RRST-Zoology

New Tapeworm Lytocestus gariepinusae n. sp. from a Freshwater Fish Clarias gariepinus at Makani Dam, Dist. Osmanabad, M.S. India

Karmveer N. Kadam and Jaywant S. Dhole

Abstract

The present communication deals with description of a new species Lytocestus gariepinusae n. sp. is reported from freshwater fish Clarias gariepinus at Makani dam, Dist. Osmanabad.. It differs from all known species of the genus, with the characters like, head is short, elongated, narrow anteriorly broad posteriorly; neck wide, medium squarish; gonads situated in posterior most region of worm, testes 1375 – 1385 in number, preovarian, scattered in middle region of worm: ovary large, butterfly shaped, Vitellaria granular.

Key Words: Tapeworm, Lytocestus gariepinusae n. sp, Clarias gariepinus, Osmanabad

Introduction

Cohn [3] erected the genus Lytocestus with its type species L. adhaerens from Clarias fuscus in Hong-Kong. This genus was first confirmed by Woodland [39] that included four more species in addition to the type species. They are L. filiformes Woodland, 1923 in Mormynus caschive, Egypt Sudan; L. chalmersius Woodland [34]; L. cunningtoni [4] and L. indicus [21] (Syn. Caryophyllaeaces indicus) from Clarias batrachus in India. Mehra [20] recorded the same species from Clarias magur and [27] from Clarias batrachus in India. [7] placed the genus in sub-family Lytocestiinae and retained only three species i.e. L. adhaerens, L. filiformis and L. indicus. He put the species L. cunningtoni and L. chalmersius in the genus Monobothrioides. Subsequent works [40,6] have adhered to these changes. Wardle and McLeod [35] followed Hunter’s classification but raised the status of Lytocestinae from Sub family to family. Wardle, McLeod and Radinovsky [36] suggested a new system of classification of cestodes, which used the term Cotyloida as a class and order Caryophyllidea is kept in this class [19] and included the species L. javanicus [2]. Here considered L. alestesi as Syn. of L. barmanicus [5, 17]. But [18] after examination of original material L. alestesi [17] concluded that it should be considered as syn. of L. filiformis [37]. L. longicollis [27] described from Clarias batrachus in India.


The present communication deals with the description of new species Lytocestus gariepinusae n. sp selected from a fresh water fish Clarias gariepinus at Makani dam, Makani, Tq. Lohara, Dist. Osmanabad M.S., India

Material and Method

The present specimens were recovered from the intestine of the freshly killed fish Clarias gariepinus from Makni Dam, Osmanabad District in the month of January 2009. These fishes were dissected opened up dorso-ventrally and the internal organs examined. The entire digestive system was removed and placed in a Petri dish with physiological saline. Infection of each group of parasites was treated as follows: collected single segmented tapeworm were first relaxed and then fixed in hot 4% formalin and stain using Harris haematoxyline. Stained parasites were washed in distilled water, dehydrated in ascending grades of alcohol, cleared in xylene, mounted in D.P.X. Drawings were made using a camera lucida. The identification is made with the help of “Systema Helminthum” by [40].

Description: Lytocestus gariepinusae n. sp. (Based on five specimens)

The head is short, elongated narrow anteriorly, broad posteriorly with convex lateral margin and measure 0.500 - 0.571 in length and 0.303 – 0.552 in breadth, neck is wide,
medium, squarish, narrow anteriorly, broad posteriorly with convex, lateral margins and measures 0.642 – 0.750 in length and 0.642 – 0.893 in breadth.

 Gonads are situated in the posterior most region of the worm, testes numerous, medium, oval 1375 – 1385 (1380) in number, pre-ovarian, scattered in middle region of worm, from base of neck to ovary and from one lateral to other side of worm, almost unevenly distributed, in a single field and measure 0.053 – 0.125 in length and 0.035 – 0.107 in breadth, cirrus pouch is small, oval, flask shaped pre-ovarian, transversely placed, curved anteriorly, narrow posteriorly, broad distally, open in middle of body and measure 0.161-0.178 in length and 0.035 – 0.089 in breadth; cirrus thin, coiled, contain within cirrus pouch and measures 0.178 – 0.195 in length and 0.017 in breadth; vas deferens thin, long tube, coiled, runs anteriorly and measures 2.042 – 2.142 in length and 0.017 in breadth; ovary large, butterfly shaped, distinctly Bilobed, with loose mass of ovas, with irregular margin, antero posteriorly elongated and measure 0.893 – 1.124 in length and 0.035 – 0.464 in breadth; ovarian follicles are 40 – 49 in number, medium, oval and measures 0.035 – 0.071 in length and 0.017 – 0.071 in breadth, isthmus wide, medium, highly muscular, connecting two ovarian lobes, transversely and obliquely placed and measures 0.464 in length and 0.107 – 0.195 in breadth; vagina thin, long tube, arises from genital pore, runs posteriorly, dorsal to uterus, for a long distance, crosses isthmus, reaches and opens in to ootype and measures 1.903 – 2.000 in length and 0.017 breadth; ootype medium, oval, roughly triangular, obliquely placed, post-ovarian and measures 0.107 in length and 0.035 – 0.071 in breadth; uterus large, irregular, arises from ootype, runs posteriorly for a short distance, turns anteriorly, crosses the isthmus, runs and enlarges to form transverse branches, loop shaped in appearance, extend up to genital pore, opens separately by an uterine pore, present at distal end of uterus and measures 3.872 – 3.427 in length and 0.011 – 1.696 in breadth; uterine pore large, oval, double walled, anteroposteriorly elongated and measures 0.303 in length and 0.178 in breadth; eggs medium, oval and measure 0.035 in length and 0.017 in breadth; Vitellaria granular, strips of medium width, on each lateral side of the worm from base of the neck region to posterior end of worm.

