

Major Diseases of Brackishwater Species

Shrimp

1. **Disease Name:** Necrosis of appendages

Species General Name: Tiger Shrimp **Species Scientific Name:** *Penaeus monodon*

Symptoms: The tips of walking legs, swimmerets and uropods undergo necrosis and become brownish black. The setae, antennae and appendages may be broken and melanized.

Cause: The epibiotic bacteria such as *Vibrio* spp., *Pseudomonas* spp., *Aeromonas* spp. and *Flavobacterium* spp.

Diagnosis: Based on gross signs and symptoms

Prevention: Maintain good water quality. Stock shrimp at optimum density. Avoid unnecessary handling of the shrimps, which may lead to injuries and necrosis.

Control: Induce moulting by applying 5-10 ppm teaseed cake.

Data Source: *Shrimp Diseases, Their Prevention and Control, CIBA Bulletin-3 (1995)*

Photo: Dr. S.V. Alavandi, Senior Scientist, AAHED



2. **Disease Name:** Monodon Type Baculovirus (MBV)

Species General Name: Tiger Shrimp **Species Scientific Name:** *Penaeus monodon*

Symptoms: Shrimps lethargic with surface and gill fouling. The virus affects all life stages. Disease severe in postlarvae and senescent adults. High cumulative mortalities.

Cause: Type A Baculovirus

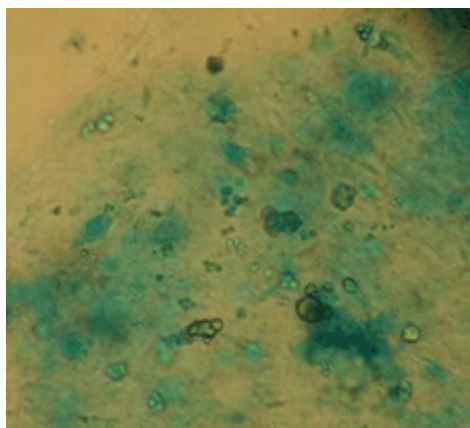
Diagnosis: Tentatively diagnosed by microscopic demonstration of single or multiple spherical intranuclear occlusion bodies in fresh squash preparations of hepatopancreas under phase contrast microscope or by staining with 0.1% malachite green (darkly stained intr

Prevention: Use MBV free stock for culture purpose. MBV infections are well tolerated by *P. monodon* until the environmental conditions are not hostile. Hence, it is essential to maintain good water quality by increased water exchange in order to minimise risks of s

Control: Not known. Destroy affected shrimp by burning or burying them after mixing with lime away from the culture facility.

Data Source: *Shrimp Diseases, Their Prevention and Control, CIBA Bulletin-3 (1995)*

Photo: Dr. S.V. Alavandi, Senior Scientist, AAHED



3. **Disease Name:** White Spot Disease (WSD)

Species General Name: Tiger Shrimp **Species Scientific Name:** *Penaeus monodon*

Symptoms: Infected shrimps show generalized signs of disease such as rapid reduction in feed consumption, and during the initial stages of infection, minute white spots of up to 2mm diameter appear on the head (cephalothorax) and tail. Subsequently they spread all

Cause: White-spot syndrome is caused by a double stranded DNA virus, called as white-spot virus (WSV) or white-spot syndrome baculovirus (WSSB) complex or systemic ectodermal and mesodermal baculovirus (SEMBV).

