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Full Length Research Paper

A new species of *Tylocephalum* (Cestode: Lecanicephalide, Braun, 1900) from marine fish at Ratnagiri, India

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The present investigation deals with systematic observation of the cestode parasites *Tylocephalum* Linton, 1890, that is, *T. damodarae* n.sp. of marine fish *Dasyatis walga* Muller and Henle, 1841 from West Coast of Maharashtra which is most pathogenic. The present worm comes closer to all the known species of the genus *Tylocephalum* in general topography of organ but differs due to scolex globular anteriorly and quadrangular posteriorly, presence of short neck, mature proglottids three to four times longer than broad, testes 60 to 70 in numbers and pre-ovarian, cirrus pouch oval, elongated placed below the middle of the proglottids, cirrus straight, vas deferens long coiled, genital pores are large, sub-marginal, irregularly alternate, vagina anterior to cirrus pouch, ovary 'U' shaped and vitellaria are granular in shape.

Key words: Parasites*, Tylocephalum, Dasyatis walga.*

INTRODUCTION

The genus *Tylocephalum* was erected by Linton (1890) with its type species *T. pingue* from *Rhinoptera quadriloba* at Woods Hole. Shipley and Hornell (1906) recorded *T. aetiobatidis* from *Aetobatis narinari* Euphrasen, 1790, *Dasybatus walga* Muller and Henle, 1841 and *T. dierma* from *Myliobatis meculata* at Ceylon. Linton (1916) reported *T. marsupium* from *Aetobatis narinari* Euphrasen, 1790 at Tortugas. Southwell (1925a) described *T. yorkei* from *Aetobatis narinari* Euphrasen, 1790, at Puri, Orissa, India. Yamaguti (1934) reported *T. squatinae* from *Squatinae japonica* at Japan. Subhapradha (1955) described *T. elongatum* and *T. minimum* from *Rhynchobatus djeddensis* (Forsskal, 1775 in India. Chincholikar and Shinde (1980) added one new species to this genus, that is, *T. madhukari* from *Trygon* sp. at Ratnagiri. Jadhav and Shinde (1981) described *T. singhii* from *Trygon* zugei Muller and Henle (1841) at Bombay, India. Ronald et al. (1984) reported *T. bonasum* from *Rhinoptera bonasus* at Massachuseus.

Jadhav and Shinde (1988) described *T. aurangabadensis* from *Aetobatis narinari* collected from Arabian Sea. Bhagwan and Shinde (2002) described *T. mehdii* from *Trygon zugei* Muller and Henle (1841) at Ratnagiri, M.S. in India. Bhagwan and Mohekar (2003) are more added new species of this genus *T. alibagensis* from *Trygon zugei* (Muller and Henle, 1841) at Alibag in Maharashtra, India. Wankhede and Jadhav (2003) added new species *T. gajanane* from *Trygon sephen* Forsskal, 1775 at Bombay (West Coast of India). Later on Pawar and Jadhav (2005) added to new species of this genus *T.*

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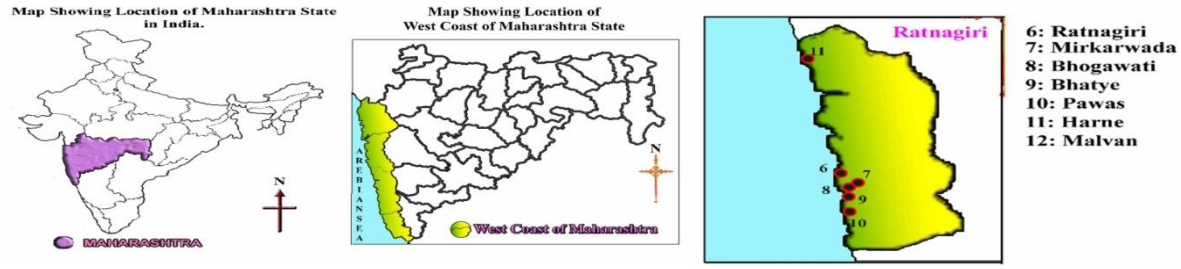

Figure 1. Map of the study area.

babulae from *T. zugei* from *Trygon. Sephen* Forskal (1775) at Ratnagiri (West Coast of Maharashra, India). Khamkar (2011) reported *T.trygoni* from *T. zugei* at Panji, Goa.

The present literature deals with *Tylocephalum damodharae* n.sp. which is collected from *Dasyatis walga* Muller and Henle (1841) at Bhatye, Ratnagiri District (West Coast of Maharashtra, India).

