



## ORIGINAL ARTICLE

## Studies on *Piscean cestode* Genus *Tetragonocephalum*, Shipley Et Hornell, 1905 (Cestoda: Tetraphyllidae) From *Dasyatis bleekeri* (Blyth, 1860)

D.M. Pathan<sup>1</sup> and D.B. Bhure<sup>2</sup>

<sup>1</sup> Department of Zoology, Shrikrishna Mahavidyalya, Gunjoti Dist. Osmanabad, M.S., India

<sup>2</sup> Post Graduate Department of Zoology, Yeshwant Mahavidyalaya, Nanded, M.S., India

Email: [dmp\\_skmg93@rediffmail.com](mailto:dmp_skmg93@rediffmail.com), [drajbhure82@gmail.com](mailto:drajbhure82@gmail.com)

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### ABSTRACT

Present study deals with a new species of the genus *Tetragonocephalum*, Shipley et Hornell in 1905 spiral valve of *Dasyatis bleekeri* (Blyth, 1860) Murud, Raigad District (West Coast of Maharashtra, India) during Dec. 2003 to Nov. 2005. New species *Tetragonocephalum murudensis* Sp.Nov. comes closer to all known species of the genus *Tetragonocephalum* in general topography of organ but differs due to having size of worm 55-58 in length and 0.68 in width. the scolex is globular anteriorly and cushion like posteriorly, neck short, testes 50-60 in numbers, presence of external seminal vesicle, genital pores oval, sub-marginal, irregularly alternate, vagina anterior to cirrus pouch, ovary 'U' shaped with many acini, vitellaria granular, gravid segments four to five times longer than broad 3.3495-3.4466 in length and (0.5097-0.8009) in width. Uterus tubular broad anteriorly and narrow posteriorly 2.4854-3.0335 in length and 0.4611-0.6067 in width and contains eggs 0.0138 in diameter.

**Key words:** Cestoda, *Dasyatis bleekeri*, *Tetragonocephalum murudensis* Sp.Nov.

### INTRODUCTION

Genus *Tetragonocephalum* was erected by Shipley et Hornell in 1905 from *Trygon walga* at Ceylon as type species *T. trygonis*. Later on the following species are added to this genus-

*T. uarnak*, Shipley et Hornell, 1906.

*T. minutum*, Southwell, 1925.

*T. raoii*, Deshmukh & Shinde, 1979.

*T. alii*, Deshmukh & Shinde, 1979.

*T. sepheni*, Deshmukh & Shinde, 1979.

*T. shipleyi*, Shinde, Mohekar & Jadhav, 1985.

*T. bhagwati*, Shinde, Mohekar & Jadhav, 1985.

*T. yamaguti*, Murlidhar, 1988.

*T. ratnagiriensis*, Shinde and Jadhav, 1990.

*T. aurangabadensis*, Shinde and Jadhav, 1990.

*T. singhi*, Pawar and Jadhav, 2005.

*T. govindii*, Khamkar and Shinde, 2012.

*Tetragonocephalum sepheni*, Lanka et. al., 2013

*Tetragonocephalum Pulensis*, Kankale, 2014.

The present literature deals with *Tetragonocephalum murudensis* Sp.Nov. from the spiral valve of *Dasyatis bleekeri* (Blyth, 1860) at Murud Raigad District (West Coast of Maharashtra, India).

### MATERIALS AND METHODS

One hundred seventeen specimens of the cestode were collected from spiral valve of *Dasyatis bleekeri* (Blyth, 1860) Murud, Raigad District (West Coast of Maharashtra, India) during Dec. 2003 to Nov. 2005. These are preserved in 4% formalin and passed in alcoholic grades, stained with Haematoxyline and mount in D.P.X. Camera lucida drawings were prepared by research microscope. All the measurements are recorded in millimeter. The collected parasites were prepared for identification by usual standard methods

**RESULT**

The largest parasite measures 55-58mm in length and 0.68 in width and consists of 25 immature segments, 10 mature segments and 03 gravid segments.

