

A case report of *Branchiomyces* infection in common carp (*Cyprinus carpio*) from Iran

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Abstract: This study was carried out during summer 2002, to isolate the *Branchiomyces spp.*, and to show the histopathological changes of gill lesions of Cyprinids fish from Iran. *Branchiomyces spp.* from gill lesions of common carp was isolated. The histopathological findings include congestion, hyperplasia, fusion, and telangiectasis of secondary lamella and also hemorrhage in primary lamella were seen. Infiltration of inflammatory cells around the blood vessels, were also observed. This is the first report of isolation of *Branchiomyces spp.* from common carp in Iran.

Keywords: Carp, *Branchiomyces*, Gill, Histopathology

Branchiomycosis is considered as a major problem in Eastern European commercial fish production (Meyer & Robinson, 1973). Two species of *Branchiomyces* have been described, *Branchiomyces sanguinis* is thought to principally infect carp (Plehn, 1912) while, the other species *B. demigrans*, typically infects pike and tench (Wundsch, 1929). Both fungal species produce similar disease in the gill. In this report, the histopathology of branchiomycosis in cultured common carp from Iran is described.

One hundred fish showing clinical symptoms of respiratory distress were caught from fish ponds, with water temperature of 22-28°C, in north of Iran during summer of 2002. Diagnostic investigations, including screening for external lesions, were carried out on the gills of sampled fish. Small portions of the gills from each fish were excised and then placed in test tube, containing distilled water with 0.01% chloramphenicol. Other parts of the gills were placed in neutral buffered 10% formalin.

In order to isolate the fungi, first excised gill samples were rinsed in distilled water. After rinsing, the gills were inoculated to Cornmeal agar (CMA), Saboroud dextrose agar (SDA) and Glucose peptone agar (GPA) media at room temperature. Active hyphae at periphery of the colony were excised and transferred to fresh GPA medium. One week after incubating at 25°C, asexual reproductive structures were evident.

For histopathological survies, gills were processed by routine histological techniques, sectioned (4µm), stained with Haematoxylin and Eosin (H&E) and Gomori-methenamine silver (GMS), then examined with a light microscope. Fungal mycelia were found in the gill tissue (Fig. 1 & 2).

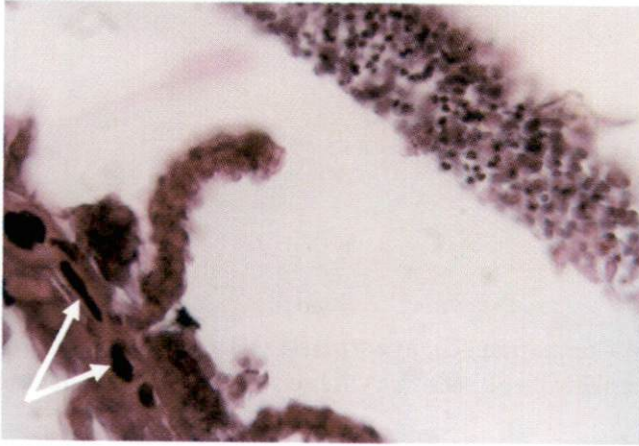


Figure 1: Fungal mycelia (arrows) in the primary gill lamella (H&E× 400)



Figure 2: Fungal mycelia (arrow) in the gill tissue (GMS ×400)

Prominent pathological findings included; congestion, hyperplasia and multifocal proliferation of the branchial epithelium, which resulted in the fusion of the secondary lamella (Fig. 3). Also, hemorrhage in primary (Fig. 4) and secondary lamella (Fig. 5) were observed. Other pathological findings were included lamellar telangiectasis (Fig. 6) and mononuclear inflammatory cells surrounding the outer surfaces of blood vessels (Fig.7).



Figure 3: Congestion (C), hyperplasia (H) and multifocal proliferation of the branchical epithelium of the secondary gill lamella (H&E \times 100)



Figure 4: Hemorrhage (H) in primary gill lamella (H&E \times 100)



Figure 5: Hemorrhage (arrows) in secondary gill lamella (H&E \times 100)

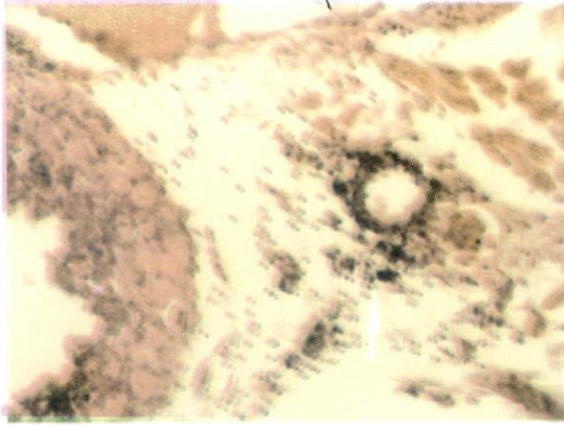


Figure 6: Mononuclear inflammatory cells (arrow) surrounded the outer surfaces of the blood vessels (H&E × 100)

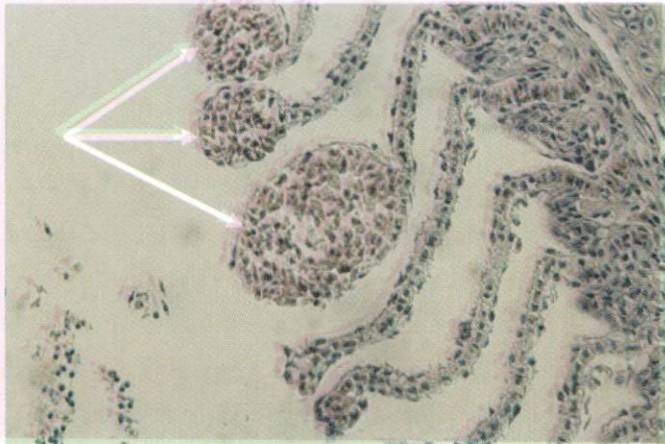


Figure 7: Telangiectasi (arrows) in secondary gill lamella (H&E × 400)

Two species of *Branchiomyces* are recognized, from which *B. sanguinis* (Plehn, 1912) tends to grow outside vessel, whereas *B. demigrans* (Wundsch, 1929) is mainly intravascular. The width of the hyphae, and the thickness of the hyphal walls and spores are also larger in *B. demigrans*. Pathogenic *Branchiomyces* spp. have been found infecting other fish species (Neish & Hughes, 1980). Susceptible species include the American eel, *Anguilla rostrata* (Noga, 2000), European eel.

A. anguila (Grimaldi *et al.*, 1973), Japanese eel, *A. japonica* (Egusa & Ohiwa, 1972), Common carp, *Cyprinus carpio* (Plehn, 1912), Tench, *Tinca tinca* (Wundsch, 1929), Bleak, *Alburnus alburnus* (Grimaldi *et al.*, 1973), Northern pike, *Esox lusius* (Wundsch, 1929), Channel catfish, *Ictalurus punctatus* (Khoo *et al.*, 1998), Mullet, *Mugil cephalus* (Wang *et al.*, 2001) and Rainbow trout, *Oncorhynchus mykiss* (Witala & Zielonka, 1974).

Pathological changes observed in the present study were similar to those reported in other species of fish which are included; hypertrophy of the branchial epithelium and fusion of the secondary lamella (Khoo *et al.*, 1998) and hemorrhages in lamella (Grimaldi, 1971 ; Khoo *et al.*, 1998). There was no obvious indication of similar fungal disease in other fish species (silver carp and grass carp) examined during the present study.

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