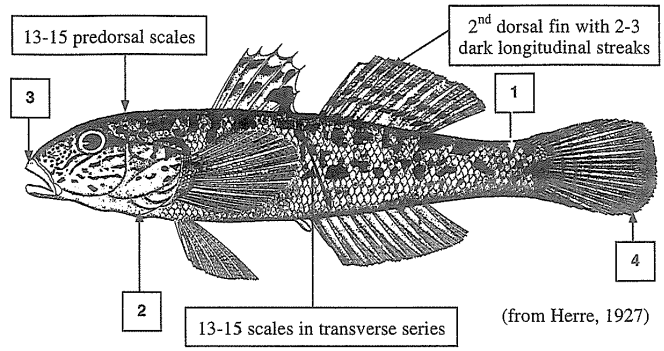
2 species likely to occur in the Cambodian Mekong.

Awaous grammepomus (Bleeker, 1849)

Local names:

Size: To 15 cm.

Habitat, biology, and fisheries: Found at bottom depths of freshwater streams with a fairly strong current and coarse substrate. Also occurs in tidal rivers and estuaries from Sri Lanka to New Guinea. Feeds on small fishes and crustaceans. Taken by seines, trawls, cast-nets, and set-nets. Not yet seen in markets, but probably sold fresh.



(from Herre, 1927)

Genus *Brachygobius* **GOBIIDAE**

(1) LATERAL LINE PORES ABSENT FROM HEAD; (2) NECK AND ISTHMUS WITH MEDIAN LONGITUDINAL GROOVE; (3) COLOUR PATTERN YELLOW WITH 3 OR 4 HIGHLY CONTRASTING BLACK BARS.

4 or 5 species possibly found in the Mekong.

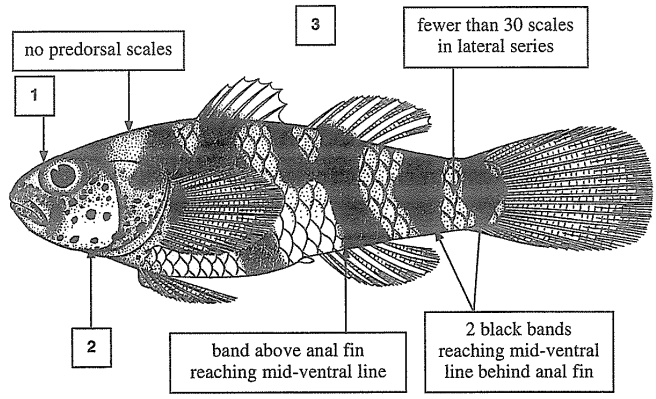
Brachygobius aggregatus Herre, 1940

FAO name: Schooling bumblebee goby.

Local names:

Size: To 1.5 cm.

Habitat, biology, and fisheries: Found in very shallow water of flowing streams, canals, ditches, and marshes from the Mekong to the Philippines. Occurs from completely freshwater habitats downstream to brackish waters of the estuarine zone. Prefers areas of considerable plant growth. Feeds on zooplankton. Due to its small size only caught accidentally with extremely fine-meshed nets. Not seen in markets.



(from Herre, 1940)

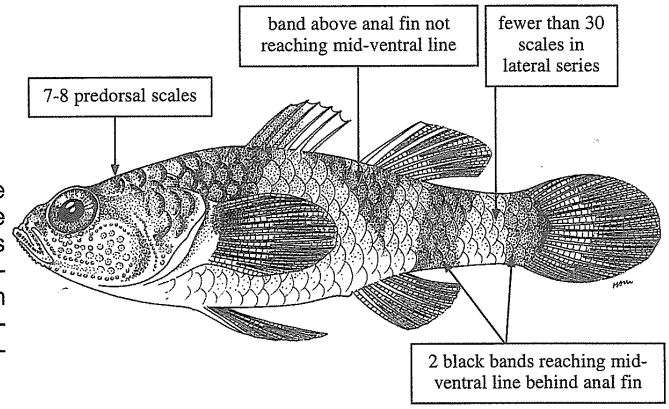
Brachygobius kabilensis Inger, 1958

FAO name: Kabili bumblebee goby.

Local names:

Size: To 1.8 cm.

Habitat, biology, and fisheries: Found in the freshwater tidal zone and brackish estuarine zone of the Mekong delta, upstream as far as Cambodia. Occurs in areas of aquatic vegetation, including mangrove roots. Feeds on zooplankton. Probably only caught accidentally with fine-meshed nets. Not seen in markets.



(after Inger, 1958)

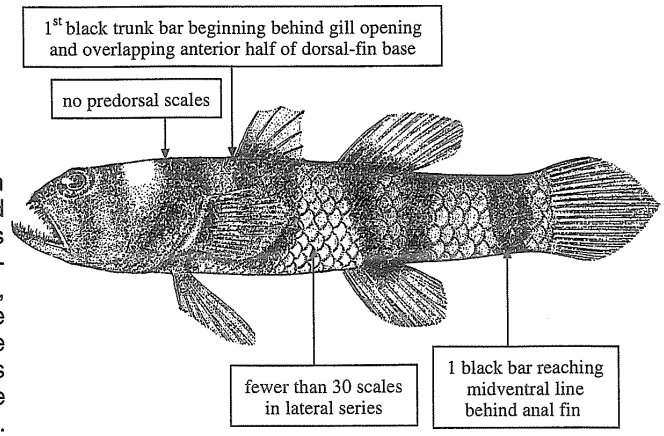
Brachygobius sua (Smith, 1931)

FAO name: Bumblebee goby.

Local names:

Size: To 3 cm.

Habitat, biology, and fisheries: Known from freshwater streams, canals, ditches, and marshes as well as brackish estuarine areas of the Southeast Asian mainland. During Mekong fishery studies in 1975 (Rainboth et al., 1975), this species was recorded from the Khorat Plateau of Thailand. It was not possible to consult Inger's (1958) revision of the genus or any other suitable literature to identify the species, so this record has to be confirmed. Feeds on zooplankton. Taken with seines and traps. Not sold in markets, but does occasionally appear in the aquarium trade.



(from Smith, 1931)

Genus *Calamiana* **GOBIIDAE**

(1) ABOUT 26 TO 40 SCALES IN LONGITUDINAL SERIES; **(2)** HEAD PORES ABSENT; **(3)** ISTHMUS LACKING MEDIAN LONGITUDINAL GROOVE; **(4)** GILL-OPENING RESTRICTED TO AREA DIRECTLY IN FRONT OF PECTORAL-FIN BASE; **(5)** MOUTH NEARLY HORIZONTAL, SNOUT BROADLY ROUNDED, ENDING IN FRONT OF UPPER LIP.

Several species recorded or likely to occur in the Cambodian Mekong, 2 of them included here.

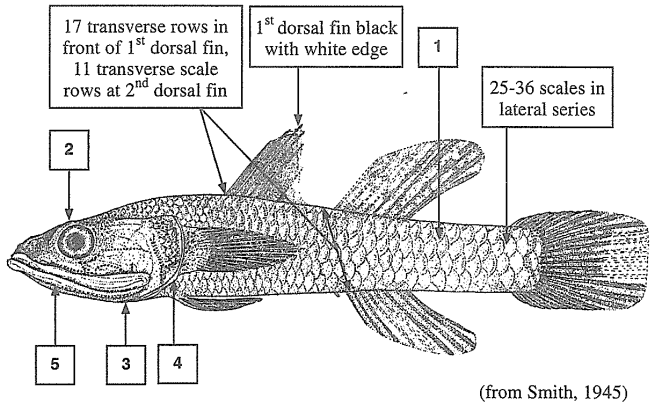
Calamiana aliceae (Smith, 1945)

Synonyms / misidentifications: *Gnathogobius aliceae, Calamiana aliciae.*

Local names:

Size: To 5 cm.

Habitat, biology, and fisheries: Found in high estuary habitats in the Chao Phrya, primarily in slow flowing canals and smaller bodies of water. Probably also found in the Mekong. Feeds on small fishes and invertebrates, including mosquito larvae and entomostracans. Caught with fine-meshed seines, set-nets, and trawls. Not seen in markets, but survives well in captivity if live food is given.



(from Smith, 1945)

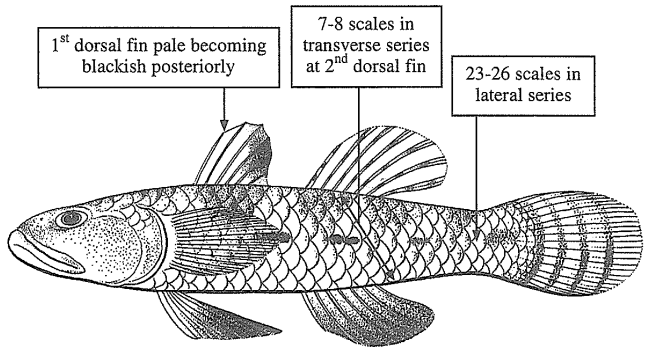
Calamiana siamensis (Fowler, 1934)

Synonyms / misidentifications: *Vaimosa siamensis.*

Local names:

Size: To 4 cm.

Habitat, biology, and fisheries: Found in lowland floodplain canals near the upstream end of the tidal zone in the Chao Phrya basin of Thailand and probably the Mekong of Cambodia. Feeds on insects and other invertebrates. Caught with fine-meshed seines, trawls, and set-nets. Not seen in markets.



(from Fowler, 1934)

Genus *Gobiopterus* **GOBIIDAE**

(1) 2 CANINE TEETH AND A SINGLE ROW OF MOVABLE TEETH IN LOWER JAW; **(2)** PELVIC FINS UNITED BUT NOT ADHERING TO BELLY; **(3)** 27 OR FEWER SCALES IN LATERAL SERIES; **(4)** MOUTH NEARLY VERTICAL.

2 species recorded.

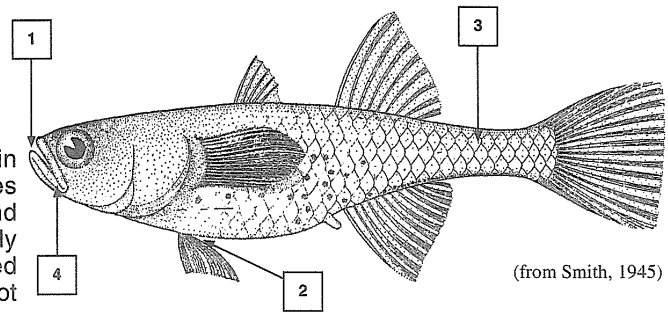
Gobiopterus chuno (Hamilton, 1822)

FAO name: Glass goby.

Local names:

Size: To 3 cm.

Habitat, biology, and fisheries: Found in fresh and brackish water in the lower courses of rivers from India to South East Asia. Found as far inland as Phnom Penh. Feeds primarily on zooplankton. Caught with fine-meshed seines, trawls, set-nets, and cast-nets. Not seen in markets.



(from Smith, 1945)

Genus *Mugilogobius* **GOBIIDAE**

(1) ABOUT 26 TO 40 SCALES IN LONGITUDINAL SERIES; **(2)** HEAD PORES ABSENT; **(3)** ISTHMUS LACKING MEDIAN LONGITUDINAL GROOVE; **(4)** GILL-OPENING RESTRICTED TO AREA DIRECTLY IN FRONT OF PECTORAL-FIN BASE; **(5)** MOUTH HORIZONTAL, SNOUT BROADLY ROUNDED, ENDING IN FRONT OF UPPER LIP.

4 species recorded or likely to occur in the Mekong.

Mugilogobius chulae (Smith, 1932)

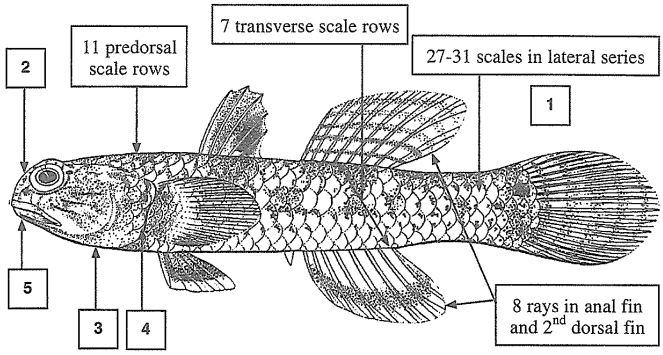
FAO name: Yellowstripe goby.

Synonyms / misidentifications: *Vaimosa chulae.*

Local names:

Size: To 4 cm.

Habitat, biology, and fisheries: Found in brackish waters along coastlines, estuaries, and tidal reaches of rivers around the Gulf of Thailand. Feeds on small crustaceans, aquatic insects, and insect larvae. Taken with small mesh nets, such as seines and set-nets. Not seen in markets. Numerous species of this genus are known from the Malay Peninsula and most of them probably occur in the Mekong delta.



(from Fowler, 1937)

Genus *Oligolepis* **GOBIIDAE**

(1) 25 TO 30 SCALES IN LONGITUDINAL SERIES; **(2)** UPPER JAW TEETH IN 3 TO 4 ROWS; **(3)** NO FLESHY FLAPS ON INNER EDGE OF PECTORAL GIRDLE; **(4)** CAUDAL FIN LONGER THAN HEAD, POINTED AT TIP; **(5)** LACKS MEMBRANEOUS CREST ON NAPE.

2 species recorded.

Oligolepis acutipennis (Valenciennes, 1837)

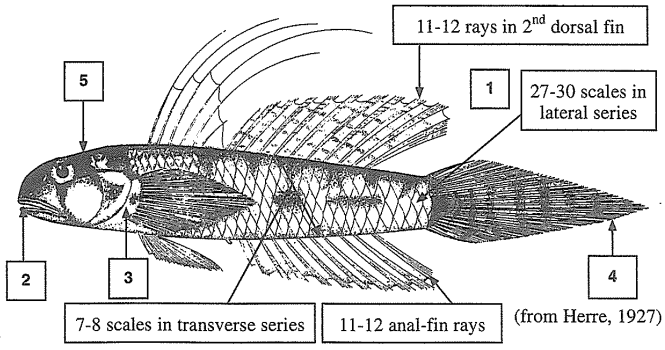
FAO name: Sharptail goby.

Synonyms / misidentifications: *Aparrius acutipinnis.*

Local names:

Size: To 12 cm.

Habitat, biology, and fisheries: Found along coastlines and in estuaries and tidal freshwaters from Sri Lanka to the Ryukyu Islands. This species was found to be common in the Mekong delta during a Mekong Fishery Study in 1974 (Rainboth et al, 1974). It may also occur upstream in Cambodia. Feeds on small fishes, crustaceans, and other invertebrates. Caught with seines, trawls, cast-nets, and set-nets. Sometimes marketed fresh in the delta.



(from Herre, 1927)

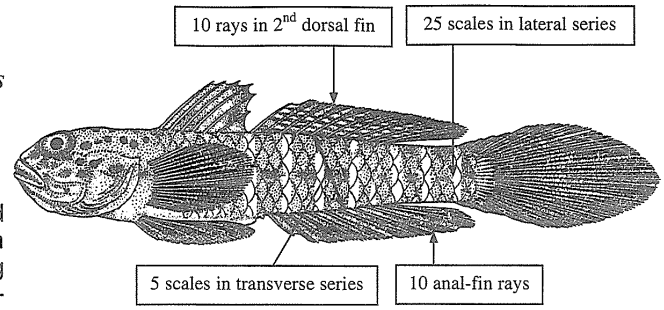
Oligolepis cylindriceps (Hora, 1923)

Synonyms / misidentifications: *Ctenogobius cylindriceps.*

Local names:

Size: To 3 cm.

Habitat, biology, and fisheries: Found mostly in brackish waters in river deltas from India through Malaysia, including the Mekong delta. Feeds on zooplankton, crustaceans, insects, and insect larvae. Caught with small meshed seines, cast-nets, and set-nets.



(from Hora, 1923)

Genus *Oxyurichthys* **GOBIIDAE**

(1) HEAD COMPRESSED WITH A MEMBRANEOUS CREST ON THE NAPE; (2) 26 TO 65 SCALES IN LONGITUDINAL SERIES; (3) UPPER JAW TEETH LARGE AND ALIGNED IN A SINGLE ROW.

4 or more species found in the Mekong.

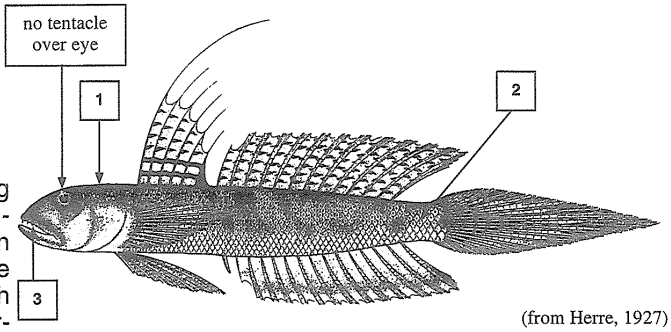
Oxyurichthys microlepis (Bleeker, 1849)

FAO name: Maned goby.

Local names:

Size: To 14 cm.

Habitat, biology, and fisheries: Found along coasts and in estuaries from the Arabian Peninsula to Fiji and north to Taiwan. Also found in the Mekong delta, and may penetrate up the tidal zone as far as Cambodia. Caught with seines, trawls, and set-nets. Sometimes marketed fresh.



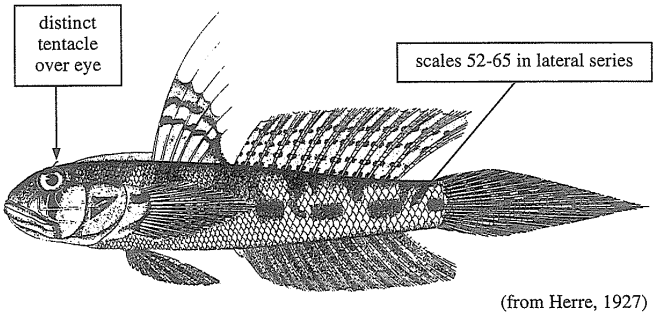
(from Herre, 1927)

Oxyurichthys tentacularis (Valenciennes, 1837)

Local names:

Size: To 15 cm.

Habitat, biology, and fisheries: Found in estuaries and the tidal zone of rivers from the Arabian peninsula to Australia and north to China. A predator on small fishes and invertebrates. Caught with seines, trawls, and set-nets. Not seen in markets.



(from Herre, 1927)

Genus *Pseudogobiopsis* **GOBIIDAE**

(1) LARGE CYCLOID SCALES ON OPERCLE AND NAPE; (2) MOUTH TERMINAL; (3) 23 TO 29 SCALES IN LATERAL SERIES; (4) LONGITUDINAL LINES OF SENSORY PAPILLAE ON HEAD; (5) NARROW INTERORBITAL SPACE, 0.8 TIMES EYE WIDTH; (6) HEAD AND BODY CYLINDRICAL ANTERIORLY; (7) TONGUE TRUNCATE OR EMARGINATE.

About 7 species recorded.

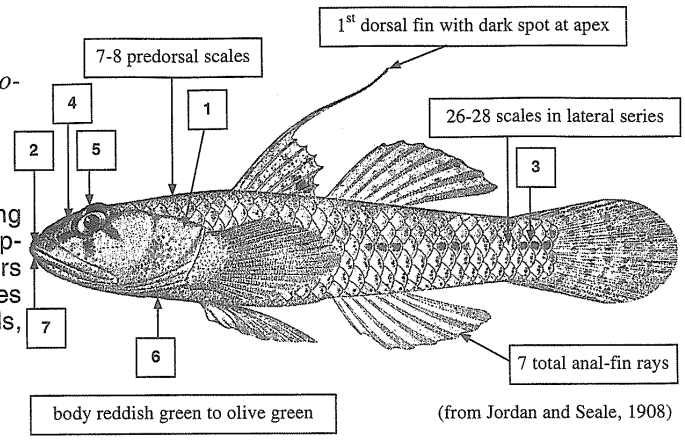
Pseudogobiopsis oligactis (Bleeker, 1875)

Synonyms / misidentifications: *Stigmatogobius oligactis.*

Local names:

Size: To 6 cm.

Habitat, biology, and fisheries: Found along the bottom in brackish water of estuaries upstream to the freshwater tidal zone of rivers from India to Indonesia. Feeds on small fishes and invertebrates. Caught with seines, trawls, and set-nets. Not seen in markets.



(from Jordan and Seale, 1908)

Genus *Pseudogobius* **GOBIIDAE**

(1) LARGE CYCLOID SCALES ON OPERCLE AND NAPE; **(2)** MOUTH INFERIOR OR SUBINFERIOR; **(3)** 25 TO 32 SCALES IN LATERAL SERIES; **(4)** LONGITUDINAL LINES OF SENSORY PAPILLAE ON HEAD; **(5)** NARROW INTERORBITAL SPACE, LESS THAN 0.5 TIMES EYE WIDTH; **(6)** HEAD AND BODY CYLINDRICAL ANTERIORLY; **(7)** TONGUE ROUNDED.

4 species recorded.

Pseudogobius isognathus (Bleeker, 1878)

cheek naked

25-26 scales in lateral series

Synonyms / misidentifications: *Stigmatogobius isognathus.*

Local names:

Size: To 6 cm.

NO ILLUSTRATION AVAILABLE

Habitat, biology, and fisheries: Found along the bottom in river mouths and estuaries, sometimes ascending into the freshwater tidal zone. Fairly common in the Mekong delta. Feeds on small fishes and invertebrates. Caught with seines, trawls, and set-nets. Not seen in markets.

teeth in inner row of lower jaw somewhat enlarged

colour greenish above, lighter below, body clouded with dark pigment

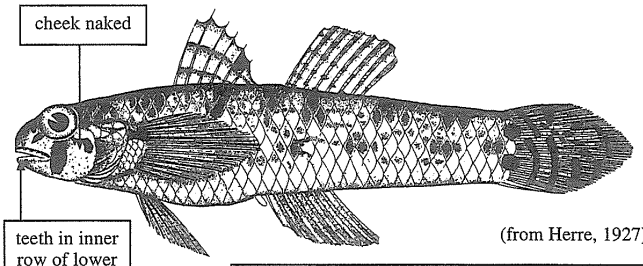
Pseudogobius javanicus (Bleeker, 1856)

Synonyms / misidentifications: *Stigmatogobius javanicus.*

Local names:

Size: To 6 cm.

Habitat, biology, and fisheries: Found in brackish water of estuaries and upstream into the tidal zone of rivers from India to Australia and northward to China. Feeds on small fishes and invertebrates. Caught with seines, trawls, and set-nets. Not seen in markets.



(from Herre, 1927)

Genus *Redigobius* **GOBIIDAE**

(1) HEAD AND ANTERIOR PART OF BODY COMPRESSED; **(2)** LONGITUDINAL LINES OF PAPILLAE ON HEAD; **(3)** 25 TO 30 SCALES IN LATERAL SERIES; **(4)** LARGE SCALES ON NAPE AND OPERCLE; **(5)** HEAD PORES PRESENT.

2 or more species found in the Mekong.

Redigobius bikolanus (Herre, 1927)

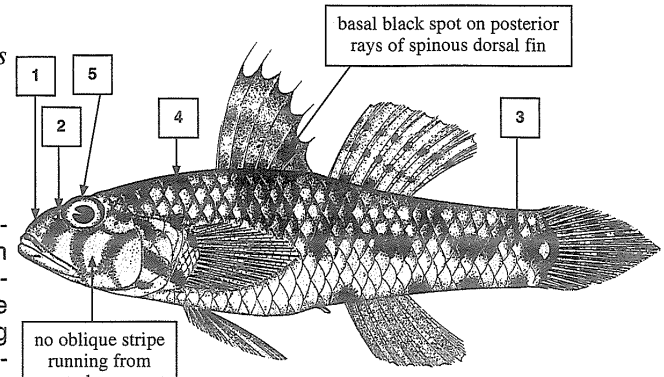
Synonyms / misidentifications: *Redigobius chrysosoma* (non Bleeker).

FAO name: Bigmouth goby.

Local names:

Size: To 3 cm.

Habitat, biology, and fisheries: Found in estuaries and the freshwater tidal zone from Africa to Indonesia and the Phlippines. Sometimes seen upstream a short distance from the tidal zone. Also recorded from the Mekong delta. Feeds on small fishes and invertebrates. Caught with seines, trawls, and set-nets. Not seen in markets.



(from Herre, 1927)

Genus *Rhinogobius* **GOBIIDAE**

(1) HEAD CYLINDRICAL OR DEPRESSED; **(2)** 28 TO 50 SCALES IN LATERAL SERIES; **(3)** CAUDAL FIN ROUNDED AND SHORTER THAN HEAD; **(4)** CHEEK, OPERCLE AND AT LEAST ANTERIOR PART OF NAPE NAKED; **(5)** FIRST DORSAL FIN LOW, NOT REACHING SECOND DORSAL WHEN DEPRESSED.

7 species possibly found in the Mekong.

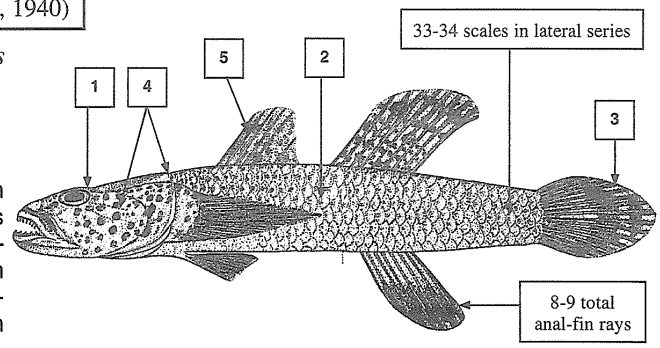
Rhinogobius mekongianus (Pellegrin and Fang, 1940)

Synonyms / misidentifications: *Ctenogobius cephalopardus, Ctenogobius mekongianus.*

Local names:

Size: To 5 cm.

Habitat, biology, and fisheries: Found in freshwater reaches of the middle Mekong as far upstream as upper Laos. Apparently endemic to the Mekong. Feeds on zooplankton and insect larvae. Caught with seines, cast-nets, and traps. Occasionally marketed fresh in mixed catches.



