Microsporidium aedium n. sp., from the Mosquito *Aedes cantans*

We found three third instar larvae infected with an unknown microsporidium among 419 larvae and adults of *Aedes cantans* collected in a flood area of the river Elbe near Poděbrady Spa, Czechoslovakia. The infected larvae showed no external sign of infection and the microsporidium was detected on Giemsa-stained smears of a portion of larval body. Examination of semithin and thin sections of another body portion of these larvae fixed in glutaraldehyde/OsO_4 and embedded in Epon–Araldite revealed that the larvae were parasitized solely with the microsporidium in question.

The parasite was detected only in gastric caeca epithelium. Spores released from infected cells were located in the space between the peritrophic membrane and the gastric epithelium (Fig. 8). On smears of infected larvae, we found merogonial plasmodia with isolated nuclei (Figs. 1, 2), sporogonial plasmodia (Fig. 3), and sporonts in chains with dividing nuclei (Fig. 4), uninucleate presporoblasts (Fig. 5), young (Fig. 6), and mature (Fig. 7) rod-shaped spores 4.2–5.4 × 1.8–2.2 μm in size. Electron microscopical observations of spores (n = 20) revealed that each spore has a single nucleus (Figs. 9, 10) and a multilayered exospore (type II.D of J. I. R. Larsson, *Progr. Protistol.* **1**, 325–390, 1986) with an underlying thin endospore (Fig. 9). An isofilar polar tube, surrounded in its apical part by a lamellar polaroplast (Figs. 9, 10), was short and formed in all observed spores a single coil only (Figs. 11, 12). The microsporidium described here is characterized by two unique features: location in the host and the polar tube morphology. Only two microsporidia—*Pleistophora caecorum* from *Culiseta inornata* (H. C. Chapman and W. R. Kellen, *J. Invertebr. Pathol.* **9**, 500–502, 1967) and *Pleistophora chapmani* from *Culex territans* (T. B. Clark and T. Fukuda, *J. Invertebr. Pathol.* **18**, 400–404, 1971)—have been found in gastric caeca of mosquitoes. Spores of both species are smaller than those of the microsporidium described here. Although no data on the fine structure of both species are available, their polar tubes, however, must form several coils because when extruded they are at least 10 times as long as the spores (H. C. Chapman and W. R. Kellen, *J. Invertebr. Pathol.* **9**, 500–502, 1969; T. B. Clark and T. Fukuda, *J. Invertebr. Pathol.* **18**, 400–404, 1971).

Interestingly, T. G. Andreadis (*J. Invertebr. Pathol.* **46**, 31–46, 1985), when studying the population of *Aedes cantator* infected by *Amblyospora sp.*, found spores in gastric caeca cells of some larvae. These spores were undistinguishable from binucleate *Amblyospora* sp. spores involved in the transovarial transmission of the parasite. The author speculated about the in-

FIGS. 1–12. *Microsporidium aedium* n. sp. Figures 1–7: Stages from Giemsa-stained smears. Figures 1, 2: Multinucleate merogonial plasmodia, ×2160, ×1800. Figure 3: Sporogonial plasmodium, ×2070. Figure 4: Sporonts in chain with dividing nuclei, ×2250. Figure 5: Isolated presporoblasts, ×1350. Figure 6: Young spores, ×2250. Figure 7: Mature spore, ×2160. Figure 8: Infected region of the gastric caeca, ×1620. Toluidine blue-stained semithin section. Figures 9–12: Electron micrographs. Figure 9: Anterior part of the spore,× 30,000. Figure 10: Longitudinal section of the spore, ×15,000. Figure 11: Transverse section of the spore, ×32,000. Figure 12: Single coil of the polar tube (note differences in the layers of the polar tube), ×43,000. Gc, gastric caeca epithelium; H, hinges (?); N, nucleus; P, polaroplast; Pt, polar tube; S, spore; Sw, spore wall.

