

STATE FAUNA SERIES 4

FAUNA OF MEGHALAYA

PART 2

(ACARI)

**ZOOLOGICAL SURVEY OF INDIA
1995**

FAUNA OF MEGHALAYA

PART 2

(ACARI)

Edited by

The Director, Zoological Survey of India, Calcutta.



सत्यमेव जयते

ZOOLOGICAL SURVEY OF INDIA
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PART 2 (ACARI)

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IXODID TICKS (ACARI : IXODIDAE)

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INTRODUCTION

The Ixodid ticks are a small group of acarines occurring throughout the world. These ticks live as host on the bodies of domestic and wild animals and in vegetation. They are responsible for causing various diseases to man and domestic animals.

Considering the immense medical importance this group of ticks attracted the attention of scientists since the days of Linnaeus (1746-1767). Later several workers throughout the world made extensive studies on this ticks and published large number of papers and monographs.

The Indian ixodids were taken up for research as early as 1758 when Linnaeus described *Acarus elephantius* from India. Later in 1767 he described another Indian species *Acarus indus*.

Neumann (1897-1911), Stiles and Hassall (1901) Nuttall and Warburton (1908, 1911, 1915), Nuttall (1912, 1913, 1916) and Robinson (1926) described many species from India and published several monographs on Indian ixodid ticks.

The most extensive and comprehensive study of Indian ixodids was done by Sharif (1928). He listed the Ixodidae occurring in India and recorded altogether 9 genera and 45 species, 4 subspecies and 6 varieties. Sen (1938) published a check-list of Indian ticks. Saito, Geevarghese, Sreenivasan, Mishra, Kaul, Dhanda, Bhat, Kulkarni, Rajagopalan, Rao and others (1964-1989) from National Institute of Virology, Pune, India studied taxonomy, ecology and biology of Indian ticks.

The Indian ixodid ticks were also extensively studied by Hoogstraal, Trapido, Verma, Mearns, Kohls, Rebello, Elkammah, Mitchell and others (1962-1971). Advani and Vazirani (1981) recorded *Ixodes vespertilionis* as ectoparasite of bat from Rajasthan. De and Sanyal (1964, 1985), Nandi and De (1984) Sanyal *et al.* (1987), Sanyal and De (1991) also studied the ixodid tick fauna of different states of India.

Several other workers studied taxonomy, ecology and biology of ixodid ticks in India. The details of which have been incorporated in a review paper by Sanyal and De (1991).

The critical estimation of Indian taxa shows that till date 87 species of ixodid ticks under 9 genera are known from India.

Though the ixodid ticks of Indian subcontinent were surveyed and studied by many scientists but very little work was so far done on ixodids from the state of Meghalaya. Baron G.A. Von Maydell first collected several specimens of ixodid ticks from Meghalaya during the Deutsche Indien Expedition (1955-1958) sponsored by the Zoological Staatsinstitut und

Zoologisches Museum, Hamburg. Hoogstraal and Rack (1967) identified the specimens and recorded 10 species under 5 genera. Since then no other attempt to study the ticks of Meghalaya was made.

The present work is based on a series of collection of ixodid ticks made from Meghalaya by the authors and the specimens collected by other survey parties of the Zoological Survey of India, which are available in National Zoological Collection. The work also includes the species which have not been studied by the authors but are reported from the state by the earlier workers.

A Brief account of the surveys undertaken for the study and collection from other surveys is given below :-

1. Meghalaya Survey Sri S. K. De (November, 1969).
2. Meghalaya Survey Dr. T. Sengupta and party (November, 1974).
3. Meghalaya Survey (East Garo Hills) - Dr. S. K. Gupta and party (September, 1988).
4. Meghalaya Survey Dr. J. R. B. Alfred and party (February, 1991).
5. Meghalaya Survey Dr. A. K. Sanyal and party (March, 1991).

A complete list of 12 species under 6 genera of ixodid ticks hitherto known from Meghalaya has been incorporated in the paper. The original and most recent references, diagnostic features wherever needed, hosts of tick species in Meghalaya and distribution of each species and key to the identification of genera and species known from Meghalaya have also been incorporated. The collection and preservation methods for the tick specimens and general morphology of ixodid ticks have also been dealt here in brief. The species studied by the present authors are deposited in the National Zoological Collection.

SYSTEMATIC ACCOUNT

Material and Methods : For collection of specimens "Hand picking" and "Flag-dragging" methods were followed. The details have been given in Sanyal and De (1992).

General morphology and terminology : The body of ixodid ticks is divided into capitulum or 'false head', dorsum and venter.

Capitulum : The capitulum is made of basis capituli, a pair of palps, a pair of chelicerae or mandibles, hypostome and a tongue like process known as 'Stylet of Sen'

Dorsum : The dorsum is formed of scutum or shield, pseudoscutum scapulae, eyes, dorsal porose areas of foveae, fields, spots and stripes, grooves, punctations, festoons and caudal processes.

Venter : The venter shows the structures like genital aperture, anus, grooves, shields and plaques and legs.

For details of morphological features please consult Sanyal and De (1992).

LIST OF TAXA KNOWN FROM MEGHALAYA

FAMILY IXODIDAE

1. Genus *Amblyomma* Koch

1. *A. testudinarium* Koch

2. Genus **Boophilus** Cartice
 2. *B. microplus* (Canestrini)
3. Genus **Dermacentor** Koch
 3. *D. auratus* Supino
4. Genus **Haemaphysalis** Koch
 1. ~~H.~~ *H. aborensis* Warburton
 5. *H. anomala* Warburton
 6. *H. bispinosa* Neumann
 7. *H. cornigera shimoga* Trapido and Hoogstraal
 8. *H. obesa* Larrousse
 9. *H. spinigera* Neumann
5. Genus **Hyalomma** Koch
 10. **Hyalomma** sp.
6. Genus **Rhipicephalus** Koch
 11. *R. haemaphysaloides* Supino
 12. *R. scalpturatus* Santos-Dias

Key to the genera of ixodid ticks from Meghalaya

1. Eyes absent; capitulum short, with lateral salience on palpal article II **Haemaphysalis**
- Eyes present; capitulum long or short, lateral salience on palpal article II present or absent 2
2. Capitulum long with long narrow palps 3
- Capitulum short with short broad palps 4
3. Ventral shields present in male scutum usually inornate; eyes spherical and orbital **Hyalomma**
- Ventral shields absent in male; scutum usually ornate; eyes usually flat and non-orbital **Amblyomma**
4. Basis-capituli hexagonal dorsally, lateral saliences present; scutum usually inornate; ventral shields four in male 5
- Basis-capituli rectangular dorsally, lateral saliences present; scutum ornate; ventral shields absent in male, coxa IV much longer than others **Dermacentor**
5. Spiracle sub-triangular or comma shaped; festoons and anal groove well developed; setiferous ventral plate on palpal article I **Rhipicephalus**
- Spiracle oval; festoons and groove faint or obsolete; no setiferous ventral plate on palpal article I **Boophilus**

1. Genus **Amblyomma** Koch

1844. *Amblyomma* Koch, *Arch. Naturgesch.*, **10** (1) : 223-231.

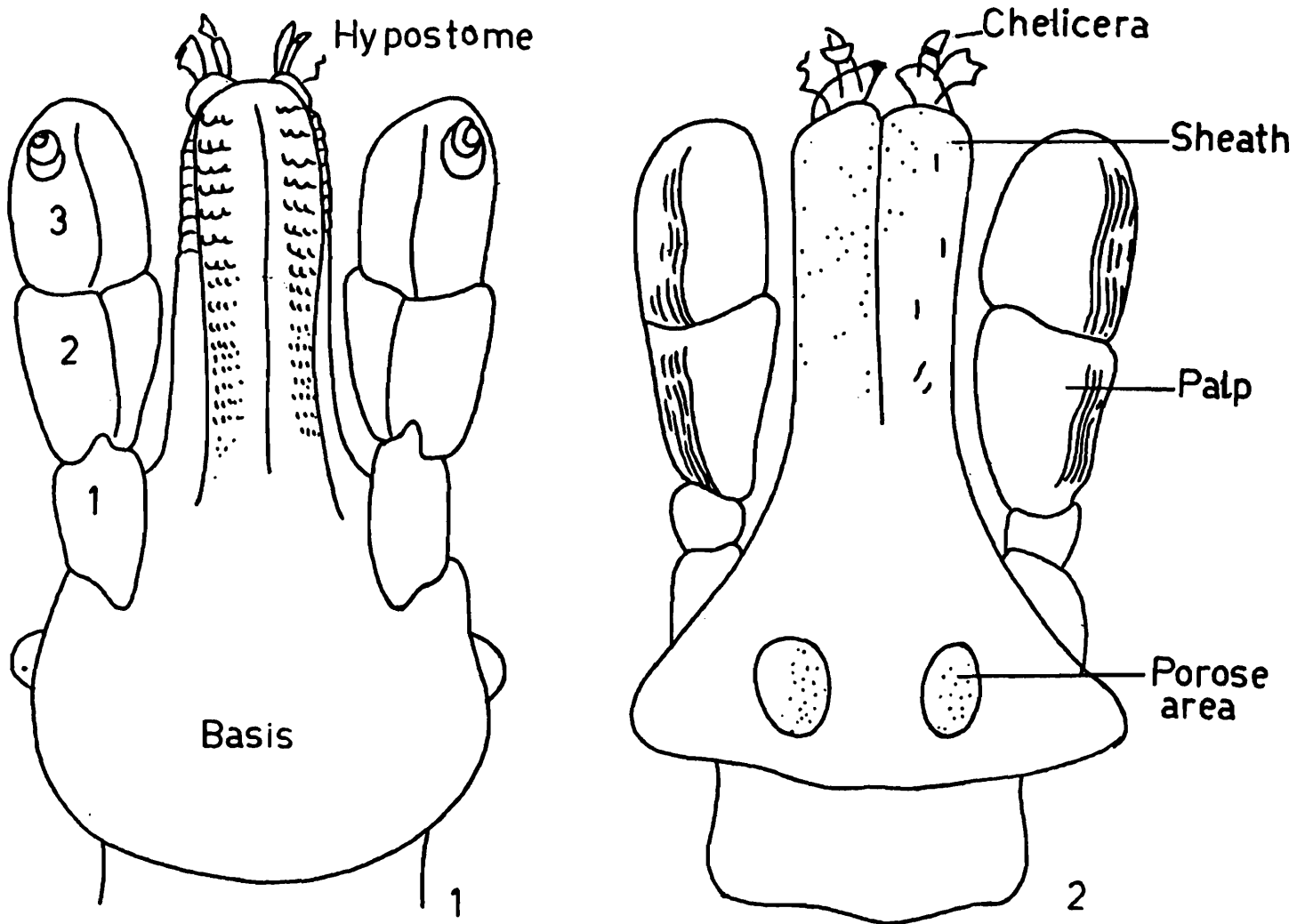
1. **Amblyomma testudinarium** Koch

1844. *Amblyomma testudinarium* Koch, *Arch. Naturgesch.*, **10** (1) : 226.

1826. *Amblyomma testudinarium*, Robinson, *Ticks-Mongr. Ixodoidea*, pt. 4 (Cambridge Univ. Press) : 257.

1967. *Amblyomma testudinarium*, Hoogstraal and Rack, *J. Med. Ent.*, 4 : 286.

Diagnosis : Male Scutum with ornamentation with dark brown markings on pale ground; large and thick falciform stripe; punctations deep; coxa I with two unequal stout spurs; dentition 4/4.



Figs. 1-2 : Capitulum of Ixodid tick.

Female Scutum triangular with narrow posterior part, ground colour yellowish, punctations numerous; coxa I with moderately stout spurs; dentition 4/4.

Hosts - *Muntiacus muntjak vaginalis*, *Sus scrofa cristatus*, *Hylobates hoolock* or *Hylopetes a. alboniger*.

Distribution Meghalaya East Garo Hills; Arunachal Pradesh, Assam, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Sikkim, West Bengal.

2. Genus : ***Boophilus*** Curtice

1891. *Boophilus* Curtice, *Journ. Compar. Med. veter. Arch.*, **12** : 313.

2. ***Boophilus microplus*** (Canestrini)

1887. *Haemaphysalis micropla* Canestrini. *Atti. Soc. Veneto. trent. Sci. nat.*, **11** : 104.

1890. *Rhipicephalus micropla* Canestrini, *Padova*, **4** : 493.

1901. *Boophilus australis*, Stiles and Hassall, *Bur. Anim. Ind., U.S. Dept. Agric.*, Washington, D.C. No. 34 : 2-3.

1943. *Boophilus microplus*, Fairchild, *Am. J. Trop. Med.*, **23** (6) : 586.

1960. *Boophilus microplus*, Arthur, *Ticks. Mongr. Ixodoidea*, pt. 5 (Cambridge Univ. Press) : 207.

1967. *Boophilus microplus*, Hoogstraal and Rack, *J. Med., Ent.*, **4** : 286.

Material examined : Ri-Bhoi : 4 female, 1 male, Umsing, from cattle, 28. xi. 1969, coll. S. K. De, East Khasi Hills : 1 male, Moulai, Shillong, from cattle, 20.iii. 1991, coll. A. K. Sanyal. East Garo Hills : 5 female, 2 male, Nangkhara, from cattle, 23.ix. 1988, coll. S. K. Gupta; 10 female, Mandi 40 kms away from Rongjeng, from cattle, 3.x. 1988, coll. S. K. Gupta, West Garo Hills 1 ♀ 5NN, Garobandha, Tura, from Cattle, 10.iii. 1991. coll. Sanyal.

Diagnosis : Male Scutum quite hirsute; caudal appendage short, tapering; margin of basal palpal segment ventrally concave.

Female Coxa I with deep, inverted 'V' shaped cleft, inner margin of basal palpal segment ventrally short, deeply concave; dentition 4/4.

Hosts *Cervus unicolor* ssp. cattle.

Distribution : Meghalaya (East Garo Hills, West Garo Hills, East Khasi Hills), Arunachal Pradesh, Andaman and Nicobar Islands, Assam, Bihar, Gujarat, Himachal Pradesh, Maharashtra, Madhya Pradesh, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal.

Remarks : This species is found to infest cattle throughout India. The species is recorded here for the second time from the state of Meghalaya.

3. Genus ***Dermacentor*** Koch

1844. *Dermacentor* Koch, *Arch. Naturgesch.*, **10** (1) : 235.

3. ***Dermacentor auratus*** Supino

1897. *Dermacentor auratus* Supino, *Alt. Soc. Veneto-trent. Sci. Nat.*, **3** (2) : 235.

Material examined : East Khasi Hills : 1 N, Mawphlong, Shillong, from armpit of the collector, 28.xi. 1974, coll. T Sengupta. East Garo Hills : 1 male, Mandi, 40 kms away from Rongjeng from cattle, 3. x. 1988, coll. S. K. Gupta.

Diagnosis : Male Capitulum rectangular, dorsally ornate; palpi large, longer than basis; ventral ridge distinct; scutum with variable brown base colour markings in the form of lines; variable brown smaller patches in lateral field; cervical grooves deep, short; all festoons ornate; dentition 3/3.

Female - Capitulum rectangular, dorsally weakly ornate; palpi longer in comparison to male, palpal article I bears three long curved palpal setae; scutum with brown markings

arranged as a longitudinal median strip, all markings devoid of punctations; cervical grooves deep; thick white hairs arise from many large punctations; dentition 3/3.

Hosts : Cattle, man.

Distribution Meghalaya (East Khasi Hills, East Garo Hills), Andaman Island, Assam, Arunachal Pradesh, Bihar, Karnataka, Orissa, Uttar Pradesh, West Bengal.

Remarks The Species is reported here for the first time from Meghalaya.

4. Genus *Haemaphysalis* Koch

1844. *Haemaphysalis* Koch, *Arch. Naturgesch.*, **10** (1) : 217-239.

Key to the species of *Haemaphysalis*

MALES

1. palps salient laterally 2
- Palps not or minutely salient laterally 4
2. Coxa IV with single spur *spinigera*
- Coxa IV with two spurs 3
3. Palps with a number of bizarre angles and planes, segment 2 with ventrolateral spur, wide, pointed and posteriorly directed; lateral grooves short wide depressions; spurs on coxa IV subequal not curved *cornigera shimoga* Trapido and Hoogstraal
- Palps without bizarre angles and planes, segment 2 with posterodorsal marking crenulate, posteroventral margins expanded externally; lateral grooves long, enclose first festoons; scissor like spurs on coxa IV *anomala*
4. Palpal segment 3 with distinct dorsal spur 5
- Palpal segment 3 without distinct dorsal spur 6
5. Palpal segment 2 and 3 of equal length; lateral groove long; ventral spur on palpal segment 2 small *bispinosa*
- Palpal segment 2 longer than segment 3; lateral groove shallow; ventral spur on trochanter short; hypostome 5/5 *obesa*
6. Lateral groove shallow; ventral spur on trochanter small; hypostome 5/5 *aborensis*

FEMALES

1. Palps salient laterally 2
- Palps minutely or not salient laterally 4
2. Lateral salience of palpal segment 2 with ventral retroverted spur *spinigera* Neumann
- Lateral salience of palpal segment 2 without such spur 3
3. Punctations small, rare in central fields; coxae III and IV each with small median spur; coxa II with slightly longer triangular spur *cornigera shimoga*
- Punctations small and medium sized, moderately numerous in central fields; coxae II and IV each with short widely triangular spur, coxa II with slightly smaller spur *anomala*
4. Palps minutely salient laterally 5
- Palps not salient laterally 6
5. Palpal segment 3 with dorsal spur; lateral grooves long, distinct; spurs on coxae II-IV reduced *bispinosa*

- Palpal segment 3 without dorsal spur; length and breadth of palpal segment 2 subequal; palpal segment 3 three-fourth as long as 2; basis capituli dorsally two times as broad as long *aborensis*
- 6. Palpal segment 3 with short ventral spur, hypostome 5/5 *obesa*

4. *Haemaphysalis aborensis* Warburton

1913. *Haemaphysalis aborensis* Warburton, *Parasitology*, **6** : 121-123.

1967. *Haemaphysalis aborensis*, Hoogstraal and Rack, *J. Med. Ent.*, **4** : 286.

Host : *Cervus unicolor* ssp.

Distribution Meghalaya (East Garo Hills), Arunachal Pradesh, Assam, West Bengal.

5. *Haemaphysalis anomala* Warburton

1913. *Haemaphysalis anomala* Warburton, *Parasitology*, **6** : 128.

1967. *Haemaphysalis anomala*, Hoogstraal and Rack, *J. Med. Ent.*, **4** : 287.

Host : *Muntiacus muntjak vaginalis*.

Distribution : Meghalaya (East Khasi Hills), Bihar, Uttar Pradesh.

6. *Haemaphysalis bispinosa* Neumann

1897. *Haemaphysalis bispinosa* Neumann, *Mem. Soc. Zool. France*, **10** : 341.

1966. *Haemaphysalis (Kaiseriona) bispinosa*, Hoogstraal and Trapido, *J. Parasit.*, **52** : 1188.

Material examined : West Garo Hills : 3 female, 12 male, Nakrek B. R., host unknown, 27.ii.1991, coll. J. R. B. Alfred; 5 male, 3 female, Rangrikathan village, 1 km east of forest hills, Tura, from cattle, 9.x. 1991, coll. A. K. Sanyal, 5 male, 4 female, Garobandha, Tura, from vegetation, 10.iii. 1991, coll. A. K. Sanyal; 1 ♀, Garobandha, Tura, from vegetation, 10.iii, 1991, Coll. A. K. Sanyal. Jaintia Hills : 9 female, 2 male, 15 NN, Umsiyngia, 2 kms southeast of Jowai, from goat, 18.iii. 1991, coll. A. K. Sanyal.

Host : Cattle, goat, vegetation.

Distribution Meghalaya (West Garo Hills), Jaintia Hills; Andaman and Nicobar Islands, Arunachal Pradesh, Assam, Bihar, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Punjab, Tamil Nadu, Uttar Pradesh, West Bengal.

Remarks : The species is reported here for the first time from Meghalaya.

7. *Haemaphysalis cornigera shimoga* Trapido and Hoogstraal

1964. *Haemaphysalis cornigera shimoga* Trapido and Hoogstraal, *J. Parasit.*, **50** (2) : 303.

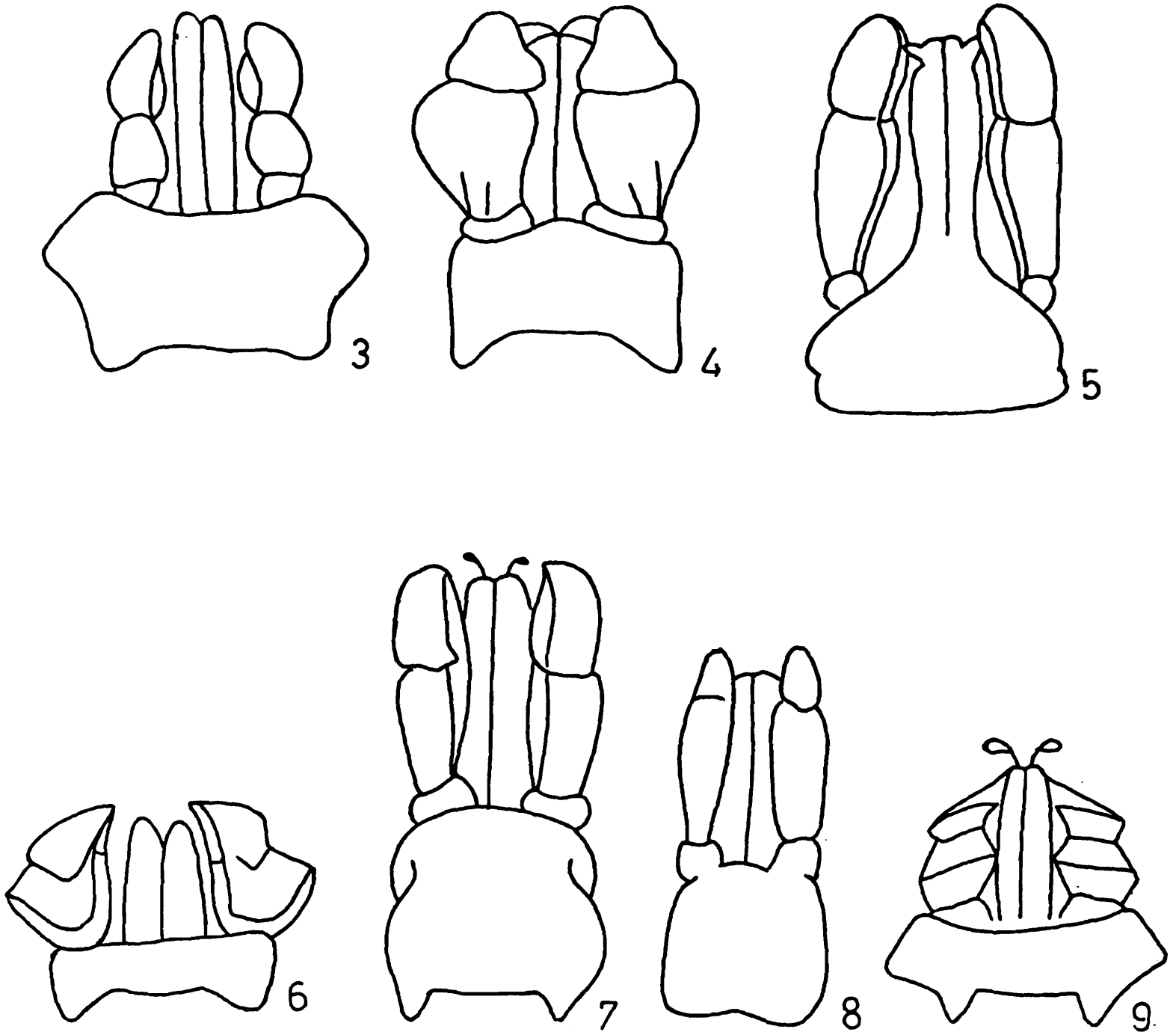
1967. *Haemaphysalis cornigera shimoga*, Hoogstraal and Rack, *J. Med. Ent.*, **4** : 287.

Host : *Cervus unicolor* ssp.

Distribution : Meghalaya (East Garo Hills), Kerala, Karnataka, West Bengal.

8. *Haemaphysalis obesa* Larrousse

1925. *Haemaphysalis obesa* Larrousse, *Ann. Parasit.*, **3** : 302-304.



Figs. 3-9 : Capitulum and basis capituli of genera of Ixodid tick : 3. *Rhipicephalus*; 4. *Dermacentor*; 5. *Ixodes*; 6. *Haemaphysalis*; 7. *Hyalomma*; 8. *Amblyomma*; 9. *Boophilus*.

1967. *Haemaphysalis obesa*, Hoogstraal and Rack, *J. Med. Ent.*, **4** : 286.

Host : *Presbytis pileatus* ssp.

Distribution : Meghalaya (East Garo Hills), West Bengal.

9. *Haemaphysalis spinigera* Neumann

1897. *Haemaphysalis spinigera* Neumann. *Mem.Soc. de France*, **10** : 324.

1967. *Haemaphysalis spinigera*, Hoogstraal and Rack, *J. Med. Ent.*, **4** : 287.

Host : *Cervus unicolor* ssp.

Distribution : Meghalaya (East Garo Hills), Andaman and Nicobar Islands, Andhra Pradesh, Maharashtra, Karnataka, Kerala, Orissa, Tamil Nadu, West Bengal.

5. Genus *Hyalomma* Koch

1844. *Hyalomma* Koch, *Arch. f. Naturgesch*, **10** (1) : 220.

10. *Hyalomma* sp.

Hoogstraal and Rack (1967) recorded 3 nymphs of *Hyalomma* sp. from East Garo Hills and remarked that although these specimens run to *H. a. anatolicum* in the key by Singh and Dhanda (1965) we have reservations, on ecological grounds, about considering these as this species.

6. Genus *Rhipicephalus* Koch

1844. *Rhipicephalus* Koch, *Arch. Naturgesch.*, **10** (1) : 238.

Key to the species of *Rhipicephalus*

MALES

Anal shields sickle shaped *haemaphysaloides*

Anal shields triangular, three sides almost straight *scalpturatus*

FEMALES

Punctations very few in number *haemaphysaloides*

Punctations moderately numerous *scalpturatus*

11. *Rhipicephalus haemaphysaloides* Supino

1897. *Rhipicephalus haemaphysaloides* Supino, *Atti. Soc. Veneto-Trent. Sci. Nat.*, 2 s, **3** (1) : 234.

1967. *Rhipicephalus haemaphysaloides*, Hoogstraal and Rack, *J. Med. Ent.*, **4** : 287.

1971. *Rhipicephalus haemaphysaloides*, Hoogstraal, Saito, Dhanda and Bhat, *J. Parasit.*, **57**(1) : 182.

Material examined : West Garo Hills : 1 ♀ Rangri Kathan village, 1 km east of Forest hills, Tura, from dog, 9.iii. 1991, coll. A. K. Sanyal.

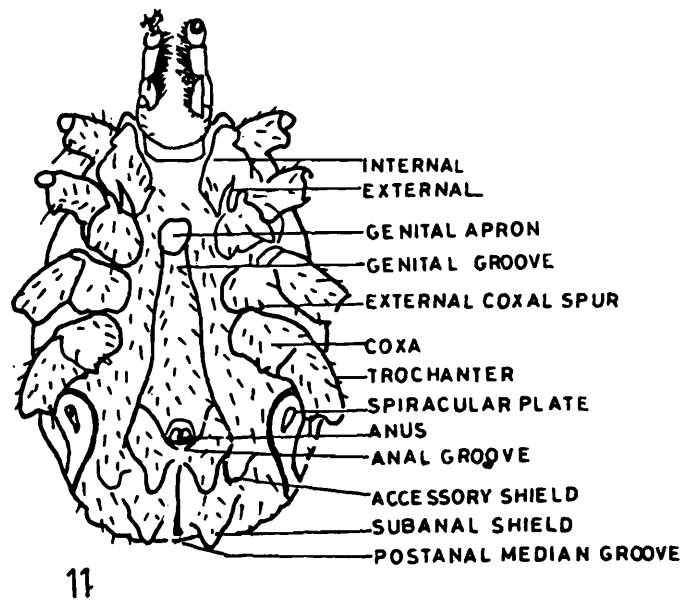
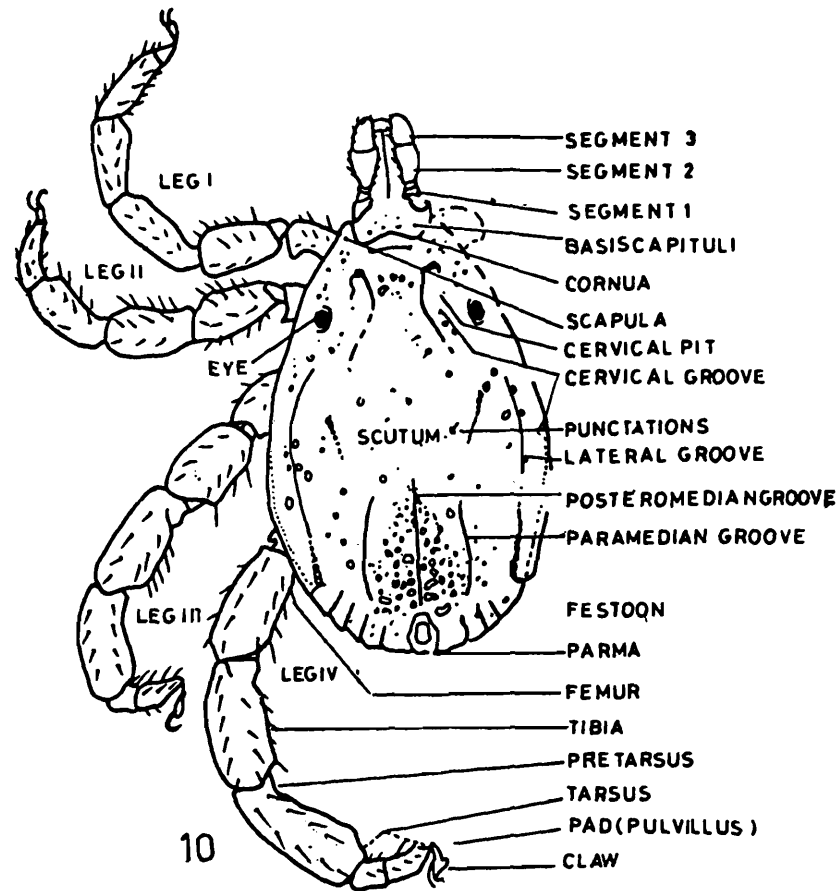
Hosts : *Cervus unicolor* ssp., *Muntiacus muntjak vaginalis*, dog.

Distribution : Meghalaya (East Garo Hills, West Garo Hills, East Khasi Hills), Arunachal Pradesh, Assam, Bihar, Madhya Pradesh, Karnataka, Kerala, Tamil Nadu, West Bengal.

12. *Rhipicephalus scalpturatus* Santos-Dias

1859. *Rhipicephalus scalpturatus* Santos-Dias, *Mem. Estudos Mus.*

Zool. Univ. Coimbra (256) : 6 p.

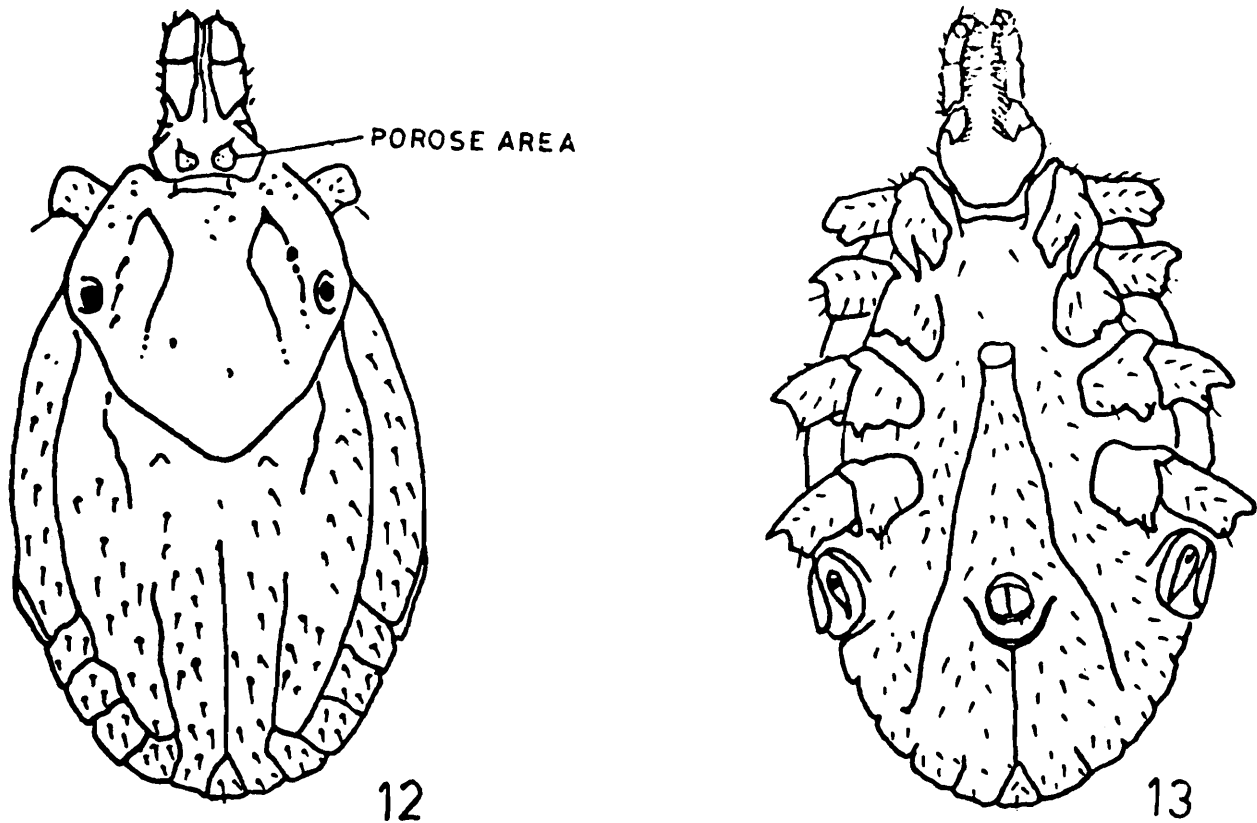


Figs. 10-11 : Morphological features shown in hypothetical male Ixodid tick.
 10. male dorsal view; 11. male ventral view;

1967. *Rhipicephalus sculpturatus*, Hoogstraal and Rack, *J. Med. Ent.*, 4 : 287.

Host : Not recorded.

Distribution Meghalaya (East Khasi Hills).



Figs. 12-13 : Morphological features shown in hypothetical female Ixodid tick.
12. female dorsal view; 13. female ventral view.

DISCUSSION

The foregoing account clearly indicates that the ixodid fauna of Meghalaya was not extensively explored and studied. The present authors made sincere attempts to collect the ticks from all possible habitats and hosts from all the districts of the state. But due to some limitations only a few typical hosts like cattle and dog were examined for collection of ticks. However, the data so far available show that of the six genera *Haemaphysalis* occupies the highest position in respect of number of species. Though the abundance of all the twelve species is not so high still *Boophilus microplus* may be considered as the common and abundant species in the state. *Rhipicephalus sculpturatus* may be considered as rare species and there is no record of species endemic for the state. As the hosts recorded in earlier studies were not examined again in recent times, it is not possible to comment on the change in abundance of species. Lastly it may be said that none of the species needs protection as these ticks are considered as one of the harmful creatures in nature.

SUMMARY

The paper deals with the ixodid tick fauna of Meghalaya. A total number of 12 species under 6 genera hitherto known from the state have been recorded. Of these, two species under two genera have been reported here for the first time from Meghalaya. The original and most recent references, diagnostic features wherever needed, hosts and distribution of the tick species in Meghalaya and key to the identification of genera and species have also been incorporated.

ACKNOWLEDGEMENTS

The authors are grateful to the Director, Zoological Survey of India, Calcutta for kind encouragement and providing facilities. They also express sincere gratitude to Dr. J.R.B. Alfred, Additional Director, Zoological Survey of India for his constant encouragement and valuable suggestions. Thanks are also due to Dr. S. K. Bhattacharyya, Joint Additional Director (Retd.), Zoological Survey of India for suggestions.

Table 1, Distribution of Ixodid ticks in different districts of Meghalaya.

| Name of the Species | East Garo Hills | West Garo Hills | South Garo Hills | East Khasi Hills | West Khasi Hills | Ri Bhoi | Jaintia Hills |
|--|-----------------|-----------------|------------------|------------------|------------------|---------|---------------|
| <i>Amblyomma testudinarium</i> | + | | | | | | - |
| <i>Boophilus microplus</i> | + | + | | + | | + | |
| <i>Dermacentor auratus</i> | + | | | + | | | |
| <i>Haemaphysalis aborensis</i> | + | | | | | | |
| <i>Haemaphysalis anomala</i> | - | | | + | | | |
| <i>Haemaphysalis bispinosa</i> | + | | | - | | | + |
| <i>Haemaphysalis cornigera shimoga</i> | | + | | | | | - |
| <i>Haemaphysalis obesa</i> | + | | | | | | |
| <i>Haemaphysalis spinigera</i> | + | | | | | | |
| <i>Hyalomma</i> sp. | + | | | | | | - |
| <i>Rhipicephalus haemaphysaloides</i> | + | + | | + | | - | - |
| <i>Rhipicephalus sculpturatus</i> | | | | + | | | - |

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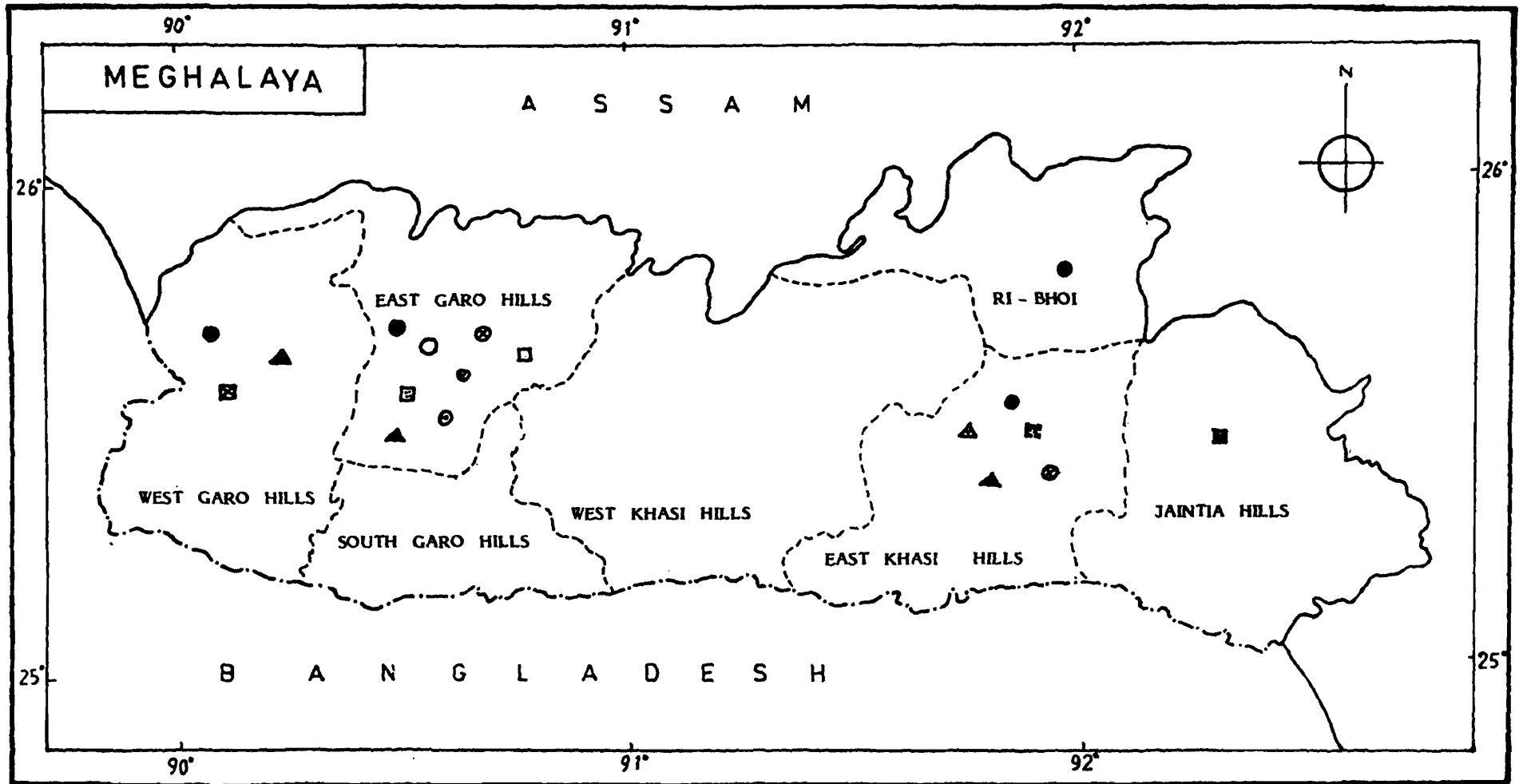
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MAP 1 - DISTRIBUTION OF SPECIES OF IXODID TICKS IN MEGHALAYA



- | | | |
|---------------------------|------------------------|----------------------------------|
| ○ AMBLYOMMA TESTUDINARIUM | ■ H. ANOMALA | ⊙ H. SPINIGERA |
| ● BOOPHILUS MICROPLUS | ▣ H. BISPINOSA | △ HYALOMMA Sp. |
| ◐ DERMACENTOR AURATUS | ⊖ H. CORNIGERA SHIMOGA | ▲ RHIPICEPHALUS HAEMAPHYSALOIDES |
| ◑ HAEMAPHYSALIS ABORENSIS | ▤ H. OBESA | ▴ RHIPICEPHALUS SCALPTURATUS |

PLANT MITE (ACARI)

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INTRODUCTION

Meghalaya is one of the few states in India endowed with rich vegetation and expectedly the plant mite fauna also is equally rich and varied. The published information on plant mite fauna from this state are : Chant (1960), Manson (1963), Gupta (1977), Gupta & Gupta (1977), Gupta (1978), Gupta (1980) and Gupta (1990) and the number of species reported through these works are 1, 3, 4, 6, 13, 1 and 5, respectively. Ghai (1964) while reviewing the plant mite fauna from India reported the occurrence of only 1 species from Meghalaya while Prasad (1974) in his catalogue on Indian mites included 6 species from this state. Gupta (1985), in his book on Plant mites of India, listed a total of 30 species so far known from Meghalaya which belonged to four families, viz. Tetranychidae (7 spp.), Tenuipalpidae (2 spp.), Eriophyidae (1 sp.) and Phytoseiidae (20 spp.). Gupta (1986) in his Fauna Volume on Indian Phytoseiidae included 17 species under 2 genera. Thus, prior to undertaking further studies by this author from this state, the number of species of plant mites that was known from Meghalaya appeared to be 30. Subsequently, the author had an opportunity of collecting further material from East Garo hill district of Meghalaya and the result of study of that material along with the previously published information from here are included in this consolidated account of plant mites of Meghalaya. A total of 71 species belonging to 28 genera under 13 families and 3 orders are included here which represent 3 districts of Meghalaya, viz. East Khasi hill, East Garo hill and West Garo hill while the fauna of the four districts, viz. Jainti hills, Ri bhoi, West Khasi and South Garo hill still remain unrepresented due the author's inability in surveying those areas and nor was any information available in literature from those regions either.

