Family 20 BELONTIDAE

49. *Polycanthus fasciatus* (Bloch & Schneider)

Family 21 MASTACEMBELIDAE

50. *Macrognathus aral* (Bloch & Schneider)
51. *M. pancalus* (Hamilton)

DISCUSSIONS & CONSERVATION

The Lake Kolleru is one of the very important freshwater lakes and National wetlands of India. Many riverine important edible fishes utilize this wetland for their breeding grounds. The presence of juvenile specimens of almost all the fishes especially the carps in this lake indicates that these fishes use this water body as their spawning grounds. Since this lake is distantly connected with the Bay of Bengal through Upputeru often some marine fishes are also found in the fish fauna of this lake. Among the important commercial fishes of this lake *Anabas testudineus, Heteropneustes fossilis* and *Labeo rohita* are abundantly found throughout the year. This lake also has been found to contain 3 endemic species of our country. *Rohtee ogilbii* of this lake is a vulnerable and endemic fish species of our country. This species is found only in the two important south Indian waters of the river Godavari and Krishna. *Hypselobarbus dobsoni* is an endangered and endemic species in India. It has been recorded in the south Indian waters of the Rivers Krishna and Cauvery, and in the Anaimalai Hill drainages. *Thynnichthys sandkhol* is a rare and endemic fish species of India, found in the south Indian waters of the river Gadavari and Krishna only. Since these commercially important vulnerable, endangered and rare fish species are already in danger of extinction due to over exploitation, habitat destruction and other external factors, their protection and conservation measures should be taken immediately to save them from extinction.

To protect and conserve the fish resources along with its vulnerable, endangered and rare fish species of the Lake Kolleru the following measures may be undertaken :

(1) Indiscriminate fishing by means of fixed engines should be stopped.

(2) Restrictions on the use of certain nets during the specified times of the year from April to June (*i.e.*, closed season) as well as mesh size (usually the minimum mesh size of the nets permitted is 25 mm. in the Indian waters).

(3) Restrictions on the capture and sale of legal sizes of fry and fingerlings of major carps to protect the juveniles of the fishes.

(4) All types of landscapes alterations must be controlled and use of herbicides and insecticides also to be prohibited in and around this lake.

(5) Mass awareness campaign should be organized to educate about the significance of the conservation of the fishes in their areas. Since the local fishermen and the people surrounding this lake are in constant contact with this wetland, they should be told that they are the real custodian of the flora and fauna of this Kolleru Lake. Destruction, shrinkage and misuses of this wetland will definitely create their socioeconomic problems due to the fact that the degradation of the wetlands with their rich faunal diversity throughout our country is already alarming.

SUMMARY

The fishes of the Lake Kolleru have been reviewed following the works of Molur & Walker (1998) and Menon (1999). This shows that it contains some very important commercial fishes in addition to 11 vulnerable species, *viz.*, *Rohtee ogilbii, Barbodes sarana sarana, Puntius chola, Cirrhinus reba, Mystus bleekeri, Mystus vittatus, Clarias batrachus, Heteropneustes fossilis, Channa orientalis, Anabas cobojius*, and *Anabas testudieus*, 4 endangered species, *viz.*, *Anguilla bengalensis, Hypselobarbus dobsoni, Ompok bimaculatus* and *Pseudeutropius atherinoides* and 1 rare species, *viz.*, *Thynnichthys sandkhol*. Considering the presence of these vulnerable, endangered and rare species, this Lake has been suggested for conservation measures.

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I thank Dr. J. R. B. Alfred, Director and Dr. S. K. Chanda, Deputy Director, Zoological Survey of India, Kolkata for necessary facilities. Thanks are also due to the Commissioner of Fisheries, Govt. of Andhra Pradesh, Hyderabad and the Assistant Director of Fisheries, Kolleru Lake for assistance and cooperation.

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Rec. zool. Surv. India : **103** (Part 1–2) : 91-98, 2004

TWO NEW SPECIES OF ASCID MITES (ACARINA : MESOSTIGMATA) FROM THE THAR DESERT OF RAJASTHAN, INDIA

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INTRODUCTION

Indian Thar Desert stretching from the west of Aravallis to the Indus basin, is an arid wasteland covered under wind-blown sands. It covers an area of 1,02,400 sq. kms., occupying 12% of the Indian mainland. Considering the huge land area, the invertebrate fauna of this region has been very little explored. Tandon (1996) gave a detailed account of taxonomic researches conducted on different insect groups in the Indian Thar Desert. Literature studies reveal that soil acarine fauna of the Thar Desert is represented by only ten species (Sanyal, 1996). Out of these, seven species belong to the order Cryptostigmata, two species belong to the order Mesostigmata and the remaining one belongs to the order Prostigmata. While working on soil acarine fauna of the Thar Desert, alongwith other acarines two new species of ascid mites belonging to two genera *viz., Lasioseius* Berlese and *Gamasellodes* Athias-Henriot were collected.

Nine species of plant-, soil- and nest-inhabiting *Lasioseius* mites are known from India (Chant, 1960; Menon and Ghai, 1968; Bhattacharyya, 1968; Gupta and Paul, 1985; Bhattacharyya *et al.*, 1997, 2000; Bhattacharyya and Bhattacharyya, 2001). Bhattacharyya (1978), Pramanik and Raychaudhury (1978) reported the occurrence of the *Gamasellodes bicolor* (Berlese, 1918) from West Bengal.

KEY WORDS : *Gamasellodes jodhpurensis* sp. nov., *Lasioseius prakashii* sp. nov., Thar Desert, Rajasthan, India.

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MATERIAL AND METHODS

Mites were cleared in lactic acid before mounting on microscopic slides using Hoyer's medium. Measurement (in micrometer, μm) were taken from slide-mounted specimens with stage-calibrated ocular micrometer. Setae were measured from the base of their insertion to their tips. The system of setal nomenclature for idiosoma and legs follows that of Lindquist and Evans (1965). Type-materials are deposited in the National Zoological Collection, Zoological Survey of India, Calcutta.

Gamasellodes jodhpurensis sp. nov.

(Text-figs. 1-3)

Female : Anterior dorsal shield (126 μm long along midline, 104 μm wide at widest point) with fifteen pairs of simple setae; setae j1, j2 and z1 almost subequal in length (11 μm); posterior dorsal shield (120 μm long, 101 μm wide) with fifteen pairs of simple setae; setae J1–J3 subequal (11 μm), J4 and J5 subequal (9 μm); setae J5 and S5 40 μm and 20 μm long respectively; area between J4 and J5 finely granulated medially; six pairs of short, simple, smooth setae present on lineated lateral membrane; peritreme visible dorsally extending upto setae z1 apically (Fig. 1).

Sternal shield smooth, 62 μm long, 61 μm wide; setae st1 placed on extended anterior portion of sternal shield; bilobed portion containing setae st1 finely granulated; setae st3 longer (13 μm) than subequal st1 and st2 (11 μm); metasternal setae placed on ventral membrane; epigynial shield with a pair of setae; ventral membrane beyond epigynial shield folded to form membrane; ventral membrane around ventri-anal shield with three pairs of ventral setae and platelets as depicted in fig. 2; metapodal platelets narrow, arranged lateral to body margin. Ventri-anal shield (78 μm long along midline, 100 μm wide) coarsely granulated posteriorly, with four pairs of setae, excluding a pair of para- and a post-anal setae. Peritreme narrow, stigma placed on anterior level of coxa IV; post-stigmatal prolongation of peritrematal shield extending posteriorly, encircling coxa IV.

Tectum trispinnate (Fig. 3). Ventrally gnathosoma with five rows of deutosternal denticles; anterior second row widest, with five teeth.

Leg setation normal for the genus *i.e.*, femora I–II–III–IV, 12–10–6–6, and that of tibiae 13–11–8–9; legs I–II–III–IV, 257 μm, 241 μm, 223 μm and 217 μm long respectively.

