

A New Species of the Genus *Tubulovesicula* Yamaguti, 1934 (Digenea: Hemiuridae Looss, 1899) From the Fish *Pomadasys olivaceum* (Day) Off Karachi Coast

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Abstract. A new species of the genus *Tubulovesicula* Yamaguti, 1934 is described here and named *T. olivaceus* from the stomach of the fish *Pomadasys olivaceum* (Pomadasyidae) off Karachi coast. The new species is separated from the previously described species as it has relatively small tail or ecsoma, ventral sucker at least 3 times larger than the oral sucker, testes close to ventral sucker, seminal vesicle pre-testicular, long, broader posteriorly reaching to posterior border of ventral sucker, pars prostatica small, hermaphroditic duct enclosed in a small, muscular pouch, genital opening at the base of pharynx immediately behind the intestinal bifurcate. Ovary is in the middle of soma, seven, coiled vitelline tubules situated almost in the middle of soma, uterus long, terminating far anterior to ecsoma. Eggs are numerous, small. Excretory pore is terminal. Excretory vesicle is tubular, arms uniting dorsal to pharynx.

Key words: Trematode, *Tubulovesicula olivaceus* digenetic trematode.

INTRODUCTION

Species reported from different parts of the world are *T. lindbergi* (Layman, 1930); Yamaguti, 1934; Siddiqi and Cable, 1960 from *Leptocephalus conger*, *Synodus* sp. and unidentified eel; *T. madurensis* Nigrelli, 1940, syn. of *T. lindbergi* Manter, 1954 from *Scorpaena madurensis*; *T. magnacetabulum* Yamaguti, 1939 from *Epinephelus akaara*; *T. marsupialia* Oshmarin, 1965 from *Saurida tumbil*; *T. muraenesocis* Yamaguti, 1934 from *Muraenesox cinereus*, *Trachinocephalus myops*, *Lophius litulon*, *Inimicus japonicus*, *Conger myriaster*, *Hamazima*, *Muraenesox coniceps*; *T. muraenesocis* from *Trachinocephalus*; *T. nanamoensis* Mc Farlane, 1936; Manter, 1947 from *Scorpaenichthys marmoratus*; *T. pinguis* (Linton, 1940; Manter, 1947; syn *Distomum grandiporum* Rud. of Linton, 1898; *D. rufoviride* Rud. of Linton, 1898; *D. tornatum* Rud. of Linton, 1905 from *Anguilla rostrata*, *Cynoscion regalis*, *Hemitripterus americanus*, *Merluccinus bilinearis*, *Menidia notata*, *Menticirrhus saxatilis*, *Opsanus tau*, *Paralichthys dentatus*, *Merlinus carolinus*, *Sphyaena borealis* and *Synodus foetens*; *T. californica* Park, 1936 from *Enophrinus bison*; *T.*

diacopae Nagaty and Abdel-Aal, 1962 from *Diacope* sp.; *T. hebrae* Nagaty and Abdel-Aal, 1962 from *Diacope* sp.; *T. pseudorhombi* Yamaguti, 1938 from *Pseudorhombus pentophthalmus* and *T. serrani* Nagaty, 1956 from *Serranus* sp.

Members of the family Hemiuridae Looss, 1899 are among the most frequently encountered digeneans in deep sea benthic teleosts. A variety of genera including *Tubulovesicula* have been described from various parts of the world including Pakistan (Bilqees and Nighat, 1981; Bhutta and Khan, 1975; Linton, 1898, 1905, 1940; Nagaty, 1956; Nagaty and Abdel-Aal, 1962; Park, 1936; Siddiqi and Cable, 1960; (Nicoll, 1914) Yamaguti, 1934; Yamaguti, 1938; Yamaguti, 1939; Zaidi and Khan, 1977; *T. microrchis* Bilqees *et al.*, 2010; *T. macrovesicula* Bilqees *et al.*, 2010 and *T. dorabi* Bilqees *et al.*, 2010). Seven species of the genus *Tubulovesicula* are known from fishes of Karachi coast. Present is an undescribed new species of the genus for which the name *Tubulovesicula olivaceus* is proposed referring to the host species.

