

Common Freshwater Fish Diseases, Their Symptoms and Control Measures :

Types	Symptoms	Control measures
A. Parasitic diseases		
1. Whirling disease	Excessive secretion of mucus and weakness, rapid tail chasing & in advanced stages head, gill, etc. may be deformed.	Application of Calcium Cyanamide (NCN ₂ Ca) jaw, at the rate of 0.2 kg/ m ² at the infected pond bottom and side after dewatering is required. If draining is possible, after draining the pond water remove the pond bottom mud then lime at the rate of 200- 250 kg/ha area can be applied to the drained pond bottom and the allowed to dry for 2 weeks to eradicate the parasites completely. After eradication of the parasite restocking is in the pond is done.
2. Trypanosomiasis (Piscine sleeping sickness)	Infected fish suffers from slack, sickness. Fishes are sluggish, anemic with pale gill & skin.	Prevention is by controlling the intermediate host the leech etc into the pond. Leech can be controlled by dipping fishes into common salt (NaCl) or copper sulphate (CuSO ₄) solution.
3. Costiasis	Costia causes dullness of skin & gills. Infected fish become restless, secrete excessive mucus & shows comparatively big head.	To avoid the incidence of costiasis proper feeding & maintenance of water quality is required. Therapeutic bath with formaline 0.2-0.3 ml/lit and combination of 0.1 mg/lit of malachite green with 15 mg/ lit. formaline is found effective.
4. Ich. Disease (White spot disease)	White spot seen on the skin, gill, fins, and cornea of the infected fish. If the infection is heavy then fish become restless and gasping air at the water surface. Infected fish reacts by rubbing their body against pond bottom and side.	Pond treatment with malachite green at a concentration of 0.1mg/ lit. or with formalin at a concentration of 15 mg/lit for once or twice or thrice on need basis. Maintenance of water P ^H above 6.5 and dissolved oxygen level at 5 ppm or above automatically save the fish stock from infection.
5. Trichodiniasis	Infected fish becomes restless, lethargic, loss body weight and body colour becomes dull with excessive mucus secretion.	Short bath in formalin at a concentration of 200-300 ml/ m ³ for half an hour. (or) Apply common salt (NaCl) at a concentration of 0.15- 0.20% for 1- 2 days to the infected pond. (or) Apply lime to the infected fish pond at the rate of 200- 300 kg/ ha with repetition at an interval of 7 days.
6. Chillodonella infection	Infected fish becomes irritable, Jump clear of the	Give short bath with potassium permanganate (KMnO ₄)for 10-

	water, slowly becomes week and unresponsive. Bluish green mucus occurs on the skin.	15 (KMnO ₄)for 10- 15 of 50 mg/lit.
7. White scale spot disease	Scale and body surface are covered with white cysts, effected fish become lethargic.	Apply lime at the rate of 250-300kg/ ha. Along with liming give bath treatment with common salt(NaCl) at the concentration of 3- 5%.
8. Dactylogyrosis	Infected fish shows – erratic swimming, appearance of local lesions, pale gill colour, excessive mucus secretion, falling of scales, rubbing of body against any submerged objects, etc.	Apply lime at the rate of 250-300 kg/ ha. Apart from liming give dip treatment in common salt (NaCl) solution at the concentration of 5%.
9. Gyrodactylus	The skin of fish becomes spotted dark and covered with bluish gray mucus layer. When it attacks on the fin the fin rays are left. In case of gill infection the fish swim listlessly below the water surface or they gather on the side, where they slowly suffocate, gills are spotted and filled with blood.	Draining and drying the pond for about a week is an effective method of killing gyrodactylus. Formalin bath at the concentration of 200-300 mg/lit. of water for 30 minutes may also be given.
10. Black spot disease (Digenea)	Numerous small black nodules or cysts are found all over the body.	Drain & dry the infected pond followed by application of lime at the rate of 250-300 kg/ ha can eradicate the parasite.
11. Strap worm disease (Lingulinosi)	The infected fish show sluggishness, slight distension of abdomen, surfacing, reluctant to accept feed etc.	Removing the infected fish as far as practicable is one way to control. Trichlorophon at the rate of 0.10-0.15 mg/ lit. of water can also be applied to the infected pond.
12. Blood fluke	Infected fish shows lethargic movement, reluctant to accept feed, surfacing and gasping air, etc. Infected fish gill become pale.	Remove the severely infected fish. Give the dip treatment with trichlorophon at a concentration of 1% for 2-3 minutes.
13. Namatods & Acanthocephalosis	Infected fish shows yellowish white granules on lip, skin and fins. Adult worm are detected in the intestine or the body cavity of diseased fish.	Drain & dry the infected pond followed by application of lime at the rate of 250-300 kg/ ha can eradicate the parasite.
14. Leech infection	Blood spots over the body surface, loose scale, sunken eyes, pale gills, etc. (It also act as a vector).	Apply lime at the rate of 250-300 kg/ ha.
15. Ergasilosis (Gill lice)	Mechanical damage to gill lamina, gill colour faded, can be seen through microscope under low magnification.	(1) Give dip treatment with trichlorophron in a concentration of 5 mg/lit. of water for 10- 15 minutes; (2) If the infection is heavy -