The systematic account here provides the original references, important synonymies, material examined, distribution and keys to the fauna while for diagnosis of each species, references may be made to Gupta (1985) and Gupta (1987).

MATERIAL AND METHODS

The entire collection was made by the author during East Khasi hill survey (1974), West Garo hill survey (1974) and East Garo hill survey (1988). The mites were collected directly in the field by examining the plant material with a good 10X lens. It was only in a few cases, the plant parts were brought to the laboratory for examining under a stereobinocular microscope. Plants were got identified through specialists, wherever needed.

The mites thus collected were preserved in 70% alcohol and for mounting and studying the material, the techniques as given in Gupta (1985) were followed.

SYSTEMATIC ACCOUNT

Key to the orders and families of plant mites of Meghalaya :

1. With full coxae to ambulatory appendages, pedipalpal ambulacra represented by a tined claw near the inner basal angle of the palp tarsus, stigma located lateral to coxae II-IV and typically elongate peritreme present; tritosternum usually with lacinae
.....MESOSTIGMATA, 3
Lacking free coxae to ambulatory appendages, pedipalpal ambulacrum completely lost, stigma never situated lateral to Coxae II-IV2
2. Pedipalpi small and comprising of 2 free podomeres and closely pressed to the sides of the hypognathum; comprising of a medium (empodial claw) with an associated pulvillus or a sucker-like pulvillus situated on an elongated pretarsus; stigma and tracheae never present; idiosoma without trichobothria and never covered dorsally by overlapping sclerites; body never vermiform.....ASTIGMATA, Acaridae
Pedipalpi usually with 3-5 podomeres and conspicuous, small, when with fewer podomeres and inconspicuous, then idiosoma either vermiform or with overlapping sclerites dorsally in the female; chelicera chelate or variously modified into piercing stylets or hook-like organs; a respiratory system usually present; idiosoma often with trichobothria.....PROSTIGMATA, 4
3. Holodorsal shield in both sexes marked by hypotrichous, with not more than 2 pairs of setae; J1 absent.....Phytoseiidae
Holodorsal and schizodorsal shields in both sexes with minimum of 30 pairs of setae, setae J1 presentAscidae
4. Body worm-like or annulate with 2 pairs of legsEriophyidae
Body round, not worm-like or annulate with 4 pairs of legs5
5. With a distinct palpal thumb claw complex 10
Without a distinct palpal thumb claw complex6
6. Rod-like solenidion on tarsus I usually lying flush with tarsus in a specially membranous depression (ragidial organs), anteriorly propodosoma with a tubercle bearing one pair of setaeEupodidae
Rod-like solenidion on tarsus I erect, arising from a small circular membranous base 7
7. Cheliceral bases fused, or if not fused, not capable of lateral scissors-like motion over gnathosoma8
Chelicera free, attached at base and free to move scissors-like laterally across gnathosoma 9
8. Propodosoma without obvious pseudostigmatid organ..... Tenuipalpidae
Propodosoma with one or two pairs of distinct pseudostigmata and pseudostigmatid organs.....Tydeidae

- 9. With 2 pairs of genital suckers, the relatively long palpi turned inwards, distal segment usually claw-like Cunaxidae
 With 3 pairs of genital suckers, the relatively long palpi elbowed with distal long setae..... Bdeiliidae
- 10. Chelicera free, hinged at base so that they are capable of lateral scissors-like movement in a horizontal direction Anystidae
 Cheliceral bases fused or partly fused with needle-like or hook-like movable chelae 11
- 11. Cheliceral bases closely fused with gnathosoma and without indication of suture, peritreme usually M-shaped Cheyletidae
 Cheliceral bases fused with each other but not with gnathosoma, having suture conspicuous; peritreme usually present on anterior propodosoma 12
- 12. Chelicera forming a long whip-like stylet occurring within the body; cheliceral bases fused to form stylophore; tarsus I and II with duplex setae Tetranychidae
 Movable chelae straight, stiff and relatively short, no stylophore, no duplex setae on tarsus I and II..... Stigmaeidae

1. Phytophagous mites

Family 1 TETRANYCHIDAE Donnadieu

1875. Tetranychidae Donnadieu Faculty des Sciences de Lyon, p. 9.

Key to the subfamilies, tribes, genera and species of Tetranychidae so far known to occur in Meghalaya :

- 1. Empodium with tenent hairs Subfam. Bryobiinae
 (With 4 pairs of propodosomal setae) *Bryobia praetiosa*
 Empodium without tenent hairs Subfam. Tetranychinae
- 2. Tarsus I distally with a single pair of usually associated duplex setae, if 2 pairs closely associated duplex setae are present then tarsus I still without closely associated duplex setae, empodium claw-like Tribe Eurytetranychini, 3
 Tarsus I distally with 2 pairs of closely associated duplex setae and tarsus II with 1 pair of duplex setae, empodium claw-like or splits distally Tribe Tetranychini, 5
- 3. With 2 pairs of anal setae ***Eutetranychus***
 (Propodosomal mediodorsal striae with developed lobes, 3rd pair of dorsolateral setae similar to other lateral setae; 3rd and 4th dorsocentral hysterosomals forming a square) *E. orientalis*
 With 1 pair of anal setae ***Aponychus***, 4
- 4. Dorsocentral hysterosomals I-III spatulate, long *A. baqhensis*
 Dorsocentral hysterosomals I-III sub-spatulate *A. corpuzae*
- 5. With 2 pairs of preanal setae 6
 With 1 pair of preanal setae 12

6. Empodium claw-like9
 Empodium ending into tuft of hairs **Eotetranychus**, 7
7. Dorsal idiodomal setae serrate *E. kankitus*
 Dorsal idiosomal setae not serrate 8
8. Distal portion of aedeagus sigmoid *E. hirsti*
 Distal portion of aedeagus not sigmoid *E. sexmaculatus*
9. Empodium with proximoventral hairs, dorsal body setae on tubercles ... **Panonychus**, 11
 Empodium splits into 2 parts, dorsal body setae not on tubercles, duplex setae approximate to one another **Schizotetranychus**, 10
10. Dorsal Idiosomal setae longer than the interval between their longitudinal bases *S. andropogoni*
 Dorsal idiosomal setae shorter than the interval between their longitudinal bases *S. meghalayensis*
11. Fifth pair of dorsolaterals and fourth pair of dorsolaterals equal in length *P. citri*
 Fifth pair of dorsolaterals 1/2 length of 4th pair of dorsolaterals *P. ulmi*
12. Empodium claw-like with proximoventral hairs **Oligonychus**, 13
 Empodium splits distally into 3 pairs of hairs **Tetranychus**, 14
13. Aedeagus bent ventrad forming an acute angle with shaft, tarsus I with not more than single tactile seta on venter just distad of duplex setae..... *O. mangiferus*
 Aedeagus bent dorsad, bent portion enlarged *O. indicus*
14. Proximal duplex setae on tarsus I of female placed distal to tactile setae *T. urticae*
 Proximal duplex setae on tarsus I of female more or less in line with tactile setae ; aedeagal knob with anterior acute projection *T. ludeni*

1. *Bryobia praetiosa* Koch

1836. *Bryobia praetiosa* Koch, *Deutsche Crustacea Myriapoda, Arachnida*, Fasc. !:8.

1985. *Bryobia praetiosa*, Gupta, *Handbk. Plant mites of India*, p. 47-48.

1992. *Bryobia praetiosa*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal*, Part 3, p.79.

Diagnosis : Refer to Gupta (1985).

Material examined: 2 ♀♀, Meghalaya, Dist. East Khasi hill, Shillong, Umphing, ex undet. plant, 1.12.1969; 3 ♀♀, Dist. East Garo hill, Rongjeng, ex pear, 30.9.1988.

Distribution : India : Meghalaya (Dist. East Khasi hill; East Garo hill), Delhi, Himachal Pradesh, Jammu & Kashmir, Punjab, West Bengal. Elsewhere : Pakistan, Taiwan, South Africa, Europe, Japan, U. S. A. Australia, New Zeland.

Remarks : The feeding of this mite on pear caused browning of leaves which later dried up and fell off.

2. *Eutetranychus orientalis* (Klein)

1936. *Anychus orientalis* Klein, *Bull. Agr. Res. Stn., Rehovoth*, 21 : 3.

1985. *Eutetranychus orientalis*, Gupta, *Handbk. Plant mites of India*, p. 66-67.

1992. *Eutetranychus orientalis*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal, Part 3*, p. 80.

Diagnosis : Refer to Gupta (1985).

Material examined: 10 ♂♂, Meghalaya, Dist. West Garo hill, Tura, ex citrus, 15.10.1974; 5 ♀♀, Dist. East Garo hill. Songsok, ex citrus, 26.9.1988; 1 ♀, Dist. Khasi hill, Bunihat, ex citrus, 12.10.1988.

Distribution : India : Meghalaya (Dist. East Khasi hill, West Garo hill, East Garo hill), Assam, Delhi, Gujarat, Jammu & Kashmir, Punjab, Uttar Pradesh, Karnataka, West Bengal. Elsewhere : Pakistan, Taiwan, Israel, Turkey, Jordan, Iran, Afghanistan, Cyprus, South Africa, Sudan, Egypt.

Remarks : This mite was found severely infesting citrus in Tura turning the infested leaves to yellowish brown and causing premature leaf drop.

3. *Aponychus corpuzae* Rimando

1966. *Aponychus corpuzae* Rimando, *Philip. Agr.*, 50 : 107.

1985. *Aponychus corpuzae*, Gupta, *Handbk. Plant mites of India*. p. 59.

Diagnosis : Refer to Gupta (1985).

Material examined : 5 ♂♂, Meghalaya, Dist. West Garo hill, Tura, ex bamboo, 15.10.1974; 2 ♀♀, Dist. East Khasi hill, Khanapara, ex bamboo, 11.10.1988.

Distribution : India : Meghalaya (Dist. West Garo hill, East Khasi hill), Assam, Orissa, Andaman & Nicobar Isls. Elsewhere : Japan, Philippines, Thailand.

4. *Aponychus baghensis* Prasad

1975. *Aponychus baghensis* Prasad, *Internat. J. Acarol.*, 1 : 2-4.

1985. *Aponychus baghensis*, Gupta, *Handbk. Plant mites of India*, p. 59-60.

Diagnosis : Refer to Gupta (1985).

Material examined : 3 ♂♂, Meghalaya, Dist. East Khasi hill, Baridua, ex banana, 12.10.1988; 1 ♀, Dist. East Garo hill, Wagasei, ex bamboo, 7.10.1988.

Distribution : India : Meghalaya (Dist. East Khasi hill, East Garo hill), Bihar.

5. *Eotetranychus hirsti* Pritchard & Baker

1926. *Tetranychus fici* Hirst, *Proc. Zool. Soc. Lond.*, p. 828.

1985. *Eotetranychus hirsti*, Gupta, *Handbk. Plant mites of India*, p. 73-74.

1992. *Eotetranychus hirsti*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal, Part 3*, p. 81.

Diagnosis : Refer to Gupta (1985).

Material examined : 3 ♂♂, Meghalaya, Dist. West Garo hill, Tura, ex fig, 15.10.1974; 5 ♀♀, Dist. East Khasi hill, Rongjeng, ex fig, 30.9.1988.

Distribution : India : Meghalaya (Dist. East Garo hill, West Garo hill), Andhra Pradesh, Bihar, Delhi, Karnataka, Punjab, Tamil Nadu, West Bengal. Elsewhere : Pakistan.

Remarks : The infestation was seen to cause severe defoliation of trees. A predatory mite, *Amblyseius finlandicus* was found to feed actively upon this mite.

6. *Eotetranychus kankitus* Ehara

1955. *Eotetranychus kankitus* Ehara, *Annot. zool. Jap.*, **28** : 78.

1985. *Eotetranychus kankitus*, Gupta, *Handbk. Plant mites of India*, p. 75.

Diagnosis : Refer to Gupta (1985).

Locality : Meghalaya, Dist. East Khasi hill, Shillong.

Host : Citrus.

Distribution : India Meghalaya (Dist. East Khasi hill). Elsewhere : Japan.

7. *Eotetranychus* sp.

Material examined : 2 ♀♀, Meghalaya, Dist. East Khasi hill, Chandmari, ex undet. plant, 12.10.1974.

Remarks : Specific identification was not possible for want of male specimens.

8. *Eotetranychus sexmaculatus* (Riley)

1890. *Tetranychus 6-maculatus* Riley, *Insect Life*, **2** : 225-226.

1985. *Eotetranychus sexmaculatus*, Gupta, *Handbk. Plant mites of India*, p. 77-78.

Diagnosis : Refer to Gupta (1985).

Locality : Meghalaya, Dist. East Khasi hill, Shillong, Mawphlong.

Distribution : India Meghalaya (Dist. East Khasi hill), Karnataka. Elsewhere : Taiwan, Formosa, New Zeland, U.S.A.

9. *Panonychus citri* (McGregor)

1916. *Tetranychus citri* McGregor, *Ann. Ent. Soc. Amer.*, **9** : 284.

1985. *Panonychus citri*, Gupta, *Handbk. Plant mites of India*, p. 92-93.

1992. *Panonychus citri*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal, Part 3*, p. 82-83.

Diagnosis : Refer to Gupta (1985).

Material examined : 1 ♂, Meghalaya, Dist. East Garo hill, Rongsok, ex undet. plant, 2.9.1988; 1 ♀, Songsok, ex mulberry, 29.9.1988.

Distribution : India : Meghalaya (Dist. East Garo hill), Andaman & Nicobar Isls., Assam, Jammu & Kashmir, West Bengal. Elsewhere : Thailand, New Zeland, China, Middle East, Japan, South Africa, U.S.A., Argentina, Bermuda, Cuba.

Remarks : This species was seen infesting mulberry producing no noteworthy damage symptoms.

10. *Panonychus ulmi* (Koch)

1836. *Panonychus ulmi* Koch, *Deutsche, Crustacea, Myriapoda, Arach.*, Fasc. 1, p. 11.

1985. *Panonychus ulmi*, Gupta, *Handbk. Plant mites of India*, p. 93-94.

1992. *Panonychus ulmi*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal, Part 3*, p. 83.

Diagnosis Refer to Gupta (1985).

Material examined : 4 ♀♀, Meghalaya, Dist. East Khasi hill, Khanapara, ex banana, 11.10.1988.

Distribution : India : Meghalaya (Dist. East Garo hill), Himachal Pradesh, Uttar Pradesh, Jammu & Kashmir. Elsewhere : Europe.

11. *Schizotetranychus andropogoni* (Hirst)

1926. *Tetranychus (Schizotetranychus) andropogoni* Hirst, *Proc. Zool, Soc. Lond.*, p. 839.

1985. *Schizotetranychus andropogoni*, Gupta, *Handbk. Plant mites of India*, p. 96

1992. *Schizotetranychus andropogoni*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal, Part 3*, p. 87.

Diagnosis : Refer to Gupta (1985).

Material examined : 4 ♀♀, Meghalaya, Dist. East Garo hill, Rongjeng, ex paddy, 1.10.1988.

Distribution : India : Meghalaya (Dist. East Garo hill), Bihar, Delhi, Orissa, Punjab, Tamil Nadu, West Bengal. Elsewhere : Pakistan, Thailand, Mexico.

Remarks : Its infestation on paddy caused the appearance of white stipplings on either side of midrib arranged longitudinally.

12. *Schizotetranychus meghalayensis* Gupta

1980. *Schizotetranychus meghalayensis* Gupta (Y. N.) *Taxonomy and bionomics of the tetranychid mites of India*. Ph. D. thesis, Agra University, p. 123-124.

Diagnosis : In female, tibia I with 2 sensory and 5 tactile setae, tarsus I with 1 sensory and 3 tactile setae proximal to duplex setae; tibia II with 2 sensory and 3 tactile setae proximal to duplex setae; tarsus II with 1 sensory and 2 tactile setae proximal to duplex setae. In male, terminal sensillum of palpus thin and long; peritreme bulb shaped distally. Tarsus I with 2 sensory setae proximal to duplex setae; tibia I with 2 sensory and 5 tactile setae; tibia I with 1 sensory and 4 tactile setae; tarsus II with 2 sensory and 1 tactile setae proximal to duplex setae. Aedeagus bends upwards to form a semi sigmoid distal end.

Locality : Meghalaya : Dist. West Garo hill, Tura.

Host : Bamboo.

Distribution India : Meghalaya (Dist. West Garo hill).

13. *Oligonychus indicus* Hirst

1923 *Paratetranychus indicus* Hirst, *Proc. Zool. Soc. Lond.*, p. 990.

1985. *Oligonychus indicus*, Gupta, *Handbk. Plant mites of India*, p. 84-86.

1992. *Oligonychus indicus*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal, Part 3*, p. 85.

Diagnosis : Refer to Gupta (1985).

Material examined 10 ♂♂, Meghalaya, Dist. East Garo hill, Rongjeng, ex banana, 30.9.1988.

Distribution : India . Meghalaya (Dist. East Garo hill), Andhra Pradesh, Delhi, Haryana, Karnataka, Orissa, Punjab, Tamil Nadu. Elsewhere : Pakistan.

Remarks : This mite was seen to develop whitish patches on the under surface of banana leaves.

14. *Oligonychus mangiferus* (Rahman & Sapro)

1940. *Paratetranychus mangiferus* Rahman & Sapro, *Proc. Indian Acad. Sci.*, 11B : 192.

1985. *Oligonychus indicus*, Gupta, *Handbk. Plant mites of India*, p. 87-88.

1992. *Oligonychus indicus*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal, Part 3*, p. 85.

Diagnosis : Refer to Gupta (1985).

Material examined : 3♂♂, Meghalaya, Dist. East Khasi hill, Shillong, ex black berry, 18.10.1974; 5♂♂, Dist. East Garo hill, Songsok, ex mango, 27.4.1988.

Distribution : India : Meghalaya (Dist. East Khasi hill, East Garo hill), Bihar, Delhi, Haryana, Himachal Pradesh, Karnataka, Kerala, Orissa, Punjab, West Bengal.

15. *Tetranychus ludeni* Zacher

1913. *Tetranychus ludeni* Zacher, *Mitt. Kais Biol. Anst. Land. u. Forstw*, 40.

1985. *Tetranychus ludeni*, Gupta, *Handbk. Plant mites of India*, p. 110-112.

1992. *Tetranychus ludeni*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal, Part 3*, p. 90.

Diagnosis : Refer to Gupta (1985).

Material examined : 5♂♂, Meghalaya, Dist. East Khasi hill, Cherrapunji, ex arum, 20.10.1974; 2♂♂, Dist. East Garo hill, Songsok, ex mulberry, 28.9.1988; 1♀, East Khasi hill, Baridua, ex mulberry, 12.10.1988.

Distribution India Meghalaya (Dist. East Khasi hill, East Garo hill), Delhi, Gujarat, Haryana, Karnataka, Uttar Pradesh, West Bengal. Elsewhere : South Africa, New Zeland, U.S.A.

Remarks : Though this mite is a serious pest of a large number of crops in many parts of the world but under present study this species posed to be a problem in none of the cases.

16. *Tetranychus neocaledonicus* Andre

1933. *Tetranychus neocaledonicus* Andre, *Bull. Mus. Natn. Hist. nat. paris*, (2) 5 : 302.

1985. *Tetranychus neocaledonicus*, Gupta, *Handbk. Plant mites of India*, p. 125-126.

1992. *Tetranychus neocaledonicus*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal*, Part 3, p. 91.

Diagnosis Refer to Gupta (1985).

Material examined : 2♀♀, 1♂, Meghalaya, Dist. East Garo hill, Rongjeng, ex *Magnolia champa*, 1.10.1988; 10♀♀, 1♂, Dist. West Garo hill, Tura, ex beans, 27.10.1974.

Distribution : India Meghalaya (Dist. East Garo hill, West Garo hill), Assam, Bihar, Delhi, Gujarat, Haryana, Karnataka, Maharashtra, Punjab, Orissa, Rajasthan, Uttar Pradesh, West Bengal. Elsewhere : Africa, Fiji, Bahamas, Hawaii, Venezuela, Puerto Rico, U.S.A.

Remarks A wide spread infestation was seen mostly on beans causing severe yellowing and drying of leaves. A predatory phytoseiid mite, *Amblyseius alstoniae* Gupta was seen actively feeding upon all stages of this pest.

17. *Tetranychus urticae* Koch

1836. *Tetranychus urticae* Koch, *Deutsche, Crustacea, Myriapoda, Arachnida*, Fasc. 1 : 10.

1985. *Tetranychus urticae*, Gupta, *Handbk. Plant mites of India*, p. 115.

Diagnosis Refer to Gupta (1985).

Material examined : 4♀♀, 1♂, Meghalaya, Dist. East Garo hill, Dianadubi, ex *Shorea robusta*, 5.10.1988.

Distribution : India : Meghalaya (Dist. East Garo hill), Uttar Pradesh, Kerala, Karnataka, West Bengal, Elsewhere Cosmopolitan.

Family 2. TENUIPALPIDAE Berlese

Key to the genera and species of Tenuipalpidae so far known to occur in Meghalaya

1. Hysterosoma normally with penultimate pairs of dorsolateral setae flagelliform ***Tenuipalpus***, 2
Hysterosoma normally with penultimate pairs of dorsolateral setae of normal length ***Brevipalpus***
Tarsus II with 2 sensory rods, propodosoma without reticulations on dorsomedian region *B. phoenicis*
2. Hysterosoma with 3 pairs of non-flagellate caudal setae *T. punjabensis*
Hysterosoma with 4 pairs of non-flagellate caudal setae *T. punicae*

18. *Brevipalpus phoenicis* (Geij.)

1939, *Tenuipalpus phoenicis* Geij. *Meded. Landb. Hoogesch. Wageningen*, **42** : 230.

1985. *Brevipalpus phoenicis*, Gupta, *Handbk. Plant mites of India*, p. 130-131.

1992. *Brevipalpus phoenicis*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal, Part. 3*, p. 93-94.

Diagnosis : Refer to Gupta (1985).

Material examined : 5♀♀, Meghalaya, Dist. East Garo hill, Songsok, ex guava, 20.9.1988; 3♀♀, Dist. East Khasi hill, Cherrapunji, ex fern, 22.10.1974.

Distribution : India : Meghalaya (Dist. East Garo hill, East Khasi hill), Assam, Bihar, Delhi, Himachal Pradesh, Karnataka, Maharashtra, Orissa, Punjab, Tamil Nadu, West Bengal. Elsewhere : Kenya, Tanganayika, Okinawa Isl., Australia, Holland, Spain, Portugal, Syria, Italy, U.S.A., Trinidad, Argentina, Brazil.

Remarks : A fairly good infestation of this species was seen on guava where infested leaves turned first yellowish, then brown and the trees suffered defoliation.

19. *Tenuipalpus punjabensis* (Maninder & Ghai)

1973. *Colopalpus punjabensis* Maninder & Ghai, *Oriental Ins.*, **12** : 111-113.

1985. *Tenuipalpus punjabensis*, Gupta, *Handbk. Plant mites of India*, p. 150.

Diagnosis : Refer to Gupta (1985).

Material examined : 2♀♀, Meghalaya, Dist. East Garo hill, songsok, ex undet. plant, 29.4.1988.

Distribution India Meghalaya (Dist. East Garo hill), Punjab.

20. *Tenuipalpus punicae* Pritchard & Baker

1958. *Tenuipalpus punicae* Pritchard & Baker, *Univ. Calif. Pub. Ent.*, **14** (3) : 240-242.

1985. *Tenuipalpus punicae*, Gupta, *Handbk. Plant mites of India*, p. 147.

Diagnosis Refer to Gupta (1985).

Material examined : 1♀, Meghalaya, Dist. East Garo hill, Wiliamnagar, ex undet. plant, 18.9.1988.

Distribution : India Meghalaya (Dist. East Garo hill), Punjab, Elsewhere : Spain, Palestine.

Family 3. ERIOPHYIDAE Nalepa

21. *Cosella fleschneri* (Keifer)

1959. *Cosella fleschneri* Keifer, *Bull. Calif. Dept. Agr. Occ. Paper* 2, p. 12-13.

1985. *Cosella fleschneri*, Gupta, *Handbk. Plant mites of india*, p. 168.

Diagnosis : Refer to Gupta (1985).

Locality : Meghalaya.

Host : Citrus.

Distribution : India : Meghalaya (Dist. East Khasi hill).

2. Predatory mites

Family 4. PHYTOSEIIDAE Berlese

Key to the subfamilies, genera and species of Phytoseiidae so far known to occur in Meghalaya

1. Prolateral setae on dorsal shield 4 pairs, in all 6-9 pairs of lateral setae present; preanal setae 3 pairs Subfam. AMBLYSEIINAE, 3
 Prolateral setae on dorsal shield 5 or more pairs, in all 9-12 pairs of lateral setae; preanal setae 3-4 pairs Subfam. PHYTOSEIINAE, 2
2. Setae r_3 on doesal shield, genu II with 7 setae, genu III with 6 setae ***Phytoseius***, 25
 Seta r_3 on lateral integument, genu II with 7 or 8 setae ***Typhlodromus***, 26
3. Metapodal plates large, single paired, triangular, genital shield very broad and punctate, ventrianal shield massive, genu III with 6 setae ***Paraamblyseius***, 4
 Metapodal plates 2 paired, slender, elongate, ventrianal shield usually narrow, genu III with 7 setae ***Amblyseius***, 5
4. Metasternal plate round, J_2 longer than Z_1 , Z_4 shorter than the distance between Z_4 and Z_5 *P. mumai*
 Metasternal plate kidney shaped, J_2 subequal to Z_1 , Z_4 reaches upto base of Z_5 *P. fragariae*
5. Dorsal shield with 5 pairs of prolateral setae6
 Dorsal shield with less than 5 pairs of prolateral setae..... Subgenus ***Paraphytoseius***, *A. (P.) multidentatus*
6. Ventrianal shield massive covering major portion of posteroventral portion Subgenus ***Phytoscutella***, *A. (P.) salebrosus*
 Ventrianal shield not like above7
7. Setae Z_5 , Z_4 , s_4 long and whip-like, longer than distance between their bases, leg IV with macroseta on genu and erect seta on tarsusSubgenus ***Amblyseius***, 12
 Setae Z_5 , Z_4 , s_4 shorter, at most as long as distance between their bases, leg I with no macroseta or only one on genu, no erect seta on tarsus8
8. Sternal shield distinct and straight or concave posteriorly, ventrianal shield approximately pentagonal or shield-shaped9
 Sternal shield indistinct, may be trilobate posteriorly, ventrianal shield elongate, vase-

- shaped or concave laterally 10
9. Z_5 and Z_4 distinctly serrate, sternal shield as wide as or wider than long, macroseta may be present on genu I and present on genu II and III.....Subgenus *Typhlodromips*, 17
 Z_5 and Z_4 mostly smooth, sternal shield longer than wide, genu I, II and III without macrosetae.....Subgenus *Nesoeiulus*, *A. (N.) fallacis*
10. Peritreme extends anteriorly upto j_3 , anterior pair of preanal setae adjacent to anterior margin of ventrinal shield.....Subgenus *Tphlodromalus*, *A. (T.) kalimpongensis*
 Peritreme not extends upto j_3 , anterior pair of preanal setae removed from anterior margin of ventrinal shield.....Subgenus *Euseius*, 20
11. Ventrinal shield vase-shaped with lateral margins concave.....12
 Ventrinal shield pentagonal or squarish.....13
12. Cervix of spermatheca elongated and of parallel diameter *A. (A.) largoensis*
 Cervix of spermatheca fundibuliform *A. (A.) herbicolus*
13. Seta Z_5 much less than 200 microns in length *A. (A.) mcmurtry*
 Z_5 over 200 microns in length 14
14. Cervix of spermatheca looped *A. (A.) paraaerialis*
 Cervix of spermatheca not looped 15
15. Macroseta on tibia and basitarsus IV almost equal *A. (A.) kulini*
 Macroseta on tibia and basitarsus IV almost unequal *A. (A.) channabasavannai*
16. Besides setae Z_5 and Z_4 , other setae being subequal 17
 Besides setae Z_5 and Z_4 there are other long setae 19
17. Z_4 weakly serrate 18
 Z_4 smooth *A. (T.) meghalayensis*
18. Cervix of spermatheca saucer-shaped *A. (T.) syzygii*
 Cervix of spermatheca elongated, flask-shaped *A. (T.) suknaensis*
19. Lateral margins of ventrinal shield concave *A. (T.) crotalariae*
 Lateral margins of ventrinal shield almost straight *A. (T.) quajavae*
20. All setae on dorsal shield minute except j_1 and Z_5 *A. (E.) ovalis*
 Besides Z_5 and j_1 some other setae also long 21
21. Setae j_1 and j_3 either equal of j_3 22
 seta j_1 longer than j_3 23
22. j_3 as long as j_1*A. (E.) alstoniae*
 j_3 and z_2 almost equal *A. (E.) neococcineae*
23. j_3 and z_2 almost equal *A. (E.) neococcineae*
 j_3 noticeably longer than z_224
24. Spermathecal cervix tubular, and spermatophoral process hooked at the tip *A. (E.) pruni*
 Spermathecal cervix saucer-shaped and spermatophoral process L-shaped at the

- tip *A. (E.) finlandicus*
25. Seta R₁ present *Phytoseius (Pennaseius) kapuri*
 Seta R₁ absent *P. (Phytoseius) meyeræ*
26. Seta Z₅ and Z₄ normally serrate and the former usually knobbed Subgenus
Amblydromella, 28
 Seta Z₅ and Z₄ never serrate, Z₅ always smooth 27
27. Leg IV with macroseta on genu, tibia and basitarsus Subgenus ***Orientiseius***, 30
 Leg IV with macroseta on basitarsus Subgenus ***Typhlodormus***, *T.(T.)*
neorhenanus
28. Macroseta present only on basitarsus IV 29
 Macroseta present on genu, tibia and basitarsus IV *T. (A.) darjeelingensis*
29. Z₄ touches almost base of Z₅ *T. (A.) fleschneri*
 Z₄ much shorter than the distance between its base and that of Z₅ *T. (A.) homalii*
30. Length of setae j₄ - j₆ vary between 8-20 microns *T. (O.) pruni*
 Length of j₄ - j₆ vary between 24-60 microns *T. (O.) rickeri*

22. *Amblyseius (Amblyseius) channabasavannai* Gupta & Daniel

1978. *Amblyseius channabasavanni* Gupta & Daniel, *Oriental Ins.*, **12** : 328-329.
1986. *Amblyseius (Amblyseius) channabasavannai*, Gupta, *Fauna of India (Acari : Mesostigmata)* Family Phytoseiidae, p. 41-43.
1987. *Amblyseius (Amblyseius) channabasavannai*, Gupta, *Rec. zool. Surv. India, Occ. Paper*, No. 95. p.8
1992. *Amblyseius (Amblyseius) channabasavannai*, Gupta, *State Fauna-Ser. 3, Fauna of West Bengal*, Part 3, p. 152.

Diagnosis : Refer to Gupta (1987).

Material examined : 2 ♀♀, Meghalaya, Dist. East Garo hill, Songsok, ex undet. plant, 27.9.1988; 1 ♂, Rongjeng, ex jute, 30.9.1988; 2 ♀♀, Songsok, ex mango, 27.9.1988; 3 ♀♀, Dist. East Khasil hill, Burnihat, ex citrus, 12.10.1988; 1 ♂, Dist East Garo hill, Darugiri, ex neem, 2.10.1988; 1 ♀, Rongjeng, ex citrus, 3.10.1988; 1 ♀, Williamnagar, ex undet. plant, 24.9.1988.

Distribution : India : Meghalaya (Dist. East Garo hill, East Khasi hill), Kerala, Tamil Nadu, West Bengal.

23. *Amblyseius (Amblyseius) herbicolus* (Chant)

1959. *Typhlodromus (Amblyseius) herbicolus* Chant, *Can Ent.*, **91** : 84-85.
1985. *Amblyseius (Amblyseius) herbicolus*, Gupta, *Fauna of India (Acari : Mesostigmata)* Family Phytoseiidae, p. 45-47.
1987. *Amblyseius (Amblyseius) herbicolus*, Gupta, *Rec. zool. surv. India, Occ. Paper*. No. 95, p. 9.

1992. *Amblyseius (Amblyseius) herbicolus*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal, Part 3*, p. 152-153.

Diagnosis : Refer to Gupta (1987).

Material examined : 1 ♀, Meghalaya, Dist. East Khasi hill, Khanapara, ex banana, 11.10.1988; 1 ♀, Dist. East Garo hill, Rongjeng, ex paddy, 3.10.1988; 1 ♀, Rombagiri, ex undet. plant, 24.9.1988; 2 ♀♀, Bansamgiri, ex undet. plant, 24.9.1988; 1 ♀, Nangkhera, ex undet. plant, 23.9.1988.

Distribution : India : Meghalaya (Dist. East Khasi hill, East Garo hill), Arunachal Pradesh, Tripura, West Bengal. Elsewhere : Philippines, Taiwan, Thailand, Japan, Madagascar, U.S.A., South America.

24. *Amblyseius (Amblyseius) largoensis* (Muma)

1955. *Amblyseius largoensis* Muma, *Ann. Ent. Soc. Amer.*, **48** : 266.
 1986. *Amblyseius (Amblyseius) largoensis*, Gupta, *Fauna of India (Acari : Mesostigmata) Family Phytoseiidae*, p. 51-55.
 1987. *Amblyseius (Amblyseius) largoensis*, Gupta, *Rec. zool. Surv. India, Occ. Paper No. 95*, p. 10-11
 1992. *Amblyseius (Amblyseius) largoensis*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal, Part 3*, p. 153-154.

Diagnosis : Refer to Gupta (1987).

Material examined : 2 ♀♀, East Khasi hill, Shillong, Chandmari, ex banana, 18.10.1974; 2 ♀♀, Shillong, ex plum, 20.10.1974; 3 ♀♀, Mawphlong, ex undet. plant, 21.10.1974; 7 ♀♀, Shillong Botanical garden, ex *Lagietia insignis*, 19.10.1974; 1 ♀, Nangkhera, ex citrus, 23.9.1988; 1 ♀, Dist. East Garo hill, Songsok, ex palm, 21.9.1988.

Distribution : India : Meghalaya (Dist. East Garo hill, East Khasi hill), Andaman & Nicobar Isl., Arunachal Pradesh, Assam, Andhra Pradesh, Bihar, Gujarat, Himachal Pradesh, Karnataka, Kerala, Manipur, Nagaland, Orissa, Pondicherry, Punjab, Tamil Nadu, Tripura, Uttar Pradesh, West Bengal. Elsewhere : Philippines, Taiwan, Thailand, Hong Kong, Israel, Iran, Japan, New Zealand, South Africa, Kenya, U.S.A., Brazil, Costa Rica, Guatemala, Honduras, Jamaica, Mexico, Puerto Rico, Trinidad.

Remarks This mite was found feeding actively on all stages of *Oilgonychus indicus* infesting banana. From the limited field observation it appeared that this predator had the potentiality of suppressing the pest mite population.

25. *Amblyseius (Amblyseius) kulini* Gupta

1978. *Amblyseius kulini* Gupta, *Indian J. Acar.*, **2** : 63-65.
 1986. *Amblyseius (Amblyseius) kulini*, Gupta, *Fauna of India (Acari : Mesostigmata) Family Phytoseiidae*, p. 50-51.
 1987. *Amblyseius (Amblyseius) kulini*, Gupta, *Rec. zool. Surv. India, Occ. Paper, No. 95*, p. 10.

Diagnosis Refer to Gupta (1987).

Material examined : 1 ♀, Meghalaya, Dist. East Garo hill, Rongjeng, ex an ornamental plant, 1.10.1988; 2 ♀♀, Rongjeng, ex jackfruit, 30.9.1988.

Distribution : India : Meghalaya (Dist. East Garo hill), Assam.

26. *Amblyseius (Amblyseius) paraaerialis* Muma

1967. *Amblyseius paraaerialis* Muma, *Fla Ent.*, **50** : 270-271.

1986. *Amblyseius (Amblyseius) paraaerialis*, Gupta, *Fauna of India* (Acari : Mesostigmata) Family Phytoseiidae: p. 63-65.

1987. *Amblyseius (Amblyseius) paraaerialis*, Gupta, *Rec. zool. Surv. India, Occ. Pap.* No. 95, p. 13.

Diagnosis : Refer to Gupta (1987).

Material examined : 1 ♀, Meghalaya, Dist. East Khasi hill, Mawphlong, ex undet. plant, 21.10.1974, 1 ♀, Dist. East Garo hill, Rongjeng, ex palm, 30.9.1988; 1 ♀, Bonsamgiri, ex undet. plant, 22.9.1988.

Distribution : India : Meghalaya (East Garo hill, East Khasi hill), Assam, Arunachal Pradesh, Kerala. Elsewhere : Thailand.

27. *Amblyseius (Amblyseius) mcmurtryi* Muma

1967. *Amblyseius mcmurtryi* Muma, *Fla Ent.*, **50** : 270-271.

1986. *Amblyseius (Amblyseius) mcmurtryi*, Gupta, *Fauna of India* (Acari : Mesostigmata) Family Phytoseiidae, p. 55-56.

1987. *Amblyseius (Amblyseius) mcmurtryi*, Gupta, *Rec. zool. Surv. India, Occ. Pap.* No. 95, p. 11-12.

Diagnosis : Refer to Gupta (1987).

Material examined : 1 ♀, Dist. West Garo hill, Dally, ex guava, 17.10.1974.

Distribution : India : Meghalaya (Dist. West Garo hill), Assam. Elsewhere : Northern and Western Iran.

28. *Amblyseius (Euseius) alstoniae* Gupta

1975. *Amblyseius alstoniae* Gupta, *Internat. J. Acarol.* **1** (2) : 31-32.

1986. *Amblyseius (Amblyseius) alstoniae*, Gupta, *Fauna of India* (Acari : Mesostigmata) Family Phytoseiidae, p. 55-56.

1987. *Amblyseius (Amblyseius) alstoniae*, Gupta *Rec. zool. Surv. India, Occ. Pap.* No. 95, p. 21.

1992. *Amblyseius (Amblyseius) alstoniae*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal*, Part 3, p. 155-156.

Diagnosis Refer to Gupta (1987).

Material examined : 1 ♀, Meghalaya, Dist. East Garo hill, Dianadubi, ex *Lantana*, 5.10.1988.

Distribution : India : Meghalaya, (Dist. East Garo hill), Bihar, Gujarat, Jammu & Kashmir, Madhya Pradesh, Punjab, Orissa, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal.

29. *Amblyseius (Euseius) coccineae* Gupta

1975. *Amblyseius coccineae* Gupta, *Internat. J. Acarol.*, 1 (2) : 33.
 1986. *Amblyseius (Euseius) coccineae*, Gupta, *Fauna of India* (Acari : Mesostigmata) Family Phytoseiidae, p. 78-80.
 1987. *Amblyseius (Euseius) coccineae*, Gupta, *Rec. zool. Surv. India, Occ. Pap.* No. 95, p. 22-23.
 1992. *Amblyseius (Euseius) coccineae*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal, Part 3*, p. 156-157.

Diagnosis : Refer to Gupta (1987).

Material examined : 2 ♂♂, Meghalaya, Dist. East Khasi hills, Cherrapunji, ex arum, 20.10.1974; 1 ♀, East Garo hill, Dianadubi, ex Saal, 5.10.1988.

Distribution : India : Meghalaya (Dists. East Khasi hill), Bihar, Gujarat, Jammu & Kashmir, Madhya Pradesh, Punjab, Orissa, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal.

30. *Amblyseius (Euseius) coccineae* Gupta

1975. *Amblyseius coccineae* Gupta, *Internat. J. Acarol.*, 1 (2) : 33.
 1986. *Amblyseius (Euseius) coccineae*, Gupta, *Fauna of India* (Acari : Mesostigmata) Family Phytoseiidae, p. 78-80.
 1987. *Amblyseius (Euseius) coccineae*, Gupta, *Rec. zool. Surv. India, Occ. Pap.* No. 95, p. 22-23.
 1992. *Amblyseius (Euseius) coccineae*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal, Part 3*, p. 156-157.

Diagnosis : Refer to Gupta (1987).

Material examined : 2 ♂♂, Meghalaya, Dist. East Khasi hills, Cherrapunji, ex arum, 20.10.1974; 1 ♀, East Khasi hill, Dianadubi, ex Saal, 5.10.1988.

Distribution : India : Meghalaya (Dist. East Khasi hill, East Garo hill), Andhra Pradesh, Bihar, Jammu & Kashmir, Madhya Pradesh, Orissa, Pondicherry, Tamil Nadu, Tripura, Uttar Pradesh, West Bengal.

30. *Amblyseius (Euseius) finlandicus* (Oudemans)

1915. *Seiulus finlandicus* Oudemans, *Ent. Ber.*, 4 : 183.
 1958. *Amblyseius finlandicus*, Athias-Henriot, *Bull. Soc. Hist. Nat. Afr. Nord.*, 42 : 34-36.
 1986. *Amblyseius (Euseius) finlandicus*, Gupta, *Fauna of India* (Acari : Mesostigmata) Family Phytoseiidae, p. 86-88.
 1987. *Amblyseius (Euseius) finlandicus*, Gupta, *Rec. zool. Surv. India, Occ. Pap.* No. 95| p.24-25
 1992. *Amblyseius (Euseius) finlandicus*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal Part 3*, p. 157-158.

Diagnosis : Refer to Gupta (1987).

Material examined : 1 ♀, Meghalaya, Dist. East Garo hill, Rongjeng, ex fig.30.9.1988.

Distribution India : Meghalaya (Dist. East Garo hill), Bihar, Himachal Pradesh, Jammu & Kashmir, Karnataka, Punjab, Uttar Pradesh, West Bengal. Elsewhere : Pakistan, Japan, Greece, Italy, Netherlands, Scandinavian countries, U.S.S.R., Africa, Mexico, South America, North America.

Remarks : This mite was found actively feeding upon *E. hirsti* infesting fig tree.

31. *Amblyseius (Euseius) ovalis* (Evans)

1953. *Typhlodromus ovalis* Evans, *Ann. Mag. Nat. Hist.*, **6** : 458-461.

