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A new nematode from Loktak Lake, Manipur

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Abstract- During a taxonomic study of parasitic insect nematode, five mature medium-sized gravid female nematodes were recovered from the intestine of a host insect *Grylotalpa africana* which was found inhabited on the floating phumdi (a thick mass of floating vegetation) of Loktak Lake (24° 32' 24" N and 93° 47' 37" E), Manipur, India. On microscopic examination the specimen exhibited many features which were not encountered in other species of the family. The present specimen possesses only two annules at the cephalic end unlike other species. Body is covered with thick, transparent and smooth cuticle. Oesophagus long consisting three parts-carpus, isthmus and rounded valvular bulb. Numerous oval eggs are present in the body. Tail conoidal with short caudal appendage. Basing on these unique characteristics, the present specimen is proposed as a new genus of the family Thelatomatidae Travassos, 1929.

Key words: Insect, *Grylotalpa* sp., Nematode, *Gryllo tum* n.gen., Loktak, Manipur

INTRODUCTION

Manipur belongs in Indo-Burma hotspot region having high diversity of species richness. The present host *Grylotalpa* was collected from a floating vegetation called phumdi found at the middle of Loktak lake. The present Nematode is recovered from the gut of host insect. This specimen-nematode is very different from other nematodes reported from the terrestrial area. However, it shows some resemblance to two other genera of the family Thelastomatidae viz., *Periplaneticola* Basir, (1940,1942)^{1,2} and *Isobinema* Rao, (1958)³. But, when studied in detail the present specimen is quite different from any other genera, not only from the two mentioned genera. Thus, on the basis of the notable characters exhibited by the present specimen, such as presence of two distinct cephalic annules surrounding the mouth, a distinct excretory pore having a protruded conical appearance, a thick and smooth cuticle,

etc. make this specimen differentiated from other similar species. Therefore, in order to keep it in a distinct status, it is proposed to be recognised as a new genus.

MATERIALS & METHODS

Many insects were collected from the different localities of the Manipur including Loktak lake. The insect hosts were brought to the laboratory in a ventilated plastic vessel in live condition and dissected in a petridish with normal saline solution. The nematode specimen recovered from intestine of the host insect *Grylotalpa africana* were fixed in A.F.A. (Alcohol Formalin Acetate) for few minutes. The fixed nematodes were transferred to G.A. (Glycerine Alcohol) in a cavity block which are ultimately transferred in the desiccator for complete dehydration. After few days the dehydrated specimen were mounted on a drop of pure dehydrated glycerine on a slide, then covered with a coverslip and sealed with nail polish and then observed under the microscope. Diagram was drawn

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with the help of camera lucida and measurements were taken with the help of ocular micrometer (figure 1). The methodology followed is the Seinhorst's (1959)⁴ rapid glycerin method. All measurement values are given in mm, if otherwise not mentioned.

OBSERVATION

Generic Characters:

Body is long, slender, cylindrical. Mouth is surrounded by six elevated labial-papillae. Only the first and second annules are distinctly demarcated at the cephalic end. Body covered with a thick and smooth cuticle. Oesophagus has three parts-corpus, short isthmus and rounded valvular bulb. Excretory pore is distinctly protruded from body wall like a pyramidal model, open at a little below the oesophagus. Beginning of intestine is wider than the valvular bulb. Vagina directed anteriorly, opens just below the mid body. Gonad mono-prodelphic. Eggs oval shaped and densely arrange inside the body with a capsulated mass. Tail very short, constricted in the middle and symmetrically chiselled tip having a very short caudal appendage lies in the mid axis of posterior body.

DESCRIPTION

Female: Body is elongated, cylindrical, 3.57-3.81 long and 0.31-0.32 wide. Mouth surrounded by six elevated structures with labial-papillae. Cuticle is very thick and smooth, covering whole body. The body has only two distinct annules at the cephalic region, the first annule surrounds the mouth opening and followed by the second annule. Oesophagus, 0.38-0.43 long, having three parts-corpus, isthmus and valvular bulb. Corpus is tubular structure, 0.28-0.32 long and 0.03-0.04 wide. Isthmus is very short connects both corpus and isthmus, 0.02-0.03 long and 0.02-0.03 wide. Valvular bulb is rounded, thick, muscular and roughly distillation flask shaped, 0.09-0.10 long and 0.09-0.10 wide. Cardia is not seen clearly. Nerve ring encircles the corpus at 0.16-0.18 from the anterior end. Excretory pore is protruded and opens at 0.59-0.71 from the anterior end. Intestinal wall is thick at the beginning near the oesophago-intestinal junction but soon continued as very thin wall giving an appearance of expanded lumen. Then after the mid body region the intestine become narrower and continued as tubular

Table 1. Showing the comparatives description of present specimen with the other two species *Periplaneticola* Basir, (1940)¹ and *Isobinema* Rao, (1958)³.