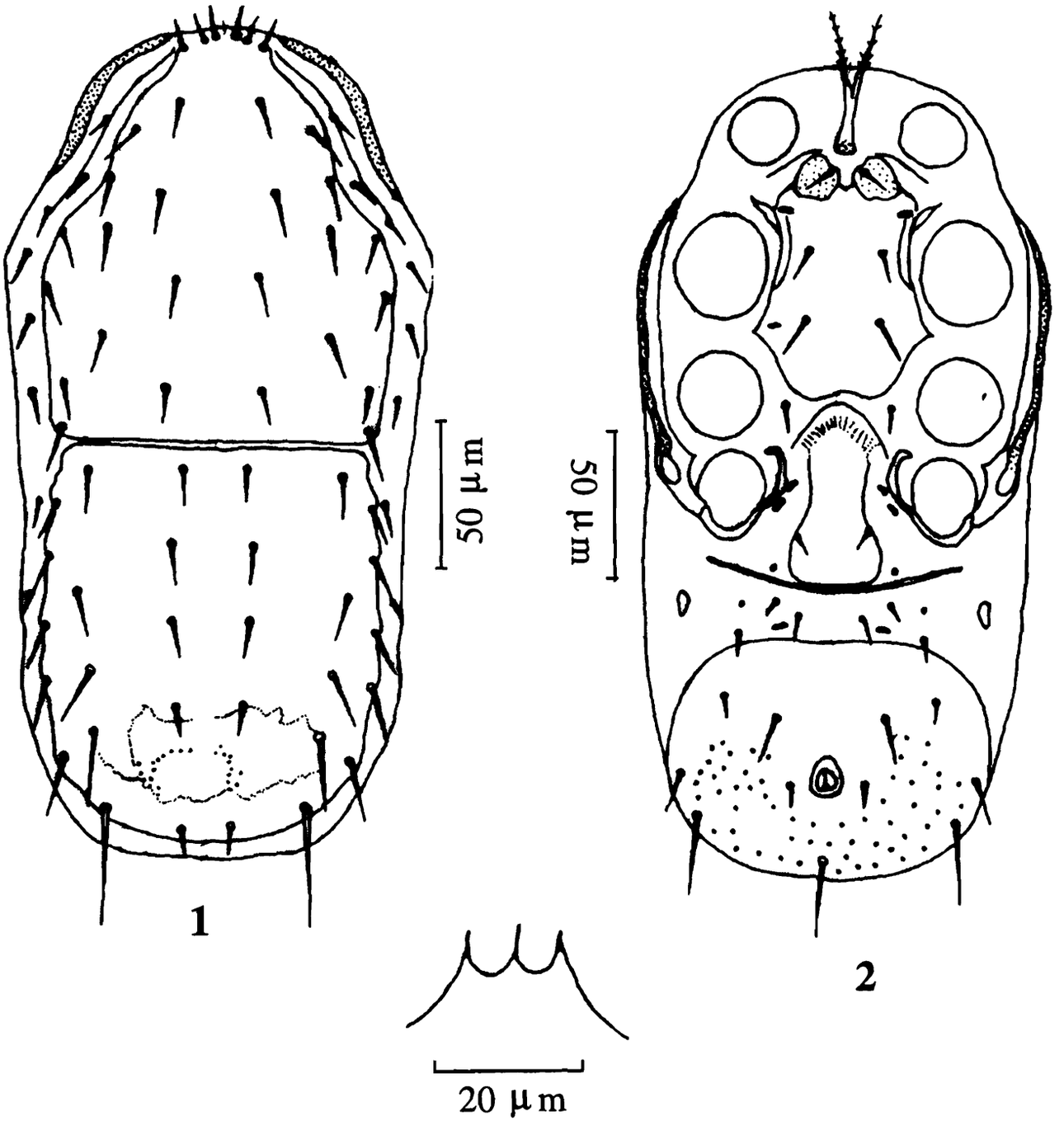
Male : Unknown.

Material examined : HOLOTYPE female, ex. soil; Kharia Mithapur, Jodhpur, Rajasthan; 20.i.2001; A. K. Bhattacharyya coll. PARATYPE : One female, data same as for holotype.

Differential diagnosis : The new species, *Gamasellodes jodhpurensis* shows its similarity with another Indian species *Gamasellodes islandicus* Bhattacharyya and Sanyal, 2002 in having similar shape of sternal and ventri-anal shield and tectum, nature and length of dorsal setae.

However, the new species differ from its allied species in the following aspects : setal disposition of j2, shorter length of j3, longer length of sternal setae st3, punctuated nature of ventri-anal shield and presence of exopodal shield.

Etymology : The specific designation *jodhpurensis* refers to the type-locality.



Figs. 1-3. : *Gamasellodes jodhpurensis* sp. nov., female : 1. Dorsum, 2. Venter, 3. Tectum.

Lasioseius prakashii sp. nov.

(Text-figs. 4–8)

Female : Dorsal shield (390 μm long along midline, 180 μm wide at their widest point) reticulated, with twenty-one pairs of simple to serrated setae; anterior region with twelve pairs of setae, nine pairs of setae on posterior region (Fig. 4); setae j1, r3, S5, Z5 and J5 33 μm, 48 μm, 60 μm, 70 μm and 12 μm long respectively; setae S5 and J5 borne on tubercles; lateral membrane with three pairs of short, simple lateral setae; peritreme visible dorsally, extending beyond apical setae anteriorly.

Tritosternum with long, pilose lacinae. Sternal shield (90 μm long along midline, 117 μm wide between two anterolateral corners) slightly convex posteriorly, with three pairs of setae, st1 longer (23 μm) than subequal st2 and st3 (15 μm); paired platelets flanking the base of tritosternum present anterior to sternal shield; metasternal shield with metasternal seta; genital shield truncate posteriorly, reticulated laterally, with paired genital setae. Peritreme moderately wide, stigma at level of coxa IV; post-stigmatal prolongation of peritrematal shield encircling coxa IV posteriorly. Ventri-anal shield (148 μm long along median line, 165 μm wide at their widest point) large, completely reticulated, with a total of fifteen setae; ventral membrane posterior to ventri-anal shield with two pairs of setae (Fig. 5).

Tectum denticulate, roughly circular in shape (Fig. 6). Ventrally seven rows of deutosternal denticles present in hypognathal groove; anterior second and seventh row with eleven and five teeth respectively.

Chaetotactic formulae of genua and tibiae of legs I–II–III–IIV as follows : 13–11–9–9 and 13–10–8–10 respectively; length of legs I–IV, 437 μm, 318 μm, 307 μm and 443 μm respectively.

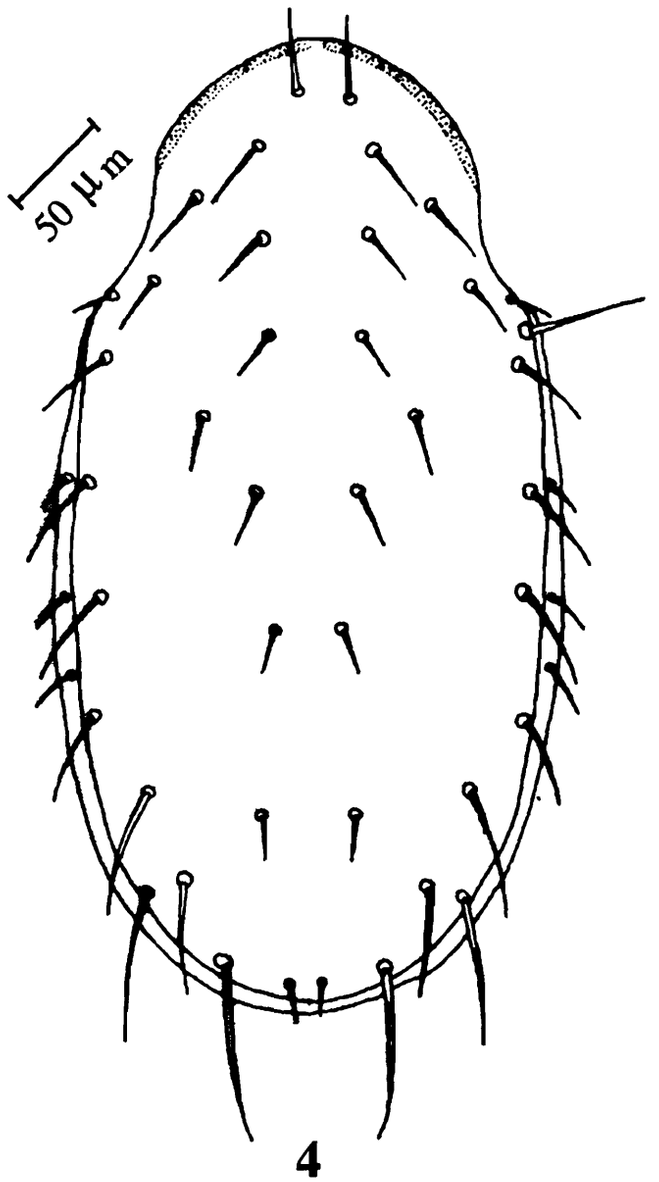
Male : Dorsal shield (278 μm long, 128 μm wide) with twenty pairs of setae, equally divided on anterior and posterior region; setae r3, j2, S5 and J5 32 μm, 28 μm, 51 μm and 9 μm long respectively (Fig. 7); reticulation of dorsal shield same as in female.

