

ORIBATID MITE (ACARINA : CRYPTOSTIGMATA) FAUNA FROM THE THAR DESERT OF RAJASTHAN, INDIA

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INTRODUCTION

Indian Thar Desert covers part of the four Indian states (Gujarat, Punjab, Haryana and Rajasthan) covering an area of 1,02,400 sq. kms. The acarine fauna of the Thar Desert is very little explored. Oribatid mites commonly known as “moss-mites” or “beetle-mites” are the most beneficial soil-dwelling mites. These tiny creatures play an important role in the formation of soil particles as well as in promoting soil fertility. Even then our knowledge on the oribatid mite fauna of Thar is not sufficient. Reddy *et al.* (1978) was the first to mention about the oribatids of the Thar Desert. They reported only one species of oribatid from Rajasthan. Later Sanyal (1996) reported five other species for the first time from this region.

The present account on soil oribatid mites, received from the Desert Regional Station, Zoological Survey of India, Jodhpur, recorded seventeen species belonging to thirteen genera under eleven families. All the species in this study are recorded for the first time from this region. Hence, the total number of oribatid species known from the Indian Thar Desert stands at twenty three.

KEY WORDS : Oribatid mite, Thar, Rajasthan, India.

MATERIAL AND METHODS

Soil and litter samples were mostly collected by shovel from a depth of 10–30 cms. Sometimes samples from deeper layer were also collected. It was found that the most suitable time for collection was post-monsoon period. The samples were extracted with the help of Tullgren funnel extraction apparatus. Before identification the mites were cleared in lactic acid. All the specimens are deposited in the National Zoological Collection, Zoological Survey of India, Kolkata.

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SYSTEMATIC ACCOUNT

I. Family PHTHIRACARIDAE

1. *Atropacarus (Hoplophorella) scapellatus* (Aoki, 1965)

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

1992. *Atropacarus (Hoplophorella) scapellatus*, Niedbala, In : Phthiracaroida (Acari, Oribatidae). Systematic Studies, Amsterdam, 226.

Material examined : Dhanpura, Bhinmal, Jalore, ex. soil, 5 exs., 7 December 2000, coll. A. K. Bhattacharyya; Sri Vijaynagar, Sri Ganganagar, ex. soil, 1 ex., 1 November 2001, coll. A. K. Bhattacharyya.

II. Family EUPHTHIRACARIDAE

2. *Rhysotritia peruensis* (Hammer, 1961)

1961. *Oribotritia peruensis* Hammer, *Biol. Skr. Dan. Vid. Selsk.*, 13(1) : 133.

1988. *Rhysotritia peruensis*, Perez-Inigo and Baggio, *Acarologia*, 29(2) : 193.

Material examined : Sri Vijaynagar, Sri Ganganagar, ex. soil, 2 exs., 1 September 2001, coll. A. K. Bhattacharyya; Dhanpura, Bhinmal, Jalore, ex. soil, 4 exs., 12 July 2000, coll. A. K. Bhattacharyya, Sikwara, Jalore, ex. soil, 1 ex., 12 June 2000, coll. A. K. Bhattacharyya.

III. Family LOHMANIIDAE

3. *Heptacarus hirsutus* Wallwork, 1964

1964. *Heptacarus hirsutus* Wallwork, *Rev. zool. Bot. Afr.*, 70 : 358.

Material examined : Sri Vijaynagar, Sri Ganganagar, ex. soil, 1 ex., 1 November 2001, coll. A. K. Bhattacharyya; Dhanpura, Bhinmal, Jalore, ex. soil, 1 ex., 12 July 2000, coll. A. K. Bhattacharyya.

IV. Family EPILOHMANNIIDAE

4. *Epilohmannia pallida indica* Bhattacharya & Banerjee, 1979

1979. *Epilohmannia pallida indica* Bhattacharya & Banerjee, *Indian J. Acar.*, 4(1) : 19.

