

Pseudorhabdosynochus kritskyi n. sp. (Monogenea: Diplectanidae) on Gag from the Gulf of Mexico

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Abstract.—*Pseudorhabdosynochus kritskyi* n. sp. from gag *Mycteroperca microlepis* (Perciformes: Serranidae) of the Gulf of Mexico is described and differs from all known species of the genus by the shape of the vagina. It may be further differentiated from *P. americanum*, *P. amplidiscatum*, *P. caballeroi*, *P. epinepheli*, *P. latesi*, *P. monaensis*, and *Cycloplectanum magnisquamodiscum* in having fewer rows of scales in each squamodisc. This new species is most similar to *P. beverleyburtonae*, *P. bocquetae*, *P. cupatum*, *P. lantauensis*, *P. melanesiensis*, *P. querni*, *P. serrani*, *P. summanae*, *P. vagampullum*, and *Cycloplectanum riouxi* in having 15 or fewer squamodisc rows, but it may be separated by differences in either squamodisc morphology or differently shaped hamuli or bars.

Several species of diplectanids have been reported from serranid fishes and in particular from *Epinephelus* spp. from numerous geographic localities. As emphasized by Beverley-Burton and Suriano (1981), "diplectanid systematics have been based, to a large extent, on the morphology of the sclerotized components of the haptor." Oliver (1968) reviewed the status of Diplectanidae and proposed the genus *Cycloplectanum* with *C. americanum* (Price, 1937) as the type species based on characteristics of the squamodiscs, the evaginable penis, and the oval-shaped egg provided with a long opercular filament. Studies on numerous diplectanids of the genus *Cycloplectanum* by Beverley-Burton and Suriano (1981) resulted in an emended generic diagnosis of *Cycloplectanum* Oliver, 1968, emphasizing the unique structure of the terminal genitalia (male copulatory organ and vagina).

Examination of diplectanids from fishes in the Neotropics, the Pacific, and the Caribbean by Kritsky and Beverley-Burton (1986) revealed a systematic problem involving the status of the genera *Pseudorhabdosynochus* Yamaguti, 1958, and *Cycloplectanum* Oliver, 1968. They concluded that *Cycloplectanum* as emended by Beverley-Burton and Suriano (1981) should be considered a junior subjective synonym of *Pseudorhabdosynochus*.

A gag *Mycteroperca microlepis*, taken in the Gulf of Mexico, was examined for helminths. A new species of diplectanid of the genus *Pseudorhabdosynochus* Yamaguti, 1958, is proposed.

Methods

A gag was speared on 22 June 1969 with an elastic-band speargun and a spearshaft-attached powerhead with a 12-gauge shotgun shell in the wreck of the vessel *Empire Mica*, 46 km south of Cape San Blas, Apalachicola, Florida, in the Gulf of Mexico. The gill arches were excised, placed in a plastic bag surrounded by ice, and examined 4 h later under a dissecting microscope. Some specimens were fixed in 5% neutral-buffered formalin at room temperature, whereas others were placed in hot 5% neutral-buffered formalin, mounted in glycerin jelly, and studied under oil immersion by phase-contrast microscopy. Measurements were made with an eyepiece micrometer and are reported in micrometers, the mean being followed by the range and number of structures measured in parentheses. Illustrations were made with the aid of a drawing tube. For comparative purposes, holotypes and paratypes were borrowed from the U.S. National Museum, Beltsville, Maryland (USNM), the Museum National d'Histoire Naturelle, Paris, France (MNHN), the Universidad Nacional Autonoma de Mexico, Mexico City (UNAM), and the Meguro Parasitological Museum, Tokyo, Japan (MPM). These were labeled as follows: holotype and paratypes, *Diplectanum americanum* Price, 1937 (USNM 35703); paratypes, *Diplectanum amplidiscatum* Bravo-Hollis, 1954 (UNAM 24-8); holotype, *Diplectanum bocquetae* Oliver and Paperna, 1984 (MNHN 112TC-96Tu); paratypes, *Diplectanum cupatum* Young,