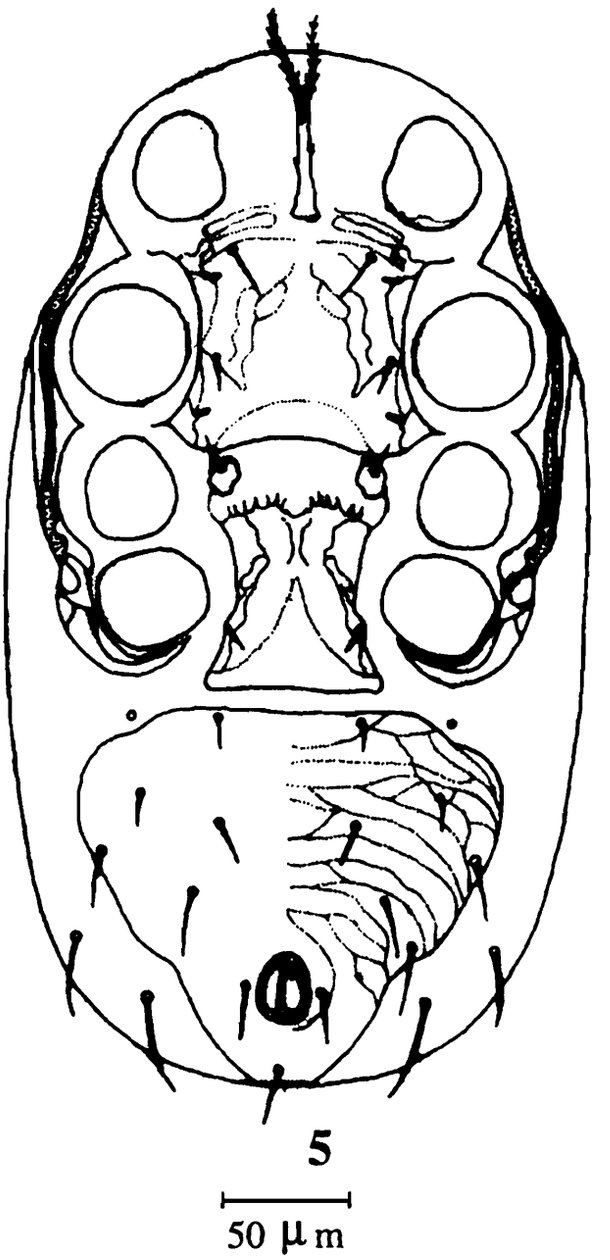
Tritosternum same as in female; sterniti-genital shield (117 μm long along midline, 51 μm wide along two anterolateral corners at level of setae st1) with three pairs of setae, st2 longest (11 μm). Peritreme moderately wide, stigma situated at level of upper half of coxa IV. Ventri-anal shield (104 μm long, 148 μm wide) reticulated, with fifteen setae (Fig. 8).

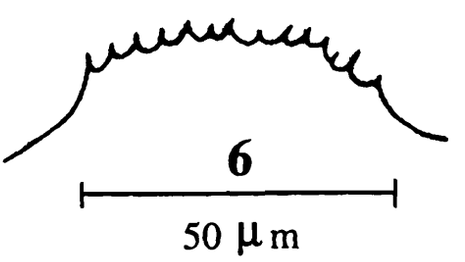
Tectum same as in female. Ventrally gnathosoma with seven rows of deutosternal denticles, with 9–15 teeth in each row, second row widest with fifteen teeth. Fixed cheliceral digit with nine teeth, spermatodactyl process long, movable cheliceral digit unidentate.

Sexual dimorphism absent in legs.

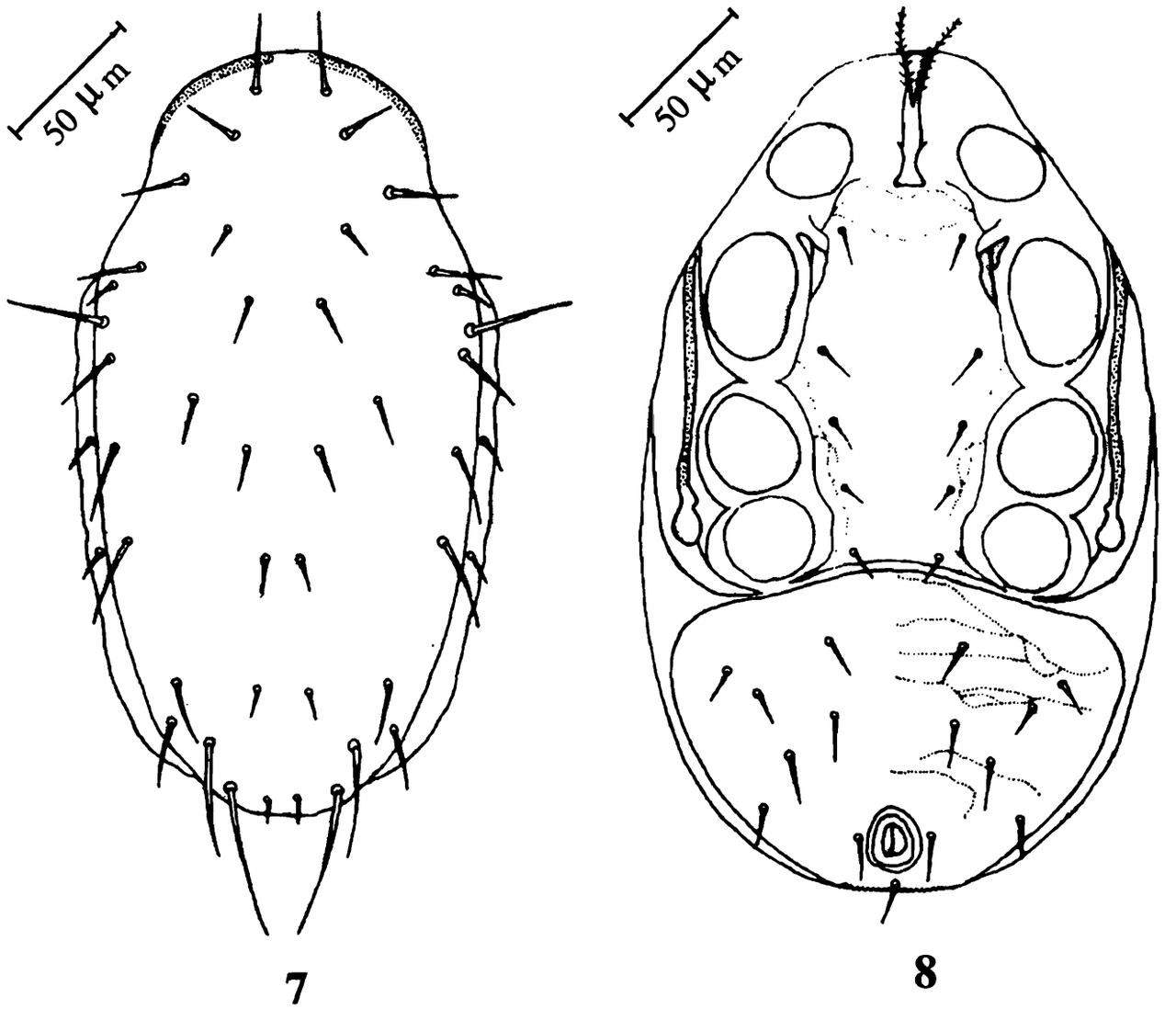
Material examined : HOLOTYPE female, ex. soil; Jaliwada, Jodhpur, Rajasthan; 15.i.2001; A. K. Bhattacharyya coll. PARATYPES : Two females, data same as for holotype. Two females,







Figs. 4-6. : *Lasioseius prakashii* sp. nov., female : 4. Dorsum, 5. Venter, 6. Tectum.