The present new species *T. olivaceus*, therefore is distinctly different from the previously described species of the genus in having a combination of characters such as ventral sucker at least 3 times larger than the oral sucker, vitellaria situated more anteriorly with relatively small winding tubules, uterus does not reach in ecsoma and tail is relatively short.

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MATERIALS AND METHODS

The fishes *Pomadasys olivaceum* were purchased from West Wharf, Fish Harbour, Karachi coast. Out of 15 fishes 2 were infected with 2 trematodes in each. Specimens were fixed in AFA solution, a mixture of 70% ethyl alcohol, formalin and acetic acid in the ratio of 90:7:3, under slight cover glass pressure for 24 hours, washed several times with 70% ethyl alcohol, stained with Mayer's Carmalum, dehydrated in graded series of alcohols, cleared in clove oil and xylene and mounted permanently in Canada balsam. Measurements are given length by width in millimeters. Drawings were made with the help of a camera lucida. Holotype and paratype specimens are in the collection of Department of Zoology, Jinnah University For Women, Karachi.

DESCRIPTION

Tubulovesicula olivaceus, new species (Fig.1)

Family:	Hemiuridae Looss, 1899
Sub-family:	Diurinae Looss, 1907 (Syn. Stomachicolinae Yamaguti, 1958)
Genus:	<i>Tubulovesicula</i> Yamaguti, 1934 Syn. <i>Lecithurus</i> Pilgulewsky, 1938
Species:	<i>Tubulovesicula olivaceus</i> n.sp.
Host:	<i>Pomadasys olivaceum</i> (Pomadasyidae)
Location:	Stomach
Locality:	Karachi coast, Pakistan
No. of specimens:	4 specimens from 2 hosts, 15 fishes examined.
Holotype:	JUW – T15
Paratypes:	JUW – T16

Body is long, tail is relatively small, rounded posteriorly, greatest width is at the region of ventral sucker. Lateral cuticular thickenings present near posterior end of soma, more prominent at the right side. Oral sucker is sub-terminal, pre-oral lobe present. Pre-pharynx is absent. Pharynx is small. Intestinal caeca are radiating directly from its base. Oesophagus is absent. Intestinal caeca long, reaching near about the posterior end of ecsoma. Ventral sucker is very large as compared to oral sucker, situated anteriorly in anterior quarter of the body. Testes are unequal, rounded, symmetrical, immediately behind ventral sucker, left testis

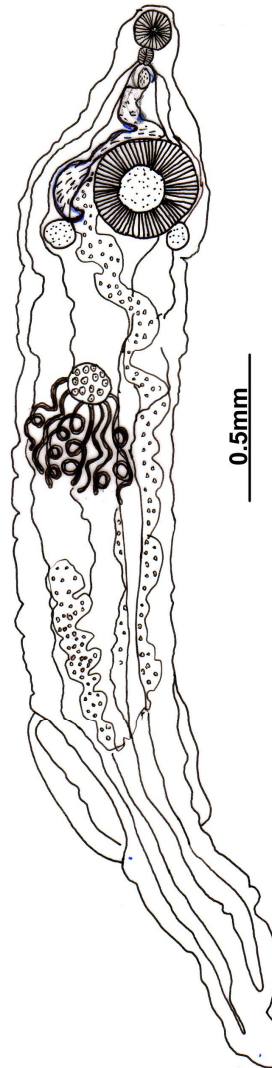


Fig. 1. *Tubulovesicula olivaceus*, new species, holotype, entire.

smaller, close to ventral sucker. Seminal vesicle is pre-testicular, long, distinctly marked off posteriorly, becoming tubular anteriorly. Pars prostatica is small. Hermaphroditic duct is enclosed in muscular pouch. Genital opening is immediately behind intestinal bifurcation. Ovary is almost rounded in the middle of soma. Vitelline tubules are coiled, 7, radiating posteriorly, far anterior to ecsoma then extending forward in the fore body joining the hermaphroditic duct. Uterus is not reaching the tail terminating far anterior to ecsoma. Eggs are numerous, small. Excretory pore is

terminal. Excretory vesicle is tubular, arms uniting dorsally at the base of pharynx.