MATERIALS AND METHODS

Ratnagiri district, one of the coastal district of Konkan region forms a narrow strip running from North to South along the Western Coasts of India (Figure 1). It lays between 16° to 18°04' North Latitude and 73°02' to 73°52' East longitude. The district has North South length of about 180 km and average East-West extension of about 64 km except in its extremities which tapers to join the coast line. District boundaries are surrounding by Sahyadri hills in the east beyond which there are Satara, Sangli and Kolhapur districts: Raigad district in the north, the Arabian Sea in the west and Sindhdurg district in the south.

Twenty nine worms were collected from spiral valve of *Dasyatis walga* (Muller and Henle, 1841) at Ratnagiri District (West Coast of Maharashtra, India) during December 2003 to November 2005. Out of these six parasites were taken for taxonomical studies. These Six cestodes parasite were preserved in hot 4% formalin, passed in alcoholic grades, stained with Harris haematoxylene and borax Caramine and Mounted in D.P.X. Camera lucida drawings were prepared and photomicrographs were taken by trinocular computerized research microscope. All the measurements are recorded in millimeter.

RESULTS

Description

The worms are creamy white in colour, long, having scolex, neck, immature, mature and gravid proglottids. The scolex is divided into two regions anterior and posterior (Figures 2a and 3a). The anterior region is some what oval, globular with muscular pad and posterior region is somewhat quadrangular, anteriorly conical, posteriorly flat in nature (Figure 2a and 3a). The scolex measures 0.6699 (0.5145-0.8252) in length and 0.5097 (0.3640-0.6553) in breadth. The anterior region measures 0.4053 (0.2184-0.5922) in length and 0.4466 (0.2669-0.6262) in width. The posterior region measures 0.4296 (0.3883-0.6262) in length and 0.4296 (0.2184-0.6407) in width. Suckers are four in numbers, oval in shape, two are placed towards the anterior side and two are placed towards the posterior side of the scolex and measures 0.1165 (0.09708-0.1359) in length and 0.08252 (0.05825-0.1067) in width. The scolex followed is by neck. The neck is short, measures 0.2451 (0.1941-0.2961) in length and 0.2087 (0.1213-0.2961) in width.

The mature proglottids are three to four times longer Than broad (Figures 2b and 3b) and measures 1.6116 (1.5631-1.6601) in length and 0.5849 (0.5631-0.6067) in width. Testes are medium, oval, 60 to 70 in numbers, pre-ovarian, placed towards anterior half of the proglottids (Figures 2b and 3b), measures 0.0364 (0.02427-0.04854) in length and 0.0412 (0.0242-0.0582) in width. The cirrus pouch is oval, elongated large, placed below the middle of the proglottids and measures 1.6116 (1.563-1.660) in length and 0.5849 (0.5631-0.6067) in width. Cirrus is thin, straight within cirrus pouch, measures 0.2402 (0.2378-0.2427) in length and 0.0072 (0.0048-0.0970) in width. The protrusible cirrus is open from the common genital pores seen in gravid proglottids and measures 0.9507 (0.9393-0.9621) in length and 0.02272 (0.01515-0.03030) in width and straight within cirrus pouch and forms vas deferens, which is long, curved, coiled anteriorly measures 0.4563 (0.4514-0.4611) in length and 0.01456 (0.09708-0.01941) in width. The cirrus and vagina opens into the common pores. The genital pores are oval, large, sub-marginal, irregularly alternate and measures 0.0436 (0.0388-0.0485) in length and 0.0388 (0.0145-0.0242) in width. The vagina opens through the genital pores, which is long tube, anterior to cirrus pouch, turns posteriorly, measures 0.9004 (0.8932-0.9077) in length and 0.0072 (0.0048-0.0970) in width and forms into short tubular receptaculum seminis, which measures 0.1383 (0.1359-0.1407) in length and 0.0072 (0.0048-0.0970) in width and reaches to the ootype. The ootype is large oval in shape; it measures 0.0485 (0.0388-0.0582) in length and 0.0679 (0.0582-0.0776) in width and from ootype ovarian lobe starts and form ovary, which is 'U' shaped with 8 to 10 acini on each lobe, placed posteriorly of the segment (Figures 2b and 3b), measures 1.3543 (1.0922-1.6165) in length and 0.1723 (0.1359-0.2087) in width. The vitellaria

