

**PRELIMINARY OBSERVATIONS ON A MICROSPORIDIAN PARASITE
OF *CHLOROSCOMBRUS CHRYSURUS* LINNAEUS, 1776
(TELEOST FISH)**

B. S. TOGUEBAYE, B. MARCHAND, N. FAYE

Premières observations sur une microsporidie parasite de *Chloroscombrus chrysurus* Linnaeus, 1776 (Poisson, Téléostéen).

RÉSUMÉ. Une microsporidie, probablement nouvelle, parasite le foie de *Chloroscombrus chrysurus* (Poisson, Téléostéen). Elle forme des kystes blanchâtres mesurant environ 1 mm de diamètre. Les spores sont pyriformes et uninucléées. Elles mesurent 3,4-4,4 µm × 1,6-2,4 µm, et possèdent un polaroplaste lamellaire et vésiculeux et un filament polaire décrivant 6 à 7 tours de spire. Il n'y a pas de vacuole parasitophore dans le kyste. Des vacuoles contenant des spores ont également été observées dans le foie. Cette microsporidie est nommée *Microsporidium chlorosombri*.

Several microsporidian species belonging to the collective group *Microsporidium* and to the genera *Encephalitozoon*, *Glugea*, *Heterosporis*, *Ichthyosporidium*, *Loma*, *Microgemma*, *Mrazekia*, *Nosemoides*, *Pleistophora*, *Spraguea*, *Tetramicra* and *Thelohania* have been examined in fishes (Sprague, 1977; Canning and Lom, 1986; Sakiti and Bouix, 1987). Some of these microsporidia induced formation of cysts. The microsporidia found in *Chloroscombrus chrysurus* formed such cysts. This is the first time that a microsporidium has been found in a fish of the family Carangidae.

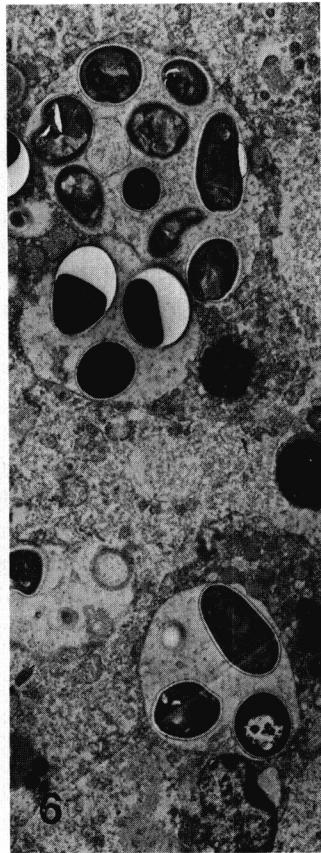
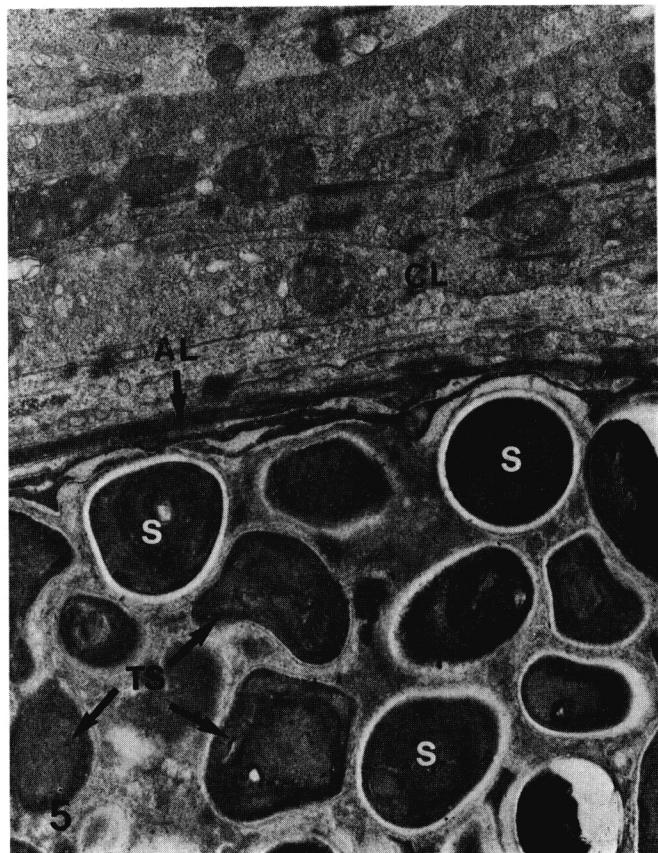
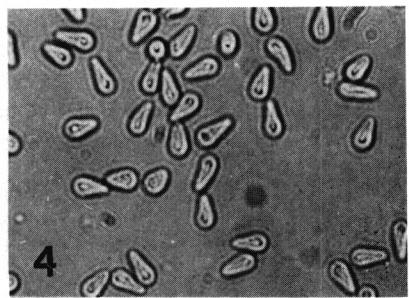
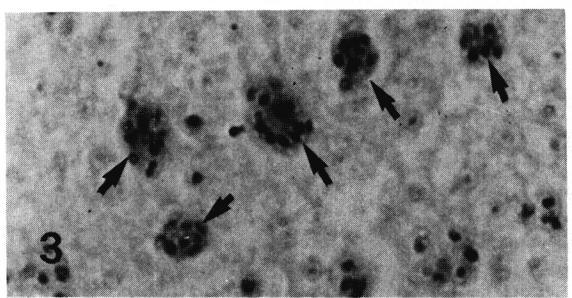
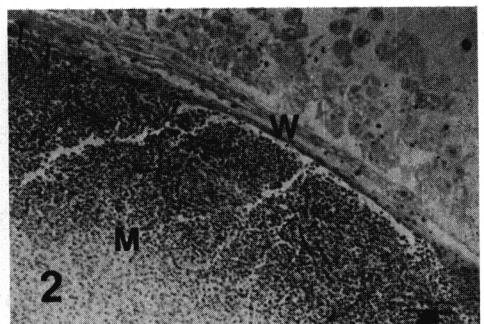
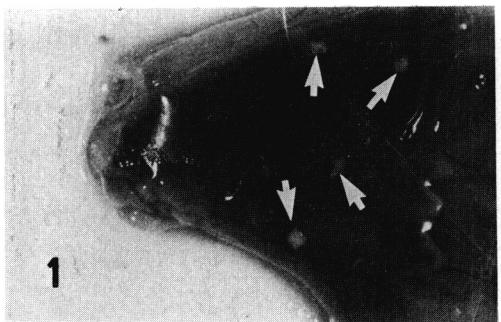
Chloroscombrus chrysurus is the only species of the genus observed in the African Atlantic. The fishes were caught around Dakar (Senegal). Eighty-six of 168 fishes dissected had hepatic cysts. The samples of livers with their cysts were prepared for light and electron microscopy according to the methods used for microsporidia (Hazard *et al.*, 1981).