Figs. 7-8. : *Lasioseius prakashii* sp. nov., male : 7. Dorsum, 8. Venter.

ex. soil; Ghaseri, Jalore, Rajasthan; 6.xii.2001; A. K. Bhattacharyya coll. Three females, ex. soil; Kharia Mithapur, Jodhpur, Rajasthan; 20.i.2001; A. K. Bhattacharyya coll. Two females, ex. soil; Sri Vijaynagar, Sri Ganganagar, Rajasthan; 9.ii.2001; A. K. Bhattacharyya coll. One male, ex. soil; Sikwada, Jalore, Rajasthan; 6.xii.2000; A. K. Bhattacharyya coll.

Differential diagnosis : *Lasioseius prakashii* sp. nov. can be differentiated from its nearest congeneric species, *L. lindquisti* Nasr and Abou-Awad, 1987, in the following aspects : total number of seate on dorsal shield, shape of sternal shield, metasternal shield and tectum.

Etymology : The species is named after the name of late Dr. Ishwar Prakash, eminent Indian ecologist, considered an authority on desert ecology.

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Rec. zool. Surv. India : **103** (Part 1–2) : 99-102, 2004

PLACOBDELLA HARASUNDARAI (HIRUDINEA : GLOSSIPHONIDAE) A NEW SPECIES OF LEECH FROM WEST BENGAL, INDIA

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INTRODUCTION

A new species of leech *Placobdella harasundarai* is described from West Bengal, and is known by six species of this genus from India. It is distinguished in possessing the following characters. One pair round eyes, Green in colour (in living). Three lines dorsal papilla palpable, others are not so. Breeding season is August to September : Eggs seven to ten in number. One mid ventral line. Anterior sucker triangular in shape. Terminal mouth opening; Posterior sucker almost round in shape. Anterior sucker is one fourth of the posterior sucker.

Placobdella harasundarai sp. nov.

(Fig. 1 & 2)

Holotype : Z.S.I. Reg. No. An 3222/1, 1ex., Coll. C. K. Mandal, 1.9.2002, Harasundarai pond, Vojerhat, South 24-Parganas, West Bengal, India.

Paratypes : Z.S.I. Reg. No. An 3223/1, Coll. C. K. Mandal, 1.9.2002, 1 ex., Harasundari pond, Vojerhat, South 24-Parganas, West Bengal, India.

Diagnosis : *Colour* : Green in colour in living, so beautiful that it is named as Green Queen leech of South 24-Parganas, Harasundari pond. The colour becomes faded in preserved state.

Body : Not transparent, so caeca are not visible. Body bears 60–65 segments.

Sucker : Anterior sucker triangular in shape, posterior sucker almost round in shape.

Length : The total length of *Placobdella harasundarai* 4.5–4.6 mm.

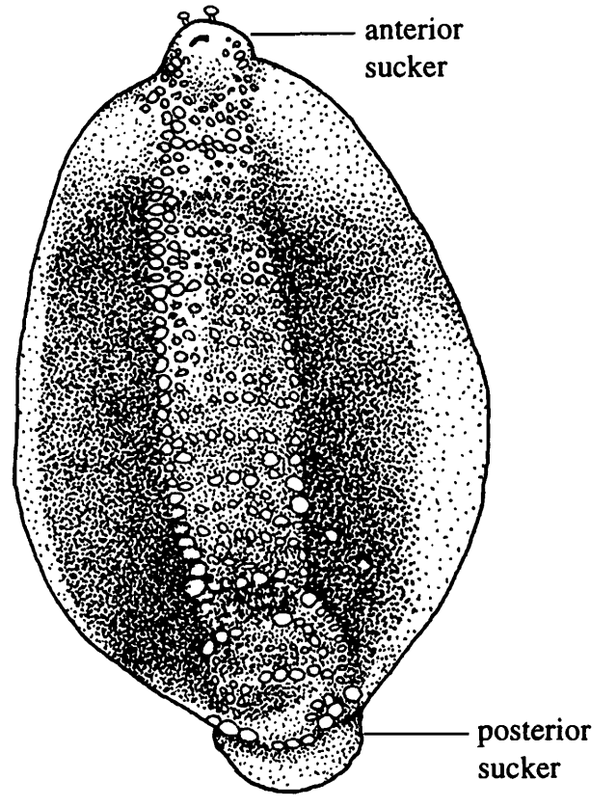

Fig. 1. : Dorsal view of the Leech *Placobdella harasundarai.*

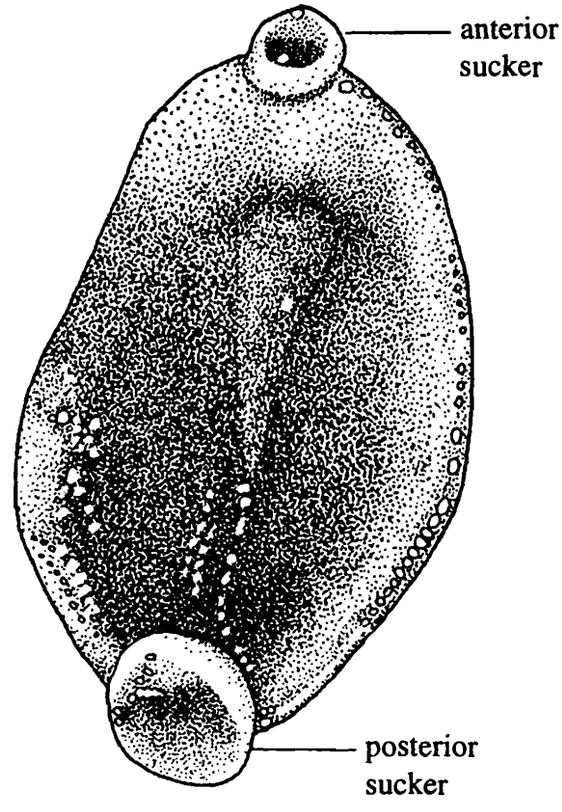

Fig. 2. : Ventral view of the Leech *Placobdella harasundarai.*

Breadth : 2.5 mm. and 3 mm. consecutively.

Distribution : *India* : West Bengal (Harasundari pond, Vojerhat, South 24-Parganas).

Breeding Season : August to September. During this time they form eggs and bear on the ventral side of the body. They bear 7–10 eggs around the gonopore in jelly like structure.

Remarks : The specific name is proposed according to the name of collection spot.

Comparision : Eyes one pair, round in shape in *Placobdella harasundarai*, coma shaped in *Placobdella emydae*, cup shaped in *Placobdella horai, Placobdella indica, Placobdella undulata* and three pairs of eyes in *Placobdella ceylanica.* Mouth opening triangular in *Placobdella harasundarai* but almost round in other six species. Posterior sucker is 1/4 of the broadest part of the body in *Placobdella harasundarai* and almost circular in shape. Circular posterior sucker of *Placobdella ceylanica* is 1/2 of the greatest width of the body, in *Placobdella emydae* posterior sucker is narrower than the widest part of the body, less than 1/2 of the body width in *Placobdella fulva*, almost 1/3 in *Placobdella horai* and *Placobdella undulata.* Breeding season in *Placobdella harasundarai* is August to September, May-July in *Placobdella emydae,* June-July in *Placobdella fulva* and *Placobdella horai*, May-July in *Placobdella undulata. Placobdella ceylonica* is parasitic on molluscs, frogs and turtles, *Placobdella emydae* on turtles, *Placobdella fulva* on fish and molluscs, *Placobdella horai* on prawn, fishes, *Placobdella undulata* on fishes, *Placobdella indica* on molluscs and *Placobdella harasundarai* on insect larvae and molluscs.

Host and Habitat : It is found in the pond, lakes under the submerged articles at the root of the water hyacinth or on the molluscs shells.