(from Smith, 1945)

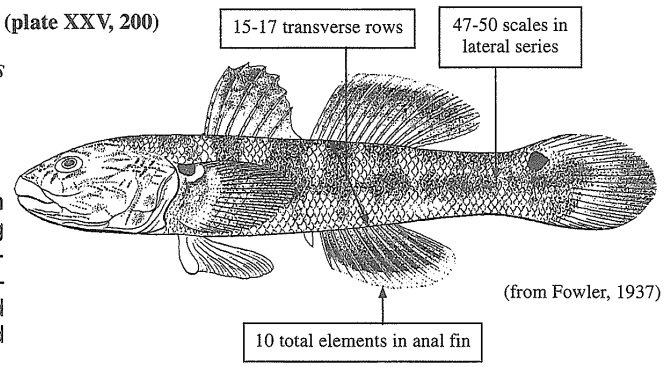
Rhinogobius ocellatus (Fowler, 1937) **(plate XXV, 200)**

Synonyms / misidentifications: *Ctenogobius ocellatus.*

Local names:

Size: To 9 cm.

Habitat, biology, and fisheries: Found in freshwater reaches of the Mekong, including upstream from Knoné Falls along the Thai-Lao border. Feeds on insects and zooplankton. Caught with seines, cast-nets, and traps. Occasionally marketed in mixed catches.



(from Fowler, 1937)

Genus *Stenogobius* **GOBIIDAE**

(1) FLESHY FLAPS PRESENT ON INNER EDGE OF PECTORAL GIRDLE; **(2)** CAUDAL FIN LONG AND POINTED, MUCH LONGER THAN HEAD; **(3)** HEAD COMPRESSED, NARROWER THAN DEEP; **(4)** 45 TO 55 SCALES IN LATERAL SERIES.

2 species found in the Mekong.

Stenogobius genivittatus (Valenciennes, 1837)

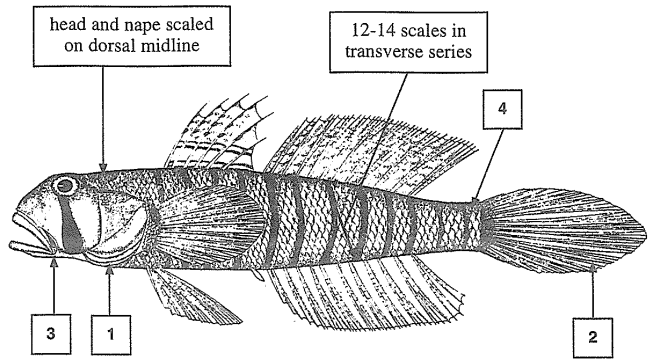
Synonyms / misidentifications: *Chonophorus lachrymosus.*

FAO name: Chinstripe goby.

Local names:

Size: To 18 cm.

Habitat, biology, and fisheries: Found in coastal waters and entering brackish and fresh water along the upper tidal zone of rivers from Madagascar to the South Pacific and northwards to Japan. Recorded from the Mekong delta. Feeds on fishes, crustaceans, and insects. Caught with seines, trawls, and set-nets. Sometimes marketed fresh in mixed catches.



(from Herre, 1927)

Stenogobius gymnopomus (Bleeker, 1853) **GOBIIDAE**

head and nape naked in dorsal midline

11 scales in transverse series

NO ILLUSTRATION AVAILABLE

Local names:

Size: To 15 cm.

Habitat, biology, and fisheries: Found in coastal waters, estuaries, and the tidal zone of rivers from India to Indonesia. Also recorded from the Mekong delta. Feeds on small fishes, crustaceans, and insects. Caught with seines, trawls, and set-nets. Not seen in markets.

Genus *Stigmatogobius* **GOBIIDAE**

(1) 24 TO 36 SCALES IN LONGITUDINAL SERIES; **(2)** CAUDAL FIN ROUNDED AND SHORTER THAN HEAD; **(3)** ROWS OF SENSORY PAPILLAE FORMING RADIAL PATTERN AROUND EYE; **(4)** INTERORBITAL SPACE BROAD, 1.2 TO 1.5 TIMES OF EYE WIDTH.

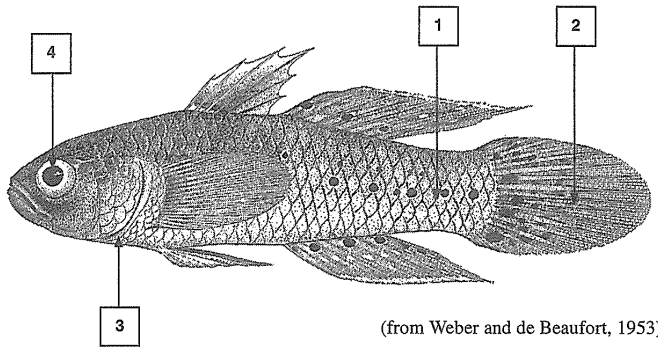
4 species recorded.

Stigmatogobius sadanundio (Hamilton, 1822)

Local names:

Size: To 9 cm.

Habitat, biology, and fisheries: Found in estuaries and the tidal zone of rivers from India to Fiji. Prefers fresh water, rarely found in brackish water. Feeds on small fishes and invertebrates, including mosquito larvae. Caught with seines, trawls, cast-nets, and set-nets. Not seen in markets, but commonly imported in the aquarium trade.



(from Weber and de Beaufort, 1953)

Subfamily OXUDERCINAE

Genus *Apocryptodon* **GOBIIDAE**

(1) LOWER EYELID ABSENT; **(2)** SECOND DORSAL FIN AND ANAL FIN WITH FEWER THAN 24 ELEMENTS; **(3)** 54 TO 55 SCALES IN LATERAL SERIES; **(4)** EYE AT OR BELOW DORSAL PROFILE OF HEAD; **(5)** FIRST DORSAL FIN LONGER THAN HIGH; **(6)** LOWER JAW TEETH BILOBATE.

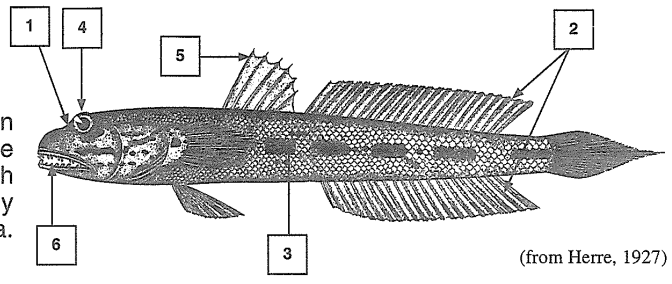
1 species recorded.

Apocryptodon madurensis (Bleeker, 1849)

Local names:

Size: To 9 cm.

Habitat, biology, and fisheries: Found in brackish water estuaries as well as in the freshwater tidal zone of rivers. Taken with seines, set-nets, and trawls. Occasionally seen in mixed catches in markets of the delta.



(from Herre, 1927)

Genus *Boleophthalmus* **GOBIIDAE**

(1) LOWER EYELID PRESENT; (2) FIRST DORSAL FIN HIGHER THAN LONG; (3) EYES ERECTILE ABOVE DORSAL PROFILE OF HEAD; (4) LOWER JAW TEETH OBLIQUELY NOTCHED; (5) 60 TO 125 SCALES IN LATERAL SERIES; (6) BARBELS ABSENT FROM UNDERSIDE OF HEAD.

1 species recorded.

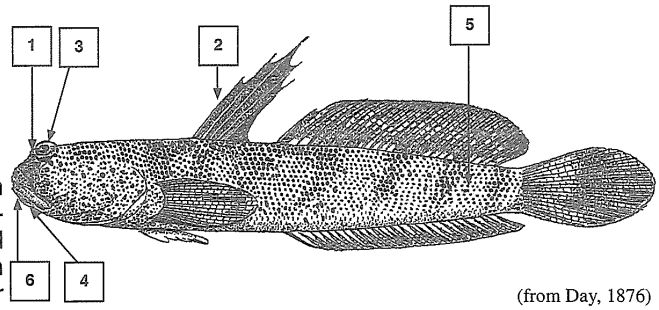
Boleophthalmus boddarti (Pallas, 1770)

FAO name: Boddart's goggle-eyed goby.

Local names:

Size: To 22 cm.

Habitat, biology, and fisheries: Found in brackish water of estuaries and in the freshwater tidal zone from India to New Guinea and north to China. Lives in burrows and is often found on mudflats in extremely shallow water where it browses on algae. Caught by seines or cast-nets. Occasionally seen in markets.



(from Day, 1876)

Genus *Oxuderces* **GOBIIDAE**

(1) LOWER EYELID ABSENT; (2) UPPER JAW WITH PROMINENT CANINE TOOTH LATERAL TO SYMPHYSIS; (3) MORE THAN 80 SCALES IN LATERAL SERIES; (4) EYES AT OR BELOW DORSAL PROFILE OF HEAD; (5) HEAD DEPRESSED ANTERIORLY.

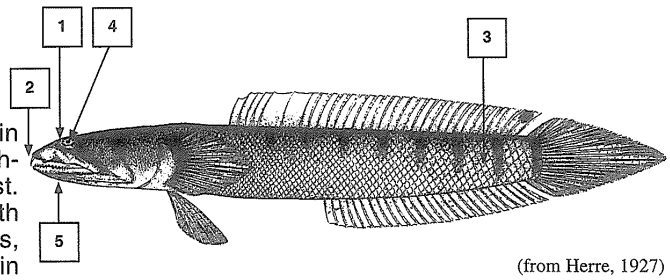
1 species recorded.

Oxuderces dentatus Valenciennes, 1842

Local names:

Size: To 10 cm.

Habitat, biology, and fisheries: Found in brackish water of estuaries and in the freshwater tidal zone along the East Asian coast. Lives on intertidal mudflats often covered with only a thin film of water. Caught by seines, cast-nets, and set-nets. Occasionally seen in markets.



(from Herre, 1927)

Genus *Parapocryptes* **GOBIIDAE**

(1) LOWER EYELID ABSENT; (2) ABOUT 80 SCALES IN LATERAL SERIES; (3) EYES AT OR BELOW DORSAL PROFILE OF HEAD; (4) TEETH IN LOWER JAW POINTED .

2 species recorded.

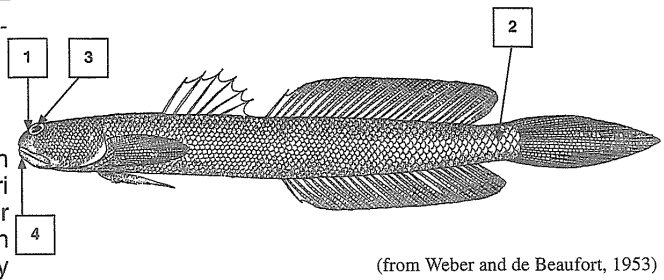
Parapocryptes serperaster (Richardson, 1846)

Synonyms / misidentifications: *Parapocryptes macrolepis*.

Local names:

Size: To 23 cm.

Habitat, biology, and fisheries: Found in bays and brackish water estuaries from Sri Lanka to China. Also found in the freshwater tidal zone of the Mekong delta. Caught with seines, trawls, and set-nets. Occasionally marketed in mixed catches.



(from Weber and de Beaufort, 1953)

Genus *Periophthalmodon* **GOBIIDAE**

(1) LOWER EYELID PRESENT; (2) EYE PROMINENT ABOVE DORSAL PROFILE OF HEAD; (3) NO CANINE TEETH AT INNER SIDE OF LOWER JAW SYMPHYSIS; (4) 2 ROWS OF TEETH IN UPPER JAW.

2 or 3 species recorded.

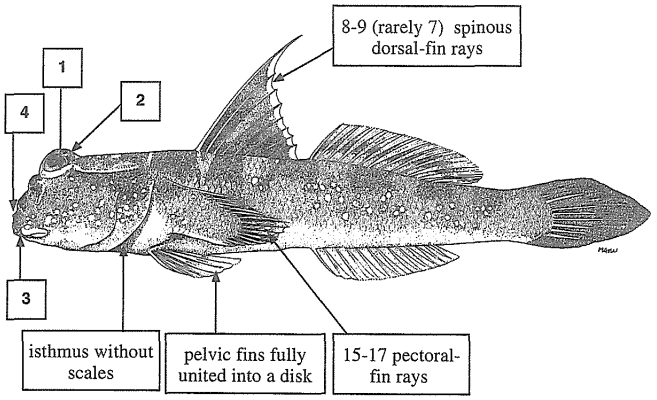
Periophthalmodon schlosseri (Pallas, 1770)

FAO name: Giant mudskipper.

Local names:

Size: To 27 cm.

Habitat, biology, and fisheries: An amphibious species, commonly found on muddy shores in estuaries and in the tidal zone of rivers from India to Australia. Lives in burrows in the mud and emerges on sunny days at low tide. Moves quickly across the mud, but can be caught with entangling nets strung above the ground or with cast-nets tossed onto the exposed mud. Marketed live in Vietnam.



Genus *Pseudapocryptes* **GOBIIDAE**

(1) LOWER EYELID ABSENT; (2) FIRST DORSAL FIN WITH 5 SPINES.

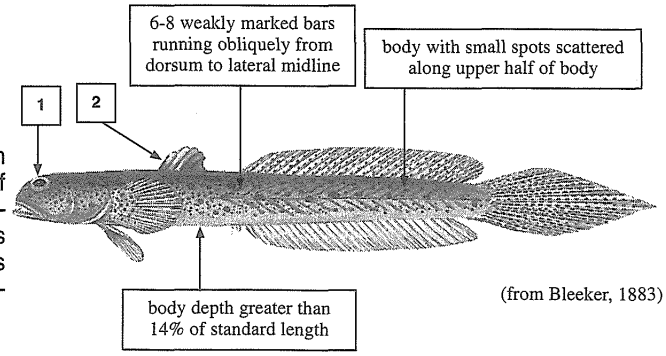
2 species recorded.

Pseudapocryptes borneensis (Bleeker, 1855)

Local names:

Size: To 12 cm.

Habitat, biology, and fisheries: Found in mudflats of estuaries and the tidal zone of rivers on the Malay and Indochinese peninsulas. Lives in deep burrows. Taken with trawls and cast-nets. Occasionally seen in markets in the Mekong delta. This species is less common than the widespread *P. lanceolatus*.



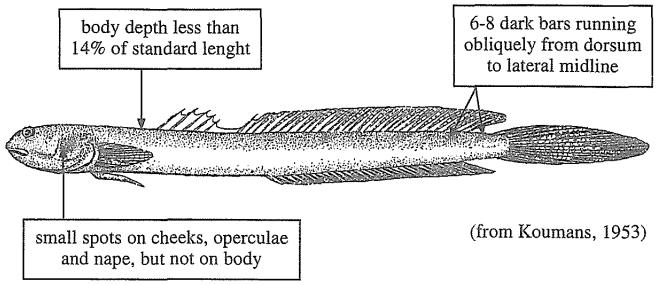
(from Bleeker, 1883)

Pseudapocryptes lanceolatus (Bloch and Schneider, 1801)

Local names:

Size: To 20 cm.

Habitat, biology, and fisheries: Found in mudflats of estuaries and the freshwater tidal zone of rivers from India to Tahiti and north to China. Commonly seen in the Mekong delta. Taken by seines, cast-nets and tidal set-nets and sometimes marketed fresh in mixed catches.



(from Koumans, 1953)

Genus *Scartelaos* **GOBIIDAE**

(1) LOWER EYELID PRESENT; **(2)** EYES ERECTILE ABOVE DORSAL PROFILE OF HEAD; **(3)** 2 CANINE TEETH AT INNER SIDE OF LOWER JAW SYMPHYSIS; **(4)** BARBELS PRESENT ON UNDERSIDE OF HEAD.

1 species recorded.

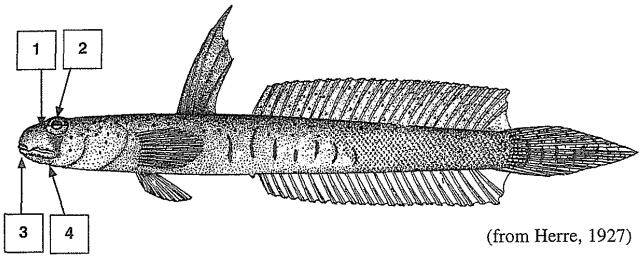
Scartelaos histophorus (Valenciennes, 1837)

Synonyms / misidentifications: *Scartelaos viridis.*

Local names:

Size: To 14 cm.

Habitat, biology, and fisheries: Found along muddy and sandy coasts and estuaries from India to Australia and north to China. Also found in the freshwater tidal zone of the Mekong. Caught by seines, cast-nets, and tidal set-nets. Not seen in markets.



(from Herre, 1927)

Subfamily AMBLYOPINAE

Genus *Brachyamblyopus* **GOBIIDAE**

(1) NO BARBELS ON HEAD; **(2)** NO CANINE TEETH IN JAWS; **(3)** 6 SPINOUS DORSAL-FIN RAYS.

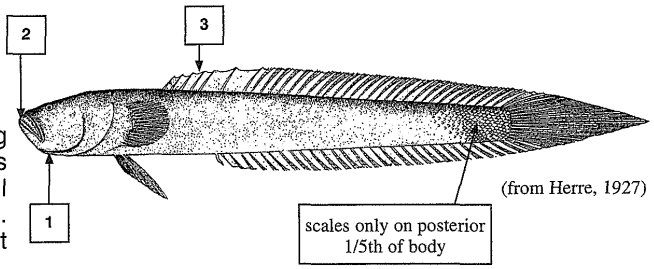
3 species recorded.

Brachyamblyopus urolepis (Bleeker, 1852)

Local names:

Size: To 8 cm.

Habitat, biology, and fisheries: Found along the bottom in muddy tidal rivers and estuaries from India to the Philippines. Feeds on small crustaceans and other benthic invertebrates. Caught with seines, trawls, and set-nets. Not seen in markets.



(from Herre, 1927)

Genus *Caragobioides* **GOBIIDAE**

(1) NO BARBELS ON HEAD; **(2)** NO CANINE TEETH IN JAWS; **(3)** 10 SPINOUS DORSAL-FIN RAYS.

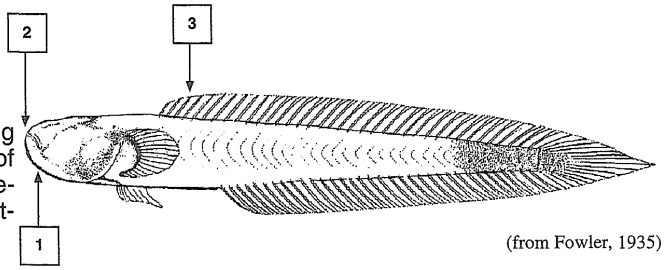
1 species recorded.

Caragobioides geomys Fowler, 1935

Local names:

Size: To 7.5 cm.

Habitat, biology, and fisheries: Found along muddy bottoms in estuaries and tidal rivers of Southeast Asia. Feeds on benthic invertebrates. Caught with seines, trawls, and set-nets. Not seen in markets.



(from Fowler, 1935)

Genus *Taenioides* **GOBIIDAE**

(1) BARBELS ON HEAD; **(2)** CANINE TEETH PRESENT IN BOTH JAWS; **(3)** PECTORAL FIN MUCH SHORTER THAN PELVIC FIN; **(4)** MOUTH NEARLY VERTICAL.

7 species possibly found in the Mekong, 3 of them included here.

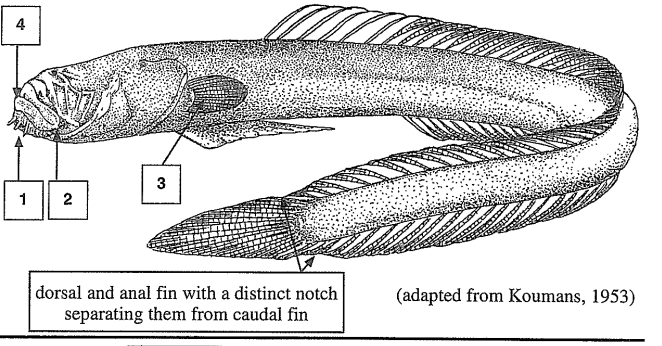
Taenioides cirratus (Blyth, 1860)

FAO name: Bearded eel goby.

Local names:

Size: To 30 cm.

Habitat, biology, and fisheries: Found along the bottom in estuaries and the tidal zone of rivers from Africa to Indonesia and Australia. Feeds on crustaceans and other invertebrates and probably small fishes. Caught with seines, trawls, and set-nets. Not seen in markets.



(adapted from Koumans, 1953)

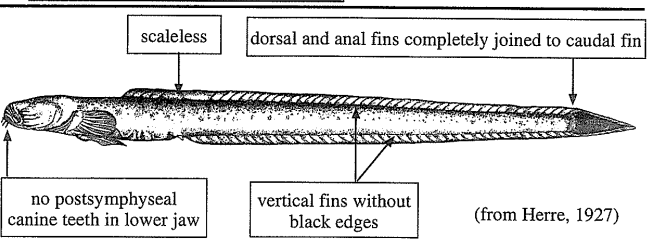
Taenioides gracilis (Valenciennes, 1837)

FAO name: Slender eel goby.

Local names:

Size: To 20 cm.

Habitat, biology, and fisheries: Found along the bottom in estuaries and the tidal zone of rivers from India to the Philippines. Diet consists of small crustaceans and fishes. Taken with seines, trawls and set-nets. Sold fresh in markets.



(from Herre, 1927)

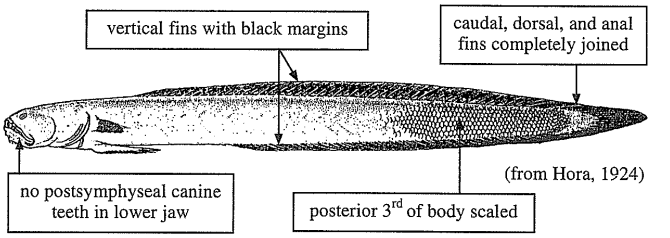
Taenioides nigrimarginatus Hora, 1924

FAO name: Blackfin eel goby.

Local name:

Size: To 23 cm.

Habitat, biology, and fisheries: Found along muddy bottoms of coastal rivers, estuaries, bays, and lakes. Known from the Malay Peninsula and also recorded from the Mekong delta. Feeds on small crustaceans and other invertebrates. Taken with seines, trawls and set-nets. Not seen in markets.



(from Hora, 1924)

Genus *Trypauchen* **GOBIIDAE**

(1) PELVIC FINS COMPLETELY UNITED TO FORM A COMPLETE FUNNEL-SHAPED DISK; **(2)** A POUCH EXTENDING INTO GILL CAVITY FROM UPPER EDGE OF OPERCULUM; **(3)** BODY FULLY SCALED.

2 species recorded.

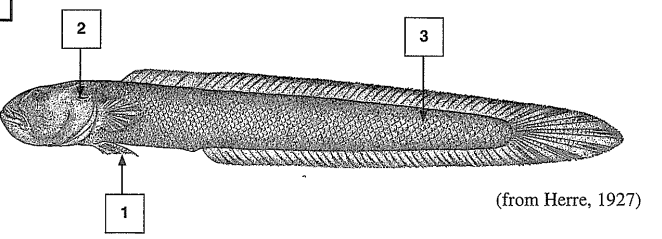
Trypauchen vagina (Bloch and Schneider, 1801)

FAO name: Burrowing goby.

Local names:

Size: To 22 cm.

Habitat, biology, and fisheries: Found along the bottom in tidal rivers and estuaries from the Persian Gulf to China and Indonesia. Feeds on small crustaceans. Stays close to a self-dug burrow, but can be caught by seines or trawls. Sometimes marketed fresh.



(from Herre, 1927)

Suborder Scombroidei

Family SCOMBRIDAE

Genus *Scomberomorus* — **SCOMBRIDAE**

(1) 2 SMALL KEELS AND A LARGE MEDIAN KEEL ON EACH SIDE OF CAUDAL PEDUNCLE; **(2)** A SINGLE LATERAL LINE; **(3)** TEETH IN JAWS STRONG, COMPRESSED AND BLADE-LIKE; **(4)** SNOUT MUCH SHORTER THAN REST OF HEAD LENGTH.

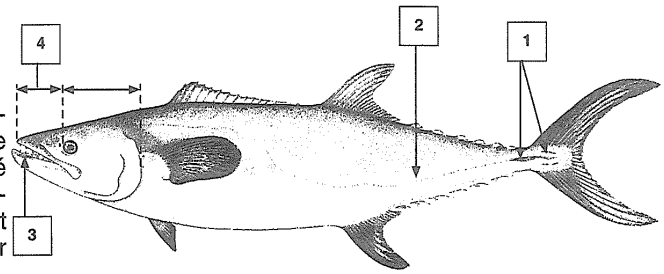
1 species known from freshwater reaches of the lower Mekong.

Scomberomorus sinensis Lacepède, 1800

FAO name: Chinese seerfish.

Local names: Trey beyka, ត្រី បេយ៉ា.

Size: To 200 cm.



Habitat, biology, and fisheries: A marine species of the western Pacific that ascends the Mekong River to the Great Lake and to Khoné Falls. Generally uncommon, the large individuals are seen during the dry season in the fast flowing Mekong from Khoné to Kratié. Smaller ones are found from Kratié to Phnom Penh. Large individuals are found in the Tonlé Sap during low waters and in Prek Tasom near Snoc-Trou during the floods. Not known to spawn in fresh waters. A predator on fishes, it apparently swims well upstream because of easy food availability. Taken with seines, gill-nets, set-nets, and traps. Marketed fresh.

Suborder Anabantoidei

Family ANABANTIDAE

Genus *Anabas* — **ANABANTIDAE**

(1) DORSAL-FIN ORIGIN IN FRONT OF PECTORAL FIN; **(2)** DORSAL-FIN BASE LONGER THAN ANAL-FIN BASE; **(3)** FIXED CONICAL TEETH IN JAWS; **(4)** TEETH ON PALATE; **(5)** OPERCLE WITH A HEAVILY SERRATED EDGE.

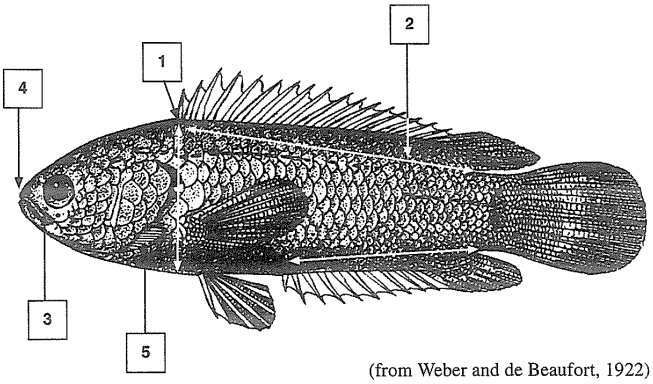
1 species recorded.