Diagnosis: WSD can be presumptively identified by microscopic examination of tissue impression smears stained by Geimsa's stain. These preparations reveal extensive damage and presence of viral inclusions in the cuticular epidermis, gills, lymphoid organ and gut wa

Prevention: So far, no control measures are known. Only integrated management involving quarantine, routine screening of shrimp for viral infection and good husbandary practice could avoid the disease. Infected stock must be properly disposed by incineration or buryi

Data Source: *Shrimp Diseases: Symptoms, Causes, Diagnosis, Prevention and Contro, CIBA Extension Series No.19 (2000)l*

4. **Disease Name:** Infectious Hepatopancreatic and Lymphoid Organ Necrosis (IHLN)

Species General Name: Tiger Shrimp **Species Scientific Name:** *Penaeus monodon*

Symptoms: The infected shrimps exhibited light pinkish to yellowish discolouration of the cephalothorax region and were most often associated with fouling by ciliate protozoa such as *Zoothamnium*. The hepatopancreas of affected shrimp was highly decayed (necrotic) a

Cause: The primary cause of the disease is attributed to viral etiology

Diagnosis: Presumptive diagnosis of IHLN could be achieved based on the gross clinical signs and symptoms and confirmed by histopathological examination. The hepatopancreas shows multifocal necrosis, marked by haemocytic infiltration and encapsulation resulting in

Prevention: Although viral etiology was the primary cause of the disease, secondary bacterial infection and environmental degradation caused mass mortality of shrimp in the affected ponds. Some of the water quality parameters such as total suspended solids, chemical

Data Source: *Shrimp Diseases: Symptoms, Causes, Diagnosis, Prevention and Contro, CIBA Extension Series No.19 (2000)l*

5. **Disease Name:** Hepatopancreatic parvo-like virus (HPV) disease

Species General Name: Tiger Shrimp **Species Scientific Name:** *Penaeus monodon*

Symptoms: Affected shrimps show generalized signs of disease such as reduced feeding, poor growth rate, body surface and gill fouling with ciliates, occasional opacity of abdominal muscles, and atrophy of hepatopancreas.

Cause: HPV is caused by a small (22-24nm size) DNA virus.

Diagnosis: HPV can be diagnosed by histopathological demonstration of single prominent basophilic (pinkish) intranuclear inclusion bodies in the hypertrophied hepatopancreatic tubule epithelial cells by haematoxylin and eosin staining method. The host cell chromatin

Prevention: HPV infection could be avoided by quarantine and screening for pathogen.

Control: No control measures are known.

Data Source: *Shrimp Diseases: Symptoms, Causes, Diagnosis, Prevention and Control, CIBA Extension Series No.19 (2000)*

6. **Disease Name:** Systemic vibriosis

Species General Name: Tiger Shrimp **Species Scientific Name:** *Penaeus monodon*

Symptoms: Infected shrimps show opaque Abdominal musculature, pale gill filaments, melanised (black) ventrolateral edges of the carapace, flared up gill covers (branchiostegites) popularly known as German helmets, blisters on the shell, brownish to black cuticular

Cause: Systemic vibriosis can be caused by bacteria such as *Vibrio alginolyticus*, *V. parahaemolyticus*, *V. anguillarum*, *V. vulnificus*, *V. damsella*, *V. fluvialis* and *V. mimicus*

Diagnosis: Diagnosis of vibriosis is usually based on gross clinical signs and symptoms and confirmed by isolation of bacteria by microbiological techniques. Haemolymph of affected shrimp contains numerous bacteria and upon culture, yield *Vibrio* spp. on the culture

Prevention: Maintenance of good water quality to reduce bacterial counts in the culture system will be of immense help in reducing incidence of bacterial infection in hatcheries and culture ponds. However, methods employed to obtain quality water in the culture p

Data Source: *Shrimp Diseases: Symptoms, Causes, Diagnosis, Prevention and Contro*, CIBA Extension Series No.19 (2000)l

7. **Disease Name:** Luminescent bacterial disease

Species General Name: Tiger Shrimp **Species Scientific Name:** *Penaeus monodon*

Symptoms: Eggs, larvae, post-larvae, juveniles and adults of shrimps may suffer from luminescent bacterial disease. Affected shrimp larvae become weak and opaque and exhibit greenish bioluminescence under darkness. The luminescent bacterial disease may lead to com

Cause: Luminescent bacteria such as *Vibrio harveyi* and *V. splendidus*.

