

MARINE FISH TREMATODES OF WEST PAKISTAN
Part VI.—Two New Species of the Genus *Prosorchis* Yamaguti, 1934
(Hemiuridae: Prosorchinae*)

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Two new species of the genus *Prosorchis* Yamaguti, 1934, are described from the fish *Stromateus sinensis* Euph., of the Karachi coast. *Prosorchis stromatei* is unique in having three testes, two large intercaecal and one smaller almost extracaecal and connected by a fine duct with the posterior larger testes, long pars prostatica surrounded by numerous prostatic gland cells and six convoluted vitelline tubes; four long extending posteriorly from the level of ovary to the posterior extremity, and two smaller extending anteriorly between ovary and acetabulum. *Prosorchis hexavitellatus* is very similar to *P. brevisformis* Srivastava, 1936, as far as size of the body is concerned but is separated from it by having a sinus sac, six vitelline tubes, anteriorly dilated excretory arms, no oesophageal diverticulum, and smaller eggs.

Known species of the genus *Prosorchis* Yamaguti are *P. psenopsis*¹ from the fish *Psenopsis anomala* (Temminck et Schlegel) of Inland sea of Japan, *P. brevisformis*² from *Seriolithys bipinnulatus* (Bleeker) of Bay of Bengal, the third species which was raised to generic level by Skrjabin et Guschan-skaja³ is *Prosorchiopsis legendrei*⁴ from *Centrolophus niger* (Gmel) of north-west coast of France and *P. chainanensis*⁵ from *Pampus argenteus* (Euph.) of South China sea. A fifth species *P. palinurichthi* Prauchin is the one which Lebedev⁵ referred to as in press, although reference to its publication is not yet available. Two new species, *P. stromatei* and *P. hexavitellatus*, were recovered from a fish host, *Stromateus sinensis* off the Karachi coast and are herein described.

Materials and Methods

The fishes, *Stromateus sinensis*, were collected from the Karachi coast. Out of the 38 fishes examined, 2 were infected with trematodes. One fish had a single, larger trematode, and the other fish had two smaller ones; all were recovered from the intestine. The specimens were studied alive, then fixed under slight cover glass pressure in 70% alcohol with few drops of acetic acid; and later stained with borax carmine. Figures were made by camera lucida. All measurements are length by width and in millimeters. Holotypes will be deposited in U.S. National Museum Helminthological collection.

Description

Prosorchis stromatei, sp. n., USNM. No. 71940.

Body long and slender, broader anteriorly, narrow posteriorly. Length 7.9, width 1.6. Oral

sucker subterminal 0.47 × 0.51. Preoral lobe small, 0.05 long. Pharynx small, 0.122 × 0.177, esophagus lacking, ceca reaching to posterior extremity. Acetabulum large 0.87 × 0.94, pre-equatorial. Testes three, spherical, preacetabular; two large intercaecal, equal in size 0.58 × 0.61; third smaller, extracaecal, 0.32 × 0.36 in size and connected with the posterior intracaecal testes by a small duct. Seminal vesicle elongated, twisted to form roughly a 'S' shape, 0.58 × 0.14, situated anterior to testes. Prostatic complex well differentiated, long, surrounded by numerous prostatic cells. Hermaphroditic duct small, genital atrium funnel shaped, genital pore wide, ventral and near the posterior border of oral sucker.

Ovary postacetabular, in posterior half of the body, smooth, 0.43 × 0.44. Receptaculum seminis small 0.182 × 0.327, preovarian. Laurer's canal present, arising at the posterior end of receptaculum seminis and passing down on the dorsal side of the ovary. Vitellaria composed of six long, convoluted tubules, four extending from level of ovary to posterior extremity, two extending anteriorly between ovary and acetabulum. Descending uterus reaches posterior end of worm, ascending dorsal to ovary, passing dorsal to testes and seminal vesicle, joining the hermaphroditic duct at the level of cecal bifurcation and in turn to the genital atrium posterior to pharynx. Eggs numerous, small 0.026–0.07 × 0.014–0.015 in size. Excretory vesicle 'Y' shaped, lateral arms dilating anteriorly and uniting at level of oral sucker.

Prosorchis hexavitellatus, sp. n., USNM. No. 71941.

