Redescription of *Rhamnocercus stichospinus* Seamster and Monaco, 1956 (Monogenea: Diplectanidae), Parasitic on *Menticirrhus americanus* (Osteichthyes: Sciaenidae) from the Coastal Zone of the State of Rio de Janeiro, Brazil

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Rhamnocercus stichospinus *Seamster and Monaco, 1956 (Diplectanidae) parasitic on the sciaenid fish* Menticirrhus americanus *from the coastal zone of the State of Rio de Janeiro, is redescribed and recorded for the first time in the South American Atlantic Ocean. The generic diagnosis of* Rhamnocercus *is emended to accommodate the presence of confluent intestinal ceca in* R. stichospinus.

Key words: Monogenea - Dactylogyrinea - Diplectanidae - *Rhamnocercus stichospinus* - *Menticirrhus americanus* - Brazil

Studies on polyonchoinean monogeneans, parasitic on marine teleost fishes, from Brazilian coastal zone are scarce. To date, three species were recorded: *Encotyllabe spari* Yamaguti, 1934 parasitic on *Haemulon sciurus*, *Orthopristis ruber* and *Micropogonias furnieri; Rhamnocercus rhamnocercus* Monaco, Wood and Mizelle, 1954 parasitic on *Micropogonias furnieri*, and *Mexicana atlantica* Luque, Amato and Takemoto, 1993 parasitic on *Haemulon steindachneri* (Kohn et al. 1984, 1989, Luque et al. 1993, 1996).

During a parasitological survey of marine fishes from the coastal zone of the State of Rio de Janeiro, Brazil, 115 specimens of the sciaenid fish *Menticirrhus americanus* Linnaeus were necropsied and numerous polyonchoinean specimens were collected. In the present paper, *Rhamnocercus stichospinus* Seamster and Monaco, 1956 is redescribed and illustrated. This species is recorded for the first time from the coastal zone of the South America Atlantic Ocean. The generic diagnosis of *Rhamnocercus* Monaco, Wood and Mizelle, 1954 is emended herein.

MATERIALS AND METHODS

The monogeneans studied are part of the material collected from 115 specimens of *M. americanus*, from the coastal zone of the State of Rio de Janeiro, Brazil (22º30'S, 41º23'W - 22º43'S, 41º40'W) during 1996. Specimens of *M. americanus* were identified according to Menezes and Figueiredo (1980). The fishes measured 28.4 ± 7.7 (17-48) cm of total length, and weighed 335.7 ± 329.5 (54-1580) g. The monogeneans were fixed and preserved in 5% formalin. The parasites were stained with Gomori's trichrome and mounted in Canada balsam. Measurements were made in micrometers (μm); the range is followed by the mean within parentheses. The illustrations were made with the aid of a drawing tube mounted on a Wild M-20 phase contrast microscope. The terms prevalence and mean intensity were used according to Bush et al. (1997). Voucher specimens were deposited in the Coleção Helmintológica do Instituto Oswaldo Cruz (CHIOC), Rio de Janeiro, Brazil and in the United States National Parasite Collection (USNPC), Maryland, USA.

RESULTS

Monogenea van Beneden, 1858
Polyonchoinea Bychowsky, 1937
Dactylogyrinea Bychowsky, 1937
Diplectanidae Monticelli, 1903
Rhamnocercus Monaco, Wood and Mizelle, 1954 emended

Emended diagnosis: Diplectanidae. Peduncle long, slender, covered with two longitudinal rows of dorsal and ventral hook-like spines. Intestinal ceca confluent posteriorly. Testis post-germarian, copulatory organ straight or coiled, without accessory piece. Germarium pretesticular, oviduct looping around right intestinal cecum. Vaginal aperture sinistrodorsal. Parasitic on marine sciaenid fishes.

