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Two New Species of the Genus *Lytocestus* (Caryophyllidea-Lytocestidae) from Freshwater Catfish, *Clarias Batrachus* Linnaeus (1758)

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Article Info	Abstract
Article History Received : 11-01-2011 Revised : 26-04-2011 Accepted : 26-04-2011	The present paper deals with the two new caryophyllaeid species of the genus <i>Lytocestus</i> viz. <i>L. vyasaei</i> n.sp. and <i>L. purnensis</i> n.sp. from the freshwater catfish <i>Clarias batrachus</i> L. from Marathwada region (M.S.) India. The differentiating characters of <i>L. vyasaei</i> are long, neck absent, head is conical shape, and ovary is bilobed, butterfly shaped. In <i>L. purnensis</i> body is elongated, grass blade like, neck present, and ovary is bilobed, H - shaped each lobe joined each other by ovarian isthmus.
*Corresponding Author Tel : +91-9028700713 Email: dirrajpawar@rediffmail.com ©ScholarJournals, SSR	Key Words: <i>Clarias batrachus</i> , <i>Lytocestus vyasaei</i> , <i>Lytocestus purnensis</i> and cestode parasites

Introduction

The genus *Lytocestus* was erected [1] with its type species, *L. adharans* found in *Clarias fuscus* in hongkong. This genus was first confirmed by [24] who included four more species in addition to the type species, and is *L. filiformis* [22] in *Mormyrus caschive*, egyptian sudan, *L. chalmersius* [24], *L. cunningtoni* [3], (syn. *Caryophyllaeus indicus*) from *Clarias magur* and [16] from *Clarias batrachus*. In India hunter (1927), placed the genus in the subfamily of his own named lytocestinae and retained only three species i.e. *L. adharans*, *L. filiformis* and *L. indicus*. He put the species *L. cunningtoni* and *L. chalmersius* in the genus monobothrioides. Subsequent work as of [5, & 15] have adhered to these changes, [24] suggested new system of classification of cestodes, who used the term cotyloda as a class and the order caryophyllidea is kept in this class. [12] included the species *L. javanicus* [1, 4, & 11] *L. parvalus* in this genus. [16] described *L. longicollis* from *Clarias batrachus* in India. [19] described *L. marathwadensis* from *Clarias batrachus* in India. Later on [7] added *L. alli* and *L. clariasae* from *Clarias batrachus* in India. Later on [8] added *L. naldurgensis* from *Clarias batrachus* in India. [18] *L. batrachusi* from *Clarias batrachus* India, [9] added *L. shindae* from *Clarias batrachus* in India, [10] added *L. nagapurensis* from *Clarias batrachus* India. Later on [20] has added four new species i.e. *L. Clarius*, *L. attenuatus* and *L. assamensis* from *Clarias batrachus* (Assam) India and *L. heteropneustii* from *Hetropneusteus fossilis* (bloch) India.

The present communication deals with the description of a two new species of the genus *Lytocestus* viz. *Lytocestus vyasaei* n.sp. And *Lytocestus purnensis* n.sp. Under the same

genus, collected from a fresh water fish, *Clarias batrachus* (Linnaeus) at kham river aurangabad and at purna, dist. Parbhani, m. S., India respectively.

Materials and Methods

The cestode parasites were recovered from the intestine of *Clarias batrachus* Linnaeus (1758), collected from Kham river at Aurangabad and at Purna from Parbhani district. The worms were collected, washed with saline water, flattened and preserved in 4% formalin, the parasites were stained with Grenacher's Alcoholic Borax Carmine and prepared whole mount slides for anatomical details. Drawings are made with the aid of camera lucida. All measurements are in mm. The identification of the parasites was carried out by referring the Systema Helminthum, Volume II by [25].

Description

***Lytocestus vyasaei* n.sp.** Figure 1. A and B (Based on five specimen)

The worms were with single proglottid; anterior and posterior end tapering, mature flattened worms are long with thin musculature and measures 14.6786-15.7143 in length and 1.6964-2.2857 in breadth.

The head is large in size, conical in shape, well marked off from the body. The anterior tip of the head narrower than the body and measures 1.3393-1.875 in length and 0.4464-1.01785 in breadth.

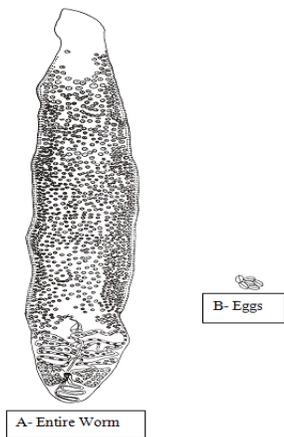
The reproductive organs are situated at the posterior region of the body. The testes are medium in size, rounded in shape, 1022-1088 in number, preovarian occupying the

medullary region of the worm body, unevenly distributed and measures 0.1071-0.1607 in length and 0.08929-0.1429 in breadth. The cirrus pouch is large in size, long cylindrical in shape, pre ovarian, obliquely placed and measures 0.3036-0.3571 in length and 0.08929-0.2321 in breadth. The cirrus is thin, with strong muscular wall, slightly curved, contained within the cirrus pouch, opening into deep narrow midventral pit and measures 0.1786-0.2321 in length and 0.01429-0.03571 in breadth. The vas deference is long, stout, convoluted, and thin measures 0.500-0.5714 in length and 0.0125-0.03393 in breadth. The genital pore is medium in size, oval situated in the centre of the worm and measures 0.03571-0.08929 in length and 0.01786-0.05357 in breadth.

The ovary is bilobed, with lateral lobes outside of the inner longitudinal muscle sheath, large in size, with loose big acini, butterfly shaped, situated near posterior region of the worm body. The lobes are large, triangular in shape with irregular margin and measures 1.5179-1.75 in length and 0.5357-1.0179 in breadth. The lobes are connected by wide isthmus, which measures 0.1429-0.1786 in length and 0.07143-0.08929 in breadth. The vagina is a thin long tube, starts from the genital pore, runs medially and posterior, slightly curved reaches and opens midventrally behind the cirrus and measures 1.3214-1.4285 in length and 0.03571-0.07143 in breadth. The ootype is big in size, oval in shape with bean shaped appearance, and measures 0.1429-0.1786 in length and 0.1786-0.03571 in breadth.

The uterus is wide, long, transverse and convoluted tube closely coiled between ovary and male terminalia, posterior and anterior to ovary, pre ovarian coils extends anterior up to genital pore, filled with numerous eggs. The eggs large oval, many in number and measures 0.1786-0.02679 in length and 0.01429-0.01786 in breadth. Uterus opens separately outside the body by an uterine pore, uterus measures 8.3929-10.3571 in length and 0.01607-0.3214 in breadth. The uterine pore is medium in size, round in shape, and measures 0.01785-0.07143 in length and 0.01607-0.07143 in breadth.

Vitellaria are follicular, rounded in shape, corticular 2-3 rows on each lateral side, extending from the base of neck to the anterior tips of the ovary, vitellaria surrounding linear longitudinal muscle sheath in testicular zone, post ovarian follicle absent. Vitellaria measures 0.0143-0.01786 in length and 0.0089-0.01607 in breadth.



Lytocestus vyasaiei n.sp.

Figure 2. A and B (based on five specimen)

Lytocestus purnensis n.sp.

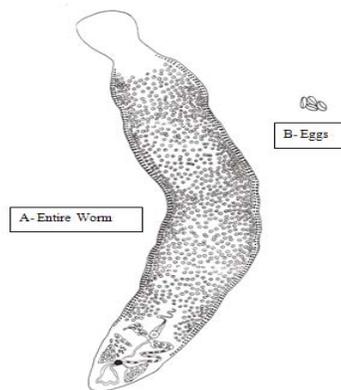
The mature worms of body elongated, flattened, anterior and posterior end tapering, grass blade like, thin and measures 12.1428-14.4642 in length and 1.0714-2.1429 in breadth. The head is large, with bluntly rounded extremity, well marked off from the body and measures 1.428-1.785 in length and 0.714-1.250 in breadth. The neck is short, wide, narrow and measures 0.535-0.804 in length and 0.893-1.071 in breadth.

The reproductive organs are situated in the posterior region of the body. The testes ovoid, 844-859 in number, larger than vitelline follicles, occupying medullary region of the body and measures 0.05357-0.08928 in length and 0.03571-0.07142 in breadth. The cirrus pouch small, cylindrical, medullary, opening separately from and anterior to utero-vaginal pore and measures 0.3214-0.4464 in length and 0.0892-0.1428 in breadth. The cirrus is thin, straight, inside the cirrus pouch and measures 0.3214-0.357 in length and 0.03571-0.0535 in breadth. Vas deferens is long, thin; more coiled and measures 0.625-0.803 in length and 0.0178-0.0357 in breadth. Genital pore is large, oval situated in the centre of the worm and measures 0.1428-0.2142 in length and 0.535-0.0892 in breadth.