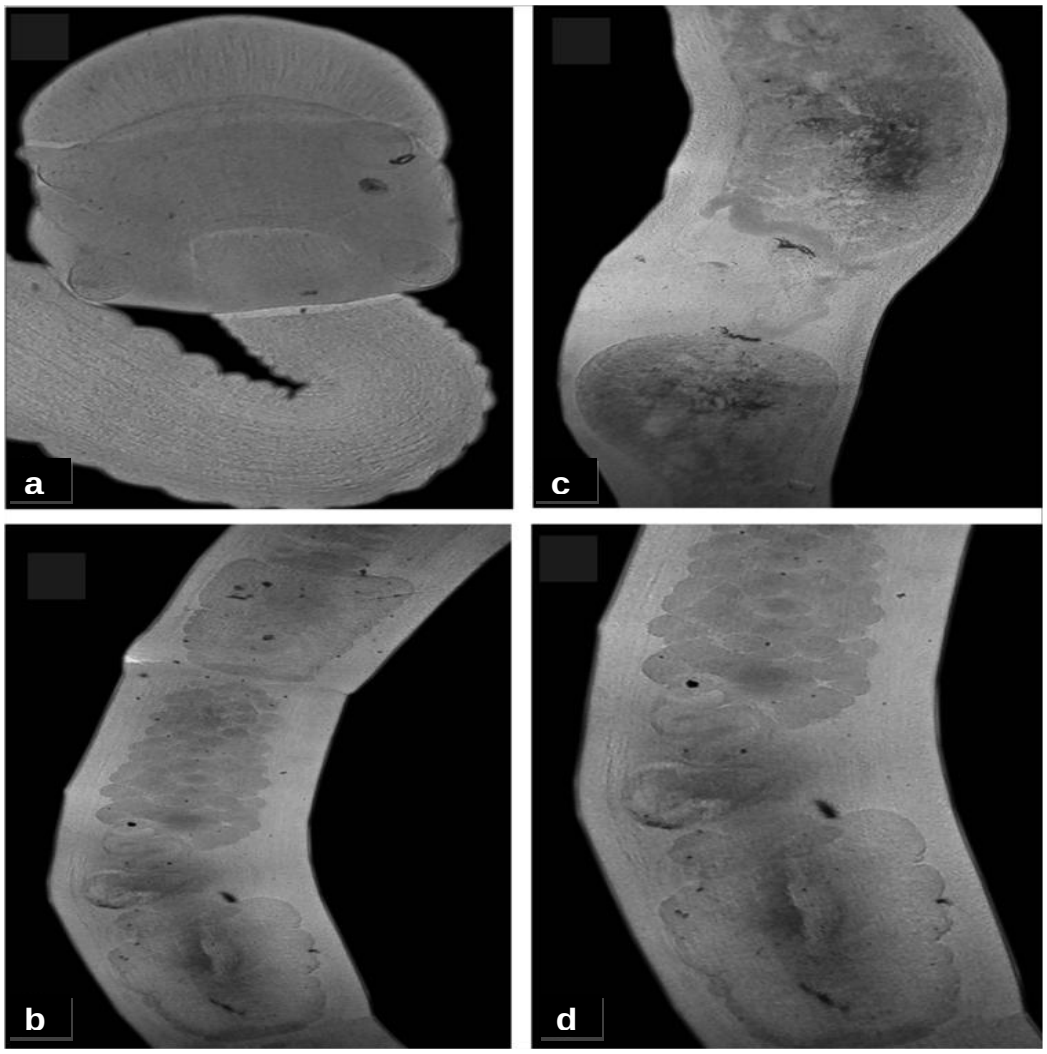

Figure 2. Microphoto plate of *Tylocephalum damodarae* n, sp. (**1**) scolex (**2**) mature proglottid (**3**) gravid proglottid (**4**) enlarge part of proglottid.

are granular in shape, placed to the both either sides, cortically except cirrus pouch of the segments. The gravid proglottids are five to six times longer than broad (Figures 2c and 3c), measures 3.6931 (3.636-3.75) in length and 0.625 (0.4545-0.7954) in width. From (Figures 2d and 3d) the ootype, tubular sacular uterus opens and placed longitudinally anteriorly in the proglottids and measures 1.9015 (1.818-1.9868) in length and 0.4507 (0.3257-0.5757) in width and contains rounded eggs and measures 0.01639 in diameter.