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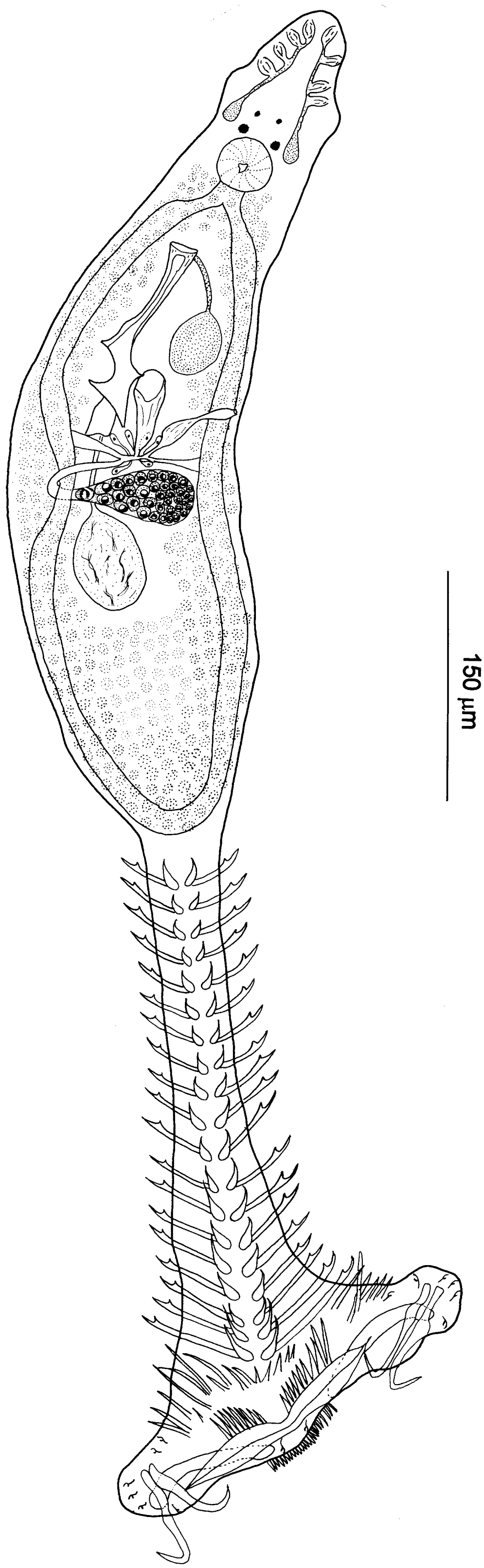
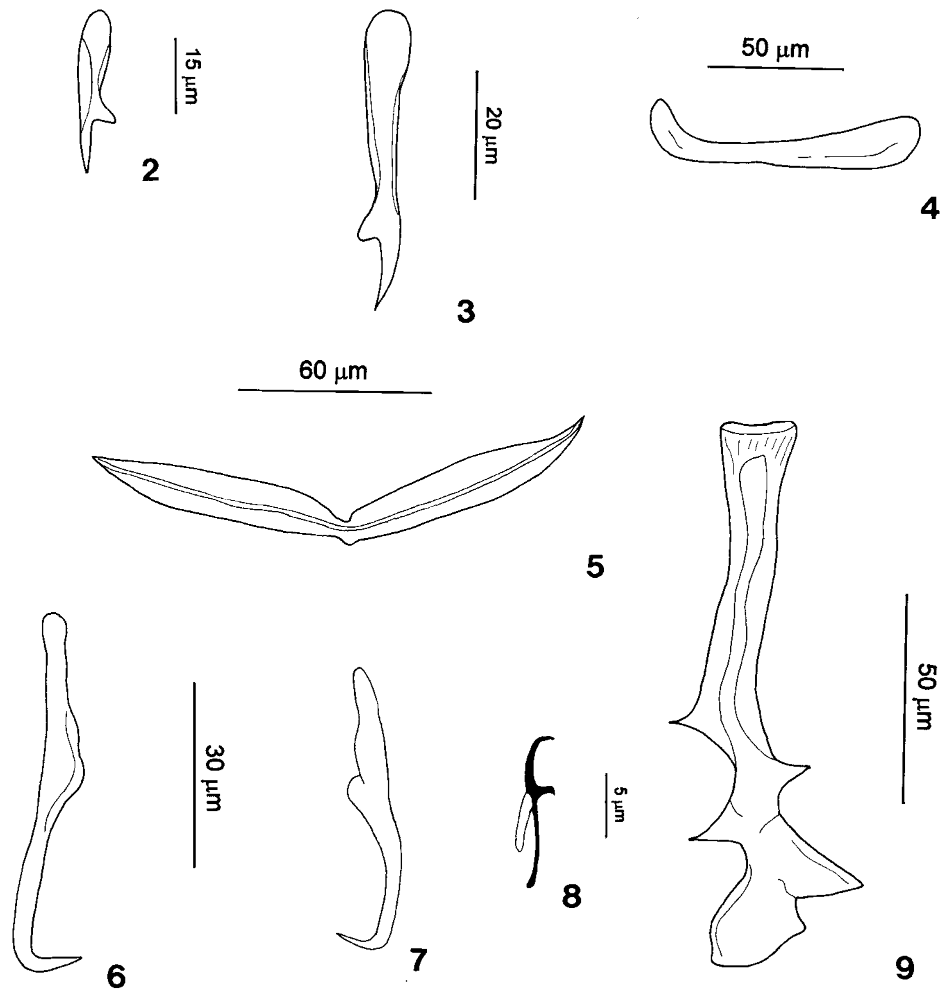
Type species: *Rhamnocercus rhamnocercus* Monaco, Wood and Mizelle, 1954
Other species: *R. bairdiella* Hargis, 1955; *R. stichospinus* Seamster and Monaco, 1956; *R. oliveri* Luque and Iannacone, 1991, and *R. stelliferi* Luque and Iannacone, 1991.

