REPORTING A NEW CARYOPHYLLIDEAN WORM FROM A FRESHWATER CLARIAS BATRACHUS

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Abstract: Present study deals with reporting of a Caryophyllidean tapeworm Lytocestus sahayi n. sp. collected from intestine of freshwater catfish Clarias batrachus (Linneus, 1758) from Mundkhede Dam near Chalisgaon (M.S.) India. Worm comes closer to all known species of the genus Lytocestus, in general topography of organs, but differs due to long head, tapering anteriorly, well-marked off from body. Testes oval to rounded, 500-530 in number, unevenly distributed. Cirrus pouch large, oval, preovarian, vertically placed, cirrus thin, straight, vas deferens short, thin, coiled. Ootype is small, oval. Vagina long, thin tube, coiled. Ovary bilobed, ‘Butterfly’ shaped, with 25-28 ovarian follicles, situated in posterior region of the worm. Eggs are oval, operculated. Vitellaria are granular, arranged in two rows.

Index Terms- Cestode, Clarias batrachus, Lytocestus, Mundkhede.

INTRODUCTION

batrachus. Surayawanshi et al., 2010 reported L. shindei from Clarias batrachus, Pawar and Hiaware, 2011 added L. vyasaei and L. purnensis, from Clarias batrachus, Kadam and Dhole, 2011 describe L. gariepinusae from Clarias gariepinus, Jawale and Borde, 2011 added L. khami from Clarias batrachus. Sawarkar, 2012 describe L. thapari and L. ali; but L. ali is already described by Jadhav & Gavahne in 1991 and its critical study was done by Sahay et al., in 2019. Salunke et al., 2012 added L. manjaraensis from Clarias batrachus at Manjara river, Latur. Nimbalkar et al., 2012 describe L. rekhaensis from Heteropneustes fossilis at Jaikwadi Dam, Augangabad, its critical study was done by Sahay and Khalkho in 2017. Deshmukh et al., 2015 added L. indica, from Clarias batrachus. Its critical study was done by Sahay et al., in 2018. Pawar and Dandwate, 2016 added L. godavariensis from Clarias batrachus. Pardeshi, 2016 describe L. mastacembellus, from Mastacembellus armatus, its critical study was done by Sahay et al., in 2019. Kankale 2017, reported L. ambe from Clarias batrachus. Kale 2017, describe L. pathanensis from Clarias batrachus but this species is already described by Shelke in 2007 and same species was critically studied by Sahay et al., in 2019. Dandawate, 2018 gives L. mulaensis from Clarias batrachus but the figures of the species L. mulaensis and L. godavariensis 2016 is similar given by same author. Also its critical study is done by Sahay et al., in 2020. Patil, 2018 describe L. bharatae from Clarias batrachus. Its critical study is also done by Sahay et al., in 2020. Recently, Barshe et al., 2018, added L. elongates, from Clarias batrachus at Latur.

The present communication deals with the reporting of Lytocestus sahayi n. sp. from a catfish Clarias batrachus (L.) At. Mundhekede Dam, Tq. Chalisgaon, Dist. Jalgaon, Maharashtra State, India.

MATERIALS AND METHODS:

About 15 specimens of the cestode parasites were collected from 05 intestines of freshwater cat fish Clarias batrachus (L.) at Mundkheda Dam, Tq. Chalisgaon, District Jalgaon (M.S.) India, in September, 2020. These cestodes were flattened and preserved in 4% formalin. 10 specimens of different age were stained with Harris Hematoxyline, dehydrated in series of alcoholic grades, cleared in xylol and mounted in DPX. Microphotographs were taken with the help of digital camera. Measurements are recorded in millimetres (mm). The identification is made with the help of books, ‘How To Know The Tapeworms’ by Gerald D. Schmidt.; ‘Systema Helminthum Volume II’ by S. Yamaguti; ‘Advances in the Zoology of Tapeworms, 1950-1970’ by Wardle, R.A., Mcleod, J.A. and Radinovsky and ‘Keys to the Cestode Parasites of Vertebrates’ by Khalil, Jones and Bray.

