

A NEW SPECIES *TUBULOVESICULA MICROCAUDUM* (TREMATODA: HEMIURIDAE LOOSS, 1899) FROM THE FISH *OTOLITHUS ARGENTEUS* OFF KARACHI COAST

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ABSTRACT

A new species of the genus *Tubulovesicula* Yamaguti, 1934 is described here and named *Tubulovesicula microcaudum* n.sp. from the stomach of the fish *Otolithus argenteus* (Sciaenidae) off Karachi coast. The new species is different from the previously described species found in Pakistan in having long soma and small ecsoma with varying degrees of small curved tail. Suckers are unequal. Seminal vesicle long and pre-testicular in position. Pars prostatica very long. Hermaphroditic duct enclosed in muscular pouch leading to prominent cirrus sac. Genital pore beneath intestinal bifurcation. Ovary oval, kidney-shaped in the middle of soma. Vitelline tubules lying immediately behind the ovary. Uterus passes in close coils, slightly intruding anterior of ecsoma. Eggs moderate-sized. Excretory pore terminal.

Keywords: Trematode, *Tubulovesicula microcaudum* n.sp., Fish parasite, *Otolithus argenteus*, Stomach, Karachi coast, Pakistan.

INTRODUCTION

Members of the family Hemiuridae Looss, 1899 are among the most frequently encountered digeneans in deep 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 et Abdel-Aal, 1962; Park, 1936; Siddiqi and Cable, 1960; (Nicoll, 1914) Yamaguti, 1934, 1938, 1939; Zaidi and Khan, 1977). Four species of the genus *Tubulovesicula* are known from fishes of Karachi coast. The present new species *Tubulovesicula microcaudum* is named due to its small tail.

MATERIALS AND METHODS

The fishes *Otolithus argenteus* were purchased from West Wharf, Fish harbour, Karachi coast. Out of 19 fishes 1 was infected with 2 trematodes. 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 and will be deposited in the Natural History Museum, Cromwell Road, London.

***Tubulovesicula microcaudum* n.sp.
(Figs. 1-2)**

- Family:** Hemiuridae Looss, 1899
- Sub-family:** Diurinae Looss, 1907
(Syn. Stomachicolinae Yamaguti, 1958)
- Genus:** *Tubulovesicula* Yamaguti, 1934
Syn. *Lecithurus* Pilgulewsky, 1938
- Species:** *Tubulovesicula microcaudum* n.sp.

Host: *Otolithus argenteus* (Sciaenidae)

Location: Stomach

Locality: Karachi coast, Pakistan

No. of specimens: 2 specimens from a single host, 19 fishes were examined.

Holotype: JUW – T10

RESULTS AND DESCRIPTION

Body spindle-shaped, differentiated into soma and ecsoma. Soma very long covering almost the entire length. Ecsoma very small, extensible to varying degrees. Oral sucker sub-terminal, very small as compared to ventral sucker. Pharynx tubular in size, adjacent to the oral sucker, prepharynx absent. Intestinal caeca long reaching the posterior end of ecsoma, ventral sucker about one-fourth of body length from anterior end. Small genital atrium is followed by large-sized genital pore.

Testes are unequal, rounded, symmetrical, away from the ventral sucker. Left testis a little larger than the right lying at its posterior border, right separate. Seminal vesicle pre-testicular, long, extending posterior to ventral sucker and situated dorsal to it, distinctly marked off curved dorsally, becoming tubular anteriorly pars prostatica very long extending from dorso-lateral to ventral sucker to the muscular pouch. Hermaphroditic duct enclosed in muscular pouch leading into prominent cirrus sac. Genital pore immediately below the intestinal bifurcation.

Ovary oval, kidney-shaped in the middle of soma, vitellaria consist of seven, long, tubular lobes, three on one side and four on the other, lying immediately behind ovary, mostly directed backward. The uterus passes in close coils, slightly intruding anterior of ecsoma and then passes forward between the testes above or beside the acetabulum and pre-acetabular area. Eggs thick-shelled and of moderate size. Excretory pore terminal.