1986. *Amblyseius (Euseius) ovalis*, Gupta, *Fauna of India (Acari : Mesostigmata) Family Phytoseiidae*, p. 92-94.

1987. *Amblyseius (Euseius) ovalis*, Gupta, *Rec. zool. Surv. India, Occ. Pap. No. 95*, p. 27-28.

1992. *Amblyseius (Euseius) ovalis*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal, Part 3*, p. 158.

Diagnosis : Refer to Gupta (1987).

Material examined : 1 ♀, Meghalaya, Dist. West Garo hill, Tura, ex ornamental plant, 27.10.1974 ; 1 ♀, Dist. East Garo hill, Rongjeng, ex fig, 30.9.1988.

Distribution India : Meghalaya (Dists. East Garo hills, West Garo hills), Andaman & Nicobar Isls., Bihar, Gujarat, Karnataka, Kerala, Maharashtra, Manipur, Pondicherry, Tamil Nadu, Tripura, West Bengal. Elsewhere : Philippines, Taiwan, Malaya, Indonesia, Japan, Hong Kong, Mauritius, New Zealand, Hawaii, Mexico.

Remarks : This mite was found actively feeding upon a tertranychid species infesting the ornamental plant. It appeared that this predator had the potentiality of suppressing the pest mite population.

32. *Amblyseius (Euseius) pruni* Gupta

1975. *Amblyseius pruni* Gupta, *Internat J. Acarol.*, **1** (2) : 43-44.

1986. *Amblyseius (Euseius) pruni*, Gupta, *Fauna of India (Acari : Mesostigmata) Family Phytoseiidae*, p. 94-96.

1987. *Amblyseius (Euseius) pruni*, Gupta, *Rec. zool. Surv. India. Occ. Pap. No. 95*, 28-29.

1992. *Amblyseius (Euseius) pruni*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal, Part 3*, p. 159-160.

Diagnosis : Refer to Gupta (1987).

Material examined : 1 ♀, Meghalaya, Dist. East Khasi hill, upper Shillong, ex pear, 13.10.1974 ; 1 ♀, Dist East Garo hill, Rongjeng, ex fig, 30.9.1988 ; 1 ♀, Dist East Garo hill, Rongjeng, ex fig, 30.9.1988 ; 1 ♀, Songsok, ex black berry, 27.9.1988.

Distribution : India : Meghalaya (Dists. East Khasi hill, East Garo hill), Assam, Himachal Pradesh, Jammu & Kashmir, Meghalaya, Tripura, West Bengal.

33. *Amblyseius (Euseius) neococcineae* Gupta

1978. *Amblyseius neococcineae* Gupta, *Indian. J. Acar.*, **2** (2) : 69.
 1986. *Amblyseius (Euseius) neococcineae*, Gupta, *Fauna of India* (Acari : Mesostigmata) Family Phytoseiidae, p. 90-92.
 1987. *Amblyseius (Euseius) neococcineae*, Gupta, *Rec. zool. Surv. India, Occ. Pap. No. 9* 5 p. 25-26.

Diagnosis : Refer to Gupta (1987).

Material examined : 1 ♀, Meghalaya, Dist. West Garo hill, Tura, ex black berry, 15.10.1974.

Distribution India Meghalaya (Dist. West Garo hill).

34. *Amblyseius (Phytoscutella) salebrosus* (Chant)

1960. *Typhlodromus (Amblyseius) salebrosus* Chant, *Can. Ent.*, **92** : 58-60.
 1986. *Amblyseius (Phytoscutella) salebrosus*, Gupta, *Fauna of India* (Acari : Mesostigmata) Family Phytoseiidae, p. 128-130.
 1987. *Amblyseius (Phytoscutella) salebrosus*, *Rec. zool. Surv. India, Occ. Pap., No. 95*, p. 48-49.

Diagnosis : Refer to Gupta (1987).

Material examined : 1 ♀, Meghalaya, Dist. East Garo hill, Rongjeng, ex jute, 30.9.1988.

Distribution : India : Meghalaya (Dist. East Garo hill), Assam. *Elsewhere* : Taiwan. Thailand.

35. *Amblyseius (Paraphytoseius) multidentatus* (Swirski & Shechter)

1960. *Typhlodromus (Amblyseius) orientalis* Narayanan, Kaur & Ghai, *Proc. Nat. Inst. Sci.*, **26B** : 394.
 1961. *Paraphytoseius multidentatus* Swirski & Shechter, *Israel J. agric. Res.*, **11**(2) : 114-116.
 1986. *Amblyseius (Paraphytoseius) multidentatus*, Gupta, *Fauna of India* (Acari : Mesostigmata) Family Phytoseiidae, p. 123-126.
 1987. *Amblyseius (Paraphytoseius) multidentatus*, Gupta, *Rec. zool. Surv. India, Occ., Pap., No. 95*, p. 46-47.
 1992. *Amblyseius (Paraphytoseius) multidentatus*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal, Part 3*, p. 163.

Diagnosis : Refer to Gupta (1987).

Material examined : 1 ♀, Meghalaya, Dist. East Khasi hill, Mawphlong, ex undet. plant. 21.10.1974 ; 1 ♀, Dist. East Garo hill, Williamnagar, ex brinjal, 15.9.1988 ; 2 ♀♀, East Khasi hill, Khanapara, ex bamboo, 11.10.1988; 2 ♀♀, East Garo hill, Songsok, ex cucurbits, 26.9.1988; 1 ♀, Songsok, ex mango, 26.9.1988.

Distribution : India : Meghalaya (Dists. East Khasi hill, East Garo hill), Andaman & Nicobar Isls., Andhra Pradesh, Assam, Bihar, Karnataka, Maharashtra, Meghalaya, Tripura, Tamil Nadu, Uttar Pradesh, West Bengal. *Elsewhere* : Pakistan, Thailand, Philippines, Malaya, Nigeria, Madagascar, Hong Kong.

Remarks : This appeared to be an effective predator of *T. urticae* infesting brinjal. It fed upon all the stages but preferred eggs.

36. *Amblyseius (Neoseiulus) fallacis* (Garman)

1948. *Iphidulus fallacis* Garman, *Bull. Conn. Agr. Exp. Sta.*, 520 : 13.
 1986. *Amblyseius (Neoseiulus) fallacis*, Gupta, *Fauna of India* (Acari : Mesostigmata) Family Phytoseiidae, p. 109-111.
 1987. *Amblyseius (Neoseiulus) fallacis*, Gupta, *Rec. zool. Surv. India. Occ. Pap. No.*, 95, p. 37.
 1992. *Amblyseius (Neoseiulus) fallacis*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal*, No. 3, p. 162.

Diagnosis : Refer to Gupta (1987).

Material examined : 2 ♂♂, Meghalaya, Dist. West Garo hill, Dallu, ex paddy, 17.10.1974.

Distribution : India : Meghalaya (Dist. West Garo hill), Assam, Bihar, Haryana, Punjab, Tamil Nadu, Tripura, West Bengal. Elsewhere : Arizona, California, Caribbean Isls., North & Central America, Eastern Canada, Gulph, Ontario, British Columbia, Quebec, Montreal, Nova Scotia, Australia, Algeria.

37. *Amblyseius (Typhlodromalus) kalimpongensis* Gupta

1969. *Amblyseius kalimpongensis* Gupta, *Bull. Ent., Ent. Soc. India*, 10 : 128-129.
 1986. *Amblyseius (Typhlodromalus) kalimpongensis*, Gupta, *Fauna of India* (Acari : Mesostigmata) Family Phytoseiidae, p. 150-152.
 1987. *Amblyseius (Typhlodromalus) kalimpongensis*, *Rec. zool. Surv. India. Occ. Pap.*, No. 95, p. 53-54.
 1992. *Amblyseius (Typhlodromalus) kalimpongensis*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal*, Part 3, p. 164-166.

Diagnosis : Refer to Gupta (1987).

Material examined : 2 ♂♂, Meghalaya, Dist. East Garo hill, Rongjeng, ex jackfruit, 30.9.1988.

Distribution : India : Meghalaya (Dist. East Garo hill), Andhra Pradesh, Assam, Bihar, Gujarat, Karnataka, Orissa, Tamil Nadu, Uttar Pradesh, West Bengal.

38. *Amblyseius (Typhlodromips) crotalariae* Gupta

1977. *Amblyseius crotalariae* Gupta, *Entomologists mon. Mag.*, 112 : 53-55.
 1986. *Amblyseius (Typhlodromips) crotalariae*, Gupta, *Fauna of India* (Acari : Mesostigmata) Family Phytoseiidae, p. 162-164.
 1987. *Amblyseius (Typhlodromips) crotalariae*, Gupta, *Rec. zool. Surv. India, Occ. Pap.*, No. 95, p. 160.
 1992. *Amblyseius (Typhlodromips) crotalariae*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal*, Part 3, p. 107.

Diagnosis Refer to Gupta (1987).

Material examined : 5 ♀♀, Meghalaya, Dist. West Garo hill, Tura, ex fern, 15.10.1974; 1 ♀, Dist. East Khasi hill, Cherrapunji, ex fern, 22.10.1974.

Distribution India : Meghalaya (Dist. East Khasi hill, West Garo hill), Assam, Tripura, West Bengal.

39. *Amblyseius (Typhlodromips) quajavae* Gupta

1978. *Amblyseius quajavae* Gupta, *Indian J. Acar.*, 2 (2) : 63.

1986. *Amblyseius (Typhlodromips) quajavae*, Gupta, *Fauna of India* (Acari : Mesostigmata) Family Phytoseiidae, p. 166.

1987. *Amblyseius (Typhlodromips) quajavae*, Gupta, *Rec. zool. Surv. India, Occ. Pap.*, No. 95, p. 61.

Diagnosis : Refer to Gupta (1987).

Material examined : 1 ♀, Meghalaya, Dist. West Garo hill, Dallu, ex guava, 17.10.1974.

Distribution India : Meghalaya (Dist. West Garo hill).

40. *Amblyseius (Typhlodromips) meghalayensis* Gupta

1978. *Amblyseius meghalayensis* Gupta, *Indian. J. Acar.*, 2 (2) : 67-69.

1986. *Amblyseius (Typhlodromips) meghalayensis*, Gupta, *Fauna of India* (Acari : Mesostigmata) Family Phytoseiidae, p. 170-171.

1987. *Amblyseius (Typhlodromips) meghalayensis*, *Rec. zool. Surv. India. Occ. Pap.*, No. 95, p. 63-64.

Diagnosis : Refer to Gupta (1987).

Material examined : 1 ♀, Meghalaya, Dist. West Garo hill, Dallu, ex guava, 17.10.1974.

Distribution India : Meghalaya (Dist. West Garo hill).

41. *Amblyseius (Typhlodromips) suknaensis* Gupta

1978. *Amblyseius suknaensis*, Gupta, *Oriental Ins.*, 4 : 185-186.

1986. *Amblyseius (Typhlodromips) suknaensis*, Gupta, *Fauna of India* (Acari : Mesostigmata) Family Phytoseiidae, p. 188-190.

1987. *Amblyseius (Typhlodromips) suknaensis*, Gupta, *Rec. zool. Surv. India, Occ. Pap.*, No. 95, p. 68.

1992. *Amblyseius (Typhlodromips) suknaensis*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal, Part 3*, p. 168.

Diagnosis : Refer to Gupta (1987).

Material examined : 1 ♀, Meghalaya, Dist. West Garo hill, Tura, Jamai Cherra Manu, ex undet. plant, 26.2.1974; 1 ♀, Dist. East Garo hill, Songsok, ex castor, 27.9.1988; 1 ♀, Songsok ex *Lantana*, 28.9.1988; 1 ♀, Khanapara, ex bamboo, 11.10.1988; 1 ♀, Dianadubi, ex *Lantana*, 5.10.1988; 2 ♀♀, Rongjeng, ex mango, 3.10.1988.

Distribution : India : Meghalaya (Dists. East Khasi hill, East & West Garo hills), Andaman & Nicobar Isls., Assam, Kerala, West Bengal.

42. *Amblyseius (Typhlodromips) syzygii* Gupta

1975. *Amblyseius syzygii* Gupta, *Internat. J. Acarol.*, **1** (2) : 44-45.
 1986. *Amblyseius (Typhlodromips) syzygii*, Gupta, *Fauna of India (Acari : Mesostigmata) Family Phytoseiidae*, p. 188-190.
 1987. *Amblyseius (Typhlodromips) syzygii*, Gupta, *Rec. zool. Surv. India, Occ. Pap.*, No. 95, p. 68.
 1992. *Amblyseius (Typhlodromips) syzygii*, Gupta, *State Fauna Ser, 3, Fauna of West Bengal, Part 3*, p. 169.

Diagnosis : Refer to Gupta (1987).

Material examined : 1 ♀, Meghalaya, Dist. East Garo hill, Williamnagar, ex undet. plant, 18.9.1988.

Distribution India : Meghalaya (Dist. East Garo hill), Orissa, Tripura, West Bengal. Elsewhere Thailand, Indonesia.

43. *Amblyseius (Typhlodromips)* sp.

Material examined : 1 ♀, Meghalaya, Dist. East Garo hill, Songsok, ex blackberry, 26.9.1988.

Remarks : The only species with which it bears resemblance is *A. (T.) crotalariae* Gupta but the shape of the spermathecal cervix and seta Z_5 being 2 times the length of Z_4 , separate this species from *crotalariae*. Because of the damaged condition of the specimen, final decision regarding novelty of the species is kept in abeyance until further material is obtained.

44. *Paraamblyseius fragariae* Gupta

1980. *Paraamblyseius fragariae* Gupta, *Entomologists' mon. Mag.*, **115** : 215-216.
 1986. *Paraamblyseius fragariae*, Gupta, *Fauna of India (Acari : Mesostigmata) Family Phytoseiidae*, p. 204-206.
 1987. *Paraamblyseius fragariae*, Gupta, *Rec. zool. Surv. India, Occ. Pap.*, No. 95, p. 74.
 1992. *Paraamblyseius fragariae*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal, Part 3*, p. 170.

Diagnosis : Refer to Gupta (1987).

Material examined : India : Meghalaya (Dist. East Garo hill), Arunachal Pradesh, West Bengal.

45. *Paraamblyseius mumai* Gupta

1980. *Paraamblyseius mumai* Gupta, *Entomologists' mon. Mag.*, **116** : 33-34.
 1986. *Paraamblyseius mumai*, Gupta, *Fauna of India (Acari : Mesostigmata) Family Phytoseiidae*, p. 206.

1987. *Paraamblyseius mumai*, Gupta, *Rec. zool. Surv. India, Occ. Pap. No. 95*, p. 75.
 1992. *Paraamblyseius mumai*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal, Part 3*, p. 170-171.
Diagnosis Refer to Gupta (1987).
Locality : Meghalaya, Dist. East Garo hill.
Host : Undet. plant.
Distribution India : Meghalaya (Dist. East Garo hill), West Bengal.

46. *Phytoseius (Pennaseius) kapuri* Gupta

1969. *Phytoseius (Phytoseius) kapuri* Gupta, *Israel. J. agric. Res.*, **19** : 115-117.
 1986. *Phytoseius (Pennaseius) kapuri*, Gupta, *Fauna of India (Acari : Mesostigmata) Family Phytoseiidae*, p. 221-223.
 1987. *Phytoseius (Pennaseius) kapuri*, Gupta, *Rec. zool. Surv. India, Occ. Pap.*, No. 95, p. 81-82.
 1992. *Phytoseius (Pennaseius) kapuri*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal, Part 3*, p. 171-172.
Diagnosis : Refer to Gupta (1987).
Material examined 1 ♀, Meghalaya, Dist. East Garo hill, Songsok, ex *Ficus* sp., 29.9.1988; 1 ♀, Dist. East Khasi hill, Khanapara, ex black berry, 11.10.1988.
Distribution : India : Meghalaya (Dist. East Khasi hill, East Garo hill), Andaman Isl., Bihar, Gujarat, Jammu & Kashmir, Kerala, Madhya Pradesh, Orissa, Pondicherry, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal.
Remarks : It is uncertain if it fed upon *E. hirsti* with which it was found associated at Songsok.

47. *Phytoseius (Phytoseius) meyeræ* Gupta

1977. *Phytoseius (Dubininellus) meyeræ* Gupta, *Indian J. Acar.*, **2** : 7.
 1986. *Phytoseius (Phytoseius) meyeræ*, Gupta, *Fauna of India (Acari : Mesostigmata) Family Phytoseiidae*, p. 244.
 1987. *Phytoseius (Phytoseius) meyeræ*, Gupta, *Rec. zool. Surv. India, Occ. Pap.*, No. 95, p. 91-92.
 1992. *Phytoseius (Phytoseius) meyeræ*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal, Part 3*, p. 174-175.
Diagnosis : Refer to Gupta (1987).
Locality : Meghalaya : West Garo hill, Tura.
Host : Weed.
Distribution : India : Meghalaya (Dist. West Garo hill), Assam, West Bengal.

48. *Phytoseius (Phytoseius)* sp.

Material examined 1 ♂, Meghalaya, Dist. East Garo hill, Songsok, ex *Lantana*, 28.9..1988.

Remarks : This species is close to *P. (P.) crinitus* Swirski & Shechter but differs with regard to the relative lengths of setae s_4 and Z_4 . The specimen is in damaged condition.

49. *Typhlodromus (Amblydromella) darjeelingensis* Gupta

1976. *Typhlodromus eharai* Gupta, *Bull. zool. Surv. India*, 1: 54.
 1986. *Typhlodromus (Amblydromella) darjeelingensis*, Gupta, *Fauna of India (Acari : Mesostigmata) Family Phytoseiidae*, p. 270-272.
 1987. *Typhlodromus (Amblydromella) darjeelingensis*, Gupta, *Rec. zool. Surv. India, Occ. Pap.*, No. 95, p. 105-106.
 1992. *Typhlodromus (Amblydromella) darjeelingensis*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal, Part 3*, p. 179.

Diagnosis : Refer to Gupta (1987).

Material examined : 1 female, Meghalaya, Dist East Garo hill, Rongjeng, ex *Michaelia champaca*, 1.10.1988; 1 female, Rongjeng, ex undet. plant, 30.9.1988.

Distribution : India : Meghalaya (Dist. East Garo hill), Karnataka, Punjab, Tamil Nadu, Tripura, Uttar Pradesh, West Bengal.

50. *Typhlodromus (Amblydromella) fleschneri* Chant

1960. *Typhlodromus (Typhlodromus) fleschneri* Chant, *Can. Ent.*, 92 : 60-62.
 1986. *Typhlodromus (Amblydromella) fleschneri*, Gupta, *Fauna of India (Acari : Mesostigmata) Family Phytoseiidae*, p. 272-274.
 1987. *Typhlodromus (Amblydromella) fleschneri*, Gupta, *Rec. zool. Surv. India, Occ. Pap.*, No. 95, p. 107.
 1992. *Typhlodromus (Amblydromella) fleschneri*. Gupta, *State Fauna Ser. 3, Fauna of West Bengal, Part 3*, p. 179.

Diagnosis : Refer to Gupta (1987).

Locality : Meghalaya, Dist. East Khasi hill, Shillong.

Host : Citrus.

Distribution : India : Meghalaya (Dist. East Khasi hill), Assam, Karnataka, West Bengal.

51. *Typhlodromus (Amblydromella) homalii* Gupta

1970. *Typhlodromus homalii* Gupta, *Oriental Ins.*, 4 : 188-189.
 1986. *Typhlodromus (Amblydromella) homalii*, Gupta, *Fauna of India (Acari : Mesostigmata) Family Phytoseiidae*, p. 274-276.
 1987. *Typhlodromus (Amblydromella) homalii*, Gupta, *Rec. zool. Surv. India, Occ. Pap.* No. 95, p. 108.
 1992. *Typhlodromus (Amblydromella) homalii*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal, Part 3*, p. 179.

Diagnosis : Refer to Gupta (1987).

Locality : Meghalaya : Dist. East Khasi hill, Cherrapunji,

Host : Arum, citrus.

Distribution India : Meghalaya (Dist. East Khasi hill), Himachal Pradesh, Punjab, Rajasthan, West Bengal.

52. *Typhlodromus (Orientiseius) pruni* Gupta

1970. *Typhlodromus pruni* Gupta, *Oriental Ins.*, 4 : 189-190.

1986. *Typhlodromus (Orientiseius) pruni*, Gupta, *Fauna of India* (Acari : Mesostigmata) Family Phytoseiidae, p. 305-307.

1987. *Typhlodromus (Orientiseius) pruni*, Gupta, *Rec. zool. Surv. India, Occ. Pap.*, No. 95, p. 125-126.

1992. *Typhlodromus (Orientiseius) pruni*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal, Part 3*, p. 182.

Diagnosis : Refer to Gupta (1987).

Material examined : 1 ♀, Meghalaya, Dist. East Garo hill, Rongjeng, ex fig, 30.9.1988.

Distribution : India . Meghalaya (Dist. East Garo hill), Arunachal Pradesh, West Bengal.

53. *Typhlodromus (Orientiseius) rickeri* Chant

1960. *Typhlodromus (Typhlodromus) rickeri*, Chant, *Can. Ent.*, 92: 62-64.

1986. *Typhlodromus (Orientiseius) rickeri*, Gupta, *Fauna of India* (Acari : Mesostigmata) Family Phytoseiidae, p. 307.

1987. *Typhlodromus (Orientiseius) rickeri*, Gupta, *Rec. zool. Surv. India, Occ. Pap.*, No. 95, p. 126.

Diagnosis Refer to Gupta (1987).

Locality : Meghalaya, Dist. East Khasi hill, Shillong.

Distribution India : Meghalaya (Dist. East Khasi hill), Karnataka, Nagaland. Elsewhere U.S.A.

54. *Typhlodromus (Typhlodromus) neorhenanus* Gupta

1977. *Typhlodromus neorhenanus* Gupta, *Indian J. Acar.*, 2 (2) : 4.

1986. *Typhlodromus (Typhlodromus) neorhenanus*, Gupta, *Fauna of India* (Acari : Mesostigmata) Family Phytoseiidae, p. 320-321.

1987. *Typhlodromus (Typhlodromus) neorhenanus*, Gupta, *Rec. zool. Surv. India, Occ. Pap.*, No. 95, p. 133.

Diagnosis Refer to Gupta (1987).

Locality : Meghalaya, Dist. West Garo hill, Tura.

Host : Fern.

Distribution India Meghalaya (Dist. West Garo hill), West Bengal.

Family 5. ASCIDAE Voigts & Oudemans

Key to the genera of Ascidae known so far from Meghalaya.

1. Adult with 2 dorsal shields, podonotal and opisthonotal ***Gamasellodes***
 Adult with a single dorsal shield holodorsal shield ***Lasioseius***

55. ***Lasioseius*** sp.

Material examined : 1 ♀, Meghalaya, Dist. East Garo hill, Bonsamgiri, ex undet. plant, 22.9.1988.

Remarks : This species was in a badly damaged condition and hence species identification was not possible.

56. ***Gamasellodes*** sp.

Material examined : 1♀, Meghalaya, Dist. East Garo hill, Rongjeng, ex citrus, 3.10.1988.

Remarks : This specimen was in badly damaged condition and therefore further identification was not possible.

Family 6. CHEYLETIDAE Leach

57. ***Cheyletus malaccensis*** Oudemans

1904. *Cheyletus malaccensis* Oudemans, *Ent. Ber. Ned. Ver.*, 1 : 84.

1974. *Cheyletus malaccensis* Prasad, *A catalogue of mites of India*, p. 105.

Material examined : 1♀, Meghalaya, Dist. East Garo hill, Rongjeng, ex *Michaelia champaca*, 1.10.1988.

Distribution : India : Meghalaya (Dist. East Garo hill), Kerala, Karnataka, West Bengal.

Family 7. TYDEIDAE Kramer

58. ***Tydeus*** sp.

Material examined : 2♀♀, Meghalaya, Dist. East Garo hill, Rongjeng, ex undet. plant, 30.9.1988.

Remarks : The specimen got damaged while mounting and that made it further difficult for identification.

Family 8. EUPODIDAE Koch

59. ***Eupodes*** sp.

Material examined : 3♀♀, Meghalaya, Dist. East Garo hill, songsok, ex walnut tree, 26.9.1988.

Distribution : India Meghalaya (Dist. East Garo hill).

Family 9 BDELLIDAE Duges

60. *Bdella* sp.

Material examined : 1 ♀, Meghalaya, Dist. East Garo hill, Rongjeng, ex pear, 30.9.1988.

Distribution : India Meghalaya (Dist. East Garo hill).

Family 10. STIGMAEIDAE Oudemans

61. *Agistemus fleschneri* Summers

1960. *Agistemus fleschneri* Summers, *Proc. Ent. Soc. Wash.*, 62 : 237-240.

1985. *Agistemus fleschneri*, Gupta, *Handbk. Plant mites of India*, p. 304-305.

1992. *Agistemus fleschneri*, Gupta, *State Fauna Ser. 3, Fauna of West Bengal, Part. 3*, p. 117-118.

Diagnosis Refer to Gupta (1987).

Material examined : 1 ♀, Meghalaya, Dist. East Garo hill, Songsok, ex Citrus, 26.9.1988.

Distribution India Meghalaya (Dist. East Garo hill), Assam. Punjab, West Bengal. Elsewhere : U.S.A., Mexico, Chile.

62. *Agistemus garrulus* Chaudhri, Akbar & Rasool

1974. *Agistemus garrulus* Chaudhri, Akbar & Rasool, *Univ. Agr. Loyalpur, Pakistan*, p. 197-200.

Diagnosis Dorsal shield smooth, dorsal setae set on tubercles and with minute barbs on entire shaft, seate be longest, $ae - ae = 1.8$; $be = 1-3$ times of $be-ce$, $a \setminus a - a = 1.3$, $le < e$, $e^{\infty} - le = 1.7$. Setal length : $ae = 44$, $be = 79$, $ce = 53$, $he = 49$, $a = 62$, $b = 65$, $c = 72$, $la = 56$, $lm = 67$, $li = 67$, $e = 43$, $le = 26$. Paragenital setae 2 pairs. $Pg_1 > pg_1$, pg_2 .

Material examined : 1 ♀, Meghalaya, Dist. East Garo hill, Songsok, ex mulberry, 28.9.1988.

Distribution : India : Meghalaya (Dist. East Garo hill). Elsewhere : Pakistan.

Remarks : This is the first record of this species from India.

63. *Agistemus* sp.

Material examined : 1 ♀, Meghalaya, Dist. East Garo hill, Wagesei, ex an undet. plant. 7.10.1988.

Remarks : The damaged condition of the specimen prevented further identification of the species.

64. *Ledermuelleria* sp.

Material examined : 1 ♀, Meghalaya, Dist. East Garo hill, Rongjeng, ex an undet. plant, 1.10.1988.

Family 11. ANYSTIDAE Oudemans

65. *Walzia indiana* Smith-Meyer & Uckermann

1987. *Walzia indiana* Smith-Meyer & Uckermann, *Ent. Mem. Dept. Agril, Wat. Supply, Repub. S. Africa*, No. 68, p. 14-16.

Diagnosis : Anterior margin of naso dentate, and opening surrounded by 1 or 2 pairs of setae instead of 5 pairs. Peritreme long, reticulated. Chelicera with 2 setae; leg segments dorsally covered by pilose setae; tarsi I and II with minute solenidia, tibia I and II each with 3 solenidia.

Material examined : 1 ♀, Meghalaya, Dist. East Khasi hill, Baridua, ex mulberry, 12.10.1988.

Distribution : India : Meghalaya (Dist. East Khasi hill), West Bengal.

66. *Walzia* sp.

Material examined : 1 ♀, Meghalaya, Dist. East Garo hill, Rongjeng, ex palm, 30.9.1988.

Remarks : The specimen was in juvenile stage and therefore specific identification was not possible.

Family 12. CUNAXIDAE Thor

67. *Cunaxa capreolus* (Berlese)

1890. *Cunaxa capreolus* Berlese, *Acari, Myriapoda et Scorpiones hucusque in Italia, Fasc. 57* (9).

1895. *Cunaxa capreolus*, Gupta & Paul, *Bull. zool. Surv. India*, 7 : 9-10.

Diagnosis : Dorsal scutum divided. Palp chaetotaxy : trochanter-nil, basifemur-one outerlateral simple seta, telofemur-inner surface with sabre-like hooked process projected upward, one outerlateral simple seta; genu-inner surface with a strong spine, one anterior midventral seta and one simple outerlateral seta; tibiotarsus proximally with spine-like seta outerlaterally; adjacent to it one midventral seta and one long simple seta at the inner surface. Propodosoma with smooth subtriangular shield with 2 pairs of finely branched sensory setae.

Material examined : 1 ♀, Meghalaya, Dist. East Garo hill, Rongjeng, ex an undet plant, 30.9.1988.

Distribution ; India : Meghalaya (Dist. East Garo hill), West Bengal. Elsewhere : U.S.A.

Remarks : Gupta & Paul (1985) reported this species from bird's nest in India.

68. *Cunaxa setirostris* (Hermann)

1804. *Scirus setirostris* Hermann, *Mem Aptelologie*, p. 60-62.

1971. *Cunaxa setirostris*, Singh & Mukherjee, *Oriental Ins.*, 5 : 488.

1985. *Cunaxa setirostris*, Gupta, *Handbk. Plant mites of India*, p. 316.

Diagnosis : Refer to Gupta (1985).

Material examined : 3 ♀♀, Meghalaya, Dist. East Garo hill, Nangkhera, ex an undet. plant, 23.9.1988.

Distribution : India : Meghalaya (Dist. East Garo hill), Andaman Isl., Uttar Pradesh, West Bengal. Elsewhere : Cosmopolitan.

Remarks : Though it is an effective predator but in the present case no predatory importance was noticed.

69. *Dactyloscirus machairodus* (Oudemans)

1922. *Rosenhofia machairodus* Oudemans, *Ent. Ber.*, **6** : 110.

1975. *Dactyloscirus machairodus*, Smiley, *Ann. Ent. Soc. Amer.*, **68** : 235.

Diagnosis : Palp genu with strong subtriangular apophysis. Chaetotaxy of palpus : trochanter-nil, basifemur with one outerlateral spine, telofemur with one outerlateral spine; innerlateral surface with one peg-like seta; genu with 1 apical dorsomedian simple seta; inner surface with 1 mediolateral simple seta; apically with 1 strong subtriangular apophysis; tibiotarsus outersurface with 1 dorsolateral simple seta; inner surface with 1 proximal simple seta; 1 median spine; ventrally with one strong simple seta.

Material examined : 1 ♀, Meghalaya, Dist. East Garo hill, Dianadubi, ex palm, 6.10.1988.

Distribution India : Meghalaya (Dist. East Garo hill).

Remarks : This is the first record of this species from India.

Family 13. ACARIDAE Ewing & Nesbitt

70. *Acarus farris* (Oudemans)

1905. *Aleurobius farris* Oudemans, *Ent. Ber.*,

Diagnosis : Omega I on leg I and II, when viewed laterally increase slightly in diameter from base upwards, then narrows gradually, before expanding into terminal head. The spine "s" on tarsi II, III and IV of the male and I-IV of female when viewed laterally is about 1/2 to 2/3 the length of tarsal claw and points anteriorly.

Material examined : 5 ♀♀, Meghalaya, Dist. East Garo hill, Songsok, ex banana, 20.9.1988.

Distribution India Meghalaya (Dist. East Garo hill). Elsewhere England, Scotland, Wales, Netherland, Germany, Kenya, U.S.A., Poland, Czechoslovakia.

Remarks : This is first record of this species from India.

71. *Tyrophagus putrescentiae* (Schrank)

1781. *Acarus putrescentiae* Schrank, *Enum Ins Aust. Indig.* 521.

1985. *Tyrophagus putrescentiae*, Gupta, *Handbk. Plant mites of India*, p. 409.

Diagnosis : Refer to Gupta (1985).

Material examined : 3 ♂♂, Meghalaya, Dist. East Garo hill, Songsok, ex an ornamental plant, 26.9.1988.

Distribution : India : Meghalaya (Dist. East Garo hill), Bihar, Uttar Pradesh, West Bengal. Elsewhere : Cosmopolitan.

DISCUSSION

Out of 727 species of plant mites known from India (Gupta, 1991), Meghalaya, one of the northeastern states of India, represents 71 species belonging to 28 genera, 13 families under 3 orders and those are reported here in this consolidated account giving an up-to-date state of knowledge regarding plant mites of Meghalaya. Out of these, 21 species belonging to Tetranychidae, Tenuipalpidae and Eriophyidae constitute phytophagous group, 47 species belonging to families Phytoseiidae, Cheyletidae, Bdellidae, Stigmaeidae, Anystidae and Cunaxidae constitute the predatory group while 4 species belonging to Ascidae, Tydeidae, Eupodidae and Acaridae most probably belong to fungus associated group.

Among the 71 species, only 30 were earlier known to occur on plants in Meghalaya and, hence the remaining 41 species are being reported here for the first time from this state. These include 3 species, viz. *Agistemus garrulus* (fam. Stigmaeidae), *Dactyloscirus machaiordus* (fam. Cunaxidae) and *Acarus farris* (fam. Acaridae) and the genus *Ledermuelleria* (fam. Stigmaeidae), the occurrence of which were hitherto unknown from India. There were altogether 5 species, viz. *Schizotetranychus meghalayensis*, *Cosella fleschneri*, *Amblyseius (Euseius) neococcineae*, *A. (Typhlodromips) guajavae* and *A. (T.) meghalayensis* which are known only from Meghalaya. In addition to these 5 species, the distribution of the following 11 species in India, viz. *Eotetranychus kankitus*, *Amblyseius (Amblyseius) kulini*, *A. (A.) mcmurtryi*, *A. (Phytoscutella) salebrosus*, *A. (Typhlodromips) crotalariae*, *Paraamblyseius fragariae*, *P. mumai*, *Phytoseius (Phytoseius) meyeriae*, *Typhlodromus (Orientiseius) pruni*, *Walzia indiana* and *Cunaxa capreolus* are not known outside eastern and northeastern India. The 11 species, viz. *Bryobia praetiosa*, *Eutetranychus orientalis*, *Eotetranychus sexmaculatus*, *Panonychus citri*, *Tetranychus urticae*, *Brevipalpus phoenicis*, *Amblyseius (Amblyseius) herbicolus*, *A. (A.) largoensis*, *A. (Euseius) finlandicus*, *A. (N.) fallacis* and *Tyrophagus putrescentiae* are cosmopolitan. The species *Aponychus corpuzae*, *Stylophoronychus baghensis*, *Eotetranychus hirsti*, *A. (T.) syzygii*, *Oligonychus indicus*, *O. mangiferus*, *A. (A.) paraaerialis*, *A. (P.) salebrosus* and *Agistemus qarrulus* are not known outside Oriental region, while there are 25 species distribution of which are not known outside India.

Among the total plant mite fauna, the occurrence of three species, viz. *Eotetranychus kankitus*, *Dactyloscirus machirodus* and *Acarus farris* in Meghalaya is rather interesting in the sense that the first one was so far known only from Japan and other two were known from Europe only. This indicates a discrete type of distribution and most likely they found entry in India through the infested plant material.

Among the 71 species reported here, five species, viz. *Bryobia praetiosa* infesting pear in East Garo hill, *Eutetranychus orientalis* infesting citrus in all districts surveyed, *Schizotetranychus andropogoni* infesting paddy in East Garo hill, *Eotetranychus hirsti* infesting fig and *Tetranychus neocaledonicus* attacking vegetables all through the state, were found as major pests. The damage done at least in case of *E. orientalis* was so severe that

the citrus growers reported premature leaf and fruit drop affecting the yield. Among the remaining phytophagous mites, *O. mangiferus* on mango, *P. citri* on mulberry, *B. phoenicis* on guava and *T. ludenion* on vegetables though often did occur in large number but never caused any noticeable damage.

Among the predatory mites, *A. (A.) largoensis* feeding upon *Oligonychus indicus* infesting banana, *A. (E.) alstoniae* upon *T. neocaledonicus* infesting vegetables, *A. (E.) ovalis* upon *T. urticae* infesting ornamental plants, *A. (E.) finlandicus* upon *E. hirsti* infesting fig and *A. (P.) multidentatus* upon *T. urticae* infesting brinjal appeared to be useful biocontrolling agents and the preliminary field observations indicated their potentiality if judiciously used.

The present report in no case indicates the total plant mite fauna of Meghalaya as because out of seven districts of the state, the collection upon which this faunal account is based represents only three districts. Therefore, more thorough survey specially during more than one season will no doubt throw more light on the potentially rich faunal wealth of the state.

SUMMARY

A total of 71 species of plant mites belonging to 28 genera, 13 families under 3 orders from Meghalaya is reported here which includes 3 species and 1 genus not hitherto known from India. Important synonymies, diagnosis wherever required, collection data of all the species, distribution and keys to orders, families, genera and species are provided. A discussion regarding geographical distribution of the species reported from Meghalaya and status of many species as pest/predator are also provided. Finally, a table indicating districtwise distribution of species is given.

ACKNOWLEDGEMENTS

The author is thankful to Dr. A. K. Ghosh, Director, Zoological Survey of India for the facilities and to Dr. Y. N. Gupta and Mr. B. C. Saha of the Zoological Survey of India for the help rendered in the field in collection.

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Table 1 : Districtwise distribution of plant mite species in Meghalaya

| Species | Districts | | | | | | |
|---------------------------|----------------|----------------|-----------------|-------------|---------|------------|------------|
| | East Garo hill | West Garo hill | East Khasi hill | Jainti hill | Ri-bhoi | West Khasi | South Garo |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| I. TETRANYCHIDAE | | | | | | | |
| 1. <i>B. praetiosa</i> | + | - | + | - | - | - | - |
| 2. <i>E. orientalis</i> | + | + | + | - | - | - | - |
| 3. <i>A. corpuzae</i> | - | + | + | - | - | - | - |
| 4. <i>A. baghensis</i> | + | - | + | - | - | - | - |
| 5. <i>E. hirsti</i> | + | + | - | - | - | - | - |
| 6. <i>E. kankitus</i> | - | - | + | - | - | - | - |
| 7. <i>E. sp.</i> | - | - | + | - | - | - | - |
| 8. <i>E. sexmaculatus</i> | - | - | + | - | - | - | - |
| 9. <i>P. citri</i> | + | - | - | - | - | - | - |
| 10. <i>P. ulmi</i> | - | - | + | - | - | - | - |

Table 1 (Contd.)

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|--------------------------------|-----|-----|-----|-----|-----|-----|-----|
| 11. <i>S. andropogoni</i> | + | - | - | - | - | - | - |
| 12. <i>S. meghalayensis</i> | - | + | - | - | - | - | - |
| 13. <i>O. indicus</i> | + | - | - | - | - | - | - |
| 14. <i>O. mangiferus</i> | + | - | + | - | - | - | - |
| 15. <i>T. ludeni</i> | + | - | + | - | - | - | - |
| 16. <i>T. neocaledonicus</i> | + | - | - | - | - | - | - |
| 17. <i>T. urticae</i> | + | - | - | - | - | - | - |
| II. TENUIPALPIADE | | | | | | | |
| 18. <i>B. phoenicis</i> | + | - | + | - | - | - | - |
| 19. <i>T. punjabensis</i> | + | - | - | - | - | - | - |
| 20. <i>T. punicae</i> | + | - | - | - | - | - | - |
| III. ERIOPHYIDAE | | | | | | | |
| 21. <i>Cosella fleschneri</i> | - | + | - | - | - | - | - |
| IV. PHYTOSEIIDAE | | | | | | | |
| 22. <i>A. channabasavannai</i> | + | - | + | - | - | - | - |
| 23. <i>A. herbicolus</i> | + | - | + | - | - | - | - |
| 24. <i>A. largoensis</i> | + | - | - | - | - | - | - |
| 25. <i>A. Kulini</i> | + | - | - | - | - | - | - |
| 26. <i>A. paraaerialis</i> | + | - | + | - | - | - | - |
| 27. <i>A. mcmurtryi</i> | - | + | - | - | - | - | - |
| 28. <i>A. alstoniae</i> | + | - | - | - | - | - | - |
| 29. <i>A. coccineae</i> | + | - | + | - | - | - | - |
| 30. <i>A. finlandicus</i> | + | - | - | - | - | - | - |
| 31. <i>A. ovalis</i> | + | + | - | - | - | - | - |
| 32. <i>A. pruni</i> | + | - | + | - | - | - | - |
| 33. <i>A. neococcineae</i> | - | + | - | - | - | - | - |
| 34. <i>A. salebrosus</i> | + | - | - | - | - | - | - |
| 35. <i>A. multidentatus</i> | + | - | + | - | - | - | - |
| 36. <i>A. fallacis</i> | - | + | - | - | - | - | - |
| 37. <i>A. kalimpongensis</i> | + | - | - | - | - | - | - |
| 38. <i>A. crotalariae</i> | - | + | + | - | - | - | - |

Table 1 (Contd.)

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|-------------------------------|-----|-----|-----|-----|-----|-----|-----|
| 39. <i>A. guajavae</i> | - | + | - | - | - | - | - |
| 40. <i>A. meghalayensis</i> | - | + | - | - | - | - | - |
| 41. <i>A. suknaensis</i> | + | + | + | - | - | - | - |
| 42. <i>A. syzygii</i> | + | - | - | - | - | - | - |
| 43. <i>A. sp.</i> | + | - | - | - | - | - | - |
| 44. <i>P. fragariae</i> | + | - | - | - | - | - | - |
| 45. <i>P. mumai</i> | - | - | + | - | - | - | - |
| 46. <i>P. kapuri</i> | + | - | + | - | - | - | - |
| 47. <i>P. meyeræ</i> | - | + | - | - | - | - | - |
| 48. <i>P. sp.</i> | + | - | - | - | - | - | - |
| 49. <i>T. darjeelingensis</i> | + | - | - | - | - | - | - |
| 50. <i>T. fleschneri</i> | - | - | + | - | - | - | - |
| 51. <i>T. homalii</i> | - | - | + | - | - | - | - |
| 52. <i>T. pruni</i> | + | - | - | - | - | - | - |
| 53. <i>T. rickeri</i> | - | - | + | - | - | - | - |
| 54. <i>T. neorhenanus</i> | - | + | - | - | - | - | - |
| V. ASCIDAE | | | | | | | |
| 55. <i>Lasioseius</i> sp. | + | - | - | - | - | - | - |
| 56. <i>Gamasellodes</i> sp. | + | - | - | - | - | - | - |
| VI. CHEYLETIDAE | | | | | | | |
| 57. <i>C. malaccensis</i> | + | - | - | - | - | - | - |
| VII. TYDEIDAE | | | | | | | |
| 58. <i>Tydeus</i> sp. | + | - | - | - | - | - | - |
| VIII. EUPODIDAE | | | | | | | |
| 59. <i>Eupodes</i> sp. | + | - | - | - | - | - | - |
| IX. BDELLIDAE | | | | | | | |
| 60. <i>Bdella</i> sp. | + | - | - | - | - | - | - |
| X. STIGMAEIDAE | | | | | | | |
| 61. <i>A. fleschneri</i> | + | - | - | - | - | - | - |
| 62. <i>A. garrulus</i> | + | - | - | - | - | - | - |
| 63. <i>A. sp.</i> | + | - | - | - | - | - | - |
| 64. <i>Ledermuelleria</i> sp. | + | - | - | - | - | - | - |

Table 1 (Contd.)