Numerous whitish cysts were seen in the liver (*fig. 1*).

By light microscopy, the cysts appeared to be bounded by a limiting wall and were filled with spores (*fig. 2*). Vacuoles containing spores were also observed

University C. A. DIOP of Dakar, Faculty of Sciences, Department of Animal Biology, Laboratory of Parasitology, Dakar, Sénégol.

Accepté le 15 mai 1988.



in the liver tissue (fig. 3). Spores were pyriform and measured 3.4 to 4.4 μm in length and 1.6 to 2.4 μm in width (fig. 4). These observations were confirmed and detailed by electron microscopy.

Under the electron microscope, the wall of the cyst appeared to have cellular and non living components (fig. 5). The external layer was composed of elongated cells. These were probably connective tissue cells. The inner acellular layer was of amorphous and electron-dense material. The cyst contained mature spores and sporoblasts of the microsporidia. They were arranged in no particular order. The cysts did not show sporophorous vacuoles. All the cysts observed were mature and presented this structure.

The vacuoles containing the spores had a granular background (fig. 6). Are these vacuoles which evolve into cysts? What is their origin? More observations are needed to answer these questions.

The stage of the parasite definitely identifiable within vacuoles and cysts were only spores (fig. 7). These spores were uninucleated, surrounded by a wall

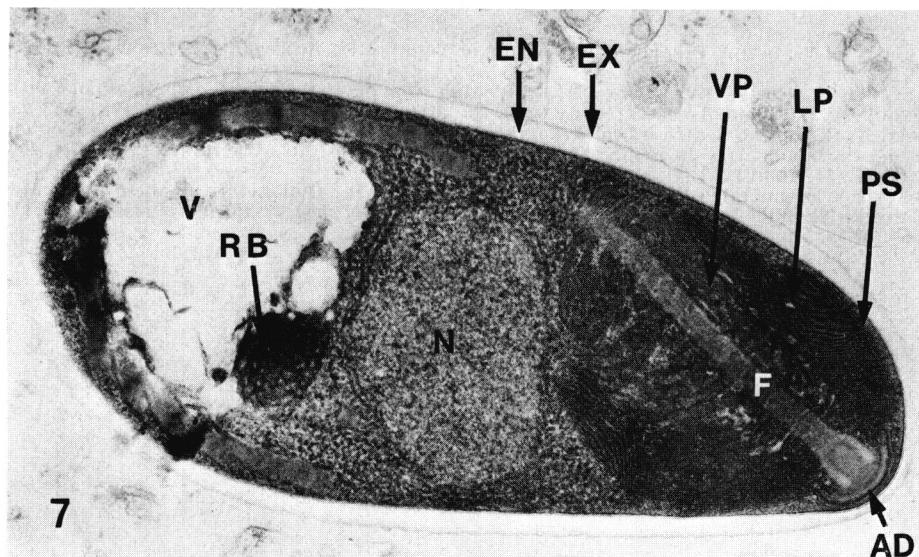


FIG. 7. — Mature spore in longitudinal section showing exospore (Ex), endospore (En), lamellar (LP) and vesicular (VP) polaroplast, polar filament (F), anchoring disc (AD), polar sac (PS), single nucleus (N), posterior vacuole (V) and a reticulated body (RB) ($\times 40,000$).

