

RECORDS OF MESOSTIGMATA, EREYNETIDAE AND PTERYGOSOMIDAE (ACARINA) IN WESTERN HIMALAYAS, SIKKIM AND HILL DISTRICTS OF WEST BENGAL¹

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During a survey of haematophagous arthropods in the western Himalayas, Himalayan districts of West Bengal and Sikkim, between 1966 and 1970 a large number of Mesostigmatid, Ereynetid and Pterygosomid mites were collected. They represent 10 families, 23 genera and 54 species. Eighteen of them are new records to India and seventeen await description. They are recorded in this communication with additional notes on their ecogeographic distribution.

INTRODUCTION

Parasitic Mesostigmata, Ereynetidae and Pterygosomidae are very little known groups of ectoparasites in India. A thorough faunistic study has been still pending. The known species are very small in number, and the available information deals either with the records of small number of species come across during ectoparasitic surveys (Mehta 1937, Mitchell *et al.* 1966, Wattall *et al.* 1965, 1967a and b), description of new species (Hirst 1921, Radford 1941, 1947, 1953), or inclusion of Indian species in the faunistic reviews of the group (Strandtmann and Wharton 1958). The last authors record only 12 species from India under Mesostigmata. Allred's (1969) list of 39 species of mites infesting rodents in the northern part of Kashmir and Prasad's (1974) list of 17 species infesting rodents in Nepal throw some light on the group elsewhere in India, particularly the western and central Himalayas.

The Mesostigmatid mites infesting bats form a distinct group themselves. The literature on this group, particularly on the families Macroonyssidae and Spinturnicidae deals very little with Indian species, except a monograph on bat parasites by Hiregaudar and Bal (1956), which lists only eleven species. The revisions of Macroonyssidae and Laelapidae of bats by Radovsky (1967) and Spinturnicidae by Rudnick (1960) add very little to the Indian species.

The families Ereynetidae and Pterygosomidae are also very little studied in India. The 699 species of mites listed by Prasad (1974) in his Catalogue of mites of India is poorly represented by mites associated with vertebrates, particularly the mesostigmatid mites, as compared to our rich reptilian, bird and mammalian fauna.

The present communication deals with Mesostigmatid, Ereynetid and Pterygosomid mites collected as ectoparasites from Mammals, Birds and Reptiles during a haematophagous arthropod survey conducted in western Himalayan region, Sikkim and Himalayan districts of West Bengal, between 1966 and 1970, under the

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auspices of Indian Council of Medical Research (Ramachandra Rao *et al.* 1973). The collection represents 23 genera and 54 species belonging to 10 families, 18 of which are new records to India and 17 need description. Perhaps this is the largest collection of Mesostigmatid mites ever made in India. Each species is recorded here with additional notes on ecology.

MATERIAL AND METHODS

The material was collected as ectoparasites from small mammals, birds and reptiles. The small mammals were trapped in wire cage traps, popularly known as wonder traps and portable Sherman traps which were set up in different habitats. A few animals were also collected by shooting. The birds and bats were collected by trapping them in mist nets. Some specimens of birds were also collected by shooting. A few specimens of reptiles were collected by beating them with stick.

Each animal trapped was put inside a plastic bag and killed with chloroform vapour. The killed animal was wrapped in white lint cloth and held for four to six hours. Every animal was given a field number and entered in a field register giving details of the species, sex, date and locality of collection. The mites were combed out along with other ectoparasites and preserved in 70 per cent alcohol. Each sample was given an arthropod collection card number and entered in a specially designed card giving all the collection data. As much care was taken as possible to avoid the mixing of mites from different individual hosts or contamination at the time of brushing and preserving.

A few collections of mites were also obtained from the habitats of the hosts.

Representative specimens of each species of small mammals were skinned and the skins and

skulls were preserved for confirming the identity and further reference. Bird and bat specimens were skinned and stuffed while reptiles were preserved in formalin or as dry specimens.

The mite specimens were partially cleared in 10 per cent KOH and mounted in Hoyer's medium. The mounted specimens were identified under the microscope. The small mammals were identified on the basis of classification by Ellerman & Morrison-Scott (1951) and Ellerman (1961) and the identity of the birds were determined on the basis of Fauna of British India volumes and according to Ripley (1961).