Material examined : Paota, Jodhpur, ex. soil under grass, 1 ex., 19 November 2000, coll. A. K. Bhattacharyya.

V. Family OPPIIDAE

5. *Brachioppia* sp.

Material examined : Dhanpura, Bhinmal, Jalore, ex. soil, 3 exs., 12 July 2000, coll. A. K. Bhattacharyya.

6. *Oppia kuhnelti* Csiszar, 1961

1961. *Oppia kuhnelti* Csiszar, *Acta zool. Hung.*, **8**(13) : 350.

Material examined : Dhanpura, Bhinmal, Jalore, ex. soil, 8 exs., 12 July 2000, coll. A. K. Bhattacharyya.

VI. Family XYLOBATIDAE

7. *Paraxylobates imitans* Balogh & Mahunka, 1969

1969. *Paraxylobates imitans* Balogh & Mahunka, *Acta. Zool. Hung.*, **15** : 20.

Material examined : Dhanpura, Bhinmal, Jalore, ex. soil, 4 exs., 12 July 2000, coll. A. K. Bhattacharyya; Sri Vijaynagar, Ganganagar, ex. soil, 3 exs., 1 September 2001, coll. A. K. Bhattacharyya; Zoological Survey of India compound, Desert Regional Station, Jodhpur, soil under grass, 6 exs., 17 November 2000, coll. A. K. Bhattacharyya; Central State Farm Nursery, Bhagwansar, Sri Ganganagar, ex. soil, 6 exs., 2 November 2001, coll. A.K. Bhattacharyya.

8. *Xylobates capucinus* (Berlese, 1908)

1908. *Protoribates capucinus* Berlese, *Redia*, **5** : 2.

1989. *Xylobates capucinus*, Norton & Kethley, *Redia*, **62**(2) : 428.

Material examined : Arid Forest Research Institute Compound, Jodhpur, ex. soil and litter, 5 exs., 13 November 2000, coll. A. K. Bhattacharyya.

VII. Family HAPLOZETIDAE

9. *Rostrozetes foveolatus* Sellnick, 1925

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

Material examined : Sri Vijaynagar, Ganganagar, ex. soil, 2 exs., 1 November 2001, coll. A. K. Bhattacharyya.

VIII. Family SCHELORIBATIDAE

10. *Scheloribates albialatus* Hammer, 1961

1961. *Scheloribates albialatus* Hammer, *Biol. Skr. Dan. Vid. Selsk.*, **13**(1) : 94.

Material examined : Jaliwara, Jodhpur; ex. soil, 6 exs., 18 January 2001, coll. A. K. Bhattacharyya; Central State Farm Nursery, Bhagwansar, Sri Ganganagar, ex. soil, 9 exs., 2 November 2001, coll. A. K. Bhattacharyya; Gardali, Jalore, ex. soil and litter, 3 exs., 12 August 2000, coll. A. K.

Bhattacharyya; Sikwara, Jalore, ex. soil, 14 exs., 12 June 2000, coll. A. K. Bhattacharyya; Guest House, Ghaseri, Jalore, ex. soil, 9 exs. 12 June 2000, coll. A. K. Bhattacharyya; Dhanpura, Bhinmal, Jalore, ex. soil, 14 exs, 12 July 2000, coll. A. K. Bhattacharyya; Sri Vijaynagar Sri Ganganagar, ex. soil, 1 ex., 1 November 2001, coll. A. K. Bhattacharyya.

11. *Scheloribates indicus* Sanyal, 1992

1992. *Scheloribates indicus* Sanyal, *State Fauna Series 3 : Fauna of West Bengal, Part 3* : 315.

Material examined : Bawri, Jodhpur, ex. soil, 3 exs., 1 January 2001, coll. A. K. Bhattacharyya.

12. *Scheloribates thermophilus* Hammer, 1961

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

Material examined : Dhanpura, Bhinmal, Jalore, ex. soil, 3 exs., 12 July 2000, coll. A. K. Bhattacharyya; Paota, Jodhpur, ex. soil under grass, 1 ex., 11 November 2000, coll. A. K. Bhattacharyya; Guest House, Ghaseri, Jalore, ex., soil & litter, 2 exs., 12 June 2000, coll. A. K. Bhattacharyya.