Characters	<i>Periplaneticola</i> Basir, (1940) ¹	<i>Isobinema</i> Rao, (1958) ³	Present Specimen
Labial Papillae	Eight labial-papillae	Eight labial-papillae	Six labial-papillae
Annules	Nine small dense annules present at the cephalic end	Annulation completely is absent	Only two distinct annules are present
Excretory Pore	Excretory pore opens as a simple hole	Excretory pore opens as a simple hole	Excretory pore protruded distinctly like a pyramidal structure
Intestine	Intestine begins as broader and gradually narrower posteriorly	Intestine begins as similar wide with the valvular bulb	Intestine begins as similar wide of valvular bulb with a very thin wall and gradually broader posteriorly
Ovary	Two long chain of ovary present	Two long chain of ovary present	Only a long chain of ovary present
Polar cap	Present	Absent	Absent
Eggs	Eggs are arranged in capsulated mass and do not possess polar filament	Eggs are not arranged in beaded structure without capsulated mass, held together by polar filament	Eggs are arranged in capsulated mass without polar filament
Tail	Tail very short with small blunt caudal appendage which closer the dorsal side of tail	Tail elongated and conical structure with a long filiform caudal appendage	Tail is very short with small caudal appendage which comes downward just in the line of mid axis

structure up to the anus. Vulva is simple, opens below the midbody at 2.05-2.23 from the anterior end. Vagina directed anteriorly. Eggs are oval shaped surrounded by thin smooth shell, 0.05-0.06 long and 0.03-0.04 wide and arranged densely in the body. A long chain of ovary present.

Anus is much closer to the posterior end of the body and opens at 3.45-3.66 from the anterior end. Tail is short 0.10-0.19 long, constricted in the middle, having a short caudal appendage, lies in the mid axis of posterior body.

Male: Male not found.