In spite of utmost care, due to large body of collections there is every possibility of contamination while processing a large number of hosts at a time and error in determining the identity of the host specimens, particularly the juveniles.

RESULTS

A. SYSTEMATIC LIST OF MITES COLLECTED

- | | |
|----------|--|
| Order | ACARINA |
| Suborder | MESOSTIGMATA Canestrini, 1891 |
| Cohort | GAMASINA Leach, 1815 |
| Family | LAELAPIDAE Berlese, 1892 |
| Genus | <i>Androlaelaps</i> Berlese, 1903 |
| | 1. <i>Androlaelaps aduncus</i> Allred, 1969 |
| | 2. <i>Androlaelaps casalis</i> (Berlese, 1887) |
| | 3. <i>Androlaelaps marshalli</i> Berlese, 1911 |
| | 4. <i>Androlaelaps zuluensis</i> (Zumpt, 1950) |
| | 5. <i>Androlaelaps</i> sp. |
| Genus | <i>Hypoaspis</i> Canestrini, 1884 |
| | 6. <i>Hypoaspis pavlovskii</i> (Bregetova, 1955) |
| | 7. <i>Hypoaspis miles</i> (Berlese, 1892) |
| Genus | <i>Laelaps</i> Koch, 1836 |
| | 8. <i>Laelaps agilis</i> Koch, 1836 |
| | 9. <i>Laelaps algericus</i> Hirst, 1925 |
| | 10. <i>Laelaps buxtoni</i> Radford, 1941 |
| | 11. <i>Laelaps jugalis</i> Allred, 1969 |
| | 12. <i>Laelaps nuttalli</i> Hirst, 1916 |
| | 13. <i>Laelaps traubi</i> Domrow, 1962 |
| | 14. <i>Laelaps turkestanicus</i> Lange, 1955 |

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15. *Laelaps* sp. 1
16. *Laelaps* sp. 2
17. *Laelaps* sp. 3
- Genus *Echinolaelaps* Ewing, 1929
18. *Echinolaelaps echidninus* Berlese, 1887
- Family MACRONYSSIDAE Oudemans, 1936
- Genus *Macronyssus* Kolenati, 1858
19. *Macronyssus kumaonicus* Bhat, 1973
- Genus *Ornithonyssus* Sambon, 1928
20. *Ornithonyssus bacoti* (Hirst, 1913)
21. *Ornithonyssus bursa* (Berlese, 1888)
22. *Ornithonyssus sylviarum* (Canestrini and Fanzago, 1877)
23. *Ornithonyssus* sp.
- Genus *Sauronyssus* Sambon, 1928
24. *Sauronyssus* sp.
- Genus *Hirstionyssus* Fonseca, 1948
25. *Hirstionyssus musculi* (Johnston, 1849)
- Genus *Steatonyssus* Kolenati, 1858
26. *Steatonyssus javensis javensis* Oudemans, 1914.
27. *Steatonyssus* sp. 1
28. *Steatonyssus* sp. 2
29. *Steatonyssus* sp. 3
- Genus *Pellonyssus* Clark and Yunker, 1956
30. *Pellonyssus passerii* Yunker, 1956
31. *Pellonyssus* sp.
- Family DERMANYSSIDAE Kolenati, 1859
- Genus *Liponyssoides* Hirst, 1913
32. *Liponyssoides muris* (Hirst, 1913)
33. *Liponyssoides sanguineus* (Hirst, 1914)
- Genus *Dermanyssus* Duges, 1834
34. *Dermanyssus gallinae* (DeGeer 1778)
35. *Dermanyssus* sp.
- Family MYONYSSIDAE Strandtman and Wharton, 1958
- Genus *Myonyssus* Tiraboschi, 1904
36. *Myonyssus* sp.
- Family HAEMOGAMASIDAE Oudemans, 1926
- Genus *Eulaelaps* Berlese, 1903
37. *Eulaelaps indiscretus* Allred, 1969
38. *Eulaelaps stabularis* (Koch, 1836)
- Genus *Haemogamasus* Berlese, 1889
39. *Haemogamasus nidiformis* Bregetova, 1955
40. *Haemogamasus gyrenodes* Allred, 1969
- Family RHINONYSSIDAE Trouessart, 1895
- Genus *Tinaminyssus* Strandtmann and Wharton, 1958
41. *Tinaminyssus* sp.
- Family SPINTURNICIDAE Oudemans, 1901
- Genus *Spinturnix* von Heyden, 1826