Diagnosis: The disease can be diagnosed based on gross signs and symptoms. Microscopic examination of infected larval shrimp would reveal large number of swarming bacteria in the haemocoel. Bacteria could be readily isolated on common culture media, such as Zobell'

Prevention: Daily exchange of 80-90% water in the hatchery and maintenance of good water quality by physical or chemical methods will help in reducing bacterial counts and incidence of bacterial infection. The hatchery facilities must be disinfected. Disinfection

Data Source: *Shrimp Diseases: Symptoms, Causes, Diagnosis, Prevention and Contro, CIBA Extension Series No.19 (2000)*

8. **Disease Name:** Larval mycosis

Species General Name: Tiger Shrimp **Species Scientific Name:** *Penaeus monodon*

Symptoms: Infected eggs do not hatch. The eggs and larvae are weak and appear whitish. Mortalities may reach 100% within two days. Upon infection, the fungal mycelium replaces the larval tissues and ramifies into all parts of the body and protrudes out of the body

Cause: Larval mycosis is caused by filamentous fungi of genus *Lagenidium* spp. and other filamentous fungi such as *Saprolegnia* spp. and *Haliphthoros* spp. are also often associated in cases of larval mycosis.

Diagnosis: The fungus can be identified by microscopic examination of affected protozoa and mysis stages, which would reveal filamentous fungal mycelia in the body cavity of affected larvae. Fungi could be identified depending upon the morphology of discharge tube,

Prevention: General hatchery management practices such as use of UV sterilised and filtered seawater, adequate water exchange, etc. must be strictly adhered to. Use of antifungal agents during infection should be discouraged. Rearing water, equipment used in the hatchery

Data Source: *Shrimp Diseases: Symptoms, Causes, Diagnosis, Prevention and Control, CIBA Extension Series No.19 (2000)*

9. **Disease Name:** Protozoan fouling

Species General Name: Tiger Shrimp **Species Scientific Name:** *Penaeus monodon*

Symptoms: Mild infestations usually do not harm the shrimp. Heavily infested shrimps are restless, appear near the surface and periphery of the pond and show generalized signs of disease such as lethargy, lack of appetite and occasional opacity of abdominal muscle

Cause: The most common ciliate fouling is caused by *Zoothamnium* spp. other protozoa such as *Vorticella* spp., *Epistylis* spp., *Acineta* spp. etc. are also often involved in epibiotic fouling especially in culture facilities that are poorly managed.

Diagnosis: Microscopic examination of shrimp larvae or scrapings from exoskeleton or wet mount preparations of gills of cultured shrimp reveal the identity of protozoa.

Prevention: Treatment with 15 to 20 ppm of formalin for 5 to 10 days depending on the extent of fouling and efficacy is usually advocated in ponds. However, primary cause of fouling must be understood before the treatment. In hatchery tanks, 25 to 250 ppm formalin t

Data Source: *Shrimp Diseases: Symptoms, Causes, Diagnosis, Prevention and Contro, CIBA Extension Series No.19 (2000)*

10. **Disease Name:** Microsporidiosis (Cotton shrimp disease or milk shrimp disease or cooked shrimp or roe shrimp)

Species General Name: Tiger Shrimp **Species Scientific Name:** *Penaeus monodon*

Symptoms: Infected shrimps appear opaque and cooked. Gradual and low levels of mortalities are observed in the affected ponds. Microsporida invade and replace host tissues such as gills, muscles, heart, gonads and hepatopancreas, and cause necrosis of the infected t

Cause: Microsporida such as *Thelohania* spp., *Nosema* spp., and *Pleistophora* spp.

Diagnosis: Microsporidial infection can be diagnosed by demonstration of microsporidian spores in the affected tissues by simple tissue impression smears under the microscope. Geimsa stained preparations also reveal the microsporidia upon microscopic examination.

