

Signs of disease

Important: animals with disease may show one or more of the signs below, but disease may still be present in the absence of any signs.

Disease signs at the tank and pond level

- larvae float inactively on the surface

Clinical signs of disease in an infected animal

- midgut gland (hepatopancreas) suddenly turns white in larvae and postlarvae
- high mortality
- white midgut line seen through abdomen

Disease agent

Baculoviral midgut gland necrosis virus is currently an unassigned virus of the family Baculoviridae. It was known as *Penaeus japonicus* nonoccluded baculovirus (PjNOB) before it was removed from the classification structure by the International Committee on Taxonomy of Viruses in 1995.

Host range

Crustaceans known to be susceptible to baculoviral midgut gland necrosis:

eastern king prawn*	(<i>Penaeus plebejus</i>)
Kuruma prawn*	(<i>Penaeus japonicus</i>)
Chinese white shrimp	(<i>Penaeus chinensis</i>)
giant black tiger prawn	(<i>Penaeus monodon</i>)
grooved tiger prawn	(<i>Penaeus semisulcatus</i>)

Presence in Asia–Pacific

While baculoviral midgut gland necrosis is not officially reported under the NACA–FAO–OIE quarterly aquatic animal disease reporting program, it is known to be present in the Asia–Pacific region..

Epidemiology

- Baculoviral midgut gland necrosis strikes suddenly, and high mortalities follow quickly.
- Infection in hatcheries is believed to arise from wild-caught female spawners.
- The virus causes high mortality of larvae; late postlarvae tend to be more resistant.
- The virus can persist and retain infectivity for up to 20 days in water averaging 15°C.

* naturally susceptible (other species have been shown to be experimentally susceptible)



Baculoviral midgut gland necrosis continued

- Transmission is horizontal, through faeces shed during spawning.
- The disease affects larvae and up to 20 days of postlarval development (PL-20).
- Mortalities are highest (up to 98%) at 9–10 days of postlarval development (PL-9–10).
- There is typically a decrease in mortality rates as the postlarvae reach PL-20.

Differential diagnosis

The differential diagnostic table and the list of similar diseases appearing at the bottom of each disease page refer only to the diseases covered by this field guide. Gross signs observed might well be representative of a wider range of diseases not included here. Therefore, these diagnostic aids should not be read as a guide to a definitive diagnosis, but rather as a tool to help identify the listed diseases that most closely account for the gross signs.

Similar diseases

White spot disease, tetrahedral baculovirosis

Sample collection

Because of uncertainty in differentiating diseases using only gross signs, and because some aquatic animal disease agents might pose a risk to humans, you should not try to collect samples unless you have been trained. Instead, you should phone your national hotline number and report your observations. If samples have to be collected, the agency taking the call will advise you on what you need to do. Local or district fisheries/veterinary authorities could advise you on sampling.

Emergency disease hotline

For your national emergency disease hotline number, see Whom to contact if you suspect a disease.

Further reading

http://www.oie.int/aac/eng/cards/en_diseasecard.htm

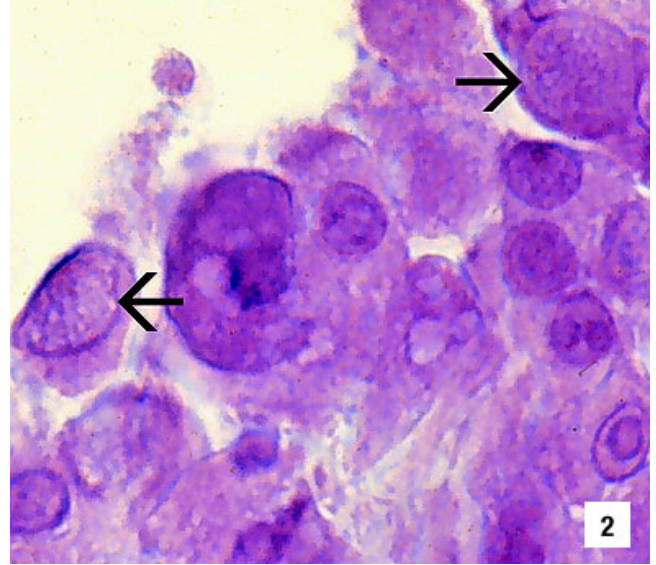
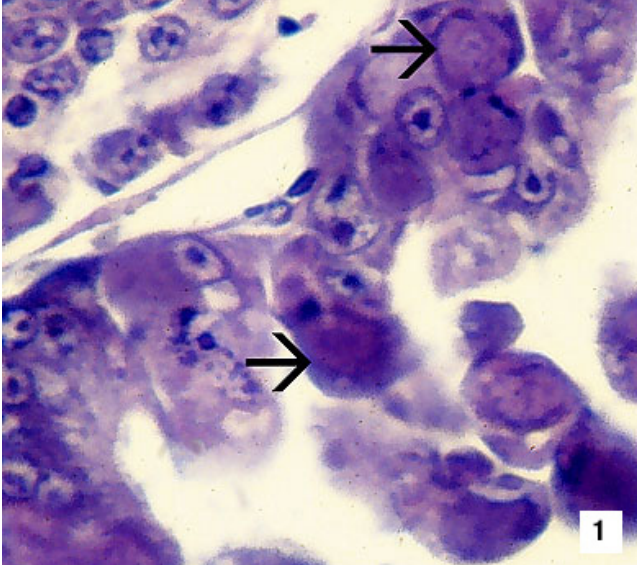
The currently accepted procedures for a conclusive diagnosis of baculoviral midgut gland necrosis are summarised at <http://www.pac.dfo-mpo.gc.ca/sci/shelldis/pages/bmnspe.htm>

These hyperlinks were correct and functioning at the time of publication.