Anabas testudineus (Bloch, 1792)

FAO name: Climbing perch.

Local names: Trey kranh srai, ត្រី ក្រាញ ទំ ស្រែ.

Size: Rarely to 23 cm, commonly from 10 to 15 cm.



(from Weber and de Beaufort, 1922)

Habitat, biology, and fisheries: Found in sluggish, standing, or even stagnant water often with dense vegetation. Occurs from Sri Lanka to China, Indonesia, and the Philippine Islands. Cultured across much of its range. A predatory species that feeds primarily on fishes. Known to emerge from the water at night when it seeks new habitats by clambering over dry land using flared gill covers and flexing the caudal peduncle. Besides seines and gill-nets underwater, this species is also caught with entangling nets hung on the dry borders of canals and rice paddies. Usually sold live in markets where it is kept alive for several days by keeping it moist. Individuals identified as *Anabas testudineus* may actually represent 2 distinct species.

Family HELOSTOMATIDAE

Genus *Helostoma* — **HELOSTOMIDAE**

(1) DORSAL-FIN ORIGIN ABOVE OR SLIGHTLY IN ADVANCE OF PECTORAL FIN; **(2)** NO TEETH ON PALATE; **(3)** NO TEETH IN JAWS.

1 species recorded.

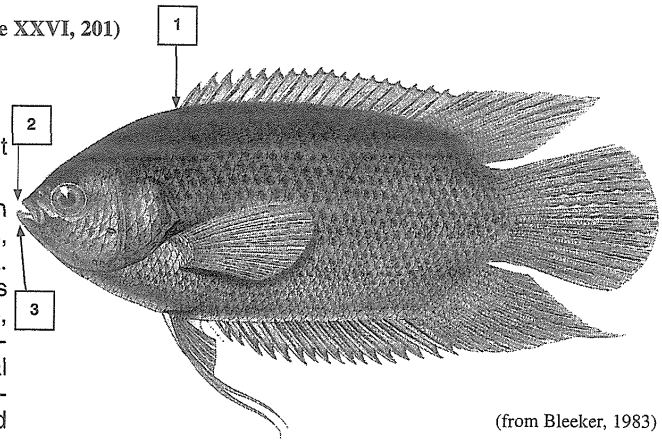
Helostoma temmincki Cuvier, 1831 **(plate XXVI, 201)**

FAO name: Kissing gourami.

Local names: Trey kantrawb, ត្រី កន្ត្រៀប.

Size: Rarely to 30 cm, commonly to about 20 cm.

Habitat, biology, and fisheries: Found in sluggish or standing waters of canals, swamps, ponds, and lakes from Thailand to Indonesia. Feeds on phytoplankton and zooplankton as well as aquatic insects near the water surface, supplemented with large amounts of plant matter. A highly valued food fish, cultured in central Thailand. Caught by seines, cast-nets, and lift-nets. Can be kept alive in markets for prolonged periods. Very common in the aquarium trade.



(from Bleeker, 1983)

Family BELONTIIDAE

Genus *Betta* — **BELONTIIDAE**

(1) PELVIC FIN WITH 1 SPINE AND 5 BRANCHED RAYS; **(2)** CAUDAL FIN ROUNDED OR POINTED; **(3)** 1 DORSAL-FIN SPINE; **(4)** 4 OR FEWER ANAL-FIN SPINES; **(5)** LACRIMAL BONE ENTIRE.

Several species found in the lower Mekong.

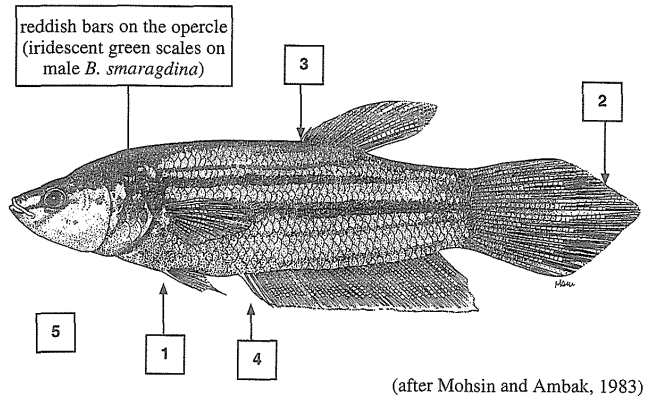
Betta splendens Regan, 1909

FAO name: Siamese fighting fish.

Local names: Trey kroem phloek, ត្រីក្រឹមភ្លឺក.

Size: To 6.5 cm.

Habitat, biology, and fisheries: Found in standing waters of floodplains, canals, rice paddies through central Thailand and in the lower Mekong. Feeds on zooplankton, mosquito, and other insect larvae. Caught with seines, cast-nets, and traps and has long been kept in captivity. Rarely seen being sold for food. It has been so highly bred in Thailand for aquarium export trade that information on "wild specimens" and natural habitats is nearly impossible to obtain. Cambodia may be one of the few places where such information can be gathered. Taxonomy of species in this genus is difficult. The specimen illustrated is one of several species encountered in Cambodia.



(after Mohsin and Ambak, 1983)

Genus *Trichogaster* **BELONTIIDAE**

(1) DORSAL-FIN ORIGIN FAR BEHIND PECTORAL-FIN BASE; (2) PELVIC FIN WITH A LONG FILAMENTOUS RAY AND 2 TO 3 SMALL RAYS IN THE AXIL; (3) LATERAL LINE INTERRUPTED OR COMPLETE.

At least 3 species present, an additional species possible.

Trichogaster microlepis (Günther, 1861)

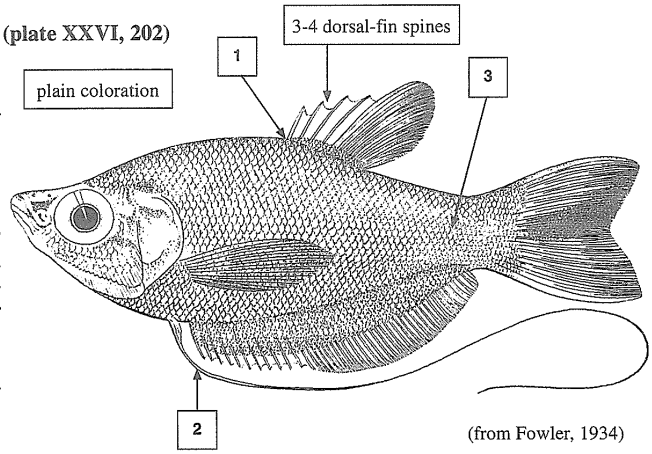
(plate XXVI, 202)

FAO name: Moonlight gourami.

Local names: Trey kawmphleanh phluk, ត្រីកំភ្លាញភ្លុក.

Size: To 15 cm.

Habitat, biology, and fisheries: Found in shallow sluggish or standing-water habitats with a lot of aquatic vegetation from Thailand to Vietnam. Common in the floodplain of the lower Mekong. Feeds on zooplankton, crustaceans, and aquatic insects. Caught with seines and cast-nets. Marketed fresh and also commonly seen in the aquarium fish trade.



(from Fowler, 1934)

Trichogaster pectoralis Regan, 1909

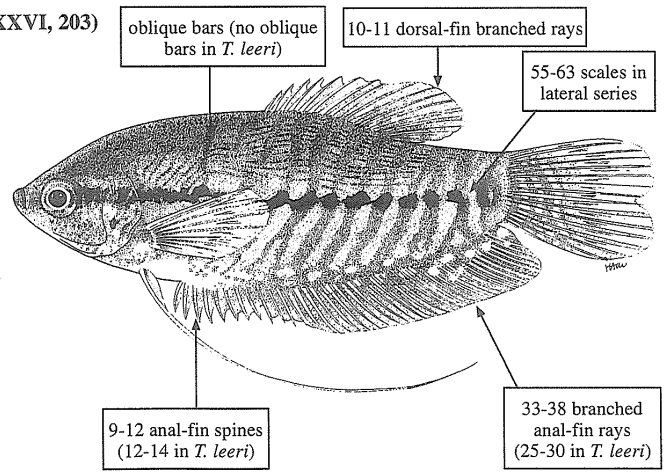
(plate XXVI, 203)

FAO name: Snakeskin gourami.

Local names: Trey kawnthor, ត្រីកន្ធរ.

Size: To over 20 cm, but more commonly to 15 cm.

Habitat, biology, and fisheries: Found in shallow sluggish or standing-water habitats with a lot of aquatic vegetation on mainland Southeast Asia. Found in flooded forests of the lower Mekong and gradually moves back to rivers and Great Lake as floodwaters recede. Caught with seines, set-nets, cast-nets, and traps. Marketed fresh and commonly seen in the aquarium fish trade.



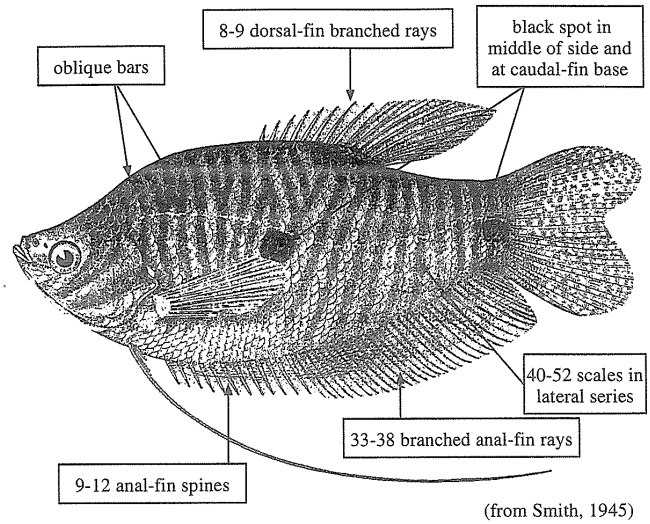
Trichogaster trichopterus (Pallas, 1770)

FAO name: Threespot gourami.

Local names: Trey kawmphleanh samrai, ត្រីកំភ្លាញសំរែ.

Size: To 15 cm.

Habitat, biology, and fisheries: Found in shallow sluggish or standing-water habitats with a lot of aquatic vegetation from Thailand to Indonesia. Occurs in seasonally flooded forests throughout the middle and lower Mekong. Feeds on zooplankton, crustaceans, and insect larvae. Caught with seines, cast-nets, set-nets, and traps. Marketed fresh and commonly seen in the aquarium fish trade.



(from Smith, 1945)

Genus *Trichopsis* **BELONTIIDAE**

(1) DORSAL-FIN ORIGIN FAR BEHIND BASE OF PECTORAL-FIN; (2) PELVIC FIN WITH 1 SPINE FOLLOWED BY A FILAMENT AND 4 BRANCHED RAYS; (3) 2 TO 4 DORSAL-FIN SPINES; (4) 4 TO 8 ANAL-FIN SPINES; (5) LATERAL LINE ABSENT.

3 species recorded.

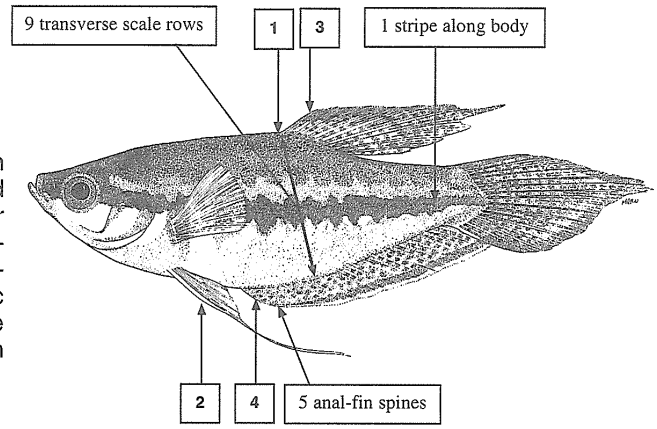
Trichopsis pumila (Arnold, 1937)

FAO name: Pygmy gourami.

Local name: Trey kroem tun sai, ត្រី ក្រឹមខន្សាយ.

Size: To 4 cm.

Habitat, biology, and fisheries: Found in ditches and small ponds across mainland Southeast Asia. Most common in standing or stagnant water that has a dense cover of floating plants and may sometimes have low oxygen levels. Feeds on zooplankton and aquatic insects. Not fished commercially, but can be taken with seines and cast nets. A popular fish in the aquarium trade.



Trichopsis vittata (Cuvier, 1831)

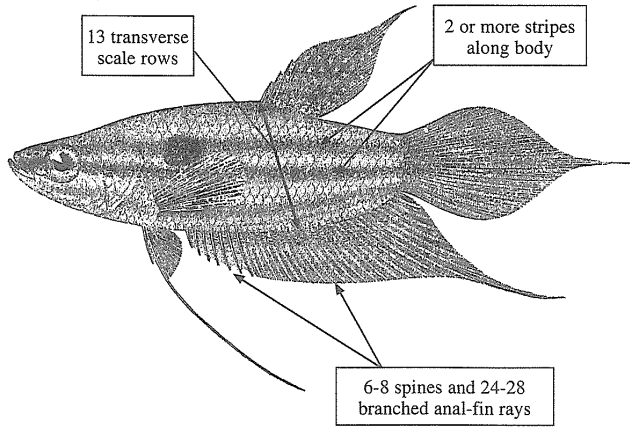
(plate XXVI, 204)

FAO name: Croaking gourami.

Local names: Trey kroem kdah, ត្រី ក្រឹមក្តារ.

Size: To 7 cm.

Habitat, biology, and fisheries: Found in shallow sluggish or standing-water habitats with a lot of vegetation. Known to occur from Thailand to Indonesia. Common throughout the middle and lower Mekong. Feeds on zooplankton, crustaceans, and insect larvae. Usually not fished commercially, but larger individuals are sometimes taken by seines, cast-nets, or set-nets. Occasionally sold as part of mixed catches in markets, and regularly seen in aquarium fish trade.



(from Smith, 1945)

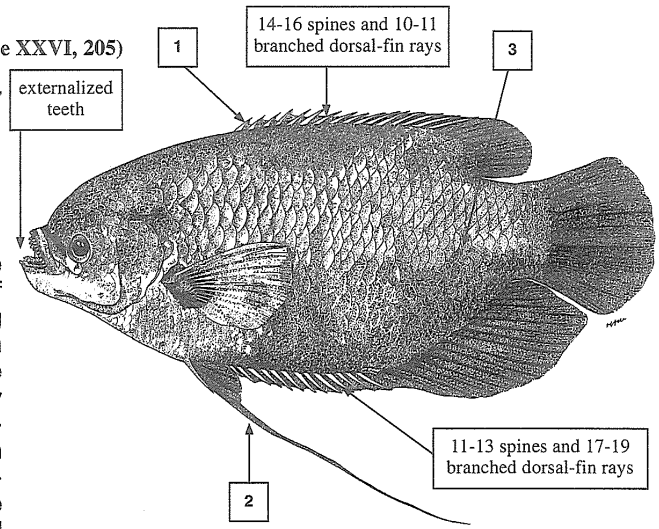
Family OSPHRONEMIDAE

Genus *Osphronemus* — **OSPHRONEMIDAE**

(1) DORSAL-FIN ORIGIN FAR BEHIND PECTORAL-FIN BASE; **(2)** PELVIC FIN WITH A SPINE AND 5 RAYS; **(3)** LATERAL LINE COMPLETE AND CONTINUOUS.

1 species recorded, an additional species uncertain.

Osphronemus exodon Roberts, 1994 (plate XXVI, 205)



Synonyms / misidentifications: *Osphronemus gouramy* (non Lacepède).

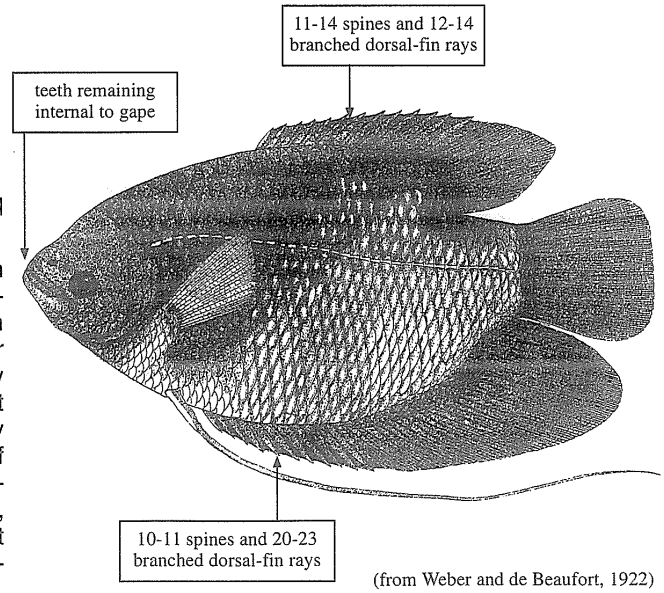
FAO name: Elephant ear gourami.

Local names: Trey romeas, ត្រី រមាស.

Size: To 60 cm.

Habitat, biology, and fisheries: Occurs in the middle Mekong in a stretch from just upstream of Khoné Falls in southern Laos southward to Stung Treng and possibly as far as Kratié. Not known from the Great Lake. Found in pools of large rivers and in flooded forests during the rainy season. Feeds apparently mostly on plant material including fruits, leaves, and flowers, with some insects and crustaceans. Said to reproduce in non-flowing waters near the river shore during lowest water levels. Caught with baited hooks. Marketed fresh in northern Cambodia.

Osphronemus gouramy Lacepède, 1802



(from Weber and de Beaufort, 1922)

FAO name: Giant gourami.

Local names: Trey trochiek damrey, ត្រី ត្រចៀកដំរី.

Size: To 70 cm, commonly between 40 and 50 cm.

Habitat, biology, and fisheries: Found in sluggish and standing-water habitats in Southeast Asia. Widely introduced and cultured from Sri Lanka to China. The specimens so far reported from the middle Mekong probably belong to *O. exodon* (Roberts, 1994). Not found around the Siem Reap area, but may occur in streams draining the northern side of the Cardamom mountains. Feeds on submerged land plants and aquatic macrophytes, fruits, seeds, and filamentous algae. Caught with seines, lift-nets, and cast-nets, and probably also with baited hooks.

Suborder Channoidei

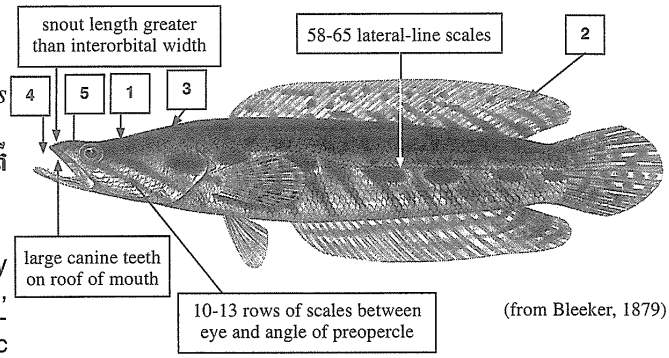
Family CHANNIDAE

Genus *Channa* **CHANNIDAE**

(1) TOP AND SIDES OF HEAD COVERED WITH SCALES; (2) DORSAL FIN LONGER THAN ANAL FIN AND BEGINNING ABOVE PECTORAL FIN; (3) HEAD BROAD AND FLATTENED; (4) MOUTH LARGE; (5) EYES IN ANTERIOR PART OF HEAD.

8 species known or expected from the Mekong.

Channa lucius (Cuvier, 1831) (plate XXVI, 206)



(from Bleeker, 1879)

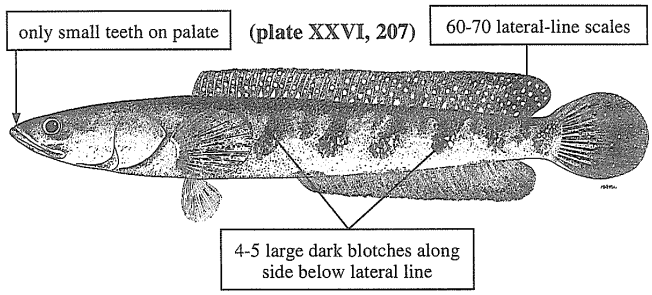
Synonyms / misidentifications: *Ophicephalus lucius.*

Local names: Trey kanh chorn chey, ត្រីកន្ធរជ័យ.

Size: To 40 cm, but usually smaller.

Habitat, biology, and fisheries: Inhabits slowly moving streams and rivers as well as lakes, ponds, and reservoirs from Thailand to Indonesia. Usually found in areas with much aquatic vegetation as well as submerged woody plants, but less common than *C. striata* or *C. micropeltes*. Predatory on fishes, prawns, and crabs and slightly less on shrimps. Caught with seines, gill-nets, and by hook-and-line. Marketed fresh and often alive.

Channa marulius (Hamilton, 1822)



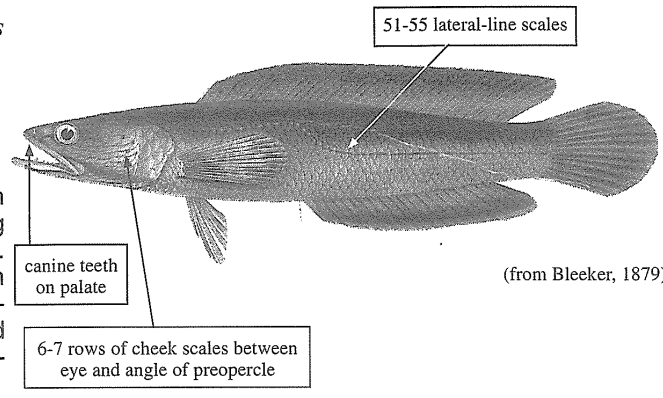
Synonyms / misidentifications: *Ophicephalus marulius.*

Local names: Trey raws, ត្រីរ៉ស់.

Size: To over 120 cm.

Habitat, biology, and fisheries: Found in sluggish or standing water in canals, lakes, and swamps from India to China, south to Thailand and Cambodia. Inhabits waters with submerged aquatic vegetation and probably ingests some plant matter along with the fishes. Taken with seines, gill-nets, and by hook-and-line. Marketed fresh and sometimes alive. Specimens from northern Cambodia do not have a well-defined ocellus at the base of the caudal fin and may represent an undescribed species.

Channa melasoma (Bleeker, 1851)



(from Bleeker, 1879)

Synonyms / misidentifications: *Ophicephalus melanosomus.*

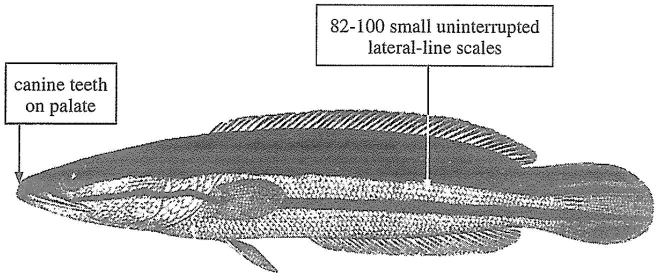
FAO name: Black snakehead.

Local names:

Size: To 30 cm.

Habitat, biology, and fisheries: Found in sluggish or standing waters from the Mekong in Thailand to Indonesia and the Philippines. This species is apparently less common than the other snakeheads included here. A predator on fishes. Caught with seines, gill-nets, and possibly by hook-and-line. Not seen it in markets.

Channa micropeltes (Cuvier, 1831) **(plate XXVI, 208)** **CHANNIDAE**



(from Weber and de Beaufort, 1922)

Synonyms / misidentifications: *Ophicephalus micropeltes.*

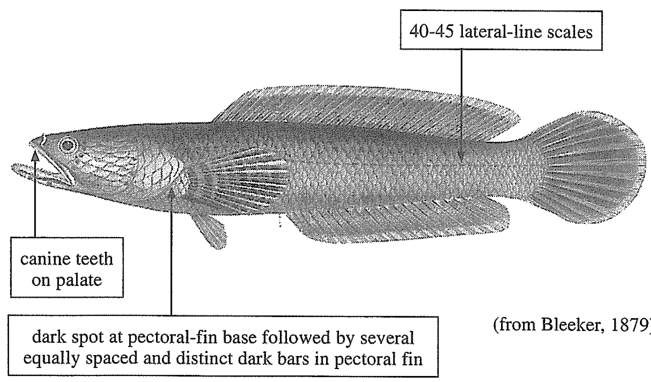
FAO name: Giant snakehead.

Local names: Trey diep (juvenile), Trey chhdaur (adult), តូចៈ ត្រីដៀប ធំៈ ត្រី ឆ្ដោរ.

Size: To 100 cm.

Habitat, biology, and fisheries: The largest of the snakeheads, at least in weight. This species inhabits standing or slowly flowing waters from India to Indonesia and is common throughout Cambodia. A predator mostly on fishes, but feeds also on some crustaceans. Caught with seines, gill-nets, traps, and baited hooks. An important food fish that is cultured in cages. Marketed fresh and sometimes alive.

Channa orientalis (Schneider, 1801) **(plate XXVII, 209)**



(from Bleeker, 1879)

Synonyms / misidentifications: *Ophicephalus gachua, Ophicephalus orientalis.*

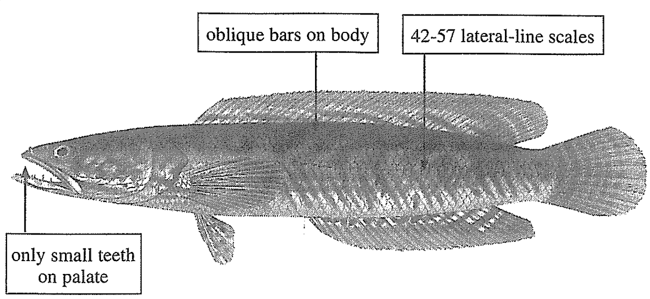
FAO name: Walking snakehead.

Local names: Trey ksan, ត្រី ក្សាន.

Size: To 20 cm.