Prevention: Not Known

Control: Not known

Data Source: *Shrimp Diseases: Symptoms, Causes, Diagnosis, Prevention and Contro, CIBA Extension Series No.19 (2000)l*

11. **Disease Name:** Soft-shell syndrome

Species General Name: Tiger Shrimp **Species Scientific Name:** *Penaeus monodon*

Symptoms: The soft-shelled shrimps are weak, usually off-feed, have a loose thin exoskeleton. However, the rostrum of these shrimp is stiff as in the healthy shrimp. Wavy undulating intestine is clearly visible in the white shrimp (*P. indicus*)

Cause: The exact cause of soft-shell syndrome is not known. However, low saline conditions in the culture pond and the deteriorating pond bottom conditions are some of the physico-chemical factors that are reported as causative factors for the disease in the wh

Diagnosis: Diagnosis of the disease is based on gross signs of disease.

Prevention: Low stocking density, feeding with high quality feed and frequent water exchange are likely to reduce the recurrence of the disease.

Data Source: *Shrimp Diseases: Symptoms, Causes, Diagnosis, Prevention and Contro, CIBA Extension Series No.19 (2000)l*

Crab

1. Disease Name: Acorn Barnacles

Species General Name: Mud crab **Species Scientific Name:** Scylla sp.

Symptoms: The acorn barnacles are found attached over the carapace, walking legs and chelipeds of adult mud crabs caught from the sea, while the goose barnacles (cirripeds) are known to infect the gill regions of the crabs collected from estuarine and marine regions

Data Source: Mud Crab Culture in India, CIBA Bulletin 17 (2004)

Finfish

Pearl Spot

1. Disease Name: Skin spottiness

Species General Name: Pearl Spot **Species Scientific Name:** *Etroplus suratensis*

Symptoms: Shallow to deep sores with fluid and/or blood and weak movements.

Cause: Caused by *Vibrio fischeri*

Control: Terramycin. Along with feed, at rate of 75 mg/kg body weight for 7-21 days

Data Source: *Biology, Fishery, Culture and Seed Production of the Pearl Spot Etroplus Suratensis (Bloch) - CIBA Bulletin No.7 (1995)*

2. **Disease Name:** Vibriosis

Species General Name: Pearl Spot **Species Scientific Name:** *Etroplus suratensis*

Symptoms: Erythema of the skin and fins, petachiae in the mouth, swimming at water surface, body darkening, abdominal distension, corneal opacity, anorexia, pale gills, enlarged or liquified spleen and kidney & myocardial lesions

Cause: Caused by *Vibrio anguillarum*

Control: Terramycin/Chloromycin. Along with feed, at rate of 75 mg/kg body weight for 7-21 days.

Data Source: *Biology, Fishery, Culture and Seed Production of the Pearl Spot Etroplus Suratensis (Bloch) - CIBA Bulletin No.7 (1995)*

3. **Disease Name:** Gill rot

Species General Name: Pearl Spot **Species Scientific Name:** *Etroplus suratensis*

Symptoms: Isolated movements, anorexia, restlessness, floating at surface, orientation against current, gill tissue decay.

Cause: Caused by *Klebsiella pneumoniae*

Control: Nifurpirinol. 1-10 mg of drug in a litre of water as one hour bath for 7-21 days.

Data Source: *Biology, Fishery, Culture and Seed Production of the Pearl Spot Etroplus Suratensis (Bloch) - CIBA Bulletin No.7 (1995)*

4. Disease Name: Tail rot

Species General Name: Pearl Spot **Species Scientific Name:** *Etroplus suratensis*

Symptoms: Loss of natural colour, fraying of tail/fin tissue, swimming near water surface. Ecchymosis may be noticed.

