

Types	Symptoms	Prevention/Control measures
<b>A.Parasitic Diseases</b>		
<b>1. Argulosis</b>	Infected fish shows erratic swimming behavior, parasite is visible with naked eye and ulceration is seen at the attachment site. Copious mucus is produced, fish lose appetite, normal growth is retarded.	<ul style="list-style-type: none"> <li>➤ Application of malathion @ 0.25-0.5ppm, 3-4times at weekly interval.</li> <li>➤ Dip treatment in 1% Malathion.</li> <li>➤ Apply potash (KMnO<sub>4</sub>) to the infected fish pond@ 4mg/lit. of water.</li> <li>➤ Bath treatment for 5-10 minutes in 2.5-3% salt solution.</li> <li>➤ Cleaner @30ml/bigha water spread area.</li> <li>➤ Use hard substrates (planks/bamboo) in pond water for attachment of eggs of <i>Argulus</i>. Remove at interval and get sun dried to kill the eggs.</li> </ul>
<b>2. Lerneosis</b>	Fish become restless, parasites penetrate into the scale and attach to the nostril; keep hanging from the body with egg sac; clearly visible to the naked eye and attachment site shows ulceration.	<ul style="list-style-type: none"> <li>➤ Dip treatment of DDT @ 10ppm for 30 seconds or NaCl @ 3-5% short bath.</li> </ul>
<b>3. Black spot disease</b>	Black ovoid patches are visible on the body surface and then are pigmented overlying cysts of the metacercarial larvae. Number of cysts may be few to hundreds.	<ul style="list-style-type: none"> <li>➤ Removal of the resident molluscan population and aquatic birds around it.</li> <li>➤ Use of molluscides.</li> </ul>

<p><b>4. Trichodiniasis</b></p>	<p>Greyish blue veil like coating over the body surface and gills, colour of the gills turns pale, becomes sluggish and shows asphyxia.</p>	<ul style="list-style-type: none"> <li>➤ Application at a concentration of 2-3% solution of sodium chloride (salt) bath till the fishes is stressed.</li> <li>➤ Application of Formalin @ 15-25ml/L in pond water, in morning hours.</li> </ul>
<p><b>5. White spot disease (Ich)</b></p>	<p>Presence of small whitish cysts on the skin, gills and fins. Hyperplasia of epidermal cells around the site of infection. Reddish color of gills fades away. Fish becomes very weak and emaciated.</p>	<ul style="list-style-type: none"> <li>➤ One hour dip treatment in 2% NaCl solution for more than 7 days.</li> <li>➤ Destroy the infected fish either by burning or digging in soil.</li> <li>➤ Maintenance of water pH above 6.5 and dissolved oxygen above 5 ppm automatically save the fish stock from infection.</li> </ul>
<p><b>6. Gyrodactylosis/ Dactylogyrosis</b></p>	<p>Gills colour fade, dropping of scales. Affected fishes are restless.</p>	<ul style="list-style-type: none"> <li>➤ Bath for 3-5 minutes in 200-250 ppm formalin.</li> <li>➤ Application of KMnO<sub>4</sub> in pond water @ 5 ppm.</li> <li>➤ Bath in 10 ppm KMnO<sub>4</sub> for 1-2 hours.</li> </ul>
<p><b>B. Bacterial Diseases</b></p>		
<p><b>1. Fin rot and tail rot disease</b></p>	<p>Whitening on the outer margin of the fin that progress towards the base. Lesions develop on the outer margin of the fin. Fin margin becomes frayed due to disintegration of the soft rays.</p>	<ul style="list-style-type: none"> <li>➤ Treat pond water with KMnO<sub>4</sub> @ 5ppm.</li> <li>➤ Sulfonamide to be fed @ 3g/kg feed for 12-19 days.</li> <li>➤ Oxytetracyclin to be fed @50-75mg/fish/day for 10-12 days or incorporate 1.8 g per Kg feed and fed for 10-12 days.</li> </ul>

<p><b>2. Haemorrhagic septicaemia</b></p>	<p>Red hemorrhagic spots on the body surface. Dropsy, glisters, abscesses and scale protrusion. Oozing of blood through base of the anal fin.</p>	<ul style="list-style-type: none"> <li>➤ Application of <math>\text{KMnO}_4</math> in pond at the rate of 1ppm.</li> <li>➤ Bath treatment for 15-30 seconds in 2.5% NaCl solution.</li> <li>➤ Liming of the pond based on <math>\text{p}^{\text{H}}</math>.</li> </ul>
<p><b>3. Dropsy</b></p>	<p>Accumulation of fluid in epidermis and body cavity leading to bulging of belly. Scales protrude out from pockets. Prevailing severe anemic condition.</p>	<ul style="list-style-type: none"> <li>➤ Treatment of pond water with <math>\text{KMnO}_4</math> @ 1-3 ppm.</li> <li>➤ Liming of the pond.</li> </ul>
<p><b>4. Eye Disease of Catla</b></p>	<p>The eye looks reddish due to vascularisation and subsequently turns milky white and becomes opaque. Protrusion of eyeballs is observed.</p>	<ul style="list-style-type: none"> <li>➤ Treat the pond with <math>\text{KMnO}_4</math> @ 4-5ppm in pond water as chemotherapeutic measures or 1 ppm in pond as prophylactic measures.</li> <li>➤ Liming is necessary in pond according to the <math>\text{p}^{\text{H}}</math>.</li> </ul>
<p><b>5. Ulcer Disease</b></p>	<p>Initially small pimple like reddish areas appear on the body surface and later ulcer formation takes place.</p>	<ul style="list-style-type: none"> <li>➤ <math>\text{KMnO}_4</math> @ 4-5ppm in the pond water.</li> <li>➤ Liming is necessary in pond according to the <math>\text{p}^{\text{H}}</math>.</li> </ul>
<p><b>C. Fungal Diseases</b></p>		
<p><b>1. Saprolegniasis (Cotton Wool Disease)</b></p>	<p>The pathogen grows over any necrotic tissue of the host imparting a cotton wool like appearance. White to brown cotton like growth consisting of fungal mycelium which appear as small to large</p>	<ul style="list-style-type: none"> <li>➤ The water surface should be sprayed with 0.15 ppm of malachite green. The treatment is repeated 3 times at interval of 3 days.</li> <li>➤ Treatment of pond water with 20-24 ppm of Potassium dichromate.</li> </ul>

