

COELOMOMYCES PSOROPHORAE VAR. PSOROPHORAE (PHYCOMYCETES: BLASTOCLADIALES) IN AEDES CASPIUS (DIPTERA: CULICIDAE) IN NORTH EASTERN ITALY

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Summary :

Coelomomyces psorophorae var. *psorophorae* is herein reported for the first time in Italy in nine out of 2,207 adults of *Aedes caspius* examined. In parasitized mosquitoes the abdomen was packed with yellow-brown, ovoid resting sporangia with morphological features (size, shape, wall ornamentation and dehiscence slit), defined via light and electronmicroscopy, allowing the classification of the parasite as *C. psorophorae* var. *psorophorae*.

KEY WORDS : *Coelomomyces psorophorae*, *Aedes caspius*, Italy.

Résumé : *COELOMOMYCES PSOROPHORAE* VAR. *PSOROPHORAE* (PHYCOMYCETES: BLASTOCLADIALES) DANS *AEDES CASPIUS* (DIPTERA: CULICIDAE) AU NORD-EST D'ITALIE.

Il s'agit de la première observation en Italie de *Coelomomyces psorophorae* var. *psorophorae* observé dans neuf exemplaires parmi 2207 *Aedes caspius* examinés. L'abdomen des moustiques parasités était rempli de sporanges jaune-brunâtres ovoïdes dont les traits morphologiques, voir les mesures, la forme, les ornements de la paroi et la ligne de déhiscence, observés en microscopie optique à lumière directe et en microscopie électronique, nous ont permis l'identification du parasite *Coelomomyces psorophorae* var. *psorophorae*.

MOTS CLÉS : *Coelomomyces psorophorae*, *Aedes caspius*, Italie.

INTRODUCTION

During a study of the biology and life cycle of *Setaria labiatopapillosa*, a filarial nematode of the bovine peritoneal cavity, 16,159 adult mosquitoes were collected from 29 June to 29 September 1994 on a farm in the Udine province (Friuli-Venezia Giulia, NE Italy) (Pietrobelli *et al.*, 1995a; Pietrobelli *et al.*, 1995b; Cancrini *et al.*, 1996). Of over 3,040 females identified and dissected, 2,207 were classified as *Aedes caspius*. Among these, nine were found having the haemocoel packed with yellow-brown, ovoid resting sporangia characteristic of the genus *Coelomomyces*. This genus (family Coelomo-

mycetaceae, order Blastocladales) was established by Keilin (1921) to include a fungus from the coelom of a single larva of *Aedes (Stegomyia) albopictus* collected in Malaya. The type species, *C. stegomyiae* Keilin, was described to have « thick-walled, yellowish, oval bodies that, along with coenocytic, irregular mycelium completely fill the body cavity of the larva ».

This paper reports, for the first time in Italy, the occurrence of *Coelomomyces psorophorae* var. *psorophorae*, in adults of *Aedes caspius*.

MATERIALS AND METHODS

Specimens stored in either 70 % ethanol or in distilled water were dissected and mounted in lactophenol or lactophenol-cotton blue on microscope slides for examination by phase contrast and bright-field microscopy. Sporangial measurements were obtained by the use of a drawing apparatus (camera lucida) and stage micrometer.

Specimens were also prepared for scanning (SEM) and transmission (TEM) electronmicroscopy with routine techniques, and examined in an Autoscan Etec (Siemens) at an accelerating voltage of 20 kV for SEM and with a Zeiss EM 109 electronmicroscope for TEM.

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RESULTS

Resting sporangia are ellipsoid, frequently flattened on one side, with color varying from amber to golden brown (Fig. 1). Sporangial dimensions ($n = 55$) are: length 70-120 μm , mean 94.1 μm (DS \pm 9.2); width 38-78 μm , mean 55.8 μm (DS \pm 10.2). The wall is 2-5 μm thick and appears as a two-layer wall: a homogeneously osmiophilic layer (outer wall layer) transected by lacunae, and an electron-translucent layer (inner wall layer) (Fig. 2). The surface of the sporangial wall bears numerous randomly arranged punctae (Figs. 3, 4). The dehiscence slit is visible along one side of sporangia, usually the most convex (Figs. 3, 5).

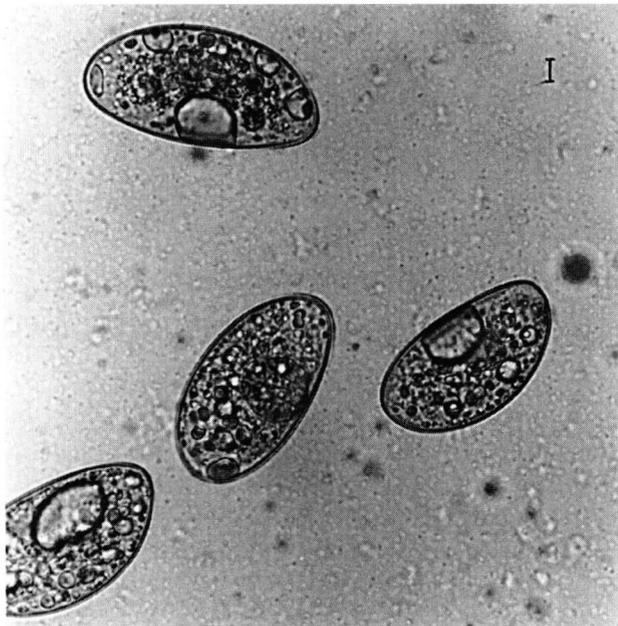


Fig. 1. — Resting sporangia of *C. psorophorae* var. *psorophorae*. Bar = 10 μm .