RESULTS AND DISCUSSION
Description (Based on 10 Specimens: Figs. 1A, B, C and D).
Mature specimens are long, elongated, with single segment, tapering at anterior ends and blunt at posterior end, and measures 30.0 (15.0-37.0) in length and 3.0 (4.0-3.0) in breadth. Head is long, tapering anteriorly, well-marked off from body, measures 3.010 in length and 0.407 in breadth. Neck absent. Testes oval to round in shape, 500-530 in number, pre-ovarian, unevenly distributed measure 0.0372 (0.0290-0.057) in length and 0.0365 (0.0290-0.753) in breadth. Cirrus pouch medium, oval, pre-ovarian, vertically placed measures 0.534 in length and 0.463 in breadth, cirrus thin, straight, within cirrus pouch and measures 0.490 in length and 0.055 in breadth. Vas deferens short, thin, coiled and measures 0.106 in length and 0.055 in breadth. Ovary large, bilobed, ‘Butterfly’ shaped, situated near the posterior end of the worm, each lobe triangular, measures 0.509 - 0.476 in length and 0.265 -0.315 in breadth. ovarian follicles 25-28 in number, lobes connected by isthmus, measure 0.324 in length and 0.0395 in breadth. Vagina long, thin tube, coiled starts from female genital pore, runs medically and posteriorly, opens into ootype, measures 1.9420 in length and 0.0466 in breadth. Ootype small, rounded to oval, situated on either side below ovarian lobe, in posterior region of body and measures 0.147 in length and 0.144 in breadth. Vitellaria are granular, arranged in two rows and measures 0.079 (0.066-0.080) in length and 0.083 (0.071-0.088) in breadth. Eggs are oval in shape, operculared and measure 0.0153 in length and 0.041 in breadth.
Microphotographs of *Lytocestus sahayi n.sp.*
A. Whole worm, B- Posterior region of worm, C- Close view of posterior region, D- Eggs.
The worm under discussion, in having the number of testes 500-530 and granular vitellaria, comes closer to L. adhaerens, Cohn, 1908; L. filiformis, Woodland, 1923; L. naldurgensis, Kadam et.al, 1999; L. chalisgaonensis, Kalse and Shinde, 1999; L. goivindae, Patil and JadHAV, 2002; L. shindae, Khadap et al., 2004; L. nagapurensis, Lakhe et al., 2004; L. clariae, and L. assamensis, Tandon et al., 2005; L. paithanensis, Shelke, 2007; L. punensis, JadHAV et al., 2008; L. murhari, Kaul, Kalse and Suryawanshi 2010; L. follicularae, Bhuere et al., 2010; L. shindei, Surayawanshi et. al., 2010; L. gariepinusae, Kadam and Dhole, 2011; L. khami, Jawale and Borde, 2011; L. manjaraensis, Salunke et al., 2012; L. godavariensis, Pawar and Dandwate, 2016; L. mastacembellusi, Pardeshi, 2016; L. mulaensis, Dandwate, 2018; L. bharaet, Patil, 2018. As L. mastacembellusi, L. mulaensis and L. bharaet is critically studied by Sahay et al., is not compared here. But the worm under discussion, differs from L. adhaerens in the shape of the scolex (differentiated Vs. undifferentiated) and in the host (Clarias batrachus Vs. Clarias fuscus).

The present form, differs from L. filiformis in the shape of the scolex (differentiated Vs. not distinctly marked off); in the neck (Absent Vs. Long slender); in the number of testes (500-530 Vs. 232-532); in the ovarian follicles (25-28 Vs. 6-11); and in the host (Clarias batrachus Vs. Moryrus caschive).

The present tapeworm, differs from L. naldurgensis in the shape of the scolex (differentiated tapering anteriorly Vs. conical blunt); in the neck (absent Vs. short); in the receptacle seminalis (absent Vs. present) and in the vitellaria (granular Vs. follicular).

The present cestode, differs from L. chalisgaonensis in the shape of the scolex (differentiated tapering anteriorly Vs. bluntly rounded elongated); in the neck (absent Vs. present, medium); in the number of testes (500-530 Vs. 1500-1600); in the receptacle seminalis (absent Vs. coiled) and in the ovarian follicles (25-28 Vs. 36-40).

The present form, differs from L. goivindae in the number of testes (500-530 Vs. 1425-1475); in the position of cirrus pouch (vertically placed Vs. obliquely placed) and in the receptacle seminalis (absent Vs. coiled).

The present cestode, differs from L. nagapurensis in the shape of the scolex (differentiated tapering anteriorly Vs. spatulate, bluntly rounded); in the number of testes (500-530 Vs. 1100-1150); in the shape of ovary (butterfly shaped Vs. H shaped) in the receptacle seminalis (absent Vs. coiled) and in the ovarian follicles (25-28 Vs. numerous).

The present worm, differs from L. shindei in the shape of the scolex (differentiated tapering anteriorly Vs. long); in the number of testes (500-530 Vs. 350-360); in the receptacle seminalis (absent Vs. long, coiled tube) and in the ovarian follicles (25-28Vs. 33-36).

The present cestode, differs from L. clariae in the shape of the scolex (differentiated tapering anteriorly Vs. undifferentiated); in the number of testes (500-530 Vs. 270-495); in the shape of ovary (butterfly shaped Vs. H shaped) and in the vitellaria (granular Vs. ovoid).