42. *Spinturnix pindarensis* Bhat, 1973
43. *Spinturnix plecotinus* (C. L. Koch, 1839)
44. *Spinturnix* sp.
- Genus *Paraperiglischrus* Rudnick, 1960
45. *Paraperiglischrus rhinolophinus* (C. L. Koch, 1841)
46. *Paraperiglischrus* sp.
- Genus *Ancystropus* Kolenati, 1856
47. *Ancystropus eonycteris* Delfinado and Baker, 1963
48. *Ancystropus kanheri* Hiregaudar and Bal, 1956
49. *Ancystropus taprobanicus* (Turk, 1950)
50. *Ancystropus zebeborii* Kolenati, 1856
- Genus *Meristaspis* Kolenati, 1857
51. *Meristaspis lateralis* (Kolenati, 1856)
- Family MACROCHELIDAE Vitzthum, 1930
- Genus *Nothroholaspis* Berlese, 1903
52. *Nothroholaspis* sp.
- Suborder TROMBIDIFORMES Reuter, 1909
- Family EREYNETIDAE Oudemans, 1931
- Genus *Boydaia* Womersley, 1953
53. *Boydaia* sp.
- Family PTERYGOSOMIDAE Oudemans, 1910
- Genus *Pterygosoma* Peters, 1849
54. *Pterygosoma* sp.

B. RECORDS AND NOTES

The detailed host and locality records for each species together with taxonomic and general ecological notes are given below in a systematic sequence. The altitudes given are approximate.

1. *Androlaelaps aduncus*

Described and recorded from *Tatera indica* from several localities in Pakistan (Allred 1969).

Present records:

Host and Habitat	No. of coll.	Specimens coll.
<i>Rattus rattus</i>		
<i>gangutrianus</i>	1	1 ♀
<i>Tatera indica</i>	1	1 ♂, 1 ♀, 1N
<i>Mus platythrix</i>	1	6 ♂, 6 ♀, 1N
<i>Suncus murinus</i>	1	1 ♀
Rodent burrow	1	2 ♀

LOCALITIES: *Himachal Pradesh*: Kangra: Nurpur (580 m) *Uttar Pradesh*: Naini Tal: Garjia (450 m); Pauri: Dalmisain (900 m); Dehra Dun: Ramgarh (620 m). *Sikkim*: Shyari at Gangtok (1350 m).

Notes: These are the first records of this species from India.

The generic differentiation of *Androlaelaps* Berlese, 1903, *Haemolaelaps* Berlese, 1910 and *Hypoaspis* Canestrini, 1884 is still under controversy (Allred 1970). In this communication the genera and species of *Androlaelaps* and *Hypoaspis* are sorted out on the basis of the keys provided by Allred (1969).

2. *Androlaelaps casalis*

Cosmopolitan, recorded from a wide variety of birds and mammals and from straw, hay, and detritus (Strandtmann and Wharton 1958). Earlier the species was recorded from *Mus musculus* at Kanha National Park, Madhya Pradesh (Mitchell *et al.* 1966).

Present records:

Host	No. of coll.	Specimens coll.
<i>Mus musculus</i>	2	2 ♀
<i>Suncus murinus</i>	3	5 ♀

LOCALITIES: *Jammu & Kashmir*: Baramulla: Sopore (1630 m); Dehari (750 m); Rajouri: Naushera (750 m). *Himachal Pradesh*: Mahasu: Bhadras (1300 m). *Sikkim*: Shyari at Gangtok.

Notes: First record from *Suncus murinus*.

3. *Androlaelaps marshalli*

Recorded earlier from Pakistan (Allred 1969).

