

FISH DISEASES IN MALAYSIA: STATUS AND PROBLEMS

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Aquaculture is still at an early stage of development in Malaysia; however, it has expanded quite rapidly over the past decade or so. Under the National Agriculture Policy, aquaculture development has been given high priority and entrepreneurs are given various incentives and support services.

The technologies of various aquaculture systems in Malaysia are already well developed. Many farms adopt intensive culture system and where inadequate fish seed is a constraint, importation from neighboring countries supports culture. It is in the intensive culture system, both in the hatchery and grow-out phases, that diseases often occur. Diseases have resulted in significant economic loss to fish and shrimp farmers.

The study of fish parasites has been carried out for sometime but it dealt mainly with taxonomy. The systematic study of fish disease and its documentation are comparatively new. At present, three institutions are involved in fish disease research: Fisheries Research Institute under the Department of Fisheries, Agriculture University of Malaysia, and Science University of Malaysia.

Disease prevention and control

Fishes. The major diseases associated with fish culture are protozoan and bacterial diseases. Other pathogens which play important roles in disease outbreaks are fungi and metazoan parasites.

The most prevalent protozoan diseases are caused by *Ichthyophthirius multifiliis* in freshwater and *Cryptocaryon irritans* in marine environments (Wong and Leong 1987). From 1985 to 1987, a government freshwater hatchery at Tapah, Perak faced these problems during the rainy season at the end of each year. The protozoans mainly affected the walking catfish, *Puntius gonionotus*; other species remained free of the infection. *C. irritans* was reported to cause high mortality in sea bass hatchery (M. Nawawi, pers. comm.) and occasionally, there were reports of the occurrence of this disease in grow-out ponds and cages.

Trichodiniasis is found in both freshwater and marine environments (primarily in groupers) but so far, there is no major outbreak reported. Two common myxosporidians found in freshwater fishes are *Myxobolus* and *Henneguya* sp. (Shariff 1984). *Myxobolus* is more prevalent, causing high mortality. To date, there is no recommended treatment.

Other protozoans which affect fish culture are *Chilodonella* spp., *Ichthyobodo* spp., *Epistylis* spp., *Piscinoodinium* spp., and *Zoothamnium* spp. However, very little or no information is available on the prevalence, intensities, or distribution of these protozoans.

The most common bacterial diseases are caused by *Aeromonas hydrophila*, *Flexibacter*, *Pseudomonas*, and *Edwardsiella* sp. for freshwater fishes (Siti Zahrah 1992) and *Vibrio* spp. for marine fishes (Leong 1989; Leong and Wong 1992). Sea bass fry cultured in cages suffer heavily from fin and tail rots. In grouper, vibriosis occurs throughout the hatchery and grow-out phases. Use of antibiotics has been attempted in hatcheries but it has not been tested in ponds.

A fish louse, *Argulus* sp., is found both in marine and freshwater environments. Affected fish are thin with hemorrhagic areas on their bodies. Infection on small fish often causes mortality. Other common parasitic copepods are *Lernaea* spp. in freshwater (Shariff 1984) and *Lenanthurus* spp. in marine environment. Dipterex is effective in treating crustacean diseases (Chong and Chao 1986; Fauzidah and Rajamanikam 1992).

Sea bass fry was reported to be very prone to infection by a monogenean *Diplectanum* sp. *Dactylogyrus* sp. is occasionally seen in marine environment but it was more prevalent in freshwater fishes particularly the fry of Chinese carps that are 10-20 cm. Short baths of formalin (0.1 ppm) are used to treat the infected fish (Chong and Chao 1986; Fauzidah and Rajamanikam 1992).

Marine shrimps. Marine shrimp culture is a fast expanding industry in Malaysia and much effort has been geared towards the improvement of culture and hatchery technology. However, the disease aspects of culture have hardly been given proper attention. Information on shrimp disease is very limited, confined mostly to the work of few government researchers (Department of Fisheries and Agriculture University).

Vibrio spp. are the major cause of bacterial diseases such as necrosis and septicemia (Anderson 1988; Palanisamy 1990) in hatcheries. In the pond, systematic bacterial condition also occurs in juvenile and adult marine shrimp. Affected ponds have low-level, continuous mortalities which begin as the shrimp approach market size. Liming is carried out routinely before each crop to disinfect ponds.

A non-infectious filamentous bacteria, *Leucothrix mucor*, usually causes secondary infection in *Penaeus monodon* postlarvae affected by *Penaeus monodon* baculovirus. Larvae can die overnight (Anderson 1988). Most hatcheries use antibiotics to control bacterial diseases. *Leucothrix mucor* has also been observed frequently in *Macrobrachium rosenbergii* larvae (Suhairi et al. 1983).