Habitat, biology, and fisheries: A broadly adapted species found in rivers, lakes, ponds, mountain streams, and even brackish water from Afghanistan and Baluchistan southward to Sri Lanka and eastward to Indonesia. A predator that feeds on some small fishes, but mostly prawns, shrimps, and other invertebrates. Caught with seines, gill-nets, and even with entangling nets strung across dry land between rice paddies. Marketed fresh.

Channa striata (Bloch, 1795) **(plate XXVII, 210)**



(from Bleeker, 1879)

Synonyms / misidentifications: *Ophicephalus striatus.*

FAO name: Chevron snakehead.

Local names: Trey phtuok (juvenile), Trey raws (adult), តូចៈ ត្រី ផ្ទក ធំៈ ត្រី រ៉ស់.

Size: To 90 cm but usually smaller.

Habitat, biology, and fisheries: Found in sluggish or standing water from Sri Lanka to Indonesia, the Philippines and China. One of the most common snakeheads in Cambodia. Feeds on fishes and crustaceans. Caught with seines, gill-nets, traps, and baited hooks. Marketed fresh or alive.

Order PLEURONECTIFORMES

Family SOLEIDAE

Genus *Achiroides* — **SOLEIDAE**

(1) CAUDAL FIN CONFLUENT WITH DORSAL AND ANAL FINS; (2) PECTORAL FINS TOTALLY ABSENT; (3) SCALES OF BLIND SIDE AROUND MOUTH REPLACED BY FLESHY TENTACLES; (4) SHORTER TENTACLES ON EYED SIDE.

2 species recorded.

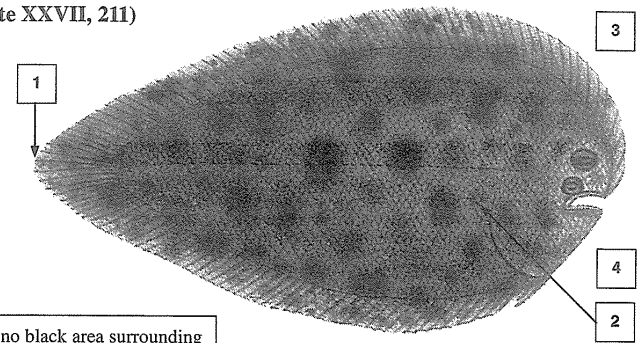
Achiroides leucorhynchos Bleeker, 1851 (plate XXVII, 211)

Synonyms / misidentifications: *Synaptura achira.*

Local names: Trey andat chhke, ត្រីអណ្តាតឆ្កែ.

Size: To 8 cm.

Habitat, biology, and fisheries: Found along the bottom in flowing fresh water and reportedly also in brackish water of the lower courses of rivers from Thailand to Indonesia. Feeds primarily on benthic invertebrates. Caught with seines, trawls, set-nets, and sometimes traps. Marketed fresh, often in mixed catches.



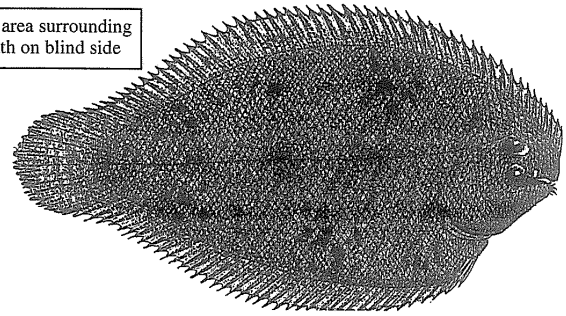
(from Bleeker, 1866-72)

Achiroides melanorhynchus (Bleeker, 1850)

Local name: Trey andat chhke, ត្រីអណ្តាតឆ្កែ.

Size: To 14 cm.

Habitat, biology, and fisheries: Found along the bottom in flowing fresh water and reportedly also in brackish water of the lower courses of rivers from Cambodia and Thailand to Indonesia. Feeds primarily on benthic invertebrates. Caught with trawls, seines, set-nets, and possibly also with traps. Not yet seen in markets, but would probably be sold fresh.



(from Weber and de Beaufort, 1912)

Genus *Euryglossa* — **SOLEIDAE**

(1) CAUDAL FIN CONFLUENT WITH DORSAL AND ANAL FINS; (2) PECTORAL FINS PRESENT, BUT SOMETIMES RUDIMENTARY; (3) OPERCULAR MEMBRANE NOT JOINED TO WELL-DEVELOPED PECTORAL FIN, BUT RUDIMENTARY PECTORAL FIN MAY BE JOINED TO UPPER PART OF MEMBRANE; (4) NO BONY PROCESS ON SNOUT.

4 species recorded.

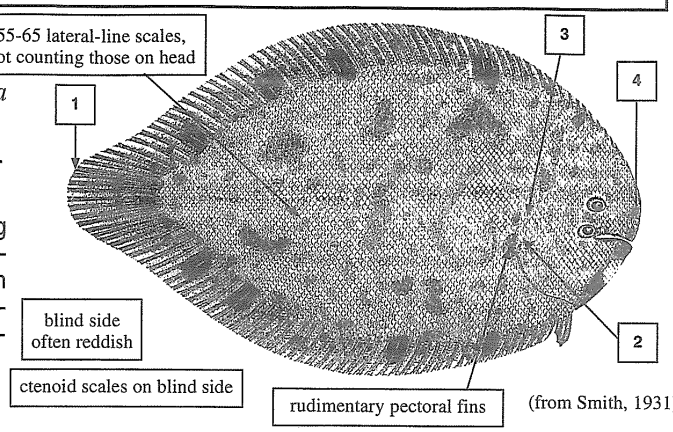
Euryglossa harmandi (Sauvage, 1878)

Synonyms / misidentifications: *Synaptura harmandi, Synaptura aenea.*

Local names: Trey andat chhke, ត្រីអណ្តាតឆ្កែ.

Size: To 10 cm.

Habitat, biology, and fisheries: Found along the bottom in flowing waters of large and medium-sized rivers on the southeast Asian mainland. Feeds primarily on benthic invertebrates. Caught with seines, trawls, and set-nets. Marketed fresh in mixed catches.



(from Smith, 1931)

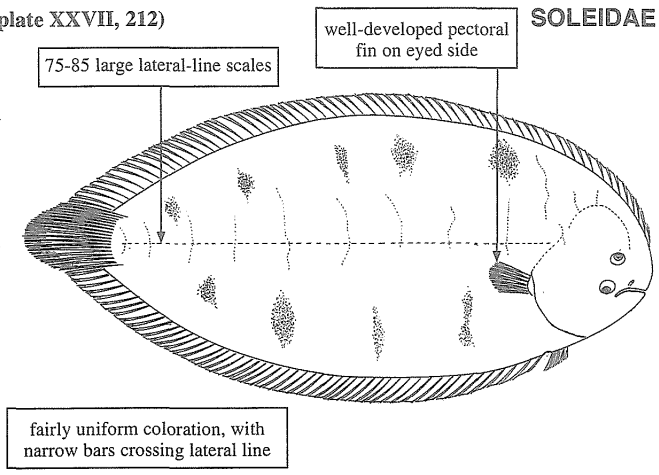
Euryglossa orientalis (Schneider, 1801) (plate XXVII, 212) **SOLEIDAE**

Synonyms / misidentifications: *Synaptura orientalis.*

Local names: Trey andat chhke nis, ត្រីអណ្តាតឆ្កែ.

Size: To 18 cm.

Habitat, biology, and fisheries: Found at bottom depths in estuaries and in the lower courses of rivers from the Persian Gulf to China and Australia. Feeds on benthic invertebrates. Caught with seines, trawls, and set-nets. Large individuals are sold separately and small ones are marketed fresh in mixed catches.



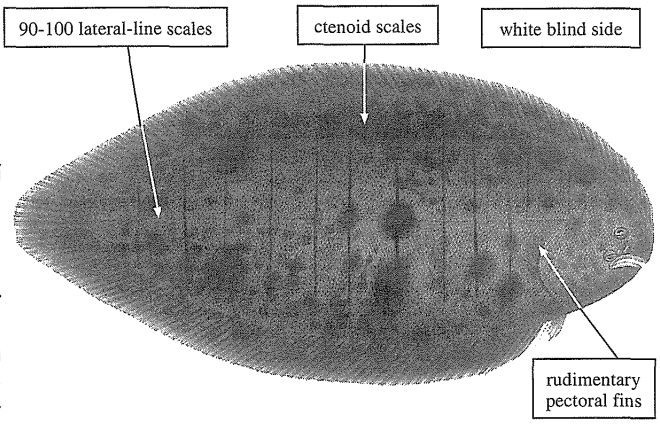
Euryglossa panoides (Bleeker, 1851)

Synonyms / misidentifications: *Synaptura panoides, Synaptura siamensis, Synaptura krempfi.*

Local names: Trey andat chhke veng, ត្រីអណ្តាតឆ្កែវែង.

Size: To 20 cm.

Habitat, biology, and fisheries: Found along the bottom in estuaries and in the lower courses of rivers from Thailand to Indonesia. Feeds on benthic invertebrates. Caught with seines, trawls, and set-nets. Large individuals are sold separately and small ones are marketed fresh in mixed catches.



(from Bleeker, 1866-72)

Genus *Typhlachirus* **SOLEIDAE**

(1) EYES ABSENT; **(2)** MOUTH CURVED, SNOUT PROJECTING DOWNWARD IN FRONT OF MOUTH; **(3)** CAUDAL FIN LONG AND POINTED; **(4)** PECTORAL FIN ABSENT ON EYED SIDE.

1 or 2 species present.

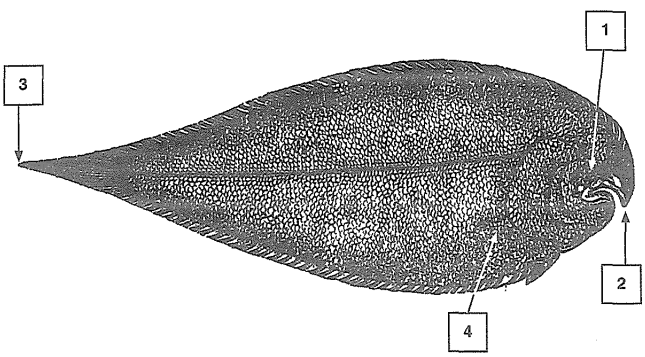
Typhlachirus elongatus Pellegrin and Chevey, 1940

FAO name: Mekong blind sole.

Local names: Trey andat chhke, ត្រី អណ្តាតឆ្កែ.

Size: To 7 cm.

Habitat, biology, and fisheries: Found in the estuarine zone of the Mekong, including the high estuarine tidal zone considerably upstream from the coastal province of Bac Lieu, Vietnam. Possibly found as far upstream as Cambodia, but not yet recorded from there. Feeds on benthic invertebrates. Caught with trawls, seines, and set-nets. Marketed fresh, often in mixed catches in the Mekong delta.



(from Pellegrin and Chevey, 1940)

Family CYNOGLOSSIDAE

Genus *Cynoglossus* **CYNOGLOSSIDAE**

(1) ONLY LEFT PELVIC FIN DEVELOPED; **(2)** PELVIC FIN CONNECTED TO ANAL FIN; **(3)** 2 OR 3 LATERAL LINES ON COLOURED SIDE; **(4)** LIPS NOT FRINGED.

Several species recorded or likely to occur in the Mekong, 7 of them included here.

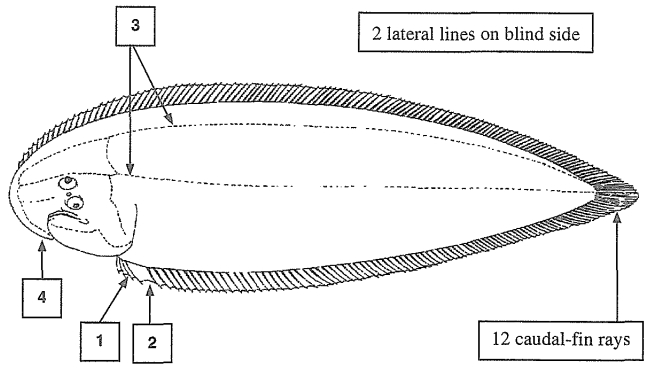
Cynoglossus bilineatus (Lacepède, 1802)

FAO name: Four-line tonguesole.

Local names: Trey andat chhke, ត្រីអណ្តាតឆ្កែ.

Size: To 34 cm.

Habitat, biology, and fisheries: A coastal and estuarine species found from Pakistan and India to Indonesia and the Philippines. This species may ascend upstream into the freshwater tidal zone of the Mekong. It is always found near or on the bottom, where it feeds on benthic invertebrates. Caught with seines, trawls, and set-nets. Marketed fresh in the Mekong delta.



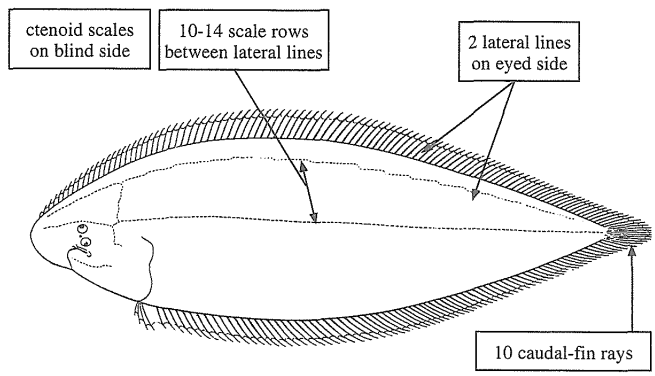
Cynoglossus cynoglossus (Hamilton, 1822)

FAO name: Gangetic tonguesole.

Local names: Trey andat chhke, ត្រីអណ្តាតឆ្កែ.

Size: To 16 cm.

Habitat, biology, and fisheries: A coastal and estuarine species known from India to the Philippines, frequently ascending rivers into tidally influenced fresh waters. As the upper margin of the Mekong tidal zone is in Cambodia, the species is probably found there. It always occurs along the bottom where it feeds on benthic invertebrates. Caught with seines, trawls, and set-nets. Marketed fresh.



(from Menon, 1977)

Cynoglossus feldmanni (Bleeker, 1853)

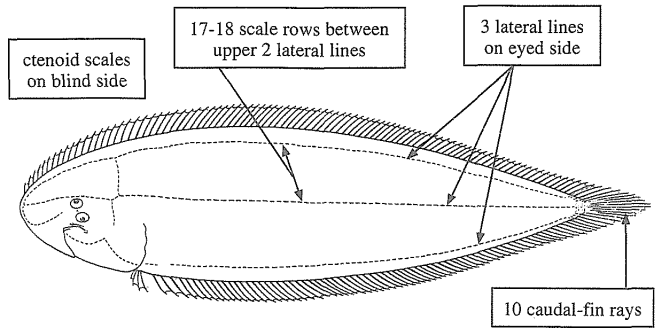
Synonyms / misidentifications: *Cynoglossus aubentoni.*

FAO name: River tonguesole.

Local names: Trey andat chhke, ត្រីអណ្តាតឆ្កែ.

Size: To 25 cm.

Habitat, biology, and fisheries: A freshwater species found well above the tidal zone in Cambodia (Prek Tasom). Lives on the bottom where it feeds on benthic invertebrates. Caught with seines, trawls, and set-nets. Marketed fresh.



(from Menon, 1977)

CYNOGLOSSIDAE

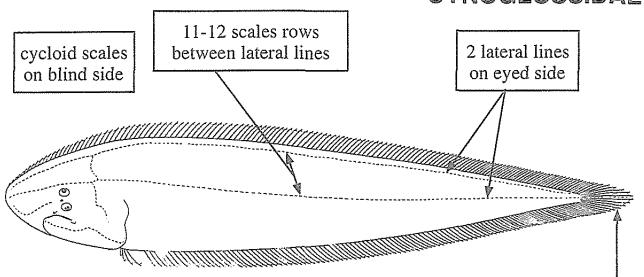
Cynoglossus lingua (Hamilton, 1822)

FAO name: Long tonguesole.

Local names: Trey andat chhke, ត្រីអណ្តាតឆ្កែ.

Size: To 38 cm.

Habitat, biology, and fisheries: A coastal and estuarine species, ascending well up into the tidal zone of large rivers from India to Indonesia and the Philippines. Lives on shallow sandy or muddy bottoms where it feeds on benthic invertebrates. Caught with seines and trawls and may also be taken with set-nets. Not yet reported from the Mekong, but when caught it is probably marketed fresh.



(from Menon, 1977)

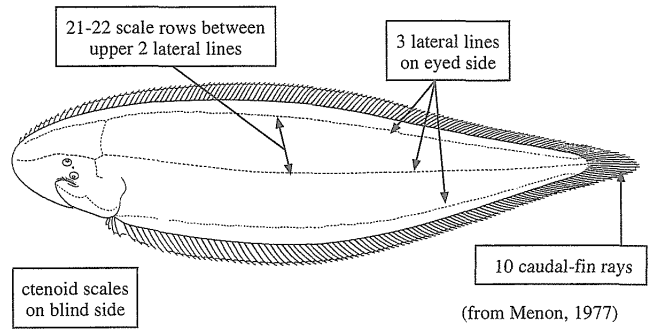
Cynoglossus microlepis (Bleeker, 1851)

FAO name: Smallscale tonguesole.

Local names: Trey andat chhke, ត្រីអណ្តាតឆ្កែ.

Size: To 25 cm.

Habitat, biology, and fisheries: A strictly freshwater species found in large rivers from Thailand to Indonesia. Occurs along the bottom where it feeds on benthic invertebrates. Caught with seines, trawls and set-nets. Marketed fresh.



(from Menon, 1977)

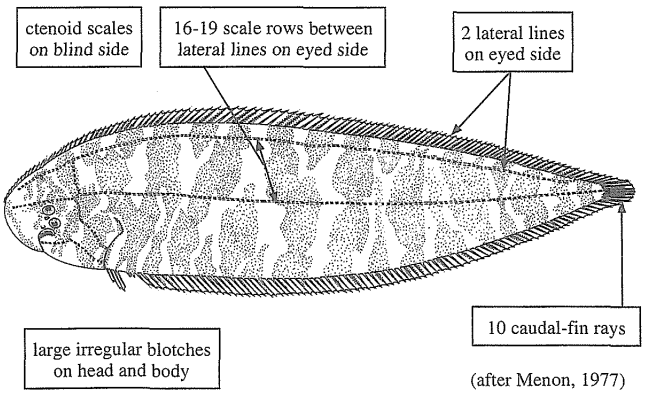
Cynoglossus punticeps (Richardson, 1846)

FAO name: Mottled tonguesole.

Local names: Trey andat chhke, ត្រីអណ្តាតឆ្កែ.

Size: To 15 cm.

Habitat, biology, and fisheries: Found in the lower courses of flowing rivers and in estuaries from Thailand to Indonesia. Common in the freshwater tidal zone of the Mekong delta, but not yet reported from Cambodia. Lives on the bottom where it feeds on benthic invertebrates. Caught with seines, trawls, and set-nets. Marketed fresh in the Mekong delta.



(after Menon, 1977)

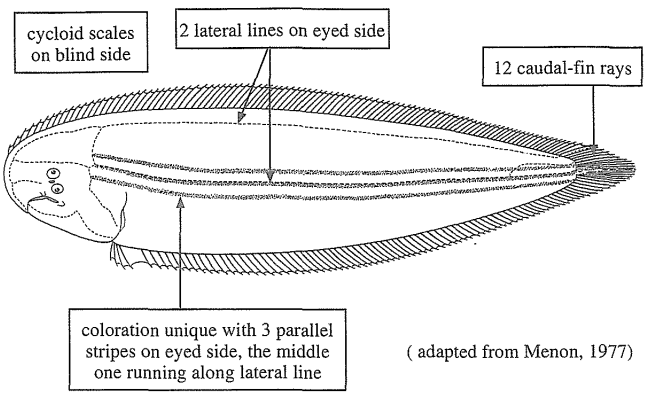
Cynoglossus trulla (Cantor, 1849)

Synonyms / misidentifications: *Cynoglossus borneensis.*

Local names: Trey andat chhke, ត្រីអណ្តាតឆ្កែ.

Size: To 45 cm.

Habitat, biology, and fisheries: A coastal and estuarine species ranging from Thailand to Indonesia, ascending some large rivers, including the Mekong. Found on the bottom, where it feeds on benthic invertebrates. Caught with seines, trawls, and set-nets. Not seen in markets.



(adapted from Menon, 1977)

Order TETRAODONTIFORMES

Family TETRAODONTIDAE

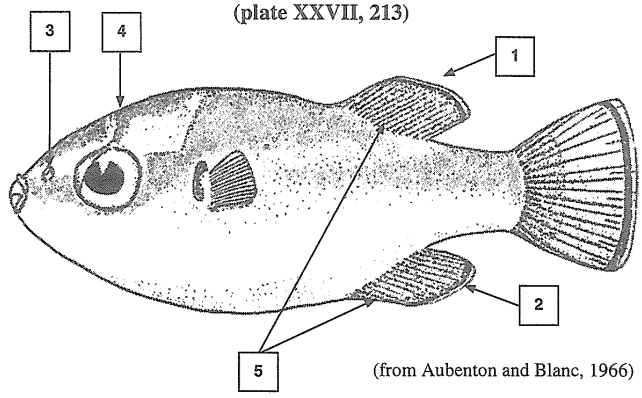
Genus *Carinotetraodon* — **TETRAODONTIDAE**

(1) 11 TO 13 DORSAL-FIN RAYS; **(2)** 10 TO 12 ANAL-FIN RAYS; **(3)** NASAL TUBE SHORT AND ROUNDED WITH A TERMINAL OPENING; **(4)** MALES OFTEN WITH A DORSAL AND VENTRAL MEDIAN SKINFOLD AND SOMETIMES PARALLEL SKINFOLDS ON THROAT; **(5)** IN LIFE, RED OR REDDISH DORSAL AND ANAL FINS AND A RED VENTRAL STRIPE.

1 species recorded.

Carinotetraodon lorteti (Tirant, 1885)

(plate XXVII, 213)



(from Aubenton and Blanc, 1966)

Synonyms / misidentifications: *Tetraodon lorteti, Monotreta tiranti, Tetraodon borneensis, Monotreta caria, Tetraodon somphongsi, Tetraodon chlupatyi.*

FAO name: Redeye puffer.

Local names: Trey kampot, ត្រីកំពត.

Size: To 6 cm.

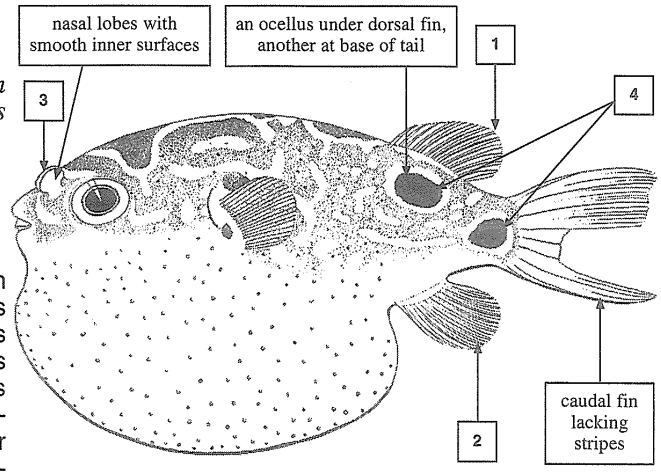
Habitat, biology, and fisheries: Found in slowly flowing or standing freshwater habitats in the Mekong. Feeds on mollusks, crustaceans, and other invertebrates and zooplankton. Not fished commercially, but may be taken incidentally with other species by seines, set-nets, or traps. A popular species in the aquarium trade. Said to be able to change colours depending on the surroundings. Sexually dimorphic, males and females have often been described as different species.

Genus *Chelonodon* — **TETRAODONTIDAE**

(1) 9 TO 16 DORSAL-FIN RAYS; **(2)** 8 TO 15 ANAL-FIN RAYS; **(3)** NASAL TUBE WITH LONG ANTERIOR AND POSTERIOR FLAPS HAVING SPONGY TISSUE ON INNER SIDES; **(4)** SIDES OF BODY WITH DARK ROUNDED SPOTS.

3 or 4 species recorded.

Chelonodon biocellatus (Tirant, 1885)



(from Fowler, 1934)

Synonyms / misidentifications: *Tetraodon steindachneri, Tetraodon palembangensis* (non Bleeker).

FAO name: Eyespot pufferfish.

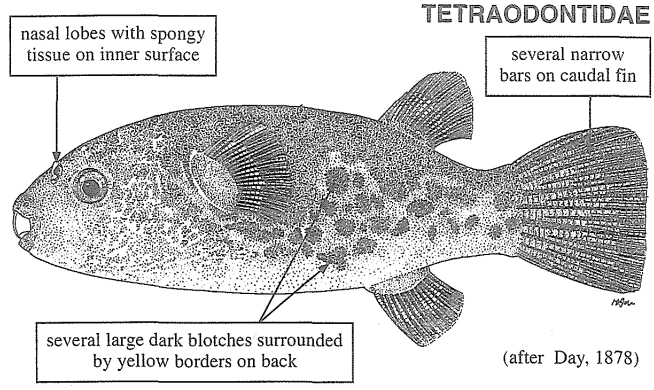
Local names: Trey kampot, ត្រីកំពត.

Size: To 8 cm.

Habitat, biology, and fisheries: Found in slowly flowing or standing freshwater habitats from Borneo to Thailand. Feeds on mollusks and crustaceans as well as other invertebrates and some vascular plants. Occasionally feeds on fish scales and fins. Not fished commercially, but may be taken incidentally with other species by seines, set-nets, or traps. Occasionally imported in the aquarium trade, but can be quarrelsome with its tankmates.

Chelonodon fluviatilis (Hamilton, 1822)

TETRAODONTIDAE



(after Day, 1878)

Synonyms / misidentifications: *Tetraodon fluviatilis.*

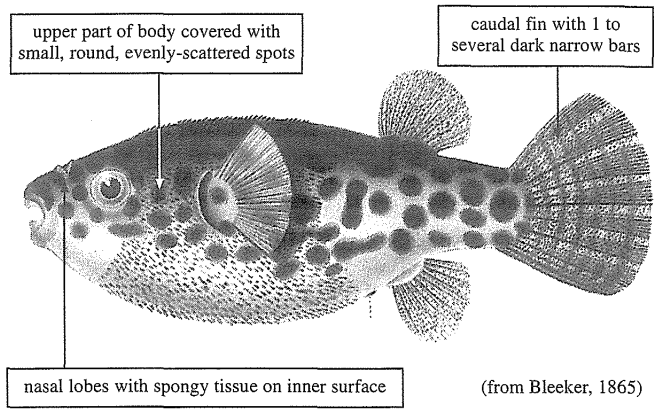
FAO name: Tidal pufferfish.

