Myxobolus dhanachandi sp. n. (Myxozoa, Myxosporida, Bivalvulida) from an Indian freshwater fish Channa orientalis (Bloch-Schneider)

Probir K. Bandyopadhyay 1, Th. Hemananda 2, Amlan Kumar Mitra 1 and N. Mohilal 2

1 Parasitology Laboratory, Department of Zoology, University of Kalyani, West Bengal, India
2 Parasitology Laboratory, Life Sciences Department, Manipur University, Canchipur, Imphal, India

Summary

Investigations on the incidence of myxozoa in fishes have assumed immense importance because of severe pathogenicity of these parasites and host mortality associated with them. The present communication describes a new myxosporean species, Myxobolus dhanachandi sp. n., from a freshwater fish Channa orientalis (Bloch-Schneider) from the state of Manipur, India.

Key words: Myxozoa, Myxobolus dhanachandi sp. n., parasite, fish, India

Introduction

The genus Myxobolus was established by O. Bützchli (1882). Since that time, approximately 500 species of Myxobolus have been reported from freshwater and marine fishes (Landsberg and Lom, 1991). A biotic survey of protozoan parasites in fishes from ponds of Kangla Fort (Manipur, Imphal, India) revealed a new Myxobolus species. The present communication deals with the description of the new species in accordance with the guidelines of Lom and Arthur (1989) and Lom and Dykova (1992).

Material and Methods

Host fishes were collected alive from the pond of Kangla Fort, brought to the laboratory and examined immediately. Sporogonic plasmodia, when found, were carefully removed with sterile forceps, smeared on clean grease-free slides with drops of 0.5% NaCl solution, covered with cover slips and sealed with bee wax for examination under the oil immersion lens of Olympus CH-2 phase contrast microscope. Some of the fresh smears were treated with various concentrations (2-10%) of KOH solution for the extrusion of polar...
filaments. The Indian ink method of Lom and Vavrů (1963) was employed for observing the mucous envelope of spores. For permanent preparations, air-dried smears were stained with Giemsa after fixation in acetone-free absolute methanol. Measurements (based on twenty fresh spores treated with Lugol’s iodine) were done with the aid of a calibrated ocular micrometer. All measurements are presented in µm as mean ± SD followed in parentheses by the range. Drawings were made on fresh or stained material with the aid of a mirror type camera lucida and the Corel Draw 10.0 computer programme.

The abbreviations used in the paper are as follows: LS - length of the spore; WS - width of spore; LLPC - length of large polar capsule; WLPC - width of large polar capsule; SPC - length of small polar capsule; LPC - width of polar capsule; LPF - length of polar filament; DIV - diameter of iodinophilous vacuole.

Results and Discussion

Myxobolus dhanachandi sp. n. (Figs 1-10).

Plasmodia. Pinkish-white spherical plasmodia, 0.27 mm in diameter, are found attached to the dorsal, ventral and caudal fins. They contain mostly matured spores, some late stage spores were also present.

Spores. The spores are small, elongated, dumb-bell shaped, broader at the middle and tapering at both ends. In sutural view, the spore is lenticular, with a slightly curved broad sutural line. The two shell valves are narrow, smooth and symmetrical. In immature forms the spores have broader middle part, and the polar capsules are shorter and thicker.

Mature spores measure 17.0-19.5 (18.4 ± 1.01) µm in length and 5.1-6.8 (6.05 ± 0.62) µm in breadth. In fresh condition there is variation in spore structure in respect to the position of the polar capsules.

There are two polar capsules of equal size. Both are elongated and tear-shaped with a sharply pointed anterior end and a slightly rounded posterior end. Polar capsules are situated almost parallel to each other. They measure 7.7-8.5 (8.26 ± 0.36) µm in length and 0.8-1.7 (1.43 ± 0.41) µm in breadth. The polar capsules occupy almost half of the total spore body. In Giemsa-stained slides, the polar capsules are somewhat posterior in position. The two polar filaments are extruded from two separate openings. They measure 27.2-34.0 (29.49 ± 3.64) µm in length.