Cause: Caused by *Proteus vulgaris*

Control: Acriflavin. Bath in 1-5 mg of drug in litre of water for 7-21 days
(Nifurpirinol may be used)

Data Source: *Biology, Fishery, Culture and Seed Production of the Pearl Spot Etroplus Suratensis (Bloch) - CIBA Bulletin No.7 (1995)*

5. Disease Name: Fin rot

Species General Name: Pearl Spot **Species Scientific Name:** *Etroplus suratensis*

Symptoms: Loss of natural colour, fraying of tail/fin tissue, swimming near water surface. Ecchymosis may be noticed.

Cause: Caused by *Pseudomonas stutzeri*

Control: Acriflavin. Bath in 1-5 mg of drug in litre of water for 7-21 days
(Nifurpirinol may be used)

Data Source: *Biology, Fishery, Culture and Seed Production of the Pearl Spot Etroplus Suratensis (Bloch) - CIBA Bulletin No.7 (1995)*

6. Disease Name: Hemorrhagic septicemia

Species General Name: Pearl Spot **Species Scientific Name:** *Etroplus suratensis*

Symptoms: Body reddening, skin lesions, swollen belly, septicemia, protruding scales and sunken eyes, inflamed anus, spleen and swim bladder and anemia.

Cause: Caused by *Pseudomonas aeruginosa*

Control: Genatamycin. Along with feed, 75 mg/kg body weight for 7-21 days.

Data Source: *Bulletin No.7 (1995)*

7. Disease Name: Enteritis

Species General Name: Pearl Spot **Species Scientific Name:** *Etroplus suratensis*

Symptoms: Enteritis, Sluggish movements, skin lesions, discolouration, swimming near surface, kidney infected.

Cause: Caused by *Escherichia coli*

Control: Sulphadiazine, Sulphizoxazole. Along with feed, 75 mg/kg body weight for 7-21 days.

Data Source: *Bulletin No.7 (1995)*

8. Disease Name: Mycobacteriosis

Species General Name: Pearl Spot **Species Scientific Name:** *Etroplus suratensis*

Symptoms: Progressive body weakening, damaged fins, swelling of abdomen, anorexia, discoloration, deformities in skeletal system, sluggish movement, opacity in cornea, listlessness, presence of tubercles.

Cause: Mycobacterium sp.

Control: Kanamycin, Gentamycin. Along with feed 75 mg/kg body weight for 7 to 21 days.

Data Source: *Bulletin No.7 (1995)*

Seabass

1. Disease Name: Lymphocystis Disease

Species General Name: Seabass **Species Scientific Name:** *Lates calcarifer*

Symptoms: Clusters of shining nodules on skins, gills and fins, lethargy, not lethal in adults

Cause: Irido virus (icosahedral, 130-330 nm)

Diagnosis: N.A.

Prevention: N.A.

Control: None Reported

Data Source: *Training Manual on Seabass Seed Production and Culture, CIBA Special Publication-8 (2003)*

2. **Disease Name:** Bacterial Infection

Species General Name: Seabass **Species Scientific Name:** *Lates calcarifer*

Symptoms: Loss of appetite, lethargy, hemorrhagic spots on body surface, fin and tail rot, Heavy mortality fin (caudal, dorsal) and gill rot, sloughing of muscles, skins and fins, ulcerative and necrotic lesions, may cause 100% mortality

Cause: Caused by *Vibrio* sp., *Vibrio parahaemolyticus*, *V. alginolyticus*, *V. anguillarum*, *Pseudomonas* spp., *Pasteurella* spp., Myxobacterial infection (columnaris disease): *Flexibacter* spp.