		remove the whole fish stock from the pond then dewater and dry the pond, after that remove a layer of soil of 20cm thickness from the pond bottom and then apply lime at the rate of 200-250 kg/ ha, then refilled the pond with water and introduce a new stock of fish for culture.
16. Lernaecosis (Commonly known as "Anchor worm disease")	Hook like attachment on the nostril/ head regions, fish become restless and rub against any hard substrate found in the pond due to irritation.	(1) Apply potash(KMnO ₄) to the infected fish pond at the rate of 4 mg/lit. of water. (or) (2) Give short bath treatment to the infected fish in common salt (NaCl) solution at a concentration of 2.5-3% for 5 – 10 minutes. Treated fish should be released to the pond immediately after the treatment.
17. Argulosis (Carp lice)	Infected fish shows- erratic swimming behaviour & reluctant to accept feed. Parasite is visible with naked eye and ulceration is seen at the attachment site.	(1) Apply potash(KMnO ₄) to the infected fish pond at the rate of 4 mg/lit. of water. (or) (2) Give short bath treatment to the infected fish in common salt (NaCl) solution at a concentration of 2.5-3% for 5 – 10 minutes. Treated fish should be released to the pond immediately after the treatment. (or) (3) Apply cleaner solution to the infected fish pond at the rate of 50- 100ml/ bigha water spread area. If draining is possible then lime at the rate of 200- 250 kg/ ha area can be applied to the drained pond bottom and the allowed to dry for 2 weeks to eradicate the parasites completely. After eradication of the parasite restocking is in the pond is done.
18. Isopod infection	Infected fish shows- lethargic movement & reluctant to accept feed, etc.	Same with argulosis.
B. Bacterial diseases		
19. Furunculosis	On the skin local erosion surrounded by inflamed reddish zone which gradually turns into a large deep ulcer. In acute cases protruding eyes and accumulation body fluids in the body cavity is seen.	Fed the infected fish with tetracycline with feed at the rate of 0.07 gm/ kg body weight of fish daily till the cure. Maintenance of hygienic environment helps in keeping the fish free from this disease.
20. Dropsy	Accumulation of body fluid/ water in the body cavity or in	Apply KMnO ₄ (Potash) at the rate of 4- 5 mg/ Lit. of water to