Discussion

The genus Lytocestus is established by Cohn [3] with its type species L. adhaerens from Clarias fuscus at Hong-Kong. The present worm comes closer to all the known species of the genus Lytocestus [3] general topography of organs. But differs due to some characters from following species. The present form differs from L. adhaerens [3] in having head undifferentiated from body, cirrus pouch strongly muscular, ovary bilobed, uterus looped, vitellaria granular and reported from Clarias fuscus, in Hong Kong. The present cestode differs from L. filiformis [37] in having testes numerous, large, rounded, in central medulla, ovary bilobed, containing 6-11 large follicles, cirrus pouch small, uterus convoluted, tubular, pre-ovarian and reported from Mormyrus caschive, in Sudan. The present worm differs from L. indicus [21] in having head bluntly rounded, testes 230-270 in numbers, cirrus pouch small, ovary with numerous follicles and uterus is thick. The present cestode differs from L. biramanicus [17] in having testes medullary, extend upto genital pores, ovary wing like, with numerous follicles, cirrus pouch medullary in position, uterus consist of number of loose cells and reported from Clarias batrachus, in Burma. The present tapeworm differs from L. alesti [17] in having testes more or less spherical, ovary bilobed, and cirrus pouch small, oval in medullary region, uterus short, vitellaria extend from short distance behind most anterior and reported from Alestes nurse, in Sudan. The present parasite differs from L. longicollis [27] in having head long, testes 105 to 140 in numbers, arranged in two layers, ovary 'H' shaped, corticall with closely packed follicles, cirrus pouch small, oval, vas deferens much convoluted and vitellaria corticall, rounded, in 1-2 rows on each lateral side, extending to anterior tip of ovary. The present worm differs from L. fossilis [31] in having head stumpy, testes numerous, cirrus pouch oval, ovary follicular, 'H' shaped, uterus compactly coiled and vitellaria granular, post ovarian. The present parasite differs from L. marathwadensis [29] in having head stumpy, testes oval, arranged in 2 or 3 rows, in central medulla, ovary 'H' shaped, uterus saccular and vitellaria small, oval, in a single row on lateral side. The present cestode differs from L. ali [8] in having head bluntly rounded, testes 460-480 in numbers, cirrus pouch small, oval, ovary bilobed, butterfly shaped, uterus convoluted tube and vitellaria follicular, corticall, in 5-6 rows. The present parasite differs from L. clariasae [9] in having head bluntly rounded, testes 700-750 in numbers, small, oval, cirrus pouch medium, ovary bilobed, like bunch of grapes and vitellaria follicular, arranged in 5-6 rows. The present form differs from L. naildurgenisis [11] in having head long, conical, blunt, spatulate, testes 500-600 in numbers, scattered in medullary region, cirrus pouch small, oval, vertical, obliquely placed, ovary bilobed, butterfly shaped, uterus wide, convoluted tube, vitellaria follicular, arranged in 3-4 in rows. The present parasite differs from L. teraenaeasis [15] in having head conical, long, bluntly rounded, testes numerous, rounded, 1200-1500 in numbers, pre-ovarian, ovary bilobed, each lobe triangular, uterus convoluted tube, vitellaria follicular, smaller, oval, arranged in 4-5 rows and reported from Wallago attu, in India. The present form differs from L. chalisgaonensis [12] in having head bluntly rounded, marked off from body, testes 1500-1600 in numbers, cirrus pouch elongated, pre-ovarian, ovary bilobed, each lobe triangular, uterus convoluted tube and vitellaria granular, corticall in position. The present tapeworm differs from L. kopardaenesis, [30] having head long, elongated testes 1600-1700, oval, genital pore is large, oval, ovary distinctly bilobed with irregular margin, vagina is wide tube, uterus is wide, coiled loop shaped, vitellaria follicular, corticall in position. The present cestode differs from L. govindae [23] in having head long, testes numerous, 1425-1475 in numbers, pre-ovarian, evenly distributed, scattered in single field, cirrus pouch small, oval, obliquely placed, ovary bilobed, butterfly shaped, receptaculum seminis coiled, uterus wide, convoluted tube and vitellaria granular, corticall in position. The present worm differs from L. batrachusae [24] in having head spatulate, testes 3800-4000 in numbers, rounded, pre-ovarian, scattered centrally, ovary bilobed, butterfly shaped, uterus convoluted tube, transversely placed and vitellaria small, oval, arranged in two rows. The present parasite differs from L. shindei [14] in having head long, testes 350-360 in numbers, cirrus pouch small, oval, pre-ovarian, obliquely placed, ovary butterfly...
shaped, uterus convoluted tube and vitellaria granular. The present form differs from L. nagapurensis [16] in having head spatulate, bluntly rounded, testes numerous, 1100-1150 in numbers, oval, scattered all over the segment, cirrus pouch medium, medullary, pre-ovarian, ovary 'H' shaped with numerous oval follicles, uterus convoluted tube and vitellaria granular. The present worm differs from L. clariae [33] in having head undifferentiated from body, testes 270-495 in numbers, oval, cirrus pouch compact, ovary 'H' shaped and uterus glandular. The present parasite differs from L. attenuatus [33] in having head undifferentiated from body, testes 195-398 in numbers, cirrus pouch medullary, ovary inverted 'A' shaped and uterus glandular. The present worm differs from L. assamensis [33] in having head undifferentiated from body, testes 266-565 in numbers, cirrus pouch prominent, ovary inverted 'A' shaped and uterus glandular. The present parasite differs from L. heteropneusti [33] in having head undifferentiated from body, testes 235-340 in numbers, ovary 'H' shaped and uterus saccular. The present tapeworm differs from L. shindei [25] in having head undifferentiated from body, testes numerous, ovary large, bilobed, 'H' shaped and uterus saccular. The present tapeworm differs from L. bokaroiensis [26] the body is long, head is basically undifferentiated, ovary is bilobed, bent inwards in the shape of inverted 'A', receptaculum seminis is absent. The present tapeworm differs from L. subhapradhi [10] having shape of head spatulate, testes 300 – 310, shape of ootype is oval, vitellaria follicular. The present tapeworm differs from L. punensis, [9] having head is long, well marked off from body, testes 1450 – 1500, receptaculum seminis distinct, shape of uterus is saccular. The present tapeworm differs from L. majumbarei [25] in having head undifferentiated from body, testes 400-500 in numbers, oval, large, cirrus pouch oval, ovary bilobed, 'H' shaped, uterus saccular and vitellaria follicular, arranged in 2-3 rows. The present tapeworm differs from L. osmanabadensis [1] having head long well marked off from the body, testes 300 – 350 in number, large oval to round receptaculum seminis is thin tube, ootype is small, rounded, ovary is bilobed 'V' shaped, uterus is saccular. The present tapeworm differs from L. shindei [32] long, head medium, neck large, testes 1580 in number, oval in shape, ovary distinctly bilobed, with irregular lateral margin, vitellaria granular corticular and subcorticular in position. The present tapeworm differs from L. mushari [13] having head bluntly elliptical, elongated marked narrower than the body, testes 600 – 650 in number, preovarian, scattered in the medulary region of the worm, ovary large, bilobed, uterus wide, convoluted, coiled tube.