Rhamnocercus stichospinus Seamster and Monaco, 1956
(Figs 1-9)

Redescription (based on 20 whole-mount, 10 measured): body 880-1200 (990), elongate (Fig. 1); greatest width 133-186 (157) in anterior trunk. Cephalic lobes well developed, four pairs of cephalic glands. Tegument smooth. Four eyes. Peduncle 264-352 (314) long, 97-132 (114) wide, slender, elongate, with two longitudinal rows of hook-like spines of 18-23 each (Fig. 1); ventral spines (Fig. 2) 24-42 (34) long, with round base; dorsal spines (Fig. 3) 32-64 (50) long, increasing its size toward haptor. Haptor 352-476 (388) long, 238-282 (254) wide, laterally expanded, with spine groups distributed irregularly. Two similar dorsal bars (Fig. 4) 100-119 (107) long, 9-12 (10) wide, round extremities; ventral bar (Fig. 5) 150-170 (160) long, 12-16 (14) wide, elongate, acute extremities, longitudinal groove, middle notch. Anchors dissimilar; ventral anchor (Fig. 6) 59-66 (63) long, elongate deep root; poorly developed superficial root; straight shaft and short point; dorsal anchor (Fig. 7) 60-70 (64) long, elongate deep root, developed superficial root; evenly curved shaft and short point. Fourteen hooks (Fig. 8) 11-13 (12) long; similar, delicate point and shaft; erect thumb; long, curved shank; FH-loop 4/5 shank length; six pairs lying on lateral haptorial margins, one pair located posterior to ventral bar. Mouth subterminal; pharynx 32-44 (38) long, 30-46 (38) wide, subespherical; intestinal ceca confluent posteriorly. Testis 40-50 (44) long, 32-44 (40) wide, postgermarian; oval prostatic reservoir, sinistral to copulatory organ. Copulatory organ (Fig. 9) 120-144 (126) long, 30-50 (36) wide; distal portion tubular, with twisted appearance in its proximal half; accessory piece absent. Germarium 34-50 (42) long, 40-56 (46) wide; oviduct looping around right intestinal cecum. Mehlis's gland conspicuous; uterus short and tubular, eggs not observed. Vaginal aperture sinistrodorsal, not sclerotised. Vitellaria limited to trunk.
Site of infestation: gills.
Specimens examined: two paratypes of *Rhamnocercus stichospinus* Seamster and Monaco, 1956 parasitic on *Micropogonias undulatus* (Linnaeus), from Texas, USA (USNPC No. 37498). Paratype of *Rhamnocercus rhamnocercus* Monaco, Wood and Mizelle, 1954 parasitic on *Umbrina*



Rhamnocercus stichospinus Seamster and Monaco, 1956. Fig. 1: ventral view.



Rhamnocercus stichospinus Seamster and Monaco, 1956. Fig. 2: ventral spine of peduncle. Fig. 3: dorsal spine of peduncle. Fig. 4: dorsal bar. Fig. 5: ventral bar. Fig. 6: ventral anchor. Fig. 7: dorsal anchor. Fig. 8: hook. Fig. 9: copulatory organ.

roncador Jordan and Gilbert from California, USA (USNPC No. 49426). Paratype of *Rhamnocercus bairdiella* Hargis, 1955 parasitic on *Bairdiella chrysura* (Lacépède) from Florida, USA (USNPC No. 49346).
Prevalence: 30.4%.
Mean intensity: 18.8.
Voucher specimens: CHIOC No. 33959 a-f (six stained whole mount), USNPC No. 88246 (two stained whole mount).
Remarks: Seamster and Monaco (1956) described this species from *Menticirrhus littoralis* and *Micropogonias undulatus* (type host) from Texas, USA. Zwerner and Lawler (1972) recorded *R. stichospinus* from *M. americanus* from Cheasapeake Bay, USA. Original description and illustrations provide scarce information on the internal morphology of *R. stichospinus*.

Rhamnocercus was established by Monaco et al. (1954) and is characterized by species having hook-like spines longitudinally distributed on the peduncle and by accessory spines clumped on the haptor. Hargis (1955) emended the diagnosis of the genus and added some information on the internal morphology and the peduncle spines. In relation to the intestinal ceca, Hargis (1955) stated "...crura unramified, apparently confluent posteriorly...". Both, Hargis (1955) and Seamster and Monaco (1956) discussed the validity of Rhamnocercinae Monaco, Wood and Mizelle, 1954, as a subfamily of Diplectanidae Monticelli, 1903 due to the possible homology of the peduncle spines with the squamodiscs.