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ENDEMIC LEECH FAUNA OF INDIA

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INTRODUCTION

The leeches which are found only in India are called "ENDEMIC LEECHES OF INDIA" The number of endemic leech fauna of India is in remarkable position in the world be cause of its identical situation and natural diversity. 32 species have been found in India which are not seen anywhere in the world. Out of 32 , 21 species being freshwater, 4 species marine and 7 species are terrestrial.

Family PISCICOLIDAE

Genus ***Branchellion***

1. ***Branchellion plicobranchus*** Sanjeeva Raj, 1954.

   Type locality : Assumption land, Bay of Bengal, Tamil Nadu.

   Type deposition : Z. S. I.

   Distribution : Tamil Nadu, Andhra Pradesh, Maharashtra and Kerala.

Genus ***Ozobranchus***

2. ***Ozobranchus polybranchus*** Sanjeeva Raj, 1951.

   Type locality : Porto Novo, Tamil Nadu.

   Type deposition : Z. S. I.

   Distribution : Tamil Nadu (Porto Novo).

Genus ***Piscicola***

3. ***Piscicola caeca*** Kaburaki, 1921.

Type locality : Orissa (Chilka lake).

Type deposition : Not known.

Distribution : Orissa (Chilka lake).

Genus ***Pterobdella***

4. ***Pterobdella amara*** Kaburaki, 1921.

Type locality : Orissa (Chilka lake).

Type deposition : Not known.

Distribution : Orissa (Chilka lake).

Genus ***Batracobdella***

5. ***Batracobdella hardingi*** Baugh, 1960.

Type locality : Bihar (Monghyr).

Type deposition : Z. S. I.

Distribution : Bihar (Monghyr), Jammu and Kashmir.

6. ***Batracobdella lobata*** (Bhatia), 1934.

Type locality : Jammu and Kashmir (Srinagar).

Type deposition : Not known.

Distribution : Jammu and Kashmir.

7. ***Batracobdella mahabiri*** Baugh, 1960.

Type locality : Madhya Pradesh (Rewa).

Type deposition : Z. S. I.

Distribution : Madhya Pradesh (Rewa).

8. ***Batracobdella reticulata*** (Kaburaki), 1921.

Type locality : Punjab (Julandhar).

Type deposition : Z. S. I.

Distribution : Punjab (Julandhar), Himachal Pradesh, Maharashtra, Jammu and Kashmir.

Genus ***Glossiphonia***

9. ***Glossiphonia cruciata*** Bhatia, 1930.

Type locality : Kashmir (Achabal).

Type deposition : Not known.

Distribution : Jammu and Kashmir.

Genus ***Helobdella***

10. ***Helobdella nociva*** Harding, 1924.

Type locality : Not known.

Type deposition : Not known.

Distribution : Himachal Pradesh, West Bengal, Orissa, Jammu and Kashmir.

Genus ***Hemiclepsis***

11. ***Hemiclapsis bhatiai*** Baugh, 1960.

Type locality : Bihar (Kalipahar, Monghyr).

Type deposition : Z. S. I.

Distribution : Bihar, Jammu and Kashmir.

12. ***Hemiclepsis marginata asiatica*** Moore, 1924.

Type locality : Srinagar.

Type deposition : Z. S. I.

Distribution : Jammu and Kashmir, Bihar.

13. ***Hemiclepsis viridis*** Chelladurai, 1934.

Type locality : Kerala (Trivandrum).

Type deposition : Z. S. I.

Distribution : Kerala, Tamil Nadu (Otacamund).

Genus ***Paraclepsis***

14. ***Paraclepsis praedatrix*** Harding, 1924.

Type locality : Not known.

Type deposition : Not known.

Distribution : Himachal Pradesh, Haryana, Bihar, West Bengal, Assam, Rajasthan, Maharashtra, Jammu and Kashmir.

15. ***Paraclepsis vulnifera*** Harding, 1924.

Type locality : Tamil Nadu (Tanjore).

Type deposition : Not known.

Distribution : Himachal Pradesh, Maharashtra, Rajasthan, Tamil Nadu, Jammu and Kashmir, West Bengal.

Genus ***Placobdella***

16. ***Placobdella fulva*** Harding, 1924.

Type locality : Not known.

Type deposition : Not known.

Distribution : Bihar, Jammu and Kashmir, West Bengal.

17. ***Placobdella horai*** Baugh, 1960.

Type locality : West Bengal (Purulia).

Type deposition : Z. S. I.

Distribution : West Bengal, Bihar (Manbhum).

18. ***Placobdella indica*** Baugh, 1960.

Type locality : Bihar (Sitkundi, Monghyr).

Type deposition : Z. S. I.

Distribution : Bihar, Jammu and Kashmir.

Genus ***Theromyzon***

19. ***Theromyzon mathaii*** Bhatia, 1939.

Type locality : Jammu and Kashmir (Srinagar).

Type deposition : Not known.

Distribution : Jammu and Kashmir.

Family ERPOBDELLIDAE

Genus ***Foraminobdella***

20. ***Foraminobdella heptamerata*** Kaburaki, 1921.

Type locality : Tamil Nadu (Nedurattan).

Type deposition : Z. S. I.

Distribution : Tamil Nadu (Nilgiris).

Genus ***Herpobdelloidea***

21. ***Herpobdelloidea lateroculata*** Kaburaki, 1921.

Type locality : Madhya Pradesh (Saugar).

Type deposition : Z. S. I.

Distribution : Rajasthan, Madhya Pradesh, Maharashtra, Manipur, Jammu and Kashmir, West Bengal, Andhra Pradesh.

Genus ***Nematobdella***

22. ***Nematobdella indica*** Kaburaki, 1921.

Type locality : Himachal Pradesh (Dharampur).

Type deposition : Z. S. I.

Distribution : Rajasthan, Himachal Pradesh, Haryana, Jammu and Kashmir, West Bengal and Andhra Pradesh.

Family HIRUDIDAE

Genus ***Dinobdella***

23. ***Dinobdella notata*** Moore, 1927.

Type locality : Not known.

Type deposition : Not known.

Distribution : Tamil Nadu.

Genus ***Haemopis***

24. ***Haemopis indicus*** Bhatia, 1940.

Type locality : Kashmir (Pahalgam).

Type deposition : Not known.

Distribution : Jammu and Kashmir.

Genus ***Poecilobdella***

25. ***Poecilobdella viridis*** Moore, 1927.

Type locality : Kerala (Travancore).

Type deposition : Z. S. I.

Distribution : Himachal Predesh, Uttar Pradesh, Tamil Nadu, Kerala, Jammu and Kashmir.

Family HAEMADIPSIDAE

Genus *Haemadipsa*

26. ***Haemadipsa dussumieri*** Blanchard, 1917.

Type locality : South India.

Type deposition : Paris Museum.

Distribution : South India (Andhra Pradesh).

27. ***Haemadipsa montana*** Moore, 1927.

Type locality : Tamil Nadu (Palni Hills).

Type deposition : Z. S. I.

Distribution : West Bengal, Sikkim, Arunachal Pradesh, Tamil Nadu.

28. ***Haemadipsa moorei*** Sanjeva Raj & Gladstone, 1981.

Type locality : Not known.

Type deposition : Not known.

Distribution : South India, Western ghat.

29. ***Haemadipsa ornata*** Moore, 1927.

Type locality : West Bengal (Darjeeling).

Type deposition : Z. S. I.

Distribution : West Bengal and Assam.

30. ***Haemadipsa zeylanica agilis*** Moore, 1927.

Type locality : Not known.

Type deposition : Not known.

Distribution : Himachal Pradesh, Uttar Pradesh, Arunachal Pradesh, Jammu and Kashmir, West Bengal.

31. ***Haemadipsa zeylanica cochiniana*** Moore, 1927.

Type locality : Kerala (Cochin).

Type deposition : Z. S. I.

Distribution : Tamil Nadu, Kerala, Maharashtra.

32. ***Haemadipsa zeylanica montivindicis*** Moore, 1927.

Type locality : West Bengal (Darjeeling).

Type deposition : Z. S. I.

Distribution : West Bengal, Assam, Sikkim and Arunachal Pradesh.