IX. Family CERATOZETIDAE

13. *Ceratozetes* sp.

Material examined : P.W.D. Guest House, Ghaseri, Jalore, ex. soil, 1 ex., 12 June 2000, coll. A. K. Bhattacharyya.

X. Family AUSTRACHTERIIDAE

14. *Lamellobates palustris* Hammer, 1958

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

Material examined : Sri Vijaynagar, Sri Ganganagar, ex. soil, 5 exs., 1 November 2001; coll. A. K. Bhattacharyya; Central State Farm Nursery, Bhagwansar, Sri Ganganagar, ex. soil, 10 exs., 2 November 2001, coll. A. K. Bhattacharyya; Bhinmal Guest House, Jalore, ex. litter, 11 exs., 12 July 2000, coll. A. K. Bhattacharyya.

XI. Family GALUMNIDAE

15. *Galumna* sp¹.

Material examined : Bhinmal, Jalore, ex. soil and litter, 2 exs., 12 July 2000, coll. A. K. Bhattacharyya.

16. *Galumna* sp².

Material examined : Sri Vijaynagar, Sri Ganganagar, ex. soil, 1 ex., 1 September 2001, coll. A. K. Bhattacharyya.

17. *Galumna* sp³.

Material examined : P. W. D. Guest House, Ghaseri, Jalore, ex. soil, 6 exs., 12 June 2000, coll. A. K. Bhattacharyya.

Keys to families, genera and species treated in this paper

1. Ptychoid body, propodosoma can be shut back against the hysterosoma and ventral region like blade of penknife; body generally laterally compressed 2
 - Body not ptychoid, propodosoma can not be shut back against the hysterosoma; body not laterally compressed 3
2. Anogenital region wide; body not much compressed laterally Phthiracaridae*
 - * Genital setae forming a row or almost a row, located near the paraxial margin; distance between g₆ and g₅ greater than that between g₅ and g₄ *Atropacarus (Hoplophorella)***
 - ** Rostral setae directed inwards; interlamellar setae lanceolate; sensillus long, narrow, inflated in the middle *scapellatus*
 - Anogenital region narrow; body considerably compressed laterally Euphthiracaridae*
 - * Longitudinal suture separating ventral plates with a median triangle; genito-aggenital plate with 8–9 genital and 2 aggenital setae; trochanters of legs III and IV with two setae each *Rhysotritia***
 - ** Aspis with two lateral carinae; prodorsal setae erect, distal half finely barbed; lamellar setae shorter than distance between lamellar and dorsal setae; notogastral setae short, erect, apically finely barbed *peruensis*
3. Anogenital region macropyline type; no ventral plate; tibia and genu of similar length and shape 4
 - Anogenital region brachypyline type; ventral plate present; tibia and genu of different length and shape 5
4. Body dichoid *i.e.*, articulation between legs II and III; preanal plate present Lohmaniidae*
 - * Genital plates with transverse suture, anal and adanal plates fused; 7 pairs of setae on fused ano-adanal plates, two pairs in median, 5 pairs in lateral rows *Heptacarus***
 - ** Notogaster with strong neotrichy, more than 40 pairs of notogastral setae; all notogastral setae heavily ciliate; body minutely punctated *hirsutus*