	scale pockets, scales become loose, abdomen bulge largely and pressing on it water comes out through the mouth etc.	the infected fish pond.
21. Columnaris	Lesions occur in the skin of the head region and back as well as gills.	Give dip treatment to the infected fish with copper sulphate (CuSO ₄) for 1-2 minutes at a concentration of 2 mg/ lit. This may be followed by feeding tetracycline to the infected fish along with feed at a concentration of 10-15 mg/ kg body weight of fish.
22. Tail and fin rot	Erosion and disintegration of fin and tails. As the lesion develops the outer fin margin becomes frayed and disintegration of soft tissues between fin rays starts.	Same with columnaris disease.
23. Bacterial gill disease	Infected fish shows pale swelling gill with excessive secretion of mucus. Sluggish movement, sign of asphyxiation and surfacing are other symptoms.	Bath in Potassium permanganate (KMnO ₄) at a conc. of 1-2 mg/lit. for 7 days.
24. Vibrio disease (Red boil disease)	Affected fish become swollen, dark in colour with skin lesions.	Fed the infected fish with Sulphamerazin 0.2 gm/kg body weight mixed with feed for 3 consecutive days and after an interval of 2 days repetition of same dose. (or) Fed the infected fish with Furazolidone 50-70 mg/ kg body weight mixed with feed for 10 consecutive days.
25. Mycobacterial Disease	Mostly seen in aquarium fish. Infected fish shows loss of appetite, loss of colour scales, destruction of fins, etc.	Fed the infected fish with Kanamycin sulphate at the rate of 10 mg/ kg body weight for 4-7 days.
26. Hemophilosis	Lesion is found in the infected fish on the fin between the fin rays and edges of jaw or roof of the mouth.	Fed the infected fish with Oxytetracycline at the rate of 25- 75 mg/ body weight/ day for 35-45 days.
27. Ulcer disease	Infected fish shows small pimple like reddish areas on the body surface and later develop into ulcers.	Apply KMnO ₄ (Potash) at the rate of 5 mg/ lit. of water in pond water. Along with potash treatment the sulphadiazine can be fed to the infected fish along with feed at the rate of 100 mg/ kg of feed for 100 mg/ kg of feed for 10- 12 days.
28. Re pest of freshwater eels	Infected fish body shows red blotches, later on the lesions of the skin become whitish blotches and form ulcer.	It is difficult treat, effected fish should be remove immediately and buried them. This is followed by disinfections of the effected pond after draining and

		drying.
29. Re pest of freshwater fish	Infected fish body shows cutaneous blotches which may be round, oval or elongated in shape, of whitish colouration and in some cases loss of epithelium and scales.	Same with red pest of freshwater eels.
30. Coldwater disease (Peduncle disease)	Affected fish shows typical lesion start as a small whitish or bluish spot behind the dorsal fin. From this, erosion occurs until a crater is present in the muscle.	Fed the infected fish with sulphamethazine at the rate of 100 mg/kg feed/day along with feed for 10 – 20 days.
31. Bacterial kidney disease	Externally it is difficult to detect, but in some cases there will be ill defined lesions on side of the body. Effected fish kidney shows grayish- white necrotic zones filled with purulent material.	It is difficult to control But erythromycin may be fed to the fish at the rate of 100 mg/ kg feed for 15- 20 days.
C. Viral diseases		
32. Infectious pancreatic necrosis (IPN Virus)	Affected fish are darker in colour, tail chasing, exophthalmia, abdomen and hemorrhages in ventral areas, etc.	No control effective control measures. As prophylaxis providing optimum feed and maintenance of hygienic environment.
33. Viral haemorrhagic Septicaemia (VHS)	The infected fish is characterized by high mortality, fishes are dark in colour, lethargic and exhibits hemorrhages in fin sockets, etc.	Isolation of healthy fish is the main prophylactic measure as there are no control measures.
34. Infectious haematopietic necrosis (IHN)	Clinical symptoms shows lethargy, weakness, dark colouration, anaemia, swelling of abdomen, pale gill, etc.	There are no control measures. But by raising water temperature above 15°C this can be controlled.
35. Swimbladder Infection (SBI)	Infected fish swim restlessly in dorsal and lateral position at the water surface, body colour becomes dark & abdomen distended.	Same with viral haemorrhagic septicemia (VHS).
36. Pike fry virus	The infected fish swim slowly, gills become pale, haemorrhages on the trunk and above the anal fin, etc.	No control measures. Avoidance of virus is the only prophylaxis.
37. Channel catfish Virus (CCV)	Affected fish- loss equilibrium, swim erratically, shows haemorrhages of gills, skin and fin base, etc.	No control measures, Avoidance of stress is the only prophylactic measure.
38. Lymphocystis Disease	Affected fish develop small pear- like tumefacious either singly or in groups in skin, fin, tail, intestinal wall, liver,	As there is no cure, so the whole effected stock should be destroyed. Then disinfect the affected Pond by draining