In view of the above differences justify the recognition of the present tapeworm, as a new species and hence the name Lytocestus gariepinusae n. sp. is proposed, after the species name of the host Clarias gariepinus.

**Taxonomic Summary**

<table>
<thead>
<tr>
<th>Genus</th>
<th>Lytocestus Cohn, [3]</th>
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<tbody>
<tr>
<td>Type Species</td>
<td>Lytocestus gariepinusae n. sp.</td>
</tr>
<tr>
<td>Host</td>
<td>Clarias gariepinus.</td>
</tr>
</tbody>
</table>

**Habitat** : Intestine

**Locality** : Makani, Osmanabad, M.S. India.

**Etymology** : Named after the species name of the host.

**A key to the species of the genus Lytocestus, Cohn, 1908:**

<table>
<thead>
<tr>
<th>Tests in between</th>
<th>Number of testes</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 – 105</td>
<td>L. indicus</td>
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<tr>
<td>230 – 270</td>
<td>L. indicus</td>
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<td>300 – 350</td>
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<td>350 – 360</td>
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<td>460 – 480</td>
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<td>500 – 600</td>
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<td>600 – 650</td>
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<td>700 – 750</td>
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<tr>
<td>1100 – 1150</td>
<td>L. indicus</td>
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</tbody>
</table>

**Type Species**

- L. punensis
- L. attenatus
- L. shindei
- L. bokaroensis
- L. subhapradhi
- L. osmanabadensis
- L. shindei
- L. mahumbari
- L. goyindae
- L. majumbarei
- L. fossilis
- L. marathwadensis

**Host**

- Clarias gariepinus.
Acknowledgements
The author is very much thankful to the Principal Shri Kumarswami Mahavidyalaya, Ausa. Dist. Latur (M.S.), and Head Department of Zoology, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (M.S.), India for providing the laboratory facilities during this work.

References
[17] Lynsdale, J. A. 1956. On two new species of Lytocestus from Burma and Sudan respectively. J. Helm. 30 (2-3) 87-96


