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First report of microsporidian infections in solefishes from Senegal coast (West Africa)

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Abstract

Three microsporidian species were isolated from solefishes from Senegal. These microsporidia were: *Microsporidium dicologoglossae* sp.n in *Dicologoglossa cuneata*, *Microsporidium synapturae* sp.n in *Synaptura cadenati* and *Synaptura lusitanica*, and Microsporidium *vanstraeleniae* sp. in *Vanstraelenia chirophthalmus*. All these species infected the liver of their hosts and induced formation of xenomas.

Introduction

Several authors have reported microsporidian infections in Pleuronectiformes fishes causing damage to organs and tissues (Bekhti and Bouix, 1985; Canning and Lom, 1986; Vismanis and Kondratovics, 1994; Turovski, 1994; Dykova, 1995). These infections have often been described in America and Europe but until now, they had not been reported in African sole populations. In this paper, microsporidian infections are described in four species of Soleidae.

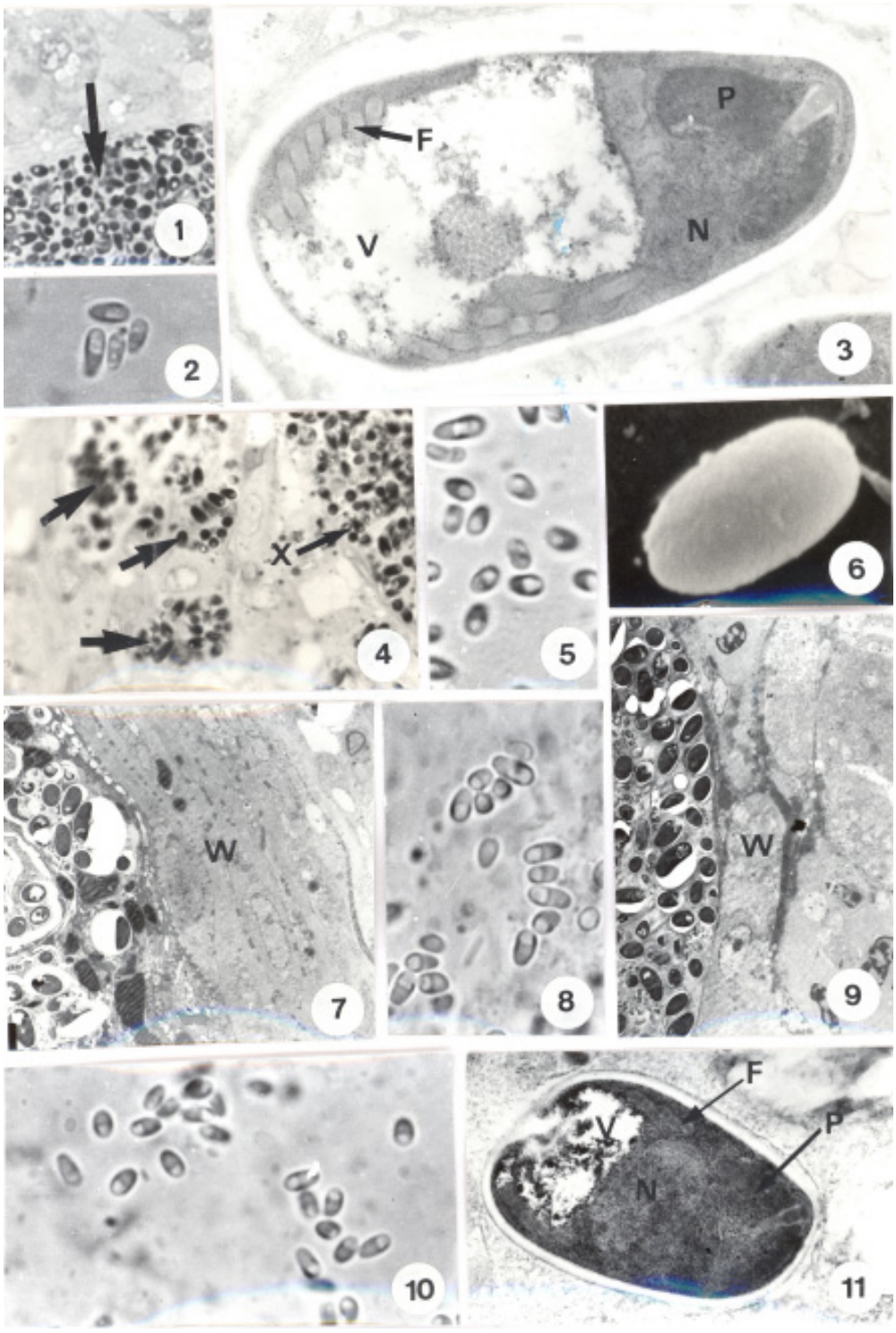
Materials and Methods

5 *Dicologoglossa cuneata* Moreau, 11 *Synaptura cadenati* Chabanaud, 2 *Synaptura lusitanica* Capello, and 25 *Vanstraelenia chirophthalmus* Regan were caught from the coasts of Senegal (West Africa) and dissected for parasite research. Microsporidia were found in the liver of these fishes and were studied by light and electron microscopy (Faye *et al*., 1991).