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|--------------------------------------|-----|-----|-----|-----|-----|-----|-----|
| XI. ANYSTIDAE | | | | | | | |
| 65. <i>Walzia indiana</i> | + | - | - | - | - | - | - |
| 66. <i>Walzia</i> sp. | + | - | - | - | - | - | - |
| XII. CUNAXIDAE | | | | | | | |
| 67. <i>C. capreolus</i> | + | - | - | - | - | - | - |
| 68. <i>C. setirostris</i> | + | - | - | - | - | - | - |
| 69. <i>Dactyloscirus machairodus</i> | + | - | - | - | - | - | - |
| XIII. ACARIDAE | | | | | | | |
| 70. <i>A. farris</i> | + | - | - | - | - | - | - |
| 71. <i>T. putrescentiae</i> | + | - | - | - | - | - | - |
| Total | 52 | 14 | 26 | - | - | - | - |

No information on plant mite fauna is available from the districts put under serial Nos. 4, 5, 6 and 7 and it was not possible for the author either to have any material from these districts.

As and when the material will be available, the distribution list will be modified accordingly.

ORIBATID MITES (ACARI : CRYPTOSTIGMATA)

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INTRODUCTION

Oribatid mites form a complex group under the order Acarina. It is an assemblage of diversified and predominant group of animals among the inhabitants of litter and soil. These mites are frequently designated as "moss" mites. They are primarily fungivorous, algivorous or saprophagous and occur in litter, soil, humus, compost heaps, moss, lichens growing over tree stumps, twigs and leaves, nests of birds (Aoki, 1966) house dust, caves (Mortiz *et al.*, 1971), aavv caves (Yamamoto and Aoki, 1971), nests of small mammals (Bulanova Zachvatkina *et al.*, 1974) and various other places, *viz.*, pasture soils, coniferous taiga forest, arctic tundra (Bregotova, 1965) and even in subantarctic zones (Wallwork, 1973). In fact they occur in all ecological niches, especially where vegetative material decay in sufficient moisture and are penetrated by mycelia.

This group of mites are of immense importance mostly of beneficial nature. They are known to promote soil fertility through humification of organic matter. These mites are also known to act as an agent for biological control of pests. Very few oribatids feed on higher plants. They are also responsible for transmitting various helminth diseases to domestic animals.

Information on the group from the World :

The first report of oribatid species was made as early as 1804 by Hermann from European soil. Later C. L. Koch (1836-1841) and A. D. Michael (1880-1884) made valuable contributions on the European oribatid mites. The most extensive and monumental work on this group was done by Berlese (1887-1916) and Oudemans (1896-1937). The other pioneer workers whose contributions enriched the knowledge of oribatid taxonomy are Willmann (1925-1951), Grandjean (1928-1972), Vander Hammen (1952-1973), Hammer (1952-1979), Balogh (1958-1989), Aoki (1959-1989), Wallwork (1960-1977), Mahunka (1965-1989), Perez Inigo (1964-1976), Engelbrecht (1969-1990), Northern (1978-1992) and others. Presently the oribatei are represented by more than 6000 species under about 800 genera from the world.

Information on the group from India :

In India the faunistic studies on oribatid mites dates back to the year 1906 when Pearce for the first time described 20 species of these mites from soils of Sikkim Himalaya. Later the knowledge was enriched to some extent by the works of Ewing (1910), Jacot (1933), Baker (1945), Anantharaman (1951), Prasad (1965) and others. Bhaduri and Raychaudhuri (1967)

for the first time reported oribatid mites from West Bengal. Later under the guidance of late Professor D. N. Raychaudhuri, Calcutta University the team of acarologists like Bhaduri, Chakrabarti, Bhattacharya, Sanyal, Mishra, Sarkar, Dhali, Deb, Ghosh, Mondal, Kundu and others during 1968-1986 described and reported several species of oribatid mites from West Bengal. Haq and Prabhoo (1976), Haq (1978a, 1978b, 1979), Haq and Adolph (1980), Balakrishna (1985, 1986a, 1986b), Balakrishna and Haq (1982) Mahunka (1985), Bayoumi and Mahunka (1979a, 1979b), Sarkar (1983, 1985, 1986), Sarkar and Subias (1982, 1983, 1984), Sanyal and Bhaduri, Sanyal and Sengupta (1981-1992) and Subias and Sarkar (1982, 1983, 1984) made extensive studies and published several papers. The details of work on Indian oribatid mites is given in Sanyal (1991). Till date, against an estimated total of about 159 families in the suborder, 64 families are represented in India, by a total number of 328 species and subspecies under 164 genera.

Information on the group from Meghalaya :

The study of oribatid mites from Meghalaya had long been neglected and only in 1979 Bayoumi and Mahunka received one specimen of oribatid mite from Meghalaya collected by Dr. W. Wittmer, Natural History Museum Basel, and they described the specimen *Hoplophthiracarus indicus* as new to science. So Dr. W. Wittmer is to be considered as the first collector and Bayoumi and Mahunka as the first worker of this group of mites from Meghalaya. Later Sanyal (1988) identified few oribatid specimens collected by Dr. V. T. Darlong, Zoological Survey of India, Eastern Regional Station, Shillong, Meghalaya and recorded seven species belonging to seven genera under six families. Of these, three species viz., *Mesotritia indica*, *Euphthiracarus meghalayensis* and *Eremobelba shillongensis* were described as new to science and four other species *Rhysotritia ardua* (koch) var. *otaheitensis*, *Dolicheremaeus coronarius*, *Suctobelba quadricarina* and *Galumna crenata* were recorded as new to the state. The present paper happens to be the third consolidated and extensive work on oribatid mites of Meghalaya.

Brief account of the collection and surveys done

The present work is based on a series of collection of oribatid mites made from Meghalaya by the author and the specimens collected by other survey parties of the Zoological Survey of India, which are available in National Zoological collection. The work also includes the species which were studied earlier and published by the author. One species reported from the state by the earlier worker is also included.

A brief account of the surveys undertaken for the study and collection from other surveys is given below :

1. Meghalaya Survey (East Garo Hills) Dr. S. K. Gupta and party (September, 1988).
2. Meghalaya Survey Dr. A. K. Sanyal and party (March, 1991).

The most important habitats which were thoroughly surveyed in Meghalaya for collection of the group are litter, soil, humus, moss, semidecomposed cow dung, plants, etc.

The contents of the present paper :

The paper deals with the oribatid fauna collected from Meghalaya. Altogether 42 oribatid species pertaining to 32 genera and 22 families have been incorporated in the paper.

It also records one species under one genera for the first time from India and 34 species, 25 genera and 16 families as the first record from Meghalaya. The original and most recent references, diagnostic features wherever needed, distribution of each species and key to the identification of families, genera and species known from Meghalaya have also been provided. The brief information on the group from World, India and Meghalaya with relevant references, general morphology and collection and preservation methods in brief were also dealt with. The species studied by the present author are deposited in the National Zoological Collection, Zoological Survey of India.

General morphology and terminology :

The morphological features in oribatid mite varies greatly. The body size of these mites measure between 100-900 μm . They are generally dorsoventrally flattened (Holonota) but occasionally may be cylindrical or laterally compressed (Ptyctima). The body is covered with thin or hard pigmented cuticle. The body colour may be opaline white, dark brown, yellow brown and even black in some specimens. However, majority are brown in colour. The body surface may be dotted, pitted, tuberculate, striolate, rugose, polygonal or reticulate in separate cases. In some cases the body surface is covered with cerotegument.

The body is divided into several regions. The body parts are either movably or immovably articulated.

The body of an oribatid mite is divided into two parts the proterosoma and hysterosoma. Dorsally the proterosoma is covered by the shield called prodorsum and the shield covering hysterosoma is notogaster. The ventral side is known as ventral plate which includes coxosternal or epimeral region, genital and anal plates with openings. The general morphology of primitive and higher oribatids shows differences (Figs. 1-6).

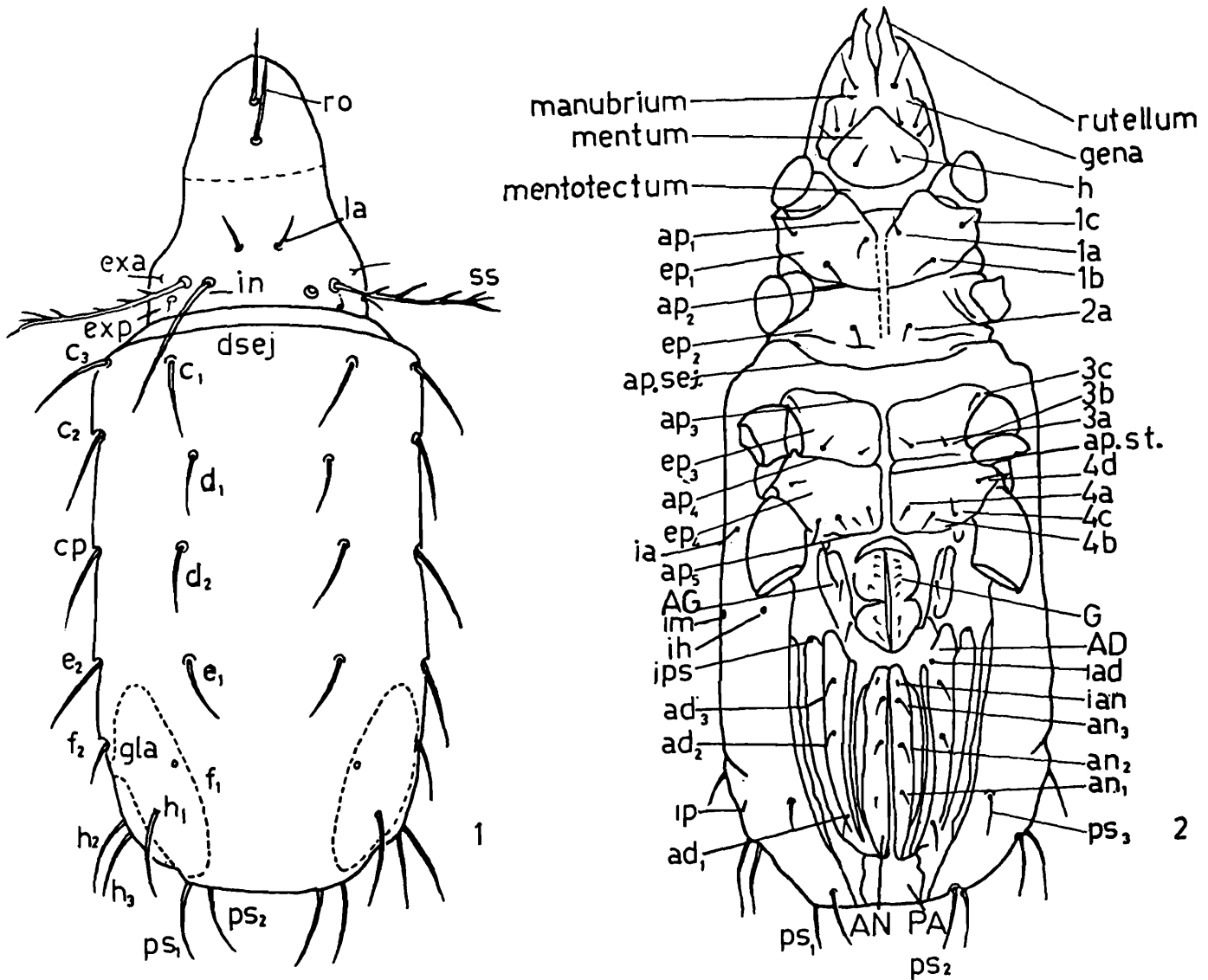
Prodorsum : This triangular area mainly with frontally pointed rostrum consists of lamellae, translamellae, condyles, tutorium, pedotecta, tubercles and other protruberences (Figs. 5, 7). The prodorsum bears 4-6 pairs of setae *viz.*, anterior exobothridial (*exa*), posterior exobothridial (*exp*) and sensillae (*ss*). The sensillus may be of different shapes and sizes (Fig. 8). In ptyctima group the prodorsum is called aspis. The prodorsum is separated from hysterosoma by dorsojugal (*dsj*) and sejugal (*sej*) sutures.

Notogaster : The notogaster in some genera is extended like wing which is known as pteromorphae (Fig. 5). It may also bear chitinous excrescences like spines, condyles, teeth and posteriorly decurrent lamellae or cristae (Fig. 5). The pteromorpha may be of different types like aptera, immoptera, oxyptera, euptera and umbrellata. In the primitive group of oribatid there are 15-16 notogastral setae while in the higher oribatids the number is usually 10. In some genera neotrichy is found. The notogaster also bears ototoxic organs like glands (*gla*), stigmata and other sense organ (laryfissure), area porosae, pore, sacculi, etc.

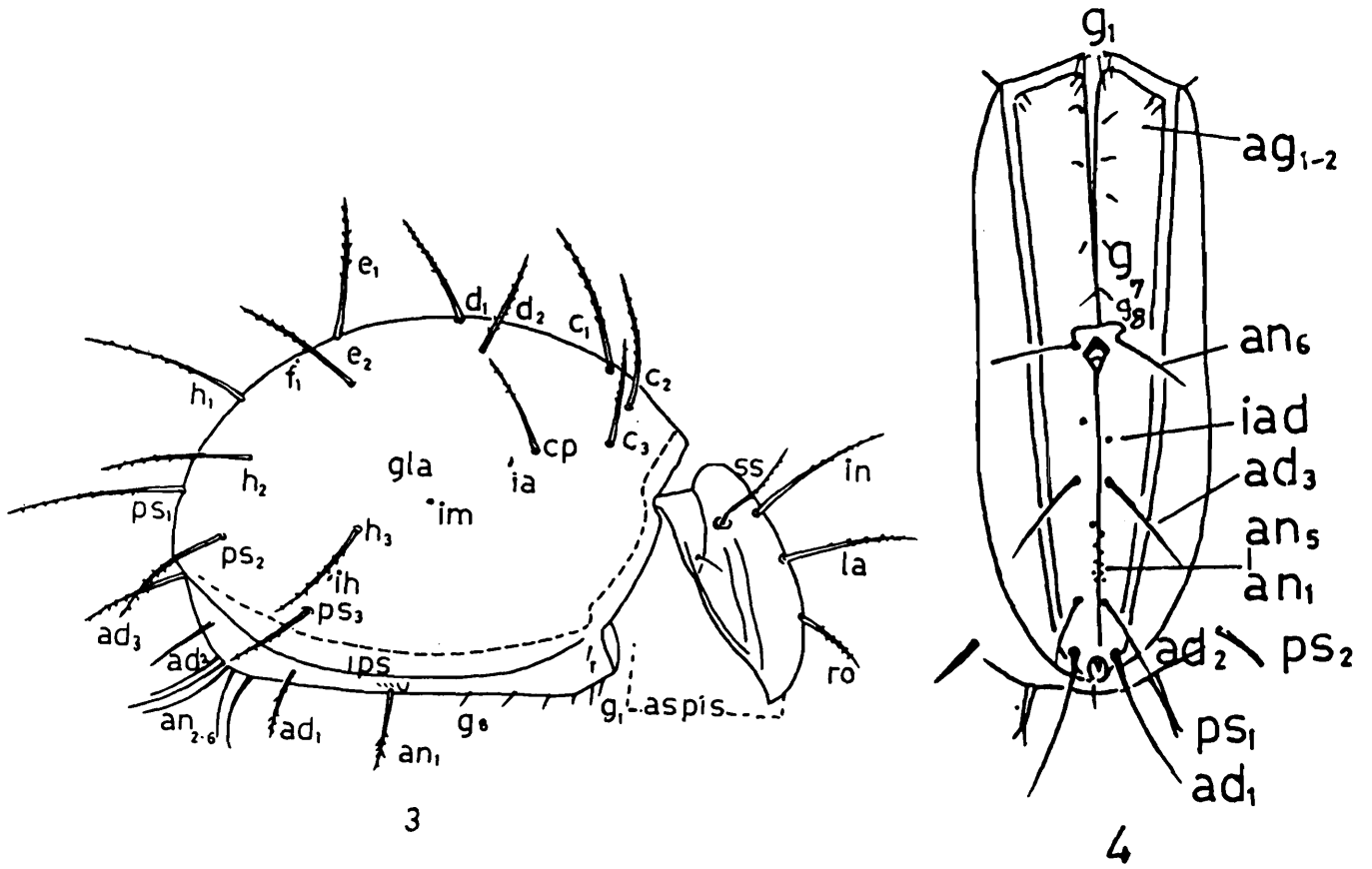
Gnathosoma : It is formed of chelicerae, pedipalpi, hypostomal and epistomal structures (Figs. 9, 10).

Epimeral region : The epimeral fields of epimeres (*ep₁-ep₄*) are separated from one another by epimeral furrows and their continuations are known as apodemes (*ap₁-ap₅*). The epimeres bear setae (Fig. 6).

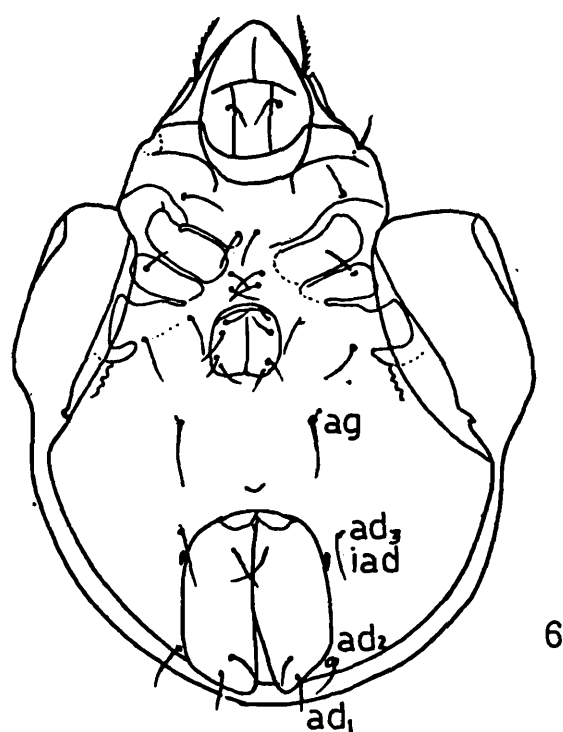
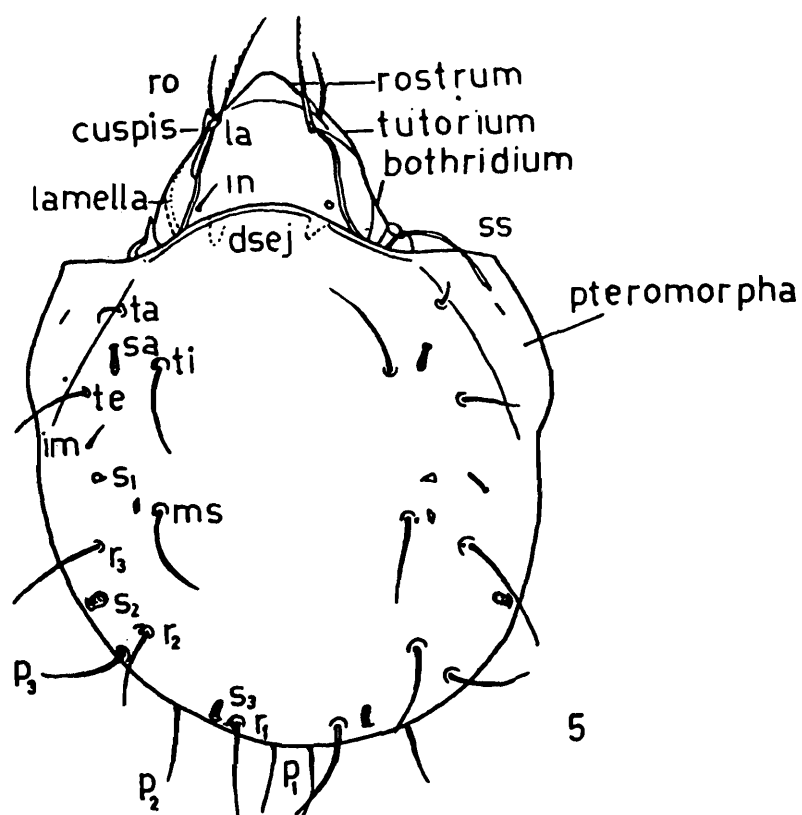
Anogenital region : The portion of the ventral plate behind the epimeral region is called the anogenital region. The region may be of two types i.e. macropyline and brachypylinetype



Figs. 1-2 : Primitive oribatids of the dichoid type. 1. dorsal view : *ro* = rostral setae, *la* = lamellar seta, *in* = inter-lamellar seta, *exa* = anterior exobothridial seta, *exp* = posterior exobothridial seta, *ss* = sensillus, *c*₁, *c*₂, *c*₃, *d*₁, *d*₂, *e*₁, *e*₂, *f*₁, *f*₂, *h*₁, *h*₂, *h*₃, *ps*₁, *ps*₂ notogastral setae, *gla* = oil gland. 2. ventral view : *G* = genital plate, *AG* = aggenital plate, *AN* = anal plate, *AD* = adanal plate, *PA* = postanal plate, *ap*₁-*ap*₅ = apodemes, *ap. sej* = sejugal apodeme, *ap. st.* = sternal apodeme, *ep*₁ - *ep*₄ = epimeres, *ia*, *ih*, *im*, *ips*, *iad*, *ian* = lyri fissures, *an*₁-*an*₃ = anal setae, *ad*₁-*ad*₃ = adanal setae, *ps*₃ = notogastral seta, *la*-*lc* = setae of epimere 1, *2a* = seta of epimere 2, *3a*-*3c* = setae of epimere 3, *4a*-*4d* = setae of epimere 4.



Figs. 3-4 : Primitive oribatids of ptychoid type. 3. lateral view : ex = exobothridial seta, g_1 - g_8 = genital setae. 4. anogenital region : ag_1 - ag_2 = aggenital setae.



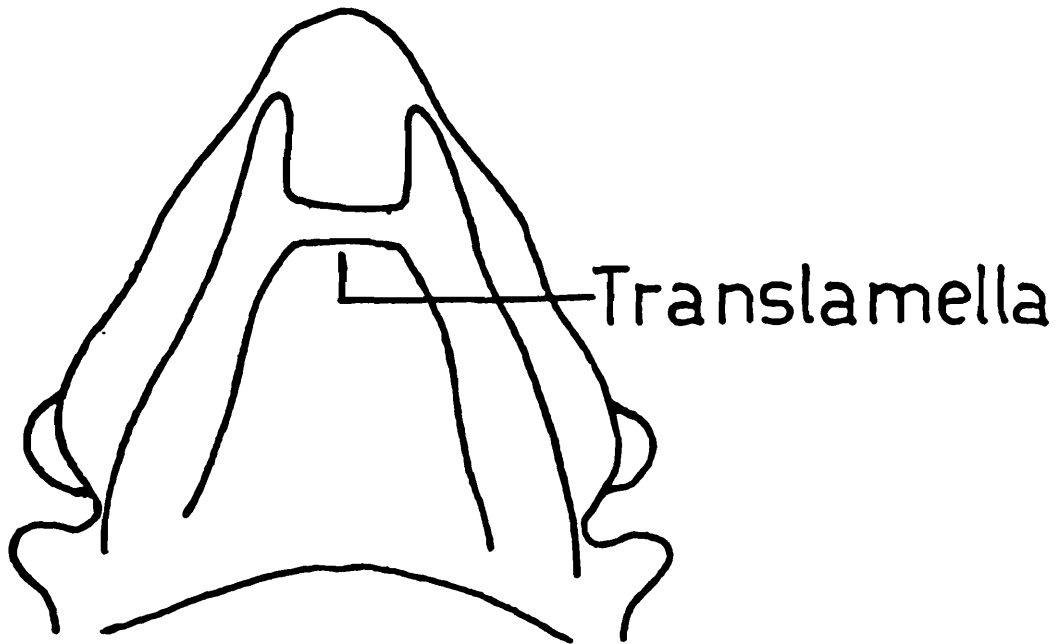
Figs. 5-6 : Body of higher oribatids. 5. dorsal view : *dsej* = dorsosejugal suture, *ta*, *te*, *ti*, *ms*, *r₁-r₃*, *p₁-p₃* = notogastral setae, *sa*, *s₁-s₃* = sacculi. 6. ventral view : *ag* = aggenital seta.

can be further divided into four subtypes *viz.*, pseudogastric, diagastric, schizogastric and hologastric.

Legs: Legs of oribatid mites usually consist of 5 free segments-trochanter, femur, genu, tibia and tarsus. In some cases where the coxae is free there are 6 segments (Fig. 11). The larvae have three pairs of legs and no genital opening. For details Sanyal (1992) may be consulted.

Material and Methods :

The taxonomic studies of oribatid mites, samples mainly litter, soil and humus from all possible habitats from the districts of Meghalaya were collected. The samples were taken from upper 10 cm of soil profile and collected in polythene bags. The samples were extracted by using modified Tullgren funnels and the mites were collected in glass tubes containing 90% alcohol.



7

Fig. 7 Prodorsum showing translamella.

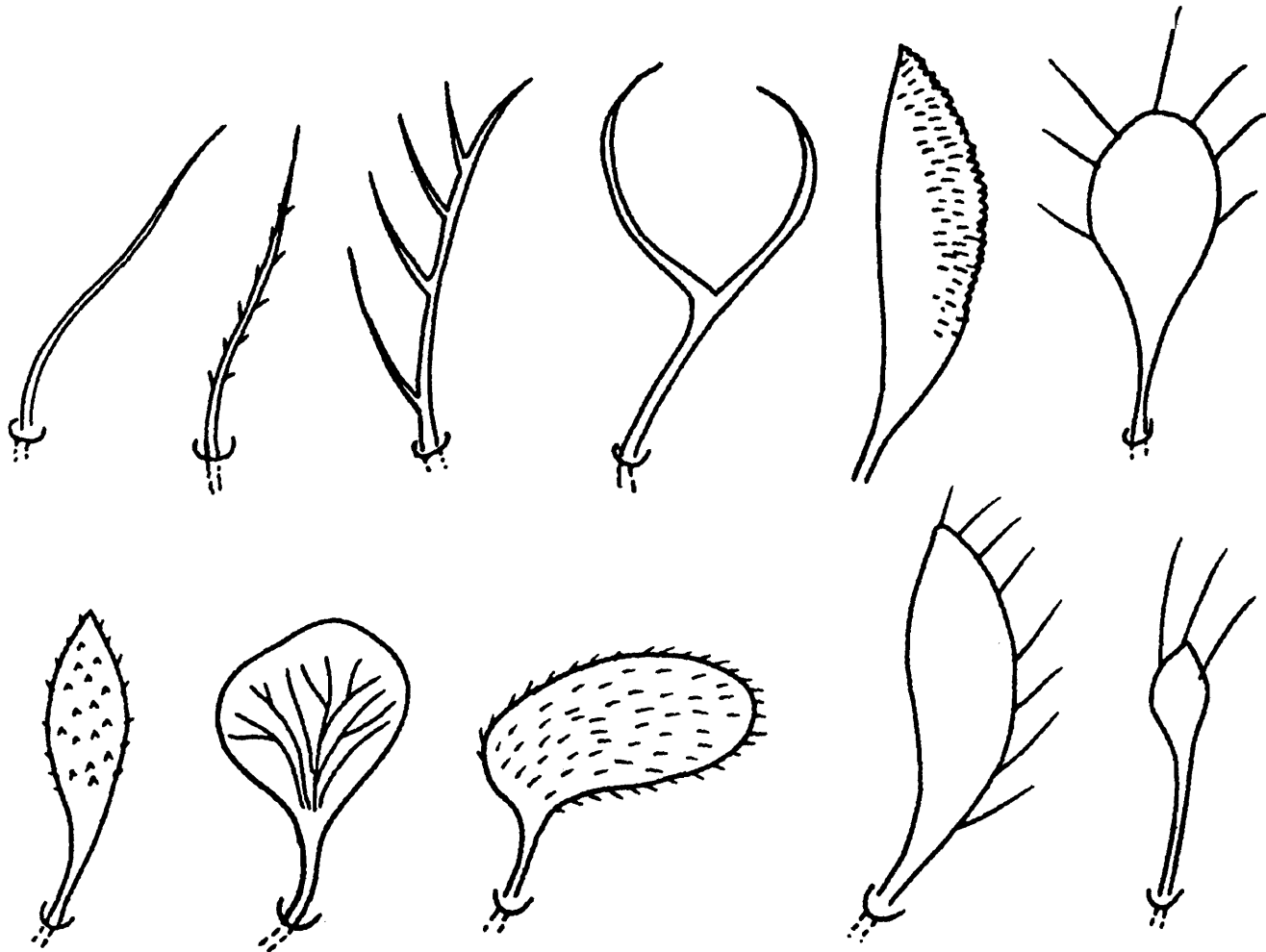
The highly sclerotized specimens were kept in a solution of 90% alcohol and lactic acid (v/v) for clearing as advocated by Balogh (1965). For microscopic observations the specimens were mounted in lactic acid and after study the same were transferred to 90% alcohol for permanent storage. The measurement of the specimens has been given in micron (μ .) For identification of specimens, the keys prepared by Balogh (1972), Balogh and Mahunka (1983), Balogh and Balogh (1988) and Subias and Balogh (1989) have been followed.

LIST OF ORIBATID TAXA KNOWN FROM MEGHALAYA

1. Family MESOPLOPHORIADE Ewing, 1917
 1. Genus ***Adoplophora*** Aoki, 1980
 1. *Apoplophora* sp.
2. Family PHTHIRACARIDAE Perty, 1841
 2. Genus ***Hoplophorella*** Berlese, 1923
 2. *H. scapellata* Aoki, 1965
 3. Genus ***Hoplophthiracarus*** Jacot, 1933
 3. *Hoplophthiracarus indicus* Bayoumi and Mahunka, 1979
 4. *Hoplophthiracarus* sp.
3. Family EUPHTHIRACARIDAE Jacot, 1930
 4. Genus ***Euphthiracarus*** Ewing, 1917
 5. *E. meghalayensis* Sanyal, 1988
 5. Genus ***Rhysotritia*** Markel and Meyer, 1959
 6. *R. aruda* (Koch) var. *otaheitensis* Hammer, 1972
 7. *Rhysotritia* sp.
4. Family ORIBOTRITIIDAE Grandjean, 1954
 6. Genus ***Mesotritia*** Forsslund, 1963
 8. *M. indica* Sanyal, 1988
5. Family TRHYPOCHTHONIIDAE Willmann, 1931
 7. Genus ***Allonothrus*** Hammen, 1953
 9. *A. monodactylous* Wallwork, 1960
 10. *A. russeolus* Wallwork, 1960
 8. Genus ***Archegozetes*** Grandjean, 1931
 11. *A. logisetosus* Adki, 1965
6. Family MALACONOTHRIDAE Berlese, 1916
 9. Genus ***Malacnothrus*** Berlese, 1904
 12. *Malacnothrus* sp.
7. Family MICROTEGEIDAE Balogh, 1972
 10. Genus ***Microtegeus*** Berlese, 1917
 13. *Microtegeus* sp.
8. Family EREMULIDAE Grandjean, 1905
 11. Genus ***Eremulus*** Berlese, 1908
 14. *Eremulus* sp.
9. Family EREMOBELBIDAE Balogh, 1961
 12. Genus ***Eremobelba*** Berlese, 1908

15. *E. shillongensis* Sanyal, 1988
16. *Eremobelba* sp.
10. Family ZETORCHESTIDAE Michael, 1898
 13. Genus **Zetorchestes** Berlese, 1988
 17. *Z. saltator* Oudemans, 1915
11. Family METRIOPPIDAE Balogh, 1943
 14. Genus **Ceratoppia** Berlese, 1908
 18. *C. bipilis* Hermann, 1804
12. Family CARABODIDAE Koch, 1837
 15. Genus **Phyllocarabodes** Balogh and Mahunka, 1969
 19. *Phyllocarabodes* sp.
13. Family TECTOCEPHEIDAE Grandjean, 1954
 16. Genus **Tectocephus** Berlese, 1913
 20. *T. velatus* (Michael, 1888)
14. Family OTOCEPHEIDAE Balogh, 1961
 17. Genus **Dolicheremaeus** Jacot, 1938
 21. *D. Coronarius*. Chakrabarti, Bhaduri and Kundu, 1981
 22. *Dolicheremaeus* sp.
 18. Genus **Pseudotocephus** Balogh, 1960
 23. *P. orientalis* Mondal and Kundu, 1983
15. Family OPPIIDAE Grandjean, 1954
 19. Genus **Ameroppia** Hammer, 1961
 24. *Ameroppia* sp.
 20. Genus **Oppia** Koch, 1836
 25. *Oppia* sp.
 21. Genus **Oppiella** Jacot, 1937
 26. *O. nova* (Oudemans, 1902)
16. Family SUCTOBELBIDAE Grandjean, 1954
 22. Genus **Suctobelba** Paoli, 1908
 27. *S. quadricarina* Hammer, 1958
 28. *S. variosetosa* Hammer, 1961
17. Family CHAUNOPROCTIDAE Balogh, 1961
 23. Genus **Chaunoproctus** Pearce, 1906
 29. *Chaunoproctus* sp.
18. Family ORIBATULIDAE Thor, 1929
 24. Genus **Scheloribates** Berlese, 1908

30. *S. parvus* Pletzen, 1963
31. *S. saswatii* Dhali and Bhaduri, 1980
32. *S. sikkimensis* Dhali and Bhaduri, 1980
33. *S. thermophilus* Hammer, 1961
34. *Scheloribates* sp.



8

Fig. 8 : Different types of sensillus

19. Family HAPLOZETIDAE Grandjean, 1936
25. Genus *Peloribates* Berlese, 1908
35. *Peloribates* sp.
26. Genus *Phalacrozetes* Aoki, 1965
36. *P. sinatus* Aoki, 1965
27. Genus *Rostrozetes* Sellnick, 1925
37. *R. foveolatus* Sellnick, 1925

28. Genus ***Xylobates*** Jacot, 1929
 38. *X. seminudus* Hammer, 1971
20. Family MOCHLOZETIDAE Grandjean, 1960
 29. Genus ***Unguizetes*** Sellnick, 1925
 39. *U. clavatus* Aoki, 1967
21. Family ORIBATELLIDAE Jacot, 1925
 30. Genus ***Lamellobates*** Hammer, 1958
 40. *L. palustris* Hammer, 1958
31. Genus ***Paralamellobates*** Bhaduri and Raychaudhuri, 1968
 41. *P. bengalensis* Bhaduri and Raychaudhuri, 1968
22. Family GALUMNIDAE Jacot, 1925
 32. Genus ***Galumna*** von Heyden, 1826
 42. *G. crenata* Deb and Raychaudhuri, 1975

Key to the families of oribatid mites known from Meghalaya

- 1(8). Body ptychoid, propodosoma can be shut back against the hysterosoma and ventral region like blade of penknife; body generally laterally compressed
- 2(3). Genital and anal plates well separated and plates rounded i.e., brachypyline type of anogenital region Mesoplophoridae
- 3(2). Genital and anal plates meeting each other i.e., macrophyline type of anogenital region; anal plates not rounded
- 4(5). Anogenital region wide, almost U-shaped; body not much compressed Phthiracaridae
- 5(4). Anogenital region narrow, V-shaped; body much compressed laterally
- 6(7). Anogenital region with interlocking triangle; genital and anal plates fused with aggenital and adanal plates Euphthiracaridae
- 7(6). Anogenital region without interlocking triangle, anal plates separated from adanal plate Oribotritiidae
- 8(1). Body not ptychoid, propodosoma cannot be shut back against the hysterosoma and ventral region; body never laterally compressed
- 9(12). Anogenital region macropyline type, V-shaped; ventral plate not developed
- 10(11). Bothridium absent Malaconothridae
- 11(10). Bothridium present Trhypochthoniidae
- 12(9). Anogenital region brachypyline type
- 13(33). Notogaster pycnonotic i.e., areae porosae, sacculi or pori absent; pteromorphae absent
- 14(20). Prodorsum having lamellae with cuspides

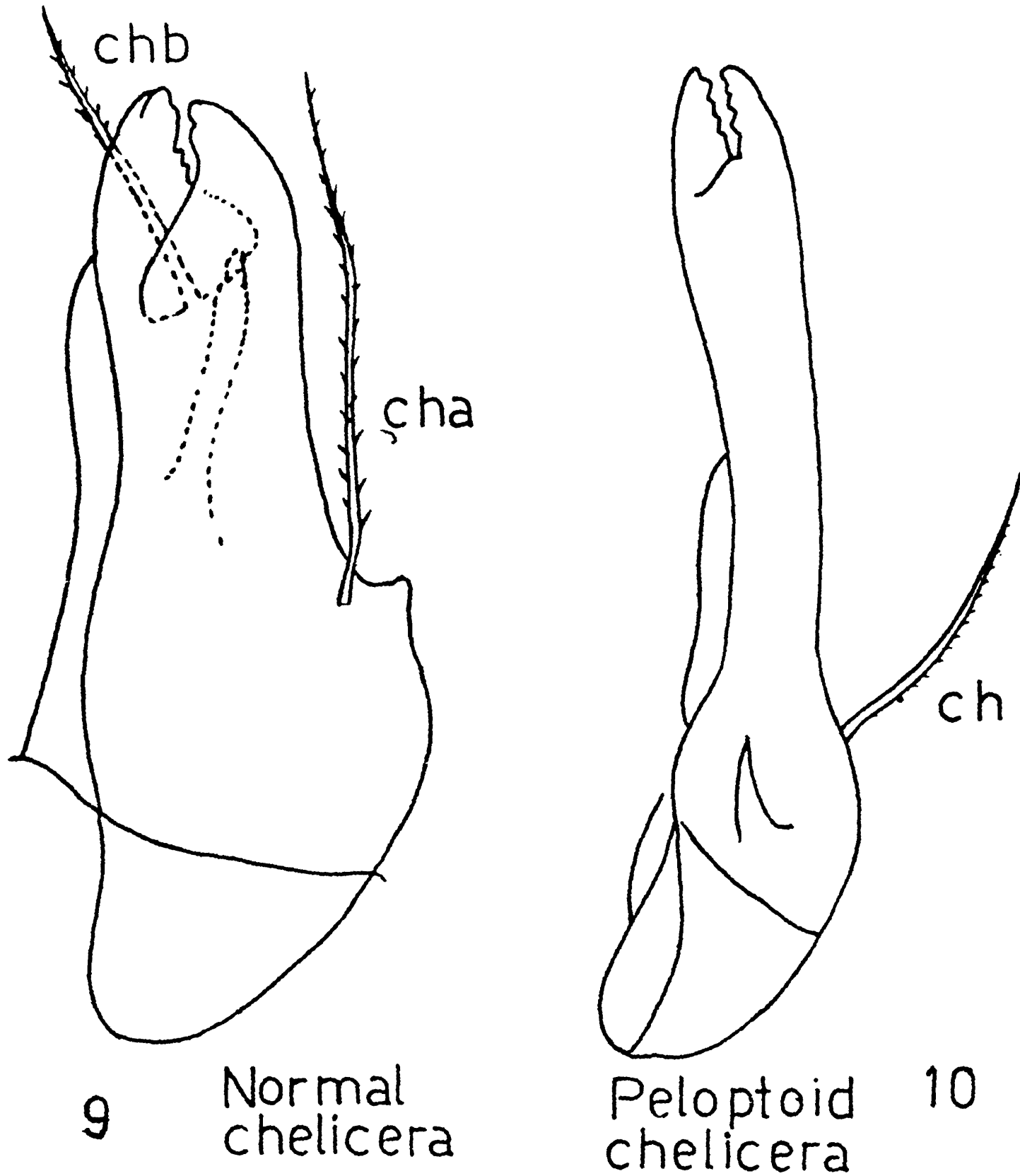


Fig. 9-10 : Two main types of chelicera. 9. normal : *cha*, *chb* = cheliceral setae. 10. pelotheid : *ch* = cheliceral seta.