Present records:

Host and Habitat	No. of coll.	Specimens coll.
<i>Mus platythrix</i>	1	7 ♀
<i>Tatera indica</i>	3	9 ♀
Rodent burrow	1	1 ♀

LOCALITIES: *Jammu & Kashmir*: Rajauri: Naushera. *Himachal Pradesh*: Kangra: Nurpur. *Uttar Pradesh*: Dehra Dun: Ramgarh; Tehri: Munikireti (450 m).

Notes: First record from India.

4. *Androlaelaps zuluensis*

Recorded earlier from Pakistan (Allred 1969).

Present records:

Host	No. of coll.	Specimens coll.
<i>Rattus rattus</i>	1	1 ♀
<i>Mus platythrix</i>	1	1 ♀

LOCALITIES: *Jammu & Kashmir*: Udhampur: Udhampur (750 m). *Uttar Pradesh*: Tehri: Ghonti (900 m).

Notes: First record from India.

5. *Androlaelaps* sp.

Apparently a new species related to *Androlaelaps casalis*.

Records:

Host and Habitat	No. of coll.	Specimens coll.
<i>Rattus rattus</i>		
<i>gangutrianus</i>	26	5 ♂, 48 ♀, 5N
<i>Rattus rattus</i>		
<i>brunneusculus</i>	2	4 ♀
<i>Rattus nitidus</i>	1	1 ♀
<i>Rattus rattoides</i>	2	2 ♀
<i>Rattus fulvescens</i>	1	1N
<i>Rattus</i> sp.	3	6 ♂, 3 ♀
<i>Rattus</i> (<i>Millardia</i>)		
<i>meltada</i>	1	2 ♀, 1N
<i>Mus platythrix</i>	1	1 ♀
<i>Mus musculus</i>	6	7 ♀, 1N
<i>Mus</i> sp.	2	2 ♀
<i>Suncus murinus</i>	10	12 ♀
Rodent burrow	1	2 ♀

LOCALITIES: *Jammu & Kashmir*: *Udhampur*: Dehari; *Doda*: Bhadarwah (1800 m); *Rajauri*: Naushera. *Himachal Pradesh*: *Kulu*: Bhuin (1100 m), Hurla (1000 m), Larji (1000 m); *Mahasu*: Dukolad (1000 m); *Bilaspur*: Deoli (510 m); *Kangra*: Baijnath (1350 m), Nurpur; *Chamba*: Krain (900 m), Chamba. *Uttar Pradesh*: *Naini Tal*: Bilaspur at Bhim Tal (1450 m), Dugada (750 m), Haldwani (420 m), Basutia (750 m), Garjia, Ranibag (700 m); *Almora*: Sukhidhang (1400 m), Chalthi (750 m); *Pithoragarh*: Aat (950 m); *Chamoli*: Bagrigad (1850 m), Didoli (900 m); *Dehra Dun*: Ramgarh, Sahasradhara (900 m); *Tehri*: Munikireti; *Uttarkashi*: Sukrala (1400 m). *West Bengal*: *Darjeeling*: Tashiding (450 m); *Jalpaiguri*: Chunabhatti (180 m). *Sikkim*: Shyari at Gangtok.

Notes: The species comes close to *Androlaelaps casalis* (Berlese, 1887), but differs by having metapodal plate less than two times as long as wide; which in *A. casalis* is three times as long as wide.

6. *Hypoaspis pavlovskii*

Recorded earlier from Pakistan (Allred 1969).

Present records:

Host	No. of coll.	Specimens coll.
<i>Rattus rattus</i>		
<i>gangutrianus</i>	7	7 ♀
<i>Rattus rattoides</i>	3	3 ♀
<i>Rattus</i> sp.	2	3 ♀
<i>Apodemus flavicollis</i>	5	8 ♀
<i>Mus musculus</i>	1	1 ♀
<i>Suncus murinus</i>	1	1 ♀

LOCALITIES: *Jammu & Kashmir*: *Doda*: Khilani (1400 m). *Himachal Pradesh*: *Lahul & Spiti*: Keylong (3250 m); *Kulu*: Bhuin; *Kangra*: Baijnath; *Kinnaur*: Sangla (2700 m),

Rakcham (3120 m), *Chitkul* (3400 m). *Uttar Pradesh*: *Naini Tal*: Mukteshwar (2150 m), Latoli (1800 m), Dugada; *Almora*: Kalika at Ranikhet (1800 m); *Chamoli*: Gwaldam (1900 m); *Dehra Dun*: Asarodi (700 m), Mussoorie (2000 m); *Uttarkashi* (1000 m).

