

Non- infectious diseases of fish

Introduction:

- Non-infectious diseases are caused by adverse environmental conditions, nutritional disorders, or genetic defects.
- While they can result in sudden mass mortality or death, they are not contagious.
- Environmental diseases are the most important in aquaculture.
- These include low dissolved oxygen, high ammonia, high nitrite, or natural or man-made toxins in the aquatic environment.

1. GAS BUBBLE DISEASE

- One of the most important of all diseases of cultured fish is the condition generally known as gas bubble disease which was first described in aquarium fishes in 1898 by Gorham.
- It is due to super saturation of dissolved gases (nitrogen and oxygen).
- Outbreaks in wild fish are less common but they have occasionally been described in both fresh water and marine fish.

Signs:

- Fish with GBD often exhibit loss of equilibrium, abnormal buoyancy and may float at the water surface
- Affected fish show bubbles in the abdominal cavity, eyes, skin, gills, fins, mouth, swim bladder and within the digestive tract and exophthalmia.
- The clinical signs of gas bubble disease should not be confused with **Swim bladder stress syndrome** because the bubbles in the latter can be seen only in the swim bladder



Effects on host:

- Death due to embolism in blood and emphysema in tissues; edema and degeneration of the gill lamellae; bulging of the cornea; mass mortalities.

Prevention and control:

- Monitor dissolved oxygen (DO)
- Avoid algal blooms
- Maintain efficient operation of waterlines and pumps
- Sufficient water exchange

2. SWIM BLADDER STRESS SYNDROME

- It's also known as swim bladder disease or swim bladder disorder.
- SBSS is associated with malfunction of the swim bladder and is also associated with a combination of handling, high ambient temperature, dense algal bloom that presumably cause oxygen depletion at night and super saturation during the day.
- The disease may be caused by constipation induced by high nitrate levels from over feeding.

Signs:

- Affected fish larvae show large bubble of gas in the region antero-dorsal to and outside the swim bladder.

**Effects on host:**

- Hyperinflation of swim bladder; high positive buoyancy and mass mortalities.

Prevention and control:

- Filter rearing water.
- Regulate algal bloom in hatcheries.
- Provide strong aeration to maintain the larvae beneath the water surface in hatchery tanks.

3. ASPHYXIATION/HYPOXIA

- Very low levels of dissolved oxygen (DO) cause asphyxiation/hypoxia.

Signs:

- Affected fish gather at the water inlets and outlets.
- Also fish with wide gaping mouth swim at water surface and show rapid opercular movement.

Prevention and control:

- Monitor DO levels and provide aeration.

4. ALKALOSIS

- Alkalosis comes about when water becomes too basic. The pH increases to a level higher than the fish can tolerate.

Signs:

- Affected fish show corroded skin, gills and milky turbidity of the skin.

Prevention and control:

- Monitor pH level, and maintain the pH in a range optimal for the species being cultured.

5. ACIDOSIS

- When the body fluids of fish contain too much acid, it's known as acidosis.
- Acidosis is caused by a drop in the pH to a level too low for the species.

Signs:

- Affected fish show rapid swimming movements and gasping.
- Increased mucus secretion and death occur very quickly.

Effects on host:

- Normal metabolism is hindered resulting in retarded growth and eventual death.

Prevention and control:

- Monitor pH
- Apply lime and flush pond bottom before stocking.

6. SUNBURN DISEASE

- Sunburn disease is due to excessive levels of ultraviolet irradiation from sunlight.

- When fish are stocked in shallow uncovered raceways under intense sunlight.
- UV-B type, which precipitates the sunburn response.
- The sunburn disease is more serious at higher altitude, and is particularly important in the Southern hemisphere, where atmospheric ozone layer thinning has allowed solar ultraviolet levels, during the summer months, which are much higher than in similar areas of the North.

Signs:

- Development of gray focal circular ulcerative lesions on top of the head, pectoral, dorsal and upper tail fins.

Effects on host:

- Ulcerative lesions may serve as portals of entry for other pathogens and may result in secondary infection.

Prevention and control:

- Place sunshades over ponds, and fish should be kept away from ultraviolet installations.

7. YOLK COAGULATION DISEASE OR WHITE SPOT DISEASE

- It is observed in salmonids in embryonic development.
- The disease appears as small white spots in the yolk due to coagulation of protein with discoloration of yolksac.
- Colour may vary from bright blue to grey and white spots appear in the yolk.
- It caused due to the unsuitable environmental conditions of physic-chemical nature affecting the development at embryonic or post embryonic stages.



Control:

- It can be control by providing optimum physic-chemical conditions of ponds during rearing.
- It helps to eliminate various stress factors to maintain a proper health of fish also strengthens defence mechanism.

8. ULCERATIVE DERMAL NECROSIS (UDN)

- The condition now called UDN was first observed in Atlantic salmon and sea trout in Britain in the period 1873 -1911.
- The outbreak began in the south east of Ireland, spreading to the rest of Ireland, to British rivers (1966), to north eastern France (1968) and to the Swedish Baltic rivers (1976).

Species affected:

- Atlantic salmon and rainbow trout.



Signs:

- small grey erosions on the head or adipose fin.
- trophic skin ulceration.

Treatment:

- Regular treatment of the fish with malachite green.

9. NUTRITIONAL DEFICIENCY

- Nutritional diseases can be very difficult to diagnose.
- A classic example of a nutritional disease of catfish is “broken back disease” , caused by vitamin C deficiency.
- The lack of dietary vitamin C contributes to improper bone development, resulting in deformation of the spinal column.
- Another important nutritional disease of catfish is “no blood disease” which may be related to a folic acid deficiency.
- Affected fish become anaemic and may die.
- The condition seems to disappear when the deficient feed is discarded and a new feed provided.

DISEASES ASSOCIATED WITH PHYSICAL FACTORS:

- Diseases associated with physical factors are mainly due to handling, transport, high stocking density and predation.
- Secondary bacterial, viral, or parasitic infection may easily set in once injuries are introduced.

DIAGNOSIS OF ENVIRONMENTAL AND OTHER NON-INFECTIOUS DISEASES:

Diagnosis of non-infectious diseases can be done through gross examination of fish for external/internal disease signs; histopathological/histochemical analysis; hematological analysis to assess the cellular composition of the blood in response to environmental stress; analysis of physico-chemical characteristics of rearing water; and evaluation of culture operations and management practices.