FIG. 1. — Infected liver. The cysts (arrows) appear whitish ($\times 3$).

FIG. 2. — Semi-thin section of the cyst. It is composed of a wall (W) and central mass (M) filled with spores (Toluidine blue, $\times 150$).

FIG. 3. — Vacuoles containing spores (arrows) in the liver tissue (Carnoy, Heidenhain's Azan, $\times 250$).

FIG. 4. — Fresh spores ($\times 400$).

FIG. 5. — Electron micrograph of the cyst. The cyst wall appear to have cellular (CL) and acellular (AL) layers. The central mass contains spores (S) and sporoblasts (SP) ($\times 15,000$).

FIG. 6. — Electron micrograph of vacuoles contains spores in the liver tissue ($\times 7,000$).

composed of an exospore and an endospore. The exospore was approximately 25 nm, while the endospore was 75-85 nm, except near the polar cap, where it measured only 20 nm. The polar filament extended through the polaroplast and then turned to form a coil with about 6-7 turns in the posterior part of the spore. The polaroplast had two distinct parts: an anterior part composed of stacked membranes (lamellar polaroplast), and a posterior part composed of elongated vesicles (vesicular polaroplast). Posterior to the polaroplast were the nucleus and the posterior vacuole. A reticulate body was frequently observed in this vacuole.

At the present time, it is impossible to assign the microsporidia found in *Chloroscombrus chrysurus* to any known genus or to establish a new genus for it. More studies should be made to determine its development and the mode of origin of the cysts and vacuoles. We assign thus this microsporidium provisionally to the collective group. *Microsporidium* Babiani, 1884. The name *Microsporidium chloroscombri* n. sp. is proposed.

REFERENCES

- CANNING E. U., LOM J. P. : The microsporidia of Vertebrates. Academic Press, New York, 1986, 289 p.
- HAZARD E. I., ELLIS E. A., JOSLYN D. J. : Identification of Microsporidia. In: Microbiol Control of Pests and Plants Diseases (ed. by H. D. Burges). Academic Press, New York, 1981, 163-182.
- SAKITI N. G., BOUIX G. : *Nosemoides tilapiae* n. sp., microsporidie parasite de poisson Cichlidæ des eaux saumâtres du Bénin : implantation et caractères ultrastructuraux. *Parasitol. Res.*, 1987, 73, 203-212.
- SPRAGUE V. : Annotated list of species of microsporidia. In: Biology of the Microsporidia (ed. by L. A. Bulla Jr., T. C. Cheng). Comparative Pathobiology 2, Plenum Press, New York, 1977, 333 p.

DES MICROFICHES ET DES MICROFILMS DE CETTE PUBLICATION PEUVENT ÊTRE OBTENUS AUPRÈS DE

This publication is available in Microform from:

MASSON - SPPIF (réf. MIMC)
120, boulevard Saint-Germain, 75280 Paris Cedex 06

© Masson, Paris, 1989.

Le Directeur de la Publication : Dr J. TALAMON

Tous droits de traduction, d'adaptation et de reproduction par tous procédés réservés pour tous pays.

Toute reproduction ou représentation intégrale ou partielle, par quelque procédé que ce soit, des pages publiées dans le présent ouvrage, faite sans l'autorisation de l'éditeur est illicite et constitue une contrefaçon. Seules sont autorisées, d'une part, les reproductions strictement réservées à l'usage privé du copiste et non destinées à une utilisation collective, et d'autre part, les courtes citations justifiées par le caractère scientifique ou d'information de l'œuvre dans laquelle elles sont incorporées (loi du 11 mars 1957, art. 20 et 41 et Code pénal, art. 425).

Des photocopies payantes peuvent être réalisées avec l'accord de l'éditeur. S'adresser au : Centre Français du Copyright, 6 bis, rue Gabriel-Laumain, 75010 Paris. Tél. 48.24.98.30.

Masson, éditeur, Paris.

Dépôt légal : 1989.

N° d'ordre : 6035.

Mai 1989

IMPRIMÉ PAR IMPRIMERIE BARNÉOUD, A LAVAL. — 9472.

Commission paritaire n° 54169

Printed in France.