	spleen, ovary, etc. Skin may develop sand papers.	followed by drying and applying lime at the rate of 200- 300 kg/ha. After disinfections fish culture should start newly.
39. Papillomatosis (Cauliflower disease)	The cauliflower like papillomonous may be white, light red or dark gray that affect fin, body, tail etc. Lesion is also seen in the skin and jaws of affected fish.	Bath in soluble quinine sulphate at the rate of 60 mg/ lit. for about 40- 50 days.
D. Fungal diseases		
40. Saprolegniasis (Cotton wool disease)	Infected fish shows whitish fungal mesh which looks like cotton wools appears in the infected parts of fish body. Sometimes lesions appear as gray white patches on various parts of the body like- skin, fins, eyes, mouth, and gill Common salt (NaCl) at	Give bath treatment to the infected fish with $KMnO_4$ (Potash) at the conc. of 1 gm/ 100lit. of water for 1 hr. (or) Give bath treatment to the infected fish with the conc. of 10 gm/ lit. of water for 20-30 minutes. (or) Give bath treatment to the infected fish with Copper sulphate ($CuSO_4$) at the conc. of 5 gm/ 10 lit. of water for 15-20 minutes.
41. Achlysis	Erosion of tail and body parts.	Give long bath with malachite green at the rate of 0.15- 0.20 mg/ lit of water 15- 30 minutes. (or) Give bath treatment to the infected fish with methylene blue at the concentration of 10- 20 mg/lit. of water for 15 minutes.
42. Branchiomycosis	Affected fish congregate near the inlet of water & refuse to take feed. Infected fish gill becomes grayish white and finally drop off.	Draining the pond Bottom & disinfecting with quick lime (CaO) at the rate of 200-250 kg/ ha. should be done at the end of each culture practice. $CuSO_4$ at the rate of 8 kg/ ha may be used in 4 monthly installments of 2-3 kg/ ha each. Bath in $CuSO_4$ at the rate of 1 gm/10 lit. of water for 10-30 minutes.
43. Ichthyophonous disease	Infected organs shows roughness, often-necrotic lesions and hyper pigmentation.	Disinfect the affected fish pond with lime as Mentioned in the branchiomycosis. Remove & destroy the infected fish stock & water can be purify by applying chlorine at the rate of 200 mg/ lit. of water.
E. Environmental diseases		
44. Changes in water depth (If the water depth becomes less than 1 m and more than 2 m) “Sun	Loss of appetite, reduction in growth and fish becomes lethargic. Sudden mortality may be occur due to	Maintain the water depth in the pond in an around 2 meters. If the water depth is less than 2 m Then fill up the required

burn disease”	increase of stress by pollutants.	quantity from the nearby source.
45. Changes in water temperature “Thermal shock”	Affected fish shows surfacing, loss of appetite, less growth and fish becomes lethargic. Effect of other factors of disease will increase and fish may die.	Supply water from a nearby source. Cut the quantity of feed supply. Turbulent the water with the help of a split bamboo. Harvest the table size fish and reduce the density of fish in the pond.
46. Changes in water P^H “Acidosis & alkalosis”	Pond water become acidic or alkaline. Affected fish shows- growth retardation, excessive mucus secretion, fraying of fins, etc. Fish will be susceptible to the infection of other diseases.	Apply lime according to P ^H of water. Apply lime at the rate of 270, 140, 70 and 25 kg/ ha for P ^H values ranges between 4.0-5.0, 5.1-6.5,6.6-7.5 & 7.6-8.5 respectively.
47. Reduction in dissolved oxygen (D.O.) concentration (Anoxia)	Affected fish shows- surfacing. Died fish mouth remains open and gill colour become pale.	Apart from taking the control measures cited incase of changes in water temperature cut application of feed & fertilizer temporarily. Reduce the stocking density of fish by harvesting the table size fish. Repeated netting may be done. KMnO ₄ (Potash) may apply at the rate of 1-2 mg/ lit. of water in the pond. Liming can be done at rate of 27 kg/ ha water spread area.
48. Increase in dissolved oxygen (D.O.) concentration (Gas Bubble Disease)	Fish fry & fingerlings are mostly affected. Due to entry of gas bubble in the arteries of fish body fish may die. Normally it is seen in the noon and afternoon hours of a day.	Supply water from the nearby source. If there is any mechanical aeration instruments then that should be stopped. Affected fish should transfer to a nearby pond.
49. Increase in dissolved carbon dioxide (CO₂) concentration	Affected fish secrete excessive mucus and suffers from asphyxiation.	Take the corrective measures given in case of reduction in dissolved oxygen concentration
50. Increase in hydrogen sulphide(H₂S) concentration in water	Effectuated fish pond mud will smell like rotten egg and bottom dwellers like- mirika, common carp, etc. will die first.	Remove the died fish and take the corrective measures give in case of changes in water P ^H .
51. Increase of turbidity of pond water	Small fish and eggs are effected first. Growth of fish retarded, dissolved oxygen concentration is reduced and fish dies from asphyxiation.	Apply aluminium (filter alum) sulphate i.e. Al ₂ (SO ₄) ₃ 14 H ₂ O at the rate of 10-40 mg/ lit. of water . Actual quantity can be determined by putting alum in a glass of turbid water. After applying alum liming should be done as per the water P ^H as mentioned in corrective measure of water P ^H .
52. Red or green or brown coloured layer over the pond water surface (Algal toxicosis disease)	Bad smell of effected fish pond water. The thickness of layer may increase from morning to noon hours. Surfacing of fish in the effected pond is seen from late night to dawn and fish may die.	Supply of feed & fertilizer to the pond should be stopped temporarily. If possible remove the coloured layer with the help of free hand or by using a split bamboo. Copper sulphate (CuSO ₄) at the rate of 0.1-0.5 mg/ lit. of water can also be