- 15(16). One pair of notogastral setae originate on central part of notogaster, remaining setae submarginal and posteromarginal Microtegeidae
- 16(15). Two to four pairs of notogastral setae originate on central part of notogaster
- 17(18). Dorsosejugal suture complete; lamellae with short cuspides; translamella often absent Carabodidae
- 18(17). Dorsosejugal suture absent; lamellar-interlamellar complex H-shaped; notogastral setae hardly visible Tectocephidae
- 19(18). Dorsosejugal suture incomplete in the middle; lamellar-interlamellar complex not H-shaped; notogastral setae long Chaunoproctidae
- 20(14). Prodorsum without true lamellae; either thin crest-shaped lamellae or thin costulae present or both lamellae and costulae absent
- 21(24). Ventral neotrichy present, more than four pairs of aggenital + adanal setae
- 22(23). Pedotecta II present; notogaster usually with polygonally arranged granulation; no costula Eremobelbidae
- 23(22). Pedotecta II absent; notogaster without polygonally arranged granulation; prodorsum with two distinct longitudinal costulae Eremulidae
- 24(21). Ventral neotrichy absent
- 25(26). Rostral setae bifurcate; legs IV longer than I-III for jumping Zetorchestidae
- 26(25). Rostral setae never bifurcate; legs IV never adopted for jumping
- 27(28). Anterior and central part of notogaster without setae; only 2-4 pairs of postero-marginal setae present; thin lamellae present
Metrioppidae Balogh, 1943
- 28(27). Anterior and central part of notogaster with setae; notogastral setae 10-14 pairs; lamellae absent
- 29(30). Body elongate, mostly at least twice longer than wide; prodorsal and notogastral condyles present Otocephidae
- 30(29). Body not elongate, mostly never twice as long as wide
- 31(30). Chelae attenuating, rudimentary Suctobelbidae
- 32(31). Mandibulae normal; costulae when present almost parallel; anal and genital plates small, placed far from each other Opiiidae
- 33(13). Notogaster pronotic i.e. areae porosae, sacculi or pori present; pteromorphae usually present
- 34(35). Pteromorphae movable, articulate or semicircular; Prodorsum without true projecting lamellae; some chitinous lines present on the
prodorsum Galumnidae
- 35(34). Pteromorphae movable or not movable but never articulate and semicircular; lamellae present
- 36(39). Pteromorphae without any hinge and fixed i.e., immovable type
- 37(38). Dorsosejugal suture interrupted medially; genital setae six pairs Mochlozetidae
- 38(37). Dorsosejugal suture complete; genital setae four or five
pairs Oribatulidae

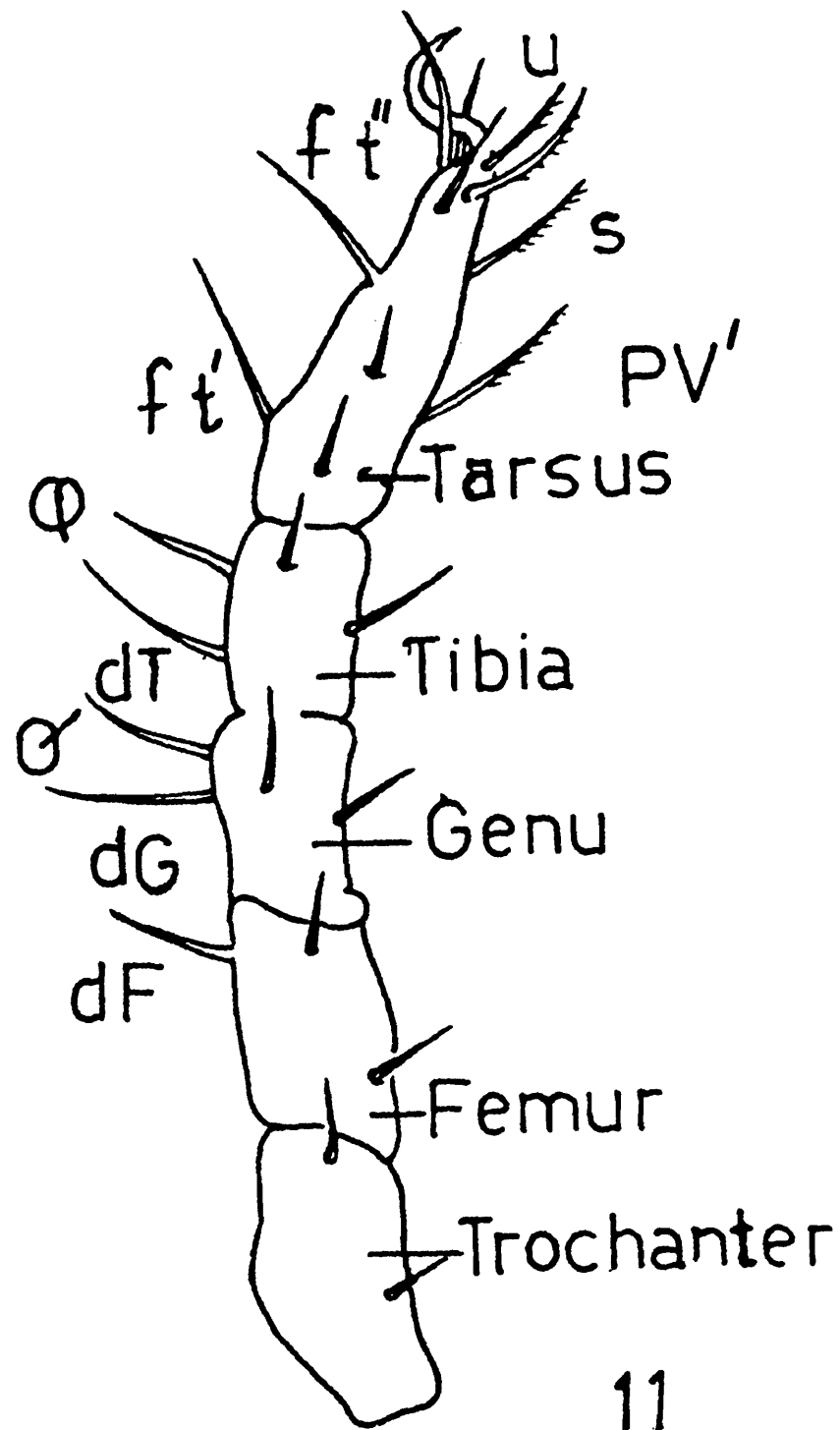


Fig. 11 : Leg of oribatid (normal setae marked with Latin letters, solenidia marked with Greek letters).

- 39(36). Pteromorphae with hinge and movable i.e., eupterous type
 40(41). Notogaster with true areae porosae; lamellae extremely wide, meeting medially or fusing only basally, covering major portion of prodorsum; cuspides free
 Oribatellidae
 41(40). Notogaster with sacculi or pori; lamellae not wide and meeting medially or fusing basally, major portion of prodorsum open Haplozetidae

1. Family MESOPLOPHORIDAE Ewing, 1917

1. Genus *Apoplophora* Aoki

1980. *Apoplophora* Aoki, *Proc. Soc. Syst. Zool.*, No. 18 : 13.

1. *Apoplophora* sp.

Material examined : East Garo Hills : 1♂, Khanapara, 12.x. 1988, from decomposed wood, coll. B.J. Sarkar.

Distribution Meghalaya (East Garo Hills), West Bengal.

Remarks : This species is different from other known species under this genera. But specific identification was not done due to only one specimen. The genus is reported here for the first time from Meghalaya.

2. Family PHTHIRACARIDAE Perty, 1841

Key to the genera of Phthiracaridae

- 1(2). Interlamellar setae decumbent and almost similar in shape to lamellar setae; three pairs of anal setae *Hoplophorella*
 2(1). Interlamellar setae erect, usually much longer and thicker than lamellar setae; two pairs of anal setae *Hoplophthiracarus*

2. Genus *Hoplophorella* Berlese

1923. *Hoplophorella* Berlese, *Redia*, 25 : 260

2. *Hoplophorella scapellata* Aoki

1965. *Hoplophorella scapellata* Aoki, *Nat. Life Southeast Asia*, 4 : 131.

Diagnosis : integument with minute pits; rostral and interlemellar setae long, strong, directed upward; lamellar setae minute, fine; sensillus almost equally thick throughout its length except distal half which is hyaline and uneven; notogastral hood absent; fifteen pairs of notogastral setae, broad, spatulate; ad_1 similar to notogastral setae, ad_2 minute.

Material examined : East Garo Hills : 2♀♀, Darugiri, 2.x. 1988, from decomposed wood, coll. B.J. Sarkar.

Distribution : Meghalaya (East Garo Hills), Bihar, Manipur, West Bengal.

Remarks : The genus and species are new to the state.

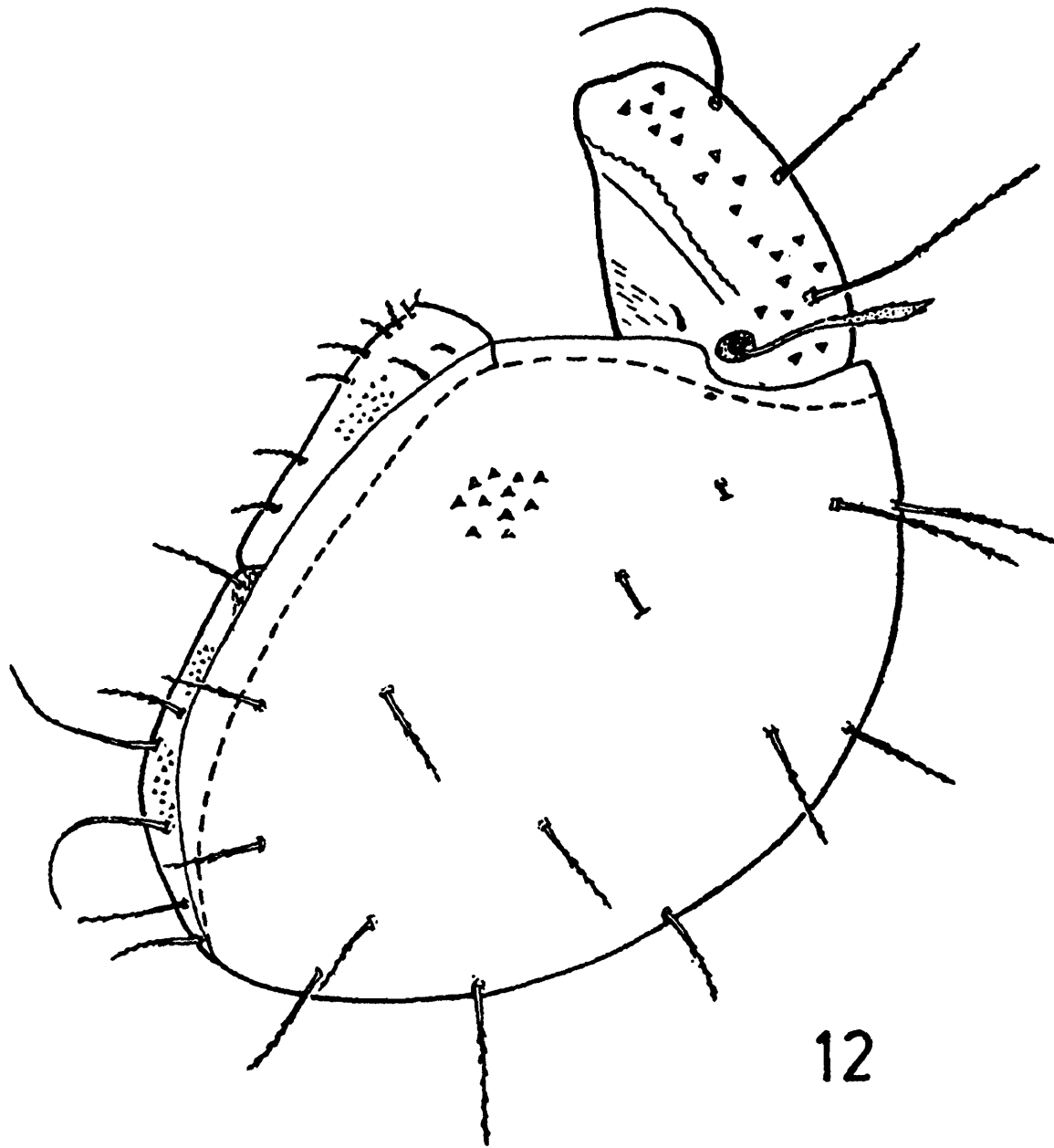


Fig. 12 : *Euphthiracarus meghalayensis* Sanyal, 1988 : lateral view.

3. Genus *Hoplophthiracarus* Jacot

1933. *Hoplophthiracarus* Jacot, *J. Elisha Mitchell Sci. Soc.*, **48** : 239.

3. *Hoplophthiracarus indicus* Bayoumi and Mahunka

1979. *Hoplophthiracarus indicus* Bayoumi and Mahunka, *Entomologica Basiliensia*, **4** : 13.

Diagnosis Aspis broadly rounded anteriorly; rostral setae long, decumbent; lamellar setae simple, minute; interlamellar setae long, erect, setiform, distally barbed; sensillus elbow-shaped; notogaster foveolate; all notogastral setae setiform, rigid, distally barbed; setae ad_1 and ad_2 about two times as long as anal setae.

Distribution : Meghalaya (East Khasi Hills).

4. *Hoplophthiracarus* sp.

Material examined : East Garo Hills : 1♀, Dianadubi Reserve Forest, 6.x. 1988, from decomposed betel nut leaves, coll. B.J. Sarkar.

Remarks : As the specimen is damaged the specific identification is not done. The genus is recorded here as new to Meghalaya.

3. Family EUPHTHIRACARIDAE Jacot, 1930

Key to the genera of Euphthiracaridae

- 1(2). Longitudinal suture separating ventral plates with one median and one posterior triangles *Euphthiracarus*
 2(1). Longitudinal suture separating ventral plates with only median triangle
 *Rhysotritia*

4. Genus *Euphthiracarus* Ewing

1917. *Euphthiracarus* Ewing, *Ann. ent. Soc. Am.*, **10** : 125.

5. *Euphthiracarus meghalayensis* Sanyal

(Fig. 12)

1988. *Euphthiracarus meghalayensis* Sanyal, *Rec. zool. Surv. India*, **85** (2) : 227.

Diagnosis : Aspis with two lateral carinae on each side; surface of aspis between the upper carinae and the whole surface of notogaster distinctly sculptured with papillae; rostral setae smooth, long, directed outward and bent downward; lamellae and interlamellar setae barbed; fourteen pairs of barbed notogastral setae; genito-aggenital region with papillae; weight pairs of genital setae.

Distribution Meghalaya (East Khasi Hills).

5. Genus *Rhysotritia* Markel and Meyer

1959. *Rhysotritia* Markel and Meyer, *Zool. Anz.*, **163** : 329.

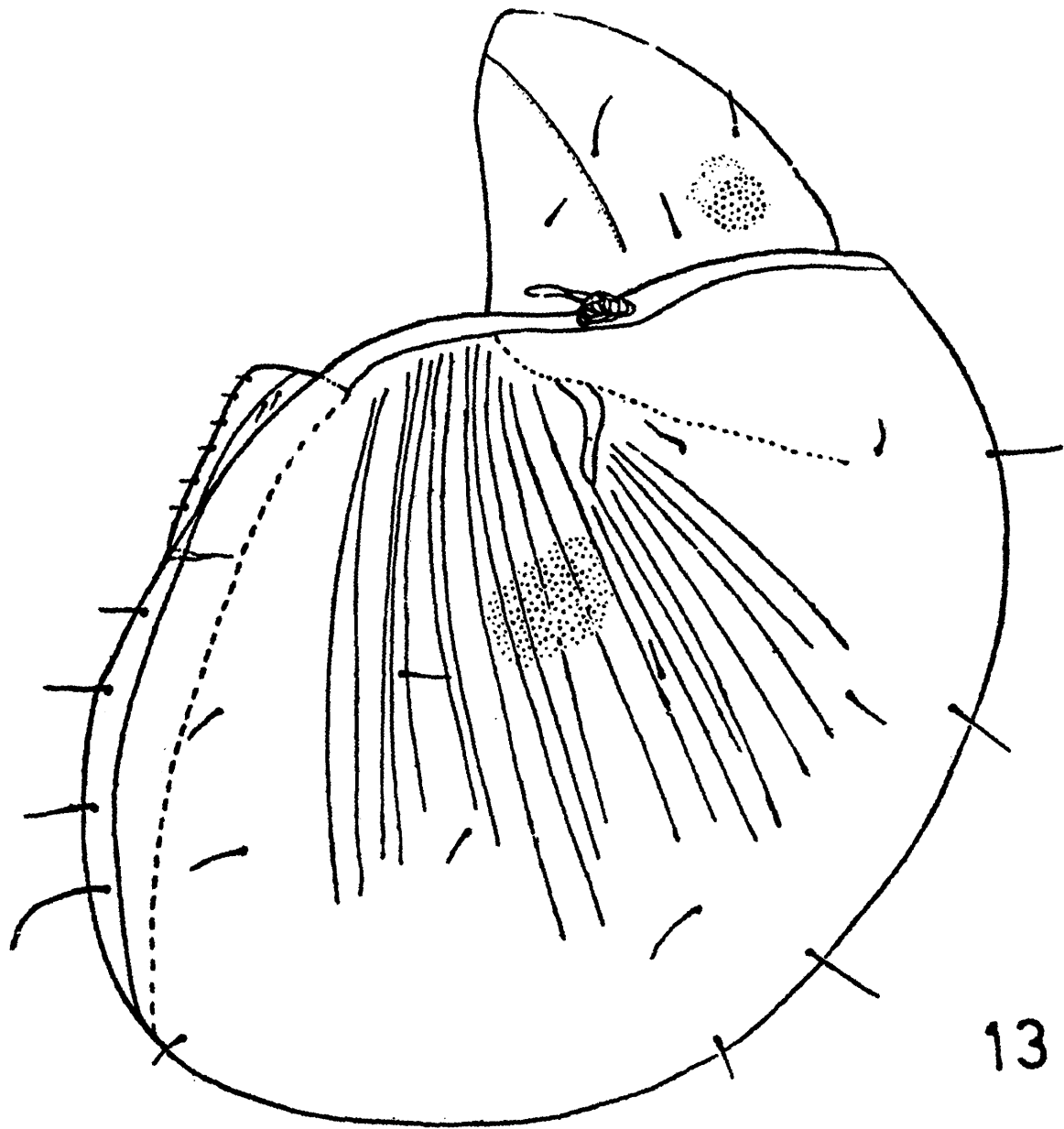


Fig. 13 : *Mesotritia indica* Sanyal, 1988 : lateral view.

6. *Rhysotritia ardua* (Koch) var. *otaheitensis* Hammer

1972. *Rhysotritia ardua* (Koch) var. *otaheitensis* Hammer, *Biol. Skr. Dan. Vid. Selsk.*, **19** (3) : 12.

1988. *Rhysotritia ardua* (Koch) var. *otaheitensis*, Sanyal, *Rec. zool. Surv. India*, **85** (2) : 230.

Diagnosis : Aspis granulated anteriorly, with single lateral carina on each side; rostral setae weakly barbed; lamellar and interlamellar setae thick, strongly barbed; sensillus distally dilated into a flat head set with coarse bristles on its surface; notogaster finely punctate; notogastral setae apically barbed; genital setae nine pairs.

Distribution : Meghalaya (East Khasi Hills), West Bengal.

Remarks : The genus and the species are new to the state.

7. *Rhysotritia* sp.

Material examined : Ri-Bhoi : 4♀♀, Lum Nehru Park, Umiam, Barapani, 21.iii. 1991, from decomposed cow dung and straw, coll. A.K. Sanyal. East Khasi Hills : 3♀♀, Cherapunjee, 22.iii. 1991, from soil, coll. A.K. Sanyal.

Remarks : The specimens seem to be interesting and need further study.

4. Family ORIBOTRITIIDAE Grandjean, 1954

6. Genus *Mesotritia* Forsslund

(Fig. 13)

1963. *Mesotritia* Forsslund, *Ent. Tidskr. Stockh*, **84** : 282-283.

8. *Mesotritia indica* Sanyal

1988. *Mesotritia indica* Sanyal, *Rec. zool. Surv. India*, **85** (2) : 225.

Diagnosis Dorsum finely granulated; a single lateral carina on each side of aspis; rostral, lamellar and interlamellar setae fine, smooth; sensillus with blunt head; notogaster granulated with fine lines of striation; fourteen pairs of fine short notogastral setae; aggenital setae on the middle portion of the aggenital plate.

5. Family TRHYPOCHTHONIIDAE Willmann, 1931

Key to the genera of Trhypochthoniidae

- 1(2). Legs tridactylous or monodactylous; seven to fourteen pairs of genital setae; notogastral setae flabelliform; notogaster pentagonal **Allonothrus**
- 2(1). Legs monodactylous; seven pairs of genital setae; notogastral setae simple, notogaster quadrangular **Archegozetes**

7. Genus *Allonothrus* Hammer

1953. *Allonothrus* Hammer, *Proc. Acad. Sci. Amst.*, **56c** : 244.

Key to the species of *Allonothrus*

- 1(2). Legs monodactylous; genital setae seven pairs; notogastral setae distally incomplete *monodactylous*
- 2(1). Legs tridactylous; genital setae thirteen pairs; notogastral setae distally not incomplete *russeolus*

9. *Allonothrus monodactylous* Wallwork

1960. *Allonothrus monodactylous* Wallwork, *Acarologia*, 2(4) : 568.

Material examined : East Garo Hills : 7♀♀, Darugiri, 2.x. 1988, from decomposed wood, coll. B.J. Sarkar; 33♀♀, Wagesi, 5.x. 1988, from soil, coll. B.J. Sarkar.

Distribution : Meghalaya (East Garo Hills), West Bengal.

Remarks : The species is reported here for the first time from Meghalaya.

10. *Allonothrus russeolus* Wallwork

1960. *Allonothrus russeolus* Wallwork, *Acarologia*, 2(4) : 571.

Material examined : East Garo Hills : 6♀♀, Darugiri, 2.x. 1988, from decomposed wood, coll. B.J. Sarkar; 12♀♀, Wagesi, 5.x. 1988, from soil, coll. B.J. Sarkar; 60♀♀, Dianadubi Reserve Forest, 6.x. 1988, from decomposed betel nut leaves and soil, coll. B.J. Sarkar; 2♀♀, Wagesi, 7.x. 1988, from soil, Coll. B.J. Sarkar; 8♀♀, Rongnil, 8.x. 1988, from decomposed leaf litter and soil, coll. B.J. Sarkar; 8♀♀, Kharkutta, 9.x. 1988, from soil, coll. B.J. Sarkar.

Distribution : Meghalaya (East Garo Hills), West Bengal.

Remarks : This is first record of the genus and species from Meghalaya.

8. Genus *Archezogozetes* Grandjean

1931. *Archezogozetes* Grandjean, *Bull. Mus. Hist. Nat. Paris*, 3(2) : 144.

11. *Archezogozetes longisetosus* Aoki

1965. *Archezogozetes longisetosus* Aoki, *Nat. Life Southeast Asia*, 4 : 147.

Diagnosis : Prodorsum with fine punctation; prodorsal and notogastral setae fine, long, beset with fine bristles; sensillus long, fine, densely beset with bristles; d_1 longer than their mutual distance; seven pairs of genital setae; $4a$ about 1/2 as long as $4b$.

Material examined : East Garo Hills : 3♀♀, Darugiri, 2.x. 1988, from decomposed wood, coll. B.J. Sarkar. West Garo Hills 8♀♀, Rangri Katham, Tura, 9.iii. 1991, from decomposed cow dung, coll. A.K. Sanyal.

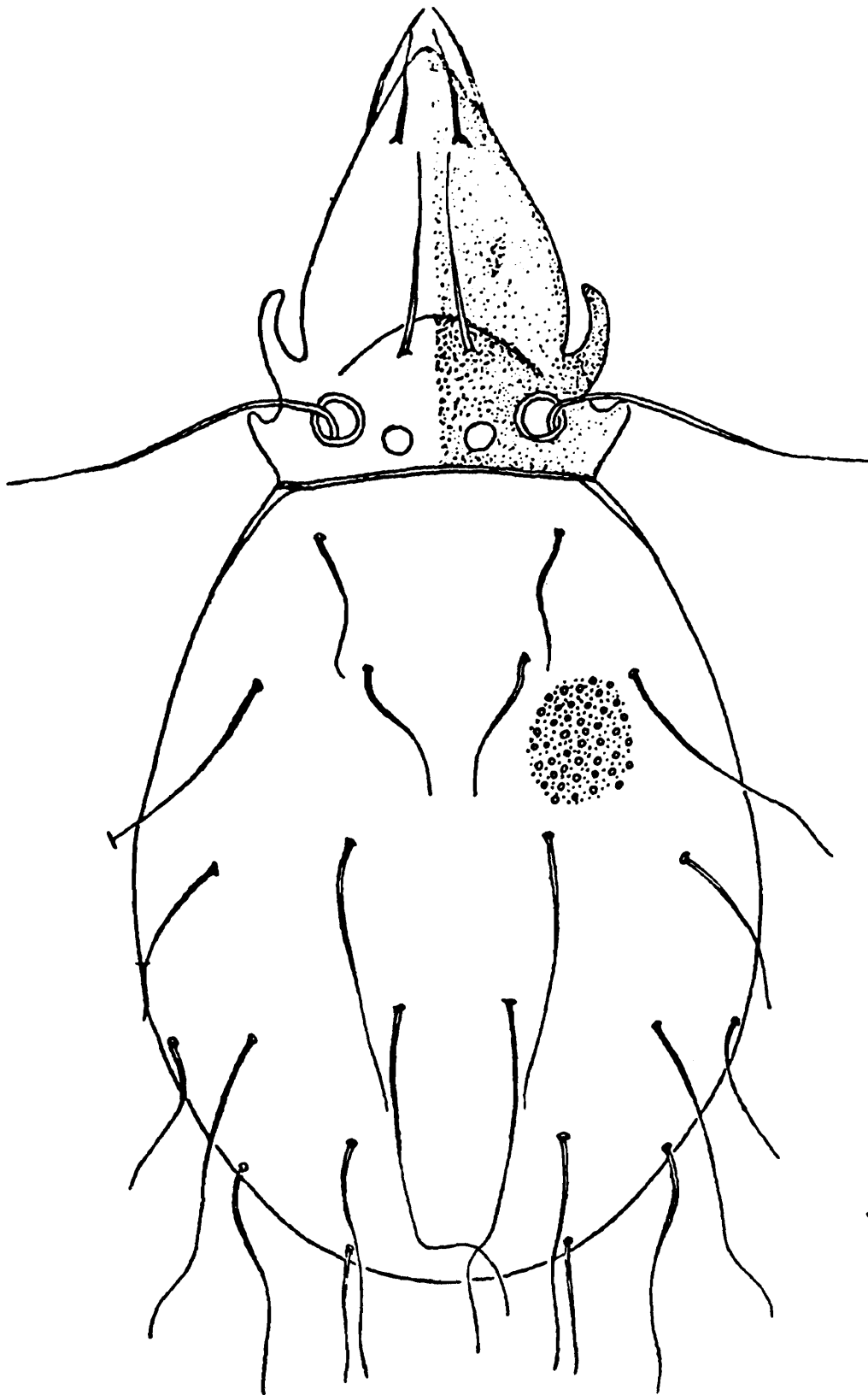
Distribution : Meghalaya (East Garo Hills), Assam, Kerala, Tripura, West Bengal.

Remarks : The genus and species are reported here for the first time from Meghalaya.

6. Family MALACONOTHRIDAE Berlese, 1916

9. Genus *Malaconothrus* Berlese

1904. *Malaconothrus* Berlese, *Redia*, 2 : 24.



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Fig. 14 : *Eremobelba shillongensis* Sanyal, 1988 dorsal view.

12. *Malaconothrus* sp.

Material examined : West Khasi Hill : 1♀, Nongstoin, 3 Kms West of the Nongstoin market, 13.iii. 1991, from soil with semidecomposed pine needles, coll. A.K. Sanyal.

Distribution : Meghalaya : West Khasi Hills.

Remarks : The paper records the genus for the first time from the State.

7. Family MICROTEGEIDAE Balogh, 1972

10. Genus *Microtegeus* Berlese

1917. *Microtegeus* Berlese, *Documents Scientifiques*, 5.

13. *Microtegeus* sp.

Material examined : East Garo Hills : 6♀♀, Darugiri, 2.x. 1988, from decomposed wood, coll. B.J. Sarkar; 1♀, Rongnil, 8.x. 1988, from leaf litter, coll. B.J. Sarkar; 2♀♀, Khanapara, 12.x. 1988, from decomposed wood, coll. B.J. Sarkar.

Distribution : Meghalaya (East Garo Hills), West Bengal.

Remarks : The genus is recorded here as new to the state.

8. Family EREMULIDAE Grandjean, 1965

11. Genus *Eremulus* Berlese

1908. *Eremulus* Berlese, *Redia*, 5 : 10.

14. *Eremulus* sp.

Material examined : East Garo Hills : 1♀, Wagesi, 5.x. 1988, from soil, coll. B.J. Sarkar; 1♀, Rongnil, 8.x. 1988, from soil and litter, coll. B.J. Sarkar. East Khasi Hills : 1♀, Cherapunjee, 22.iii. 1991, from soil, coll. A.K. Sanyal.

Distribution : Meghalaya (East Garo Hills), West Bengal.

Remarks : The genus is reported here for the first time from Meghalaya.

9. Family EREMOBELBIDAE Balogh, 1961

12. Genus *Eremobelba* Berlese

1908. *Eremobelba* Berlese, *Redia*, 5 (1) : 9.

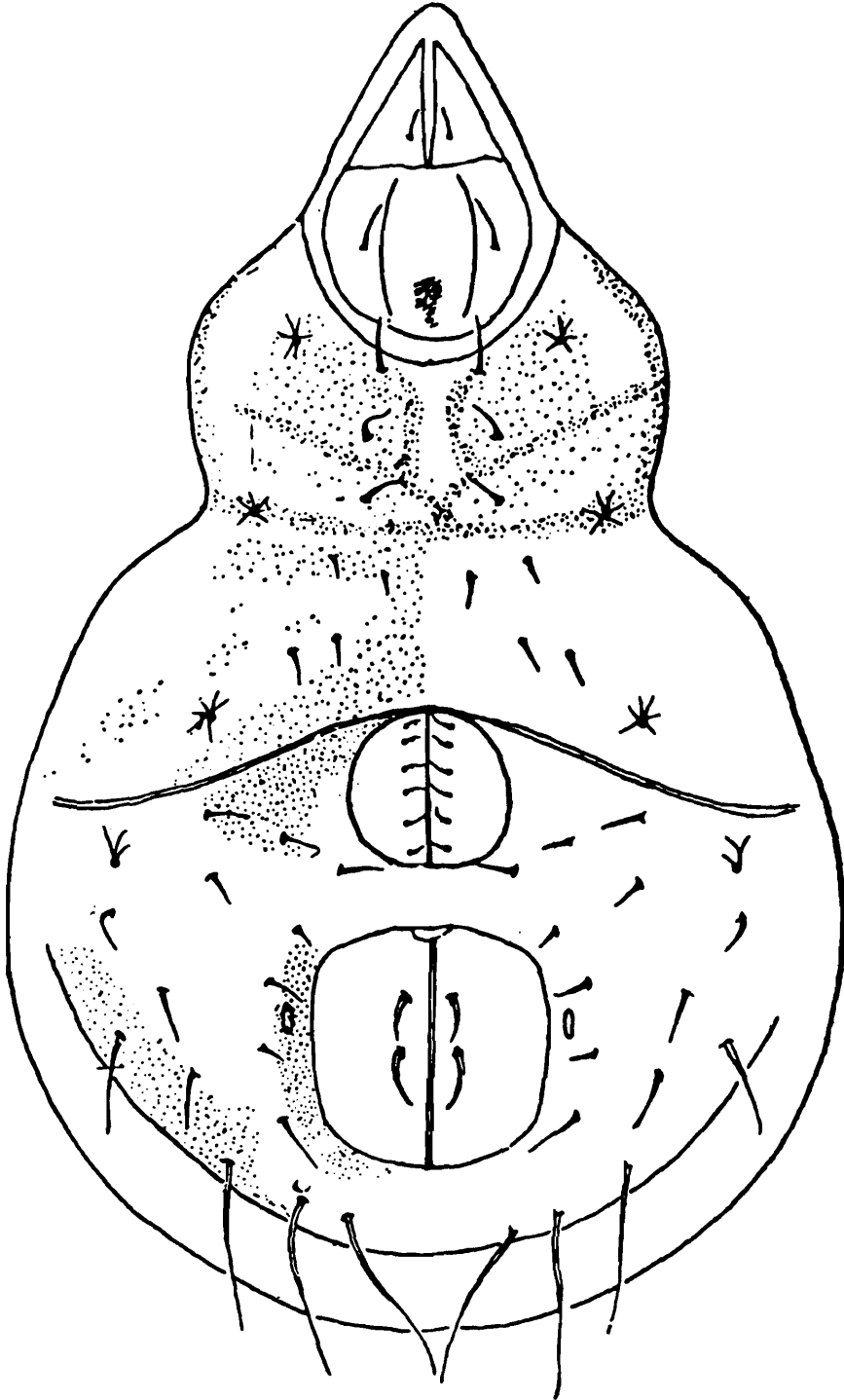
15. *Eremobelba shillongensis* Sanyal

(Figs. 14-15)

1988. *Eremobelba shillongensis* Sanyal, *Rec. zool. Surv. India*, 85 (2) : 230

Diagnosis : Prodorsum granulated; rostral setae smooth, fine, slightly longer than lamellar setae; lamellar and interlamellar setae fine, smooth, straight; sensillus long, flagellate, smooth; notogaster foveated and granulated; eleven pairs of notogastral setae, flagellate, smooth; ventral region finely granulated; genital setae six pairs.

Distribution : Meghalaya (East Khasi Hills),.



15

Fig. 15 : *Eremobelba shillongensis* Sanyal, 1988 : ventral view.

16. *Eremobelba* sp.

Material examined : East Garo Hills : 1♂, Wagesi, 7.x. 1988, from soil, coll. B. J. Sarkar.

Distribution Meghalaya (East Garo Hills),.

10. Family ZETORCHESTIDAE Michael, 1898

13. Genus *Zetorchestes* Berlese

1888. *Zetorchestes* Berlese, *Acari, Myriopoda et Scorpiones hucusque in Italian reperta, Padova*.

17. *Zetorchestes saltator* Oudemans

1915. *Zetorchestes saltator* Oudemans, *Ber. Net. End. ver.*, 4 : 194.

Material examined : East Garo Hills : 3♀♀, Darugiri, 2.x. 1988, from soil and decomposed wood, coll. A. K. Sanyal; 3♀♀, Kharkutta, 9.x. 1988, from soil and litter; coll. B. J. Sarkar. West Garo Hills 2♀♀, Rangri Katham, Tura, 9. iii. 1991, from decomposed cowdung, coll. A. K. Sanyal. West Khasi Hills : 4♀♀, Nongstoin, 3 kms West of Nongstoin market, 13.iii. 1991, from soil, coll. A. K. Sanyal.

Diagnosis : Body granulated; rostrum with nasiform apex; rostral setae thick, long, bifurcated distally, placed on two small tubercles; prodorsal and notogastral setae phylliform; notogastral setae ten pairs; postero-median part of notogaster with high elevation; six pairs of genital setae.

Distribution Meghalaya (East Garo Hills), West Bengal.

Remarks : This is the first report of the genus and species from the state.

11. Family METRIOPPIDAE Balogh, 1943

14. Genus *Ceratoppia* Berlese

1908. *Ceratoppia* Berlese, *Redia*, 5 (1) : 7.

18. *Ceratoppia bipilis* Hermann

1804. *Ceratoppia bipilis* Hermann, *Memore Apterologie*.

Diagnosis : Rostrum with five to six teeth on each side; prodorsal setae barbed; lamella almost straight, weakly converging towards the anterior part; lamellar cusp with an outer teeth; sensillus filiform, finely barbed; two pairs of notogastral setae (p_1 and p_2) situated on the posterior part of notogaster; two pairs of hypostomal setae.

Material examined : West Garo Hills : 5♀♀, Garobadha, Tura, 10. iii. 1991, from soil, coll. A. K. Sanyal. East Khasi Hills : 1♂, Moulai, Shillong, 20. iii. 1991, from soil with semidecomposed pine needle, coll. A. K. Sanyal.

Distribution : Meghalaya (West Garo Hills, East Khasi Hills), Himachal Pradesh, West Bengal.

Remarks The genus and the species are reported here for the first time from Meghalaya.

12. Family CARABODIDAE Koch, 1837

15. Genus *Phyllocarbodes* Balogh and Mahunka1969. *Phyllocarbodes* Balogh and Mahunka, *Opuse. Zool. Bpest.*, 9 : 48.19. *Phyllocarbodes* sp.

Material examined : East Garo Hills : 1 ♀, Rongnil, 8. x. 1988, from soil and litter, coll. B.J. Sarkar.

Distribution : Meghalaya (East Garo Hills).

Remarks : The genus is reported here for the first time from India.

13. Family TECTOCEPHEIDAE Grandjean, 1954

16. Genus *Tectocepheus* Berlese1913. *Tectocepheus* Berlese, *Redia*, 9 : 91.20. *Tectocepheus velatus* (Michael)1888. *Tectocepheus velatus* (Michael), *Ray. Soc.*, 65.

Diagnosis : The whole surface of body rough with irregularly raised dots; rostrum trifid; lamellae large, extend beyond the lateral margin of prodorsum, cusps narrow or thick, almost reaching the tip of rostrum; translamella present; rostral and lamellar setae curved inward and unilaterally barbed; interlamellar setae smooth, minute; sensillus long with slender stalk, head licheniform; dorsosejugal suture interrupted medially; paired *iad* large, placed parallel to the anterior part of the lateral side of anal field.

Material examined : East Garo Hills : 1♀, Darugiri, 2.x. 1988, from soil, coll. B. J. Sarkar; 3 ♀♀, Mendi, 3.x. 1988, from soil and litter, coll. A. K. Sanyal; 1 ♀, Rongnil, 8.x. 1988, from decomposed leaf litter, coll. B. J. Sarkar. West Garo Hills : 1 ♀, Rangri Katham, Tura, 9.iii. 1991, from soil, coll. A. K. Sanyal; 3 ♀♀, Kherapara, 9. iii. 1991, from soil, coll. A. K. Sanyal. West Khasi Hills 13 ♀♀, Nongstoin, 3 kms west of the Nongstoin market, 13/14. iii. 1991, from soil, coll. A. K. Sanyal; 8 ♀♀, Nongbroi, 55 kms from Nongstoin on Nongstoin-Shillong road, 15.iii. 1991, from soil, coll. A. K. Sanyal. Jaintia Hills : 1 ♀, Umsiyngia, 2 km southeast of Jowai town, Jowai, 18.iii. 1991, from soil, coll. A. K. Sanyal. East Khasi Hills : 1 ♀, Cherapunjee, 22.iii. 1991, from soil, coll. A. K. Sanyal.

Distribution Meghalaya (East Garo Hills, West Garo Hills, West Khasi Hills, Jaintia Hills, East Khasi Hills), Bihar, Himachal Pradesh, Orissa, Sikkim.

Remarks : The genus and species are new to the state.

14. Family OTOCEPHEIDAE Balogh, 1961

Key to the genera of Otocepheidae

- 1 (2). Genital seate four pairs *Dolicheremaeus*
 2 (1). Genital setae three pairs *Pseudotocepheus*

17. Genus *Dolicheremaeus* Jacot

1938. *Dolicheremaeus* Jacot, *Florida Ent.*, **21** (4) : 51.

21. *Dolicheremaeus coronarius* Chakrabarti, Bhaduri and Kundu

1981. *Dolicheremaeus coronarius* Chakrabarti, Bhaduri and Kundu, *Mitt. Zool. Mus. Berlin*, **57** (1) : 15.

1988. *Dolicheremaeus coronarius*, Sanyal, *Rec. zool. Surv. India*, **85** (2) : 233.

Diagnosis Rostral and lamellar setae unilaterally barbed on outside; interlamellar setae simple; sensillus lanceolate; condyles *co. pm* and *co. nm*. overlapping; notogaster with indistinct double line ridges; ten pairs of notogastral setae, simple, short; four pairs of genital setae.

Distribution : Meghalaya : (East Garo Hills), West Bengal.

22. *Dolicheremaeus* sp.

Material examined : West Garo Hills : 2 ♀♀, Garobadha. Tura, 10. iii. 1991, from soil, coll. A. K. Sanyal. West Khasi Hills : 4 ♀♀, Nongstoin town, 13/14.iii. 1991, from soil, coll. A. K. Sanyal. Jaintia Hills : 2 ♀♀, Mukhla, Jowai, 17.iii. 1991, from soil with semidecomposed pine needle, coll. A. K. Sanyal.

Distribution Meghalaya (West Garo Hills, West Khasi Hills, Jaintia Hills).

Remarks : The species is interesting and will be described in separate publication.

18. Genus *Pseudotocepheus* Balogh

1960. *Pseudotocepheus* Balogh, *Mem. Inst. Sci. Madagascar*, **14A** : 23.

23. *Pseudotocepheus orientalis* Mondal and Kundu

1983. *Pseudotocepheus orientalis* Mondal and Kundu, *Indian J. Acar.*, **8** (2) : 63.

Diagnosis : Rostral and lamellar setae outwardly barbed; interlamellar setae sparsely barbed bilaterally; sensillus with narrowly clavate head, smooth; ten pairs of notogastral setae, bilaterally and finely barbed, apices pointed; genital setae three pairs.

Material examined : East Garo Hills : 4 ♀♀, Mendi, 3.x. 1988, from soil and litter, coll. B. J. Sarkar.

Distribution Meghalaya (East Garo Hills), West Bengal.

Remarks : The paper records the genus and species for the first time from the state.

15. Family OPPIIDAE Grandjean, 1954

Key to the genera of Oppiidae

- 1 (4). Costula and crista absent
- 2 (3). Interlamellar setae absent **Ameroppia**
- 3 (2). Interlamellar setae present **Oppia**
- 4 (1). Short costula present; crista present **Oppiella**

19. Genus **Ameroppia** Hammer

1961. *Ameroppia* Hammer, *Biol. Skr. Dan. Vid. Selsk.*, **13** (1) : 54.

24. **Ameroppia** sp.

Material examined : East Garo Hills : 4 ♀♀, Darugiri, 2.x. 1988, from soil and decomposed wood, Coll. B. J. Sarkar; 1 ♀, Kharkutta, 9.x. 1988 from soil and litter, coll. B. J. Sarkar.

Distribution : Meghalaya (East Garo Hills).

Remarks The genus is new to Meghalaya.

20. Genus **Oppia** Koch

1836. *Oppia* Koch, *Deutschlands Crustaceen Myriapoden Und Arachniden*, 1-9.

25. **Oppia** sp.

Material examined : East Garo Hills : 1 ♀, Rongnil, 8.x. 1988, from soil and litter, coll. B. J. Sarkar.

Distribution : Meghalaya (East Garo Hills).

Remarks : The genus is reported here as new to the state.

21. Genus **Oppiella** Jacot

1937. *Oppiella* Jacot, *J. N. Y. ent. Soc.*, **45** : 356.

26. **Oppiella nova** (Oudemans)

1902. *Oppiella nova* (Oudemans), *Ent. Ber.*, **1** : 36.

Diagnosis : Rostrum with a '(') shaped slit; all prodorsal setae smooth; a thin transverse line below the rostral setae; lamellar setae thin, originating from the tip of short costulae; sensillus fusiform with 7-8 radiating branches, ten pairs of notogastral setae, smooth; genital setae six pairs.

Material examined : East Garo Hills : 1 ♀, Kharkutta, 9.x. 1988, from soil and litter, coll. B. J. Sarkar. West Khasi Hills : 2 ♀♀, Nongstoin town, 13.iii. 1991, from soil with semidecomposed pine needle, coll. A. K. Sanyal.

Distribution : Meghalaya (East Garo Hills), West Khasi Hills, West Bengal.

Remarks : The genus and species are recorded here for the first time from Meghalaya.

16. Family SUCTOBELBIDAE Grandjean, 1954

22. Genus **Suctobelba** Paoli

1908. *Suctobelba* Paoli, *Redia*, **5** (1) : 72.

Key to the species of **Suctobelba**

- 1(2) Rostrum with three lateral teeth; sensillus with long flat semilunar head; all notogastral setae thick, smooth *quadricarina*

- 2(1) Rostrum with four lateral teeth; sensillus with flat disc-shaped head; notogastral setae both thin, short and spoon shaped *variosetosa*

27. *Suctobelba quadricarina* Hammer

1958. *Suctobelba quadricarina* Hammer, *Biol. Skr. Dan. Vid. Selsk.*, **10**(1) : 43.
 1988. *Suctobelba quadricarina*, Sanyal, *Rec. zool. Surv. India*, **85** (2) : 233.
Distribution Meghalaya (East Khasi Hills), West Bengal.
Remarks : Sanyal (1988) first recorded the species from Meghalaya.