Infestation by ciliates such as *Zoothamnium* spp., *Epistylis* spp., and *Vorticella* spp. is a common problem in Malaysian marine shrimp hatcheries. Some hatcheries have problems with an unidentified ciliate that causes similar symptoms (Anderson 1988). *Vorticella* and *Zoothamnium* have been observed frequently on the larvae of *M. rosenbergii* at NAPFRE, Kedah (NAPFRE, pers. comm.).

Rickettsia (an obligate intracellular parasite) has caused serious disease problem in two Johore shrimp farms (Anderson 1988). Only *P. monodon* was affected with mortalities reaching 90-95%. Chemotherapy and change in pond

management had no effect. At present, the only action considered is changing the cultured species.

Fungal diseases encountered in Malaysian marine shrimp hatcheries are mainly caused by *Lagenidium* and *Sirolopidium*. Protozoal and mysis stages are most susceptible. Fungal diseases have caused serious mortality in several hatcheries (Anderson 1988) including that for *Macrobrachium rosenbergii*. The fungi isolated include *Penicillium* spp., *Pullularia* spp. and *Aspergillus* spp. (Shariff et al. 1978).

Three types of virus have been identified: MBV (monodon baculovirus), IHNV (infectious hypodermal and haematopoietic necrosis virus), and HPV (hepatopancreatic parvo-like virus). MBV is considered endemic to all Malaysian marine shrimp hatcheries and farms but prevalence and infection intensity are low. HPV lesion or disease has not been observed in marine shrimps but recently, HPV-like hepatopancreatic changes were found in *M. rosenbergii* postlarvae. IHNV has been observed in *P. monodon* juveniles from farms in Sabah but it is not significant in terms of shrimp health. The actual distribution and importance of IHNV in Malaysia is still unknown (Anderson 1988).

Many farms in Malaysia have reported the occurrence of soft-shell disease (Anderson 1988; Fauzidah and Rajamanikam 1992). The recommendations for its prevention in ponds include addition of extra calcium in pond water, increasing water exchange, and improvement in feeding levels and quality of feed given.

Molluscs. The main species of molluscs cultured in Malaysia are cockle (*Anadara granosa*), green mussel (*Perna viridis*), and oyster (*Crassostrea belcheri*). The main problem in culture has been bacterial contamination of sewage and animal wastes rather than diseases in culture until the recent outbreak of tubellarian worms in Malacca.

In early 1991, Melaka experienced a very bad drought which lasted for 3 months, and there were reports of mass mortality of mussel. Salinity of the culture area has increased to 34-35 ppt. The mussels were found to be heavily infected (100-200/mussel) by tubellarian worms. Mortality was observed mainly in the water column where salinity was higher; thus, it appeared that the tubellarians favored more saline conditions. To prevent the spread of the infestation, the farmers were advised to transfer the mussel rafts to other areas with lower salinity (Choo 1992).

Problems

Many shrimp farmers and hatchery operators carry out good hygiene practices such as disinfection of hatchery/pond, careful maintenance of water quality, use of breakcycle, and cleaning of tanks, equipment, floor, footwear, etc. Whenever disease is suspected, treatment is usually done using recommended chemicals. In most cases, farmers seek the assistance of the Department of Fisheries when they cannot diagnose the disease. However, they sometimes report the problem when the outbreak is already serious. There are also farmers who are totally ignorant of fish diseases while others simply ignore the problem, hoping that it will disappear with time and will not recur in future production.

Another major constraint is limited skilled manpower in this field, at all levels, in the country. In Malaysia, there are Fisheries Assistants at every district level responsible for giving technical advise to fishfarmers. Most of the assistants have only very basic knowledge. Whenever they encounter disease problems they are not familiar with, they refer these to higher authority or the few institutions which are involved directly in fish diseases. By the time a problem reaches the people concerned, it is usually too late for remedial action. It is also quite difficult for the few people concerned to cover the whole of Malaysia.

Malaysia imports a large number of fish fry without any proper quarantine upon entry to the country. It is well recognized that such importation is a serious source of diseases.

The Department of Fisheries, being the main government body responsible for the development of the aquaculture industry, has taken several measures to overcome fish disease problems. Steps have been taken to improve the skill in fish disease diagnosis, prevention, and control among its technical staff at every level. Training courses on fish diseases have been conducted and many technical staff have also been sent overseas for training. All aquaculture training courses for farmers conducted by the Department include fish health aspects to give them an understanding of fish diseases that could occur in the culture system and factors that trigger them.

A national committee has been set up to undertake fish disease work under the Ministry of Agriculture. A subunit within the Department of Fisheries was launched early this year headed by a Fisheries Officer who coordinates national efforts on fish diseases and pollution. Systematic documentation and follow-up will be done when there are reports on disease outbreaks. This will enable researchers to determine the distribution of various fish diseases in the country and to recommend precautionary measures to reduce fish disease problems.

The government also plan to establish quarantine centers at five major entry points importing live fish. In late 1991, a quarantine center at the International Subang Airport has already started operation. The implementation of quarantine measures for live fish imports can also assist in checking the spread of diseases in the country.

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