Results

All the four solefish species examined were infected by microsporidia. These parasites were localized in spherical xenomas appearing as whitish spots near the surface of or surrounded by the liver tissue. The developmental stages and the sporophorous vesicles were not observed within the xenomas.

In *Dicologoglossa cuneata*, 1 out of 5 specimens was parasitized. Only mature xenomas were observed; they were 0.5 to 1.5 mm in diameter and full of mature spores (Fig.1). The spores (Figs. 2 and 3) were ovoid, elongate, uninucleate and measured 3.27 ± 0.45 (2.7-5.0) x 1.70 ± 0.19 (1.5-2) μm. The posterior vacuole was large, the polar tube was isofilar with 7 to 8 coils and the polaroplast was lamellar. In *Synaptura cadenati*, 3 out of 11 specimens were infected. The xenomas were 0.5 to 1.5 mm in diameter and contained only mature spores (Fig. 4). Sometimes, near the xenomas, sporophorous vacuoles containing numerous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Figures 1-3. *Microsporidium dicologoglossae.* Fig.1: Semi-thin section of a xenoma (arrow) containing mature spores (X 1000). Fig. 2: Fresh spores (X 2000). Fig. 3: Ultrastructure of a mature spore. F: polar filament ; P: polaroplast; N: nucleus; V: posterior vacuole.

Figures 4-6*: Microsporidium synapturae* in *Synaptura cadenati.* Fig. 4: Semi-thin section of infected liver showing sporophorous vacuoles (arrows) near the xenoma (X 1000). Fig. 5: Fresh spores (X 2000); Fig. 6: Scanning electron micrograph of a mature spore (X 10000).

Figures 7-8 : *Microsporidium synapturae* in *Synaptura lusitanica.* Fig .7 : Ultrastructure of a xenoma containing mature spores. W : wall (X 3000). Fig. 8: Fresh spores (X 2000).

Figures 9-11*: Microsporidium vanstraeleniae.* Fig. 9*:* Ultrastructure of a xenoma containing mature spores. W : wall (X 3000); Fig. 10: Fresh spores (X 2000); Fig. 11: Ultrastructure of a mature spore. F: polar filament; P: polaroplast; N: nucleus; V: posterior vacuole (X 20000).

mature spores were observed (Fig. 4). The spores (Fig. 5) were ovoid, uninucleate, measured 3.95 ± 0.38 (3.0-5.0) x 2.40 ± 0.27 (1.6-2.8) µm and their surface was smooth (Fig. 6). The posterior vacuole was large, the polar tube was isofilar with 9 to 10 coils and the polaroplast was lamellar. In *Synaptura lusitanica*, the two specimens examined were parasitized. Only mature xenomas with mature spores were found (Fig. 7). These xenomas were 0.3 to 1 mm in diameter. The spores (Fig. 8) were ovoid, uninucleate, measured 3.66 ± 0.70 (3.0-5.50) x 1.77 ± 0.19 (1.6-2.2) µm and had a large posterior vacuole. In *Vanstraelenia chirophthalmus*, 1 out of 25 fishes was infected. The xenomas observed were mature, measured 0.3 to 0.8 in diameter and contained only mature spores (Fig. 9). The spores (Figs. 10 and 11) were ovoid, elongate, uninucleate and measured 3.78 ± 0.31 (2.5-4.0) x 1.94 ± 0.23 (1.5-2,5)µm. The posterior vacuole was large, the polar tube was isofilar with 4 to 5 coils and the polaroplast was lamellar and vesicular.

Discussion

At the present time, it is impossible to assign the microsporidia found to the genera described in fishes (Canning and Lom, 1986; Canning and Vavra, 2000; Matthews *et al.*, 2001, Azevedo and Matos, 2003) or to establish a new genus for them because their developmental stages were not observed. We assign them provisionally to the collective group *Microsporidium* Balbiani, 1884. The comparison of morphological and ultrastructural characters of the mature spores of these four microsporidia induces us to consider that the species found in *Synaptura cadenati* and *Synaptura lusitanica* are similar and those found in *Dicologoglossa cuneata* and *Vanstraelenia chirophthalmus* are distinct. The following names are provisionally proposed: *Microsporidium synapturae* sp.n for the species of *Synaptura cadenati* and *Synaptura lusitanica*, *Microsporidium dicologoglossae* sp. for the species of *Dicologoglossa cuneata* and *Microsporidium vanstraeleniae* sp.n. for the species of *Vanstraelenia chirophthalmus*.

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