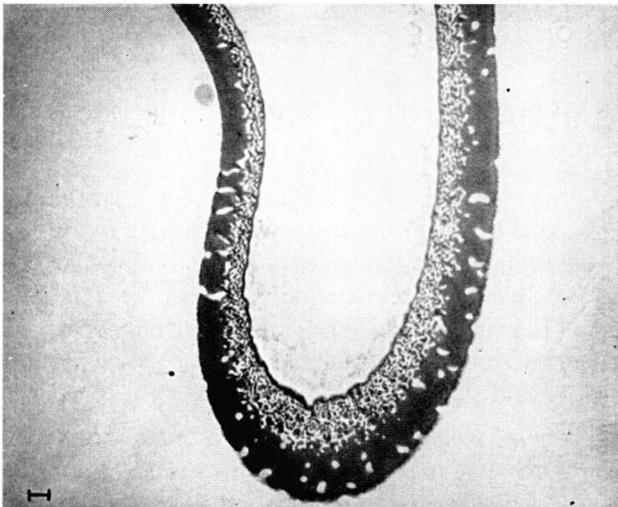


Fig. 2. — Transmission electron micrograph: empty sporangium showing remaining two wall layers. Bar = 1 μm .

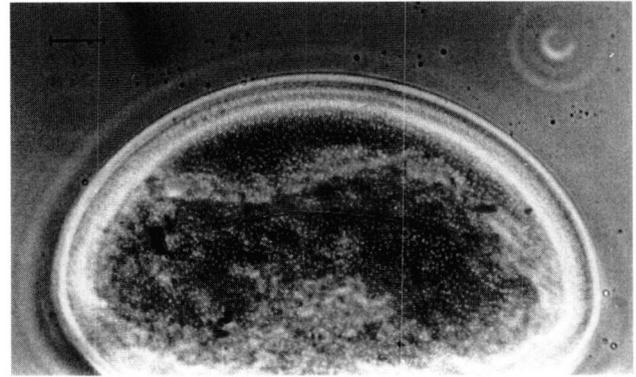


Fig. 3. — *C. psorophorae* var. *psorophorae*. Surface view of resting sporangia. The dehiscence slit is visible along one side of the sporangium. Bar = 10 μm .

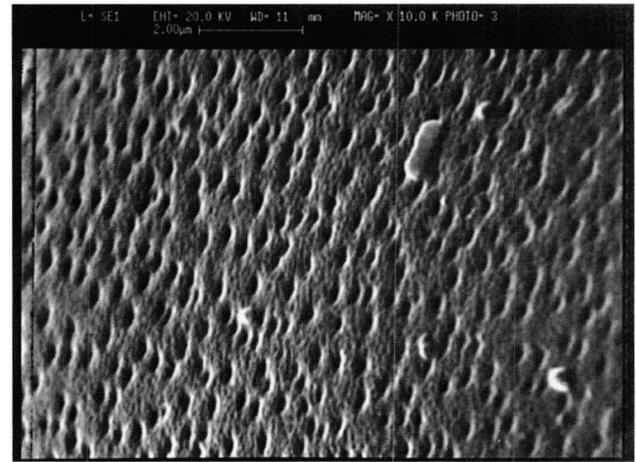


Fig. 4. — Scanning electron micrograph: sporangial surface ornated with numerous punctae. Bar = 2 μm .



Fig. 5. — *C. psorophorae* var. *psorophorae*. Scanning electron micrographs of resting sporangium. The dehiscence slit is visible along one side. Bar = 20 μm .

DISCUSSION

Based on observed morphology, characterized by a sporangial surface ornamented with simple punctae lacking internal differentiation, and a dehiscence slit bordered by punctae, which are not along a longitudinal low ridge, this organism was classified as belonging to the species *C. psorophorae*. Three varieties are described in this species: var. *psorophorae*, from host occurring in fresh water, var. *halophilus* and var. *tasmaniensis*, from hosts occurring in brackish water. All the parasitized adults of *Ae. caspius*, whose aquatic stages are also salt tolerant, were collected between 11 August and 28 September in an area full of irrigation canals, in habitats characterized by both fresh and brackish water.

The two distinctive varieties from hosts occurring in brackish water differ from our specimen: the first one, *C. psorophorae* var. *halophilus*, on the basis of its thinner-walled resting sporangia and its smaller size; the second, *C. psorophorae* var. *tasmaniensis*, is similar in size, but with relatively thin-walled sporangia and fine, more closely spaced punctae.

Based on these peculiarities, our organism is classified as *C. psorophorae* var. *psorophorae*. Because of high variability in sporangial size, wall thickness and frequency of punctae, this variety was considered by Couch & Bland (1985) as a « complex ».

Specimens of *C. psorophorae* var. *psorophorae*, originally described by Couch (1945) in a single larva of *Psorophora ciliata* from Georgia (USA), have been collected from many hosts, including *Ae. caspius*, and habitats all over the world. In Italy, however, the only species of *Coelomomyces* previously reported was *C. raffaelei*, described as a new species by Coluzzi & Rioux (1962), in larvae of *Anopheles claviger*. *Coelomomyces raffaelei* differs from *C. psorophorae* varieties on the basis of sporangial size (18-26 × 36-49 µm for *C. raffaelei*) and surface ornamentation.

Therefore is the first report of *C. psorophorae* var. *psorophorae* in Italy.

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