Notes: First records from India.

7. *Hypoaspis miles*

Recorded earlier from Pakistan (Allred 1969).

Present records:

Host	No. of coll.	Specimens coll.
<i>Mus musculus</i>	3	2 ♀, 1N
<i>Suncus murinus</i>	1	3 ♀, 2N
<i>Herpestes edwardsi</i>	1	1 ♀

LOCALITIES: *Jammu & Kashmir*: *Udhampur*: Phalata (710 m), Dehari; *Rajauri*: Naushera. *Himachal Pradesh*: *Mahasu*: Pipty at Rampur (1100 m), Ratanadi at Baghi (2700 m).

Notes: First records from India.

8. *Laelaps agilis*

The species is known to be distributed in Europe and USSR on *Apodemus*, *Clethrionomys* and *Talpa* (Strandtmann and Wharton 1958). Also recorded from Turkey on *Apodemus*, *Cricetulus* and *Mus* (Garret and Allred 1971).

Present records:

Host	No. of coll.	Specimens coll.
<i>Apodemus flavicollis</i>	126	183 ♂, 1045 ♀, 88N
<i>Mus musculus</i>	4	2 ♂, 30 ♀, 3N
<i>Rattus rattoides</i>	2	5 ♀
<i>Alticola roylei</i>	2	3 ♀
<i>Crocidura</i> sp.	2	3 ♀

LOCALITIES: *Jammu & Kashmir*: *Ladakh*: Kargil (2700 m), Drass (3200 m), Fraw (3200 m), Baru (3200 m), Leh (3500 m). *Baramulla*: Chektreran (2250 m), Chetternar (2000 m); *Srinagar*: Sonamarg (2750 m); *Anantnag*: Pehalgam (2450 m). *Himachal Pradesh*: *Chamba*: Kalatop (2450 m), Surkhigalli (1650 m), Thiro (3150 m), Tindi (2500 m); *Lahul & Spiti*: Kelong, Sissu (3120 m), Yongkirting (2800 m); *Kulu*: Kothi (2460 m); *Kinnaur*: Kalpa (2750 m), Sangla, Rakcham, Chitkul; *Mahasu*: Ratanadi at Baghi. *Uttar Pradesh*: *Pithoragarh*: Milam (3540 m), Relkote (3000 m); *Chamoli*: Badrinath (3170 m); *Uttarkashi*: Harsil (2600 m), Choolmie (2750 m).

Notes: Allred (1969) recorded *Laelaps pavlovskyi* Zachvatkin, 1948 from Pakistan. His further comparative studies of *L. pavlovskyi* and *L. agilis* from Turkey led him to the presumption that the two species are synonymous, and represent only intra-specific variant as is typical with several other species of *Laelaps* (Garrett and Allred 1971). The senior author of the present paper has examined USSR specimens of both the species, *L. agilis* from *Apodemus flavicollis* and *L. pavlovskyi* from *A. agrarius*. The species appear to be quite distinct and associated with *A. flavicollis* and *A. agrarius* respectively. The specimen of *L. pavlovskyi* differs from those of *L. agilis* mainly by having the posterior setal pairs on genitoventral plate wide apart, in addition to other specific characters.

In the Himalayas the species has been collected only in the upper temperate and alpine zones, the ecogeographical limit of the distribution of *Apodemus flavicollis*. This is the first record of this mite from India.

9. *Laelaps algericus*

The species has been recorded from Algeria, Egypt, Israel, Turkey, Pakistan, USSR; from

mammals of 13 genera (Strandtmann and Wharton 1958, Garrett and Allred 1971). In India it has been recorded from *Mus booduga* and *Mus musculus* (Mitchell *et al.* 1966).