		apply.
53. Increase in the concentration of unionized ammonia	Affected fish gill become reddish and effected fish may die also.	Control the water temperature, P ^H and also the concentration of phytoplankton in the pond and for that purpose take the renovative measures given in case of changes of water P ^H & temperature.
54. Tarumatic injuries	Effected fish shows biting sign of predators on body surface and other external organs like- fins. In acute cases some lesions may be seen on the body surface.	Remove predators from the pond. Apply KMnO ₄ (Potash) at the rate of 4-5 mg/lit of water to the effected pond.
55. Acute anaphylaxis	Effected fish shows extreme rigor with all fins erect, body colour become very dark & body become very rigid and twitching.	Effected fish should not be disturbed and they usually recover automatically before the next meal.
56. Deterioration of water quality by pollutants Nowadays pollutants are also taking leading role in the disease of fishes. Sources of this pollutants are- Chemical waste, industrial waste, sewage, agricultural waste, oil pollution, etc.	Affected fish shows- haemorrhagic eyes, pectoral fins may drop off, surfacing, loss of balance, sudden mass mortality, etc.	Fish from the effected pond should be removed and buried under soil. Water of the effected pond should be drained out and pond bed should be dried. After that pond bottom mud up to 1 ft. depth (minimum) should be removed. Then pond should be disinfected with lime depending on P ^H as mentioned in the case of change in water P ^H . Afterwards the pond should be refilled with water and a new stock of fish can be cultured.

F. Genetical diseases

Genetical diseases of fishes are originated due to the - hereditary factors, shock received by fish in its early stage i.e. egg, spawn, fry, etc. This shock may be natural (like-oxygen deficiency, temperature variation, variations in light concentration, water flow variation, etc. in the spawning & cultured environment), or artificial (like- effect of chemicals and others in the spawning & cultured environment).

There is no control measure of this disease. Removal of affected fishes from the stocking pond, not using the effected fish for the production of fish seed, introduction of healthy fish seed to the culture system from known sources, maintenance of congenial environment for the cultured stock, etc. are the only preventive measures.

Some of the commonly found genetical fish diseases are-

Types	Symptoms	Control measures
57. Kyphosis	Affected fish shows hum formation in between the head and dorsal fin.	
58. Vertebral column abnormality	Affected fish shows marked dropping of back, shortening of vertebral column and fusion of vertebra.	
59. Lordosis	Concavity before the dorsal fin or at the dorsal fin.	
60. Scoliosis	Bending of caudal fin	
61. Caudal peduncle	Downward & upward bending of	