1969 (USNM 63138); holotype and paratype, *Diplectanum epinepheli* Yamaguti, 1938 (MPM 22259); holotype and paratype, *Pseudorhabdosynochus epinepheli* Yamaguti, 1958 (MPM 23375); paratypes, *Cycloplectanum hongkongensis* Beverley-Burton and Suriano, 1981 (USNM 76726); holotypes and paratypes, *Cycloplectanum lantauensis* Beverley-Burton and Suriano, 1981 (USNM 76719); holotype, *Diplectanum melanesiensis* Laird, 1958 (USNM 38304); holotype and paratype, *Pseudorhabdosynochus monaensis* Dyer, Williams and Bunkley-Williams, 1994 (USNM 82789-82790); holotype, *Diplectanum querni* Yamaguti, 1968 (USNM 63662); paratypes, *Diplectanum summanae* Young, 1969 (USNM 63144); and paratypes, *Diplectanum vagampullum* Young, 1969 (USNM 63146). Kritsky and Beverley-Burton (1986) considered *D. epinepheli* Yamaguti, 1938, *P. epinepheli* Yamaguti, 1958, and *C. hongkongensis* Beverley-Burton and Suriano, 1981 to be synonyms of *P. epinepheli* (Yamaguti, 1938). Other species of *Diplectanum* and *Cycloplectanum* just mentioned have been assigned to *Pseudorhabdosynochus*.

Characteristics of

Pseudorhabdosynochus kritskyi n. sp.

Description (Figures 1–7): Diplectanidae (sensu Yamaguti 1963), *Pseudorhabdosynochus* Yamaguti, 1958 (sensu *Cycloplectanum* as emended by Beverley-Burton and Suriano 1981). Total body length including haptor, 643 μm (514–784 μm ; $N = 12$); maximum breadth at level of ovary, 239 μm (157–352 μm ; $N = 12$). Pharynx, 56 μm long (46–72 μm ; $N = 8$) and 54 μm wide (36–64 μm ; $N = 7$); ceca terminating immediately posterior to testes. Cephalic glands lateral to pharynx; ducts leading to head organs. Haptor, 63 μm long (46–77 μm ; $N = 10$) and 156 μm wide (150–220 μm ; $N = 10$); dorsal hamuli length from tip of deep root to outer curve of blade, 36 μm (33–44 μm ; $N = 13$); ventral hamuli, with elongated deep and superficial roots, length from tip of deep root to outer curve of blade, 37 μm (35–42 μm ; $N = 13$); dorsal bars, with rounded medial extremity, 46 μm long (44–49 μm ; $N = 11$); ventral bar bow-shaped, 93 μm long (70–102 μm ; $N = 8$), with medial groove and rounded ends; 14 hooks, 9 μm long (8–12 μm ; $N = 3$). Dorsal and ventral squamodiscs, 76 μm in diameter (55–88 μm ; $N = 10$), consisting of 12 rows of scales (11–15; $N = 14$); rows 1–4 closed, remaining rows open, U-shaped. Testis subspherical, 56 μm long (48–72 μm ; $N = 8$), and 51 μm wide (40–67 μm ; $N = 8$) in posterior

half of body, with vas deferens arising anteriorly to pass forward to saccular seminal vesicle; ejaculatory duct opening into basal bulb of male copulatory organ along with prostatic reservoir. Male copulatory organs sclerotized, proximal region reniform, 118 μm long (105–127 μm ; $N = 10$), divided into four chambers, distal tubular region curved, 40 μm long (25–64 μm ; $N = 8$), terminating at genital opening. Ovary, sack-shaped, 67 μm long (55–80 μm ; $N = 6$) and 36 μm wide (28–49 μm ; $N = 6$), located immediately anterolateral to testis, distal portion curving dorsally around right cecum. Vagina sclerotized, tubular, 20 μm long (17–27 μm ; $N = 11$), leading to proximal, oval-shaped, sclerotized reservoir which may serve as a seminal receptacle, 22 μm long (18–26 μm ; $N = 12$). Ootype surrounded by Mehlis' glands opening at genital pore. Vitellaria lateral, overlapping ceca and extending from pharynx to slightly beyond posterior ends of intestinal ceca. Eggs not observed.