The description is based on two specimens from one host. Body long and slender, fore-body narrower than hind-body. Holotype length 4.95, maximum width 0.21. Oral sucker sub-terminal, surmounted by small preoral lobe 0.12 in

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length. Pharynx prominent, 0.086×0.12 , ceca long reaching to near posterior end of body. Acetabulum larger than oral sucker 0.5×0.61 in size. Testes tandem, preacetabular, oval, anterior 0.29×0.29 , posterior 0.32×0.29 . Seminal vesicle oval in shape 0.18×0.15 , pretesticular. Pars prostatica long and narrow, surrounded by prostate gland cells. Hermaphroditic duct enclosed in a thin-walled sinus sac, genital atrium indistinct, genital pore ventral to posterior border of pharynx.

Ovary smooth, small 0.25×0.29 , situated behind acetabulum in posterior half of body. Testis 0.28×0.299 in size, larger than ovary. Vitellaria of six long, convoluted tubules, two extending anteriorly for a short distance and four longer tubules reaching to posterior extremity. The two anteriorly directed tubules are dilated at the distal end. Uterus coiling to posterior end of body and then forward, dorsal to acetabulum and gonads, joining the sinus sac

behind the cecal bifurcation. Eggs elongated, small $0.024-0.025 \times 0.0180-0.0184$ in size. Excretory vesicle bifurcating immediately posterior to acetabulum, arms dilated anteriorly and uniting dorsal to oral sucker.

Remarks.—*Prosorchis hexavitellatus*, differs from *P. stromatei*, by having only two testes, more prominent preoral lobe, difference in sucker ratio, differences in general shape and size, genital pore ventral to pharynx instead of ventral to oral sucker, a well-differentiated sinus sac, and much smaller seminal vesicle. The two anteriorly directed vitelline tubes in *P. hexavitellatus* are also much smaller than in *P. stromatei*.

Discussion

An interesting host-parasite relationship is noticeable in the genus *Prosorchis* Yamaguti. Hosts represent the fish families Stromateidae, Pamphidae,⁵ Centrolophidae⁴ and Carangidae.² Jordan⁶