5. Notogaster pycnonotic *i.e.*, ototaxic organs absent; usually pteromorphae absent 6
 – Notogaster poronotic *i.e.*, areae porosae, sacculi or pori present; pteromorphae usually present 7
6. Eight or nine pairs of genital setae; anogenital plate schizogastric type; 14 pairs of notogastral setae; anal setae 3 pairs *Epilohmanniidae**
 * Protero-hysterosomatic articulation (dichoid); 8 pairs of genital setae arranged in two longitudinal rows (5+3) *Epilohmannia***
 ** Genital setae 7 pairs placed both in antiaxial and paraxial position; notogastral setae 13 pairs *pallida indica*
 – Genital setae 3–6 pairs; ventral plate hogastric type *i.e.*, without transverse suture; notogastral setae 10–14 pairs; prodorsum without true lamellae, either thin crest-shaped lamellae or thin costulae present or both lamellae and costulae absent *Oppiidae**
 * Sensillus pectinate; notogastral setae 9 pairs; pori *iad* usually placed obliquely to the anal field *Brachioppia*
 – Sensillus not pectinate; notogastral setae 10 pairs; pori *iad* usually placed parallel to the anal field *Oppia***
 ** Sensillus elongated, slightly fusiform apically; prodorsal setae finely ciliated; p_1 and p_2 smooth; 5 pairs of genital setae *kuhnelti*
7. Pteromorphae movable, articulate or semicircular; prodorsum without true projecting lamellae; some chitinous lines present on the prodorsum *Galumnidae**
 * Lamellar line present; lamellar setae placed between lines *L* and *S* *Galumna*
 – Pteromorphae movable or immovable but never articulate, sometimes absent 8
8. Prodorsum with tutorium; usually 6 pairs of genital setae (exceptionally 5 or 4 pairs) 9
 – Prodorsum without tutorium; usually 3–5 pairs of genital setae (exceptionally 6 pairs) 10
9. Pteromorphae immovable; lamellae broad, some times synlamella type *Austrachipteriidae**
 * Interlamellar area small; lamellae without free tips; adanal region with 1 or 2 pairs of setae *Lamellobates***
 ** Sensillus with long stalk, club-shaped, head beset with fine setae; outer lamellar cuspides not long and narrow *palustris*
 – Lamellae broader, lath-shaped, with linear lamellae and without cuspis often connected with well developed translamella *Ceratozetidae**
 * Larger and broader species; dorsosejugal suture arched; notogaster smooth; rostrum never broadly truncate, with two incisions and three small teeth; genital setae 6 pairs *Ceratozetes*

10. Notogaster with true areae porosae 11
 – True areae porosae absent, notogaster with sacculi or pori 12
11. Sensillus long, reclinate, setiform, often slightly lanceolate at its tip *Xylobatidae**
 * Ten pairs of notogastral setae or alveoli; 6 pairs of genital setae; setae *ad*₁ and *ad*₂ long, *ad*₃ and *ag* minute *Paraxylobates***
 ** Prodorsal setae long, ciliate; sensillus long with slightly dilated end *imitans*
 * Ten pairs of notogastral setae; 4–6 pairs of genital setae; legs monodactylous
 *Xylobates***
 ** Rostral and lamellar setae smooth; sensillus with swollen, barbed head; notogastral setae minute, 11 pairs *capucinus*
12. Pteromorphae movable, hinged *Haplozetidae**
 * Dorsosejugal suture with three arches; notogastral setae 10 pairs *Rostrozetes***
 ** Prodorsum and notogaster foveolated *foveolatus*
 – Pteromorphae immovable or absent *Schelorbitidae**
 * Rostral setae placed apart; dorsosejugal suture distinct; genital setae 4 pairs, legs tridactylous *Schelorbites***
 ** Hysterosoma as broad as long; lamellar setae thinner than rostral setae; sensillus with short stalk and disc-shaped head *albialatus*
 * Hysterosoma longer than broad ***
 *** Sensillus club-shaped; prodorsal setae smooth *indicus*
 – Sensillus with lanceolate head; prodorsal setae barbed *thermophilus*

SUMMARY

In an attempt to prepare an account of the soil cryptostigmatid fauna of the Indian Thar Desert, a total of 17 species belonging to 13 genera under 11 families is listed here. One species *viz.*, *Paraxylobates imitans* Balogh & Mahunka, 1969 is the first record from India and all other species reported here are the first record from the Indian Thar Desert.

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