The present form, differs from L. assamensis in the neck (absent Vs. present); in the number of testes (500-530 Vs. 266-565) and in the shape of ovary (butterfly shaped Vs. inverted ‘A’ shaped).

The present worm, differs from L. paithanensis in the neck (absent Vs. short); in the number of testes (500-530 Vs. 1550-1575); in the shape of cirrus pouch (oval Vs. cylindrical) and in the ovarian follicles (25-28Vs. 47-75).

The present cestode, differs from L. punensis in the number of testes (500-530 Vs. 1450-1500); in the position of cirrus pouch (vertically placed Vs. transversely placed) and in the receptacle seminalis (absent Vs. distinct).

The present form, differs from L. murhari in the shape of the scolex (differentiated, tapering anteriorly Vs. bluntly elliptical, elongated); in the neck (absent Vs. present); in the number of testes (500-530 Vs. 600-650); in the vagina (coiled Vs. slightly curved) and in the ovarian follicles (25-28Vs. 25-40).

The present worm, differs from L. follicularae in the number of testes (500-530 Vs. 400-500); in the shape of ovary (butterfly shaped Vs. ‘H’ shaped) and in the vitellaria (granular Vs. follicular, in 2-3 rows).

The present tape, differs from L. shindei in the shape of the scolex (differentiated, tapering anteriorly Vs. medium); in the number of testes (500-530 Vs. 1580); and in the position of cirrus pouch (vertically placed Vs. transversely placed).

The present form, differs from L. gariepinusae in the shape of the scolex (long Vs. short); in the neck (absent Vs. present); in the number of testes (500-530 Vs. 1375 – 1385); in the number of ovarian follicles (25-28 Vs. 40 – 49) and in the host (Clarias batrachus Vs. Clarias gariepinus).

The present worm, differs from L. khami in the number of testes (500-530 Vs. 1350-1400); in the receptacle seminalis (absent Vs. present) and in the eggs (operculated Vs. non operculated).
The present cestode, differs from *L. thapari* in the shape of the scolex (differentiated tapering anteriorly Vs. bluntly oval); in the number of testes (500-530 Vs. 480-500); in the position of cirrus pouch (vertically placed Vs. obliquely placed); in the receptacle seminalis (absent Vs. present); in the number of ovarian follicles (25-28 Vs. 30-31) and in the vitellaria (granular Vs. follicular).

The present tapeworm, differs from *L. manjaraensis* in the shape of the scolex (differentiated tapering anteriorly Vs. cylindrical); in the neck (absent Vs. present) and in the number of testes (500-530 Vs. 460-470(467)).

The present worm, differs from *L. godavariensis* in the number of testes (500-530 Vs. 460-470); in the position of cirrus pouch (vertically placed Vs. transversely placed) and in the number of ovarian follicles (25-28 Vs. 24-26).


These characters justify the recognition of present worm as a new species and named *Lytocestus sahayi n.sp*. in honor of Prof. Umapati Sahay former University Professor and Dean, Faculty of Science, Ranchi University, Ranchi. Who has remarkably contributed in exploring helminthology.

**TAXONOMIC SUMMARY**

<table>
<thead>
<tr>
<th>Type Species</th>
<th><em>Lytocestus sahayi n.sp.</em></th>
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</thead>
<tbody>
<tr>
<td>Type host</td>
<td><em>Clarias batrachus</em> (Linneus, 1758)</td>
</tr>
<tr>
<td>Habitat (Site)</td>
<td>Intestine</td>
</tr>
<tr>
<td>Type locality</td>
<td>Mundkhede Dam Tal-Chalisgaon, Dist. Jalgaon, M.S., India.</td>
</tr>
<tr>
<td>Period of collection</td>
<td>September 2020.</td>
</tr>
<tr>
<td>Holotype and Paratype</td>
<td>Deposited in Helminth Research lab, P.G. Department of Zoology, Nanasaheb Y. N. Chavan A S C College Chalisgaon, Dist. Jalgaon, M.S., India.</td>
</tr>
<tr>
<td>Etymology</td>
<td>The species is named in the honor of Prof. Umapati Sahay.</td>
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</tbody>
</table>

**Systemic Classification of genus *Lytocestus***:

- **Domain**: Eukaryota
- **Kingdom**: Animalia
- **Division**: Metazoa
- **Sub-division**: Eumetazoa
- **Group**: Bilateria
- **Sub-group**: Protostomia
- **Clade**: Spiralia
- **Sub-clade**: Lophotrochozoa
- **Phylum**: Platyhelminthes
- **Class**: Cestoda
- **Sub-Class**: Cestodaria
- **Order**: Caryophyllidea
- **Family**: *Lytocestidae*
- **Genus**: *Lytocestus*
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REFERENCES:


