



ORIGINAL ARTICLE

Status of Diversity of Hold-Fast Organs of Some Piscean Tapeworms

Dhanraj Balbhim Bhure and Sanjay Shamrao Nanware

Department of Zoology, Yeshwant Mahavidyalaya, Nanded, M.S., India
Email: drajbhure82@gmail.com

ABSTRACT

Present investigation deals with status of diversity of hold-fast organs of some Piscean tapeworms from Maharashtra State India. Hold-fast organs are important for attachment and adhesion purpose. These attachments are due to presence of hold-fast organs like muscular suckers, rostellum with spines or hooks and tentacles. Since the work on the hold-fast organs of piscean tapeworms in India had left a great deal of scope for research in taxonomy. Hence the present study was undertaken on the role and status of diversity of holdfast organs of piscean tapeworms from Maharashtra State, India.

Key Words: Diversity, Hold-fast organs, Piscean Tapeworms, Maharashtra

Received: 11th March 2018, Revised: 3rd March 2018, Accepted: 14th April 2018

©2018 Council of Research & Sustainable Development, India

How to cite this article:

Bhure D.M. and Nanware S.S. (2018): Status of Diversity of Hold-Fast Organs of Some Piscean Tapeworms. *Annals of Natural Sciences*, Vol. 4[2]: June, 2018: 24-27.

INTRODUCTION

Tapeworms are the most specialized flatworms. It is endoparasites of vertebrates from fishes to mammals. The parasitic diseases are the major public health problems of tropical countries including India. They infect man and also invade domestic animal and wild life. Fishes are important components of ecosystem because the human beings are used as a delicious and nutritious food from fishes.

MATERIALS AND METHODS

Study Area: Different localities of Maharashtra State India.

Cestode parasites were collected from intestine of fishes from Maharashtra State India during January, 2015 to December, 2017. Cestodes are preserved in 4% formalin, stained in Haematoxylin and Borax carmine, mounted in D.P.X, microphotograph were taken with digital camera and identification is done with the help of *Systema Helminthum* by S. Yamaguti .

RESULTS AND DISCUSSIONS

The present studies focus the diversity of hold-fast organs of some piscian tapeworms includes Sixteen genera of Nine families from Maharashtra State India-

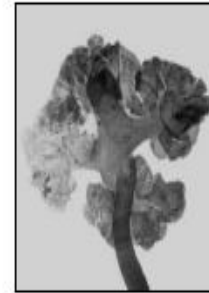
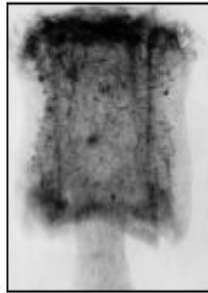
- 1. MARSIPOMETRA CAPOOR, 1917 (Family: Amphicotyllidae Ariola, 1899):** Hold fast organ is pyramidal, arrow shaped, divided into two region. The anterior region is represented by a pyramidal arrow shaped apical disk. The Posterior region represents suckers, which are oval to rounded in shape, arranged in two groups.
- 2. PHOREIOBOTHRIUM LINTON, 1889 (Family: Onchobothriidae Braun, 1900):** Scolex Hold fast organ is quadrangular. Narrow anteriorly and broad posteriorly. Bothridia sessile, rectangular, four in number. Each bothridium armed with a pair of

hooks. The hooks are trifurcated i.e. having three prongs, the middle prong is longer than the adjacent prongs.

3. **UNCIBILOCLARIS SOUTHWELL, 1925 (Family: Onchobothriidae Braun, 1900):** Hold fast organ is rounded, oval, triangular. The bothridia are sessile, four in number, balloon shaped. Each bothridium is divided into two oval locula of which the anterior locula is larger than the posterior one. Accessory sucker absent. Each bothridium having bifurcated hooks.
4. **PHYLLOBOTHRIUM BENEDEN, 1849 (Family: Phyllobothriidae Braun, 1900):** Hold fast organ is oval, china rose shaped. Bothridia sessile, four, leaf like. Loculia 40-50 on each bothridium. The powerful longitudinal muscle fibers are attached to each bothridium.
5. **POLYPOCEPHALUS BRAUN, 1878 (Family: Lecanocephallidae Braun, 1900):** Hold fast organ oval, rectangular. Anterior region represented by a crown of 10-20 tentacles. Posterior region with 4 suckers.
6. **TYLOCEPHALUM LINTON, 1890 (Family: Lecanocephallidae Braun, 1900):** Hold fast organ is divided into two region. Anterior region oval, globular. Posterior region quadrangular with four sucker.
7. **CEPHALOBOTHRIUM SHIPLEY ET HORNEILL, 1906 (Family: Lecanocephallidae Braun, 1900):** Hold fast organ is squarish, rectangular, quadrangular divided into two region. Anterior region bears four, cuplike suckers. Posterior region bears large central disc.
8. **CALYCOBOTHRIUM SOUTHWELL, 1911 (Family: Lecanocephallidae Braun, 1900):** Hold fast organ is quadrangular, rectangular, divided into two region. Anterior region bears four suckers. Posterior region bears 10-16 finger like tentacles.
9. **HEXACANALIS SOUTHWELL, 1911 (Family: Lecanocephallidae Braun, 1900):** Hold fast organ is rectangular, square in shape. Anterior region is highly muscular and bears large protrusible sucker. Posterior region bears four small suckers at corner.
10. **NYBELINA POCHE, 1926 (Family: Tentaculariidae Poche, 1926):** Hold fast organ is tubular. Anterior part consist four bothridia. Posterior part consist pores bulbosa. Hooks three in numbers.
11. **GYMNOTRICHUS (CUVIER 1817) RUDOLPHI, 1819 (Family: Gymnotrichidae Dollfus, 1935):** Hold fast organ is Tubular, cylindrical in shape. Bothridia sessile and divided into four parts.
12. **TETRAGONOCEPHALUM SHIPLEY ET HORNEILL, 1905 (Family: Tetragonocephalidae Yamaguti, 1959):** Hold fast organ is divided into two region. Anterior region globular, muscular. Posterior region cushion like with four sucker.
13. **SENGA DOLLFUS, 1934 (Family: Ptychobothriidae Luhe, 1902):** Hold fast organ is triangular, conical, pear shaped, tapering anteriorly and broad posteriorly, having pair of sessile bothria, rostellum oval to rounded, armed with circled or semi circled hooks.
14. **GANGESIA WOODLAND, 1924 (Family: Proteocephalidae La Rue, 1911):** Hold fast organ is globular with marked rostellum, rostellum armed with hooks, suckers four, muscular.
15. **PROTEOCEPHALUS WEINLAND, 1858 (Family: Proteocephalidae La Rue, 1911):** Hold fast organ is large, suckers four to five in numbers, muscular.
16. **SILUROTAENIA NYBEIN, 1942 (Family: Proteocephalidae La Rue, 1911):** Hold fast organ is large, pear shaped, suckers four, muscular, rostellum oval to rounded, armed with 'V' shaped hooks.

Scolex located at anterior end, is the attachment portion, the morphology and dimensions of which are key features in identification of these worms. To facilitate attachment to the host's intestinal wall, tapeworms utilize several types of structures on their scolices, the most common of which are suckers. An acetabulate scolex is characterized by the presence of 4 muscular cups sunk into the equatorial surface of the scolex. In addition to

muscular cups, there may be accessory holdfast structures, such as hooks to help anchor the scolox to the host's intestinal wall.

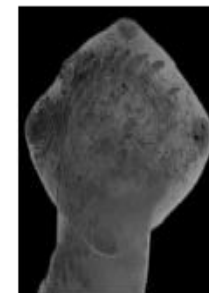
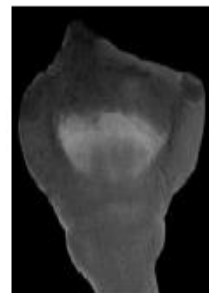
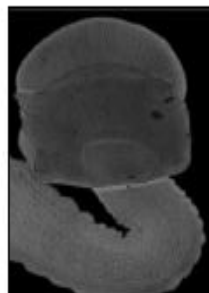
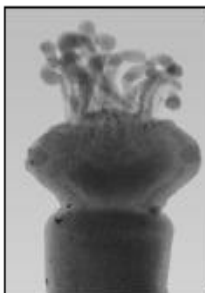


Marcipometra Capoor, 1917

Phoreiobothrium Linton, 1899

Uncibilocularis Southwell, 1925

Phyllobothrium, Beneden, 1849



Polycephalus Braun, 1878

Tylocephalum Linton, 1890

Cephalobothrium Shipley et Hornell, 1906

Calycobothrium Southwell, 1911

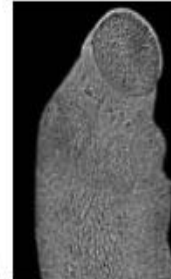
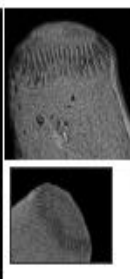


Hexacanalus Southwell, 1911

Nybelina Poche, 1926

Gymnorhynchus Cuiver, 1817 Rudolphi, 1819

Tetragonocephalum Shipley et Hornell, 1905



Senga Dollfus, 1934

Gangesia Woodland, 1924

Proteocephalus Weinland, 1858

Silurotaenia Nybein, 1942

Fig. 1: Diversity of Hold-Fast Organs of Piscian Tapeworms

In this case, the scolex is called an armed scolex. These hooks are usually grouped at the apical end of the scolex on a protrusible Rostellum. A bothriate scolex is characterized by the presence of 2, or rarely 4 to 6, longitudinally arranged, shallow depressions called bothria (sing. bothrium). Various types of glandular secretions are associated with the scolex of many tapeworms; they are proteolytic, adhesive, and/or stimulatory, depending on the species.

Results of present investigation are agreed with Jadhav, Manna and Bhure, 2006; studied morphological diversity of hold fast organs of Lecanicephalidean tapeworms. Hiscock, 1954; reported comparative morphological and functional information on scolex structures for use of systematic and phylogenetic investigation of Trypanorhyncha. Palm, 1997 uses number of bothridia, presence or absence of bothridial pits and bulbular organs to distinguish major Trypanorhyncha taxa. Campbell and Beveridge, 1994 classified the trypanorhynchs largely on arrangements of tentacular hooks, structure of scolex, mature proglottids.

REFERENCES

1. Ahuwallia S.S. (1960): *Gastrodiscoides hominis* (Lewis and Mc.Connel) Leiper, 1913 (*Amphistome* parasite of pig). Indian Journal of Medical Research. 48: 315-325.
2. Braun M. (1878): Zwei new Bandwurmen. *Abrasive Zoologischen Zootomein*. Institute Wurzburg 4: 297-304.
3. Campbell R. and Beveridge I. (1994): Order Trypanorhyncha Diesing, 1863. In L. Khalil, A. Jones and R. Bray (Eds.) keys to the cestodes of vertebrates. CAB International, Wallingford pp. 50-148.
4. Capoor A.R. (1917): A morphological study of bothriocephalid cestode from fishes. *J. Par.* 4: 33-39
5. Cuvier G. (1817) : Le Regne Animal distribute D Apres son Orgnization, Paris, Vol.4
6. Jadhav B.V., Buddhdeb Manna and Bhure D.B. (2006): Morphological diversity of hold fast organs of Lecanicephalidean tapeworms. *Jr. of Natural History*. 2(2): 16-20.
7. Kapustina N.I. (1978): Host parasite relationships in the system *Khawia sinensis* - carp in low intensity infections- *Tr. Vses. Nauchno-issled. Inst. Prud. Rybn. Khoz.* 27: 75-87 (in Russian).
8. Linton E. (1890): Notes on entozoa of marine fishes of New England with description of several new species. *II rp.U.S.Commer. Fish.*(1887): Pb.15:719-899
9. Railliet A. (1892) : Notices parasitologiques: Taenia Tenuirostris Rud. Chez Poie domestique: remarques sur pa classification des cestodes parasites des oiseaux. *Bull soc. Zool rance* 17, 110-117.
10. Railliet A. (1893) : Traite De Zoolojie medical et. Agricole, 2nd Ed. Paris, pp 736.
11. Shipley A.E. and Hornell J. (1905): Further report of parasites found in connection with the pearl oyster fisheries in Ceylon. *Herdman Reports; Govt. Ceylon Pearl Oyster Fish. Gulf Mannar. Part. 3:* 49-56.
12. Shipley et. Hornell (1906): Report on Cestode & nematode parasites from the marine fishes of Ceylon. *Herdman Reports; Govt. Ceylon Pearl Oyster Fish. Gulf Mannar. Part 5:*43-96.
13. Southwell T. (1925): A Monograph on the Tetraphyllidea with notes on the related cestodes.
14. Wardle R.A. and Ma Cleod J.A. (1952): The zoology of tapeworms; University of Minnesotar Press.Minneapolis 780pp.
15. Wardle R.A., Mcleod J.A. and Radinovsky (1974): Advances in the Zoology of tapeworm 1950-1970, University of Minnesotar Press, Minneapolis 1-780.
16. Yamaguti S. (1934): Studies on the Helminth fauna of Japan. Pt. 4 Cestodes of fishes. *Japan. J. Zool.* 6: 1-112.
17. Yamaguti S. (1959): *Systema Helminthum. II.The Cestodes of Vertebrates.* Intescience Publ., N.Y., 860 PP.