Host: Gag *Mycteroperca microlepis* (Goode and Bean, 1879) (Serranidae).

Locality: Gulf of Mexico (29°15'N, 86°36'W), 22 June 1969.

Site of infection: Gill filaments.

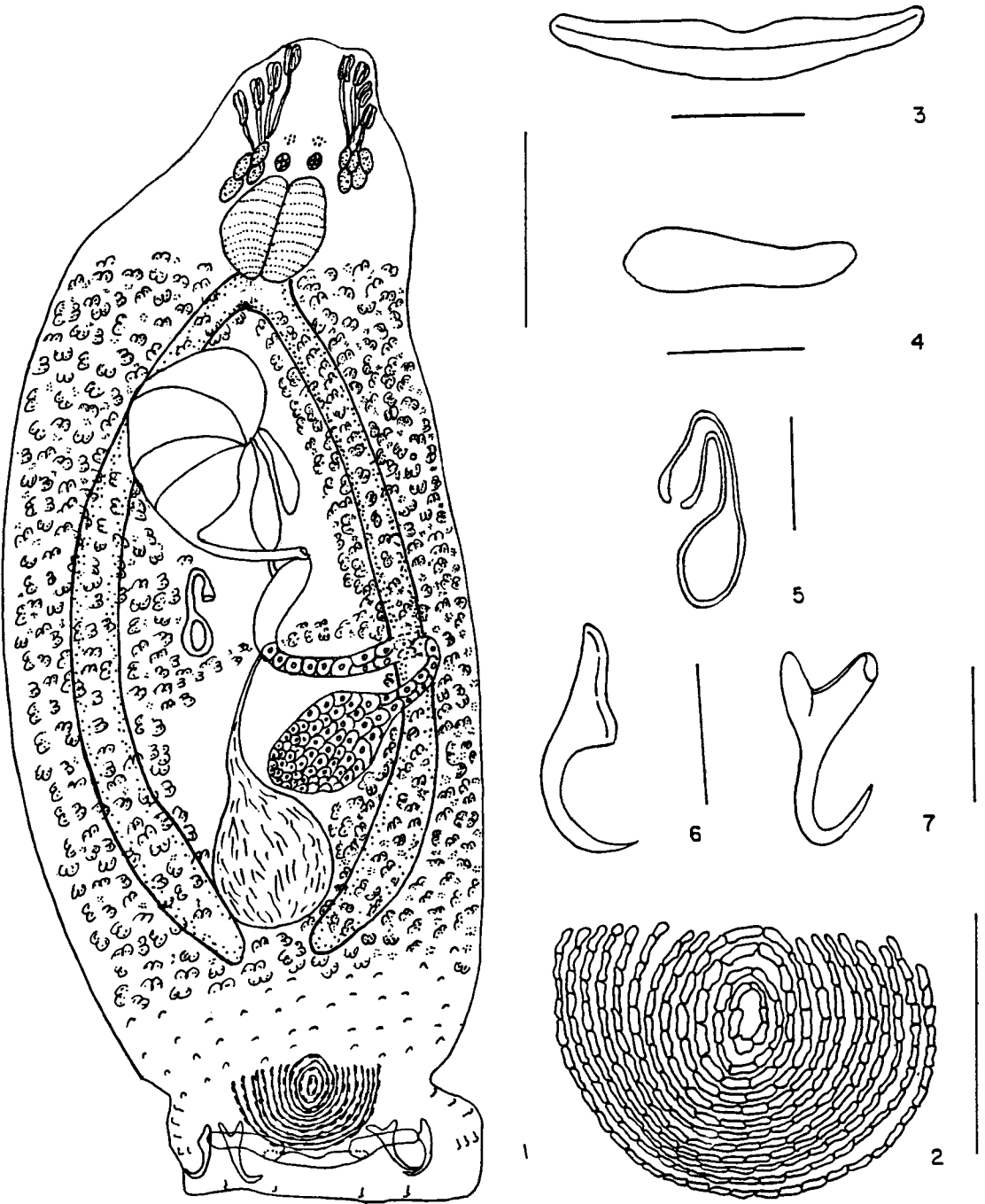
Etymology: Named for Delane C. Kritsky, College of Health Professions, Idaho State University, in recognition of his contributions to the systematics of the Monogenea.