Scolex is divided into two regions, the anterior and posterior. The scolex measures 0.8543 (0.6893-1.0194) in length and 0.8009 (0.5097-1.0922) in width. The anterior region is smaller, globular, completely evaginated muscular measures 0.3446 (0.2184-0.4708) in length and 0.515 (0.3155-0.7135) in width. The posterior region is large, cushion like measures 0.4830 (0.3106-0.6553) in length and 0.7645 (0.4368-1.0922) in width and bearing four circular or rounded suckers, two are placed centrally one behind the other, two are placed marginally with small papillae protruded and measures 0.0533 (0.09708-0.1553) in length and 0.1504 (0.1067-0.941) in width. Scolex followed by neck. The neck is short, measures 0.2475 (0.2427-0.2524) in length and 0.3834 (0.3786-0.3883) in width.

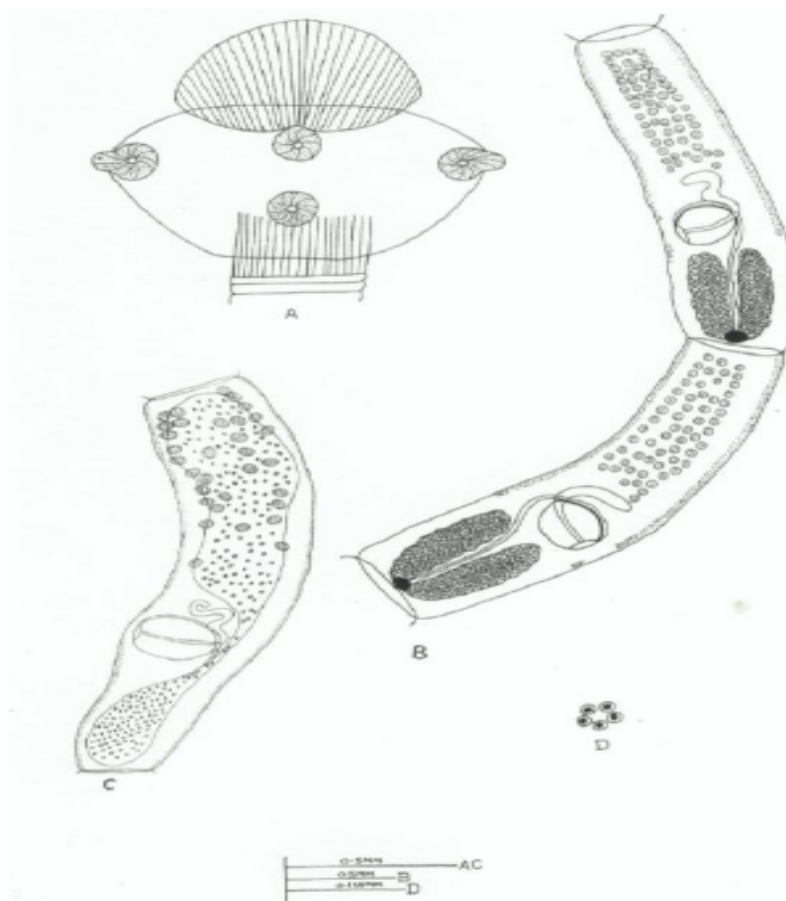
Mature segments are three to four times longer than broad measures 2.1893 (2.1060-2.2727) in length and 0.5265 (0.5000-0.5530) in width. The gravid segments longer than broad measures 3.3980 (3.3495-3.4466) in length and 0.6553 (0.5097-0.8000) in breadth. The testes are oval to rounded in shape, 50-60 in numbers and measures 0.03787 (0.03030-0.04545) in length and 0.03409 (0.03030-0.3787) in width. All testes are placed in the anterior half of the segments above the cirrus pouch. Cirrus pouch is large, oval in shape, placed below the middle of the segments, measures 0.2424 (0.2272-0.2575) in length and 0.2234 (0.1818-0.2651) in width. The cirrus is thin, slightly curved within cirrus pouch measures 0.17045 (0.1666-0.1742) in length and 0.01893 (0.01515-0.02272) in width and forms vas deferens which is coiled runs anteriorly measures 0.6212 (0.6136-0.6282) in length and 0.0492 (0.02272-0.07575) in width. The cirrus and vagina open into a common genital pores. The genital pores are large, oval in shape, sub-marginal, irregularly alternate and measures 0.1022 (0.07575-0.1287) in length and 0.03030 (0.02272-0.03787) in width.