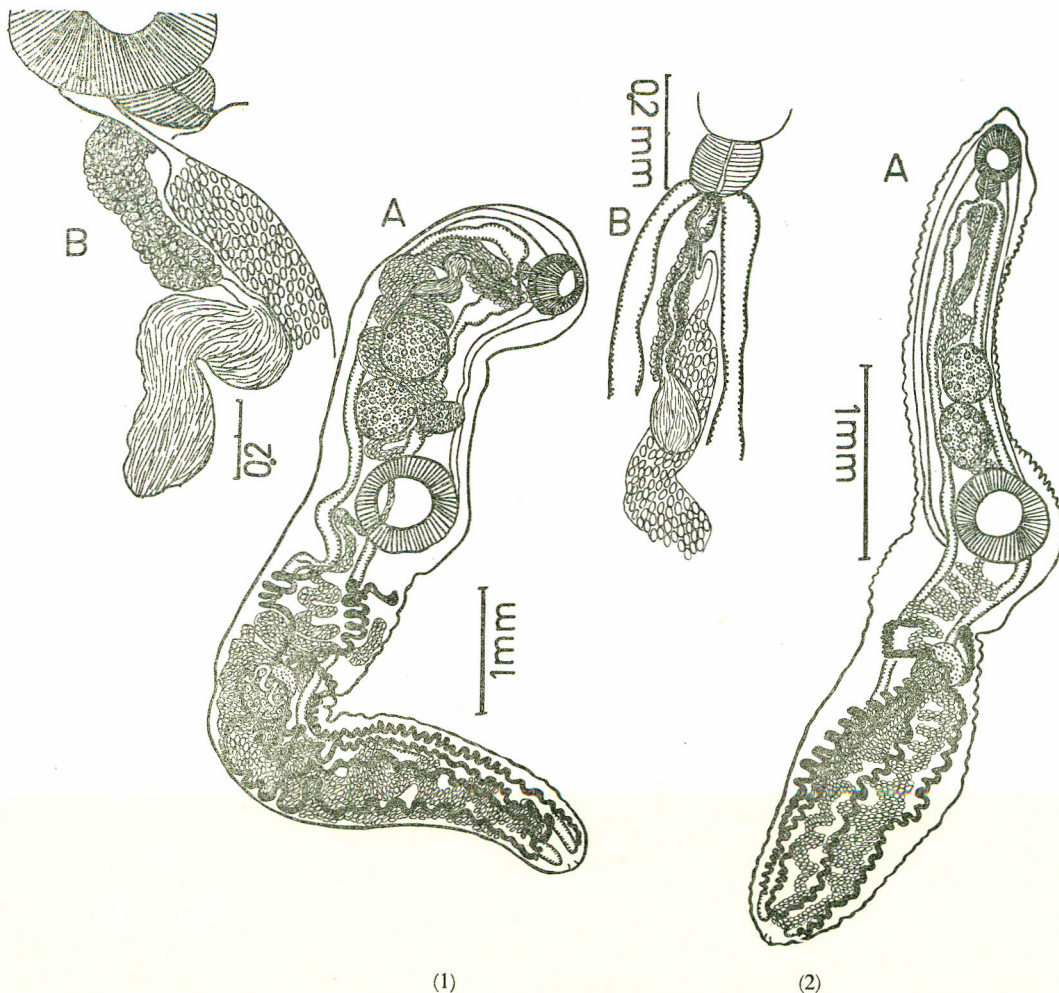


Fig. 1.—(A) *Prosorchis stromatei*, sp. n., holotype, Dorsolateral view; (B) Anterior region of the same showing the genital atrium and associated structures, ventral view, USNM Helm. Coll. No. 71940.
 Fig. 2.—(A) *Prosorchis hexavitellatus*, sp. n., holotype, ventral view; (B) Anterior region of the same, ventral view showing the terminal genitalia, USNM Helm. Coll. No. 71941.

states that "Pampidae and Centrolophidae are closely allied to Stromateidae" and that "Carangidae has the general aspect of *Stromateus*". *Seriolichthys bipinnulatus*, the host of *Prosorichis breviformis*² is a synonym of *Elagatis bipinnulatus* (Quoy et Gaimard, 1824), and *Seriolichthys* Bleeker, 1854, is a synonym of *Elagatis* Bennett, 1840 (Carnagidae).⁶

The new species *Prosorichis stromatei*, from *Stromateus sinensis* of the Karachi coast, is smaller than the type species *P. psenopsis*¹ and proportionately wider. Ratio of width to length in the former

is 1:5, and in the latter it is 1:15.5. *Prosorichis stromatei* is also relatively wider than *P. breviformis*, *Prosorchiopsis legendrei*⁴ and *P. chainanensis*.⁵ The new species has a third extracaecal testes which is absent in the known species. The position of two larger testes is similar to *P. psenopsis*, *P. breviformis* and *P. chainanensis*, but differs from *Prosorchiopsis legendrei*, in which even the anterior testes is not entirely anterior to acetabulum. *Prosorichis stromatei* can also be differentiated by its broader anterior end with small preoral lobe, large ovary, wider seminal vesicle and six vitelline tubes; two of which extend anteriorly from the level of ovary while four longer extend posteriorly reaching to posterior extremity. In *Prosorichis psenopsis*, there are seven vitelline tubes, in *P. breviformis* there are two to four tubes extending from the ovary to the posterior end; the main tubes giving off convoluted, anastomosing secondary branches, *Prosorchiopsis legendrei* has four convoluted vitelline tubes extending from the anterior border of ovary, reaching to little above the posterior end of body, *P. chainanensis* also has four but relatively small convoluted tubes arising almost from the middle of ovary, reaching to posterior extremity. Eggs of *P. stromatei* are the smallest among the known species.

Prosorichis hexavitellatus, is somewhat similar to *P. breviformis*,² in size relationship but can be differentiated from the latter by having no esopha-

geal diverticulum, narrow fore-body, broad and rounded posterior end, six convoluted vitelline tubules; two smaller of which extend anterior to the ovary while four longer extend from the ovary to the posterior extremity, anterior excretory arm dilation, and smaller eggs. Eggs of *P. hexavitellatus* are also much smaller than *P. psenopsis*,¹ *Prosorchiopsis legendrei*⁴ and *P. chainanensis*.⁵ A sinus sac enclosing the hermaphroditic duct is also present in *P. hexavitellatus* which is absent in the known species and in *P. stromatei*.

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References

1. S. Yamaguti, Japan J. Zool., **5**, 249 (1934).
2. H.D. Srivastava, Proc. Nat. Inst. Sci. India, **6**, 175 (1936).
3. S. Yamaguti, *Systema Helminthum* (Interscience New York, 1958), vol. 1, p. 1775.
4. R. Ph. Dollfus, Ann. De Parasitologie, **22**, 314 (1947).
5. B.L. Lebedev. Helminths of epipelagic Fish of the South China Sea (1970), pp. 191-216. In Oshmarin, P.G., L. Mamaev and B.I. Lebedev. Helminth Animals of South Eastern Asia. Div. Parasitol., Instit. Biol. and Pedology, USSR Acad. Sci., Vladivostok. pp. 220.
6. D.S. Jordan, *The Genera of Fishes and a Classification of Fishes* (Stanford University Press, California, 1963).