* FUNGAL DISEASES IN FISHES

Dr . G. B. CHAND

Associate Professor

Department of Zoology

Aquatic Toxicology laboratory

Patna University, Patna

Email : gbchand@rediffmail.com

FUNGAL DISEASES IN FISHES

Disease Caused by Fungus / Fungal Disease or Mycosis

Fish diseases caused by fungal infection is encountered in eggs, fry, fingerlings and adult fishes cultured in India. They have been considered as secondary invader and are known to attack the host when it gets injured either mechanically or as a result of infection other than fungal. (Gopal Krishnan, 1968).

The most prevalent group of fungus associated with mycosis is as follows:-

Group of the fungus	Disease
i) Oomycetes :-	
• Saprolegnia	— Saprolegniasis
• Achlya	
• Aphanomyces sps.	

(A) SAPROLEGNIASIS :- It is most common fungal disease reported in almost every important fish sps. in India

* Taxonomic Position:-

Class :- Oomycetes
Order :- Saprolegniales
Family :- Saprolegniaceae
Genus :- Saprolegnia
Achlya
Aphanomyces sps.

* Causative agent:-
  i) Saprolegnia parasitica (common name - fish moulds) (Coker, 1923)
  ii) S. diclina
  iii) S. ferox

* Morphology & life history of Fungus:-
The genus saprolegnia is characterised by filamentous non septate hyphae without a conspicuous hold fast organ. The mycelium branches profusely and intertwine to produced white tuft or matted appearance.

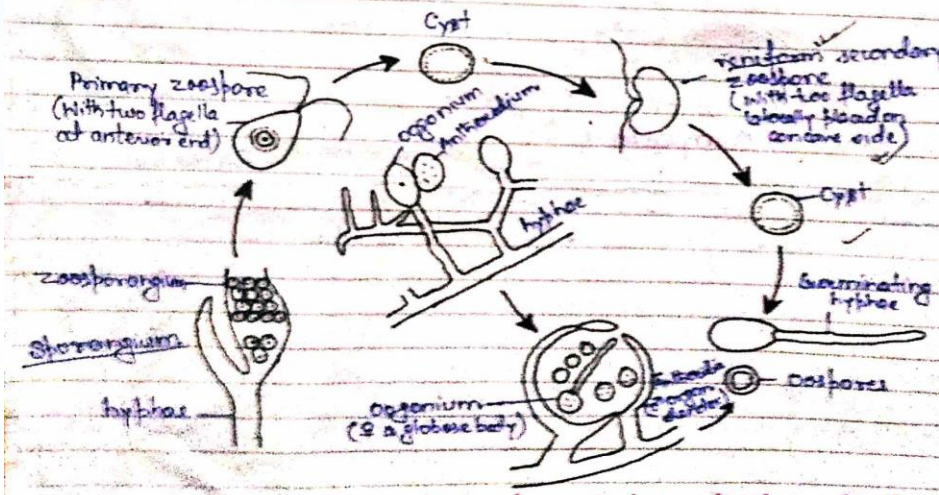

Fig:- Diagrammatic representation of life cycle of Saprolegnia sps. (Neish & Hughes 1981, Srivastava 1982)

* Species affected:-
Egg, fry and fingerlings of cultured Indian and exotic carps (Gopalkrishnan 1968, Jha etal, 1981)

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* External Symptom:-
- Infected eggs become white, darken gradually and finally become black in colour and fail to hatch.
- In host hatch stages and in adult wooly cotton like growth mostly white & vividly coloured appears in fishes.
- Fishes becomes lethargic, loss less and less responsive to external stimuli.

* Effect on host:-
- Generally fungal growth is initiated/restricted to epidermis and dermis and gradually spread in adjoining muscles penetrates into the tissues occassionally.
- Histologically, from the focus mycelial hyphae spread and adjacent tissues are encompassed forming myriotic granuloma, cellular necrosis, spongiosis, inter cellular edema, and ultimately sloughing off of epidermis. Inflammatory response are absent or weak.
- Fishes die from massive osmoregulatory problems caused by distruction of superficial tissue.

* Treatment:-
Ⓐ. Prophylactic:- i) Maintain optimum water quality.
ii) Stock optimum density of fish.
iii) Feed fishes with nutritious feed.
iv) Treat pond ≅ 1 mg L^{-1} $KMnO_4$ sol^n

Ⓑ Therapeutic:-
- Give bath treatment to affected fishes with Sodium chloride @ 3-4% or Give bath treatment with Malachite green @ 1-2 mg L^{-1} for half an hour.
- Give bath treatment to affected adult fishes with 160 mg L^{-1} $KMnO_4$ sol^n till stressed for 5 days.
- Give Swab treatment for small delicate fishes ≅ $K_2Cr_2O_7$ @ 100 mg L^{-1} for one week.
- Effected fish egg are to be just flushed with 2 mg L^{-1} Malachite green for 5 days.
- Ponds are to treated with 20 mg L^{-1} formalin.

Ⓑ BRANCHIOMYCOSIS (Gill rot):-
Branchiomycosis is a important parasite to fish gill tissue.

* Causative agent:-
i) Branchiomyces demigrans (Windel, 1930) ✓
ii) B. sanguinis (Pletin, 1912).

* Morphology and life history:-
The hyphae of parasitic fungal species are branched, coenocytic and 9-30 mm thick. The thickness of hyphal wall varies from 0.2 to 0.7 mm. It reproduces by spores called aplanospores produced by endogenous cleavage. The infection spreads from the liberated spores.