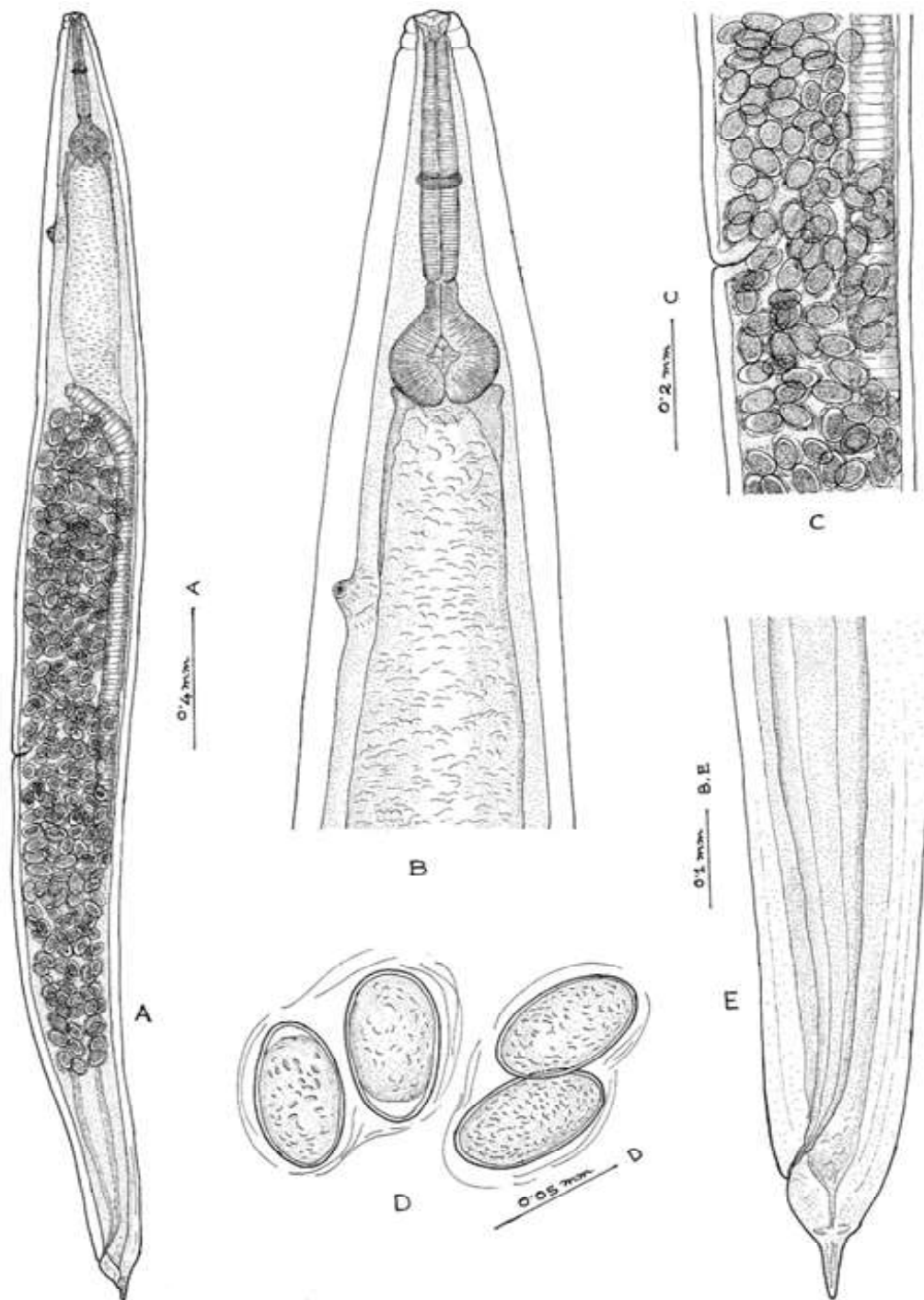


Figure-1: Camera lucida drawing of *Grylloium loktaklica* n.gen. & n.sp. A. Entire Female; B. Anterior end; C. Vulval region; D. Eggs; E. Female posterior end.

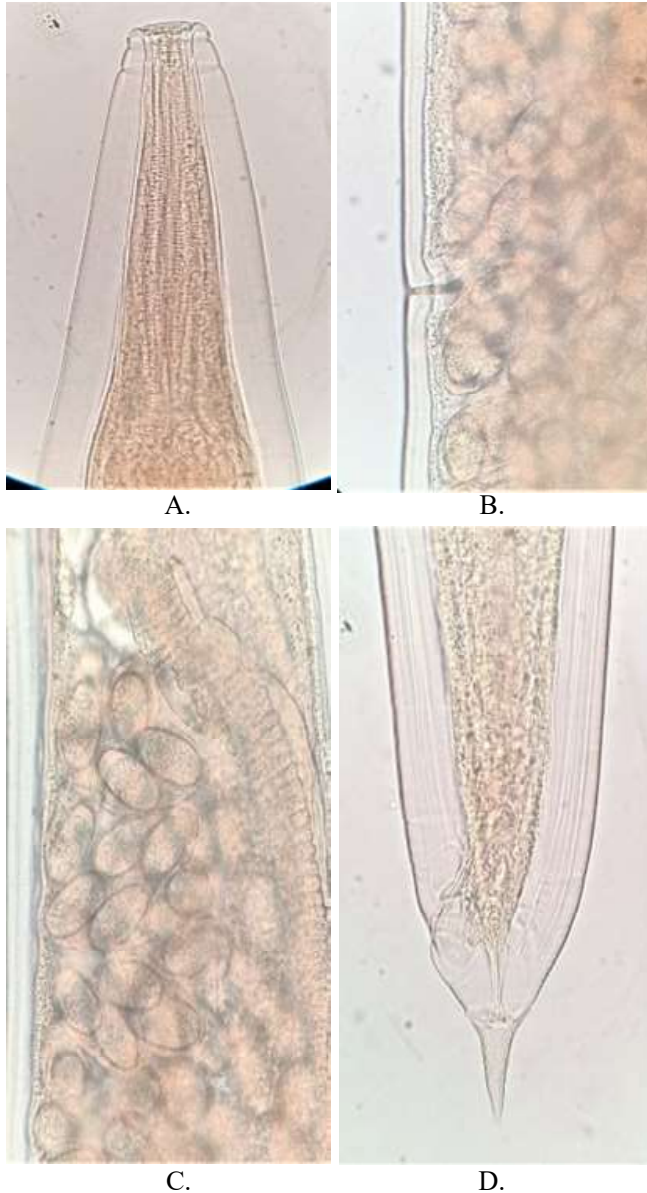


Figure-2. Photomicrograph of *Grylloctum lohtaklica* n.gen. and n.sp. A. Cephalic end showing prominent two annules, mouth part and entire oesophagus, B. Vulval region showing vaginal opening, C. Body showing ovary and numerous eggs, D. Posterior end showing short caudal appendage.