Local names: Trey kampot, ត្រីកំពត.

Size: To 17 cm.

Habitat, biology, and fisheries: Found in estuaries and the freshwater tidal zone of rivers from India to Indonesia, usually staying close to salt water. Found in the Mekong delta and possibly also in Cambodia. Feeds on mollusks, crustaceans, and other invertebrates as well as vascular plants and detritus. May occasionally eat fish scales or fins. The muscular tissue and viscera of this species are extremely toxic. Not fished commercially. Sometimes seen in the aquarium trade, but adults are known to be pugnacious and aggressive with its tankmates.

Chelonodon nigroviridis (Procé, 1822)



(from Bleeker, 1865)

Synonyms / misidentifications: *Tetraodon fluviatilis* (non Hamilton), *Tetraodon leiurus* (non Bleeker).

FAO name: Spotted green pufferfish.

Local names: Trey kampot, ត្រីកំពត.

Size: To 17 cm.

Habitat, biology, and fisheries: Found in freshwater streams, rivers, and floodplains from Sri Lanka to Indonesia and north to China. Feeds on mollusks, crustaceans, and other invertebrates, as well as some plant matter. May eat fish scales and fins. Not fished commercially, but may be taken incidentally in catches from seines, set-nets, or traps. May be poisonous like *C. fluviatilis*. Seen in the aquarium trade, but known to be aggressive with its tankmates.

Genus *Chonerhinos*

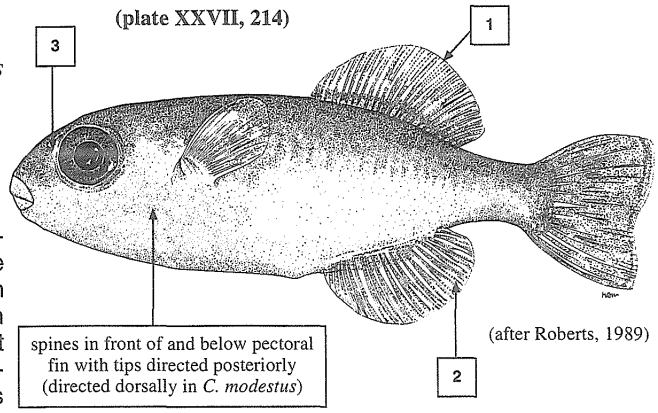
TETRAODONTIDAE

(1) 25 TO 28 DORSAL-FIN RAYS; **(2)** 21 TO 22 ANAL-FIN RAYS; **(3)** NOSTRIL WITH SIMPLE IMPERFORATE CAVITY SURROUNDED BY A HIGH RIM.

At least 1 species present, another species possible.

Chonerhinos nefastus Roberts, 1982

(plate XXVII, 214)



(after Roberts, 1989)

Synonyms / misidentifications: *Chonerhinos modestus* (non Bleeker).

FAO name: Greenbottle pufferfish.

Local names: Trey kampot, ត្រីកំពត.

Size: To 13 cm.

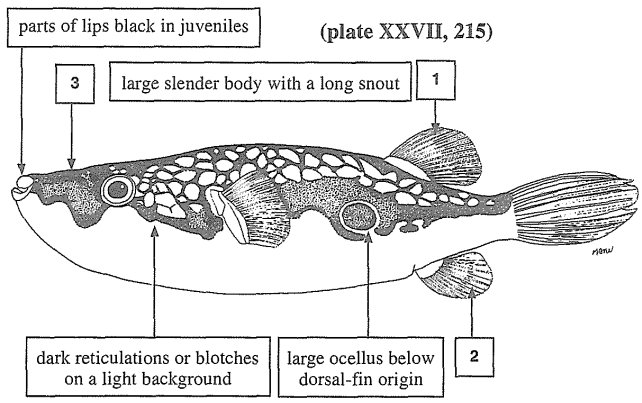
Habitat, biology, and fisheries: Found in flowing waters of rivers and streams in the middle and lower Mekong basin. May also be found in flooded forests and plains during the river's high water levels. Feeds on fish scales and fins. Not fished commercially, but may be taken incidentally by seines, set-nets, or traps. Sometimes seen in markets as part of mixed catches. Not seen in the aquarium trade.

Genus *Monotreta* **TETRAODONTIDAE**

(1) 12 TO 14 DORSAL-FIN RAYS; (2) 10 TO 12 ANAL-FIN RAYS; (3) NOSTRIL WITH TUBULAR NASAL TENTACLE THAT IS DISTALLY DIVIDED INTO 2 LIPS THAT ARE LESS THAN ONE HALF ITS LENGTH.

Several poorly understood species.

Monotreta cambodgiensis (Chabanaud, 1923)



(after Dekkers, 1975)

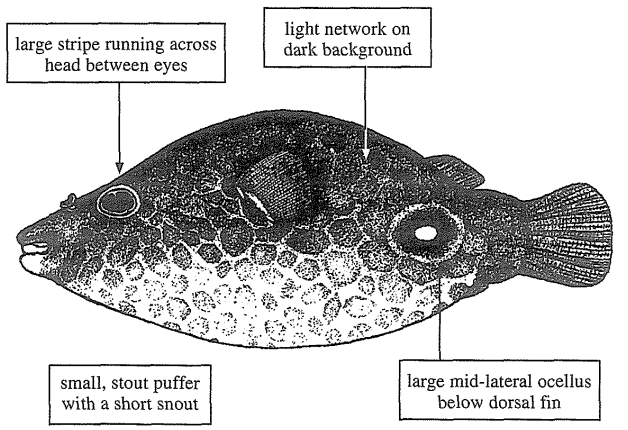
Synonyms / misidentifications: *Tetraodon cambodgiensis; Tetraodon leiurus* (non Bleeker); *Monotreta cutcutia* (non Hamilton).

Local names: Trey kampot, ត្រីកំពត.

Size: To 16 cm.

Habitat, biology, and fisheries: Found in slowly flowing fresh water in the lower Mekong as far upstream as the Great Lake. Feeds on mollusks, crustaceans, and other invertebrates as well as some plant matter. Not fished commercially, but taken incidentally in seines, cast-nets, set-nets, and traps. Occasionally imported in the aquarium trade although known to be a quarrelsome and aggressive fish.

Monotreta fangi (Pellegrin and Chevey, 1940)



(from Pellegrin and Chevey, 1940)

Synonyms / misidentifications: *Tetraodon leiurus* (non Bleeker); *Tetraodon ocellaris; Tetraodon leiurus brevirostris.*

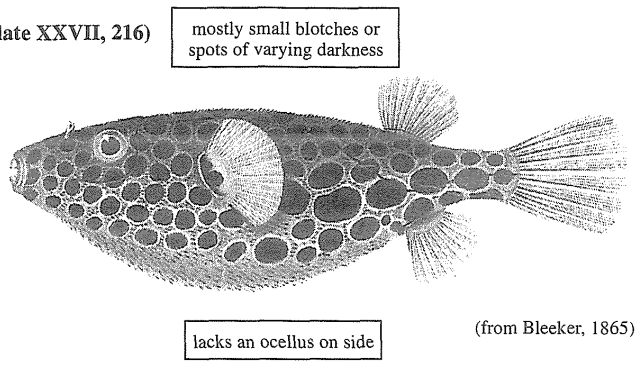
Local names: Trey kampot, ត្រីកំពត.

Size: To 6 cm.

Habitat, biology, and fisheries: Found in slowly flowing streams in the lower and middle Mekong basin, as far upstream as Laos and Thailand. Feeds on mollusks, crustaceans, and other invertebrates as well as some vegetable matter. Not fished commercially and possibly poisonous. Sometimes taken incidentally in seines, cast-nets, set-nets, and traps. Imported in the aquarium trade but reported as being snappish and quarrelsome.

Monotreta leiurus (Bleeker, 1851)

(plate XXVII, 216)



(from Bleeker, 1865)

Synonyms / misidentifications: *Tetraodon leiurus; Tetraodon leiurus; Crayracion leiurus; Monotreta cutcutia* (non Hamilton).

Local names: Trey kampot, ត្រីកំពត.

Size: To 13 cm.

Habitat, biology, and fisheries: Found in flowing and standing water habitats from Thailand to Indonesia. Found well above the tidal zone in the Mekong. Feeds on mollusks, crustaceans, and other invertebrates as well as some plant matter and detritus. Possibly poisonous, and not a commercial fish. Taken incidentally with seines, cast-nets, set-nets, and traps. Sometimes imported in the aquarium trade but known to be very aggressive and snappish.

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INDEX OF SCIENTIFIC AND VERNACULAR NAMES

Explanation of the System

Italics	:	Valid scientific names (genera and species).
Italics	:	Synonyms (genera and species), misidentifications.
ROMAN	:	Family names.
ROMAN	:	Names of orders, suborders, subfamilies, tribes, and subtribes.
Roman	:	FAO and local names.

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LIST OF COLOUR PLATES

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2. NOTOPTERIDAE: *Chitala lopis*
3. NOTOPTERIDAE: *Chitala ornata*
4. NOTOPTERIDAE: *Notopterus notopterus*
5. MEGALOPIDAE: *Megalops cyprinoides*
6. CLUPEIDAE: *Clupeoides borneensis*
7. CLUPEIDAE: *Corica laciniata*
8. CLUPEIDAE: *Clupeichthys aesarnensis*

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59. CYPRINIDAE: *Mystacoleucus* sp.
60. CYPRINIDAE: *Puntioplites falcifer*
61. CYPRINIDAE: *Puntioplites proctozysron*
62. CYPRINIDAE: *Sikukia gudgeri*
63. CYPRINIDAE: *Sikukia stejnegeri*
64. CYPRINIDAE: *Barbodes altus*

PLATE IX

65. CYPRINIDAE: *Barbodes gonionotus*
66. CYPRINIDAE: *Barbodes schwanefeldi*
67. CYPRINIDAE: *Hypsibarbus lagleri*
68. CYPRINIDAE: *Hypsibarbus malcolmi*
69. CYPRINIDAE: *Poropuntius deauratus*
70. CYPRINIDAE: *Poropuntius laosensis*
71. CYPRINIDAE: *Scaphognathops bandanensis*
72. CYPRINIDAE: *Scaphognathops stejnegeri*

PLATE X

73. CYPRINIDAE: *Hampala macrolepidota*
74. CYPRINIDAE: *Puntius brevis*
75. CYPRINIDAE: *Systomus aurotaeniatus*
76. CYPRINIDAE: *Systomus binotatus*
77. CYPRINIDAE: *Systomus orphoides*
78. CYPRINIDAE: *Systomus partipentazona*
79. CYPRINIDAE: *Systomus* n. sp.
80. CYPRINIDAE: *Catlocarpio siamensis*

PLATE XI

81. CYPRINIDAE: *Thynnichthys thynnoides*
82. CYPRINIDAE: *Bangana behri*
83. CYPRINIDAE: *Barbichthys nitidus*
84. CYPRINIDAE: *Cirrhinus jullieni*
85. CYPRINIDAE: *Cirrhinus microlepis*
86. CYPRINIDAE: *Cirrhinus prosemion*
87. CYPRINIDAE: *Dangila* sp. cf. *cuvieri*
88. CYPRINIDAE: *Dangila lineata*

PLATE XII

89. CYPRINIDAE: *Dangila spilopleura*
90. CYPRINIDAE: *Henicorhynchus cryptopogon*
91. CYPRINIDAE: *Henicorhynchus siamensis*
92. CYPRINIDAE: *Labeo erythropterus*
93. CYPRINIDAE: *Lobocheilos davisi*
94. CYPRINIDAE: *Lobocheilos melanotaenia*
95. CYPRINIDAE: *Lobocheilos quadrilineatus*
96. CYPRINIDAE: *Morulius chrysophekadion*

PLATE XIII

97. CYPRINIDAE: *Osteochilus hasselti*
98. CYPRINIDAE: *Osteochilus lini*
99. CYPRINIDAE: *Osteochilus melanopleurus*
100. CYPRINIDAE: *Osteochilus microcephalus*
101. CYPRINIDAE: *Osteochilus schlegeli*
102. CYPRINIDAE: *Osteochilus waandersi*
103. CYPRINIDAE: *Crossocheilus oblongus*
104. CYPRINIDAE: *Crossocheilus reticulatus*

PLATE XIV

105. CYPRINIDAE: *Crossocheilus siamensis*
106. CYPRINIDAE: *Epalzeorhynchos munense*
107. CYPRINIDAE: *Garra cambodgiensis*
108. CYPRINIDAE: *Garra fasciacauda*
109. CYPRINIDAE: *Mekongina erythrospila*
110. BALITORIDAE: *Homaloptera leonardi*
111. BALITORIDAE: *Homaloptera* sp. cf. *orthogoniata*
112. BALITORIDAE: *Homaloptera smithi*

PLATE XV

113. BALITORIDAE: *Homaloptera tweediei*
114. BALITORIDAE: *Homaloptera zollingeri*
115. BALITORIDAE: *Annamia normani*
116. BALITORIDAE: *Nemacheilus pallidus*
117. BALITORIDAE: *Nemacheilus platiceps*
118. BALITORIDAE: *Schistura laterimaculata*
119. BALITORIDAE: *Schistura pellegrini*
120. BALITORIDAE: *Tuberoschistura cambodgiensis*

PLATE XVI

121. COBITIDAE: *Botia eos*
122. COBITIDAE: *Botia helodes*
123. COBITIDAE: *Botia lecontei*
124. COBITIDAE: *Botia modesta*
125. COBITIDAE: *Botia morleti*
126. COBITIDAE: *Botia* sp., adult
127. COBITIDAE: *Botia* sp., juvenile
128. COBITIDAE: *Acanthopsoides delphax*

PLATE XVII

129. COBITIDAE: *Acanthopsoides hapalias*
130. COBITIDAE: *Acantopsis* sp. 1
131. COBITIDAE: *Acantopsis* sp. 2
132. COBITIDAE: *Acantopsis* sp. 3
133. COBITIDAE: *Lepidocephalichthys birmanicus*
134. COBITIDAE: *Lepidocephalichthys hasselti*
135. COBITIDAE: *Pangio anguillaris*
136. COBITIDAE: *Pangio oblonga*

PLATE XVIII

137. GYRINOCHELIDAE: *Gyrinocheilus aymonieri*
138. GYRINOCHELIDAE: *Gyrinocheilus pennocki*
139. BAGRIDAE: *Heterobagrus bocourti*
140. BAGRIDAE: *Leiocassis siamensis*
141. BAGRIDAE: *Mystus atrifasciatus*
142. BAGRIDAE: *Mystus filamentus*
143. BAGRIDAE: *Mystus multiradiatus*
144. BAGRIDAE: *Mystus mysticetus*

PLATE XIX

145. BAGRIDAE: *Mystus nemurus*
146. BAGRIDAE: *Mystus wolffi*
147. BAGRIDAE: *Mystus wyckioides*
148. SILURIDAE: *Belodontichthys dinema*
149. SILURIDAE: *Hemisilurus mekongensis*
150. SILURIDAE: *Kryptopterus cheveyi*
151. SILURIDAE: *Kryptopterus cryptopterus*
152. SILURIDAE: *Kryptopterus schilbeides*

PLATE XX

153. SILURIDAE: *Micronema apogon*
154. SILURIDAE: *Micronema micronema*
155. SILURIDAE: *Ompok bimaculatus*
156. SILURIDAE: *Ompok hypophthalmus*
157. SILURIDAE: *Wallago attu*
158. SILURIDAE: *Wallago leeri*
159. PANGASIIDAE: *Helicophagus waandersi*
160. PANGASIIDAE: *Pangasianodon hypophthalmus*

PLATE XXI

161. PANGASIIDAE: *Pangasius conchophilus*
162. PANGASIIDAE: *Pangasius larnaudiei*
163. PANGASIIDAE: *Pangasius pleurotaenia*
164. PANGASIIDAE: *Pangasius polyuranodon*
165. PANGASIIDAE: *Pangasius siamensis*
166. AMBLYCIPITIDAE: *Amblyceps mangois*
167. AKISIDAE: *Acrochordonichthys* sp. cf. *rugosus*
168. AKISIDAE: *Akysis* sp. cf. *variegatus*

PLATE XXII

169. SISORIDAE: *Bagarius bagarius*
170. SISORIDAE: *Bagarius yarrelli*
171. SISORIDAE: *Glyptothorax fuscus*
172. SISORIDAE: *Glyptothorax lampris*
173. CLARIIDAE: *Clarias batrachus*
174. CLARIIDAE: *Clarias macrocephalus*
175. ARIIDAE: *Arius stormi*
176. ARIIDAE: *Arius thalassinus*

PLATE XXIII

177. BELONIDAE: *Xenentodon cancila*
178. HEMIRAMPHIDAE: *Dermogenys pusilla*
179. HEMIRAMPHIDAE: *Hyporhamphus limbatus*
180. SYNBRANCHIDAE: *Monopterus albus*
181. CHAUDHURIIDAE: *Chaudhuria caudata*
182. MASTACEMBELIDAE: *Macrognathus taeniagaster*
183. MASTACEMBELIDAE: *Macrognathus siamensis*
184. MASTACEMBELIDAE: *Macrognathus* sp.

PLATE XXIV

185. MASTACEMBELIDAE: *Mastacembelus armatus*
186. AMBASSIDAE: *Parambassis apogonoides*
187. AMBASSIDAE: *Parambassis wolffi*
188. AMBASSIDAE: *Pseudambassis notatus*
189. GERREIDAE: *Gerres filamentosus*
190. POLYNEMIDAE: *Polynemus borneensis*
191. POLYNEMIDAE: *Polynemus longipectoralis*
192. SCIAENIDAE: *Boesemania microlepis*

PLATE XXV

193. TOXOTIDAE: *Toxotes microlepis*
194. SCATOPHAGIDAE: *Scatophagus argus*
195. NANDIDAE: *Nandus nandus*
196. NANDIDAE: *Pristolepis fasciata*
197. TERAPONTIDAE: *Terapon jarbua*
198. ELEOTRIDAE: *Oxyeleotris marmorata*
199. GOBIIDAE: *Glossogobius koragensis*
200. GOBIIDAE: *Rhinogobius ocellatus*

PLATE XXVI

201. HELOSTOMATIDAE: *Helostoma temmincki*
202. BELONTIIDAE: *Trichogaster microlepis*
203. BELONTIIDAE: *Trichogaster pectoralis*
204. BELONTIIDAE: *Trichopsis vittata*
205. OSPHRONEMIDAE: *Osphronemus exodon*
206. CHANNIDAE: *Channa lucius*
207. CHANNIDAE: *Channa marulius*
208. CHANNIDAE: *Channa micropeltes*

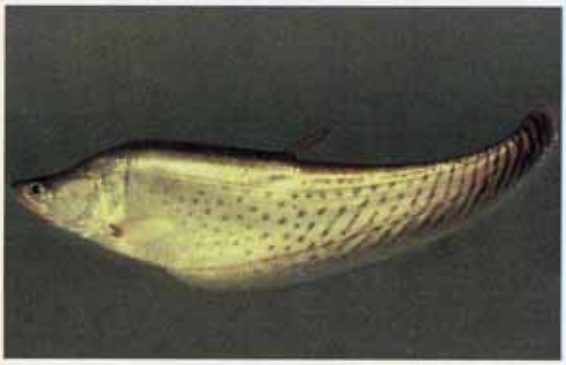
PLATE XXVII

209. CHANNIDAE: *Channa orientalis*
210. CHANNIDAE: *Channa striata*
211. SOLEIDAE: *Achiroides leucorhynchos*
212. SOLEIDAE: *Euryglossa orientalis*
213. TETRAODONTIDAE: *Carinotetraodon lorteti*
214. TETRAODONTIDAE: *Chonerhinos nefastus*
215. TETRAODONTIDAE: *Monotreta cambodgiensis*
216. TETRAODONTIDAE: *Monotreta leiurus*

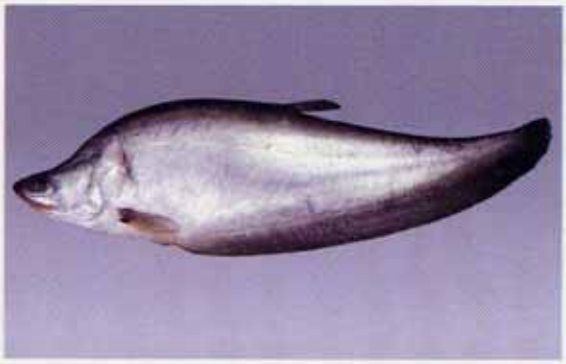
COLOUR PLATES

Photographs by Walter J. Rainboth

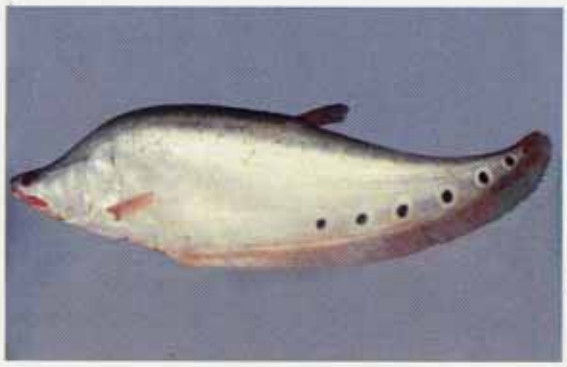
PLATE I



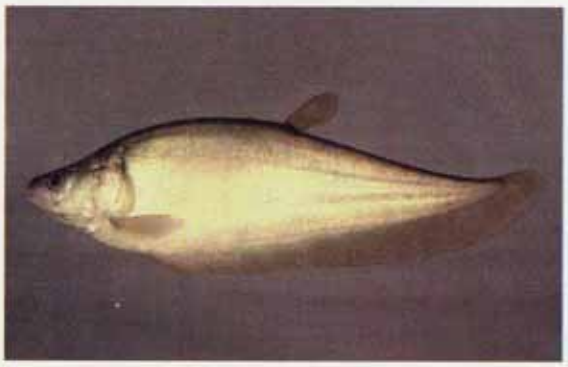
1. NOTOPTERIDAE: ***Chitala blanci***



2. NOTOPTERIDAE: ***Chitala lopis***

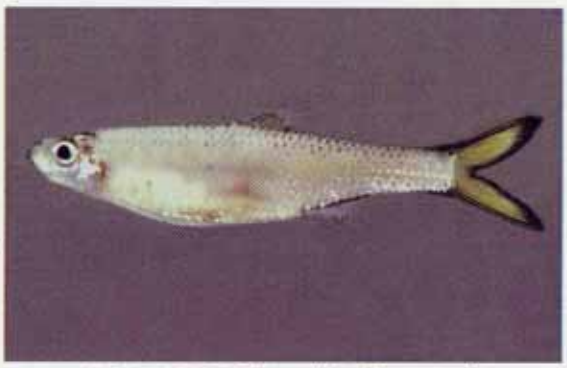


3. NOTOPTERIDAE: ***Chitala ornata***

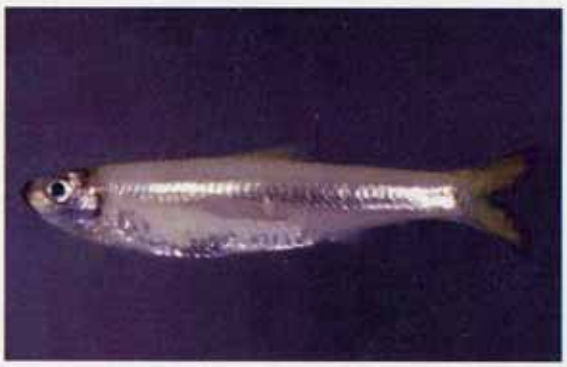


4. NOTOPTERIDAE: ***Notopterus notopterus***

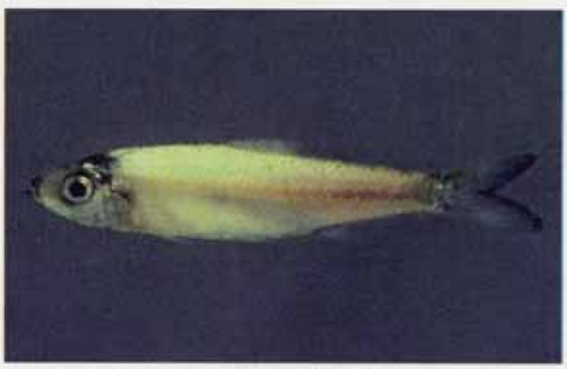
5. MEGALOPIDAE: ***Megalops cyprinoides***
photo by G. Bianchi