The ovary is bilobed, H- shaped situated near posterior region of the worm, each lobe joined to each other by isthmus and measures 1.071-1.3928 in length and 0.0892-0.3214 in breadth. The ovarian lobes are large, triangular in shape with numerous loose follicles, connected by wide isthmus, which measures 0.2678-0.357 in length and 0.0178-0.0357 in breadth. The vagina is a thin long tube, starts from genital pore, runs posterior in the middle of the body, reaches and opens into the ootype and measures 1.071-10.1607 in length and 0.0178-0.357 in breadth. The ootype is small in size, round to oval in shape, transversely broad, below the isthmus and measures 0.0714-0.892 in length and 0.0357-0.0892 in breadth.

Uterus wide, coiled, loop shaped, convoluted tube, preovarian, coils, extends anterior up to genital pore, filled with numerous eggs which measures 0.3214-0.357 in length and 0.08928-0.1428 in breadth and opens separated outside the body by an uterine pore and measures 4.1071-4.5535 in length and 0.0714-0.2142 in breadth. The uterine pore is small in size, round in shape, and measures 0.08928 in diameter.

Vitellaria are follicular, rounded, arranged in 1-2 rows on each lateral side, extending from just anterior to testes up to cirrus pouch and measures 0.05357 in diameter.



Lytocestus purnensis n.sp.

Discussion

The genus *Lytocestus*, [2] as *L. adhaerens* from *Clarias fuscus* at hong-kong. the present two new species differs from following known species of the genus *Lytocestus*.

The present worm *Lytocestus vyasaai* n.sp. under discussion is long, neck absent. head is large conical in shape, testes 1022-1088 in number, cirrus pouch large, preovarian, obliquely placed, cirrus is thin, vas deferens is long, stout, convoluted, genital pore medium in size, ovary bilobed, butterfly shaped situated near posterior region of the body of worm, vagina is thin, long tube, ootype big, oval in shape, uterus wide, long, transverse and convoluted tube, coiled, pre and post ovarian, uterine pore medium, vitellaria follicular, rounded 2-3 rows on each lateral side.

The worm *Lytocestus purnensis* n.sp. under discussion is elongated, grass blade like, neck present, testes ovoid, 844-859 in number, longer than vitelline follicles, cirrus pouch small and cylindrical, ovary is bilobed, h-shaped, each lobes joined each other by ovarian isthmus, vagina is thin, long reaches and opens into ootype. the ootype is small, round to oval in shape, uterus wide, coiled, loop shaped, filled with numerous eggs, vitellaria are follicular, rounded, arranged in 1 to 2 rows on each lateral side.