Vagina is thin, opens from genital pores, runs anterior to cirrus pouch, takes a turn and runs posteriorly and measures 1.2424 (1.2272-1.2575) in length and 0.01893 (0.00757-0.03030) in width and forms receptaculum seminis. Which is short tubular measures 0.0265 (0.02272-0.03030) in length and 0.01136 (0.007575-0.01515) in width and reaches to ootype. Which is small, rounded, measures 0.06439 (0.05303-0.07575) in length and 0.09848 (0.09090-0.1060) in width and form ootype the two ovarian lobes starts and from ootype uterus starts, broad anteriorly and narrow posteriorly measures 2.9053 (2.4854-3.0339) in length and 0.5339 (0.4611-0.6067) in width and contains eggs measures 0.01386 in diameter. From ootype two ovarian lobes starts and form 'U' shaped ovary with many acini on each side, placed posteriorly, measures 0.9545 (1.1515-1.4393) in length and 0.06818 (0.1363-0.1666) in width. Granular vitellaria are placed cortically except the cirrus pouch region and pre-ovarian.

**Fig. 1:** *Tetragonocephalum murudensis* Sp. Nov.



**Fig. 2:** Camera Lucida diagram of *Tetragonocephalum murudensis* Sp. Nov. (A- Scolex; B- Mature Proglottids; C- Gravid Proglottid; D- Eggs)



## DISCUSSION

The present parasite under discussion is having size of worm 55-58 in length and 0.68 in width. the scolex is globular anteriorly and cushion like posteriorly, neck short, testes 50-60 in numbers, presence of external seminal vesicle, genital pores oval, sub-marginal, irregularly alternate, vagina anterior to cirrus pouch, ovary 'U' shaped with many acini, vitellaria granular, gravid segments four to five times longer than broad 3.3495-3.4466 in length and (0.5097-0.8009) in width. Uterus tubular broad anteriorly and narrow posteriorly 2.4854-3.0335 in length and 0.4611-0.6067 in width and contains eggs 0.0138 in diameter.

1. The present cestode differs from *T. trygonis*, Shipley et Hornell, 1905, in the worm length 27 in length and 0.8 in width, testes 7-12 in numbers and ovary massive with follicular and eggs 0.05 in diameter.
2. The present form differs from *T. uarnak*, Shipley et Hornell, 1906, is having worm length 8.30, worm width 0.14-0.4, length of scolex 0.22-0.28, width of scolex 0.21-0.41, testes 16-27 in numbers, external seminal vesicle absent, ovary massive with follicular, length of gravid segment 5.00 and eggs 0.06 in diameter.
3. The present worm differs from *T. minutum*, Southwell, 1925 with worm length 20, worm width 0.68, length of scolex 0.53, width 0.68, testes 38-63 in numbers, ovary quadrangular and gravid segments 4.5 in length.
4. The present communication differs from *T. raoii*, Deshmukh and Shinde, 1979, which is having the length of worm 16-20, width of worm 0.38, length of scolex 0.63-0.89, width of scolex 0.45-0.54, testes 50-55 in numbers, external seminal vesicle absent, ovary quadrangular with follicular and length of gravid segments 3.18 and length of uterus 2.94.