6. CLUPEIDAE: ***Clupeoides borneensis***

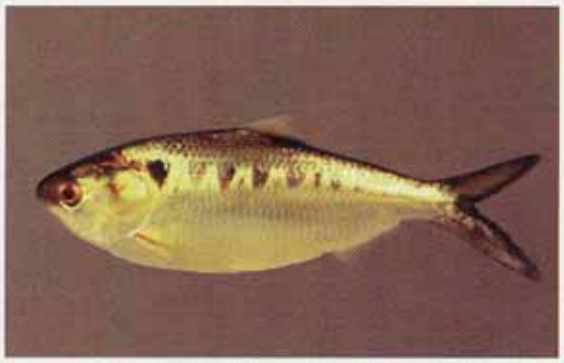


7. CLUPEIDAE: ***Corica laciniata***

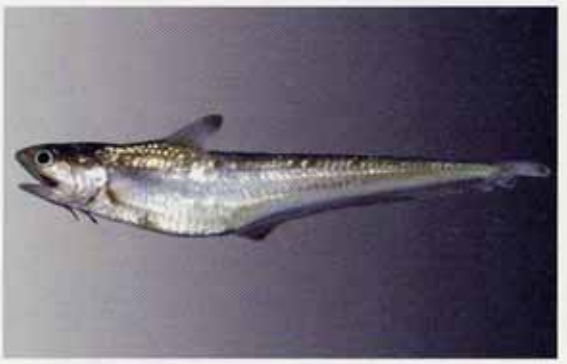


8. CLUPEIDAE: ***Clupeichthys aesarnensis***

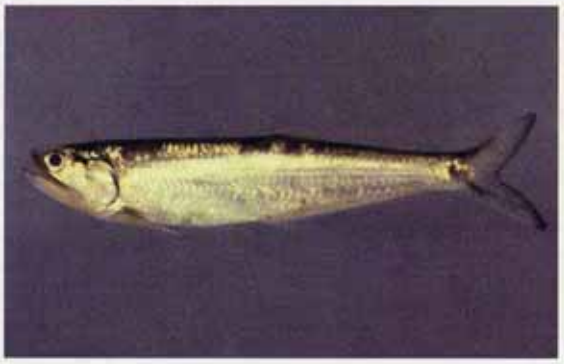
PLATE II



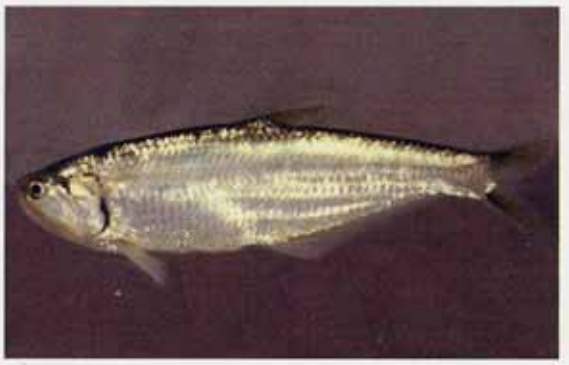
9. CLUPEIDAE: ***Tenualosa thibaudeaui***



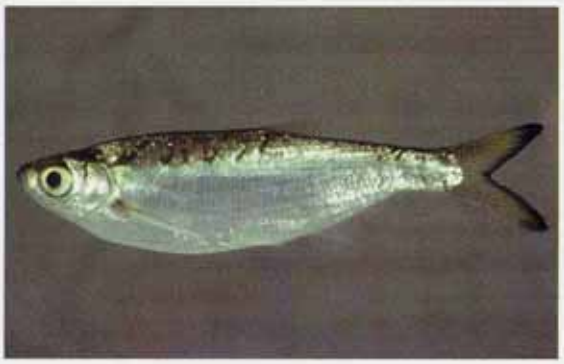
10. ENGRAULIDAE: ***Coilia lindmani***



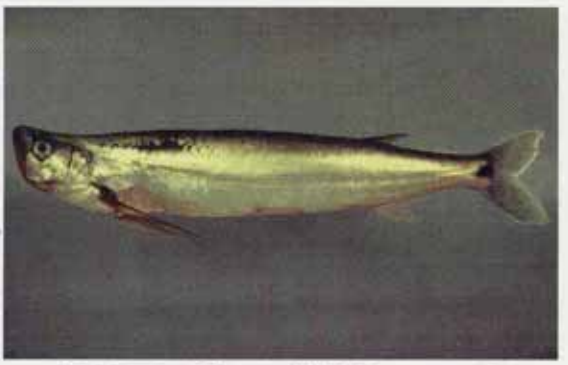
11. ENGRAULIDAE: ***Lycothrissa crocodilus***



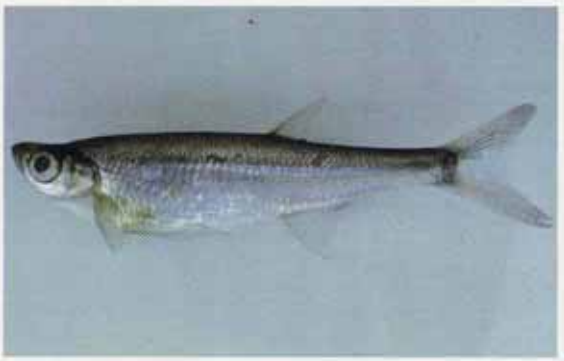
12. ENGRAULIDAE: ***Setipinna melanochir***



13. CYPRINIDAE: ***Paralaubuca typus***



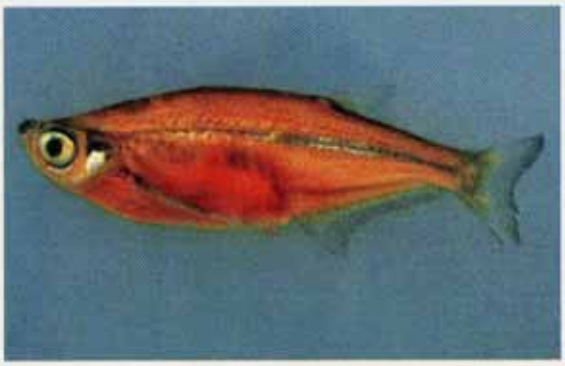
14. CYPRINIDAE: ***Macrochirichthys macrochirus***



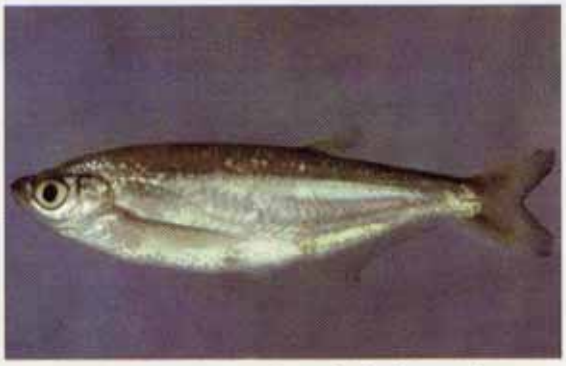
15. CYPRINIDAE: ***Oxygaster pointoni***

16. CYPRINIDAE: ***Parachela maculicauda***

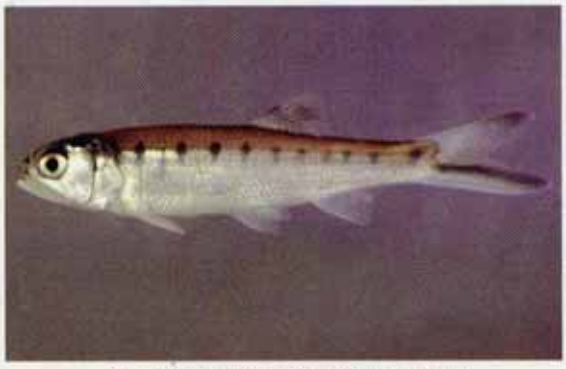
PLATE III



17. CYPRINIDAE: ***Parachela oxygastroides***



18. CYPRINIDAE: ***Parachela siamensis***

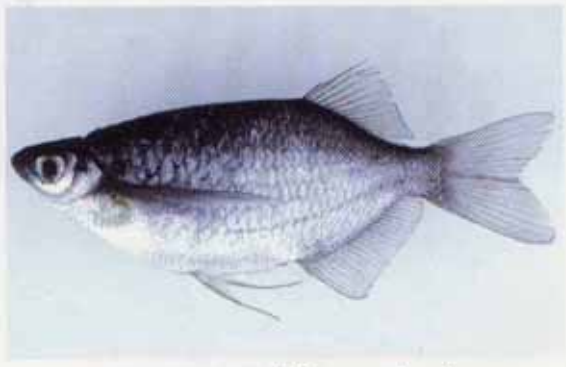


19. CYPRINIDAE: ***Raiamas guttatus***

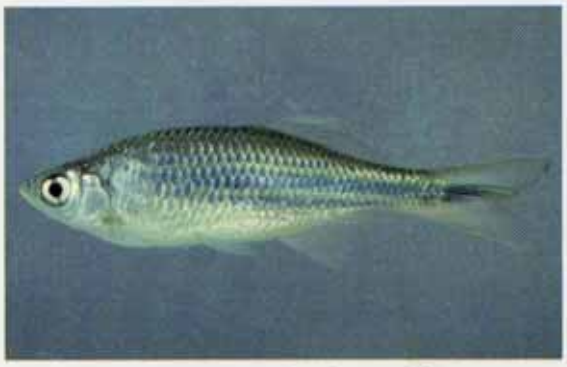
20. CYPRINIDAE: ***Opsarius koratensis***

21. CYPRINIDAE: ***Opsarius pulchellus***

22. CYPRINIDAE: ***Amblypharyngodon chulabornae***

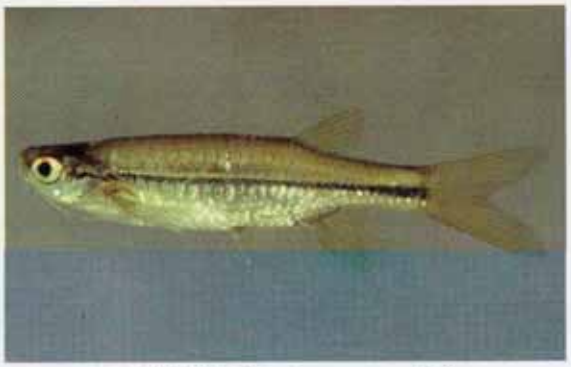


23. CYPRINIDAE: ***Chela caeruleostigmata***

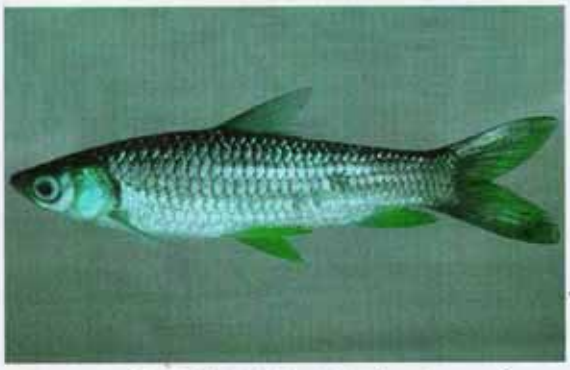


24. CYPRINIDAE: ***Danio aequipinnatus***

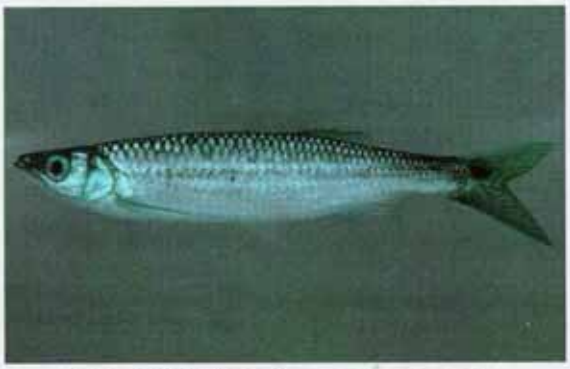
25. CYPRINIDAE: ***Esomus longimanus***



26. CYPRINIDAE: ***Esomus metallicus***



27. CYPRINIDAE: ***Leptobarbus hoeveni***



28. CYPRINIDAE: ***Luciosoma bleekeri***

29. CYPRINIDAE: ***Luciosoma setigerum***

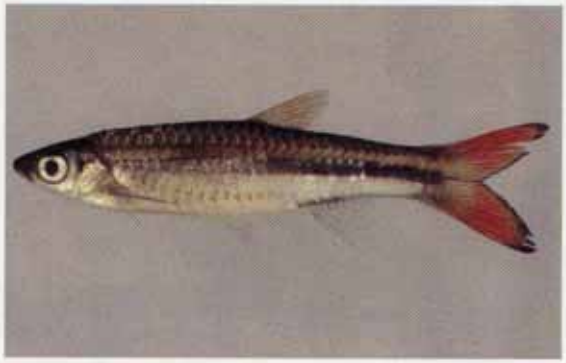
30. CYPRINIDAE: ***Rasbora aurotaenia***

31. CYPRINIDAE: ***Rasbora*** sp. cf. ***beauforti***

32. CYPRINIDAE: ***Rasbora borapetensis***

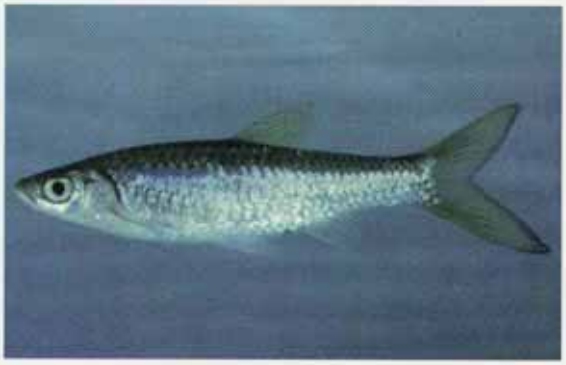
PLATE V

33. CYPRINIDAE: ***Rasbora daniconius***

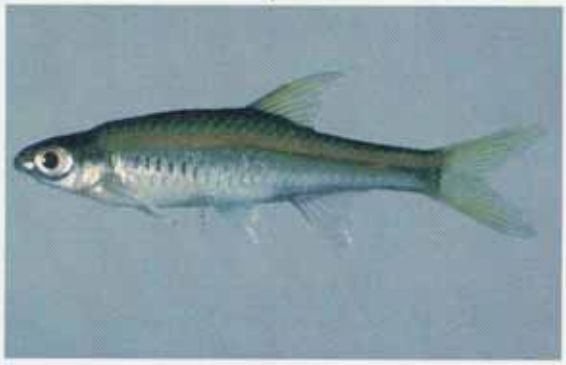


34. CYPRINIDAE: ***Rasbora dusonensis***

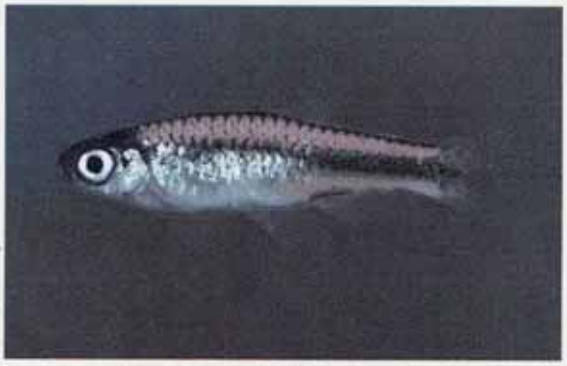
35. CYPRINIDAE: ***Rasbora espei***



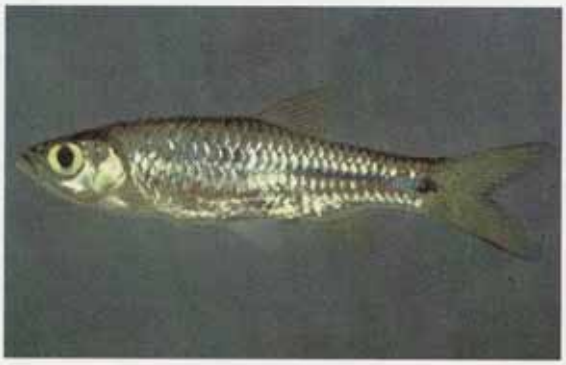
36. CYPRINIDAE: ***Rasbora myersi***



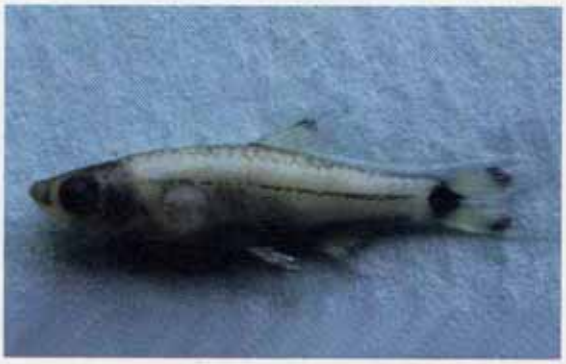
37. CYPRINIDAE: ***Rasbora pauciperforata***



38. CYPRINIDAE: ***Rasbora paucisquamis***

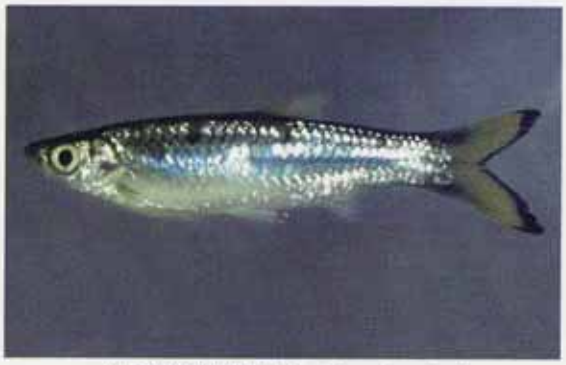


39.CYPRINIDAE: ***Rasbora paviei***



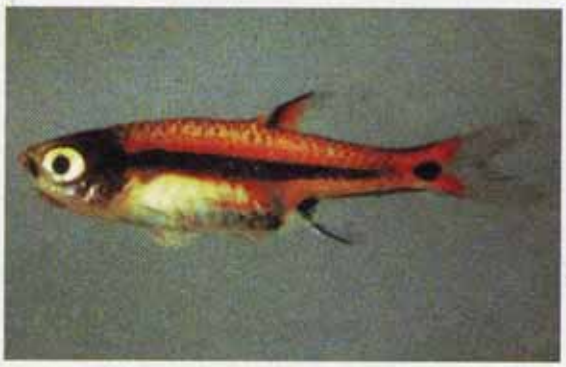
40. CYPRINIDAE: ***Rasbora spilocerca***

PLATE VI

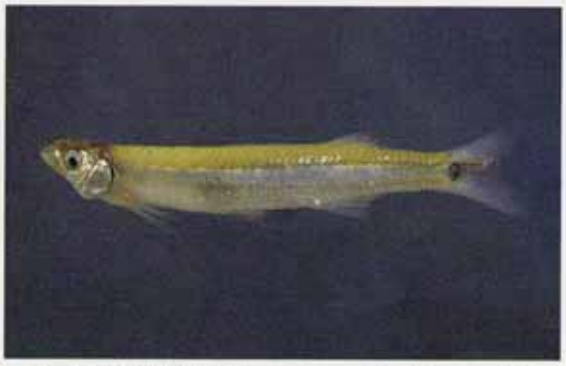


41. CYPRINIDAE: ***Rasbora tornieri***

42. CYPRINIDAE: ***Rasbora trilineata***

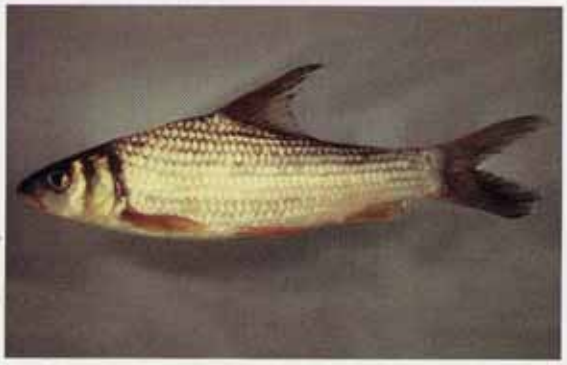


43. CYPRINIDAE: ***Rasbora urophthalmoides***



44. CYPRINIDAE: ***Thryssocypris tonlesapensis***

45. CYPRINIDAE: ***Probarbus jullieni***

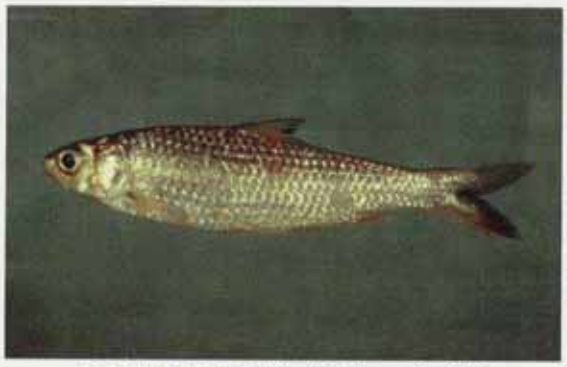


46. CYPRINIDAE: ***Probarbus labeamajor***

47. CYPRINIDAE: ***Tor sinensis***

48. CYPRINIDAE: ***Tor tambroides***

PLATE VII

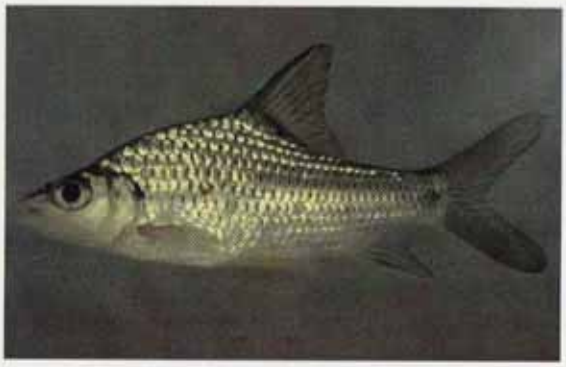


49. CYPRINIDAE: ***Albulichthys albuloides***

50. CYPRINIDAE: ***Amblyrhynchichthys truncatus***

51. CYPRINIDAE: ***Cosmochilus harmandi***

52. CYPRINIDAE: ***Cyclocheilichthys apogon***



53. CYPRINIDAE: ***Cyclocheilichthys armatus***

54. CYPRINIDAE: ***Cyclocheilichthys enoplos***

55. CYPRINIDAE: ***Cyclocheilichthys furcatus***

56. CYPRINIDAE: ***Cyclocheilichthys repasson***

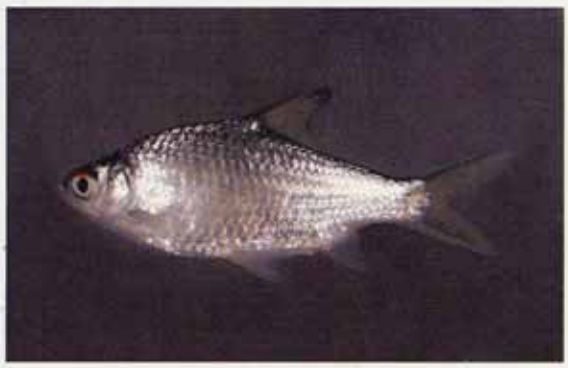
57. CYPRINIDAE: ***Discherodontus ashmeadi***

58. CYPRINIDAE: ***Mystacoleucus marginatus***

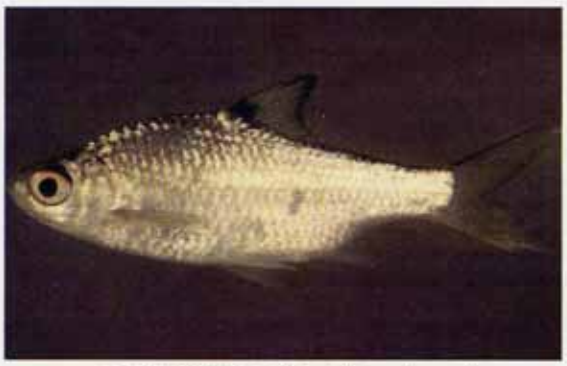
59. CYPRINIDAE: ***Mystacoleucus*** sp.