Measurement (mm)

Entire body size, 3.8 – 3.9 x 0.62 – 0.625; Soma length, 3.0 – 3.05; Soma width, 0.65 – 0.66; Ecsoma length, 0.89 – 0.90; Ecsoma width, 0.36 – 0.37; Fore body length, 0.49 – 0.50; Hind body length, 3.09 – 3.10; Oral sucker, 0.11 – 0.12 x 0.14 – 0.145; Pharynx, 0.05 – 0.055 x 0.043 – 0.044; Ventral sucker, 0.35 – 0.355 x 0.38 – 0.385; Sucker width ratio, 1: 0.03 – 0.031; Pars prostatica length, 0.19 – 0.20; Seminal vesicle length, 0.45 – 0.46; Anterior testis, 0.08 – 0.09 x 0.078 – 0.80; Posterior testis, 0.13 – 0.14 x 0.10 – 0.11; Posterior testis to ovary, 0.5 – 0.51; Ovary, 0.25 – 0.24 x 0.21 – 0.25; and Eggs, 0.022 – 0.04 x 0.017 – 0.02.

DISCUSSION

Species of the genus *Tubulovesicula* Yamaguti, 1934 reported previously from Karachi coast, Pakistan are *T. spari* Yamaguti, 1934; (Bilqees, 1981); Zaidi and Khan, 1977 from *Muraenesox cinereus* (Forsk); (Congridae); *T. anguillae* Yamaguti, 1934 (Zaidi and Khan, 1977) from *Harpodon nehereus* (Har) (Synodidae); *T. magna* Bilqees and Nighat, 1981 from *Pomadasyds olivaceum* (Day) (Pomadasyidae), *T. anguisticauda* Nicoll, 1914; Yamaguti, 1934; (Bhutta and Khan, 1975); Bilqees, 1981 from *Muraenesox cinereus* (Forsk) (Muraenesocidae) and *T. dorabi* Bilqees *et al.*, 2010 from *Chirocentrus dorab*.

Species of the genus *Tubulovesicula* reported from different parts of the world are *T. lindbergi* (Layman, 1930) Yamaguti, 1934; Siddiqi and Cable, 1960 from *Leptocephalus conger*, *Synodus* sp. and unidentified eel; *T. madurensis* Nigrelli, 1940, syn. of *T. lindbergi* Manter, 1954 from *Scorpaena madurensis*; *T. magnacetabulum* Yamaguti, 1939 from *Epinephelus akaara*; *T. marsupialia* Oshmarin, 1965 from *Saurida tumbil*; *T. muraenesocis* Yamaguti, 1934 from *Muraenesox cinereus*, *Trachinocephalus myops*, *Lophius litulon*, *Inimicus japonicus*, *Conger myriaster*, *Hamazima*, *Muraenesox coniceps*; *T. muraenesocis* from *Trachinocephalus*; *T. nanamoensis* Mc Farlane, 1936; Manter, 1947 from *Scorpaenichthys*

marmoratus; *T. pinguis* (Linton, 1940; Manter, 1947; syn *Distomum grandiporum* Rud. of Linton, 1898; *D. rufoviride* Rud. of Linton, 1898; *D. tornatum* Rud. of Linton, 1905 from *Anguilla rostrata*, *Cynoscion regalis*, *Hemitripteris americanus*, *Merluccinus bilinearis*, *Menidia notata*, *Menticirrhus saxatilis*, *Opsanus tau*, *Paralichthys dentatus*, *Merlinus carolinus*, *Sphyaena borealis* and *Synodus foetens*; *T. californica* Park, 1936 from *Enophryns bison*; *T. diacopae* Nagaty and Abdel-Aal, 1962 from *Diacope* sp.; *T. hebrae* Nagaty and Abdel-Aal, 1962 from *Diacope* sp.; *T. pseudorhombi* Yamaguti, 1938 from *Pseudorhombus pentophthalmus* and *T. serrani* Nagaty, 1956 from *Serranus* sp.