Present records:

Host	No. of coll.	Specimens coll.
<i>Mus musculus</i>	274	19 ♂, 1234 ♀, 30 N
<i>Mus sp.</i>	9	24 ♀
<i>Apodemus flavicollis</i>	1	8 ♀
<i>Alticola roylei</i>	1	6 ♀
<i>Rattus rattus</i>		
<i>gangutrianus</i>	2	2 ♀
<i>Rattus rattoides</i>	3	3 ♀
<i>Rattus rattus</i>		
<i>rufescens</i>	5	6 ♀
<i>Rattus sp.</i>	10	1 ♂, 18 ♀
<i>Suncus murinus</i>	2	3 ♀

LOCALITIES: *Jammu & Kashmir*: *Ladakh*: Kargil, Baru; *Shrinagar*: Sonamarg; *Anantnag*: Pehalgam, Mondilan (3200 m); *Baramulla*: Ferozpur (2460 m), Chektreran, Sopore, Bandipore (1850 m), Chetternar, Erin (2000 m), Marder (2000 m), Rampore (1400 m); *Doda*: Bhadarwah, Khilani; *Udhampur*: Phalata. *Himachal Pradesh*: *Chamba*: Salooni (1770 m), Rakh (1070 m), Schuin at Bharmaur (2300 m), Bharmaur (2300 m), Gothalhu at Bharmaur (2150 m), Durgathi (1500 m), Tissa (1570 m), Dikrond at Tissa (1700 m); *Lahul & Spiti*: Morang (3820 m); *Kangra*: Dadh (1080 m), Bagsunag (1900 m); *Kulu*: Bharie at Kulu (1400 m), Bhuin, Gutkar (710 m), Sooma (1400 m), Palchan (2350 m), Kothi at Mandi, Hurla, Kasol (1550 m), Naggar (1550 m), Jibi (1900 m), Khundan (1420 m), Larji, Manali (1824 m), Vaishista (1820 m); *Mahasu*: Pipty, Rachauli (1450 m), Dukolad, Nirith (990 m), Khaneri (1300 m), Sarhan (2500 m), Manjagaon (2150 m), Gangtoli & Kapoori at Rohru (1600 m), Samoli (1700 m) & Somala

(1600 m) at Rohru, Kotkhai (1800 m), Chhol (1700 m), Darhar at Kothaki (1800 m), Gumma (1700 m), Jugatkhana (1200 m), Bhadras, Jeori (1400 m), Gaura, Ratanadi at Baghi, Bhagi (2740 m), Sungri (2650 m); *Kinnaur*: Jeorit, Karcham (1800 m). *Uttar Pradesh*: *Naini Tal*: Bhim Tal (1380 m); *Almora*: Sukhidhang, Silagadi (1400 m); Khati (2350 m); *Pithoragarh*: Kotera at Dharchula (1050 m); *Chamoli*: Gwaldam, Radki (750 m), Sunyala (1050 m), Badrinath, Joshimath (2000 m), Sonla (900 m); *Tehri*: Ghansali (1050 m); *Uttarkashi*: Sukhi (2650 m), Choolmie (2700 m), Kuthnaur (1600 m), Sukrala. *Sikkim*: Lachung (2750 m).

10. *Laelaps buxtoni*

Originally described on specimens collected from "a gerbille", probably *Tatera indica*, at Madras (Radford 1941).

Present record:

Host	No. of coll.	Specimens coll.
<i>Tatera indica</i>	1	1 ♀

LOCALITY: *Uttar Pradesh*: *Naini Tal*: Garjia.

Notes: The species appears to be rare. A dozen specimens of *Tatera indica* collected in Jammu & Kashmir and Himachal Pradesh were found negative for this mite. The record appears to be the first, subsequent to its description by Radford.

11. *Laelaps jugalis*

Described on the basis of specimens collected from *Rattus rattus*, *Nesokia indica* and *Tatera indica* in Pakistan (Allred 1969).