60. CYPRINIDAE: ***Puntioplites falcifer***

61. CYPRINIDAE: ***Puntioplites proctozysron***



62. CYPRINIDAE: ***Sikukia gudgeri***



63. CYPRINIDAE: ***Sikukia stejnegeri***

64. CYPRINIDAE: ***Barbodes altus***

65. CYPRINIDAE: ***Barbodes gonionotus***

66. CYPRINIDAE: ***Barbodes schwanefeldi***

67. CYPRINIDAE: ***Hypsibarbus lagleri***

68. CYPRINIDAE: ***Hypsibarbus malcolmi***

69. CYPRINIDAE: ***Poropuntius deauratus***

70. CYPRINIDAE: ***Poropuntius laosesins***

71. CYPRINIDAE: ***Scaphognathops bandanensis***

72. CYPRINIDAE: ***Scaphognathops stejnegeri***

PLATE X

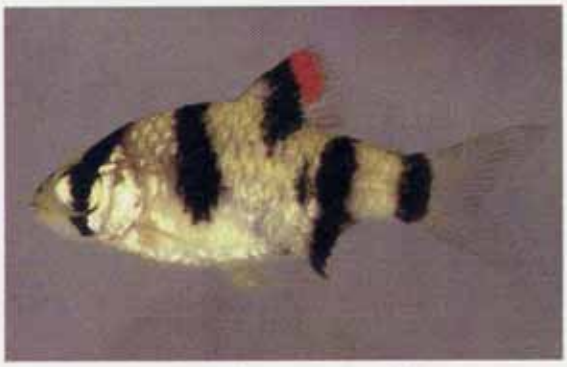
73. CYPRINIDAE: ***Hampala macrolepidota***

74. CYPRINIDAE: ***Puntius brevis***

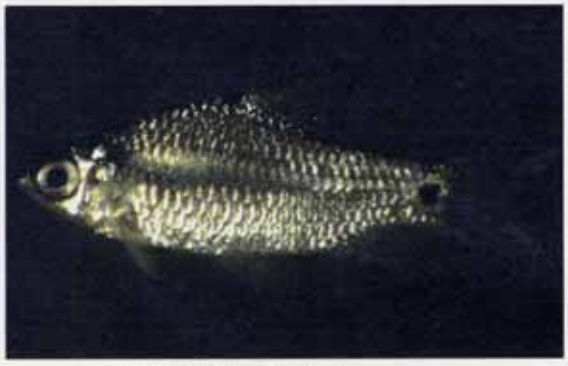
75. CYPRINIDAE: ***Systomus aurotaeniatus***

76. CYPRINIDAE: ***Systomus binotatus***

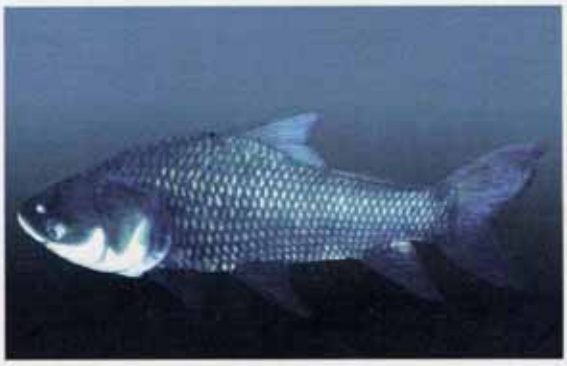
77. CYPRINIDAE: ***Systomus orphoides***



78. CYPRINIDAE: ***Systomus partipentazona***



79. CYPRINIDAE: ***Systomus*** n. sp.



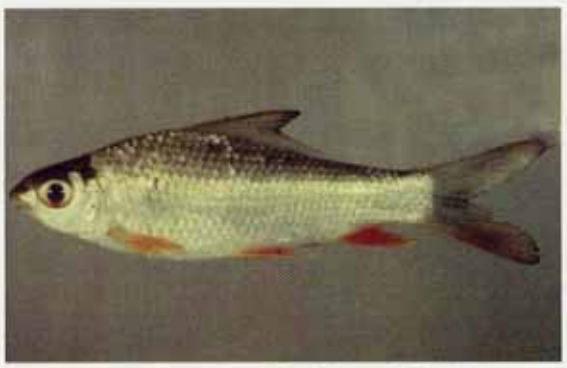
80. CYPRINIDAE: ***Catlocarpio siamensis***

PLATE XI

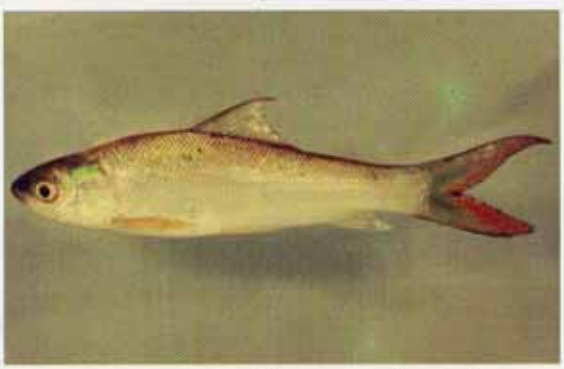
81. CYPRINIDAE: ***Thynnichthys thynnoides***

82. CYPRINIDAE: ***Bangana behri***

83. CYPRINIDAE: ***Barbichthys nitidus***



84. CYPRINIDAE: ***Cirrhinus jullieni***

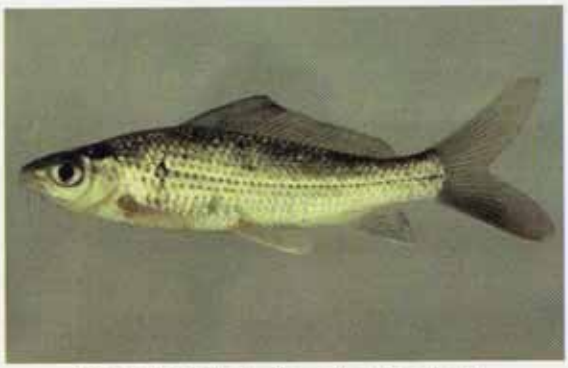


85. CYPRINIDAE: ***Cirrhinus microlepis***

86. CYPRINIDAE: ***Cirrhinus prosemion***

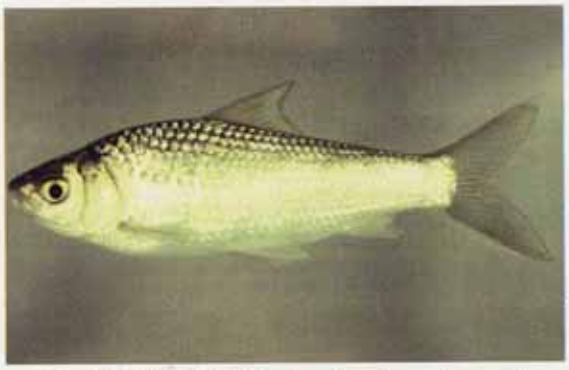
87. CYPRINIDAE: ***Dangila*** sp. cf. ***cuvieri***

88. CYPRINIDAE: ***Dangila lineata***

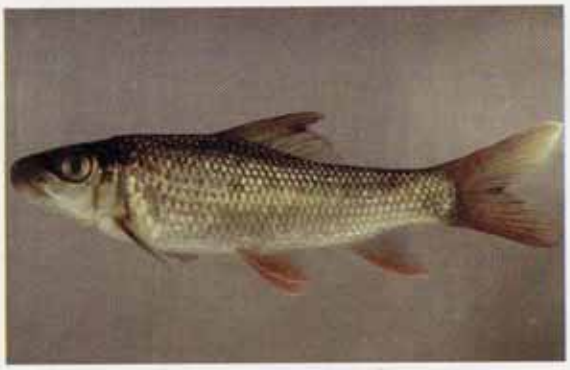


89. CYPRINIDAE: ***Dangila spilopleura***

90.CYPRINIDAE: ***Henicorhynchus cryptopogon***

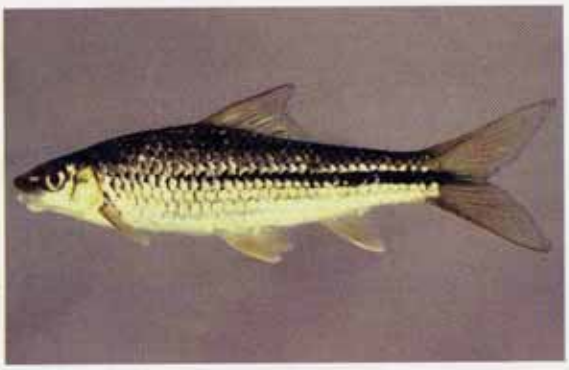


91. CYPRINIDAE: ***Henicorhynchus siamensis***



92. CYPRINIDAE: ***Labeo erythropterus***

93. CYPRINIDAE: ***Lobocheilos davisi***



94.CYPRINIDAE: ***Lobocheilos melanotaenia***

95.CYPRINIDAE: ***Lobocheilos quadrilineatus***

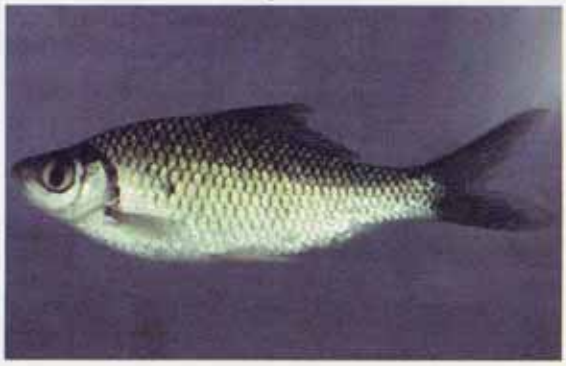
96. CYPRINIDAE: ***Morulius chrysophekadion***

97. CYPRINIDAE: ***Osteochilus hasselti***

98. CYPRINIDAE: ***Osteochilus lini***

99. CYPRINIDAE: ***Osteochilus melanopleurus***

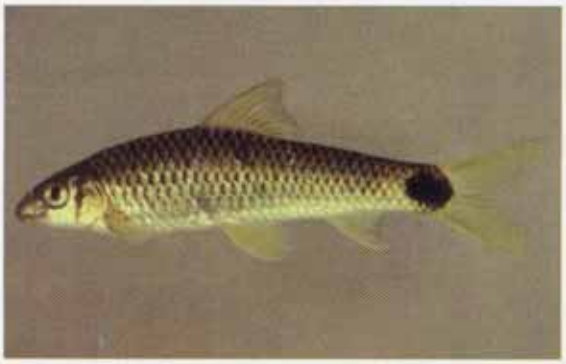
100.CYPRINIDAE: ***Osteochilus microcephalus***



101. CYPRINIDAE: ***Osteochilus schlegeli***

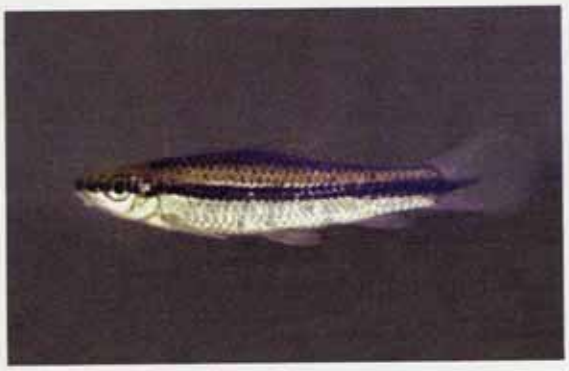
102. CYPRINIDAE: ***Osteochilus waandersi***

103. CYPRINIDAE: ***Crossocheilus oblongus***



104. CYPRINIDAE: ***Crossocheilus reticulatus***

PLATE XIV



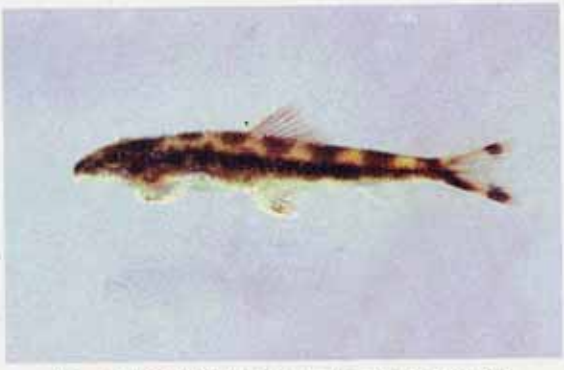
105. CYPRINIDAE: ***Crossocheilus siamensis***

106. CYPRINIDAE: ***Epalzeorhynchos munense***

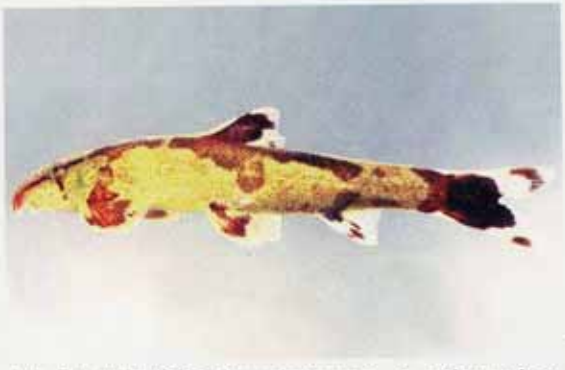
107. CYPRINIDAE: ***Garra cambodgiensis***

108. CYPRINIDAE: ***Garra fasciacauda***

109. CYPRINIDAE: ***Mekongina erythrospila***



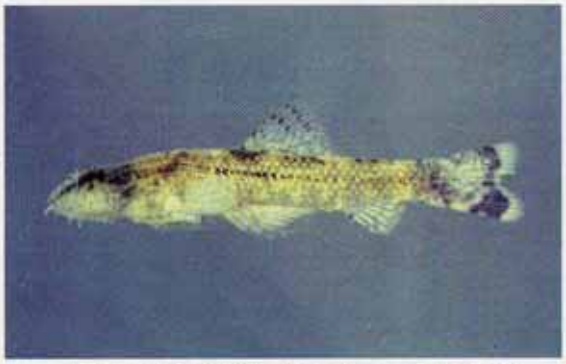
110. BALITORIDAE: ***Homaloptera leonardi***



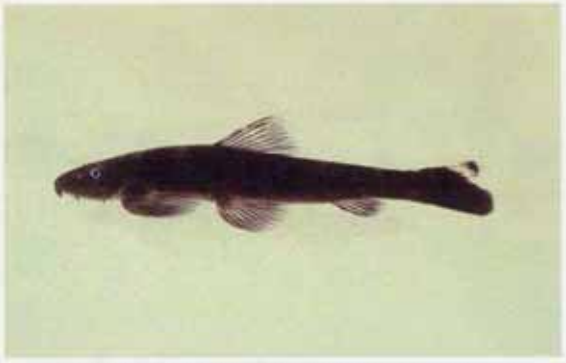
111. BALITORIDAE: ***Homaloptera*** sp. cf. ***orthogoniata***

112. BALITORIDAE: ***Homaloptera smithi***

PLATE XV



113. BALITORIDAE: ***Homaloptera tweédiei***

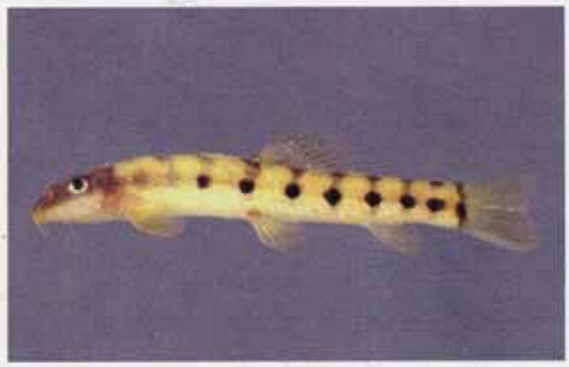


114. BALITORIDAE: ***Homaloptera zollingeri***

115. BALITORIDAE: ***Annamia normani***

116. BALITORIDAE: ***Nemacheilus: pallidus***

117. BALITORIDAE: ***Nemacheilus platiceps***



118. BALITORIDAE: ***Schistura laterimaculata***

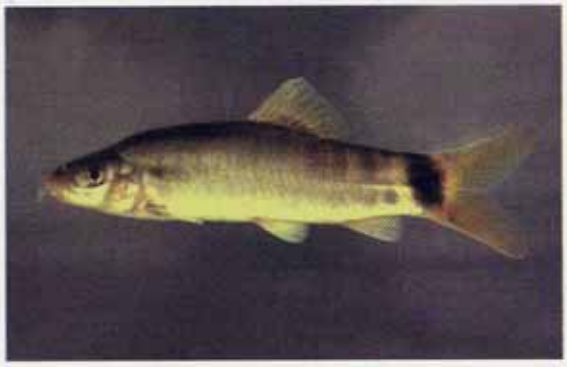
119. BALITORIDAE: ***Schistura pellegrini***

120. BALITORIDAE: ***Tuberoschistura cambodgiensis***

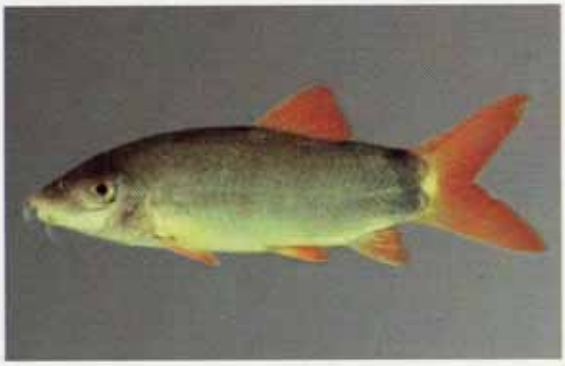
PLATE XVI

121. COBITIDAE: ***Botia eos***

122. COBITIDAE: ***Botia helodes***



123. COBITIDAE: ***Botia lecontei***

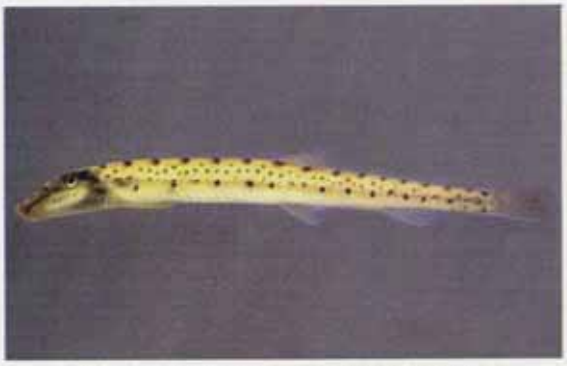


124. COBITIDAE: ***Botia modesta***

125. COBITIDAE: ***Botia morleti***

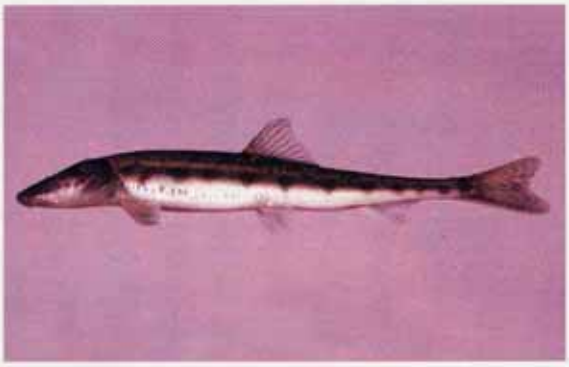
126. COBITIDAE: ***Botia*** sp., adult

127. COBITIDAE: ***Botia*** sp., juvenile

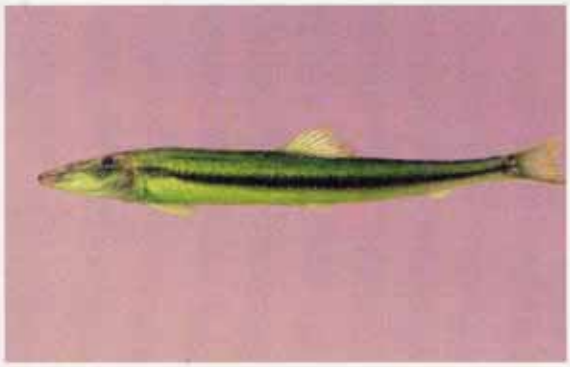


128. COBITIDAE: ***Acanthopsoides delphax***

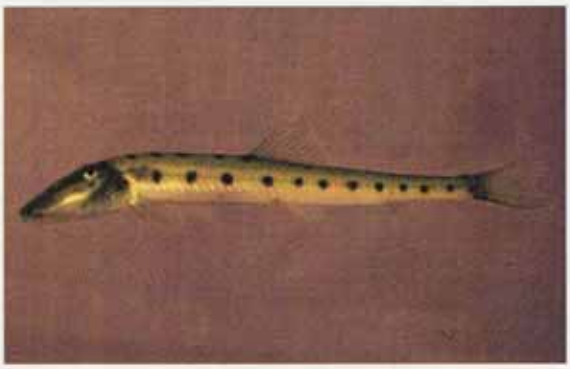
129. COBITIDAE: ***Acanthopsoides hapalias***



130. COBITIDAE: ***Acantopsis*** sp. 1

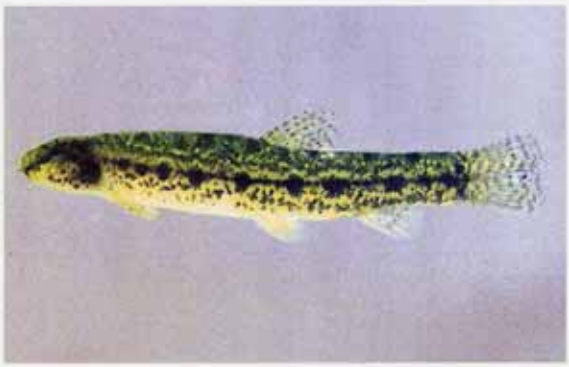


131. COBITIDAE: ***Acantopsis*** sp. 2

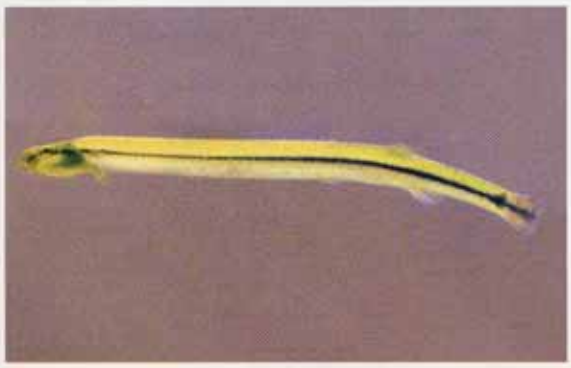


132. COBITIDAE: ***Acantopsis*** sp. 3

133. COBITIDAE: ***Lepidocephalichthys birmanicus***



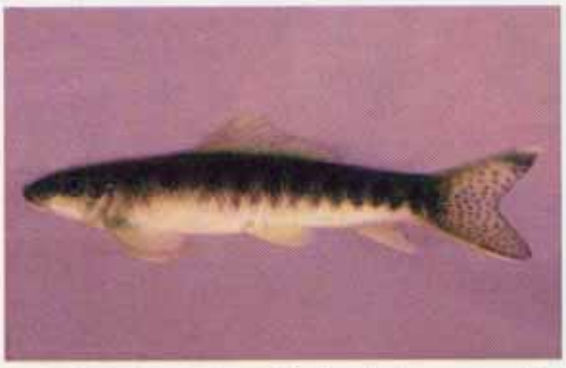
134. COBITIDAE: ***Lepidocephalichthys hasselti***



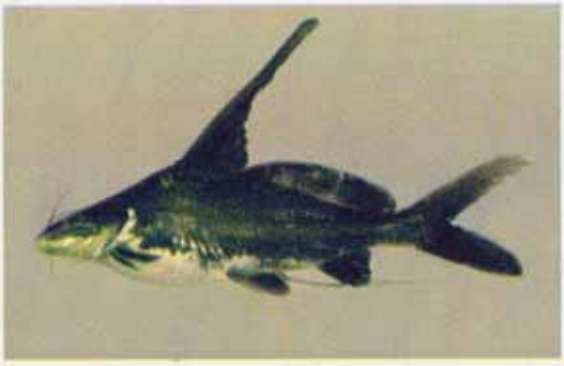
135. COBITIDAE: ***Pangio anguillaris***

136. COBITIDAE: ***Pangio oblonga***

137. GYRINOCHELIDAE: ***Gyrinocheilus aymonieri***

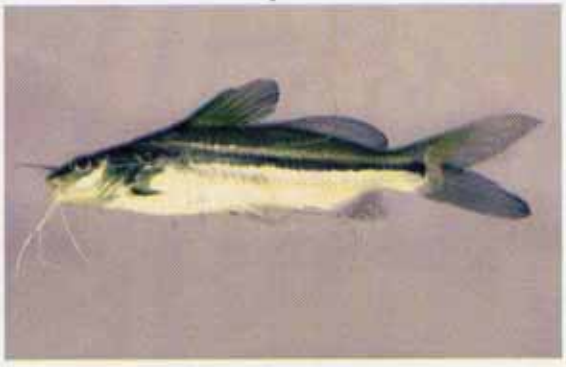


138. GYRINOCHELIDAE: ***Gyrinocheilus pennocki***



139. BAGRIDAE: ***Heterobagrus bocourti***

140. BAGRIDAE: ***Leiocassis siamensis***



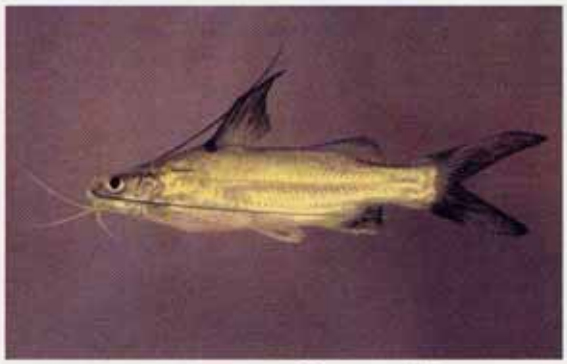
141. BAGRIDAE: ***Mystus atrifasciatus***

142. BAGRIDAE: ***Mystus filamentus***

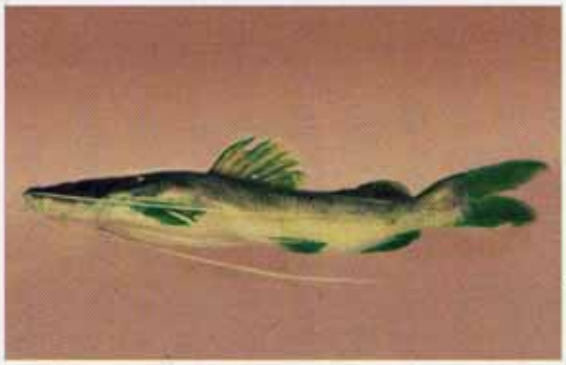
143. BAGRIDAE: ***Mystus multiradiatus***

144. BAGRIDAE: ***Mystus mysticetus***

145. BAGRIDAE: ***Mystus nemurus***

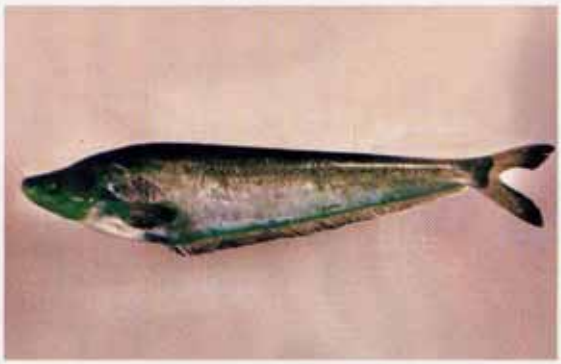


146. BAGRIDAE: ***Mystus wolffi***

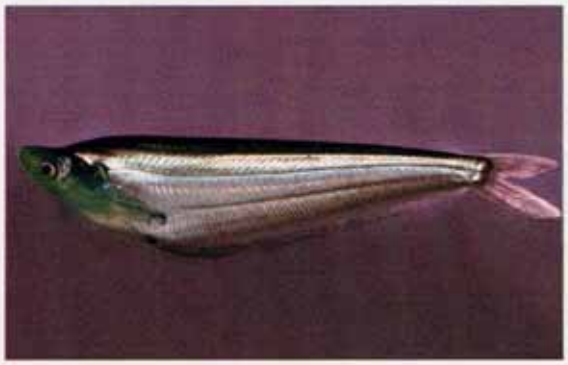


147. BAGRIDAE: ***Mystus wyckioides***

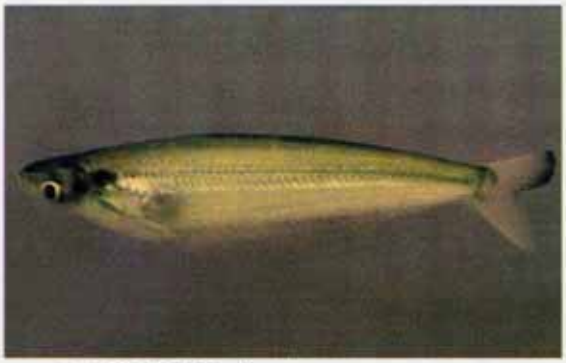
148. SILURIDAE: ***Belodontichthys dinema***



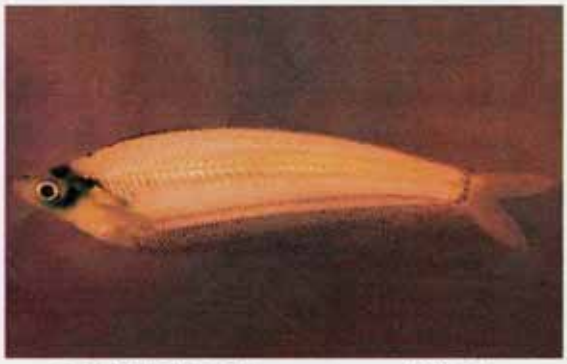
149. SILURIDAE: ***Hemisilurus mekongensis***