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I am grateful to Dr. J. R. B. Alfred, Director, Zoological Survey of India, for facilities to carry out the work. I am also thankful to Dr. A. Misra, Officer in-Charge, General Non-Chordata Sec. of the same Institution. My sincere thanks are also due to Dr. S. K. Chanda, Scientist, Z.S.I., for critically going through the manuscript.

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PARACLEPSIS GARDENSI (HIRUDINEA : GLOSSIPHONIDAE) A NEW SPECIES OF LEECH FROM WEST BENGAL, INDIA

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ABSTRACT

A new species of leech *Paraclepsis gardensi* is described from West Bengal, and is known by two species of this genus from India. It is distinguished in possessing the following characters : Eyes three pairs (2nd pair largest) stomach with seven pairs of caeca (Branched), mouth opening almost terminal, a bulb shaped structure on the dorseventral part of the left anterior portion of the body, 18 greenish brown sub parallel longitudinal lines on the dorsal side 6 mid ventral. Length of a full grown preserved specimen is 10 mm. and width is 4.8 mm. Posterior sucker is 1 mm. in diameter. A living specimen resting in a dish is 28 mm. in length and 3.8 mm. in width.

Paraclepsis gardensi sp. nov.

Holotype : Z.S.I. Reg. No. An 2768/1, 1 ex., Coll. C. K. Mandal, 25.6.1994, King Lake, Botanical Garden, Shibpur, Howrah, West Bengal, India.

Paratypes : Z.S.I. Reg. No. An 2816/1, Coll. C. K. Mandal, 6.6.19-95, 2 exs., Kalikapur field side pond, P.S. Barasat (N), 24-Parganas, West Bengal.

2 exs., Z.S.I. Reg. No. An 2785/1, 2785/2, Coll. C. K. Mandal, 21. 7. 1995, Mechagram, Midnapur District, West Bengal, India.

1 ex., Z.S.I. Reg. No. An 3221/1, Coll. C. K. Mandal, 1.9.2002, Vojerhat, South 24-Parganas, West Bengal.

Diagnosis : *Colour* : Raddish brown in living condition and greyish in preserved state.

Body : Ovate, continuous with the head region.

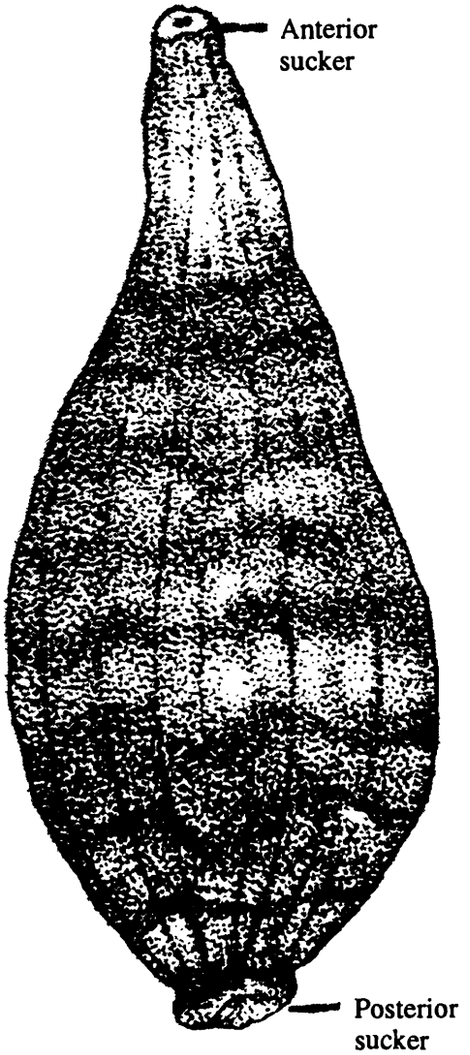
Length : The total length of *Paraclepsis gardensi* 10 mm. (in preserved state), 28 mm. in living.

Distribution : *India* : West Bengal (Howrah, Midnapur, North and South 24-Parganas).

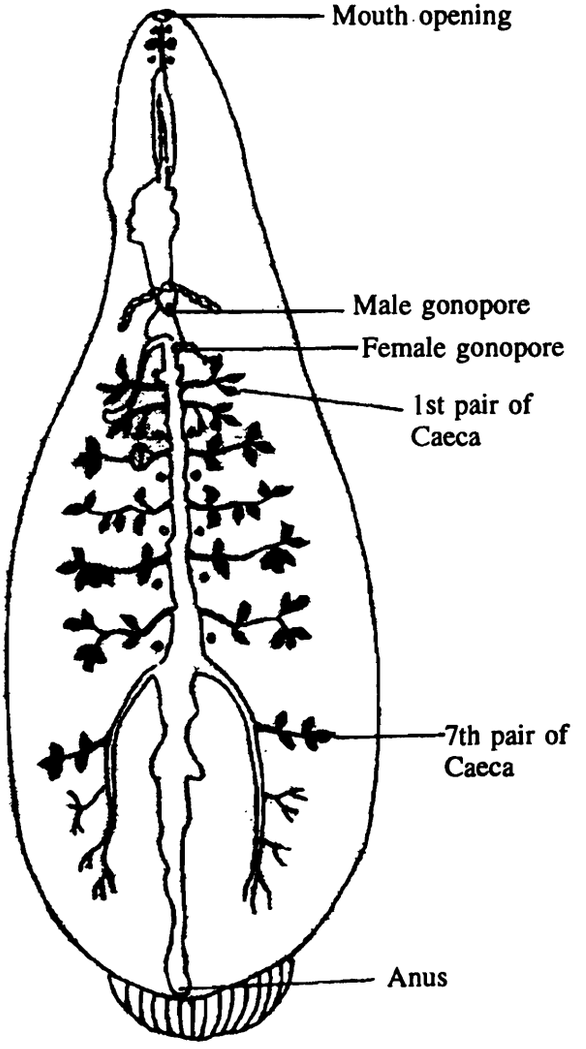
Breeding Season : April to August. During this time they form eggs and bear on the ventral side of the body. 5–7 eggs are found in the jelly like brood, within 20–25 days offsprings came out from the brood, taking rest for few hours leave the mothers body in search of food.

Remarks : The specific name is proposed according to the name of the place where from the first example was collected.

Comparision : *Paraclepsis gardensi* differs from other two species of the genus, so far recorded from Indian region. Dimention of eyes of the *Paraclepsis gardensi* varies from *Paraclepsis praedatrix* and *Paraclepsis vulnifera*. Third pair of eyes are largest in the two species where as in *Paraclepsis gardensi* 2nd pair largest. In *Paraclepsis gardensi* stomach is more branched than



Paraclepsis gardensi sp. nov.



Alimentary canal & caecal arrangement in the sp. nov. *Paraclepsis gardensi*

other two species of the genus. In *Paraclepsis gardensi* mouth opening is horse-shoe shaped and terminal in position. In other two species the mouth opening is almost round and sub terminal. Bulb shaped structure is absent in *Paraclepsis praedatrix* and *Paraclepsis vulnifers.* 18 dorsal sub parallel lines and 6 ventral greyish green lines (2 mid ventral) in *Paraclepsis gardensi* but such number of lines are not present in other two species of the genus. Greatest length of *Paraclepsis gardensi* in preserved state is 10 mm. whereas 15.5 mm. in *Paraclepsis praedatrix,* and 14 mm. in *Paraclepsis vulnifera.*

Host and Habitat : It is found in ponds, lakes and canals where tortoises, snakes and frogs abound in.

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I am grateful to Dr. J. R. B. Alfred, Director, Zoological Survey of India, for facilities to carry out the work. I am also thankful to Dr. A. Misra, Officer in-charge, General Non-Chordata Section of the same Institution. My sincere thanks are also due to Dr. S. K. Chanda, Scientist, Zoological Survey of India and Dr. S. K. Raut, Reader in Zoology, University of Kolkata, for critically going through the manuscript.

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Whitman, C. O. 1986. The Leeches of Japan. *Q. Jl. microsc. Sci.*, **26** : 317-416.