The extracapsular space is occupied by granular homogenous mass of sporoplasm. A iodinophilus vacuole, 0.8-1.7 (0.97 ± 0.42) µm in diameter, and two or three very small sporoplasmic nuclei are present in the sporoplasm. In some of the spores, there is a rounded structure adjacent to the inner wall.

The present species resembles M. angustus Kudo, 1934 reported from gill filaments of Cliola vigilax (Kudo, 1934); M. calbasui Chakravarty, 1939 reported from the gall bladder of Labeo rohita (Hamilton) and Cirrhinus mirgala (Hamilton) (Chakravarty, 1939); M. punctatus Roychaudhuri and Chakravarty 1970 from spleen and pharyngeal epithelium of Opisthephalus punctatus (Bloch) (Roychaudhuri and Chakravarty, 1970); M. vedavatiensis Seenapa and Manohar, 1981 from gills and muscles of Cirrhinus mirgala (Hamilton) (Seenapa and Manohar, 1981); M. bhaduria (Sarkar, 1985) Gupta and Khera, 1988 from gills and fins of Puntius sarana (Hamilton) (Gupta and Khera, 1988) and M. iranicus Molnar, Masoumain et Abasi, 1996 from the spleen of Barbus luteus (Heckel) (Molnar et al., 1996); M. catlae Chakravarty, 1943 from fins and gills of Cirrhinus mirgala (Hamilton) (Chakravarty, 1943) and M. koi Kudo, 1919 from gill filaments of Cyprinus carpio haematopterus (Kudo, 1919).

However, M. angustus (LS: 14-15; WS: 7-8), M. calbasui (LS: 12.4-15; WS: 8.2-10; LLPC: 6.1; WLPC: 4.1; LSPC: 4.1; WSPC: 3.0), M. vedavatiensis (LS: 13-15; WS: 8-10 ; LLPC: 6.9-7.5; WLPC: 3-4; LSPC: 3-
5; WSPC: 2-3), M. iranicus (LS: 13.2-14; WS: 7.5-9.2; LLPC: 6.9-7.5; WLPC: 2.9-3.5; LSPC: 6.6-7.2) differ from the present species (Table 1) in morphometric characteristics.

M. punctatus (LS: 12.2-15; WS: 8.5-10; WPC: 2.1-2.8), M. bhaduria (LS: 10-14; WS: 5-8; LPC: 5-7; WPC: 2-4), M. catlae (LS: 14-15; WS: 2-2.5; LPF: 30-41) have polar capsules similar in size to the present species but differ from it in other morphometric characteristics and spore shape.

Finally, M. koi (LS: 14-16; WS: 7-9; LPC: 7.0-9.0; WPC: 2.7) is morphometrically similar to our species. However, the former has elongated, tear-shaped spores, and the latter, the dump-bell shaped spores.

In view of these differences, the myxozoan under study should be considered as a new species. Hereby, we name it Myxobolus dhanachandi sp. n.

**Taxonomic summary**

**Type host:** Channa orientalis (Bloch-Schneider).

**Type locality:** Kangla, Manipur.

**Type specimens:** One holotype, slide CO/04/2003, and paratypes, slides CO/01/2003, CO/06/2003, CO/08/2003, Collection of the Life Science Department, Manipur University, India.

**Prevalence and Intensity of Infection:** 08/10 (80%).

**Etymology:** The specific epithet dhanachandi has been given after the name of late Prof. Ch. Dhanachand of Life Sciences Department, Manipur University, for his outstanding contribution to parasitology.

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**References**


Address for correspondence: Probir K. Bandyopadhyay. Parasitology Laboratory, Department of Zoology, University of Kalyani, Kalyani 741235, West Bengal, India. E-mail: prabir0432@hotmail.com

Editorial responsibility: Andrew Dobrovolskij