5. The present parasite differs from *T. alii*, Deshmukh and Shinde, 1979, in the worm length 30-32, worm width, 0.73, length of scolex 0.74, width of scolex 0.80, absence of neck, testes 40-45 in numbers, length of gravid segments 2.55 and eggs 0.04 in diameter.
6. The present Cestode differs from *T. sepheni*, Deshmukh and Shinde, 1979, in the length of worm 10, width of worm 0.72, length of scolex 0.53-0.62, width of scolex 0.53-0.55, testes 36-38 in numbers, external seminal vesicle absent, ovary quadrangular and length of gravid segment 2.59.
7. The present worm differs from *T. shipleyi*, Shinde et.al. 1985, in having length of worm 40, width of worm 1.83, scolex length 0.50-0.56, scolex with 0.38-0.48, testes 12 in numbers ovary 'H' shaped and length of gravid segments 1.78-1.83.
8. The present cestode differs from *T. bhagwati*, Shinde et.al., 1985 having length of worm 20-25, width of worm 0.50-0.95, length of scolex 0.40-0.46, width of scolex 0.48-0.54, absence of neck, testes 37-38 in numbers, ovary 'H' shaped and length of gravid segment 0.86-0.92.
9. The present form differs from *T. yamaguti*, Murlidhar, 1988, in the length of worm 7, width of worm 0.23-0.3, scolex length 0.12-0.16, scolex width 0.21-0.26, testes 54-56 in numbers external seminal vesicle absent and ovary rectangular.
10. The present parasite differs from *T. ratnagiriensis*, Shinde and Jadhav, 1990 in the size of scolex 0.843 in length 0.459-0.537 in width, testes 40-44 in numbers and ovary rectangular.
11. The present Form differs from *T. aurangabadensis*, Shinde and Jadhav, 1990 in the length of scolex 0.55-0.56, width of scolex 0.29-0.60, absence of neck, testes 105-110 in numbers and ovary oval in shape.
12. The present cestode differs from *T. singhii*, Pawar and Jadhav, 2005, in the size of scolex 0.55-0.56 in length and 0.29-0.60 in width, testes 39 in numbers, Genital pores marginal, regularly alternate and length of uterus 0.67-0.68.
13. It is differ from *T. govindii* Khamkar and Shinde, 2012 in having scolex distinctly marked off from the strobila, globular, short neck, mature proglottids 4-5 times longer than broad, testes 100 - 105 numbers, genital pore sub-marginal, irregularly alternate ,ovary 'Y' shaped, uterus secular and vitellaria granular.
14. Present form differs from *Tetragonocephalum sepheni*, Lanka et. al., 2013 which is having scolex divided into two regions anterior & posterior. Anterior region is quadrangular, short neck, mature segments longer than broad. Testes oval to rounded, pre-ovarian, distributed in two fields, 20-25 in numbers, cirrus pouch oval, genital pore marginal, Ovary compact, 'U' shaped.
15. It is differs from *Tetragonocephalum Pulensis*, Kankale, 2014 in having scolex globular or oval, neck present, testes (39-40), ovary 'U' shape, vitellaria granular (2 or 3 rows).

In view of the above differences, it is regarded as a new species for which the name *Tetragonocephalum murudensis* n.sp. is named after Tq, Murud from where author has collected the parasites.

#### TAXONOMIC SUMMARY

<b>Type species</b>	: <i>Tetragonocephalum murudensis</i> Sp.Nov.
<b>Host</b>	: <i>Dasyatis bleekeri</i> (Blyth, 1860).
<b>Habitat</b>	: Spiral valve
<b>Locality</b>	: Murud, Raigad District (West Coast of Maharashtra, India).
<b>Period of collection</b>	: December 2003 to November 2005.
<b>Deposition</b>	: Helminthology Research Lab. Dept. of Zoology, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad.
<b>Etymology</b>	: The species is named after the locality of host.

#### REFERENCES

1. Deshmukh R.A. and Shinde G.B. (1979): Three new species of *Tetragonocephalum shipleyi*, ex, Hornell, 1905 (Cestoda: Tetracophyllidae) from marine fishes, West coast of India. Bro. Res. Ujjain, 3:19 -23.
2. Khamkar D.D. and Shinde G.B. (2012): A new species *Tetragonocephalum govindi* n.sp. (Eucestoda: Lecanicephalidea) from *Trygon zugei* at Panji, Goa, India Trends in Parasitology Research, 1(2): 22-24.

3. Lazarus Lanka, Rajshekar Hippargi and Patil S.R. (2013): A New *Tetragonocephalum sepheni* (Cestoda: Lecanicephalidae) From *Trygon sephen* at Ratnagiri in Maharashtra, India. Journal of Entomology and Zoology Studies, 1(3): 11-13.
4. Nilima M. Kankale (2014): A New Species of the Genus- *Tetragonocephalum Pulensis* from a Marine Fish *Trygon zugei*. Indian Journal of Applied Research, 4(4): 568-569.
5. Shinde G.B., Mohekar A.D. and Jadhav B.V. (1985): Two new species of the genus *Tetragonocephalum* Shipley and Hornell, 1905 (Cestoda: Cecanicephalidea) from west coast of India. Ind. J. Parasitol, 9(1): 79-82.
6. Shipley A.E. and J. Hornell (1905): Further report on Parasites found in connection with Pearl oyster fisheries in Ceylon, 1(3): 49-56.
7. Shipley A.E. and J. Hornell (1906): Report on the cestode and nematodes parasites form the marine fishes of Ceylon. Rept. Govt. of Ceylon Pearl oyster fish Gulf, Mannar, 5: 43-96.
8. Southwell T. (1925): On the genus *Tetracampos wedl*, 1861. Annl. Tropical Med. Parasitol. 19: 315-317.