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Note to Establish as a New Species a Previously Reported Microsporidium of Philippine Prawns[1]

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ABSTRACT. A previously reported microsporidium in *Penaeus merguiensis* de Man, 1888 (Decapoda, Penaeidae), in the Philippines has been identified as a species of *Agmasoma* Hazard & Oldacre, 1975, and named *Agmasoma aquinoae* n. sp. (Microsporida, Thelohaniidae).

A considerable amount of descriptive information regarding an unnamed "microsporidian parasite" of cultured prawns in the Philippines has already been reported (1–3). That parasite evidently belongs to the genus *Agmasoma* Hazard & Oldacre, 1975 (4), which resembles species of *Thelohania* Henneguy, 1892, but is distinguished by having an anisofilar polar tube. The purpose of this note is to summarize its taxonomic characters and to give it a name.

Agmasoma aquinoae n. sp.

Synonymy. "Microsporidian parasite" Enriquez, Baticados & Gacutan, 1980 (1). Baticados & Enriquez, 1982 (1, 3).

[1] Contribution No. 1877, Center for Environmental and Estuarine Studies of the University of Maryland.

Type host. Penaeus merguiensis de Man, 1888 (Crustacea, Decapoda).
Site of infection. Oocytes.
Transmission. No data.
Relation to host cell. Various stages randomly dispersed in host cell cytoplasm. Meronts in direct contact with host cell cytoplasm. Sporont elaborates an envelope, isolating itself and subsequent sporulation stages from host cell cytoplasm. ". . . There was no apparent change in size or shape of infected oocytes. . . . The parasite destroys and replaces the contents of the oocytes . . ." (2).
Developmental characters. With one known sporulation sequence. Diplokarya present in meronts. Diplokaryon present in sporont, giving rise to single nuclei in sporoblasts and spores. Sporogony typically octosporoblastic (details of division process not fully clarified). ". . . During the sporoblast stage . . . spore organelles . . . start to form" (1) (see Remarks). Sporophorous vesicle present, delicate, persistent.
Spore morphology. Spores generally pyriform, many ovoid, some oblong, some teratological, most in the size range 1.5–2.2 × 2.4–3.6 μm, a few larger ones 2.2–3.6 × 5.1–6.6 μm (fresh). Uninucleate. Exospore rather thin, endospore moderately thick. Polar tube anisofilar, being in coil with a thick proximal part forming about two turns and a thin distal part forming about five turns. Polaroplast fairly large, extending about to middle of spore; apparently with anterior laminate and posterior vesiculate parts (structural details not fully clarified). Posterior vacuole of moderate size.
Type locality. Pond of Southeast Asian Fisheries Development Center (SEAFDEC), Tigbauan, Iloilo, Philippines.
Differentiation of the taxon. The type and only other known species of *Agmasoma* is *A. penaei* (Sprague, 1950) Hazard & Oldacre, 1975 (4). This was originally *Thelohania penaei* Sprague, 1950 (5). It was found in the ovary (apparently also in male reproductive organs) of *Penaeus setiferus* (L.) collected along the Gulf coast of the United States. Its spores were originally reported to be pyriform, 2.2 × 4.0 μm (fresh), with anisofilar polar tube about 70 μm long, the two parts being roughly equal in length. Using electron microscopy, Hazard & Oldacre (4), found that the coiled polar tube had two and one half turns in the broader proximal part and six in the narrower distal part. *Agmasoma aquinoae* is distinguished by having somewhat smaller spores, fewer turns in the coiled polar filament, a different host species, and a far removed locality.
Deposition of type specimens. Type materials of *A. aquinoae* not extant. Three slides of *Thelohania penaei* Sprague, 1950, syntype material, USNM No. 33639, have recently been deposited in the International Protozoan Type Slide Collection, National Museum of Natural History, Smithsonian Institution, Washington, DC 20560.
Etymology. The specific name *aquinoae* is proposed in honor of Philippine President Corazon C. Aquino.

Remarks. Hazard & Oldacre (4) found in *Agmasoma penaei* a peculiar type of sporogony in which cytokinesis apparently had not yet begun after three nuclear divisions were complete and the spore walls had started to develop. That finding (much different from the finding in *A. aquinoae*) is not reliable, however, because the ". . . information came from electron photomicrographs of tissues taken from a shrimp packed in ice for many days, and this treatment may have produced abnormalities in the sporonts" (4). We expect that further observations, using suitable material, would show this species to have developed, like *A. aquinoae,* to the sporoblast stage before the spore organelles began to form. We also expect that adequate study would demonstrate the occurrence of meiosis in both species during sporogony.

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Persistence of Oral Structures in the Sexual Process of Amicronucleate *Paramecium tetraurelia*

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ABSTRACT. In the sexual process, amicronucleate *Paramecium tetraurelia,* unlike micronucleates, fail to produce an oral apparatus, but resorb the pre-existing one. Exceptions were found in some amicronucleate cell lines in which about 1% of the cells possessed oral structures, including pieces of oral membranelles, sometimes complete with buccal cavity, after autogamy or conjugation. By following oral development in the sexual process in some detail, the present study supports the view that these oral structures are derived from the pre-existing oral apparatus and not newly developed from the oral primordium. The possible involvement of the micronucleus and the pre-existing oral apparatus in oral resorption is discussed. The possession of a functional oral apparatus after the sexual process may open up a new evolutionary avenue to the amicronucleates.

IN *Paramecium,* the oral apparatus is resorbed, and simultaneously a new one is produced during sexual reproduction (autogamy or conjugation) (Fig. 1). When conditions that lead to autogamy in micronucleate *P. tetraurelia* are applied to amicronucleates of this species, the macronucleus undergoes fragmentation and the pre-existing oral apparatus is resorbed, but a new one is not produced (Fig. 2). Stomatogenesis is arrested at the early stage of alignment of basal bodies into parallel rows in the oral anarchic field (stage 2) (14, 16). The consequence of the sexual process for amicronucleates is thus astomy and death. The micronucleus is thus indispensable for stomatogenesis in the sexual cycle. Moreover, both of these reports (14, 16) recorded the presence in low frequency (<1%) of oral structures, including membranelles and sometimes the buccal cavity, after the sexual process in some of the amicronucleate cell lines. This generates interest as to whether such oral structures are relics