28. *Suctobelba variosetosa* Hammer

1961. *Suctobelba variosetosa* Hammer, *Biol. Skr. Dan. Vid. Selsk.*, **13** (1) : 51.
Material examined · East Garo Hills : 1♂, Darugiri, 2.x. 1988, from soil, coll. B.J. Sarkar; 3♀♀, Kharkutta, 9.x. 1988, from soil and litter, coll. B.J. Sarkar.
Distribution : Meghalaya (East Garo Hills), West Bengal.
Remarks The species is recorded here as new to the state.

17. Family CHAUNOPROCTIDAE Balogh, 1961

23. Genus *Chaunoproctus* Pearce

1906. *Chaunoproctus* Pearce, *Journ. Roy. Micr. Soc.*, 271.

29. *Chaunoproctus* sp.

- Material examined* · East Garo Hills : 3♀♀, Kharkutta, 9.x. 1988, from soil and litter, coll. B.J. Sarkar.
Distribution : Meghalaya (East Garo Hills).
Remarks : This is the first record of the genus from Meghalaya.

18. Family ORIBATULIDAE Thor, 1929

24. Genus *Scheloribates* Berlese

1908. *Scheloribates* Berlese, *Redia*, **5** : 2.

Key to the species of *Scheloribates*

- 1(4) Sensillus with lanceolate head
 2(3) Lamellar setae not extends beyond the rostral tip; interlamellar setae never extends beyond the base of rostral setae *thermophilus*
 3(2) Lamellar setae extends beyond the rostral tip; interlamellar setae very long, extends beyond the insertion of base of rostral setae *sikkimensis*
 4(1) Sensillus with club-shaped or clavate head
 5(6) Sensillus with club-shaped head *parvus*
 6(5) Sensillus with clavate head *saswatii*

30. *Scheloribates parvus* Pletzen

1963. *Scheloribates parvus* Pletzen, *Acarologia*, 5(4) : 701.

Material examined : East Garo Hills : 1♂, Dianadubi Reserve Forest, 6.x. 1988, from decomposed betel nut leaves, coll. B.J. Sarkar; 22♀♀, Rongnil, 8.x. 1988, from decomposed leaf litter, coll. B.J. Sarkar. West Garo Hills : 12♀♀, Kherapara, Tura, 9.iii. 1991, from soil, coll. A.K. Sanyal. West Khasi Hills : 30♀♀, Nongstoin town, 13/14.iii. 1991, from soil, coll. A.K. Sanyal. Jaintia Hills : 30♀♀, Jowai, near soil conservation I.B., 16.iii. 1991, from soil, coll. A.K. Sanyal; 1♀, Mukhla, 10 kms on the way to Shillong from Jowai, 17.iii. 1991, from semi decomposed wood, coll. A.K. Sanyal. East Khasi Hills : 2♀♀, Moulai, Shillong, 20.iii. 1991, from soil and pine needle, coll. A.K. Sanyal. Ri-Bhoi : 8♀♀, Lum Nehru Park, Umiam, Barapani, 21.iii. 1991, from decomposed cowdung and straw, coll. A.K. Sanyal.

Distribution : Meghalaya (East Garo Hills), West Garo Hills, West Khasi Hills, Jaintia Hills, East Khasi Hills, Ri-Bhoi), Assam, West Bengal.

Remarks : The genus and species are recorded here for the first time from Meghalaya.

31. *Scheloribates saswatii* Dhali and Bhaduri

1980. *Scheloribates saswatii* Dhali and Bhaduri, *Indian J. Acar.*, 5 : 52.

Material examined : East Garo Hills : 160♀♀, Darugiri, 2.x. 1988, from soil and decomposed wood, coll. B.J. Sarkar; 140♀♀, Mendi, 3.x. 1988, from soil and litter, coll. B.J. Sarkar; 2♀♀, Wagesi, 5.x. 1988, from soil, coll. B.J. Sarkar; 2♀♀, Dianadubi Reserve Forest, 5.x. 1988, from decomposed teak leaves, coll. B.J. Sarkar; 4♀♀, Dianadubi Reserve Forest, 6.x. 1988, from soil and litter, coll. B.J. Sarkar; 5♀♀, Wagesi, 7.x. 1988, from soil, coll. B.J. Sarkar; 10♀♀, Rongnil, 8.x. 1988, from soil and decomposed leaf litter, coll. B.J. Sarkar; 105♀♀, Kharkutta, 9.x. 1988, from soil and litter, coll. B.J. Sarkar. West Garo Hills : 9♀♀, Rangri Katham, Tura, 9.iii. 1991, from soil and decomposed cowdung, coll. A.K. Sanyal. West Khasi Hills : 20♀♀, Nongstoin town, 13/14.iii. 1991, from soil, coll. A.K. Sanyal; 14♀♀, Nongbroi, 55 kms from Nongstoin on Nongstoin-Shillong road, 15.iii. 1991, from soil, coll. A.K. Sanyal; 3♀♀, Mairang, 15.iii. 1991, from soil, coll. A.K. Sanyal. Jaintia Hills : 2♀♀, Mukhla, 10 kms on the way to Shillong from Jowai, 17.iii. 1991, from soil and pine needle, coll. A.K. Sanyal; 4♀♀, Umsiyngia, 2 kms southeast of Jowai town, Jowai, 18.iii. 1991, from soil, coll. A.K. Sanyal. East Khasi Hills : 1♀, Moulai, Shillong, 20.iii. 1991, from soil, coll. A.K. Sanyal; 1♀, Cherapunjee, 22.iii. 1991, from soil, coll. A.K. Sanyal; 3♀♀, Nohkalikai Falls, 22.iii. 1991, from soil, coll. A.K. Sanyal. Ri-Bhoi : 2♀♀, Umiam, near MSEB, Barapani, 21.iii. 1991, from decomposed cow dung and straw, coll. A.K. Sanyal.

Distribution : Meghalaya (East Garo Hills, West Garo Hills, West Khasi Hills, Jaintia Hills, East Khasi Hills, Ri-Bhoi), Sikkim.

Remarks : The species is new to the state.

32. *Scheloribates sikkimensis* Dhali and Bhaduri

1980. *Scheloribates sikkimensis* Dhali and Bhaduri, *Indian J. Acar.*, 5 : 50.

Material examined : East Garo Hills : 10♀♀, Wagesi, 7.x. 1988, from wild plant, coll. B.J. Sarkar; 4♀♀, Rongnil, 8.x. 1988, from soil and leaf litter, coll. B.J. Sarkar; 4♀♀, Khanapara,

12.x. 1988, from decomposed wood, coll. B.J. Sarkar. Ri-Bhoi : 1♂, Lum Nehru Park, Umiam Barapani, from decomposed cow dung and straw, coll. A.K. Sanyal.

Distribution Meghalaya (East Garo Hills, Ri-Bhoi), Sikkim.

Remarks This is the first record of the species from Meghalaya.

33. *Schelorbates thermophilus* Hammer

1961. *Schelorbates thermophilus* Hammer, *Biol. Skr. Dan. Vid. Selsk.*, **13**(1) : 95.

Material examined : West Garo Hills : 8♀♀, Rangri Katham, Tura, 9.iii. 1991, from soil, coll. A.K. Sanyal.

Distribution : Meghalaya (West Garo Hills), West Bengal.

Remarks : The species is reported here as new to the state.

24. *Schelorbates* sp.

Material examined : East Khasi Hills : 70♀♀, Cherapunjee, 22.iii. 1991, from soil, coll. A.K. Sanyal.

Distribution Meghalaya (East Khasi Hills).

19. Family HAPLOZETIDAE Grandjean, 1936

Key to the genera of Haplozetidae

- 1(4) Legs monodactylous
- 2(3) Dorsosejugal suture with three arches; fourteen pairs of notogastral setae; six pairs of genital setae **Rostrozetes**
- 3(2) Dorsosejugal suture with a single arc; ten pairs of notogastral setae; four to six pairs of genital setae **Xylobates**
- 4(1) Legs tridactylous
- 5(6) Interlamellar setae present; fourteen pairs of notogastral setae **Peloribates**
- 6(5) Interlamellar and notogastral setae absent, represented by ten pairs of alveoli **Phalacrozetes**

25. Genus *Peloribates* Berlese

1908. *Peloribates* Berlese, *Redia*, **5** : 3.

35. *Peloribates* sp.

Material examined : East Garo Hills : 2♀♀, Darugiri, 2.x. 1988, from soil, coll. B.J. Sarkar.

Distribution : Meghalaya (East Garo Hills).

Remarks The genus is reported here as new to Meghalaya.

26. Genus *Phalacrozetes* Aoki

1965. *Phalacrozetes* Aoki, *Nat. Life Southeast Asia*, **4** : 188.

36. *Phalacrozetes sinatus* Aoki

1965. *Phalacrozetes sinatus* Aoki, *Nat. Life Southeast Asia*, 4 : 188.

Diagnosis : Rostral setae very minutely barbed, directed inward; lamellar and interlamellar setae very minute, simple; sensillus spindle-shaped, distal end pointed, head beset with fine setae; notogastral setae represented by ten pairs of alveoli; *At* elliptical and placed on dorsosejugal suture.

Material examined (East Garo Hills), 2♂♂, Wagesi, 5.x. 1988, from soil and litter, coll. B.J. Sarkar.

Distribution : Meghalaya : East Garo Hills; West Bengal.

Remarks : The genus and species are reported here for the first time for Meghalaya.

27. Genus *Rostrozetes* Sellnick

1925. *Rostrozetes* Sellnick, *Suppl. Ent. Berlin*, 11 : 84.

37. *Rostrozetes foveolatus* Sellnick

1925 *Rostrozetes foveolatus* Sellnick, *Suppl. Ent. Berlin*, 11 : 84.

Diagnosis : Body distinctly foveolated; prodorsal setae long, thin, unilaterally finely barbed; sensillus with swollen brush-like head; ten pairs of notogastral setae, short, fine; five pairs of genital setae.

Material examined : East Garo Hills : 6♂♂, Darugiri, 2.x. 1988, from soil and decomposed wood, coll. B.J. Sarkar; 3♂♂, Wagesi, 5.x. 1988, from soil, coll. B.J., Sarkar; 5♂♂, Dianadubi Reserve Forest, 6.x. 1988, from soil and decomposed betel nut leaves, coll. B.J. Sarkar; 1♂, Wagesi, 7.x. 1988, from soil, coll. B.J. Sarkar. Jaintia Hills; 3♂♂, Mukhla, 10 kms on the way to Shillong from Jowai, 17.iii. 1991, from semidecomposed wood, coll. A.K. Sanyal. East Khasi Hills ; 2♂♂, Nohkalikai Falls, 22.iii. 1991, from soil, coll, A.K. Sanyal.

Distribution : Meghalaya (East Garo Hills, Jaintia Hills), East Khasi Hills, Bihar, Tripura, West Bengal.

Remarks This is first record of the genus and species from Meghalaya.

28. Genus *Xylobates* Jacot

1929. *Xylobates* Jacot, *Trans. Amer. Micr. Soc. Menasha*, 48 : 429.

38. *Xylobates seminudus* Hammer

1971. *Xylobates seminudus* Hammer, *Biol. Skr. Dan. Vid. Selsk.*, 16(6) : 38

Diagnosis : All prodorsal setae barbed; sensillus with long stalk, head lanceolate, beset with long bristles on outer border; notogastral setae represented by ten pairs of pores; five pairs of genital setae.

Material examined : East Garo Hills : 3♂♂, Darugiri, 2.x. 1988, from soil, coll. B.J. Sarkar; 4♂♂, Mendi, 3.x. 1988, from soil and litter, coll. B.J. Sarkar; 5♂♂, Wagesi, 5.x. 1988, from soil and litter, coll. B.J. Sarkar; 20♂♂, Dianadubi Reserve Forest, 6.x. 1988, from soil and decomposed betel nut leaves, coll. B.J. Sarkar; 2♂♂, Rongnil, 8.x. 1988, from soil and litter, coll B.J. Sarkar; 15♂♂, Kharkutta, 9.x. 1988, from soil and litter, coll. B.J. Sarkar.

Distribution Meghalaya : East Garo Hills; West Bengal.

Remarks The genus and species are recorded here for the first time from the state.

20. Family MOCHLOZETIDAE Grandjean, 1960

29. Genus *Unguizetes* Sellnick

1925. *Unguizetes* Sellnick, *Treubia*, **6** : 473.

39. *Unguizetes clavatus* Aoki

1967. *Unguizetes clavatus* Aoki, *Nat. Life Southeast Asia*, **5** : 195.

Diagnosis : Lateral side of rostrum with distinct crest; translamella with a prejection on the middle and one crest behind; prodorsal setae rough; sensillus clavate-shaped, head with few fine bristles; notogastral setae represented by seven pairs of alveoli; six pairs of genital setae.

Material examined : East Garo Hills : 1♀, Rongengiri, 20.ix. 1988, from cow dung, coll. B.J. Sarkar; 7♀♀, Songsokorrom Reserve Forest, 27.ix. 1988, from soil, coll. B.J. Sarkar; 2♀♀, Darugiri, 2.x. 1988, from decomposed wood, coll. B.J. Sarkar; 2♀♀, Dianadubi Reserve Forest, 5.x. 1988, from decomposed teak leaves, coll. B.J. Sarkar; 1♀, Dianadubi Reserve Forest, 6.x. 1988, from decomposed betel nut leaves, coll. B.J. Sarkar; 8♀♀, Wagesi, 7.x. 1988, from soil and decomposed teak leaves, coll. B.J. Sarkar; 2♀♀, Rongni, 8.x. 1988, from soil and litter, coll. B.J. Sarkar; 4♀♀, Kharkutta, 9.x. 1988, from decomposed teak and banana leaves, coll. B.J. Sarkar. East Khasi Hills : 1♀, Moulai, Shillong, 20.iii. 1991, from soil and pine needle, coll. A.K. Sanyal. Ri-Bhoi : 1♀, Umiam, Near MSEB, Barapani, 21.iii. 1991, from decomposed cowdung and straw, coll. A.K. Sanyal.

Distribution : Meghalaya (East Garo Hills, East Khasi Hills, Ri-Bhoi), West Bengal.

Remarks : The paper records the genus and species for the first time from the state.

21. Family ORIBATELLIDAE Jacot, 1925

Key to the genera of Oribatellidae

- 1(2) Interlamellar area large; lamellae with free tips; one pair of anal and one pair of adanal setae ***Paralamellobates***
- 2(1) Interlamellar area small; lamellae without free tips; two pairs of anal and two pairs of adanal setae ***Lamellobates***

30. Genus *Lamellobates* Hammer

1958. *Lamellobates* Hammer, *Biol. Skr. Dan. Vid. Selsk.*, **10** (1) : 100.

40. *Lamellobates palustris* Hammer

1958. *Lamellobates palustris* Hammer, *Biol. Skr. Dan. Vid. Selsk.*, **10**(1) : 100.

Diagnosis : Inner cuspides of lamellae rounded, outer lamellar cuspides tapering into a short and sharp point; lamellar setae thick, rough; interlamellar setae long, rough; club-

shaped sensillus, beset with short setae; nine pairs of notogastral setae; six pairs of genital setae.

Material examined : East Garo Hills : 4♀♀, Darugiri, 2.x. 1988, from decomposed wood, coll. B.J. Sarkar; 6♀♀, Wagesi, 5.x. 1988, from soil, coll. B.J. Sarkar; 1♀, Dianadubi Reserve Forest, 6.x. 1988, from soil and litter, coll. B.J. Sarkar; 1♀, Wagesi, 7.x. 1988, from soil, coll. B.J. Sarkar; 25♀♀, Rongnil, 8.x. 1988, from soil and decomposed leaf litter, coll. B.J. Sarkar. Ri-Bhoi 1♀, Umiām, near MSEB, Barapani, 21.iii. 1991, from decomposed cowdung and straw, coll. A.K. Sanyal.

Distribution : Meghalaya (East Garo Hills, Ri-Bhoi), Bihar, Tripura, West Bengal.

Remarks : This is the first report of the genus and species from the state.

31. *Paralamellobates* Bhaduri and Raychaudhuri

1968. *Paralamellobates* Bhaduri and Raychaudhuri, *Oriental Ins.*, 2(2) : 197.

41. *Paralamellobates bengalensis* Bhaduri and Raychaudhuri

1968. *Paralamellobates bengalensis* Bhaduri and Raychaudhuri, *Oriental Ins.*, 2(2) : 197.

Diagnosis : All morphological features are similar to *Lamellobates palustris*. The main difference is presence of one pair of anal setae.

Material examined : East Garo Hills : 1♀, Wagesi, 7.x. 1988, from soil, coll. B.J. Sarkar; 2♀♀, Rongnil, 8.x. 1988, from decomposed leaf litter, coll. B.J. Sarkar; 1♀, Khanapara, 12.x. 1988, from decomposed wood, coll. B.J. Sarkar. West Khasi Hills : 1♀, Nongbroi. 15.iii. 1991, from soil, coll. A.K. Sanyal.

Distribution : Meghalaya (East Garo Hills, West Khasi Hills), Kerala; Sikkim; West Bengal.

Remarks : The genus and the species are recorded here as new to the state.

22. Family GALUMNIDAE Jacot, 1925

32. Genus *Galumna* von Heyden

1826. *Galumna* von Heyden, *Isis Oken*, 18 : 611.

42. *Galumna crenata* Deb and Raychaudhuri

1975. *Galumna crenata* Deb and Raychaudhuri, *Annot. Zool. Japan*, 48(3) : 167.

Diagnosis : Rostral setae absent; lamellar and interlamellar setae represented by pits; club-shaped sensillus, beset with bristles; *Ad* guttiform, provided with comma-like slit on inner end; *hy* leaf-like; *Aa* placed obliquely; notogastral setae represented by ten pairs of pits; a crenate line across the hypostome; six pairs of genital setae.

Distribution : Meghalaya (East Khasi Hills), West Bengal.

Remarks : This is the first record of the genus and species from Meghalaya.

DISCUSSION

The study of oribatid fauna of Meghalaya was first done by Bayoumi and Mahunka (1979). Later Sanyal (1988) studied the oribatid mites of Meghalaya. Till then no other attempt was made and the present work is second of its kind. The assessment of oribatid fauna of Meghalaya shows that only eight species under eight genera and seven families were known before the present work was started. The paper includes 42 species under 32 genera and 22 families. Of these, 34 species, 25 genera and 16 families are reported here for the first time from Meghalaya. It also records the genus *Phyllocarabodes* with one species as the first record from India (Table 1).

The analysis of the present account shows that 12.5% of Indian oribatid fauna are known from Meghalaya.

It is also noted that the genus *Phyllocarabodes* and five species are to be considered as endemic. Further, the species viz., *Allonothrus russeolus*, *Tectocepheus velatus*, *Scheloribates parvus*, *S. saswatii*, *Rostrozetes foveolatus*, *xylobates seminudus*, *Unguizetes clavatus* and *Lamellobates palustris* are most common and abundant in occurrence. The other species occur very rare. The result also shows that East Garo Hills district occupies highest position in respect of faunal composition. This may be due to the fact that this district was extensively surveyed. The oribatid fauna of South Garo Hills district is unrepresented as the district was not surveyed due to some unavoidable reasons. The distribution of oribatid species in different districts of Meghalaya is shown in Maps 1-3.

SUMMARY

The paper deals with the oribatid fauna collected from Meghalaya. Altogether 42 species of oribatid mites belonging to 32 genera and 22 families have been recorded. Before undertaking the present work only eight species under eight genera and seven families were known from the state. The work records one genus with one species for the first time from India and 25 genera, 34 species and 16 families as the first record from Meghalaya. Keys to identification of families, genera and species are dealt in the paper. The diagnostic features of the species wherever needed have also been incorporated.

ACKNOWLEDGEMENTS

The author expresses his gratefulness to the Director, Zoological Survey of India, for kind encouragement and providing laboratory facilities. He also extends his indebtedness to Dr. J.R.B. Alfred, Scientist—SG, Z.S.I. for his constant guidance and supervision throughout the course of this work. A deep sense of gratitude is expressed to Dr. S.K. Bhattacharyya, Scientist—'SG (Retd.), Z.S.I. for his valuable suggestion and help. Thanks are also due to Sri B.J. Sarkar, Zoological Assistant, Z.S.I. for constant assistance and to Sri D. Sengupta, Darjeeling Government College for valuable suggestions.

Table 1. Distribution of oribatid species in different districts of Meghalaya.

| Name of the species | West Garo Hills | East Garo Hills | South Garo Hills | West Khasi Hills | East Khasi Hills | Ri—Bhoi | Jaintia Hills |
|--|-----------------|-----------------|------------------|------------------|------------------|---------|---------------|
| | 1 | 2 | 3 | 5 | 5 | 6 | 7 |
| <i>Apoplophora</i> sp. | - | + | - | - | - | - | - |
| <i>Hoplophorella scapellata</i> | - | + | - | - | - | - | - |
| <i>Hoplophthiracarus indicus</i> | - | - | - | - | + | - | - |
| <i>Hoplophthiracarus</i> sp. | - | + | - | - | - | - | - |
| <i>Euphthiracarus meghalayensis</i> | - | - | - | - | - | + | - |
| <i>Rhysotritia ardua</i> (Koch) var. <i>otaheitensis</i> | - | - | - | - | + | - | - |
| <i>Rhysotritia</i> sp. | - | - | - | - | + | + | - |
| <i>Mesotritia Indica</i> | - | - | - | - | + | - | - |
| <i>Allonothrus monodactylous</i> | - | + | - | - | - | - | - |
| <i>A. russeolus</i> | - | + | - | - | - | - | - |
| <i>Archegozetes longisetosus</i> | + | + | - | - | - | - | - |
| <i>Malaconothrus</i> sp. | - | - | - | + | - | - | - |
| <i>Microtegeus</i> sp. | - | + | - | - | - | - | - |
| <i>Eremulus</i> sp. | - | + | - | - | + | - | - |
| <i>Eremobelba shillongensis</i> | - | - | - | - | + | - | - |
| <i>Eremobelba</i> sp. | - | + | - | - | - | - | - |
| <i>Zetorchestes saltator</i> | + | + | - | + | - | - | - |
| <i>Ceratoppia bipiles</i> | + | - | - | - | + | - | - |
| <i>Phyllocarabodes</i> sp. | - | + | - | - | - | - | - |
| <i>Tectocephus velatus</i> | + | + | - | + | + | - | + |
| <i>Dolicheremaeus coronarius</i> | - | + | - | - | - | - | - |
| <i>Dolicheremaeus</i> sp. | + | - | - | - | + | - | + |
| <i>Pseudotocephaeus orientalis</i> | - | + | - | - | - | - | - |
| <i>Ameroppia</i> sp. | - | + | - | - | - | - | - |
| <i>Oppia</i> sp. | - | + | - | - | - | - | - |
| <i>Oppiella nova</i> | - | + | - | + | - | - | - |
| <i>Suctobelba Guadricarina</i> | - | - | - | - | + | - | - |

Contd ... Table 1

| | 1 | 2 | 3 | 5 | 5 | 6 | 7 |
|-------------------------------------|---|---|---|---|---|---|---|
| <i>S. variosetosa</i> | - | + | - | - | - | - | - |
| <i>Chaunoproctus</i> sp. | - | + | - | - | - | - | - |
| <i>Scheloribates parvus</i> | + | + | - | + | + | + | + |
| <i>S. saswatii</i> | + | + | - | + | + | + | + |
| <i>S. sikkimensis</i> | - | + | - | - | - | + | - |
| <i>S. thermophilus</i> | + | - | - | - | - | - | - |
| <i>Scherloribates</i> sp. | - | - | - | - | + | - | - |
| <i>Peloribates</i> sp. | - | + | - | - | - | - | - |
| <i>Phalacrozetes sinatus</i> | - | + | - | - | - | - | - |
| <i>Rostrozetes foveolatus</i> | - | + | - | - | + | - | + |
| <i>Xylobates seminudus</i> | - | + | - | - | - | - | - |
| <i>Unguizetes clavatus</i> | - | + | - | - | + | + | - |
| <i>Lamellobates palustris</i> | - | + | - | - | - | + | - |
| <i>Paralamellobates bengalensis</i> | - | + | - | + | - | - | - |
| <i>Galumna crenata</i> | - | - | - | - | + | - | - |

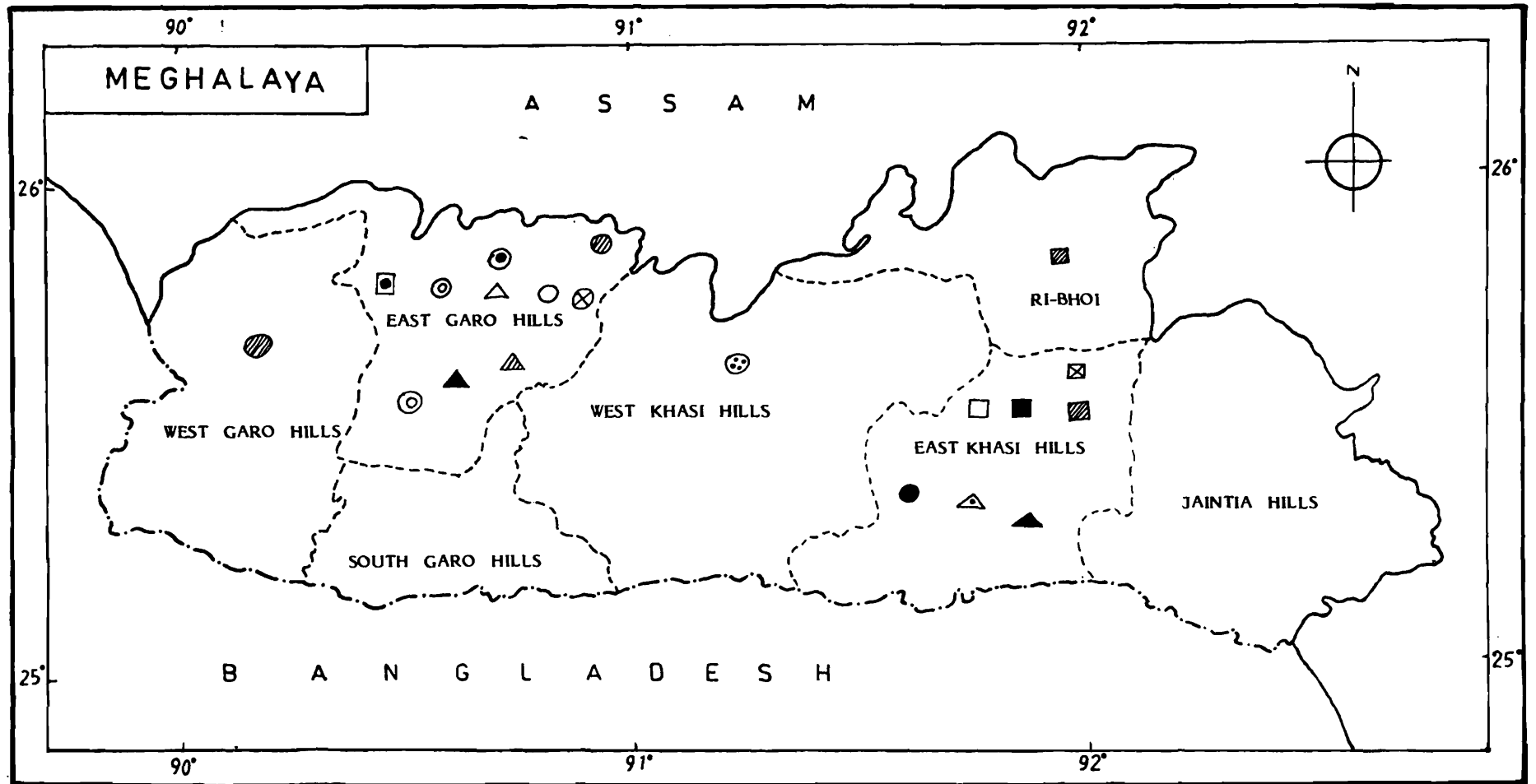
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MAP 1 DISTRIBUTION OF SPECIES OF ORIBATID MITE IN MEGHALAYA



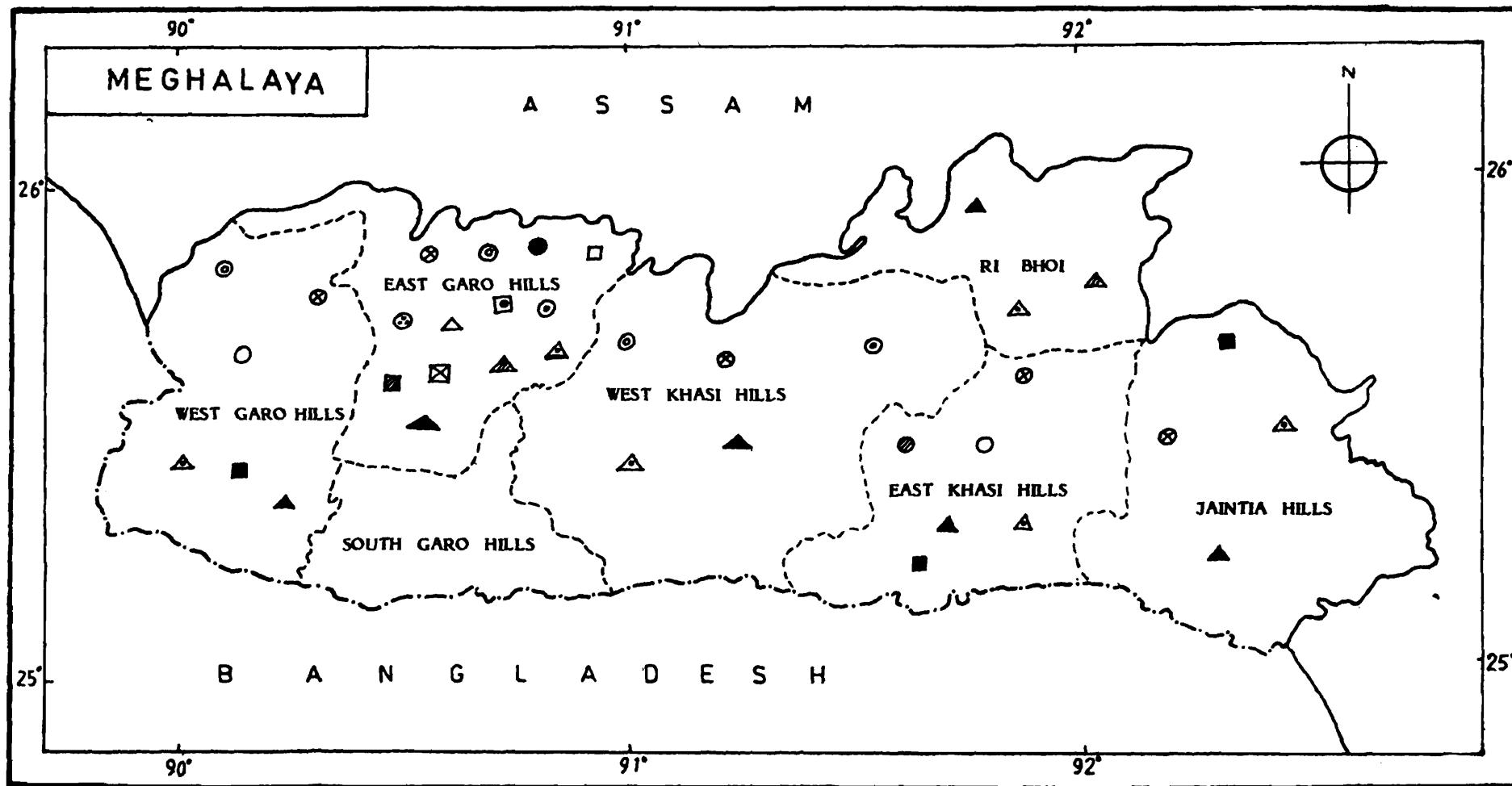
- ⊙ APOLOPHORA SP.
- HOPLOPHORELLA SCAPELLATA
- HOPLOPHTHRACARUS INDICUS
- ⊗ HOPLOPHTHRACARUS SP.

- EUPHTHRACARUS MEGHALAYENSIS
- RHYSOTRITIA ARDUA (KOCH) VAR. OTAHEITENSIS
- ▨ RHYSOTRITIA SP.
- ⊠ MESOTRITIA INDICA

- ▣ ALLONOTHRUS MONODACTYLOUS
- ⊙ A. RUSSEDLUS
- ⊙ ARCHEGOZETES LONGISETOSUS
- ⊙ MALACONOTHRUS SP.

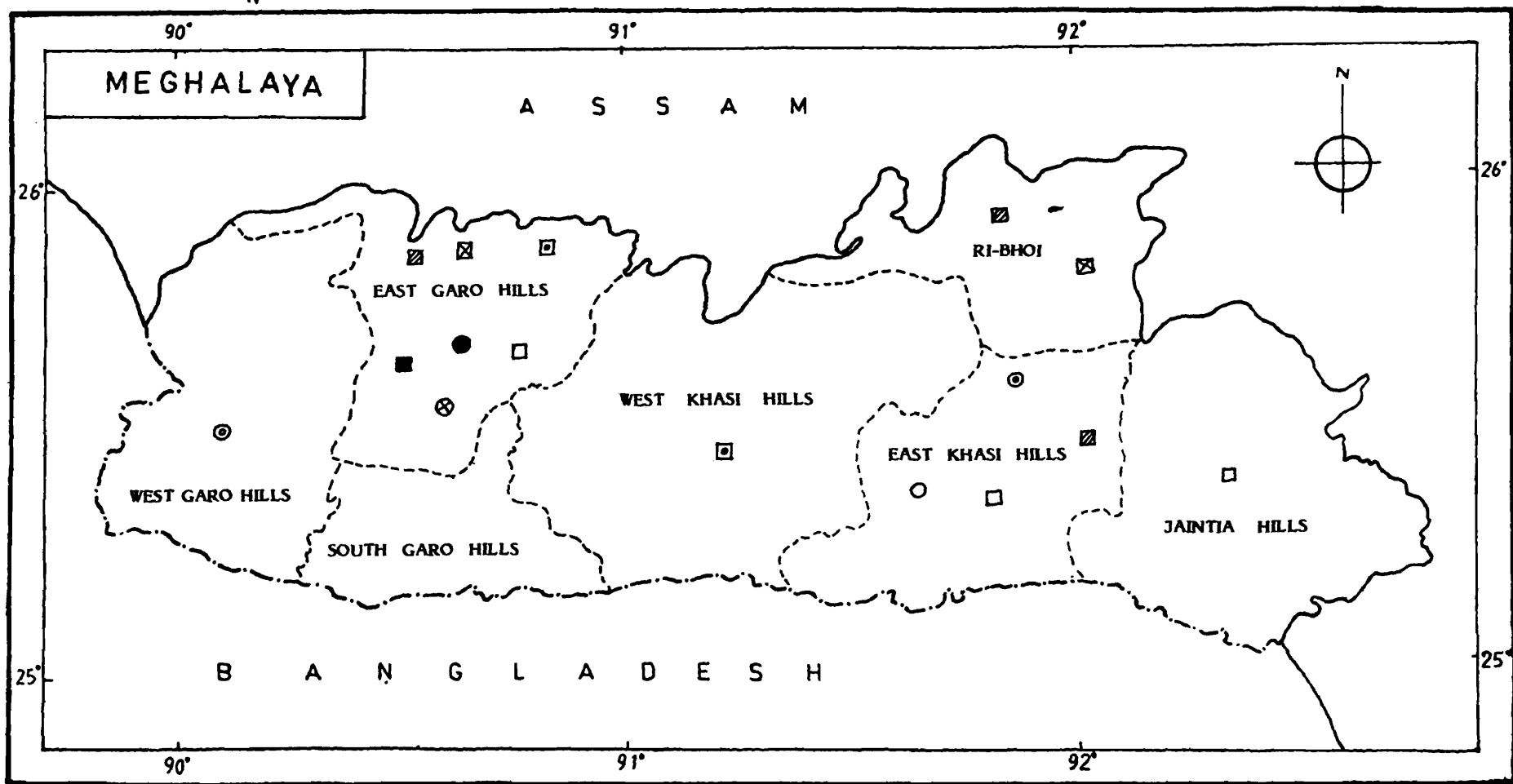
- △ MICROTEGEUS SP.
- ▲ EREMULUS SP.
- ⚠ EREMOBELBA SHILLONGENSIS
- ⚠ EREMOBELBA SP.

MAP 2 - DISTRIBUTION OF SPECIES OF ORIBATID MITE IN MEGHALAYA



- | | | | |
|-------------------------|------------------------------|---------------------------|------------------------|
| ⊙ ZETORCHESTES SALTATOR | □ DOLICHEREMAEUS CORONARIUS | ■ OPPIA SP. | △ CHAUNOPROCTUS SP. |
| ○ CERATOPPIA BIPILIS | ■ DOLICHEREMAEUS SP. | ⊙ OPPIELLA NOVA | ▲ SCHELORIBATES PARVUS |
| ● PHYLLOCARABODES SP. | ▨ PSEUDOTOCEPHEUS ORIENTALIS | ⊙ SUCTOBELBA QUADRICARINA | ▲ S. SASWATI |
| ⊗ TECTOCEPHEUS VELATUS | ⊗ AMEROPPIA SP. | ⊙ S. VARIOSETOSA | ▲ S. SIKKIMENSIS |

MAP 3 DISTRIBUTION OF SPECIES OF ORIBATID. MITE IN MEGHALAYA



⊙ SCHELOBATES THERMOPHILUS

□ ROSTROZETES FOVEOLATUS

▣ PARALAMELOBATES BENGALENSIS

○ SCHELOBATES SP.

■ XYLOBATES SEMINUDUS

⊙ GALUMNA CRENATA

● PELORIBATES SP.

▨ UNGUIZETES CLAVATUS

⊗ PHALACROZETES SINATUS

⊠ LAMELOBATES PALUSTRIS

ARANEAE : SPIDER

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The spider fauna of Meghalaya has not yet been studied in a comprehensive manner. Tikader (1967) was the pioneer worker who worked the spider fauna of Khasi and Jaintial Hill (Meghalaya) on the families : Thomisidae, Araneidae, Salticidae, Clubionidae and Theraphosidae. The present work was taken up to give an up-to-date information regarding the families : Araneidae, Thomisidae, Salticidae, Oxyopidae, Clubionidae, Gnaphosidae and Lycosidae from Meghalaya in the light of modern taxonomic concept. The comprehensive account in these families, the present work will prove quite useful to the future workers also.

1. Family ARANEIDAE

1806. *Araneidae* Latreille, *Genera Crustaceorum*, 1 : 82.

1981. *Araneidae* : Tikader & Bal, *Rec. zool. Surv. India*, occ. pap. No. 24 : 42.

Type genus : *Araneus* Clerck.

Distribution : Cosmopolitan.

Key to the genera of the family Araneidae Latreille

1. Median eyes closer to each other than the laterals. Tibia I of male is straight and unmodified **Argiope**
Median eyes not closer to each other than laterals. Tibia I of male is not straight and unmodified 2
2. Spinnerets situated on an elevated circular space surrounded by a thick flange in the form of a ring **Gasteracantha**
Spinnerets not situated on an elevated circular space surrounded by a thick flange in a form of ring 3
3. Abdomen elongated; cephalothorax with convex and elevated cephalic region **Nephila**
Abdomen oval; cephalothorax without convex and elevated cephalic region 4
4. Thoracic groove longitudinal; epigyne with unwrinkled scape and provided with one or two pairs of lateral lobes **Neoscona**
Thoracic groove not longitudinal; epigyne without unwrinkled scape and without lateral lobes 5
5. Abdomen pointed over the carapace with a little mid-dorsal projection **Larinia**
Abdomen not pointed over the carapace and without little mid-dorsal projection 6

6. Femora IV with a double fringe of hair on the prolateral surface of the basal half **Leucauge**
 Femora IV without double fringe of hair on the prolateral surface of the basal half 7
7. Integument of abdomen leathery, dorsum of the abdomen strongly convex..... **Cyrtarachne**
 Integument of abdomen not leathery, dorsum of the abdomen not strongly convex.... 8
8. Thoracic groove transverse, epigyne with distinct scape **Araneus**
 Thoracic groove not transverse, epigyne without distinct scape 9
9. Carapace provided with 'U' shaped junction between cephalic and thoracic region **Cyclosa**
10. Carapace not provided with 'U' shaped junction between cephalic and thoracic region **Herennia**

Genus 1. **Argiope** Audouin

1826. *Argiope* Audouin, in Savigny, *Descriptions de l' Egypte.*, 1 (4) : 121.

1970. *Argiope* : Tikader, *Rec. zool. Surv. India*, 64 (1-4) : 27.

Type-species : *Argiope lobata* (Thorell).

Distribution : Tropical and temperate countries of the world.

Key to the species of the genus **Argiope** Audouin

1. Dorsum with nine distinct transverse brown stripes *pradhani*
 Dorsum without nine distinct transverse brown stripes 2
2. Epigynal septum thin; dorsum provided with inconspicuous lateral lobe ... *shillongensis*
3. Epigynal septum gradually wider posteriorly; dorsum without lateral lobes *pulchella*

1. **Argiope pradhani** Sinha

1951. *Argiope pradhani* Sinha, *Rec. Indian Mus.*, 49 : 76.

1982. *Argiope pradhani* : Tikader, *Fauna of India, Spiders : Araneae*, 2 (1) : 123.

Specimen examined : 2 ♀, Sonapahar, Khasi and Jaintia Hill, Shillong, Meghalaya, India, 27.xi.1977, coll. K. R. Rao.

Distribution : India : Shillong, Meghalaya; Assam, Pakistan.

2. **Argiope shillongensis** Sinha

1951. *Argiope shillongensis* Sinha, *Rec. Indian Mus.*, 49 : 75.

1982. *Argiope shillongensis* : Tikader, *Fauna of India, Spiders : Araneae*, 2 (1) : 117.

Distribution : India : Shillong, Meghalaya.

3. *Argiope pulchella* Thorell

1881. *Argiope pulchella* Thorell, *Annali. Mus. civ. Genova*, **18** : 74.

1982. *Argiope pulchella* : Tikader, *Fauna of India*, Spiders : Araneae, **2** (1) : 129.

Specimen examined : 3 ♀, Khasi Hill, Shillong, Meghalaya, 25.i.1975, coll. M. S. Jyrwes.

Distribution : India : Meghalaya, Andaman & Laccadeep Islands; West Bengal, Madhyapradesh; Orissa; Assam; Maharashtra; Tamil Nadu. Burma and Malaya Peninsula.

Genus 2. *Gasteracantha* Sundevall

1833. *Gasteracantha* Sundevall, *Conspectus Arachnidum*, : 14.

1981. *Gasteracantha* : Tikader & Biswas, *Rec. zool. Surv. India*, Occ. pap. No. 30 (1) : 33.

Type-species : *Gasteracantha cancriformis* (Linnaeus).

Distribution : Tropical countries of the world.

