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Pathogens after shrimp: A rogue's gallery of the industry's four most destructive adversaries

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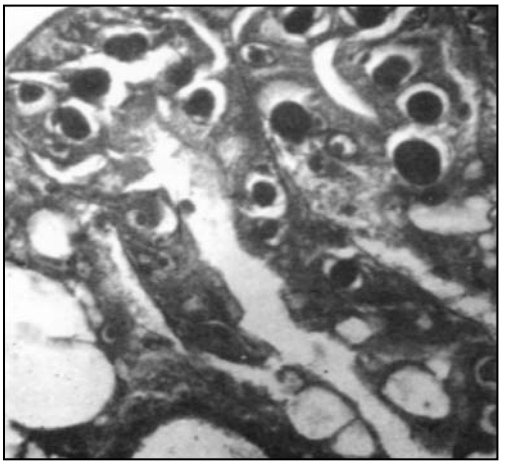
Pathogens after shrimp

A rogues' gallery of the industry's four most destructive adversaries



MBV occlusion bodies in the hepatopancreas of tiger shrimp postlarvae.

MBV, the monodon baculovirus

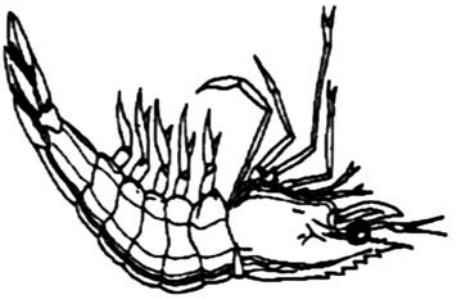
Shrimp stocks die gradually with MBV, and mortality of shrimp juveniles cultured in raceways and tanks can reach 70%.

MBV also affects postlarvae and adults.

MBV weakens shrimp by destroying the hepatopancreas and the lining of the digestive tract. Spherical occlusion viral bodies (picture above) may be found in the hepatopancreas The hepatopancreas appear yellowish-white.

HOW TO DETECT MBV Monitor shrimp health constantly. MBV-infected shrimp become pale bluish-gray to dark blue-black, have fouled exoskeleton, swim sluggishly, wont feed, and won't grow. Bring shrimp samples immediately to fish health laboratories to check the hepatopancreas for MBV occlusion bodies.

TREATMENT No treatment has been reported. But infected shrimp must be destroyed by burning or burying in pits lined with lime. MBV infection may be prevented from recurring (or occurring) by using MBV-free stocks, and reducing stress by using good husbandry practices and proper nutrition.



IHHNV, the infectious hypodermal and hematopoietic necrosis virus

More than 90% of shrimp juveniles in intensive culture systems can die because of IHHNV infection.

IHHNV also affects postlarvae and adults. Shrimp larval stages (zoea and mysis) are presumed to be latently infected.

IHHNV destroys cuticle cells, bloodforming tissues, and connective tissues. Death of these tissues causes abnormal metabolism, and shrimp die.

HOW TO DETECT IHHNV Monitor shrimp health constantly. Suspect IHHNV if shrimp won't feed and if they swim erratically - its pleopods (or walking legs) and pereopods (or swimmerets) cease their motion; shrimp sink, right itself but remain weak. This is repeated until the shrimp die, usually within 4-12 hours.

TREATMENT No treatment has been reported. But if IHHNV is suspected, exposed shrimp must be destroyed and contaminated facilities or premises immediately disinfected. Farmers are advised to strictly follow quarantine procedures for all live and newly acquired shrimp.

IHHNV infection may be prevented by not introducing IHHNV-infected postlarvae, juvenile or adult shrimp into the shrimp farm.

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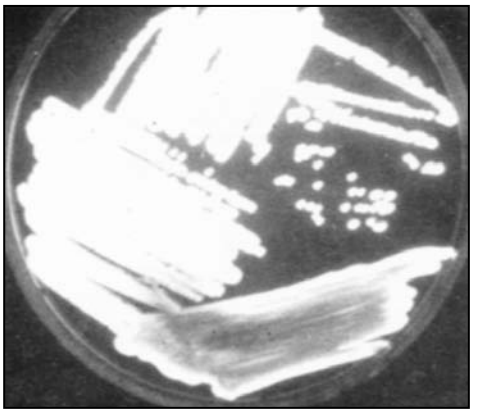


Pure culture of the luminous bacterium *Vibrio harveyi.*

Vibrio harveyi, the luminous bacterium

Luminous vibriosis can cause death to nearly 100% of shrimp stock in the hatchery. In ponds, severe mortalities can occur in the first 30 days of culture.

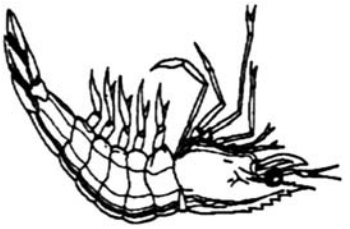
Vibrio harveyi also affects eggs.

Vibrio harveyi can be found densely packed in internal tissues of shrimp, destroying these tissues and killing shrimp.

HOW TO DETECT VIBRIOSIS Monitor fish health constantly. Shrimp have vibriosis if they become weak and opaque-white. Larvae and postlarvae appear luminescent if seen at night with the hatchery lights off.

In ponds, farmers can monitor the bacteria present in the water. (Farmers can send water samples regularly to fish health laboratories.) Usually, the bacterial profile or bacterial composition of pond water becomes altered (*V. harveyi* starts to dominate) 2-3 weeks after farmers change water. Once *V. harveyi* dominates, shrimp stocks start dying.

TREATMENT Farmers are advised to change water, about 80-90% daily to flush out bacteria. In hatcheries, luminous vibriosis may be prevented by chlorination, using UV-treated water or by employing a series of filters (sandfilters, filter bags, cartridge filters, 0.45 micron pore-sized microfilter). Farmers must avoid stressing shrimp by using good husbandry practices and proper nutrition. Vaccination and immunostimulation of larval shrimps by glucans, and probiotics for grow-out culture are suggested (see related articles, this issue).



WSBV, the white spot syndrome-associated baculovirus

WSBV was recently reported to devastate the Taiwanese shrimp industry. Outbreaks are characterized by obvious white spots on the carapace, appendages, and the inside surface of the body. In experimental infection trials, around 100% of shrimp can die within 5-7 days.

Researchers continue to study WSBV, its route of infection and what it can do to the shrimp.

Researchers suspect that infection is water-borne and/or transmitted orally. In one experiment, about 66% of healthy shrimp are infected within 12 hours if a diseased shrimp is placed in the same holding tank. At 48 hours, rate of infection is 100%. Researchers also found that 100% of healthy shrimp are infected within 24 hours if these ingest or eat diseased shrimp.

Researchers also noted cellular degradation and severe nuclear hypertrophy in skin tissues of diseased *Penaeus monodon* and *P. japonicus.* WSBV is non-occluded and rod-shaped.

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