DISCUSSION

The worm under discussion is having scolex globular anteriorly and quadrangular posteriorly, presence of short neck, mature proglottids three to four times longer than broad, testes 60 to 70 in numbers and pre-ovarian, cirrus pouch oval, elongated placed below the middle of the proglottids, cirrus straight, vas deferens long coiled, genital pores are large, sub-marginal, irregularly alternate, vagina anterior to cirrus pouch, ovary 'U' shaped and vitellaria are granular in shape.

The present communication differs from *T*. *pingue,* (Shinde, 1976), which is having the scolex globose, absence of neck, testes 20 to 27 in number, ovary like transverse band and follicular vitellaria in one to two rows. It is also differs from *T*. *aetiobatidis,* (Shipley et. Hornell, 1905), with the scolex circular at the anterior part and swollen at the base, absence of neck, testes 7 to 12 in numbers and ovary massive like. It differs from *T*. *dierma,* (Shipley and Hornell, 1906), which is having the scolex variable in shape, testes about 50 in number, ovary bilobed and composed of very small, elongated club shaped acini and vitellaria follicular in shape. The present parasite differs from *T*. *marsupium* (Linton, 1916), relatively large size scolex, absence of neck, testes 30 to 32 in numbers and ovary lobed. It also differs

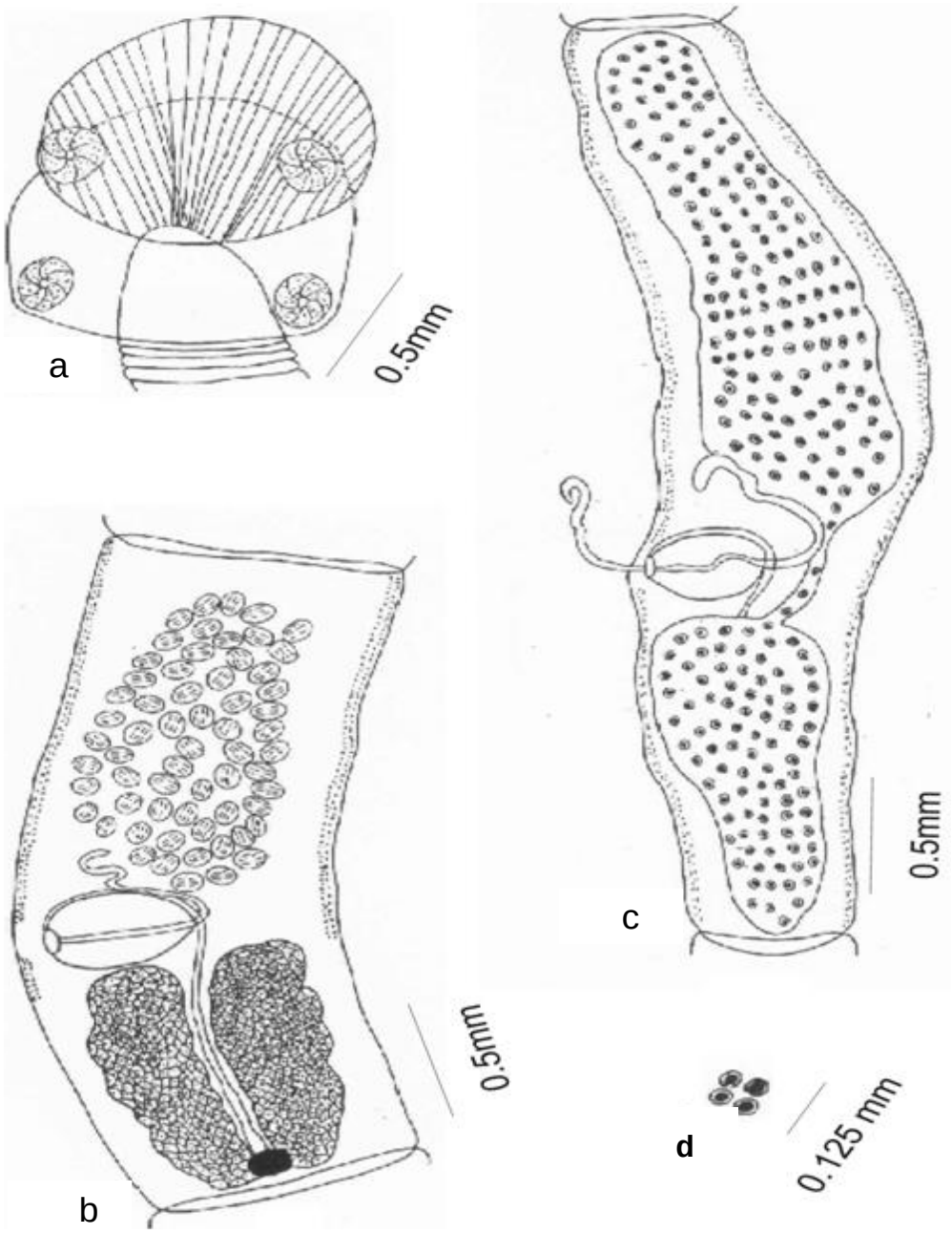

Figure 3. Camera Lucida figure of *Tylocephalum damodarae* n. sp. (**5**) scolex (**6**) mature proglottid (**7**) gravid proglottid (**8**) eggs.