Key to the species of the genus *Gasteracantha* Sundevall

1. Dorsum of abdomen provided with one conspicuous transverse yellowish bar *kuhlii*
Dorsum of the abdomen not provided with one conspicuous transverse yellowish bar....2
2. Median spine slender and arcuate *arcuata*
3. Dorsum of the abdomen provided with three conspicuous transverse yellowish bars *diadesmia*
4. Dorsum of the abdomen not provided with three conspicuous transverse yellowish bars *mammosa*

4. *Gasteracantha kuhlii* C. L. Koch

1838. *Gasteracantha kuhlii* C. L. Koch, *Die Arachniden*, **4** : 20.

1982. *Gasteracantha kuhlii* : Tikader, *Fauna of India*, Spiders : Araneae, **2** (1) : 59.

Specimen examined : 1 ♀, Mowphlong, Khasi Hill, Shillong, Meghalaya, 21.viii.1974, coll. S. K. Chanda.

Distribution : India : Shillong, Meghalaya (New Record); West Bengal; Assam; Andaman & Nicobar Islands; Sikkim. Bhutan; Burma; Indo-Malayassia.

5. *Gasteracantha arcuata* (Fabricius)

1793. *Aranea arcuata* Fabricius, *Ent. Syst.*, **2** : 425.

1951. *Gasteracantha arcuata* : Sinha, *Rec. India Mus.*, **49** : 82.

1982. *Gasteracantha arcuata* : Tikader, *Fauna of India*, Spiders : Araneae, **2** (1) : 69.

Distribution : India : Shillong, Meghalaya; Sikkim. Burma, Indo Malayassia.

6. *Gasteracantha diadestia* Thorell

1887. *Gasteracantha diadestia* Thorell, *Ann. Mus. civ. Genova*, **25** : 225.

1982. *Gasteracantha diadestia* : Tikader, *Fauna of India*, Spiders : Araneae, **2** (1) : 61.

Specimen examined : 1 ♀, Worema, William nagar, Khasi and Garo Hill, Meghalaya, 1.x.1991, coll. R. K. Varshney.

Distribution : India : Meghalaya (Shillong); West Bengal; Sikkim; Andaman & Nicobar Islands. Burma, Thailand.

7. *Gasteracantha mammosa* C. L. Koch

1845. *Gasteracantha mammosa* C. L. Koch, *Die. Arachniden*, **11** : 57.

1982. *Gasteracantha mammosa* : Tikader, *Fauna of India*, Spiders : Araneae, **2** (1) : 55.

Distribution India : Shillong, Meghalaya; Maharashtra; West Bengal; Bihar; Orissa; Sikkim; Tamil Nadu; Uttar Pradesh. Burma, Japan, Sri Lanka, Austro-Malayassia.

Genus 3. *Nephila* Leach

1815. *Nephila* Leach, *Zoological Miscellany*, : 133.

1962. *Nephila* : Tikader, *J. Linn. Soc.*, **44** (300) : 566.

Type-species : *Nephila maculata* (Fabricius).

Distribution : Tropical and rarely sub-tropical countries of the world.

Key to the species of the genus *Nephila* Leach

1. Carapace provided with 'V' shaped yellow patch *clavata*
Carapace not provided with 'V' shaped yellow patch 2
2. Abdomen provided with numerous small pale lines, placed laterally; ducts of spermatheca originated dorso-posteriorly *maculata*
Abdomen without small numerous pale lines, ducts of the spermatheca originated ventro-posteriorly *robusta*

8. *Nephila clavata* L. Koch

1878. *Nephila clavata* L. Koch, *Verh. zool. -bot. Ges. Wien.*, **27** : 741.

1982. *Nephila clavata* : Tikader, *Fauna of India*, Spiders : Araneae, **2** (1) : 102.

Specimen examined : 4 ♀, Mawphlong, Khasi Hill, Meghalaya, 21.viii.1974, coll. S. K. Gupta; 3 ♀ Jhadlakai Lake, Jaintia Hill, Shillong, Meghalaya, 18.viii.1981, coll. J. P. Sati; 5 ♀, Botanical Garden, Shillong, Meghalaya, 19.x.1974, coll. M. S. Jyrwa; 5 ♀, Chabeti, Shillong, Meghalaya, 19.ix.1963, coll. V. Sati; 2 ♀, Tripura Castle Hill, Shillong, Meghalaya, 30.iii.1974, coll. M. S. Jyrwa.

Distribution : India : Shillong, Meghalaya. Bhutan; Sikkim; Andaman & Nicobar Islands; Laccadive Islands. Burma, Thailand, Japan, Chin, Pakistan, Baluchistan, Formosa.

9. *Nephila maculata* (Fabricius)

1793. *Aranea maculata* Fabricius, *Ent. Syst.*, 2 : 425.

1982. *Nephila maculata* : Tikader, *Fauna of India*, Spiders : Araneae, 2 (1) : 97.

Specimen examined : 2 ♀, Sonapahar, Khasi Hill, Shillong, Meghalaya, 27.xi.1977, coll. K. R. Rao; 3 ♀ Norgpol forest, Khasi Hill, Shillong, Meghalaya, 6. viii.1966, coll. Mathur & party; 5 ♀, Elephant falls, Khasi Hill, Meghalaya, 12.vii.1990, coll. S. K. Chanda.

Distribution : India Shillong, Meghalaya (New record); Tamil-Nadu; Karnataka; M.P.; U.P.; Assam, Sikkim; West Bengal; Maharashtra; Gujarat; Andaman & Nicobar Islands. Burma, Sri Lanka, China, Australia, Malaysia, Japan, New Guinea.

10. *Nephila robusta* Tikader

1962. *Nephila robusta* Tikader, *J. Linn. Soc.* 44 (300) : 566.

1982. *Nephila robusta* : Tikader, *Fauna of India*, Spiders : Araneae, 2 (1) : 100.

Specimen examined : 2 ♀, Umbling, Khasi Hill, Upper Shillong, Meghalaya, 1.x.1988, coll. A. K. Lahiri.

Distribution : India : Shillong, Meghalaya (New record); West-Bengal.

Genus 4. *Neoscona* Simon

1864. *Neoscona* Simon, *Hist. nat. des. Aragin*, 1 : 261.

1971. *Neoscona* : Levi, *Bull. Mus, Camp. Zool.*, 141 (8) : 465.

Type-species : *Neoscona anabesca* (Walck.).

Distribution : Species of *Neoscona* distributed all over the world, but many species of this genus have been erroneously placed under the genus *Araneus*.

Key to the species of the genus *Neoscona* Simon

1. Carapace provided with two longitudinal rows of irregular pale patches *achine*
Carapace not provided with two longitudinal rows of irregular pale patches 2
2. Epigynal scape is right angle to the base; lateral lobe inconspicuous *bengalensis*
Epigynal scape is not right angle to the base; lateral lobe not inconspicuous 3
3. Abdomen roundish at both the ends anterior and posterior; genital opening placed underneath the epigynal scape *elliptica*
Abdomen not roundish at both the ends; genital opening not placed underneath the epigynal scape 4
4. Cephalic region provided with a 'V'-shaped conspicuous dark brown patches ... *mukerjei*
Cephalic region not provided with 'V' shaped dark brown patches 5
5. Sternum dark brown in colour, provided with longitudinal white band *theis*
Sternum not dark brown in colour and not provided with longitudinal white band 6
6. Maxilla broad nearly as long as wide *shillongensis*
7. Maxilla not broad nearly as long as wide *nautica*

11. *Neoscona achine* (Simon)

1906. *Araneus achine* Simon, *Annals. Soc. ent. Fr.*, 75 : 309.

1981. *Neoscona achine* : Tikader and Bal, *Rec. zool. Surv. India*, occ. pap. No. 24 : 39.

Specimen examined : 2 ♀, Maidan Labon, Khasi Hill, Shillong, Meghalaya, 26.xi.1966, coll. S. K. Chanda.

Distribution : India : Shillong, Meghalaya (New record) ; Sikkim; Assam.

12. *Neoscona bengalensis* Tikader & Bal

1981. *Neoscona bengalensis* Tikader & Bal, *Rec. zool. Surv. India*, occ. pap. No. 24 : 13.

1982. *Neoscona bengalensis* : Tikader, *Fauna of India*, Spiders : Araneae, 2 (1) : 246.

Specimen examined : 3 ♀, Air port area, Khasi Hill, Shillong, Meghalaya, 11.ix.1988, coll. A. R. Lahiri; 2 ♀, Botanical garden, Shillong, Meghalaya, 12.viii.1976, coll. M. S. Jyrwa; 2 ♀, Nongthamai, Shillong, Meghalaya, 19.viii.1961, coll. S. N. Prasad.

Distribution : India : Shillong, Meghalaya (New record); West-Bengal (Type-locality).

13. *Neoscona elliptica* Tikader & Bal

1981. *Neoscona elliptica* Tikader & Bal, *Rec. zool. Surv. India*, occ. pap. No. 24 : 24.

1982. *Neoscona elliptica* : Tikader, *Fauna of India*, Spiders : Araneae, 2 (1) : 259.

Specimen examined : 2 ♀, Maidan Labon, Dist. Khasi Hill, Meghalaya, 26.xi.1966, coll. S. K. Chanda.

Distribution : India : Shillong, Meghalaya (New record); Maharashtra.

14. *Neoscona mukerjei* Tikader

1980. *Neoscona mukerjei* Tikader, *Proc. Indian Acad. Sci.*, 89 (3) : 247.

1982. *Neoscona mukerjei* : Tikader, *Fauna of India*, Spiders : Araneae, 2 (1) : 248.

Specimen examined : 3 ♀, Air port area, Khasi Hill, Shillong, Meghalaya, 2.xi. 1966, coll. S. K. Chanda ; 2 ♀ Newphlena, Khasi-Hill, Meghalaya, 21.viii.1974, coll. S. K. Chanda.

Distribution India : Shillong, Meghalaya (New record) ; West Bengal; Maharashtra.

15. *Neoscona theis* (Walck.)

1841. *Epeira theis* Walckenaer, *Hist. Nat. Ins. Apt.*, 2 : 53.

1982. *Neoscona theis* : Tikader, *Fauna of India*, Spiders : Araneae, 2 (1) : 269.

Specimen examined : 2 ♀, Khasi Hill, Upper Shillong, Meghalaya, 11.ix.1988, coll. A. R. Lahiri.

Distribution : India : Shillong, Meghalaya (New record); Maharashtra; Orissa; Gujarat; West Bengal. South New Guinea.

16. ***Neoscona shillongensis*** Tikader & Bal

1981. *Neoscona shillongensis* Tikader & Bal, *Rec. zool. Surv. India*, Occ. pap. No. 24 : 34.

1982. *Neoscona theis* : Tikader, *Fauna of India*, Spiders; Araneae, 2 (1) : 269.

Specimen examined : 2 ♀, Nongthamar, Shillong, Meghalaya, 19.viii.1961, coll. S. N. Prasad.

Distribution : India : Shillong, Meghalaya.

17. ***Neoscona nautica*** (L. Koch)

1875. *Epeira nautica* L. Koch, *Aegypt. Abyssin. Arachn. Jickeli*, : 17.

1982. *Neoscona nautica* : Tikader, *Fauna of India*, Spiders : Araneae, 2 (1) : 242.

Distribution : India Shillong, Meghalaya; West Bengal; Gujarat. Burma, Pakistan, North America.

Genus 5. ***Larinia*** Simon

1874. *Larinia* Simon, *Ar. Fr.*, 1 : 115.

1982. *Larinia* : Tikader, *Fauna of India*, Spiders : Araneae, 2 (1) : 205.

Type-species *Larinia lineata* (Lucas).

Distribution : Tropical and sub-tropical countries of the world.

18. ***Larinia chloris*** (Audouin)

1825. *Epeira chloris* Audouin, *Descr. de l'Egypte*, 22 : 347.

1982. *Larinia chloris* : Tikader, *Fauna of India*, Spiders : Araneae, 2 (1) : 206.

Diagnosis : Cephalothorax brownish yellow, abdomen greyish brown. Cephalothorax nearly one and half times longer than wide; narrow in front. Occular quadrate forming a trapezium which is three times wider in front than behind. Abdomen elongated which is two times longer than wide.

Specimen examined 1 ♀, Laitkar park, Shillong, Meghalaya, 28.viii.1976, coll. M. S. Jyrwa; 2 ♀, Pinuslla, Khasi Hill, Meghalaya, 22.viii.1980, coll. A. Singh.

Distribution : India Shillong, Meghalaya (New record) ; Maharashtra; West Bengal. Syria, Egypt, Israel, Uganda.

Genus 6. ***Leucauge White***

1841. *Leucauge* White, *Ann. Mag. nat. Hist.*, 7 (1) : 473.

1962. *Leucauge* : Tikader, *J. Linn. Soc.*, 44 (300) : 563.

Type-species *Leucauge hortorum* (Hentz).

Distribution Tropical and sub-tropical countries of the world.

Key to the species of the genus *Leucauge* White

1. Abdomen uniformly silver white and decorated with longitudinal black bands
 *celebesiana*
 Abdomen not uniformly silver white and not decorated with longitudinal black bands 2
2. Both paired tubercles and median caudal tubercle are large and highly prominent..... *decorata*
 Both paired tubercles and median tubercle are small and less prominent *tessellata*

19. *Leucauge celebesiana* (Walckenaer)

1841. *Tetragnatha celebesiana* Walckenaer, *Hist. Nat. Ins. Apt.*, 2 : 222.

1982. *Leucauge celebesiana* : Tikader, *Fauna of India, Spiders : Araneae*, 2 (1) : 83.

Specimen examined : 3 ♀, Rissa colony, Shillong, Meghalaya, 16.xii.1976, coll. M. S. Jyrwa; 2 ♀, Milki forest, Shillong, Meghalaya, 12.iii.1965, coll. M. S. Jyrwa.

Distribution : India : Shillong, Meghalaya; West Bengal; Tamil-Nadu; Assam; Maharashtra; Sikkim. Burma, China.

20. *Leucauge decorata* (Blackwall)

1864. *Tetragnatha decorata* Blackwall, *Ann. Mag. nat. Hist.*, 14 (3) : 44.

1906. *Leucauge decorata* : Simon, *Annl. Soc. ent. Fr.*, 75 : 282.

1982. *Leucauge decorata* : Tikader, *Fauna of India, Spiders : Araneae*, 2 (1) : 78.

Specimen examined 2 ♀, Office campus, Zoological Survey of India, Rissa colony, Shillong, Meghalaya, 22.xii.1976, coll. M. S. Jyrwa; 1 ♀, G. S. Road, Shillong, Meghalaya, 12.iv.1990, coll. S. K. Gupta.

Distribution : India : Shillong, Meghalaya; Karnataka; West Bengal; Kerala; Tamil Nadu; Uttar Pradesh; Sikkim; Assam; Bihar; Orissa; Gujarat; Pondicheri. Sri Lanka, Burma, Pakistan.

21. *Leucauge tessellata* (Thorell)

1887. *Callinethis tessellata* Thorell, *Annali. Mus. civ. Genova*, 25 : 135.

1921. *Leucauge tessellata* : Gravely, *Rec. Indian Mus.*, 22 (4) : 455.

1982. *Leucauge tessellata* : Tikader, *Fauna of India, Spiders : Araneae*, 2 (1) : 80.

Specimen examined : 2 ♀, Mawphlong, Shillong, Meghalaya, 20.viii.1986, coll. R. Mathur.

Distribution India Shillong, Meghalaya (New record); Kerala; West Bengal; Sikkim; Assam; Gujarat; Karnataka. Bhuttan, Burma.

Genus 7. *Cyrtarachne* Thorell

1868. *Cyrtarachne* Thorell, *Eug. Resa. Arachn.*, : 10.

1960. *Cyrtarachne* : Tikader, *J. Bombay nat. Hist. Soc.*, 57 (3) : 547.

Type-species *Cyrtarachne qrubei* (Keyserling).

Distribution : Asia, Africa and Australia.

22. *Cyrtarachne avimerdaria* Tikader

1963. *Cyrtarachne avimerdaria* Tikader, *J. Bombay nat. Hist. Soc.*, **60** (1) : 269.

1982. *Cyrtarachne avimerdaria* : Tikader, *Fauna of India, Spiders : Araneae*, **2** (1) : 154.

Diagnosis Cephalothorax convex, clothed with hair. Ocular quadrate forming a squire. Chelicera small but strong. Abdomen large, strong overlapping the cephalothorax.

Distribution : India Cherrapunji (Type-locality), Meghalaya.

Genus 8. *Araneus* Clerck

1757. *Araneus* Clerck, *Argn. Suec.*, : 15.

1973. *Araneus* : Levi, *Bull. Mus. comp. Zool. Harv.*, **145** (9) : 473.

Type-species : *Araneus angulatus* Clerck.

Distribution Cosmopolitan.

23. *Araneus cucurbitinus* Clerk

1757. *Araneus cucurbitinus* Clerck, *Avan. Suec.*, : 44.

1982. *Araneus cucurbitinus* : Tikader, *Fauna of India, Spiders : Araneae*, **2** (1) : 236.

Diagnosis Cephalothorax longer than wide, ocular quad nearly as long as wide. Both rows of eyes recurved. Maxillae broad, chelicera strong, legs moderately strong.

Abdomen oval, longer than wide.

Distribution : India Risha colony, Shillong, Meghalaya. Great-Britain, all over the British Island.

Genus 9. *Cyclosa* Menge

1866. *Cyclosa* Menge, *Schrift. Nat. Ges. Danzig (N. F.)*, **1** : 73.

1977. *Cyclosa* : Levi, *Bull. Mus. comp. Zool. Harv.*, **148** (3) : 73.

Type-species : *Cyclosa conica* (Pallas).

Distribution Cosmopolitan.

Key to the species of the genus *Cyclosa* Menge

1. Caudal tubercle long *bifida*
2. Caudal tubercle short *insulana*

24. *Cyclosa bifida* (Doleschall)

1859. *Epeira bifida* Doleschall, *Act. Soc. India Nerl.*, **5** : 38.

1982. *Cyclosa bifida* Tikader, *Fauna of India, Spiders Araneae*, **2** (1) : 185.

Distribution : India Shillong, Meghalaya; Sikkim. Sri Lanka; New Guinea, Malaysia.

25. *Cyclosa insulna* (Costa)

1834. *Epeira insulana* Costa, *Ann. Zool.*, : 65.

1977. *Cyclosa insulana* : Levi, *Bull. Mus. comp. zool. Harv.*, **148** (3) : 81.

1982. *Cyclosa insulana* : Tikader, *Fauna of India, Spiders : Araneae*, **2** (1) : 201.

Distribution : India : Shillong, Meghalaya (Kuppa valley); Ligship, Sikkim.

Genus 10. *Herennia* Thorell

1877. *Herennia* Thorell, *Annali. Mus. civ. Genova*, **10** : 370.

1971. *Herennia* : Chrysanthus, *Zool. Verh. Leiden*, **113** : 41.

Type-species *Herennia ornatissima* (Doleschall).

Distribution : India, Sri Lanka, Malaysia.

26. *Herennia ornatissima* (Doleschall)

1859. *Epeira ornatissima* Doleschall, *Act. Soc. Ind. Neerl.*, **5** : 32.

1982. *Herennia ornatissima* : Tikader, *Fauna of India, Spiders : Araneae*, **2** (1) : 106.

Diagnosis : Cephalothorax longer than wide, narrowing in front, ocular quad as long as wide. Anterior row of eyes recurved, posterior row straight. Chelicerae strong and stout. Legs are long and slender.

Abdomen flat having four pairs of lateral lobes.

Distribution : India : Shillong, Meghalaya; Tamil Nadu; Goa. Sri Lanka, Burma, Australia, Malaysia.

2. Family CLUBIONIDAE

1887. *Clubionidae* Wagner, *Horae Soc. ent. Russ.*, **22** : 104.

1922. *Clubionidae* : Petrunkevitch, *Trans Connect, Acad. Arts. Sci.*, **25** : 237.

Type genus : *Clubiona* Latreille 1804.

Distribution All tropical parts of the world.

Key to the genera of the family Clubionidae

1. Male palp provided with single hooked retrolateral apophysis; cymbium with long spur at its base ***Cheiracanthium***
Male palp without retrolateral apophysis; cymbium with short spur at its base 2
2. Anterior legs shorter than the posterior legs; lateral eyes both anterior and posterior not close to each other ***Clubiona***
3. Anterior legs not shorter than the posterior legs; lateral eyes both anterior and posterior close to each other ***Oedignatha***

Genus 11. ***Cheiracanthium*** Koch

1839. *Cheiracanthium* Koch, C. L., *Die. Arach. Sechster Band*, : 9.

1981. *Cheiracanthium* : Tikader & Biswas, *Rec. zool. Surv. India*, Occ. pap. No. 30 : 69.

Type-species *Cheiracanthium punctorium* Villers.

Distribution All tropical parts of the world.

Key to the species of the genus ***Cheiracanthium*** Koch

1. Prominent fovea present at the middle of the cephalothorax *saraswati*
Prominent fovea not present at the posterior portion of the carapace 2
2. Genital bulb or male pulpus broad anteriorly, membrane of the pulpal organ well developed *trivialis*
Genital bulb or male pulpus narrow anteriorly, membrane of the pulpal organ not well developed 3
3. Cymbium with long stout spur at its base, extending almost at the middle of the tibia *indicum*
Cymbium with short spur at its base, not extending almost at the middle of the tibia .. 4
4. Tibia of the male pulpus with short retrolateral apophysis *melanostoma*
5. Tibia of the male pulpus with long retrolateral apophysis *himalayansis*

27. ***Cheiracanthium saraswati*** Tikader

1962. *Cheiracanthium saraswati* Tikader, *J. Linn. Soc., London*, **44** : 568.

1991. *Cheiracanthium saraswati* : Majumder & Tikader, *Rec. zool. Surv. India*, Occ. pap. No. 102: 70.

Distribution India : Shillong, Meghalaya; Madhya Pradesh; Gujarat.

28. ***Cheiracanthium trivialis*** (Thorell)

1895. *Eutitha trivialis* Thorell, *Spider of Burma*, : 40.

1991. *Cheiracanthium trivialis* : Majumder & Tikader, *Rec. zool. Surv. India*, Occ. pap. No. 102 : 56.

Specimen examined : 1 ♀, Jaintia Hill, Shillong, Meghalaya, 26.i.1975, coll. A. K. Ghosh.

Distribution India : Shillong, Meghalaya; Tamil Nadu; Madhya-Pradesh; Maharashtra; West Bengal; Goa. Burma.

29. ***Cheiracanthium indicum*** Cambridge

1874. *Cheiracanthium indicum* Cambridge, *Pro. zool. Soc., London*, : 411.

1991. *Cheiracanthium indicum* : Majumder & Tikader, *Rec. zool. Surv. India*, Occ. pap. No. 102 : 56.

Distribution India Shillong, Meghalaya; Maharashtra; West Bengal; Gujarat; Sikkim.

30. ***Cheiracanthium melanostoma*** (Thorell)

1895. *Eutitha melanostoma* Thorell, *Spider of Burma*, : 44.

1931. *Cheiracanthium melanostoma* : Gravelly, *Rec. Indian Mus.*, **33** (3) : 264.

1991. *Cheiracanthium melanostoma* : Majumder & Tikader, *Rec. zool. Surv. India*, Occ. pap. No. 102 : 62.

Specimen examined: 2 ♀, Rongjerg Reserve Forest, Shillong, Meghalaya, 3.x.1988, coll. S. Ahmed.

Distribution: India : Shillong, Meghalaya; West Bengal; Bihar; Orissa; Gujarat; Maharashtra; Karnataka; Rajasthan.

31. *Cheiracanthium himalayaensis* Gravelly

1931. *Cheiracanthium himalayaensis* Gravelly, *Rec. Indian Mus.*, **33** (3) : 264.

1991. *Cheiracanthium himalayaensis* : Majumder & Tikader, *Rec. zool. Surv. India*, Occ. pap. No. 102 : 65.

Distribution : India : Shillong, Meghalaya; West Bengal; Gujarat; Maharashtra.

Genus 12. *Clubiona* Latreille

1804. *Clubiona* Latreille, *Nouv. Diet. Hist. Nat.*, **24** : 134.

1984. *Clubiona* : Biswas, *Bull. zool. Surv. India*, **6** (1-3) : 119.

Type-species *Clubiona pallidulla* (Clerck).

Distribution : All tropical parts of the world.

Key to the species of the genus *Clubiona* Latreille

1. Fovea present at the middle of the carapace; lateral striae present encircling the median fovea *ludhianaensis*
2. Fovea not present at the middle of the carapace; lateral striae not present *shillongensis*

32. *Clubiona ludhianaensis* Tikader

1976. *Clubiona ludhianaensis* Tikader, *J. Bombay nat. Hist. Soc.*, **73** (1) : 175.

1991. *Clubiona ludhianaensis* : Majumder & Tikader, *Rec. zool. Surv. India*, Occ. pap. No. 102 : 31.

Distribution : India : Shillong, Meghalaya; West Bengal; Assam; Gujarat; Punjab.

33. *Clubiona shillongensis* Majumder & Tikader

1991. *Clubiona shillongensis* Majumder & Tikader, *Rec. zool. Surv. India*, Occ. pap. No. 102 : 39.

Distribution : India Shillong, Bishnupur (Type-locality), Meghalaya; West Bengal; Tamil Nadu.

Genus 13. *Oedignatha* Thorell

1881. *Oedignatha* Thorell, *Ann. Mus. Civ. Stor. nat., Genova*, **18** : 209.

1931. *Oedignatha* : Gravelly, *Rec. Indian Mus.*, **33** : 264.

1991. *Oedignatha* : Majumder & Tikader, *Rec. zool. Surv. India*, Occ. pap. No. 102 : 114.

Type-species : *Oedignatha scrobiculata* Thorell.

Distribution India; Sri Lanka; Java; Kratakau; Penang (Type-locality).

34. *Oedignatha shillongensis* sp. nov. (Figs. 1-3)

General: Cephalothorax and legs redish brown; abdomen darkish. Total length 7.80 mm. Carapace 3.50 mm. long, 2.80 mm. wide; abdomen 4.30 mm. long and 3.20 mm. wide.

Cephalothorax : Longer than wide, broader at the middle, slightly narrower both anterior and posterior. Cephalic shield prominent with central fovea situated just below the median half of the carapace. Median tubercle absent. Eyes in two rows; anterior and posterior. The anterior row usually recurved, median larger than laterals and close to each other than the laterals. The posterior row usually larger than anterior row, slightly procurved, median smaller than the laterals and also smaller than the anterior medians, not in close to each other. Ocular quadrate wider than long, narrow anteriorly and broad posteriorly. Chelicera not enormous in size like *microsculata*, inner margin provided with seven small teeth and the outer margin with three big teeth. Maxillae longer than broad, slightly deepressed at the middle. Labium longer than wide not extended beyond the middle of the maxillary lobe like *microsculata*. Sternum heart shaped, pointed posteriorly. Legs long and slender very strong. Legs formula are 3214. Tibia and metatarsi of I & II provided with five to ten and seven pairs of ventral spines. Tarsi less scopulated provided with two claws.

Abdomen Longer than wide. Dorsum strongly sclerotized. Scutum present just above the median half of the dorsum. Epigyne with copulatory opening.

Remarks This species resembles to *O. microsculata* Reimoser in similar structure and colouration of the body but differs from it on the following particulars

1). Chelicera not enormous in size provided with seven and two teeth on the inner and outer margin where as in *O. microsculata* the chelicera enormous in size and the inner and outer margin with nine and three teeth.

2). The labium not extended beyond the middle of the maxilla where as in *O. microsculata* labium extended beyond the middle of the maxilla. 3) Epigyne and internal genitalia are also structurally different.

Type-locality: Lonkor Reserve Forest, Shillong, Meghalaya, 21.iv.1976, coll. *M. S. Jyrwa*.

Holotype : Female in spirit, deposited at Zoological Survey of India, Calcutta, Redg. No. 5412/18.

3. Family LYCOSIDAE

1833. *Lycosidae* Sundevall, *Conspectus Arachnidum*, : 1-39.

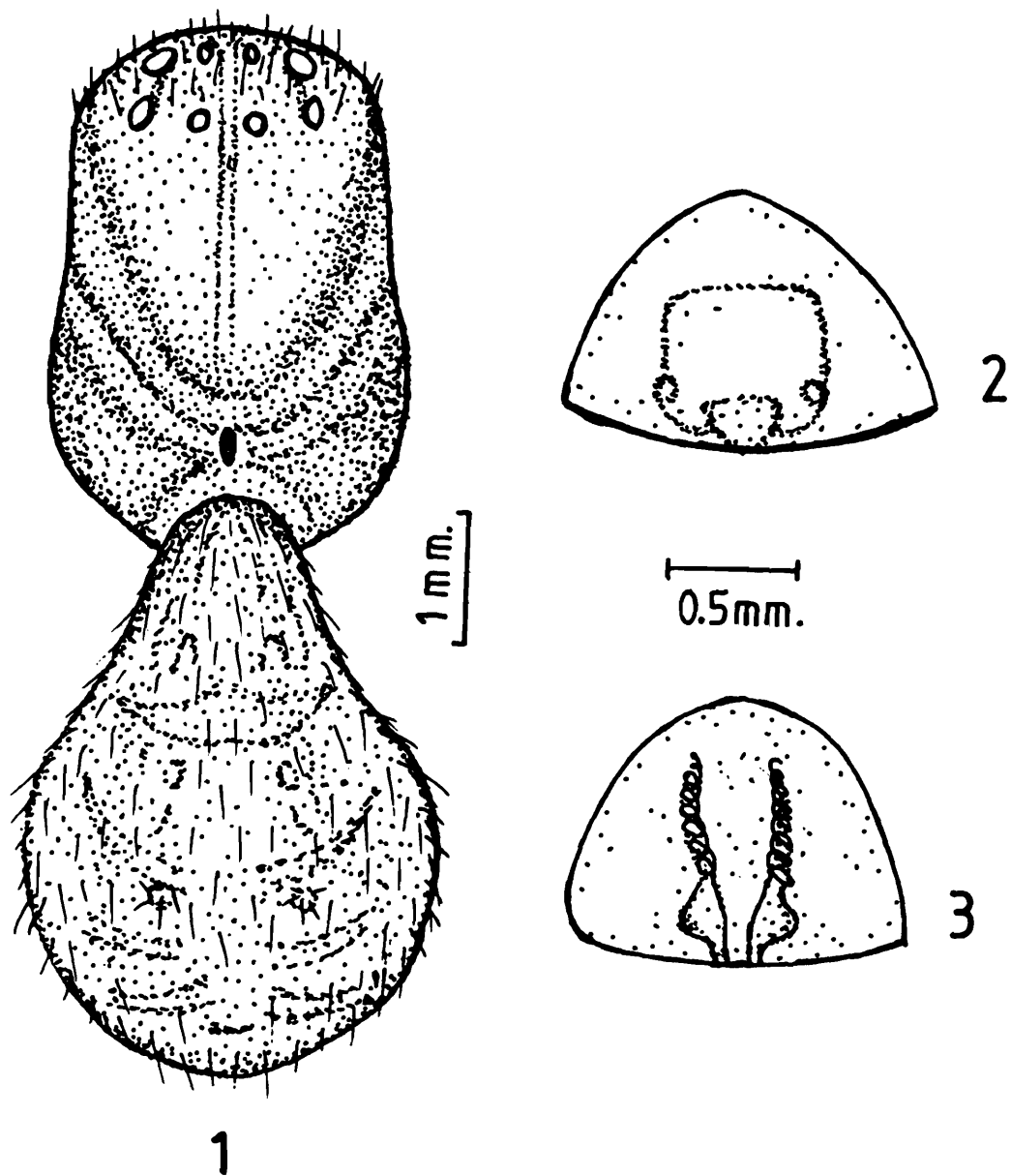
1970. *Lycosidae* : Tikader, *Rec. zool. Surv. India*, **64** (1-4) : 62.

Type genus *Lycosa* Latreille.

Distribution Cosmopolitan.

Key to the genera of the family Lycosidae

1. Carapace glabrous; labium longer than wide **Arctosa**
- Carapace not glabrous; labium wider than long 2



Figs. 1-3 : *Oedignatha shillongensis* sp. nov. : 1. dorsal view of female, legs omitted. 2. Epigyne. 3. Internal genitalia.

2. Anterior portion of the cephalothorax abruptly elevated from the thoracic region; metatarsi IV longer than tibia ***Evippa***
Anterior portion of the cephalothorax not abruptly elevated from the thoracic region; metatarsi IV not longer than tibia 3
3. Posterior spinnerets distinctly longer than the anterior spinnerets; sternum generally provided with mid longitudinal dark markings ***Hippasa***
Posterior spinnerets not distinctly longer than the anterior spinnerets; sternum not provided with mid longitudinal dark markings 4
4. Head at the top is wider than at clypeus and the metatarsi IV usually longer than tibia plus patella IV together ***Pardosa***
Head at the top narrower than at clypeus metatarsi IV shorter than tibia plus patella IV together 5
5. Anterior row of eyes strongly procurved; anterior median eyes never smaller than anterior laterals ***Lycosa***
Anterior row of eyes strongly procurved; anterior median eyes smaller than the anterior laterals 6
6. Superior tarsal claws heavily pectinated; third pair of legs not longer than the first pair ***Venonia***
7. Superior tarsal claws not pectinated; third pair of legs longer than the first pair ***Ocyle***

Genus 14. ***Arctosa*** Koch

1847. *Arctosa* Koch, *Die Arachniden*, 14 (3) : 94.

1980. *Arctosa* : Tikader & Malhotra, *Fauna of India*, Spiders : Araneae, 1 (2) : 368.

Key to the species of the genus ***Arctosa*** Koch

1. Legs provided with conspicuous greenish patches; bases of both second and third row of eyes provided with contiguous patches *mulani*
2. Legs not provided with conspicuous patches; bases of both second and third row of eyes provided with separate patches *khudiensis*

35. ***Arctosa mulani*** (Dyal)

1935. *Pardosa mulani* Dyal, *Bull. Dept. Zool. Punjab Univ.*, 1 : 146.

1980. *Arctosa mulani* : Tikader & Malhotra, *Fauna of India*, Spiders : Araneae, 1 (2) : 373.

Specimen examined: 1 ♂, Risha colony, Shillong, Meghalaya, 7.iii.1977, coll. M. S. Jyrwa;
2 ♀, Lailum Krach, near Shillong College, Meghalaya, 26.ii.1973, coll. M. S. Jyrwa.

Distribution : India Shillong, Meghalaya (New Record); Maharashtra. Pakistan.

36. ***Arctosa khudiensis*** (Sinha)

1951. *Lycosa khudiensis* Sinha, *Rec. Indian Mus.*, 48 (2) : 22.

1980. *Arctosa khudiensis* Tikader & Malhotra, *Fauna of India*, Spiders : Araneae, 1 (2) : 375.

Specimen examined : 3 ♀, Dharai giri, Shillong, Meghalaya, 20.x.1988, coll. S. Ahmed.

Distribution : India Shillong, Meghalaya (New Record); Bihar. Pakistan.

Genus 15. *Evippa* Simon

1882. *Evippa* Simon, *Ann. Mus. civ. stor. Nat. Genova*, **18** : 222.

1951. *Evippa* : Sinha, *Rec. Indian Mus.*, **48** (2) : 48.

Type-species : *Evippa arenaria* (Audouin).

Distribution Africa, Egypt, Asia.

Key to the species of the genus *Evippa* Simon

1. Abdomen dorsally provided with regular greenish brown patches *praelongipes*
2. Abdomen not provided with regular greenish brown patches *banarensis*

37. *Evippa praelongensis* (Cambridge)

1870. *Lycosa praelongensis* Cambridge, *Proc. Zool. Soc. Lond.*, : 822.

1980. *Evippa praelongensis* : Tikader & Malhotra, *Fauna of India, Spiders : Araneae*, **1** (2) : 310.

Specimen examined: 2 ♀, Mowphlong forest, Khasi Hill, Shillong, Meghalaya, 20.vi.1974, coll. A. K. Ghosh.

Distribution : India . Shillong, Meghalaya (New record); Rajasthan; Assam; Punjab; West Bengal. Pakistan.

38. *Evippa banarensis* Tikder

1980. *Evippa banarensis* Tikader & Malhotra, *Fauna of India, Spiders : Araneae*, **1** (2) : 305.

Specimen examined: 2 ♀, Mowphlong forest, Khasi Hill, Shillong, Meghalaya, 20.vi.1974, coll. A. K. Ghosh.

Distribution India Shillong, Meghalaya (New record); Rajasthan.

Genus 16. *Hippasa* Simon

1885. *Hippasa* Simon, *Bull. Soc. Zool. Fr.*, **10** : 31.

1951. *Hippasa* : Sinha, *Rec. Indian Mus.*, **48** (2) : 11.

Type-species *Hippasa agelenoides* (Simon).

Distribution : India, Madagascar, Africa, Arabia, Malaysia.

Key to the species of the genus *Hippasa* Simon

1. Abdomen provided with an antero-mid dorsal lens shaped marking; sternum without dark mid-longitudinal band *madrassetana*
2. Abdomen without an antero mid-dorsal lens shaped marking; sternum with dark mid-longitudinal band *mahabaleshwarseni*

39. *Hippasa madraspatana* Gravely

1924. *Hippasa madraspatana* Gravely, *Rec. Indian Mus.*, **26** : 595.

1980. *Hippasa madraspatana* : Tikader & Malhotra, *Fauna of India, Spiders : Araneae*, **1** (2) : 289.

Specimen examined : 2 ♀, Garamponi, Jaintia Hill, Shillong, Meghalaya, 27.i.1975, coll. A. K. Ghosh.

Distribution India : Shillong, Meghalaya (New record); Madras, Tamil Nadu.

40. *Hippasa mahabaleshwariensis* Tikader & Malhotra

1980. *Hippasa mahabaleshwariensis* Tikader & Malhotra *Fauna of India, Spiders : Araneae*, **1** (2) : 285.

Specimen examined : 2♂, 1 ♀, Pooshutia, Shillong, Meghalaya, 27.v.1979, coll. G. K. Srivastava.

Distribution India : Shillong, Meghalaya (New record); Satara, Maharashtra.

Genus 17. *Pardosa* Koch.

1848. *Pardosa* Koch. *Die. Arachnide*, **14** : 100.

1951. *Pardosa* : Sinha, *Rec. Indian Mus.*, **48** (2) : 45.

Type-species *Pardosa striatipes* Koch.

Distribution : Asia, America, Europe.

Key to the species of the genus *Pardosa* Koch

1. Maxillae provided with inconspicuous scopula; ocular area not black and hairy
..... *annandalei*
Maxillae without inconspicuous scopula; ocular area black and hairy 2
2. Chelicera uniform in colour; patella not provided with longitudinal black streak dorsally *birmanica*
Chelicera not uniform in colour; patella provided dorsally with longitudinal black streak 3
3. Abdomen provided with ventrally two lateral irregular brown patches on the side of the spinnerets *heterophthalmus*
Abdomen not provided with ventrally two lateral irregular brown patches on the side of the spinnerets 4
4. Sternum provided with conspicuous V-shaped mark *minutus*
Sternum not provided with conspicuous 'V' shaped mark 5
5. Abdomen mid-dorsally provided with a broad longitudinal pale band and light brown irregular patches *mukundi*
Abdomen mid-dorsally without a broad longitudinal pale band and light brown patches 6
6. Tibia and metatarsi of I & II provided with 4 and 3 pairs of ventral spines; maxillae without scopulae *sutherlandi*
7. Tibia and metatarsi of I & II not provided with 4 and 3 pairs of ventral spines; maxillae with conspicuous scopulae *sumatrana*

41. *Pardosa annandalei* (Gravely)

1924. *Lycosa annandalei* Gravely, *Rec. Indian Mus.*, **26** : 606.

1980. *Pardosa annandalei* : Tikader & Malhotra, *Fauna of India*, Spiders : Araneae, **1** (2) : 351.

Specimen examined : 3 ♀, Lailum Khrah, near Shillong College, Meghalaya, 26.ii.1973, coll. *M. S. Jyrwa*; 1 ♀, Upper Shillong, Meghalaya, 9.vii.1983, coll. *St. Peter*.

Distribution India Shillong, Meghalaya; Kerala; Maharashtra; Andhra Pradesh; Tamil Nadu; Madhya Pradesh; Bihar; West Bengal; Assam; Gujarat. Bangla Desh, Burma, Pakistan.

42. *Pardosa birmanica* Simon

1884. *Pardosa birmanica* Simon, *Ann. Mus. civ. stor. nat. Genova*, **20** : 333.

1980. *Pardosa birmanica* : Tikader & Malhotra, *Fauna of India*, Spiders : Araneae, **1** (2) : 329.

Specimen examined : 2 ♀, Thadlakai lake, Jayantia Hill, Shillong, Meghalaya, 18.ix.1981, coll. *J. P. Seti*; 3 ♀, Khasi Hill, Upper Shillong, Meghalaya, 24.i.1975, coll. *M. S. Jyrwa*.

Distribution India : Shillong, Meghalaya; West Bengal; Bihar; Orissa; Maharashtra; Punjab; Gujarat; Uttar Pradesh; Himachal-Pradesh; Madhya Pradesh; Andhra Pradesh; Tamil Nadu. Burma, Pakistan.

43. *Pardosa heterophthalmus* (Simon)

1898. *Acroniops heterophthalmus* Simon, *Hist. nat. des Araignees*, **2** : 362.

1980. *Pardosa heterophthalmus* : Tikader & Malhotra, *Fauna of India*, Spiders : Araneae, **1** (2) : 345.

Specimen examined : 2 ♀, Daragiri, Shillong, Meghalaya, 2.x.1988, coll. *S. Ahmed*.

Distribution : India Shillong, Meghalaya (New record); Tamil Nadu; West Bengal. Java.

44. *Pardosa minutus* Tikader & Malhotra

1976. *Pardosa minutus* Tikader & Malhotra, *Proc. Indian Acad. Sci.*, **83** (3) : 126-128.

1980. *Pardosa minutus* : Tikader & Malhotra, *Fauna of India*, Spiders : Araneae, **1** (2) : 319.

Specimen examined : 3 ♀, Khasi Hill, Upper Shillong, Meghalaya, 28.i.1975, coll. *M. S. Jyrwa*.

Distribution : India Shillong, Meghalaya (New record); Maharashtra.

46. *Pardosa sutherlandi* (Gravely)

1924. *Lycosa sutherlandi* Gravely, *Rec. Indian Mus.*, **26** : 606.

1980. *Pardosa sutherlandi* : Tikader & Malhotra, *Fauna of India*, Spiders : Araneae, **1** (2) : 347.

Specimen examined : 2 ♀, Fruit garden, Shillong, Meghalaya, 7.vi.1977, coll. *M. S. Jyrwa*; 1 ♀, Upper Shillong, Meghalaya, 9.vii.1983, coll. *St. Peter*.

Distribution India Shillong, Meghalaya (New record); West Bengal.

47. *Pardosa sumatrana* (Thorell)

1890. *Lycosa sumatrana* Thorell, *Ann. Mus. Stor. nat. Genova*, **30** : 136.