Present records:

Host	No. of coll.	Specimens coll.
<i>Rattus (Millardia)</i> <i>meltada</i>	11	1 ♂, 193 ♀

LOCALITIES: *Jammu & Kashmir*: *Udhampur*: Dehari; *Rajauri*: Naushera. *Himachal Pradesh*: *Kangra*: Nurpur; *Mandi*: Gutkar.

Notes: First record from India and on *Rattus (Millardia) meltada*.

12. *Laelaps nuttalli*

Originally described on specimens collected from *R. rattus* and *R. norvegicus* in Ceylon, by Hirst. Subsequently it has been recorded from several genera and species of rodents. The preferred hosts of this mite are species of the genus *Rattus*. The mite is found throughout tropical and warm temperate zones wherever its host is found, with the apparent exception of Europe (Strandtmann and Wharton 1958).

Present records:

Host	No. of coll.	Specimens coll.
<i>Rattus rattus</i> <i>gangutrianus</i>	57	2 ♂, 237 ♀
<i>Rattus rattus</i> <i>brunneusculus</i>	2	1 ♂, 37 ♀
<i>Rattus rattus</i>	10	1 ♂, 53 ♀
<i>Rattus nitidus</i>	1	3 ♀
<i>Rattus rattoides</i>	1	3 ♀
<i>Rattus (Millardia)</i> <i>meltada</i>	8	4 ♂, 24 ♀, 1N
<i>Mus platythrix</i>	1	1 ♀
<i>Mus sp.</i>	1	9 ♀
<i>Suscus murinus</i>	2	4 ♀

LOCALITIES: *Jammu & Kashmir*: *Udhampur*: Dehari; *Rajauri*: Naushera. *Himachal Pradesh*: *Mandi*: Gutkar; *Kangra*: Dadh, Nurpur, Baghany (600 m); *Kulu*: Palcham; *Bilaspur*: Deoli, Ghumarwin (740 m); *Mahasu*: Baghi. *Uttar Pradesh*: *Naini Tal*: Bhim Tal, Dugada, Basutia, Dwan (250 m), Garjia, Ranibag (650 m); *Almora*: Chalthi; *Pithoragarh*: Dharchula (1050 m); *Pauri*: Raitoli (770 m), Shrinagar (560 m), Dugadda (700 m), Dalmisain, Hanu-

manti (770 m); *Chamoli*: Radki, Sunyala, Didoli at Sonla; *Dehra Dun*: Ramgarh, Barkote (450 m), Satyanarayan (370 m), Asarodi; *Tehri*: Ghansali; *Uttarkashi*: Sukrala.

Notes: From the record this species appears to be distributed in the tropical and subtropical zone only.

13. *Laelaps traubi*

This species was described on the basis of specimens collected from *Rattus fulvescens*, *R. edwardsi*, *Rattus* sp. and *Dremomys rufigenis* from Gunong Brinchang, Camerol Highlands, Malaya by Domrow (1962). Recently the species was recorded from *R. nitidus*, *R. eha*, *R. fulvescens* and *Rattus* sp. in Nepal (Prasad 1974).

Present records:

Host	No. of coll.	Specimens coll.
<i>Rattus fulvescens</i>	24	11 ♂, 314 ♀, 2N
<i>Rattus niviventer</i>	10	58 ♀
<i>Rattus eha</i>	2	11 ♀
<i>Rattus rattoides</i>	3	7 ♀
<i>Rattus</i> sp.	1	1 ♀
<i>Suncus murinus</i>	1	1 ♀

LOCALITIES: *Himachal Pradesh*: Kangra: Dadh; *Kulu*: Jibi, Rashala (1900 m); *Sirmaur*: Moginand (500 m). *Uttar Pradesh*: *Naini Tal*: Mukteshwar; *Almora*: Khati, Dwali (2750 m); *Pithoragarh*: Munshiari (2300 m); *Chamoli*: Gwaldam, Sunilgaon at Joshimath (2300 m), Bagrigad (1800 m); *Uttarkashi*: Kuthnaur. *West Bengal*: *Darjeeling*: Kurseong (1400 m), Jorepokhri (2350 m). *Sikkim*: Chungtang (1850 m).