Type material: U.S. National Museum, Helminthological Collection, holotype 83991, 13 paratypes 83992.

Discussion

Pseudorhabdosynochus kritskyi may be differentiated from all previously described species in having a sclerotized tubular vagina leading to an oval-shaped sclerotized reservoir. Further, *P. kritskyi* with 11–15 rows of scales in each squamodisc is dissimilar to *P. americanum* (Price, 1937), *P. amplidiscatum* (Bravo-Hollis, 1954), *P. caballeroi* (Oliver, 1984), *P. epinepheli* (Yamaguti, 1938), *P. latesi* (Tripathi, 1955), *P. monaensis* Dyer, Williams and Bunkley-Williams, 1994, and *Cycloplectanum magnisquamodiscum* Aljoshkina, 1984, all of which have 16 or more rows.

Pseudorhabdosynochus kritskyi is similar to *P. beverleyburtonae* (Oliver, 1984), *P. bocquetiae* (Oliver and Paperna, 1984), *P. cupatum* (Young, 1969), *P. lantauensis* (Beverley-Burton and Suriano, 1981), *P. melanesiensis* (Laird, 1958), *P. querni* (Yamaguti, 1968), *P. serrani* (Yamaguti, 1953), *P. summanae* (Young, 1969), *P. vagampul-*



FIGURES 1-7.—*Pseudorhabdosynochus kritskyi* n. sp. **Figure 1.** Entire worm, dorsal view (composite illustration from several specimens). Scale bar (to upper right of worm) = 100 μm . **Figure 2.** Dorsal squamodisc (dorsal view). Scale bar (right) = 50 μm . **Figure 3.** Ventral bar (dorsal view). Scale bar (below) = 25 μm . **Figure 4.** Right dorsal bar (dorsal view). Scale bar (below) = 25 μm . **Figure 5.** Vagina (ventral view). Scale bar (right) = 25 μm . **Figure 6.** Dorsal hamulus (ventral view). Scale bar (right) = 25 μm . **Figure 7.** Ventral hamulus (dorsal view). Scale bar (right) = 25 μm .

lum (Young, 1969), and *Cycloplectanum riouxi* Oliver, 1986, in having 15 or fewer rows of scales on each squamodisc. However, *P. kritskyi* may be differentiated from *P. beverleyburtonae*, *P. querni*, *C. riouxi*, and *P. summanae* in having the four innermost rather than the two innermost rows of scales in the squamodiscs closed. It differs from *P. bocquetiae* and *P. cupatum* in having fewer than five closed rows of scales. *Pseudorhabdosynochus kritskyi* may be separated from *P. lantauensis*, *P. serrani* and *P. vagampullum* in that all the rows of scales in the squamodiscs of the three latter species are open. Although *P. kritskyi* and *P. melanesiensis* have the innermost four rows of scales closed, they may be differentiated on the basis of the morphology of the dorsal hamuli and ventral bar.

The review by Kritsky and Beverley-Burton (1986) of diplectanid monogeneans includes a list of 14 described species of *Pseudorhabdosynochus* along with their synonyms. That same year, Oliver (1986) described *Cycloplectanum riouxi* from *Epinephelus guaza*. Apparently Kritsky and Beverley-Burton (1986) were not aware of Aljoshkina's description (1984) of *Cycloplectanum magnasquamodiscum* from *Chaetodon hoefleri*. We (Dyer et al. 1994) suggested that both species of *Cycloplectanum* be transferred to *Pseudorhabdosynochus*, but because we were unable to obtain a loan of holotypes or paratypes for examination, we were reluctant to make a more definitive recommendation.

Except for Aljoshkina's report (1984) of *C. magnasquamodiscum* from *Chaetodon hoefleri*, all species of *Pseudorhabdosynochus* have been reported from serranids.

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