Measurements of *T. microcaudum* n.sp. (in millimeters)

Body size	5.4 – 5.42 x 1.11 – 1.15
Soma length	4.4 – 4.42
Soma width	1.2 – 1.21
Ecsoma length	1.3 – 1.32
Ecsoma width	0.5 – 0.51
Fore body length	0.8 – 0.83
Hind body length	3.1 – 3.13
Oral sucker	0.21 – 0.22 x 0.27 - 0.28
Pharynx	0.09 – 0.10 x 0.10 – 0.105
Ventral sucker	0.56 – 0.57 x 0.56 – 0.561
Sucker width ratio	1: 0.035 – 0.037
Pars prostatica	1.05 – 1.10

Seminal vesicle	0.41 – 0.42
Ventral sucker to seminal vesicle	0.14 – 0.15
Ventral sucker to anterior testis	0.1
Anterior testis	0.1 – 0.16
Posterior testis to ovary	0.39 – 0.4
Ovary	0.15 – 0.20
Eggs	0.029 – 0.05 x 0.03 – 0.038

ETYMOLOGY: The present new species *Tubulovesicula microcaudum* refers to its short tail.

DISCUSSION

Tubulovesicula is a poorly known genus in Pakistan and only four species have been reported from Marine fishes. These include *Tubulovesicula spari* Yamaguti, 1934 (Bilqees, 1981) from the fish *Muraenesox cinereus* (Forsk); (Congridae); *T. anguillae* Yamaguti, 1934 (Zaidi and Khan, 1977) from *Harpodon nehereus* (Har) (Synodidae); *T. magna* Bilqees and Nighat, 1981 from *Pomadasydys olivaceum* (Day) (Pomadasyidae) and *T. anguisticauda* Nicoll, 1914; Yamaguti, 1934; (Bhutta and Khan, 1975); Bilqees, 1981 from *Muraenesox cinereus* (Forsk) (Muraenesocidae).

During the present studies species of the genus *Tubulovesicula* has been recovered from the intestine of *Otolithus argenteus* which appears totally different from the species described from Pakistan and other parts of the world and is regarded a new species and the name *T. microcaudum* n.sp. is proposed.

The new species is different from the species found in Pakistan in having relatively small sized body with soma very long and ecsoma very small, curved tail. Seminal vesicle pre-testicular, long, extending posterior to ventral sucker. Hermaphroditic duct enclosed in muscular pouch. Uterus occupy extensive part of soma, slightly intruding into the ecsoma, while in *T. anguisticauda* the tail is very long, tubular seminal vesicle is not enclosed within muscular pouch, posteriorly it extends upto the posterior margin of the ventral sucker, uterus is extensive and occupies a major portion of the body space between the ventral sucker to the proximal part of the tail. Excretory vesicle is Y-shaped.

In *T. spari* body is spindle-shaped, fusiform, smaller than the present species, broadest at the level of vitellaria. Seminal vesicle is long and slender, as in the present specimen *T. microcaudum* n.sp., broad at the base, runs sinuously on the postero-dorsal side of the acetabulum. Pars prostatica is surrounded by numerous prostatic cells. Hermaphroditic pouch is pear shaped and muscular. Uterus coils down on the left side half way into the tail which shows that the *T. spari* is different from the present specimen.

The diagnostic characters of *T. anguillae* are very different from the presently described specimen of *T. microcaudum* n.sp. The body is equally divided into soma and ecsoma in which uterus reaches the middle of the ecsoma. Seminal vesicle is S-shaped lying in front of the right testis in *T. anguillae*.

In *T. magna* the tail is knob-like, more or less longer than the present specimen in which the tail is straight and curved. Seminal vesicle tubular, more or less winding, pre-testicular in position. Testes are almost symmetrical in position and lying in the middle of the two testes. Uterus is not reaching the ecsoma. While in the present specimen the position of the testes and ovary are different and uterus does not reach the ecsoma.