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THE LEGACY OF DR. NELSON ANNANDALE AND HIS CONTRIBUTION TO THE TAXONOMY OF PHLEBOTOMINE SANDFLY SPECIES (DIPTERA : PSYCHODIDAE : PHLEBOTOMINAE) TRANSMITTING LEISHMANIASIS[1]

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INTRODUCTION

Dr. T. N. Annandale was an extraordinary professional zoologist and gifted with administrative foresight. Under the stewardship of Annandale, the Zoological Survey of India was established on 1st July 1916 from the Zoological and Anthropological section of then known Indian Museum. He was primarily instrumental in the activities of Zoological Survey of India and laid the foundation for research on taxonomic zoology in India. This paper presents Annandale's contribution to the taxonomy of phlebotomine sandflies of which some are vectors of bishmaniasis.

BIOGRAPHY OF ANNANDALE

Academic pursuit : Dr. Thomas Nelson Annandale, D.Sc., C.I.E., F.R.S., F.L.S., C.M.Z.S. (Fig. 1) was borne at Edinburgh on 15th June 1976. He was educated at Rugby and at Balliol College, graduating in 1898. In 1899 he joined the Sheat Expedition to Malay Archipelago. From 1902 to 1904 he held a research fellowship in Anthropology in the University of Edinburgh and was awarded the degree of D.Sc. in 1905.

Research and professional excellence : Annandale came to India in 1904 and joined the Indian Museum as Deputy Superintendent and later he was appointed as Superintendent in 1907.

[1]Featured in 4th International Symposium on Phlebotomine Sandflies held in Salvador-Bahia, Brazil during August 3–7, 2002, as Entomol. Vect. 9 (Supl. 1) ISOPSIV, 2002 by the Universidade Gama Filho : 145 and abstracted in Zoological Record, Review of Applied Entomology, Quarterly Bibliography of Major Tropical Diseases & other international periodicals.

During this period he was responsible to bring out the Records of Indian Museum and Memoirs of the Indian Museum in 1907.He became the Director of Zoological Survey of India and continued to hold the post until his death in 1924.

Annandale was interested in wide groups of animal taxonomy, their field biology and ecology. He worked on sponges, polyzoa, fresh and brackish water molluscs, termite and termite mounds, true flies, lizards and snakes and published his findings in a series of volumes in the Fauna of British India, Ceylon and Burma, in the Records of Indian Museum and Memoirs of Indian Museum and in the Journals of Asiatic Society of Bengal, Bombay Natural History. For carriers of human disease, his works on the fresh water molluscs suspected vector of schistosomiasis and phlebotomine sand flies transmitting leishmaniasis are worth mentioning.

Fig. 1. Dr. Thomas Nelson Annandale

Annandale was an Honorary Secretary to the Trustee of the Indian Museum for several years, President of Asiatic Society of Bengal in 1923 and twice the Chairman of the Zoology Section of Indian Science Congress and its President in 1924. Dr. Annandale died in Calcutta on 10th April 1924 [sources, ZSI 1990].

ANNANDALE'S CONTRIBUTION TO PUBLIC HEALTH ZOOLOGY

Medical Malacology : When the incidence of schistosomiasis occurred among the Indian troops returning from South Africa during the World War, Dr. Annandale was entrusted to take up the aetiology of the disease and its possible intermediate host. In his search for the intermediate snail host, Annandale travelled as far as Seistan Persia and to several places in India. He provided wealth information about the Indian fresh water molluscs collected from wide range of ecosystems including hill streams, ponds and lakes (Annandale, 1920b).

Taxonomy of Phlebotomine sand fly vectors of leishmaniasis : At the beginning of 20th century, a series of studies was made by the Europeans to explore the Dipterans, among other faunas, of India. Their interest for Indian Dipterans is that they represented not only bewildering diversity but also some of them, a serious pest of agriculture crops and of human diseases. They also extensively travelled across the Indian subcontinent to collect the Dipterans fauna, which were deposited both in their museums and in the Indian Museum.

During this period, Dr. T. N. Annandale joined the Indian Museum in 1904 and laid strong foundation to study the lower Diptera and public health entomology. A special 3 days fever [pappatacifieber, subsequently known popularly as leishmaniasis] being transmitted by the bite of Phlebotomine sand fly species was prevalent in Southern Europe and was believed to occur also in some parts of Northern India (Brunetti, 1912). This public heath problem led and inspired Dr. Annandale for studying the natural history and taxonomy of Indian *Phlebotomus* sp. Annandale extensively travelled the entire India and its neighbouring regions to collect sand flies, provided flawless description and deposited them in the National collection of ZSI.

CATALOGUE OF PHLEBOTOMINES DESCRIBED BY ANNANDALE

Annandale described 6 species of phlebotomines, which were subsequently treated under different genera and subgenera by the reviewers for taxonomic stability. Of the 6 taxa, 3 species are known as species complex and 2 species are now considered as major vectors of leishmaniasis. Their current catalogue, taxonomic status, geographical distribution and biology in reference to leishmaniasis are as follows :

Genus ***Phlebotomus*** Rondani & Berte

Subgenus ***Euphlebotomus*** Theodor

Phlebotomus argentipes Annandale & Brunetti

Phlebotomua argentipes Annandale & Brunetti in Annandale, 1908 : 101 [male, female]. Lectotype male [designated Quate (1962b : 157)], India : Calcutta, 28.xii.1907; monsoon forest (ZSI Calcutta).

P. argentipes var. *marginatus* Annandale; 1910b : 62 [female]. Holotype female, Sri Lanka : Peradeniya, v. 1909. [Types lost : Quate (1962b : 157).] [Synonmized by Sinton (1932a : 59).]

P. annandalei Sinton, 1923a : 744 [male]. Holotype male, India : Madras, Guindy, 1.ii.1922 (Dep?). [Synonymized by Sinton (1925a : 789).]

P. argentipes var. *glaucus* Mitra & Roy, 1953 : 372 [female]. Syntypes 10 female, India : Maharashtra, Pune (AFMC, Pune). [Synonymized by Lewis (1967a : 24).]

Distribution : Bangladesh, Burma, India, Indonesia, Laos, Nepal, Pakistan, Sri Lanka, Thailand, Vietnam, Malaysia.

Biology : Geographical and biological variation may indicate a species complex; in parts of India it is markedly anthropophilic and an important vector of Visceral Leishmaniasis (Kala-azar) caused by *L. donovani* (Killick-Kendrick, 1990; Lane, 1988; Lewis, 1978, 1982, 1987 cited in Seccombe *et. al.*, 1993; Ilango *et. al.*, 1994). Based on the morphology, especially genital diversity as a source of species isolation and biogeography, *Phlebotonus argentipes* sensu lato has been revised to include 3 sibling species (Ilango, unpublished).

Subgenus ***Larroussius*** Nitzulescu

Phlebotomus major Annandale

Phlebotomus majo, Annandale, 1910a : 46 [male]. Lectotype male [designated Quate (1962b : 157)], India : Naini Tal; dry tropical scrub and thorn forest (ZSI Calcutta). Female : Sinton (1925b : 107).

P. major var. *grisea* Annandale 1911 : 320 (as var.of *major*). Syntypes, India : Darjiling, Kurseong,1425 m,vi.1910&iv.1911. [Types lost : Quate (1962b : 157).]

[Synonymized by Sinton (1932 : 59) & Quate (1962b : 157).]

P. crimicus Shtefko & Minkevich, 1923 : 52 [male, female]. Syntypes 1 male, 1 female, U.S.S.R. (MH, Sinferopol). [Synonymized by Perfil'ev (1966 : 279); poor description, position doubtful; Lewis (1982) suggested this may be *P. sergenti.*]

Distribution : India, Nepal, Pakistan,Thailand.

Biology : *P. major* s.l. has been infected with L.*infantum* (Adler & Theodor, 1957); occurs along Himalayan foot hills in India, where summer rains are heavy (Sinton, 1932a; Lewis, 1982 cited in Seccombe *et. al.*, 1993).

Notes : The *P. major* species complex is reviewed by Artemiev & Neronov (1984), Leger & Pesson (1987) and Lewis (1982). The taxa include *P.krimensis, P.major, P.neglectus, P.syriacus, P.wenyoni, and P.wui*, most of which have been referred to as *P.major* in the past (Seccombe *et. al.*, 1993).

Genus ***Sergentomyia*** Franca & Parrot

Subgenus ***Neophlebotomus*** Franca & Parrot

Sergentomyia malabarica (Annandale)

Phlebtomus malabarica Annandale, 1910a : 48. [male, female]. Lectotype male [designated Quate (1962b : 158)], India : Maddathorai, 16.xi.1908 (ZSI Calcutta).