Control: Oxytetracycline, Nitrofurazone, Quinolones, Nitrofurans, Tetracyclines

Data Source: *Training Manual on Seabass Seed Production and Culture, CIBA Special Publication-8 (2003)*

3. Disease Name: Viral Nervous Necrosis (VNN)

Species General Name: Seabass **Species Scientific Name:** *Lates calcarifer*

Symptoms: Loss of balance, abnormal swimming, lethargy and anorexia, extensive vacuolation of brain and retina , 90% mortality

Cause: Noda virus (icosahedral, 20-30 nm)

Prevention: Prevention by disinfecting the fish eggs using iodine and rinsing with filtered sea water

Data Source: *Training Manual on Seabass Seed Production and Culture, CIBA Special Publication-8 (2003)*

4. Disease Name: Cytophaga maritimus, C. columnaris, Streptococcosis

Species General Name: Seabass **Species Scientific Name:** *Lates calcarifer*

Symptoms: Lethargy, abnormal swimming, hemorrhagic cornea, exophthalmia

Cause: Caused by Streptococcus sp.,

Control: Tetracycline

Data Source: *Training Manual on Seabass Seed Production and Culture, CIBA Special Publication-8 (2003)*

5. Disease Name: Parasitic Disease - Trichodiniasis

Species General Name: Seabass **Species Scientific Name:** *Lates calcarifer*

Symptoms: Ectoparasite on gills and skin

Cause: Trichodinina spp.

Control: Formalin and Acriflavin bath

Data Source: *Training Manual on Seabass Seed Production and Culture, CIBA Special Publication-8 (2003)*

6. Disease Name: White spot disease

Species General Name: Seabass **Species Scientific Name:** *Lates calcarifer*

Symptoms: Ectoparasite on gills and skin, whitish or grayish spots on the skins or gills

Cause: Caused by Cryptocaryon spp.

Control: Formalin

Data Source: *Training Manual on Seabass Seed Production and Culture, CIBA Special Publication-8 (2003)*

7. Disease Name: Velvet disease

Species General Name: Seabass **Species Scientific Name:** *Lates calcarifer*

Symptoms: White spots on skin and gills, tissue necrosis, abnormal swimming

Cause: Caused by *Amyloodinium ocellatum*

Control: Copper sulfate

Data Source: *Training Manual on Seabass Seed Production and Culture, CIBA Special Publication-8 (2003)*

8. Disease Name: Worm Infestation - Monogeneans

Species General Name: Seabass **Species Scientific Name:** *Lates calcarifer*

Symptoms: On gills, on skin, heavy mortality.

Cause: Diplectanum spp., Gyrodactylus spp.

Control: Formalin

Data Source: *Training Manual on Seabass Seed Production and Culture, CIBA Special Publication-8 (2003)*

9. Disease Name: Worm Infestation - Digeneans

Species General Name: Seabass **Species Scientific Name:** *Lates calcarifer*

Symptoms: Skin, fins, muscles, retraded growth

Cause: *Bucephalus* sp., *Lecithochirium* sp., *Pseudometadena celebesensis*,
Proisorhynchus sp.,

Data Source: *Training Manual on Seabass Seed Production and Culture, CIBA
Special Publication-8 (2003)*

10. Disease Name: Crustacean infections - Caligus spp.

Species General Name: Seabass **Species Scientific Name:** *Lates calcarifer*

Symptoms: Gills, skins and oral cavity, Hemorrhagic/ulcerated

Control: Neguvon

Data Source: *Training Manual on Seabass Seed Production and Culture, CIBA Special Publication-8 (2003)*

11. Disease Name: Crustacean infections - Ergasilus sp.

Species General Name: Seabass **Species Scientific Name:** *Lates calcarifer*

Symptoms: On gills and body surface, Necrotic gills

Prevention: Dipterex

Data Source: *Training Manual on Seabass Seed Production and Culture, CIBA Special Publication-8 (2003)*

12. Disease Name: Viral nervous necrosis (VNN), Viral encephalopathy and retinopathy (VER)

Species General Name: Seabass **Species Scientific Name:** *Lates calcarifer*

Symptoms: Disease of larval, juvenile and some times older fish showing a variety of swimming behaviour. Symptoms appear in larvae at 18-21 day post hatch. Usually darker in colour, lethargic showing abnormal and corkscrew like swimming. Loss of balance and belly