In the present species *T. olivaceus* n.sp. pars prostatica is smaller than the seminal vesicle, ecsoma is much smaller than the soma and vitelline tubules are seven in number and uterus does not extend to ecsoma.

Manter has shown that number of vitelline tubules in a species of *Tubulovesicula* may be either 7 or 8 arranged in various positions. *T. serrani* is similar to *T. anguillae* Yamaguti, 1934 which has a very long pars prostatica; in *T. anguillae* it is much longer than the seminal vesicle; the uterus extends rather far into the ecsoma and eggs are 0.034 x 0.023 – 0.024. *T. serrani* differs from *T. anguisticauda* (Nicoll, 1914) in much longer ecsoma and more posterior extent of the pars prostatica.

Position of pars prostatica in *T. pseudorhombi* and *T. anguisticauda* is anterior to the ventral sucker, very similar to the present specimen; while in *T. spari* and *T. anguillae* the pars prostatica is well developed and extends from the middle of the acetabulum to near the internal bifurcation. In *T. serrani* the length of pars prostatica appears to be slightly less, than the length of seminal vesicle and hermaphroditic duct.

In *T. pseudorhombi* seminal vesicle is moderately long in close spirals on dorsal side of posterior half of acetabulum; while in *T. spari* seminal vesicle is broad at the base, runs sinuously on the postero-dorsal side of the ventral sucker. In *T. anguillae* the position of seminal vesicle is different. It is S-shaped lying in front of right testis. In *T. magna* and *T. anguisticauda* the seminal

vesicle is tubular, more or less winding, pre-testicular in position. In *T. serrani* the seminal vesicle is sinuous, dorsal to posterior half of acetabulum and is slightly larger in length than the pars prostatica, while in the present specimen *T. olivaceus* n. sp. the seminal vesicle is long, pre-testicular, distinctly marked off posteriorly.

In *T. serrani* the ovary is ovoid, almost twice as large as one testis to right mid-line, posterior to right testis and overlapped dorsally by the right caecum. The position of ovary of *T. pseudorhombi*, *T. spari*, *T. anguillae*, *T. angusticauda* and *T. serrani* is compared, the testes and the ovary is close to the ventral sucker. But in the present species *T. olivaceus* n. sp. the ovary is far posterior from the ventral sucker.

In *T. pseudorhombi*, *T. magna* and *T. serrani* the uterus does not reach in the ecsoma as in the present species; while in *T. spari* the position is entirely different. Here the uterus coils down on the tail where it turns to the right and passes forward on the ventral side of the right caecum. In *T. anguillae* the tail region is a little longer than the body proper so the uterine coils extend into the tail as far as its middle. In *T. angusticauda* the uterus is extensive and occupies a major portion of the body space between the ventral sucker to the proximal part of the tail.

T. magnacetabulum Yamaguti, 1939 is extraordinary different from all other species in having four times large acetabulum than the oral sucker. Pars prostatica very long as in *T. anguillae*. Seminal vesicle posterior to ventral sucker. One of the two testes is contiguous with the ovary which is at a negligible distance to the acetabulum. Uterus extending into the anterior part of the tail region.

T. pseudorhombi Yamaguti, 1938 in *Pseudorhombus pentophthalmus*; regarded by Manter (1954), as a syn. of *T. spari* despite difference in egg size.

The present new species, therefore, is distinctly different from the previously described species of the genus in having a combination of characters such as ventral sucker at least 3 times larger than the oral sucker, vitellaria situated more anteriorly with relatively small winding tubules, uterus does not reach in ecsoma and tail is relatively short.

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