Sergentomyia zeylanica (Annandale)

Phlebotomus zeylanica Annandale, 1910b : 60. [male, female]. Lectotype female [designated Quate (1962b : 158)], Sri Lanka : Peradeniya, 17.v.1910; tropical rainforest (ZSI Calcutta). Male : (as P.*chalami*) Young & Chalam (1927 : 849).

P. chalami Young & Chalam, 1927 : 849. [male, female]. Syntypes, India : Bombay, Colaba, 25.ix-5.x.1926 (BMNH 1 male, 1 female; (CRI.Kas.).[Synonymized by Sinton (1928c : 319).]

Distribution : India, Sri Lanka.

Notes : Male of the type series of *zeylanica* reidentified as *P. argentipes.*

Subgenus ***Parrotomyia*** Theodor

Sergentomyia babu (Annandale)

Phlebotomus babu Annandale, 1910a : 49. [male,female]. Lectotype male [designated Quate (1962b : 158)], India : Calcutta, vi.1908; monsoon forest (ZSI Calcutta).

P. niger Annandale, 1911 : 320(*as var. of babu*). Syntypes, India : Bihar, Pusa. [believed lost (Quate, 1962b : 158).[Synonymized by Sinton (1932a : 60).]

P. thapari Mitra & Roy, 1952b : 188 [female]. Holotype female, India : Maharashtra, Pune ('Poona'), Hadapsar (Dep?). [Synonymized by Lewis (1978 : 257).]

Distribution : Afghanistan, Bangladesh, India Mauritius, Pakistan.

Biology : *S. babu* s.l. has been revised as the species complex with inclusion of *Sergentomyia babu* (Annandale) sensu stricto, *S. shorttii* Adler & Theodor, *S. baghdadis* Adler & Theodor, *S. insularis* (Theodor) and *S. yercaudensis* sp. nov. All 5 species are known exclusively from the Oriental Region. Their biology in relation to leishmaniasis, ecological distribution and adaptive radiation were discussed (Ilango, 2003).

Sergentomyia himalayensis Annandale

Phlebotomus himalayensis Annandale, 1910a : 50. [male, female]. Lectotype female [desinated Quate (1962b : 158)], India : Darjiling District, Kurseong, 1500m, 3.vii.1908; mountain vegetation (ZSI Calcutta).

Distribution : India.

SUMMARY

Dr. Thomas Nelson Annandale, the founder Director of Zoological Survey of India, has been widely remembered for his exceptional interest in studying from invertebrates to anthropology. Among the contributions of Annandale, phlebotomine sand fly species transmitting leishmaniasis and fresh water snails as suspected vectors of schistosomiasis are the most important studies relevant to India. Annandale discovered and described 6 species of phlebotomines, of which *Sergentomyia babu, Phlebotomus argentipes* and *P. major* are super/or complex of sibling species and the latter

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DESCRIPTION OF THREE NEW SPECIES OF CRAB SPIDERS (ARANEAE : THOMISIDAE) FROM MADHYA PRADESH, INDIA

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INTRODUCTION

Crab spiders of the genus *Runcinia* Simon, 1875 are not well known from India. Simon (1895) described the species *Runcinia bifrons* and Reimoser (1934) described *Runcinia escheri* from India. Tikader (1965) described *Runcinia roonwali*; Sen and Basu (1972) described *Runcinia chauhani* and Tikader (1980) *Runcinia ghorpadei.* Recently, Gajbe and Gajbe (2000b) described the species *Runcinia yogeshi* from India.

Unlike other crab spider genera, the genus *Thomisus* Walckenaer, 1805 is well represented from India. Stoliczka (1869) described the species *Thomisus elongatus* and *T. pugilis*; Simon (1906) described *Thomisus granulifrons, T. leucaspis* and *T. rigoratus.* Dyal (1935) described two species *Thomisus albens* and *T. tuberculatus.* Tikader (1960) described the species *Thomisus bulani, T. dhakuriensis* and *T. projectus.* The species *Thomisus sikkimensis* was described by Tikader (1962) and *Thomisus katrajghatus* by Tikader (1963). Basu (1963) described *Thomisus sorajaii*; Sen (1963) described *Thomisus shillongensis,* and Sen and Basu (1963) *Thomisus memae.* Basu (1965) described one species *Thomisus beautifularis,* while Tikader (1965) described three species *Thomisus lobosus, T. pooneus* and *T. shivajiensis.* Tikader (1966, 1970) described *Thomisus cherapunjeus* and *T. rishus,* respectively. Tikader (1980) described *Thomisus andamanensis* from the Andaman Islands, Reddy and Patel (1992) described two species *Thomisus godavariae* and *T. krishnae.* Kumari and Mittal (1997) described two species *Thomisus dyali* and *T. ludhianaensis.* Recently, Gajbe and Gajbe (2000a) described the species *Thomisus sundari* and Bhandari and Gajbe (2001) *Thomisus rajani* from Madhya Pradesh, India.

A new species of the genus *Runcinia* Simon and two new species of the genus *Thomisus* Walckenaer are described herein from Madhya Pradesh. The type specimens will in due course be deposited with the National Zoological Collection, Zoological Survey of India, Kolkata.

SYSTEMATIC ACCOUNT

Family THOMISIDAE SUNDEVALL, 1833

Genus I. *Runcinia* Simon, 1875

1980. *Runcinia* Tikader, *Fauna of India, Spiders,* **1**(1) : 58.

Diagnosis : Cephalic region with prominent ocular tubercles, clothed with hairs and spines. Legs long and stout, I and II remarkably longer than others. Abdomen long, spined, narrower behind. Lateral sides with conspicuous muscular corrugation.

Type species : Runcinia grammica (C. L. Koch, 1837)

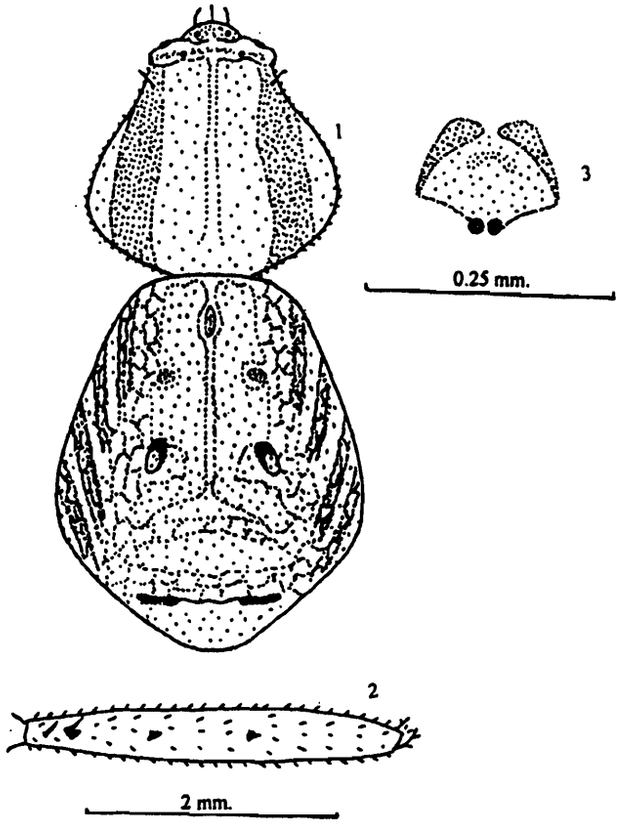
Distribution : Europe, Africa, Asia and Australia.

1. *Runcinia sitadongri* sp. nov.

(Figs. 1-3)

General : Cephalothorax, legs and abdomen brownish in colour. Total length 5.0 mm. Carapace 2.0 mm. long, 2.0 mm. wide; abdomen 3.0 mm. long, 2.5 mm. wide.

Cephalothorax : As long as wide, laterally with two longitudinal broad dark brown stripes, middle region with a longitudinal narrow chalk white stripe as in fig. 1. Eyes eight, black, arranged



Figs. 1-3. *Runcinia sitadongri* sp. nov. 1. Dorsal view of female, legs omitted. 2. Dorsal view of femur. 3. Epigyne.