1. The present worms differ from *L. indicus* [14] which is having the length of the body 27-40 and width of the same 0.30-0.50. testes 230-270 in number round in shape, extend up to the cirrus pouch region, vas deference followed by ducts ejaculatorius, ovary with numerous follicles, connected by big pipe shaped isthmus, the wall of the uterus is thick, coiled, and vitellaria follicular, in 2-3 rows on each lateral side.
2. The present worm differ from *L. filiformis* [22] which is having testes numerous, large, round in shape in central medulla, cirrus pouch small, bent between concavity of the 6-11 large follicles, connected by a big spindle shaped isthmus near the posterior region of the worm, vagina thick tube, short, wide, uterus convoluted, tubular, preovarian with small and large convolution, anterior to cirrus pouch, uterine pore oval, vitellaria large, rounded all along the testicular zone and modularly parenchyma.
3. The present worm differs from *L. alestesii*, [11] which is having the length 10.5mm. neck is absent, testes more or less spherical (0.050-0.070x0.040x0.060), cirrus pouch oval in shape, modularly in region, ovary bilobed to the posterior region of the body, uterus short, lie in loose follicles, vitellaria extend from short distance behind the most anterior testes, up to the anterior tips of the ovary.
4. The present worm differ from *L. birmanicus*, [11] which is having the length of the body 10-12 and width of the body 0.9, neck long, testes modularly extending up to the genital pore, cirrus pouch modularly in position, ovary wing like with numerous follicles, uterus is a number of loose cells, the most anterior loop reaching the space between the two genital opening, vitellaria up to the uterovaginal pore (in the size of vitelline glands).
5. The present worm differs from *L. longicollis* [16] which is having the length 10.8-20.0 and width 0.50-0.84, neck long, 5.3 to 5.6mm, testes 105-140 in number, spherical broad, oval, cirrus pouch oval in shape, vas deference convoluted ovary 'h' corticalar, all around testes, extending from the base of neck to the anterior tip of the ovary, in 1-2 rows on each lateral side.
6. The present worm differs from *L. marathwadensis* [19] which is having testes arranged in two to three rows in central medulla, oval in shape, cirrus pouch large, oval, ovary 'h' shaped, ovarian lobes extends up to corticalar region filled with follicles, uterus saccular, vitellaria small, oval, arranged in single row on lateral side.
7. The present worm differs from *L. alli*, [7] which is having testes 460-480 in number, in the central medulla in a single field, cirrus pouch small, vas deference short, ovary bilobed, butterfly shaped, vagina dilates to form receptaculum seminis, uterus wide, convoluted tube, vitellaria small, follicular, rounded, corticalar, arranged in 5-6 rows on each lateral side.
8. The present worm differs from *L. clariasae* [7] which is having testes numerous, 700-750 in number, rounded in shape in the medullary region in a single field, cirrus pouch medium, pre ovarian, vas deference much convoluted, ovary bilobed, ovarian follicles 36-42 in number, vagina dilates to form receptaculum seminis, uterus convoluted tube, vitellaria follicular, rounded, in 5-6 rows on each lateral side.
9. The present worm differs from *L. naldurgensis* [8] which is having neck is short, testes 500-600 in number, ore ovarian, cirrus pouch obliquely placed, small, oval and vertical, ovary bilobed, lobes extends up to sub corticalar region, vagina wide tube, post ovarian ootype, receptaculum seminis present, uterus wide tube convoluted, coiled anterior to isthmus, vitellaria follicular, small, 3-4 rows on each lateral side.
10. The present worms differs from *L. batrachusi*, [18] which having neck is long, testes is round, medium, 3800-4000 in number, cirrus pouch large, oblong, preovarian, vas deferens long, slightly curved, ovary bilobed, butterfly shaped, ootype is medium oval, uterus is medium, convoluted tube and vitellaria small, oval in 2- rows.
11. The present worms differs from *L. shindae* [9] which is having the length of body 12-13 and width of body 1.421-2.245, testes are numerous 350-360 in number, preovarian, cirrus pouch is small, oval, obliquely placed, ovary is bilobed, butterfly shaped in appearance, near the posterior region of worm, uterus is wide convoluted tube, transversely situated filled with numerous eggs and vitellaria are granular and corticalar in position.
12. The present worms differs from *L. nagapurensis*, [10] which is having neck is short, testes numerous 1100-1150 in number, vas deferens thin, coiled, cirrus pouch is medium, medullary, preovarian, ovary bilobed, vagina long, thin tube, ootype large in size, oval, uterus, wide long, preovarian, loop shaped and vitellaria granular.
13. The present worms differs from *L. clariae*, [20] which is having body is elongated, neck is short, testes are numerous, 270-495 in number, cirrus pouch compact, bulbous, ovary bilobed, h- shaped, vaginal tube joining the uterus and vitelline follicles ovoid.
14. The present worms differs from *L. attenuatus*, [20] which is having body thin, slender, elongated, neck narrow, long, testes ovoid, 155-398 in number, cirrus sac medullary, ovary bilobed, follicular, inverted a- shaped,

uterus glandular extending from behind mehlis gland, vagina distinct, straight or slightly convoluted and vitelline follicles ovoid arranged in two lateral to testes.

15. The present worms differs from *L. assamensis*, [20] which is having body is long, testes numerous 266-565 in number, cirrus sac prominent, ovary bilobed, bent inwards in shape of inverted a, vagina distinct, uterus glandular, and vitelline follicles cortical.
16. The present worms differs from *L. heteropneustii*, [20] which is having, body elongate, flat, neck is short, testes numerous 235-340 in number, cirrus sac prominent, occupying entire thickness of medulla, ovary bilobed, follicular, h- shaped, uterus glandular, extending from in front of isthmus anterior beyond lateral horns of ovary, vagina distinct, joining terminal end of uterus and vitelline follicles ovoid or spherical, cortical in disposition. The distinct characters, as noted above, justify the recognition of the present worm as a new species and hence the name *Lytocestus vyasaei* n.sp. is proposed in honor of vyas and the *Lytocestus purnensis* n.sp. is proposed after the name of locality, purna dist. parbhani, m.s. India.

Type species : *Lytocestus vyasaei* n.sp.
 Host : *Clarias batrachus*, linnaeus (1758)
 Habitat : intestine
 Locality : aurangabad, m. s., India
 Type species : *Lytocestus purnensis* n.sp.
 Host : *Clarias batrachus*, linnaeus (1758)
 Habitat : intestine
 Locality : purna, dist. parbhani, m. s., India

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