abnormality	caudal peduncle, absence of caudal fin, etc.	
62. Mouth abnormality	Downward displacement of the mouth, distortion of the mouth because of abnormalities in jaws etc.	
63. Pectoral fin abnormality	Large growth of pectoral fins.	
64. Atrophy of pelvic fin	Absence of one or both the pelvic fins.	
65. Scale abnormality	Changes in scales number, size, shape, etc.	
66. Genetically or hereditary modifications of colour		
I) Xanthorism	Gold colouration of fish due to gene mutation e.g. gold fish	
II) Albinism	Whitish colouration of fish body.	
III) Melanism	Black colouration of fish	
IV) Alampy	Blue colouration of fish	
67. Genetical or hereditary modifications due to disturbances in the embryonic stages of fish		
I) Over ripening or immature eggs	Deformity in jaws, eyes, vertebral columns, etc.	
II) Oxygen deficiency	Distortion of the pectoral fins, shortening of flesh in adult fish, etc.	
III) Temperature variation	Abnormality in fins.	
IV) Variations in light	Lordosis & scoliosis may be caused. Number of dorsal and anal fin rays get reduced.	
V) Effect of flow rate of water, Chemicals, etc.	Deformity in vertebral column, body colour, fins, scales, etc.	
68. Deformity in organs conformation	Position of internal organs in other than its actual places e.g. liver on	
69. Tumours	Effectuated fish shows tumours on the body surface, enlargement of abdomen, loss of appetite, softening of bones, etc	
G. Nutritional diseases		
Nutritional deficiency causes Scoliosis, blindness, goiter, seakoke, etc.	Symptoms of nutritional deficiency-eye cataract, blindness, swelling of throat, liver degeneration, damage of kidney, poor wound healing, poor growth, loss of appetite, susceptibility to infection by other pathogens, etc.	Severely infected fish should be removed from the culture system. Proper quality & quantity feed supply to the cultured fishes is the only prophylactic measure.

H. Epizootic Ulcerative Syndrome (Locally known as “Machar Gha Laga Bemar”).

Species Infected:

Indian Major Carps:	Bhakua/ Dhekera/ Bahu (Catla), Rohu and Mirika.
Exotic Carps:	Silver Carp, Grass Carp and Common Carp.
Minor Carps:	Kurhi, Mali and Java Puthi.
Murrels:	Goroi, Cheng, Sal and Sol.
Airbreathing fish:	Magur, Singi, Ari, Tengra, etc.
Eels:	Kuchia.
Weed fish:	Puthi, Darikana, Moa, Khalihana, Botia, Tora, etc.
Clinical Signs:	Tiny red spot on the body surface initially. This spot later develop ulcer. After few days loosing its scales and muscles exposes body. Infected fish dies within a short period.



Photo:EUS infected Common Carp treated at College of Fisheries, AAU, Raha.

Prophylaxis:

To prevent the infection of EUS in the cultured fish this is required. This helps in maintaining the health of cultured fish and also helps in getting a good production.

The following prophylactic measures are needed for EUS:

1. Apply lime at the rate of 10- 15 kg/bigha of water spread area depending on P^H of water before the onset of winter. This is followed by application of KMnO₄ (Potash) to the pond water at the rate of 4-5 ppm (4- 5 mg/lit. of water).

(OR)

2. Apply lime as mentioned in the 1st prophylactic measure. After 1- 2 days of application of lime to the pond water spraying of “Sukrena W.S.” over the pond water surface at the rate of 500ml/ bigha water spread area give encouraging result.

Treatment measures:

1. Apply lime at the rate of 10- 15 kg/bigha of water spread area depending on P^H of water. After 1- 2 days of application of lime to the pond water spraying of “Sukrena W.S.” over the pond water surface at the rate of 500ml/ bigha water spread area. Repeat the application of Sukrena W.S. to the infected pond for 2nd or 3rd times depending on the need basis at 10 –15 days interval.

(OR)

2. Dip the infected fish at 3- 4% common salt (NaCl) solution and released the treated fish immediately to the pond water.

(OR)

3. Apply common salt (NaCl) to the pond water at the rate of 10- 12 kg/ bigha water spread area.

(OR)

4. Apply lime at the rate of 10- 15 kg/bigha of water spread area depending on P^H of water. This is followed by application of KMnO₄ (Potash) to the pond water at the rate of 4-5 ppm (4- 5 mg/lit. of water).

(OR)

5. Give bath treatment to the infected fish at 4- 6 ppm (4- 6 mg/lit. of water) potash (KMnO₄) solution for a short period and then released the treated fish immediately to the pond water.

Apart from the any of the above treatment measures antibiotic Oxytetracycline treatment may be given along with any one of the above cited treatment measures. Oxytetracycline are fed to the infected fish along with feed at the rate of 60- 70 mg/ kg feed for 7- 10 days on need basis.