from *T*. *yorkei,* (Southwell, 1925b), which is having the scolex cushion shaped testes 30 to 36 in numbers ovary small and bilobed and follicular vitellaria in one row. The present worm differs from *T*. *squatinae* (Yamaguti, 1934), in the scolex sub globular, long neck, testes 40 to 50 in numbers, ovary with elongated acini and follicular vitellaria in two rows. It is also differs from *T*. *minimum,* (Subhapradha, 1955), with having scolex anterior much smaller than posterior region, absence of neck, testes 33 in numbers and follicular vitellaria in one row. The present form differs from *T*. *elongatum,* (Subhapradha, 1955), is having shape of the scolex anterior region almost as large as posterior region, absence of neck, testes 40 in numbers, ovary bilobed with no. of small acini and vitellaria follicular arranged in band. It also differs from *T*. *madhukari,* (Chincholikar and Shinde, 1980), with the shape of Scolex sub-globular, absence of neck, testes 16 in numbers arranged in two rows, cirrus pouch obliquely placed and ovary compact, bean shaped. The present worm differs from *T*. *singhii,* (Jadhav and Shinde, 1981), in the shape of scolex globular, testes 78 to 80 in numbers, cirrus claviform and recumbent, genital

pores regularly alternate, vagina posterior an ventral to cirrus sac and follicular vitellaria. It is differs from *T. bombayensis,* (Jadhav and Shinde, 1983), having scolex rounded in shape, mature proglottids squarish, testes 31 to 38 in numbers, genital pores marginal and ovary roughly bilobed or transverse band, cylindrical. The present form differs from *T. bonasum*, (Ronald et al., 1984), with the shape of scolex quadrangular testes 73 to 82 in numbers, ovary bilobed and each lobe sub-divided into dentric processes radiating from ends of ovarian isthmus and follicular vitellaria. It is also differs from *T. aurangabadensis,* (Jadhav and Shinde, 1988), in the shape of the scolex quadrangular in shape, testes 16 in numbers, and follicular vitellaria. It is differs from *T. mehdii*, (Bhagwan and Shinde, 2002), having scolex globular in shape and testes 43 to 47 in numbers. The present form differs from *T. alibagensis*, (Bhagwan and Mohekar, 2003) having scolex squarish, absence of neck, testes small 64 in numbers in two lateral fields and genital pores marginal. It also differs from *T. gajanane,* (Wankhede and Jadhav, 2003), with the scolex quadrangular, absence of neck, testes 64 in numbers, cirrus pouch spindle shaped and obliquely placed anteriorly directed, ovary dumpbell shaped and vagina posterior to cirrus pouch. The present worm differs from *T. babulalae*, (Pawar and Jadhav, 2005), in the globular scolex, testes 11 to 12 in numbers, cirrus pouch obliquely placed, genital pores marginal, vagina posterior to cirrus pouch, ovary small with 10 to 12 acini and vitellaria follicular, oval in shape. It also differs from *T. shindei*, (Pawar and Jadhav, 2005), having scolex globular , testes 26 to 27 in numbers, vas deferens runs posteriorly in the mature proglottids, vagina posterior to cirrus pouch and coiled, ovary small with many acini and vitellaria follicular, rounded placed in one line. It differ from *T. trygoni,* (Khamkar, 2011), in having scolex globular, testes 35 to 40 in numbers, arranged in central medulla, cirrus pouch large, sub marginal, vagina anterioventral to cirrus pouch, ovary Bilobed and genital pore sub marginal.

Conclusion

By differentiating the above characters there is no other way for the author to erect a new species and to accommodate these worms and hence the name *Tylocephalum damodharae* n.sp., named in honour of Dr. Damodhar B. Patange, who is Secretary, Shri. Krishna Education Society, Gunjoti, Dist. Osmanabad, who is a well known Social workers in Maharashtra.

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