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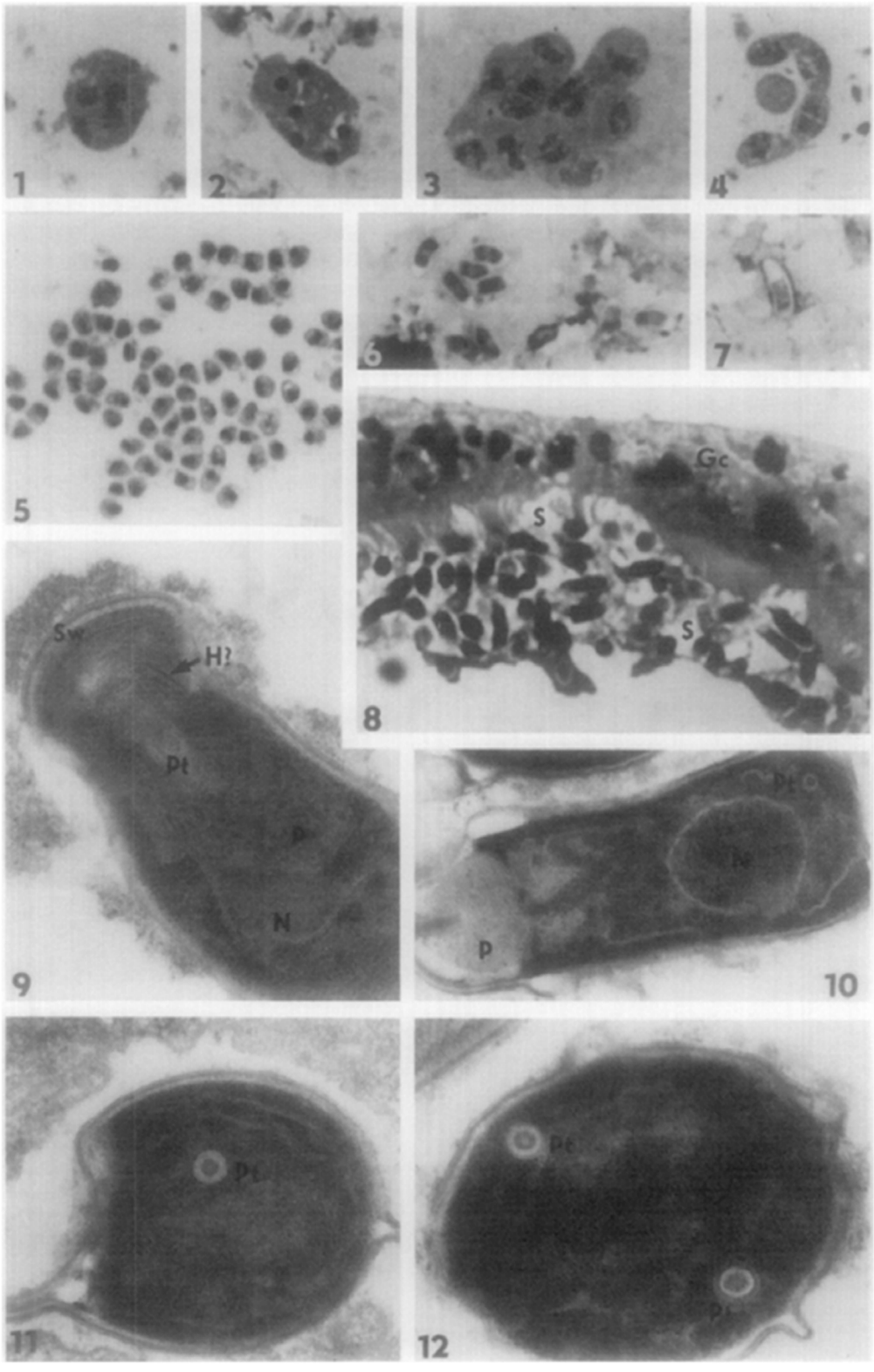
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volvement of the gastric caeca microsporidium in the complex life cycle of *Amblyospora* sp.

In our material, however, light and electron microscopical observations revealed considerable morphological differences between the microsporidium described here and the developmental stages of *A. weiseri* found in the same locality in several females of *Aedes cantans*. The spores of *A. weiseri* were binucleate, with one-layer exospore and a polar tube making seven uniformly thin coils (J. Lukeš and J. Vávra, *Eur. J. Protistol.* **25**, 200–208, 1990).

As far as we know, this is the first microsporidium having the polar tube with a single coil. Uncoiled tubes were hitherto described from five species of microsporidia (see J. I. R. Larsson, *Protistologica* **22**, 379–398, 1986); however, most microsporidia studied ultrastructurally have polar tubes with at least two coils.

The microsporidium described in this paper clearly differs from either *P. chapmani* and *P. caecorum*, which both occur in gastric caeca of mosquitoes. The morphology of its polar tube is unique and does not correspond to any known microsporidian genus. However, our information being so far limited, we prefer to classify this microsporidium as a new species in the collective group *Microsporidium* proposed by V. Sprague (1977, *in* "Comparative Pathobiology," L. A. Bulla, Jr. and T. C. Cheng, Eds., Vol. 2, pp. 1–30, Plenum, New York).

KEY WORDS: *Microsporidium aedium* n. sp.; microsporidia; *Aedes*, mosquito; gastric caeca.

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