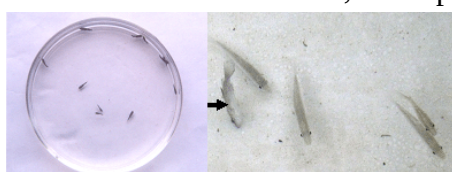
Cause: Piscine nodavirus (Family: Nodaviridae; Genus: Betanodavirus) - non-enveloped, icosahedral to spherical ssRNA virus of 25-30 nm in diameter. The virus is highly resistant to various environmental conditions and can survive for long time in seawater.

Diagnosis: Presumptive diagnosis is made by gross observations of symptoms and histopathology. Extensive vacuolation in the brain, retinal layer of eye and spinal cord are most prominent in H&E stained slides. Isolation of the virus in efficient cell lines like SSN-

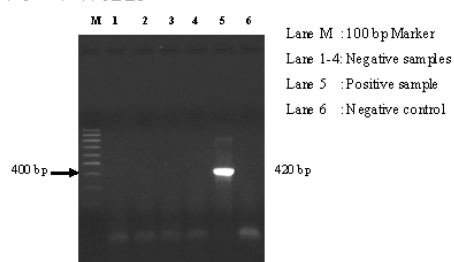
Prevention: Screening the intended brooders for betanodavirus during quarantine, screening spawners prior to production cycle and disinfection of fertilised eggs using iodine can significantly prevent a disease incident in the hatchery. Being hygienic and vigilant no

Control: No treatment for the disease. Being hygienic around the hatchery/farm facilities is the best policy to control the virus outbreak. Early diagnosis of disease can resist a significant loss through better management practices. Complete disinfection of hatch

Photo: Dr.K.P. Jithendran, Principal Scientist, AAHED



Darkening of post larvae and typical erratic swimming of juvenile seabass



Agarose gel electrophoresis showing VNN specific nested (RT) PCR amplicon of 420 bp from asymptomatic seabass fingerling.

13. Disease Name: Parasitic Infections

Species General Name: Seabass **Species Scientific Name:** *Lates calcarifer*

Symptoms: Behavioral changes like congregation and blackening of the body, excessive mucus production on gill/body surface, laboured breathing, darting movement and rubbing to the surface are some indicative signs of parasitic infection. Shown high prevalence durin

Cause: All major groups of animal parasites are found in fish. Parasites with direct life cycles can be important pathogens of cultured fish. Parasites with indirect life cycles frequently use fish as intermediate hosts. The most common group of parasites in sea

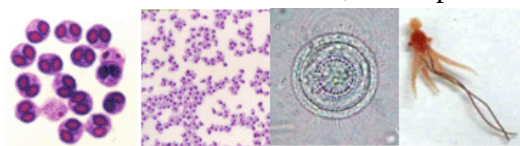
Diagnosis: Gross and/or microscopic examination of fresh smears that contain living parasite is diagnostic.

Prevention:

Control: For controlling ectoparasites treatment with 50-250 ppm formalin for 30 min. to two hrs depending upon the age and condition of the host fish. Organophosphorus pesticide, Dichlorvos @ 1ppm for 1 hour is also being used. Creating a confined microenvironmen

Data Source:

Photo: Dr.K.P. Jithendran, Principal Scientist, AAHED



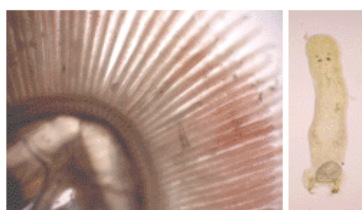
Myxobolus sp. *Glugea* sp. *Trichodina* sp. *Lernanthropus*



Seabass juvenile fish affted with parasites



Gyrodactylus sp. *Dactylogyrus* sp



Diplectanum sp. from the gills of *Lates calcarifer*