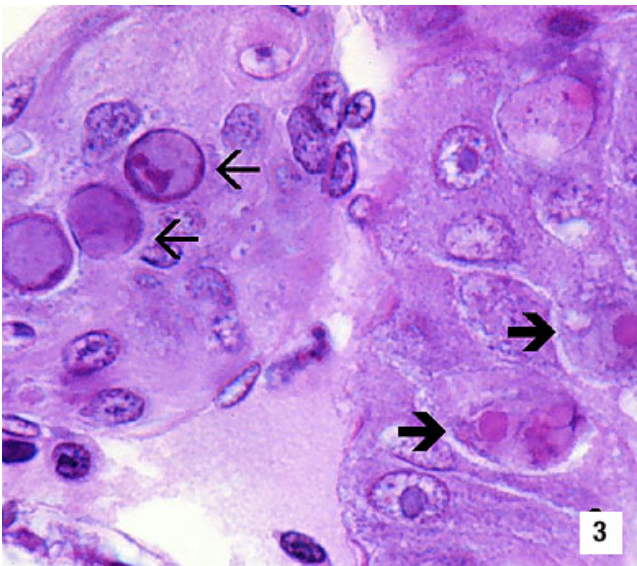
Baculoviral midgut gland necrosis continued

Histological images



Sections of the hepatopancreas (HP) of a postlarval *Penaeus japonicus* with severe baculoviral midgut gland necrosis (BMN). HP tubules have been mostly destroyed, and the remaining HP tubule epithelial cells contain markedly hypertrophied nuclei that contain a single eosinophilic to pale basophilic, irregularly shaped inclusion body that fills the nucleus. BMNV infected nuclei also display diminished nuclear chromatin, marginated chromatin (which may include remnants of the laterally displaced and flattened nucleolus), and the absence of occlusion bodies that characterise infections by the occluded (SNPV-type or type-A) baculoviruses. Mayer-Bennett H&E. Magnifications: Fig 1 = 1300x; Fig 2 = 1700x

Source: DV Lightner



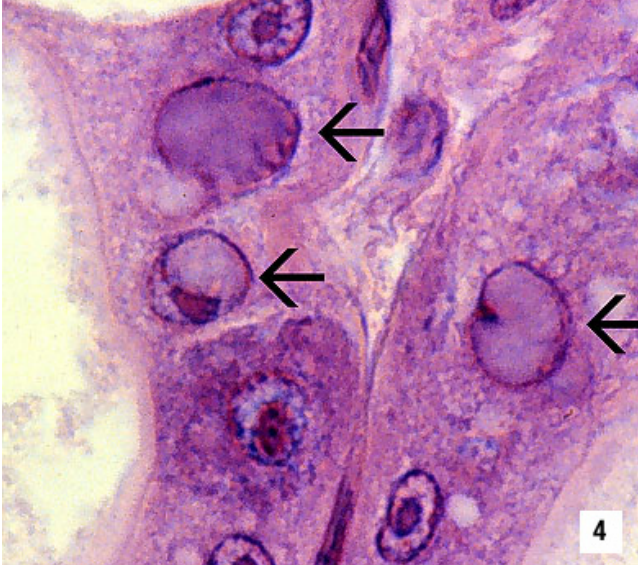
Section of the HP from a juvenile *P. monodon* presenting a dual infection by a BMN-type baculovirus, as suggested by the three cells with the basophilic intranuclear inclusion bodies (small arrow), and by monodon baculovirus (MBV; large arrow). Mayer-Bennett H&E. Magnification 1700x

Source: DV Lightner



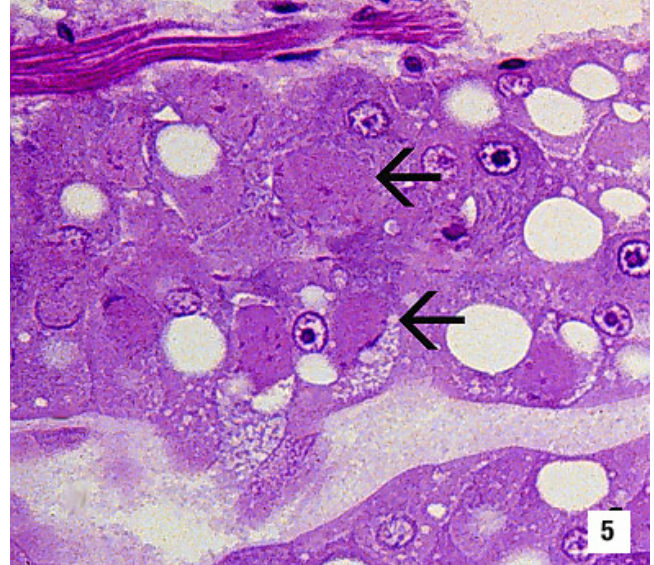
Baculoviral midgut gland necrosis continued

Histological images



Section of the HP of a *P. plebejus* displaying several HP cells that contain BMN-type intranuclear inclusion bodies. Mayer-Bennett H&E. Magnification 1700x

Source: DV Lightner



Low-magnification (700x) view of the hepatopancreas of a giant black tiger prawn (*P. monodon*) with a severe midgut gland baculovirus infection. Most of the cells display infected nuclei

Source: DV Lightner



High-magnification (1700x) view of the hepatopancreas of a giant black tiger prawn (*P. monodon*) with a severe midgut gland baculovirus infection. Most of the cells display infected nuclei

Source: DV Lightner



Australian Government
Department of Agriculture,
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