Species from other parts of the world include, *T. muraenesocis* Yamaguti, 1934; which is closely related to *T. anguisticauda* Nicoll, 1915 but differs markedly in the size of the eggs and in the posterior extent of the vesicula seminalis and pars prostatica. The uterus is confined to body proper and the tail region is very long, which shows that this specimen is fairly different from the present specimen.

T. pseudorhombi Yamaguti, 1938; is similar to the present specimen in having short tail but other diagnostic features are very different. In *T. pseudorhombi*, the body is fusiform, pointed at both extremities, very broad in the middle of ecsoma. Tail is short and straight. Seminal vesicle long, spirally coiled, while in *T. microcaudum* n.sp., soma is much longer and tubular as compared to *T. pseudorhombi*. Tail is short and curved. Seminal vesicle is tubular, curved dorsally. In the present specimen, uterus slightly enters the ecsoma, while in *T. pseudorhombi*, the uterus terminates a little above the soma.

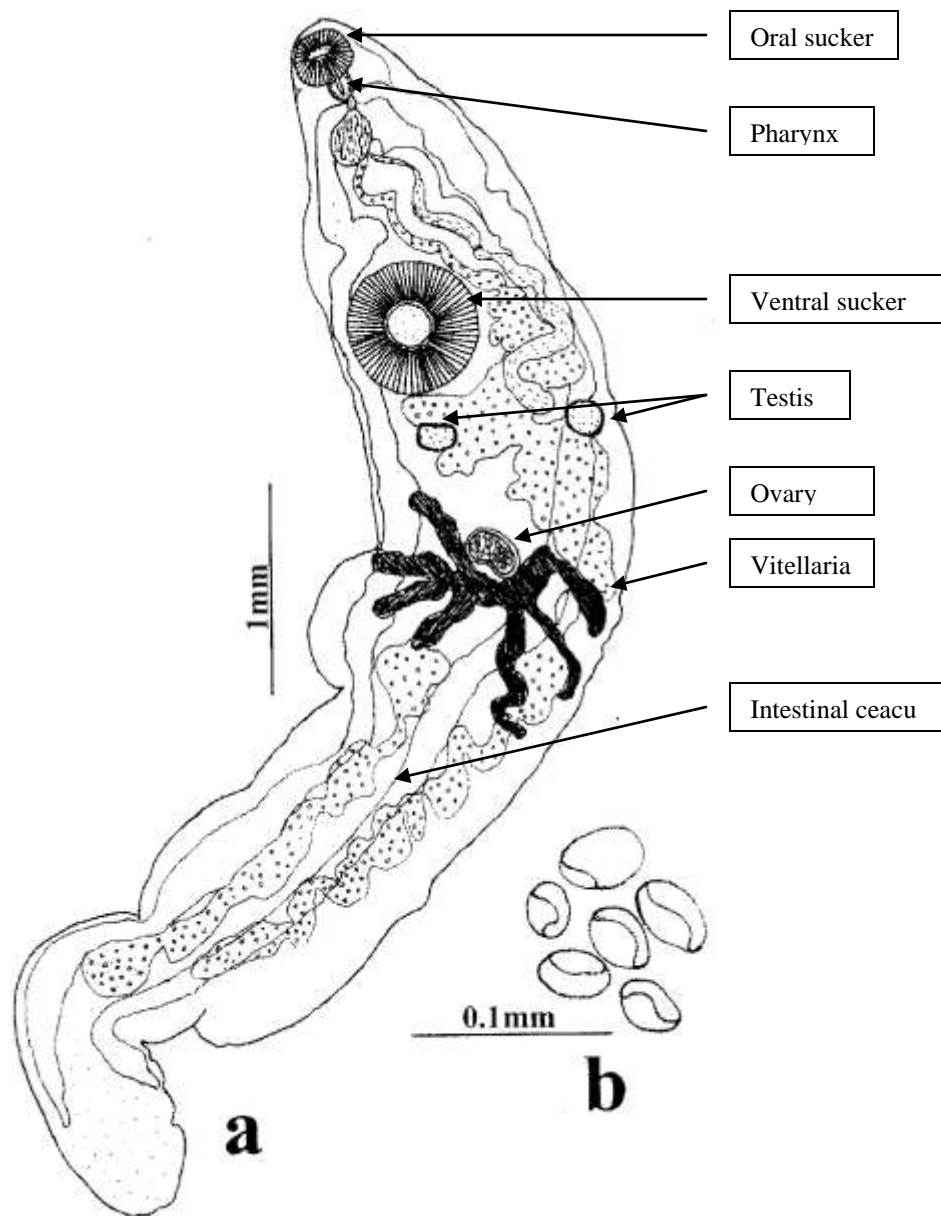


Fig. 1. (a) *Tubulovesicula microcaudum* n.sp., holotype, entire. (b) Eggs enlarged.

T. lindbergi (Layman, 1930) Yamaguti, 1934 (is the synonym of *T. spari* as reported by McCauley, 1960) is different from the present specimen in having anterior end broadly rounded, having prominent ecsoma. Pre-pharynx present (absent in the present specimen). Seminal vesicle tubular, sinuous at about the level of ventral sucker. Prostatic vesicle tubular, long, with some convolutions, partially or completely surrounded with prostatic gland cells, its posterior end usually, though not always within the zone occupied by ventral sucker. Ovary close to the posterior testis, while in the present species ovary is far away from the ventral sucker and posterior testis. Uterus with descending and ascending arms, much coiled. Excretory bladder Y-shaped.

T. pinguis (Linton, 1940) Manter, 1947 is also different from the present specimen in having cervical glands into its anterior portion and posteriorly it communicates with two lateral pouches, termed 'stomachs'. The stomachs are slightly larger than the oesophagus. The caeca are lined with tall epithelium and extend the length of the body, terminating blindly near the posterior end. Testes are large, close to ventral sucker, seminal vesicle reaching near about the anterior testis. Vitellaria not extending to the ecsoma, uterus slightly protruding in the ecsoma. Ovary and