	patches on various parts of the body like fins, gills, mouth, eyes or muscle.	<ul style="list-style-type: none"> <li>➤ Dip treatment with 3% common salt solution.</li> </ul>
<b>2. Epizootic Ulcerative Syndrome</b>	Small haemorrhagic spots over the body which ultimately turns into big ulcers of the size of a coin with sloughing of scales and degeneration of epidermal tissue. All individuals of fish species get infected at a time within a very short period. Outbreak mostly takes place during winter.	<ul style="list-style-type: none"> <li>➤ Maintenance of water pH at around 8.0 steadily throughout the winter season.</li> <li>➤ Temporary suspension of manuring and fertilization during outbreak.</li> <li>➤ Disinfection of pond water with <math>\text{KMnO}_4</math> @1.0ppm</li> <li>➤ Dip treatment if 500ppm <math>\text{KMnO}_4</math> to the highly infected fishes.</li> <li>➤ Dilution of 130ml "CIFAX" and spread over one bigha water surface.</li> <li>➤ Dip treatment of infected fish @3-4% common salt and release immediately</li> </ul>
<b>3. Gill rot disease</b>	Gasp for air at the surface water. Yellow brownish discoloration of the gill filaments which at a later stage becomes grayish white and may finally drop off altogether leaving cartilaginous support exposed.	<ul style="list-style-type: none"> <li>➤ Application of Copper Sulphate @ 12kg/ha subdivided into 4 doses or @0.1ppm 2-4 times at weekly interval.</li> <li>➤ Application of lime @ 10kg/bigha in affected pond.</li> <li>➤ Drain the affected pond and sundry and apply lime at the bottom.</li> <li>➤ Sodium Chloride (NaCl) bath of the affected fishes @ 3-5% for 1-2 min.</li> </ul>
<b>D. Occasional Diseases</b>		
<b>1. Acidosis/ Alkalosis</b>	A brown coating on the gills, consisting of necrotic epithelium. The tips of filaments are particularly	<ul style="list-style-type: none"> <li>➤ <math>\text{pH}</math> adjustment usually by judicious application of lime.</li> </ul>

	affected. The coating becomes thicker as exposure goes on, but eventually breaks up and sloughs off. The skin assumes a muddy appearance and shed layers of thick mucus.	
<b>2. Leech</b>	Weaken the small fishes. Mechanical injury at the site of attachment. Haemorrhagic conditions on the body surface. Sunken eyes of the affected fish.	<ul style="list-style-type: none"> <li>➤ Drying and disinfection of the leech infested pond by application of lime. While drying care must be taken not to leave any moist patches on the pond bed.</li> <li>➤ Application of Lysol @ 2ppm in affected pond.</li> <li>➤ Application of CaO into the pond water.</li> </ul>
<b>3. Gas bubble disease</b>	Tiny bubbles at the periphery of eyes, near the scales and on the gills. The abdomen gets swollen like dropsy.	<ul style="list-style-type: none"> <li>➤ Stop application of fertilizers and feeding immediately.</li> <li>➤ Stop any mechanical aeration instrument.</li> <li>➤ Affected fish should be transferred to a nearby pond.</li> </ul>
<b>4. Algal toxicosis</b>	Surfacing of fish with erratic movement and cause mortality in many cases due to clogging of gills.	<ul style="list-style-type: none"> <li>➤ <math>\text{CuSO}_4</math> @ 0.5ppm in pond in acidic water and 1.0 ppm in pond in alkaline water or cowdung @ 200kg/ha sprinkled over the surface.</li> </ul>
<b>5. Asphyxiation</b>	Fishes gasp for air at the surface water. Such a situation occurs particularly during the period proceeding dawn and immediately after sun set. It can occur at any time during continuous cloudy weather or after a short heavy rainfall.	<ul style="list-style-type: none"> <li>➤ Spraying water over the water surface of the pond by using water pump. Where such action is not possible, the surface of the pond water should be agitated to facilitate oxygen uptake.</li> <li>➤ Removal of excessive decayed or half decayed organic matter and aquatic weeds.</li> <li>➤ If the population density is high, immediately partial harvesting is suggested.</li> </ul>

		➤ If the situation occurs due to abundant algal bloom, the bloom should be removed immediately by netting or using barrier.
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**In case of any disease outbreak or health related hazards, departmental officers in the districts or any other technical persons should be contacted.**

**Farmers may also directly contact at the following address for disease related matters under "National Surveillance Programme for Aquatic Animal Diseases":**