1980. *Pardosa sumatrana* : Tikader & Malhotra, *Fauna of India, Spiders : Araneae*, **1** (2) : 353.

Distribution : India : Shillong, Meghalaya; West Bengal; Tripura; Kerala; Karnataka; Tamil Nadu; Andhra Pradesh; Arunachal Pradesh; Himachal Pradesh; Madhya Pradesh; Maharashtra; Gujarat; Rajasthan. Bangla Desh, Nepal, Sri Lanka, Sumatra.

Genus 18. *Lycosa* Latreille

1804. *Lycosa* Latreille, *Nouv. Dist.d' Hist. Nat.*, **24** : 135.

1970. *Lycosa* : Tikader, *Rec. zool. Surv. India*, **64** (1-4) : 63.

Type-species : *Lycosa tarantula* Rossi.

Distribution All over the world.

Key to the species of the genus *Lycosa* Latreille

1. Femora of the legs provided with conspicuous irregular greenish brown patches
..... *barnesi*
Femora of the legs not provided with conspicuous irregular greenish brown patches ... 2
2. Carapace provided with a median broad pale band extending from bases of the 2nd row of eyes to the bases of the cephalothorax *himalayensis*
Carapace not provided with a median broad pale band extending from the bases of the 2nd row of eyes to the bases of the cephalothorax 3
3. Proximal end of femora provided with light brown patches; distal end with two longitudinal streaks *geotubalis*
Proximal end of femora not provided with light brown patches and the distal end not provided with two longitudinal streaks 4
4. Tibia, metatarsi and tarsi of I and II legs generally pale ventrally *iranii*
Tibia, metatarsi and tarsi of I and II legs not pale ventrally 5
5. Carapace redish brown and the femora of legs provided with light green patches
..... *kempi*
Carapace not redish brown and the femora of the legs not provided with light green patches 6
6. Ventral side of the tibia IV provided with broad dark brown band *nigrotibialis*
7. Ventral side of the tibia IV not provided with dark brown broad band *shillongensis*

48. *Lycosa barnesi* Gravely

1924. *Lycosa barnesi* Gravely, *Rec. Indian Mus.*, **26** : 599.

1980. *Lycosa barnesi* : Tikader & Malhotra, *Fauna of India, Spiders : Araneae*, **1** (2) : 417.

Specimen examined : 2 ♀, Lailum Kharch near Shillong College, Meghalaya, 26.ii.1973, coll. M. S. Jyrwa.

Distribution India Shillong, Meghalaya (New record); South Malabar.

49. ***Lycosa himalayensis*** Gravely

1924. *Lycosa himalayensis* Gravely, *Rec. Indian Mus.*, **26** : 603.

1980. *Lycosa himalayensis* : Tikader & Malhotra, *Fauna of India*, Spiders : Araneae, **1** (2) : 382.

Specimen examined : 2 ♀, Risha colony, Meghalaya, 7.iii.1977, coll. *M. S. Jyrwa*.

Distribution : India : Shillong, Meghalaya; Assam; West Bengal.

50. ***Lycosa geotubalis*** Tikader & Malhotra

1980. *Lycosa geotubalis* Tikader & Malhotra, *Fauna of India*, Spiders : Araneae, **1** (2) : 413.

Specimen examined : 2 ♀, Margkhota, Shillong, Meghalaya, 23.ix.1988, coll. *S. Ahmed*.

Distribution : India : Shillong, Meghalaya (New record); Maharashtra (Type-locality) ; Gujarat.

51. ***Lycosa iranii*** Pocock

1901. *Lycosa iranii* Pocock, *J. Bombay nat. Hist. Soc.*, **13** (3) : 485.

1980. *Lycosa iranii* : Tikader & Malhotra, *Fauna of India*, Spiders : Araneae, **1** (2) : 415.

Specimen examined : 2 ♀, Dobasipara, Garo Hill, Shillong, Meghalaya, 1.iii.1991, coll. *H. C. Ghosh & Party*.

Distribution India : Shillong, Meghalaya (New record); Maharashtra.

52. ***Lycosa kempi*** Gravely

1924. *Lycosa kempi* Gravely, *Rec. Indian mus.*, **26** : 602.

1980. *Lycosa kempi* : Tikader & Malhotra, *Fauna of India*, Spiders : Araneae, **1** (2) : 389.

Specimen examined : 3 ♀, Hot Spring, Juckrem, Shillong, Meghalaya, 24.iii.1981, coll. *K. P. Shing*.

Distribution India : Shillong, Meghalaya; West Bengal; Assam; Sikkim. Bhutan.

53. ***Lycosa nigrotibialis*** Simon

1884. *Lycosa nigrotibialis* Simon, *Ann. Mus. Stor. Nat. Genova*, **20** : 330.

1980. *Lycosa nigrotibialis* : Tikader & Malhotra, *Fauna of India*, Spiders : Araneae, **1** (2) : 405.

Specimen examined : 2 ♀, Sonapahar, Khasi Hill, Shillong, Meghalaya, 29.viii.1977, coll. *K. R. Rao*.

Distribution : India : Shillong, Meghalaya; Maharashtra; Gujarat; Himachal Pradesh; West Bengal; Bihar; Assam; Sikkim. Afganistan, Burma, Pakistan.

54. ***Lycosa shillongensis*** Tikader & Malhotra

1980. *Lycosa shillongensis* Tikader & Malhotra, *Fauna of India*, Spiders : Araneae, **1** (2) : 403.

Specimen examined : 2 ♀, Mawphlong, Khasi Hill, Shillong, Meghalaya, 21.iii.1972, coll. R. S. Pillai.

Distribution : India : Shillong, Meghalaya.

Genus 19. *Venonia* Thorell

1894. *Venonia* Thorell, *Bull. Soc. Ent. Ital.*, **26** : 332.

1951. *Venonia* : Sinha, *Rec. Indian Mus.*, **26** : 608.

Type-species : *Venonia coruscans* Thorell

Distribution : India, Singapore, New Holland.

55. *Venonia himalayensis* Gravely

1924. *Venonia himalayensis* Gravely, *Rec. Indian Mus.*, **26** : 608.

1980. *Venonia himalayensis* : Tikader & Malhotra, *Fauna of India, Spiders : Araneae*, **1** (2) : 434.

Specimen examined : 3 ♀, Shillong Park, Meghalaya, 6.ix.1977, coll. H. Khajuria; 2 ♀, Motinagar, Shillong, Meghalaya, 26.iv.1979, coll. M. S. Jyrwa.

Diagnosis Cephalothorax longer than broad, narrow anteriorly and provided with conspicuous fovea at the middle. Anterior row of eyes strongly procurved, median smaller than the laterals. Ocular quad wider than long. Labium as long as wide. Legs long and moderately strong.

Abdomen longer than wide. Dorsum provided with conspicuous pale spots.

Distribution : India : Shillong, Meghalaya (New record) West Bengal.

Genus 20. *Ocyale* Audouin

1825. *Ocyale* Audouin, in Savigny's *Description de l' Egypte Arachnides' Paris*, **1** : 150.

1951. *Ocyale* : Sinha, *Rec. Indian Mus.*, **48** (2) : 18.

Type-species : *Ocyale atalanta* Audouin.

Distribution India, Egypt, Ethiopia, Sri Lanka, Burma, Guinea, Congo and Europe.

56. *Ocyale atalanta* Audouin

1825. *Ocyale atalanta* Audouin, *Description de l' Egypte Arachnides' Paris*, **1** : 150.

1980. *Ocyale atalanta* : Tikader & Malhotra, *Fauna of India Spiders : Araneae*, **1** (2) : 364.

Specimen examined : 1 ♀, Putias forest, Shillong, Meghalaya, 11.iv.1991, coll. S. K. Ghosh.

Diagnosis : Cephalothorax longer than wide, prominent fovea present at the centre from which thin bands are radiated. Anterior row of eyes slightly recurved, anterior median larger than anterior laterals. Eyes of the second and third rows are in equal size. Labium slightly longer than wide. Maxilla very much wider at the distal end. Legs are long and strong.

Abdomen oval, pointed behind, provided with irregular brown and yellow patches.

Distribution : India Shillong, Meghalaya (New record); Orissa; Bihar. Sri Lanka, Burma and Africa.

4. Family : THOMISIDAE

1833. *Thomisidae* Sundevall, *Conspectus arachnidum* London, : 27.

1971. *Thomisidae* : Tikader, *Mem. zool. Surv. India*, **15** (3) : 1-90.

Type genus *Thomisus* Walckenaer.

Distribution Asia, Africa, America, Australia, Europe.

Key to the genera of the family Thomisidae Sundevall

1. Body covered with conspicuous spines ***Diaea***
Body not covered with conspicuous spines 2
2. Anterior eyes nearly in equidistant to each other ***Misumena***
Anterior eyes not nearly in equidistant to each other 3
3. Integumen clothed with some clavate sitae ***Oxyptila***
Integumen not clothed with some clavate sitae 4
4. Second pair of legs longer than first pair ***Philodromus***
Second pair of legs not longer than first pair 5
5. Abdomen broadened and truncated behind ***Pistius***
Abdomen not broadened and truncated behind 6
6. First pair of legs conspicuously robust ***Regillus***
First pair of legs not conspicuously robust 7
7. Anterior median eyes closer to the anterior lateral than to each other ***Xysticus***
Anterior median eyes not closer to the anterior lateral than to each other 8
8. Abdomen longer in size, lateral side provided with longitudinal muscular corrugation ***Runcinia***
9. Abdomen widened and truncated behind; lateral side not provided with longitudinal muscular corrugation ***Thomisus***

Genus 21. ***Diaea*** Thorell

1869. *Diaea* Thorell, *Eur. Spid. Etc.*, : 184.

1966. *Diaea* : Tikader, *Proc. Indian Acad. Sci.*, **64** (1) : 59.

Type-species : *Diaea dorsata* (Fabricius).

Distribution Asia, Africa, America and Europe.

57. ***Diaea jaintious*** Tikader

1966. *Diaea jaintious* Tikader, *Proc. Indian Acad. Sci. Bangalore*, **64** (1) : 59.

1980. *Diaea jaintious* : Tikader, *Fauna of India, Spiders* : Araneae, **1** (1) : 105.

Specimen examined : 1 ♀, Polobazar, Turist lodge, Shillong, Meghalaya, 7.iv.1971, coll. S. K. Ghosh.

Diagnosis Cephalothorax longer than wide, narrow in front, clothed with spines. Eyes are black, lateral eyes situated on the shallow tubercles. Ocular quadrate wider than long. Abdomen oval prominently dialated behind, clothed with spiny hair.

Distribution : India Shillong, Meghalaya.

Genus 22. *Misumena* Latreille

1804. *Misumena* Latreille, *Nouv. Dict. Hist. Nat.*, **24** : 135.

1962. *Misumena* : Tikader, *J. Linn. Soc.*, London, **44** (300) : 573.

Type-species *Misumena vatia* (Clerck).

Distribution : America, Asia and Europe.

Key to the species of the genus *Misumena* Latreille

1. Abdomen provided with longitudinal rows of black spots; no sigilla *horai*
2. Abdomen without longitudinal rows of black spots; 5 6 sigilla present *mridulai*

58. *Misumena horai* Tikader

1962. *Misumena horai* Tikader, *J. Linn. Soc.*, London, **44** (300) : 573.

1980. *Misumena horai* : Tikader, *Fauna of India, Spiders* :
Araneae, **1** (1) 93.

Distribution India Shillong, Meghalaya.

59. *Misumena mridulai* Tikader

1962. *Misumena mridulai* Tikader, *J. Linn. Soc.*, London, **44** (300) : 573.

Distribution : India Shillong, Meghalaya.

Genus 23. *Oxyptila* Simon

1864. *Oxyptila* Simon, *Hist. Nat. Ar.*, **1** : 439.

1964. *Oxyptila* : Basu, *Sci. & Cult.*, Calcutta, **30** (3) : 154.

Type-species *Oxyptila brevipes* (Hahn).

Distribution All tropical and sub-tropical countries and North temperate region of the world.

60. *Oxyptila khasi* Tikader

1960. *Oxyptila khasi* Tikader, *Proc. zool. Soc.*, Calcutta, **13** (2) : 116.

1980. *Oxyptila khasi* : Tikader, *Fauna of India, Spiders* : Araneae, **1** (1) : 80.

Diagnosis : Cephalothorax slightly wider than long, anterior end abruptly narrowing. Eyes encircled by white tubercles, the anterior lateral eyes are the largest of all the eyes. Legs I & II larger than the III & IV.

Abdomen ovate, clothed with clavate hair.

Distribution : India : Shillong, Meghalaya.

Genus 24. ***Philodromus*** Walckenaer

1825. *Philodromus* Walckenaer, *Ent. Fr. Ar.*, : 86.

1966. *Philodromus* : Tikader, *Proc. Linn. Soc.*, London, **177** (1) : 35.

Type-species : *Philodromus aureolus* (Clerck).

Distribution : All over the world.

Key to the species of the genus ***Philodromus*** Walckenaer

1. Abdomen provided with lateral brown patches *assamensis*
Abdomen not provided with lateral brown patches 2
2. Lateral margin of the cephalothorax provided with pigmented patches *shillongensis*
Lateral margin of the cephalothorax without pigmented patches 3
3. Ventral side of the abdomen provided with broad longitudinal deep brown band
..... *barmani*
Ventral side of the abdomen without longitudinal deep brown band 4
4. Femora of I leg provided with three strong frontal spines *decoratus*
5. Femora of I leg without three strong frontal spines *manikae*

61. ***Philodromus assamensis*** Tikader

1962. *Philodromus assamensis* Tikader, *J. Linn. Soc.*, London, **44** (300) : 581.

1980. *Philodromus assamensis* : Tikader, *Fauna of India*, Spiders : Araneae, **1** (1) : 185.

Distribution : India : Shillong, Meghalaya.

62. ***Philodromus shillongensis*** Tikader

1962. *Philodromus shillongensis* Tikader, *Proc. zool. Soc.*, Calcutta, **15** (1) : 40.

1980. *Philodromus shillongensis* : Tikader, *Fauna of India*, Spiders : Araneae, **1** (1) : 189.

Distribution : India : Shillong, Meghalaya.

63. ***Philodromus barmani*** Tikader

1980. *Philodromus barmani* Tikader, *Fauna of India*, Spiders : Araneae, **1** (1) : 208.

Distribution : India : Shillong, Meghalaya.

64. ***Philodromus decoratus*** Tikader

1962. *Philodromus decoratus* Tikader, *J. Linn. Soc.*, London, **44** (300) : 582.

1980. *Philodromus decoratus* : Tikader, *Fauna of India*, Spiders : Araneae, **1** (1) : 196.

Distribution : India : Shillong, Meghalaya.

65. *Philodromus manikae* Tikader

1971. *Philodromus manikae* Tikader, *Mem. zool. Surv. India*, **15** (3) : 75.

1980. *Philodromus manikae* : Tikader, *Fauna of India*, Spiders : Araneae, **1** (1) : 195.

Distribution India Shillong, Meghalaya.

Genus 25. *Pistius* Simon

1875. *Pistius* Simon, *Ar. Fr.*, **2** : 257.

1965. *Pistius* : Basu, *Proc. zool Soc.*, Calcutta, **18** : 71.

Type-species : *Pistius truncatus* (Pallas).

Distribution India, Central Asia, Europe, Japan.

66. *Pistius sreepanchamii* Tikader

1962. *Pistius sreepanchamii* Tikader, *J. Linn. Soc.*, London, **44** (300) : 571.

1980. *Pistius sreepanchamii* : Tikader, *Fauna of India*, Spiders : Araneae, **1** (1) : 71.

Diagnosis Cephalothorax oval, somewhat narrow in front. Eyes are black, anterior median slightly closer than posterior medians. Ocular quadrate slightly larger than wide. Legs I & II larger than III & IV. Abdomen almost rounded, slightly overlapping the posterior region of the cephalothorax.

Distribution India : Shillong, Meghalaya.

Genus 26. *Regillus* Cambridge

1884. *Regillus* Cambridge, *Proc. zool. Soc.*, London, **1884** : 203.

1966. *Regillus* : Tikader, *Proc. Indian Acad. Sci.*, Bangalore, **64** (1) : 54.

Type-species *Regillus asper* Cambridge.

Distribution : India, Africa and Malaysia.

67. *Regillus elephantus* Tikader

1966. *Regillus elephantus* Tikader, *Proc. Indian Acad. Sci.*, Bangalore, **64** (1) : 54.

1980. *Regillus elephantus* : Tikader, *Fauna of India*, Spiders : Araneae, **1** (1) : 167.

Diagnosis : Cephalothorax longer than wide nearly flat but cephalic region mid-dorsally provided with high longitudinal ridge and narrow in front. Eyes of both rows are recurved, lateral eyes large and situated on the prominent tubercles. Ocular quadrate longer than wide, slightly narrow in front. Margin of the clypeus provided with seven spines. Legs are robust with conspicuous spines.

Abdomen longer than wide, widest behind, clothed with conspicuous blunt spines.

Distribution : India : Shillong (Khasi & Jaintia Hill), Meghalaya.

Genus 27. *Xysticus* Koch

1835. *Xysticus* Koch, H. Schaeff. *Deutschl. Ins.*, : 35.

1962. *Xysticus* : Tikader, J. Linn. Soc., London, **44** (300) : 576.

Type-species : *Xysticus critatus* (Clerck)

Distribution : Asia, Africa, America and Europe.

Key to the species of the genus *Xysticus* Koch

1. Tibia and metatarsi of I & II provided with two pairs of ventral spines *khasiensis*
Tibia and metatarsi of I & II not provided with two pairs of ventral spines 2
2. Abdomen provided with two longitudinal brown lines extending mid-ventrally to the base of spinnerets *jayantius*
Abdomen not provided with two longitudinal brown lines extending mid-ventrally to the base of spinnerets 3
3. Two conspicuous black lines present at the dorsum *mandali*
Two conspicuous black lines absent at the dorsum 4
4. Cephalothorax provided with two conspicuous longitudinal broad dark brown band
..... *pynurus*
Cephalothorax not provided with two conspicuous longitudinal broad dark brown band 5
5. Ocular quadrate as long as wide, lateral eyes larger and contiguous *shillongensis*
Ocular quadrate longer than broad, lateral eyes not larger and contiguous 6
6. Dorsum provided with transverse whitish or pale lines *sujatai*
Dorsum not provided with transverse whitish or pale lines 7
7. Cephalothorax provided with broad 'U' shaped dark brown patches *kamakhyai*
8. Cephalothorax not provided with 'U' shaped dark brown patches *shyamrupus*

68. *Xysticus khasiensis* Tikader

1980. *Xysticus khasiensis* Tikader, *Fauna of India*, Spiders : Araneae, **1** (1) : 132.

Distribution India Shillong, Meghalaya.

69. *Xysticus jayantius* Tikader

1966. *Xysticus jayantius* Tikader, *J. Asiat. Soc.*, Bengal, **8** (4) : 250.

1980. *Xysticus jayantius* : Tikader, *Fauna of India*, Spiders : Araneae, **1** (1) : 124.

Distribution India Shillong, Meghalaya.

70. *Xysticus mandali* Tikader

1966. *Xysticus mandali* Tikader, *Proc. Indian Acad. Sci.*, Bangalore, **64** (1) : 58.

1980. *Xysticus mandali* : Tikader, *Fauna of India*, Spiders : Araneae. **1** (1) : 118.

Specimen examined : 1 ♀, Mahanagar, Shillong, Meghalaya, 21.ix.1971, coll. R. Giri.

Distribution India Shillong, Meghalaya.

71. *Xysticus pynurus* Tikader

1966. *Xysticus pynurus* Tikader, *J. Asiat. Soc., Bengal, Calcutta*, **8** (4) : 249.

1980. *Xysticus pynurus* : Tikader, *Fauna of India, Spiders : Araneae*, **1** (1) : 123.

Specimen examined : 1 ♀, Fruit Garden, Shillong, Meghalaya, 11.viii. 1977, coll. M. S. Jyrwa.

Distribution India Shillong, Meghalaya.

72. *Xysticus shillongensis* Tikader

1962. *Xysticus shillongensis* Tikader, *J. Linn. Soc., London*, **44** (300) : 572.

1980. *Xysticus shillongensis* : Tikader, *Fauna of India, Spiders : Araneae*, **1** (1) : 126.

Distribution India Shillong, Meghalaya.

73. *Xysticus sujatai* Tikader

1962. *Xysticus sujatai* Tikader, *J. Linn. Soc., London*, **44** (300) : 577.

1980. *Xysticus sujatai* : Tikader, *Fauna of India, Spiders : Araneae*, **1** (1) : 121.

Distribution India Shillong, Meghalaya.

74. *Xysticus kamakhyai* Tikader

1962. *Xysticus kamakhyai* Tikader, *J. Linn. Soc., London*, **44** (300) : 575.

1980. *Xysticus kamakhyai* : Tikader, *Fauna of India, Spiders : Araneae*, **1** (1) : 109.

Distribution India : Shillong, Meghalaya.

75. *Xysticus shyamrupus* Tikader

1966. *Xysticus shyamrupus* Tikader, *Proc. Indian Acad. Sci. Bangalore*, **64** (1) : 57.

1980. *Xysticus shyamrupus* : Tikader, *Fauna of India, Spiders : Araneae*, **1** (1) : 113.

Distribution India Shillong, Meghalaya.

Genus 28. *Runcinia* Simon

1934. *Runcinia* Simon, *Ar. Fr.*, **2** : 254.

1965. *Runcinia* : Tikader, *Proc. Indian Acad. Sci.*, **61** (5) : 277.

Type-species : *Runcinia lateralis* (Koch).

Distribution : Asia, Africa, Australia and Europe.

Key to the species of the genus *Runcinia* Simon

1. Tibia I and II provided with 4-8 pairs of ventral spines *chauhani*
2. Tibia I and II not provided with 4-8 pairs of ventral spines *roonwali*

76. *Runcinia chauhani* Sen & Basu

1972. *Runcinia chauhani* Sen & Basu, *J. zool. Soc. India*, **24** : 103.

1980. *Runcinia chauhani* : Tikader, *Fauna of India, Spiders : Araneae*, **1** (1) : 60.

Distribution : India : Upper Shillong, Meghalaya.

77. *Runcinia roonwali* Tikader

1965. *Runcinia roonwali* Tikader, *Proc. Indian Acad. Sci., Bangalore*, **61** (5) : 278.

1980. *Runcinia roonwali* : Tikader, *Fauna of India, Spiders : Araneae*, **1** (1) : 62.

Distribution : India : Shillong, Meghalaya; Maharashtra,

Genus 29, *Thomisus* Walckenaer

1805. *Thomisus* Walckenaer, *Tabl. Aron.*, : 28.

1971. *Thomisus* : Tikader, *Mem. zool. Surv. India*, **15** (3) : 13.

Type-species : *Thomisus albus* (Gmelin).

Distribution : Asia, Africa, America, Australia and Europe.

Key to the species of the genus *Thomisus* Walckenaer

1. Cephalothorax provided with lateral longitudinal deep brown bands; abdomen at the .. broadest end not provided with transverse black band *cherapunjeus*
2. Cephalothorax not provided with lateral longitudinal deep brown bands and the abdomen at the broadest end provided with lateral transverse black band *shillongensis*

78. *Thomisus cherapunjeus* Tikader

1966. *Thomisus cherapunjeus* Tikader, *Proc. Indian Acad. Sci., Bangalore*, **64** (1) : 54.

1980. *Thomisus cherapunjeus* : Tikader, *Fauna of India, Spiders : Araneae*, **1** (1) : 54.

Distribution : India Shillong, Meghalaya.

79. *Thomisus shillongensis* Sen

1963. *Thomisus shillongensis* Sen, *Sci. & Cult., Calcutta*, **29** (12) : 610.

1980. *Thomisus shillongensis* : Tikader *Fauna of India, Spiders : Araneae*, **1** (1) : 51.

Distribution : India : Shillong, Meghalaya.

5. Family OXYOPIDAE

1870. *Oxyopidae* Thorell, *Ofvers. Kongl. Vet. Acad. Forh.*, **27** (4) : 367.

1965. *Oxyopidae* : Tikader, *Proc. Indian Acad. Sci., Bangalore*, **62** (3) : 140.

Type-genus *Oxyopes* Latreille.

Distribution : Asia, Africa, America, Australia and Europe.

Key to the genera of the family Oxyopidae Thorell

1. Cephalothorax high and convex; posterior lateral eyes strongly procurved ***Oxyopes***
2. Cephalothorax not so high enough or convex; posterior lateral eyes slightly procurved
..... ***Peucetia***

Genus 30. ***Oxyopes*** Latreille

1804. *Oxyopes* Latreille, *Hist. Nat. Arach. France*, **14** (7) : 144.

1900. *Oxyopes* : Pocock, *Fauna of Brit. India Arach.*, : 255.

Type-species : *Oxyopes heterophthalmus* Latreille.

Distribution : Cosmopolitan.

Key to the species of the genus ***Oxyopes*** Latreille

1. Abdomen provided with irregular darty white and deep brown hair *sikkimensis*
Abdomen not provided with irregular darty white and deep brown hair 2
2. Conspicuous fovea present at the centre of the cephalic region and the cephalothorax
clothed with spatulated hair *sunandae*
Inconspicuous fovea present at the centre of the cephalic region and the cephalothorax
not clothed with spatulated hair 3
3. Lower side of the femora of all legs provided with only one longitudinal black line
..... *shweta*
4. Cephalothorax longer than wide provided with central fovea *sitae*
Cephalothorax not longer than wide and not provided with central fovea *tikaderi*

80. *Oxyopes sikkimensis* Tikader

1970. *Oxyopes sikkimensis* Tikader, *Rec. zool. Surv. India*, **64** (1-4) : 76.

Specimen examined : 4 ♀, Daraigiri, Shillong, Meghalaya, 2.x.1988, coll. S. Ahmed; 3 ♀, Bombarg, Shillong, Meghalaya, 3.x.1988, coll. S. Ahmed; 2 ♀, 1 (Male), Khasi Hill, Shillong, Meghalaya, 9.x.1988, coll. S. Ahmed.

Distribution India : Shillong, Meghalaya (New record); West Sikkim.

81. *Oxyopes sunandae* Tikader

1970. *Oxyopes sunandae* Tikader, *Rec. zool. Surv. India*, **64** (1-4) : 74.

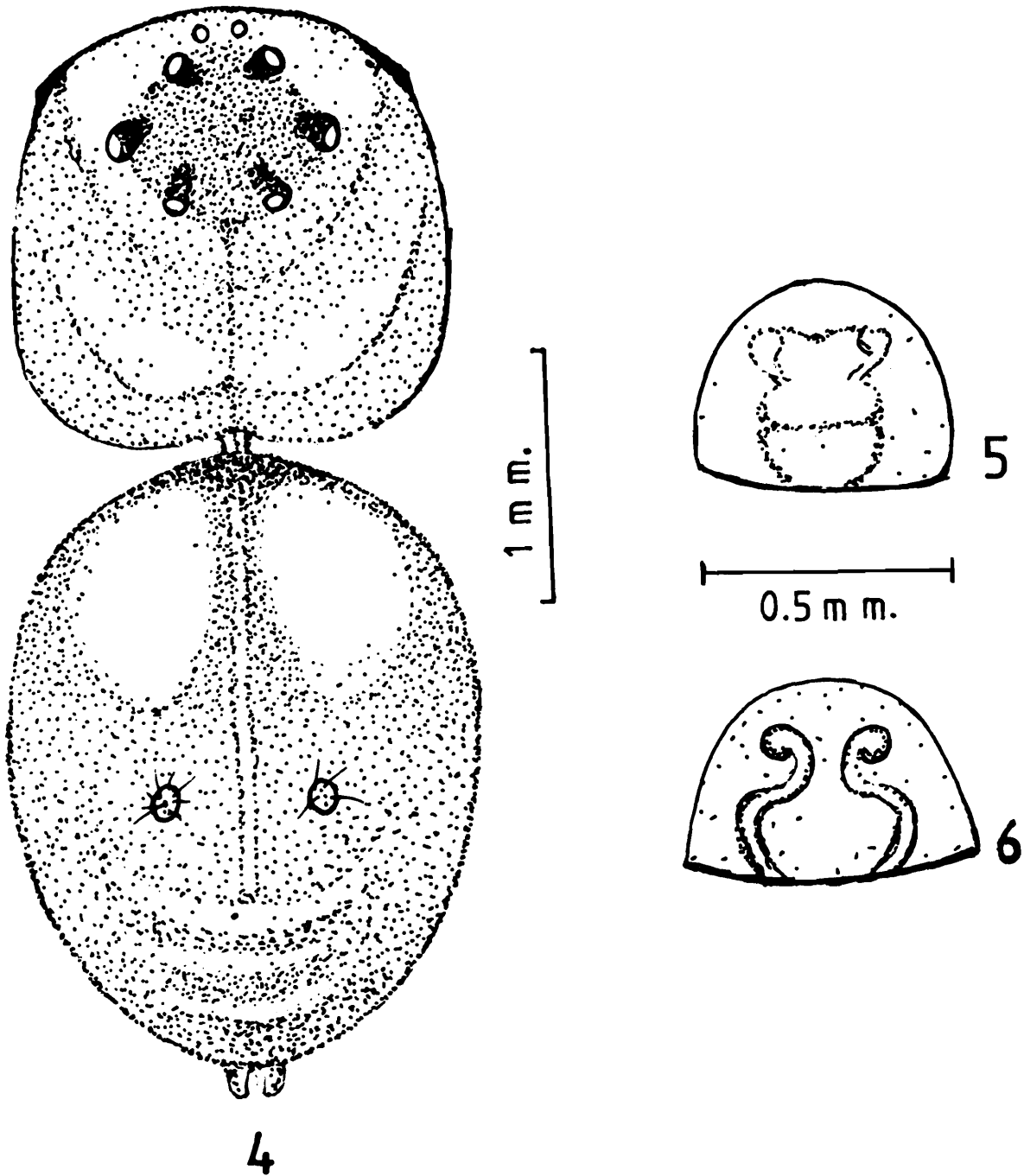
Specimen examined : 2 ♀, Bombarg, Shillong, Meghalaya, 24. ix. 1988, coll. S. Ahmed;
1 ♀, Nargkhota, Shillong, Meghalaya, 23.ix.1988, coll. S. Ahmed.

Distribution : India Shillong, Meghalaya (New record); West Sikkim.

82. *Oxyopes shweta* Tikader

1970. *Oxyopes shweta* Tikader, *Rec. zool. Surv. India*, **64** (1-4) : 78.

Specimen examined : 3 ♀, Risha colony, Shillong, Meghalaya, 18.viii.1977, coll. M. S. Jyrwa.



Figs. 4-6.: *Oxyopes tikaderi* sp. nov. : 4. Dorsal view of female, legs omitted. 5. Epigyne. 6. Internal genitalia.

Distribution India Shillong, Meghalaya (New record); West Bengal; West Sikkim.

83. *Oxyopes sitae* Tikader

1970. *Oxyopes sitae* Tikader, *Rec. Zool. Surv. India*, **64** (1-4) : 75.

Specimen examined · 2 ♀, Nargkhota, Shillong, Meghalaya, 23.ix.1988, coll. S. Ahmed.

Distribution India Shillong, Meghalaya (New record); West Bengal; West Sikkim.

84. *Oxyopes tikaderi* sp. nov. (Figs. 4-6)

General Cephalothorax and legs redish brown, abdomen yellowish in colour. Total length 4.30 mm. Carapace 1.80 mm. long, 1.80 mm. wide; abdomen 2.50 mm. long and 1.90 mm. wide.

Cephalothorax Round in shape not longer than wide. Central fovea almost absent. Cephalic region slightly high, clothed with brown hair. Posterior row of eyes strongly procurved situated at an equal distance, median eyes pearly white. Anterior row strongly recurved, black in colour, lateral eyes are large and the medians small. Ocular area with no conspicuous black patches. Sternum heart-shaped pointed behind clothed with hair and spines. Legs long and strong clothed with hair and spines.

Abdomen Long, narrow behind, clothed with fine grey and brown hair. Dorsum with irregular decoration almost uniformly coloured. Ventral side not provided with any black patches. Epigyne as in the text figs. 5-6...

Remarks This species resemble to *Oxyopes sitae* Tikader, but differs from this on the following characters 1) Cephalothorax not longer than wide and with no fovea where as in *O. sitae* cephalothorax longer than wide and with central fovea. 2) Abdomen uniform colour and without any ornamentation where as *O. sitae* abdomen not uniform coloured and provided with longitudinal black lines. 3) Epigyne structurally different.

Type-locality · Botanical garden, Shillong, Meghalaya, 18.xi.1965, coll. B. K. Tikader.

Holotype : Female in spirit, deposited at Zoological Survey of India, Calcutta, Regd. No. 5413/18.

Genus 31. *Peucetia* Thorell

1869. *Peucetia* Thorell, *On European Spiders*, Uppasala, **7** : 196.

1964. *Peucetia* : Brady, *Bull. Mus. Comp. Zool.*, Harvard, **131** (13) : 505.

Type-species *Peucetia viridis* Blackwall

Distribution Asia, Africa, America and Europe.

85. *Peucetia latikae* Tikader

1970. *Peucetia latikae* Tikader, *Rec. zool. Surv. India*, **64** (1-4) : 80.

Specimen examined · 1 ♀, Noghwal bibra, Shillong, Meghalaya, 1.x.1991, coll. R. K. Varshney.

Diagnosis : Cephalothorax longer than wide, cephalic region high and broad with a sharp fovea. Eyes encircled by black patched. Anterior row strongly recurved, middle eyes small. Sternum oval. Legs long and strong with long spines.

Abdomen long, narrowing behind, mid-dorsally with a longitudinal broad band.

Distribution : India Shillong, Meghalaya (New record); West Bengal; West Sikkim.

6. Family SALTICIDAE

1841. *Salticidae* Blackwall, *Trans. Linn. Soc., London*, **18** : 616.

1967. *Salticidae* : Tikader, *Sci. & Cult.*, **5** : 262.

Type-genus : *Salticus* Latreille.

Distribution : Asia, Africa, America and Europe.

Key to the genera of the family Salticidae Blackwall

1. The third row of eyes not smaller and not situated at the broader part of the cephalothorax ***Plexippus***
 Third row of eyes smaller and situated at the broadest part of the cephalothorax 2
2. Leg first is haviest and largest of all the legs ***Zygoballus***
3. Leg first is not haviest and largest of all the legs ***Salticus***

Genus 32. ***Plexippus*** Koch

1846. *Plexippus* Koch, *Die Arachn.*, **13** : 107.

1967. *Plexippus* : Tikader, *Proc. Indian Acad. Sci.*, **66** (4) : 118.

Type-species : *Plexippus paykullii* (Audouin).

Distribution Cosmopolitan.

86. ***Plexippus paykullii*** (Audouin)

1825. *Attus paykullii* Audouin, *Descr. Egypte, 2nd Ed.*, **22** : 172.

1967. *Plexippus paykullii* : Tikader, *Proc. Indian Acad. Sci.*, **66** (4) : 120.

Specimen examined : 3 ♀, Dinaduli Reserve Forest, Shillong, Meghalaya, 5.x.1988, coll. S. Ahmed.

Diagnosis : Cephalothorax longer than wide. Anterior row of eyes recurved; second row of eyes small and nearer to the first row. The third row situated of the broadest part of the cephalothorax. Leg I is robust and strongest of all the legs. Abdomen longer than broad, narrowing behind, clothed with fine hair.

Distribution : India Shillong, Meghalaya (New record); West Bengal; Jabalpur (Uttar Pradesh).

Genus 33. **Zygoballus** Peckham

1885. *Zygoballus* Peckham, *Proc. Nat. Hist. Soc. Wis.*, 1 : 82.

1948. *Zygoballus* : Kaston, *Spiders of Connecticut*. : 496.

Type-species *Zygoballus rufipes* Peckham.

Distribution : India, America.

87. **Zygoballus narmadaensis** Tikader

1975. *Zygoballus narmadaensis* Tikader, *Proc. Indian Acad. Sci.*, 81 (4) : 151.

Specimen examined: 1 ♀, Garo Hill, Shillong, Meghalaya, 4. x. 1991, coll. R. K. Varshney.

Diagnosis : Cephalothorax little longer than broad. Anterior row of eyes slightly recurved and close together. The second row small and much nearer to the first row. The third row situated of the broadest part of the cephalothorax. Leg I is robust and strongest of all the legs. Abdomen longer than broad, narrowing behind, clothed with fine hair.

Distribution : India : Shillong, Meghalaya (New record); West Bengal; Uttar Pradesh.

34. Genus **Salticus** Latreille

1804. *Salticus* Latreille, *Nouv. Dict. H. N.*, 24 : 135.

1981. *Salticus* : Tikader & Biswas, *Rec. zool. Surv. India*, occ. pap. No. 30 (1) : 89.

Type-species : *Salticus scenicus* Clerck.

Distribution : Cosmopolitan except Australia.

88. **Salticus andamanensis** Tikader

1977. *Salticus andamanensis* Tikader, *Rec. zool. Surv. India*, 72 : 197.

Specimen examined: 3 ♀, Rongjery Reserve Forest, Shillong, Meghalaya, 6.x.1988, coll. S. Ahmed.

Diagnosis : Cephalothorax longer than wide, cephalic region nearly flat, clothed with black hair. Eyes nearly white, middle row very small situated equidistant from anterior and posterior row. Ocular quadrate one third broader than long. Tibia and metatarsi of I & II legs provided with two and three ventral spines respectively.

Distribution India Shillong, Meghalaya (New record); Middle Andaman.

7. Family GNAPHOSIDAE

1884. *Gnaphosidae* Pocock, *Ann. Mag. nat. Hist.*, 2 (7) : 219.

1977. *Gnaphosidae* : Tikader, *Rec. zool. Surv. India*, 72 (1-4) : 186.

Type-genus : *Gnaphosa* Latreille.

Distribution : All over the world.

Key to the genera of the family Gnaphosidae

1. Posterior median eyes larger and close to each other than the laterals **Drassodes**
Posterior lateral eyes smaller not close to each other than the laterals 2

2. Tibia III provided with a median dorsal spine **Sergiolus**
 Tibia III not provided with a median dorsal spine **3**
3. Cephalothorax provided with a distinct median furrow and the inner margin of the chelicera with no teeth **poecilochroa**
4. Cephalothorax with faint median furrow and the inner margin of the chelicera with single tooth **Geodrassus**

35. Genus **Drassodes** Westring

1851. *Drassodes* Westring, *Goteborgs. K. Vetensk-O. Vitterh Samh. Handle*, **2** : 25.

1977. *Drassodes* : Tikader, *Rec. zool. Surv. India*, **72** (1-4) : 186.

Type-species *Drassodes lepidosus* (Walckenaer).

Distribution : Oriental, Sub-tropical and temperate region of the world.

89. **Drassodes meghalayaensis** Tikader & Gajbe

1977. *Drassodes meghalayaensis* Tikader & Gajbe, *Rec. zool. Surv. India*, **73** (1-4) : 66.

Diagnosis : Cephalothorax longer than wide. Eyes pearly white except anterior medians. Anterior and posterior row are procurved, medians slightly larger than the laterals and closer to the laterals than to each other. Chelicera moderately strong. Tibia and metatarsi without paired spines. Abdomen longer than wide, nearly elliptical.

Distribution India Shillong, Meghalaya.

36. Genus **Sergiolus** Simon

1891. *Sergiolus* Simon, *Proc. zool. Soc. London*, : 573.

1976. *Sergiolus* : Tikader & Gajbe, *Proc. Indian Acad. Sci.*, **84** (5) : 185.

Type-species *Sergiolus variegatus* (Hentz).

Distribution : India, America.

90. **Sergiolus meghalayensis** Tikader & Gabe

1976. *Sergiolus meghalayensis* Tikader & Gajbe, *Proc. Indian Acad. Sci.*, **84** (5) : 186.

Diagnosis Cephalothorax longer than wide, narrow in front. Eyes pearly white except anterior medians. Both the rows anterior and posterior are recurved. Anterior medians slightly larger than the laterals and close to the adjacent lateral than to each other. Chelicera moderately strong. Tibia III without dorsal spines. Abdomen oval, longer than wide, provided with three pairs of sigillae.

Distribution India Shillong, Meghalaya.

37. Genus **Poecilochora** Westring

1874. *Poecilochroa* Westring, *Goteborgs. K. Vetensk.-o. Vitterh Samh. Handl.*, **14** : 45.

1940. *Poecilochroa* : Comstock, *The Spider Book*, New York, : 329-330.

Type-species *Poecilochroa variana* (Koch C. L.).

Distribution Asia, America, Europe.

91. *Poecilochroa barmani* Tikader

1982. *Poecilochroa barmani* Tikader, *Fauna of India, Spiders* : Araneae, 2 (2) : 451.

Diagnosis : Cephalothorax longer than wide with short fovea. Both anterior and posterior row of eyes are recurved, medians oval and slightly longer than the laterals. Ocular quadrate longer than wide and wider than the behind. Chelicerae moderately strong.

Abdomen longer than wide, nearly elliptical in shape.

Distribution India Shillong, Meghalaya.

38. Genus *Geodrassus* Chamberlin

1922. *Geodrassus* Chamberlin, *Proc. biol. Soc. Wash.*, 35 : 159.

1977. *Geodrassus* : Tikader & Gajbe, *Rec. zool. Surv. India*, 73 (1-4) : 71.

Type-species *Geodrassus gosiutus* (Chamberlin).

Distribution India, America, Utah.

92. *Geodrassus sirmourensis* Tikader & Gajbe

1977. *Geodrassus sirmourensis* Tikader & Gajbe, *Rec. zool. Surv. India*, 73 (1-4) : 71.

Specimen examined : 1 ♀, Jaintial Hill, Shillong, Meghalaya, 26.i.1975., coll. A. K. Ghosh.

Diagnosis : Cephalothorax longer than wide. Both anterior and posterior row of eyes are procurved. Posterior medians longer and oval; anterior medians rounded. Chelicera moderately strong. Legs relatively strong. Male smaller than female.

Abdomen longer than wide, nearly elliptical.

Distribution India : Shillong, Meghalaya (New record); Himachal Pradesh.

S U M M A R Y

This faunistic work summerizes the two years (1988-1990) of the families Araneidae, Clubionidae, Lycosidae, Thomisidae, Oxyopidae, Salticidae, Gnaphosidae. The materials provides this work usually collected from the different districts of Meghalaya Shillong, Khasi Hills, jaintia Hills, Garo Hills.

During the course of studies 500 specimens of these families were examined and identified. Altogether 92 species 38 genera under 7 families were treated here. Among these 2 species in 2 genera under 2 families are described here new to science and 31 species 17 genera under 5 families are recorded here for the first time from Meghalaya.

The synonymes, distributional records both in India and abroad, ecological observation are given as far as possible for each species. All the references cited in the text are listed in the bibliography which is arranged authorwise and chronologically.

The types of all the new species are deposited in the National collection of Zoological Survey of India, Calcutta.

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