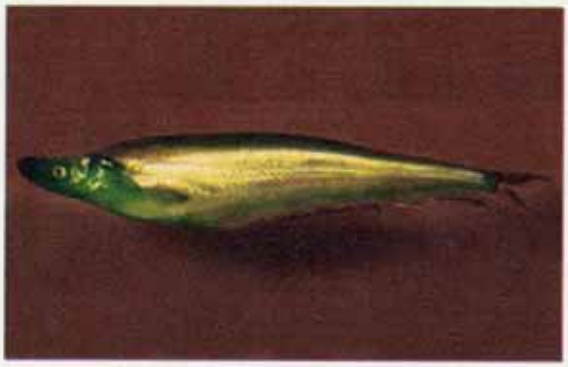
150. SILURIDAE: ***Kryptopterus cheveyi***



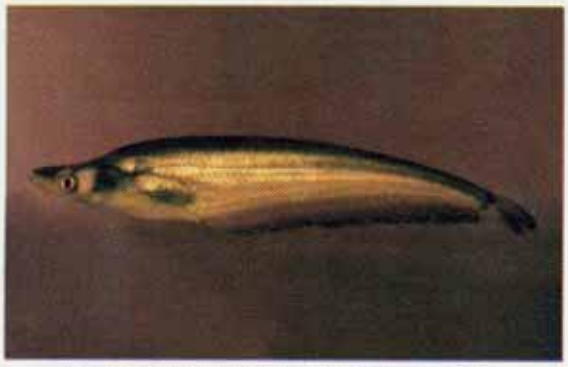
151. SILURIDAE: ***Kryptopterus cryptopterus***



152. SILURIDAE: ***Kryptopterus schilbeides***

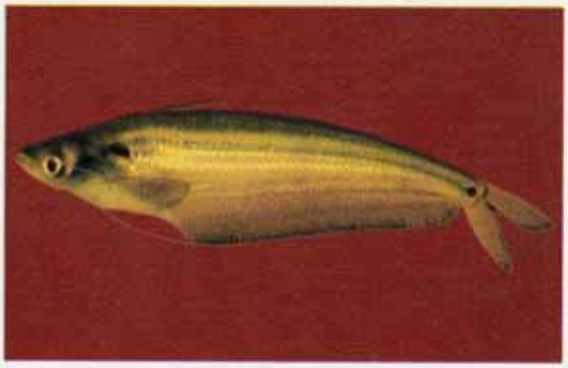


153. SILURIDAE: ***Micronema apogon***

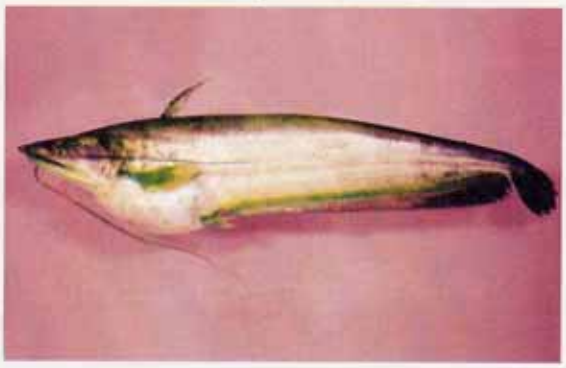


154. SILURIDAE: ***Micronema micronema***

155. SILURIDAE: ***Ompok bimaculatus***

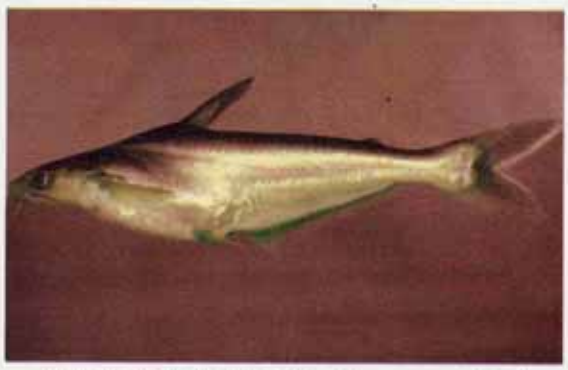


156. SILURIDAE: ***Ompok hypophthalmus***

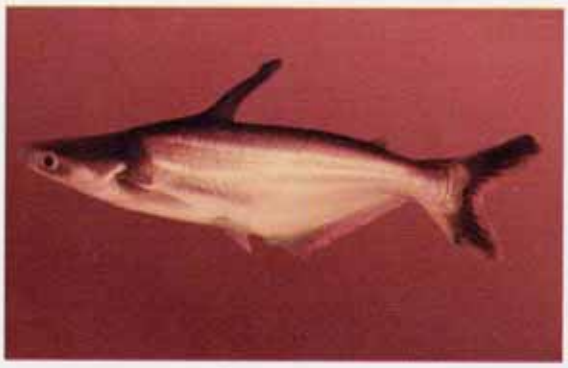


157. SILURIDAE: ***Wallago attu***

158. SILURIDAE: ***Wallago leeri***



159. PANGASIIDAE: ***Helicophagus waandersi***

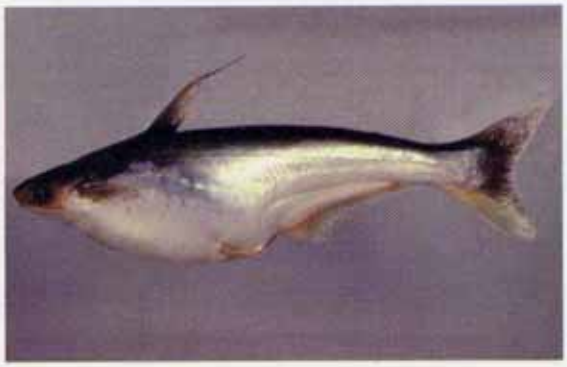


160. PANGASIIDAE: ***Pangasianodon hypophthalmus***

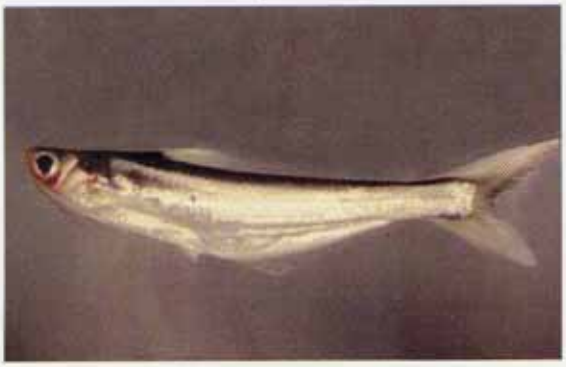
161. PANGASIIDAE: ***Pangasius conchophilus***

162. PANGASIIDAE: ***Pangasius larnaudiei***

163. PANGASIIDAE: ***Pangasius pleurotaenia***

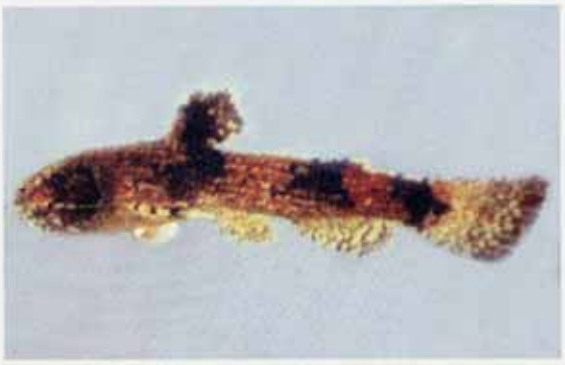


164. PANGASIIDAE: ***Pangasius polyuranodon***



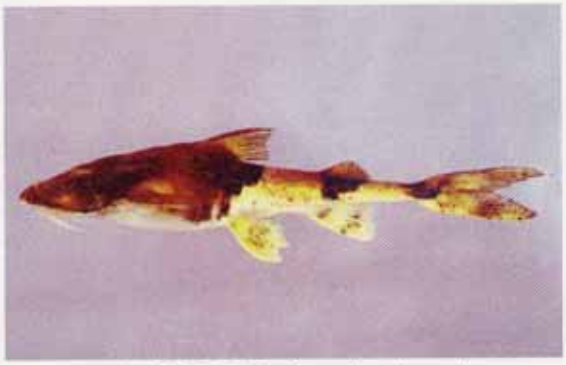
165. PANGASIIDAE: ***Pangasius siamensis***

166. AMBLYCIPITIDAE: ***Amblyceps mangois***

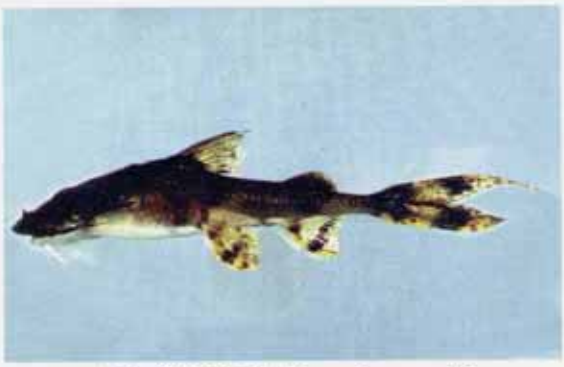


167. AKISIDAE: ***Acrochordonichthys*** sp. cf. ***rugosus***

168. AKISIDAE: ***Akysis*** sp. cf. ***variegatus***

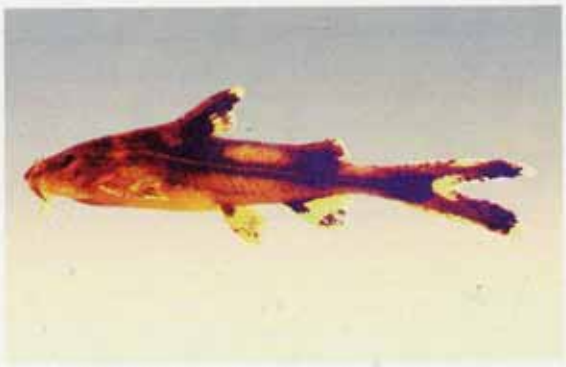


169. SISORIDAE: ***Bagarius bagarius***



170. SISORIDAE: ***Bagarius yarrelli***

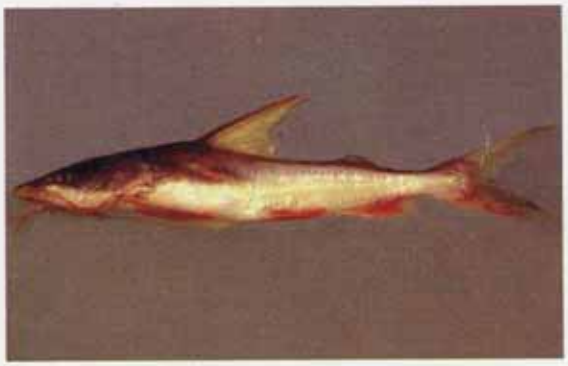
171. SISORIDAE: ***Glyptothorax fuscus***



172. SISORIDAE: ***Glyptothorax lampris***

173. CLARIIDAE: ***Clarias batrachus***

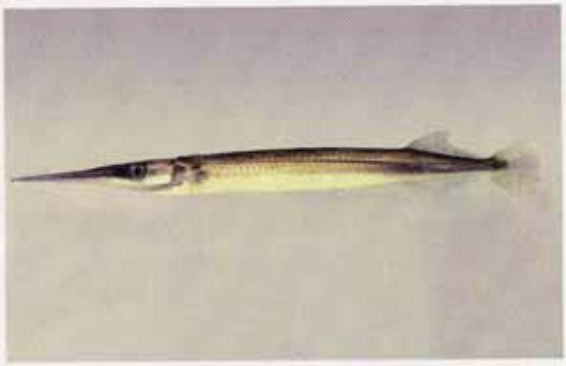
174. CLARIIDAE: ***Clarias macrocephalus***



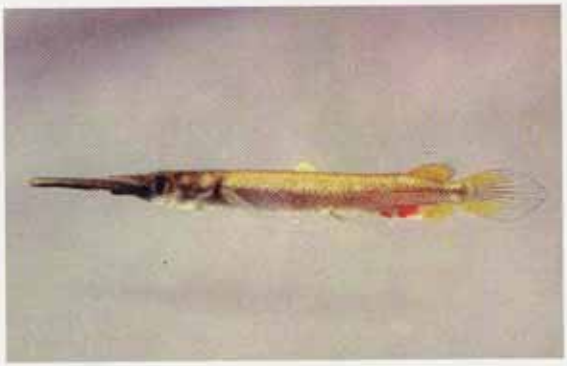
175.ARIIDAE: ***Arius stormi***

176. ARIIDAE: ***Arius thalassinus***
photo by J.E. Randall

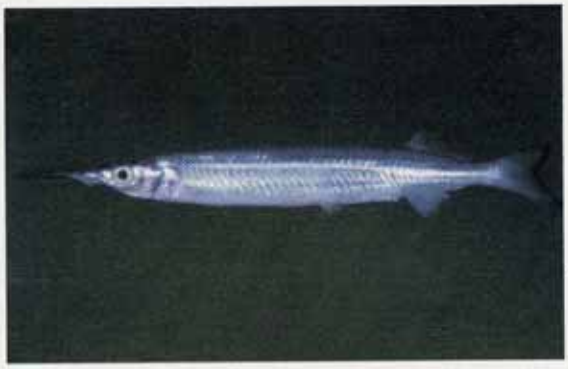
PLATE XXIII



177. BELONIDAE: ***Xenentodon cancila***

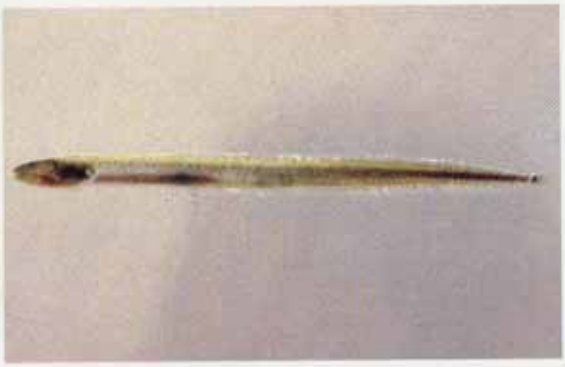


178. HEMIRAMPHIDAE: ***Dermogenys pusilla***

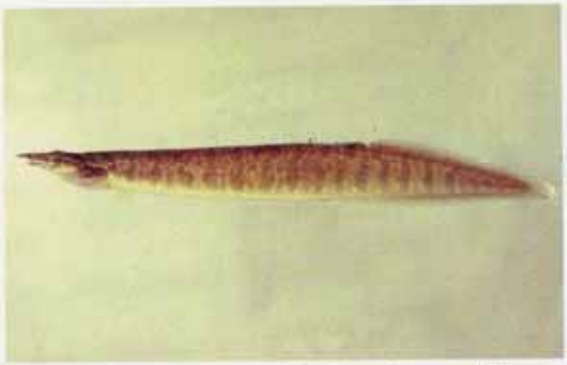


179. HEMIRAMPHIDAE: ***Hyporhamphus limbatus***

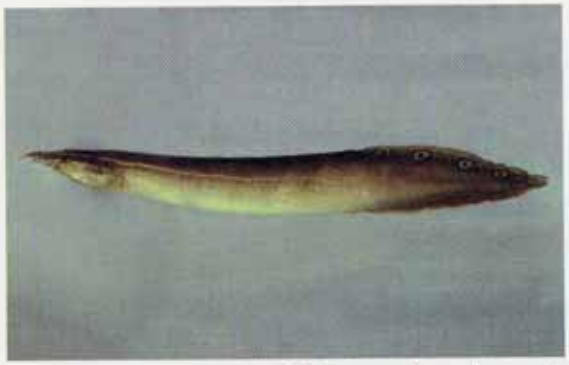
180. SYNBRANCHIDAE: ***Monopterus albus***



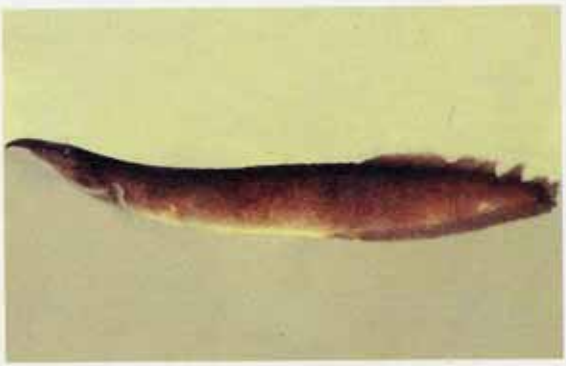
181. CHAUDHURIIDAE: ***Chaudhuria caudata***



182. MASTACEMBELIDAE: ***Macrognathus taeniagaster***



183. MASTACEMBELIDAE: ***Macrognathus siamensis***



184. MASTACEMBELIDAE: ***Macrognathus*** sp.

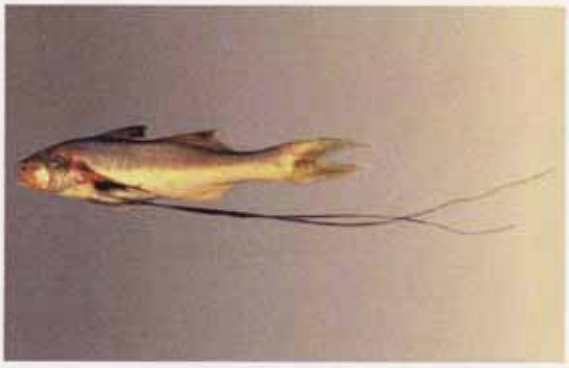
185. MASTACEMBELIDAE: ***Mastacembelus armatus***

186. AMBASSIDAE: ***Parambassis apogonoides***

187. AMBASSIDAE: ***Parambassis wolffi***

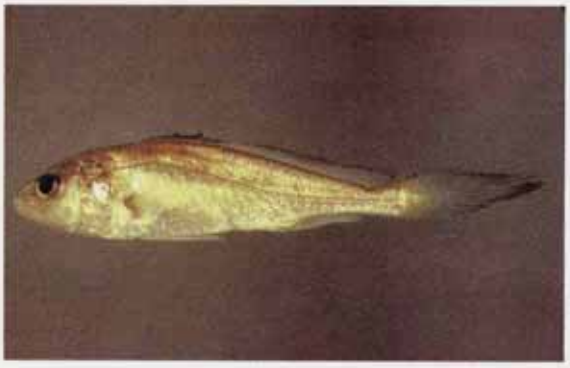
188.AMBASSIDAE: ***Pseudambassis notatus***

189. GERREIDAE: ***Gerres filamentosus***
photo by J.E. Randall



190. POLYNEMIDAE: ***Polynemus borneensis***

191. POLYNEMIDAE: ***Polynemus longipectoralis***



192. SCIAENIDAE: ***Boesemania microlepis***

PLATE XXV

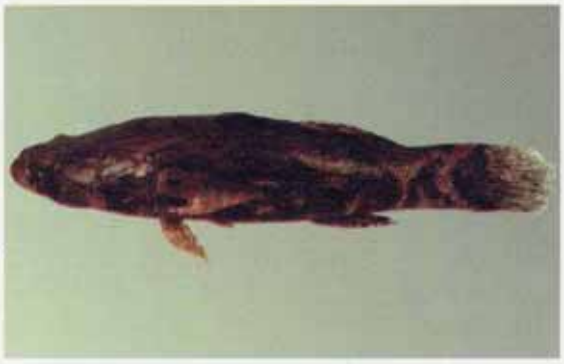
193. TOXOTIDAE: ***Toxotes microlepis***

194. SCATOPHAGIDAE: ***Scatophagus argus***
photo by J.E. Randall

195. NANDIDAE: ***Nandus nandus***

196. NANDIDAE: ***Pristolepis fasciata***

197. TERAPONTIDAE: ***Terapon jarbua***
photo by G. Bianchi



198. ELEOTRIDAE: ***Oxyeleotris marmorata***

199. GOBIIDAE: ***Glossogobius koragensis***

200. GOBIIDAE: ***Rhinogobius ocellatus***

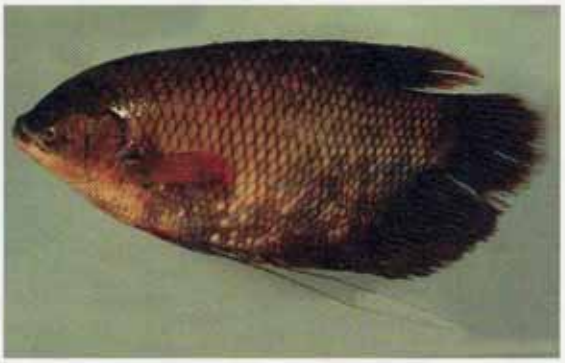
PLATE XXVI

201. HELOSTOMATIDAE: ***Helostoma temmincki***

202. BELONTIIDAE: ***Trichogaster microlepis***

203. BELONTIIDAE: ***Trichogaster pectoralis***

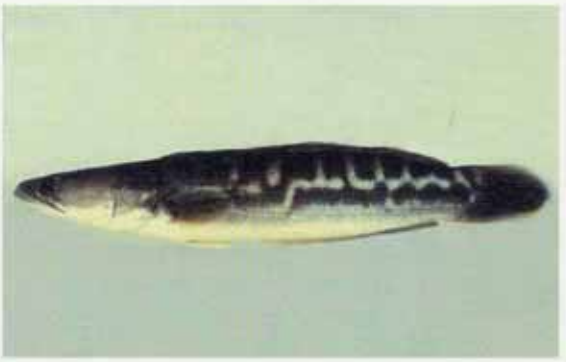
204. BELONTIIDAE: ***Trichopsis vittata***



205. OSPHRONEMIDAE: ***Osphronemus exodon***

206. CHANNIDAE: ***Channa lucius***

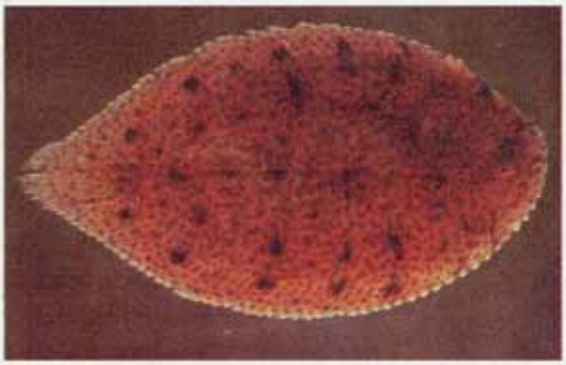
207. CHANNIDAE: ***Channa marulius***



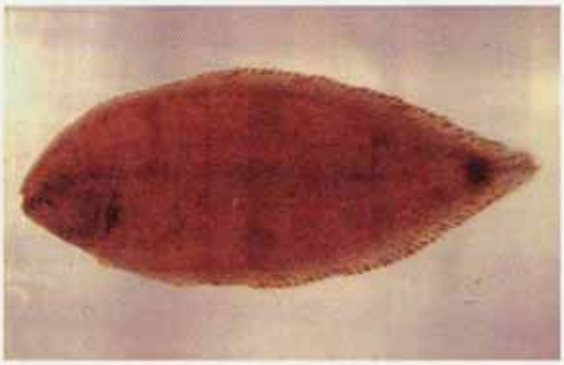
208. CHANNIDAE: ***Channa micropeltes***

209. CHANNIDAE: ***Channa orientalis***

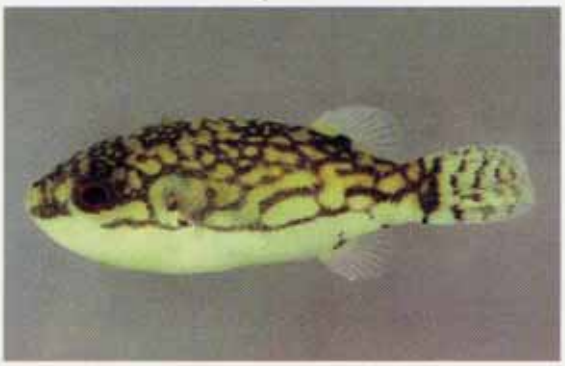
210. CHANNIDAE: ***Channa striata***



211. SOLEIDAE: ***Achiroides leucorhynchos***

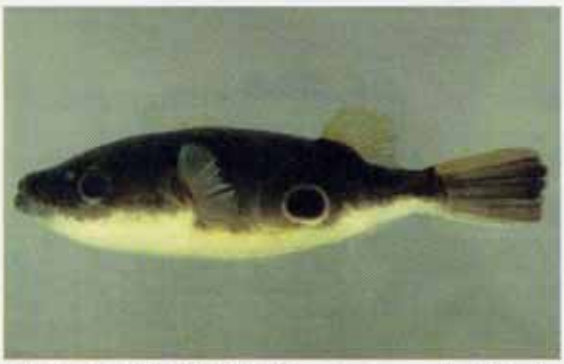


212. SOLEIDAE: ***Euryglossa orientalis***

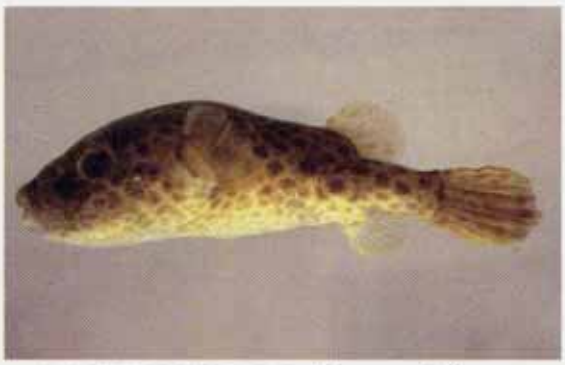


213. TETRAODONTIDAE: ***Carinotetraodon lorteti***

214. TETRAODONTIDAE: ***Chonerhinos nefastus***



215. TETRAODONTIDAE: ***Monotreta cambodgiensis***



216. TETRAODONTIDAE: ***Monotreta leiurus***

This field guide covers the major resource groups likely to be encountered in the fisheries of the Cambodian Mekong. These groups include sharks, batoid fishes and bony fishes. The introduction outlines the geographical, environmental and ecological factors influencing fisheries, and the basic components of the fisheries of the Cambodian Mekong. As an aid to identification to higher taxonomic levels, a pictorial index to families and an illustrated guide to orders and families are included. Each species account provides scientific nomenclature, FAO names in English, local names, sizes, notes on fisheries, habitat and biology, and one or more illustrations. The guide is fully indexed and a list of related literature is appended. Finally, 27 colour plates are presented.

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