Luque and Iannacone (1991) observed, for the first time, confluent ceca in Rhamnocercinae and, following Oliver (1987), placed the species described by them into Rhamnocercidae. The taxonomic act of Luque and Iannacone (1991) is not valid because these authors followed the criteria of Oliver (1987), which in his unpublished doctoral dissertation, mentioned Rhamnocercinae at the family status. According to the International Code of Zoology Nomenclature (Article 9), dissertation does not constitute valid publication.

The type material of the Atlantic species of *Rhamnocercus* deposited in the USNPC does not allow observation of internal morphology but the observation of Luque and Iannacone (1991), in relation to ceca, is confirmed by the examination of Brazilian specimens of *R. stichospinus*. Yamaguti (1963) and Hargis (1955) mentioned that Diplectanidae Monticelli, 1903 is composed by species with intestinal ceca not confluent. Monaco et al. (1954), Hargis (1955), Seamster and Monaco (1956), and Yamaguti (1963) include *Rhamnocercus* as a genus or subfamily (Rhamnocercinae) of Diplectanidae. Confirmation of the confluence of the intestinal ceca in the Peruvian and Brazilian specimens, suggest that a possible change on the taxonomic status of Rhamnocercinae should be tested through a phylogenetic analysis of Diplectanidae.

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REFERENCES

Bush AO, Lafferty KD, Lotz JM, Shostak AW 1997. Parasitology meets ecology on its own terms: Margolis et al. revisited. *J Parasitol 83*: 575-583.

Hargis Jr WJ 1955. Monogenetic Trematodes of Gulf of Mexico Fishes. Part III. The Superfamily Gyrodactyloidea (Continued). *Quart J Florida Acad Sci 18:* 33-47.

Kohn A, Abramson B, Macedo B 1984. Studies on some monogenean parasites of *Haemulon sciurus* (Shaw, 1803) (Pomadasyidae). *J Helminthol 58*: 213-218.

Kohn A, Santos CP, Cohen SC 1989. Monogenean parasites of *Micropogonias furnieri* (Desmarest, 1823) (Pisces, Sciaenidae) from the littoral of Rio de Janeiro State, Brazil. *Mem Inst Oswaldo Cruz 84* (Suppl. IV): 291-295.

Luque JL, Iannacone J 1991. Rhamnocercidae (Monogenea: Dactylogyroidea) in Sciaenid fishes from Peru, with description of *Rhamnocercoides menticirrhi* n. gen, n. sp. and two new species of *Rhamnocercus*. *Rev Biol Trop 39*: 193-201.

Luque JL, Amato JFR, Takemoto R 1993. A new species of *Mexicana* (Monogenea: Dactylogyridae) parasitic on *Haemulon steindachneri* (Jordan & Gilbert) (Osteichthyes: Haemulidae) from the Brazilian coast. *Rev Brasil Parasitol Vet 1*: 85-88.

Luque JL, Amato JFR, Takemoto RM 1996. Comparative analysis of the communities of metazoan parasites of *Orthopristis ruber* and *Haemulon steindachneri* (Osteichthyes: Haemulidae) from the southeastern Brazilian littoral: I. structure and influence of the size and sex of hosts. *Rev Brasil Biol 56:* 279-292.

Menezes NA, Figueiredo JL 1980. *Manual de Peixes Marinhos do Sudeste do Brasil. IV. Teleostei (3)*. Museu de Zoologia, Universidade de São Paulo, São Paulo, 96 pp.

Monaco LH, Wood RA, Mizelle JD 1954. Studies on Monogenetic Trematodes. XVI. Rhamnocercinae, a new subfamily of Dactylogyridae. *Am Midl Nat 52*: 129-132.

Oliver G 1987. *Les Diplectanidae Bychowsky, 1957 (Monogenea, Monopisthocotylea, Dactylogyridea). Systématique. Biologie. Ontogénie. Ecologie. Essai de phylogenèse,* PhD Thesis, Université des Sciences et Techniques du Languedoc, 340 pp.

Seamster A, Monaco LH 1956. A new species of Rhamnocercinae. *Am Midl Nat 55*: 180-183.

Yamaguti S 1963. *Systema Helminthum. Vol. IV. Monogenea & Aspidocotylea,* Inc. Publishers, New York, 699 pp.

Zwerner D, Lawler AR 1972. Some parasites of Chesapeake Bay fauna, p. 78-94. In ML Wass, *A Checklist of the Biota of Chesapeake Bay,* Virginia Institute of Marine Sciences Report No. 65, Virginia, USA.