

Fungal Infection Causing Mass Mortality of Fresh Water Fish Tilapia Mossambica

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ABSTRACT

In the year 1977, a case of mass mortality of *Tilapia mossambica* was diagnosed as caused by a pathogenic fungus of the *Fusarium* genus. The *in vitro* and *in vivo* effect of anti-septics: acriflavine, brilliant green, methylene blue, silver nitrate, and antibiotics: erythromycin, gentamycin, kanamycin, mycostatin, against the fungal strain were investigated. The antiseptics, brilliant green and silver nitrate, found effective *in vitro*, were equally useful in controlling the infection *in vivo*. The antibiotics had no effect on this strain even *in vitro*.

INTRODUCTION

This paper embodies a case study of mycotic infection, in a fresh water fish, *Tilapia mossambica*, resulting in mass mortality, which occurred at the Taraporevala Aquarium, Bombay.

Fungal diseases are widely prevalent among fish and fish eggs in natural and artificial environments. Species of *Saprolegnia* usually affect fish and fish eggs and the infections caused by *Achlya*, *Aphanomyces*, *Lep-tomitus* and *Pithium* have also been

reported (Khan, 1922; Chidambaram, 1942; Scot and O'Bier, 1962; Gopala-krishnan, 1963 and 1964). Branchio-mycosis has been reported several times in carps (Hora and Pillai, 1962; Rehulka and Tesareik, 1972). In general, information on various species of fungi which attack finfishes is available (Conroy and Herman, 1970; Van Duijn, 1973; Roberts, 1978; Ahne, 1980), but cases of *Fusarium* attacks have rarely been reported (Horter, 1960; Ribelin and Migaki, 1975; Ahne 1980).

MATERIALS AND METHODS

The infected fishes from the Aquarium were found to be covered with cottony outgrowths (Fig. 1) over almost the entire body, and the gills and eye tissue were seriously damaged.

The moribund fishes collected in sterile containers under aseptic conditions were immediately transported to the laboratory. The pathological samples-gills, skin and kidney-were removed and diluted according to the method described by Pillai (1978). The suitably diluted sample was cultured in Sabouraud's agar, incubated

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at room temperature (28 + 2C°) for 2—7 days, after microscopic examination of the wet mounts of the pathological samples.

The fungal colonies which developed were picked up and maintained on Sabouraud's agar slants for further investigation.

The gross morphological characters of the pure strain were studied and the isolate was identified according to Bessey (1961).

To satisfy Koch's postulates, the isolate was tested in healthy fishes, *Troplus suratensis* maintained under suitable ecological conditions (Pillai, 1978).

To evolve suitable remedies, *in vitro* and *in vivo* studies were carried out using four antiseptics: acriflavine, brilliant green, methylene blue and silver nitrate, and four antibiotics: erythromycin, gentamycin, kanamycin,

and mycostatin against the fungal strain according to the method described by Pillai (1978).

RESULTS AND DISCUSSION

The gross morphological characters of the fungal strain are presented in table 1.

In India, Khan (1922) has recorded *Saprolegnia* disease resulting in mortality of fry of the murrel, *Ophiocephalus marulius*. Chidambaran (1942) observed Saprolegniasis in the gourami, *Osphronemus goramy* at Madras and suggested that over crowding, pollution due to decaying matter and injuries on the fish are the contributing factors for the spread of the disease. The incidence of the disease has also been observed in major carps (Gopalakrishnan, 1963 and 1964). Branchiomycosis has been reported to be common in cultivated fishes in ponds with abundant decaying matter (Hora and Pillai, 1962). Srivastava and Srivastava (1975) could isolate the

TABLE 1
GROSS CHARACTERS OF THE FUNGAL STRAIN

Species of fish	Disease	Isolate no (s)	Cultural characters in Sabouraud's agar	Microscopic characters of the wet mount observed under high power and stained with Lactophenol cotton blue	Identity
<i>Tilapia mossambica</i>	Dermatomycosis	DM 1	Rapid growth producing cottony colonies. Abundant aerial mycelium present. Colour at first white turning to pink later.	Both microconidia and macroconidia produced. Terminal chlamydo spores also produced. Unicellular microconidia and multicellular macroconidia were noted.	<i>Fusarium</i> sp.

fungal strains, *Aphanomyces laevis* and *Achlya flagellata* from *Channa striatus*

The fungal suspension injected intramuscularly and intraperitoneally did not successfully affect the host. But the infections done through artificial surface injuries were quite successful. Visible growth appeared within 16-24 hours, rate of infection was very slow and death occurred within 20-25 days, causing severe damage especially to the gills and eye tissue.

The antibiotics were totally ineffective, but the antiseptics, brilliant green and silver nitrate were quite helpful in controlling the pathogen both *in vitro* and *in vivo*, the results agreeing with the findings of van Duijn (1973) that the above antiseptics are useful in the control of mycotic infections.

Although *Fusarium* infection in carp fishes has been recorded by Horter (1960), the present case of a similar infection in *Tilapia mossambica* seems to be recorded for the first time in our country (Davis and Graham, 1979; Jhingran, 1982).

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