* Species affected:-
Egg, fry and fingerlings as well as adult of catla catla (B. sanguinis), C. mrigala and H. molitrix.

* Organ affected:-
Fish gill tissues.

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* External Symptoms :-
- The gill lamellae loose their normal colour and turn yellowish brown. The position of gill, affected may degenerated it looses it's normal function.

- The infected fish gasp for air on the water surface for some times and die soon after words.

* Effect on host :-
- The fungus form long tubule in the gill epithelium of fish. The hyphae displace the host tissue and stop the blood supply to gill tissue by causing swelling and distruction of blood vessel.

- Large batches of the distroyed gill become necrotic and fall off (Srivastava, 1987) hyperplasia and fusion of gill lamellae occurs.

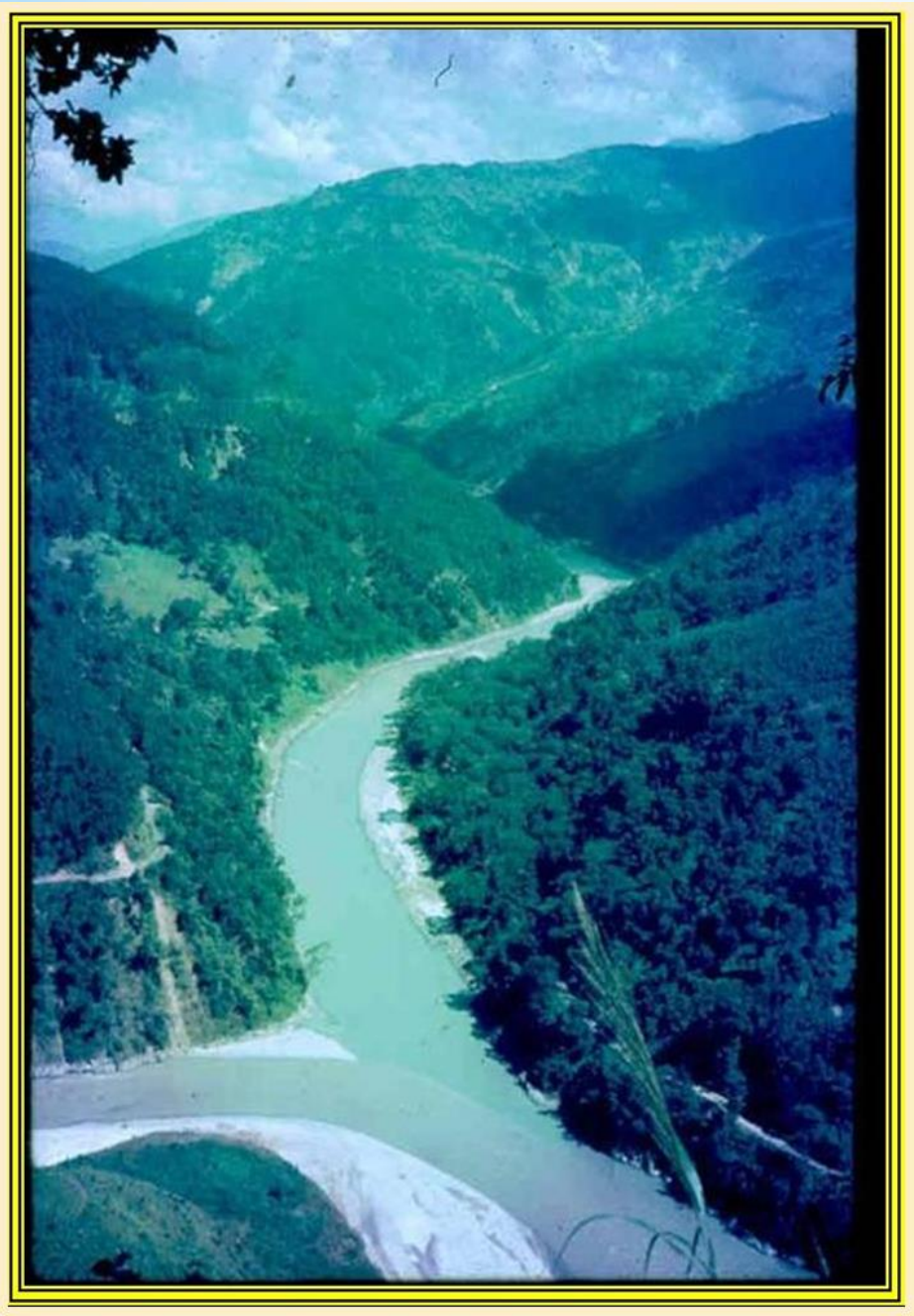
* Treatment :-
(A) Prophylactic :- To maintain proper water quality and hygienic condition of pond. (Hora and Pillay, 1962)

(B) Therapeutic :- i) Liming the pond @ 50kg/ha.
ii) Bath treatment of the affected fish ≥ NaCl @ 3-5%.

(C) OTHER FUNGAL INFECTIONS :-
- Infection of fish by Achlya, Pythium, Aphanomyces have been recorded by several Ichthyologists time to time. Srivastava etal (1994) reported deep mycosis of chela lambuca Ham. ≥ varying degrees of distruction of epidermis, hypodermis and under lying tissues.

- The casual water moulds are identified as :- Achlya onion, S. dicline, S. ferase and Pythium aphanidermatum.

- Occasionally some non-aquatic fungi viz. Aspergillus nigar and Helminthosporium have been related to fish mortality.



THANK YOU