Vitellaria are close to the testes. While in the present species there is no stomach. Testes are small, seminal vesicle long, terminating at the anterior level of the left testis. Ovary and Vitellaria are not close to the testes.

The other specimen namely *T. madurensis* Nigrelli, 1940; *T. magnacetabulum* Yamaguti, 1939; *T. marsupialia* Oshmarin, 1965; *T. nanamoensis* McFarlane, 1936; *T. californica* Park, 1936; *T. diacopae* Nagaty et Abdel-Aal, 1962 and *T. serrani* Nagaty, 1956; are also different from the present species showing differences in the important diagnostic features.

In *Tubulovesicula* the degree to which prostate gland cells enclose the prostatic vesicle appears to be a function of maturity and not a taxonomic character as suggested by McCauley, 1960.

The first new species described above is *T. olivaceus* n.sp. is different from the presently recovered second new species of *T. microcaudum* n.sp. in having long esoma and longer tail as compared to *T. microcaudum* n.sp. in which the tail is very short and curved. The ventral sucker in *T. olivaceus* n.sp. is larger than the ventral sucker of *T. microcaudum* n.sp. Seminal vesicle in *T. olivaceus* n.sp. is broader than long while in *T. microcaudum* n.sp. it is longer than broad. The two testes are far away from the oral sucker in *T. microcaudum* n.sp. while in *T. olivaceus* n.sp. they are close to the posterior border of the ventral sucker. In *T. microcaudum* n.sp. cirrus sac larger in size as compared to *T. olivaceus* n.sp. Ovary kidney-shaped with moderate sized eggs in *T. microcaudum* n.sp. while in *T. olivaceus* n.sp. the ovary is globular and eggs are small sized. Uterus long terminating far anterior to esoma in *T. olivaceus* n.sp. while in *T. microcaudum* n. sp. it passes in close coils slightly intruding anterior of esoma.

Due to the differences mentioned above between the present species and the previously described species, the present is regarded as new species and named as *Tubulovesicula microcaudum* referring to the small tail.

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