RESULTS & DISCUSSION

The present specimen belongs to the order Oxyurida and the largest family Thelastomatidae Travassos, (1929)⁵ by the presence of cuticular wall, annulated cephalic end and posterior tail region, etc. Some more commonly occurring genera that belongs to the family Thelastomatidae, which are slightly resembling the present

specimen are *Binema* Trvassos (1925)⁶, *Blatticola* Schwenck (1926)⁷, *Cameronia* Basir (1948)⁸, *Cephalobellus* Cobb (1920)⁹, *Gryllophila* Basir (1942)², *Hammerchmidtella* Chitwood (1932)¹⁰, *Isobinema* Rao (1958)³, *Leidynema* Schwenck (in Travassos, 1929)⁵, *Linstowiella* Basir (1956)¹¹, *Periplaneticola* Basir, (1940,1942)^{1,2}, *Pseudonymus* Diesing (1857)¹², *Schwenkiella* Basir (1956)¹¹, *Thelastoma* Leidy (1849)¹³, *Zonothrix* Todd (1942)¹⁴. However, when it is studied in detail many distinctive characters are come out, differentiating the present specimen from any known genera. Out of the fourteen genera mentioned the present specimen have some more closer resemblance with only two genera viz., *Periplaneticola* and *Isobinema* but in detail studies with the two genera and the present specimen have many distinguishing characters which are given below:

Comparison of present specimen with the genus *Periplaneticola* Basir, (1940,1942)^{1,2} and *Isobinema* Rao, (1958)³.

The mouth opening of the present specimen is surrounded by six labial-papillae (eight labial-papillae in *Periplaneticola* and *Isobinema*).

Body has only two large annules at the cephalic end. The first annule enclosed the mouth opening followed by second annule (body has nine small dense annules at the cephalic region of *Periplaneticola*, annulation is completely absent in *Isobinema*).

Excretory pore is protruded as pyramidal like outgrowth in the present specimen (it is opened as a simple hole in *Periplaneticola* and *Isobinema*).

Intestine begins with similar wide of valvular bulb having a very thin wall and become gradually broader posteriorly (it begins similar size with valvular bulb and gradually narrower posteriorly in *Periplaneticola* and *Isobinema*).

A long chain of ovary present in the present specimen (two long chain of ovary in *Periplaneticola* and *Isobinema*).

Eggs do not bear polar cap (polar cap present in *Periplaneticola*).

Eggs are arranged in capsulated mass as cluster in the present specimen and do not possess any polar filament (eggs are single but arranged in beaded like structure which are held together by polar filament in *Isobinema*).

Tail very short with a small caudal appendage which is beautifully chiselled just in the mid axis of the posterior body (tail elongated and conical structure with a long filiform caudal appendage in *Isobinema* whereas caudal appendage is very short which closer to dorsal side from mid axis of the tail region in *Periplaneticola*).

TAXONOMIC SUMMARY

Genus : *Grylloatum* n.gen.
Species : *loktaklica* n.sp.
Type Host : *Grylotalpa africana*
Type Habitat : Posterior part of alimentary canal.
Locality of Host: Loktak Lake (24° 32' 24" N & 93° 47' 37" E), Manipur, India.
Etymology : The genus and species name are based on the name of host and place collection of the host, respectively.

CONCLUSION

Due to the above points of differences, the present specimen cannot be accommodated under any known genera of the family Thelastomatidae. Therefore, it becomes necessary to accommodate the present specimen and proposing a new genus and giving a name *Grylloatum* n.gen with *loktaklica* as its type species. The generic name *Grylloatum* n.gen. is derived from the name of the host. The species name *loktaklica* n.sp. is given after the name of Loktak Lake from where the host was recovered.

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