Notes: This is the first record from India. The species appears to be associated with the subgenus *Myxomys* of the genus *Rattus*. The record from *Rattus rattoides* is probably due to its overlapping distribution with the species

of *Myxomys*, because the specimens of *R. rattoides* collected from other localities where this subgenus was not found did not yield this species.

14. *Laelaps turkestanicus*

Original description and record is based on specimens from *Rattus turkestanicus* in Tadzhikistan, USSR. Allred (1969) recorded it in Pakistan and Prasad (1974) in Nepal.

Present records:

Host	No. of coll.	Specimens coll.
<i>Rattus rattoides</i>	61	4 ♂, 554 ♀
<i>Rattus fulvescens</i>	17	3 ♂, 252 ♀, 4N
<i>Rattus niviventer</i>	6	27 ♀
<i>Rattus eha</i>	1	1 ♀
<i>Rattus rattus</i>		
<i>gangutrianus</i>	4	22 ♀
<i>Rattus rattus</i>		
<i>rufescens</i>	1	1 ♀
<i>Rattus</i> sp.	14	7 ♂, 138 ♀
<i>Mus musculus</i>	1	2 ♀

LOCALITIES: *Jammu & Kashmir*: Baramulla: Rampore; *Doda*: Bhadarwah. *Himachal Pradesh*: *Chamba*: Banikhet (1700 m), Surkhigalli, Kalatop; *Kulu*: Kothi at Manali, Palcham, Jibi, Vaishista at Manali; *Simla*: Simla (2000 m); *Mahasu*: Sarhan, Chool, Guara, Dobhdha (2000 m), Baghi, Sungri (2650 m); *Kinnaur*: Kalpa, Sangla, Rakcham. *Uttar Pradesh*: *Naini Tal*: Mukteshwar, Latoli; *Almora*: Khati, Dwali; *Pithoragarh*: Kuity (1250 m), Munshiari; *Chamoli*: Gwaldam, Sunilgaon, Bagrigad, Pangarpooora (2450 m), Dogalbita (2350 m); *Dehra Dun*: Mussoorie, Polu at Mussoorie (1800 m); *Tehri*: Chirbatia (2450 m); *Uttarkashi*: Sukhi, Kuthnaur, Sukrala. *West Bengal*: *Darjeeling*: Jorepokhri.

Notes: This is the first record from India.

The species appears to be primarily associated with *Rattus rattoides* and secondarily adapted to the subgenus *Myxomys* wherever there is geographical overlapping between *rattoides* and *Myxomys* in the Himalayan temperate zone. Records from other host species appear to be spurious.

15. *Laelaps* sp. 1

Records:

Host	No. of coll.	Specimens coll.
<i>Mus platythrix</i>	13	51 ♀, 2N

LOCALITIES: *Himachal Pradesh*: Kangra: Dharamashala (1250 m). Baijnath; Simla: Malkumajara (500 m); Sirmaur: Beradwala at Nahan (520 m), Moginand (500 m). *Uttar Pradesh*: Almora: Silagadi; Pauri: Narkota (750 m); Chamoli: Radki at Karnprayag; Tehri: Munikireti, Ghonti.

Notes: The species closely resembles *L. algericus* by heavily chitinated thickened anterolateral margin of the dorsal plate, but the specimens are much larger. The larger size and the association with *Mus platythrix* distinguishes this species. The species awaits description.

16. *Laelaps* sp. 2

Records:

Host	No. of coll.	Specimens coll.
<i>Golunda ellioti</i>	6	3 ♂, 13 ♀

LOCALITIES: *Jammu & Kashmir*: Udhampur: Dehari; Rajauri: Naushera. *Himachal Pradesh*: Mandi: Gutkar. *Uttar Pradesh*: Pauri: Raitoli; Chamoli: Radki.

Notes: Somewhat resembles *L. nuttalli*, but differs from it by having slender and longer coxal spurs. A distinct species, apparently associated with *Golunda ellioti*. The species is awaiting description.

17. *Laelaps* sp. 3

Records:

Host	No. of coll.	Specimens coll.
<i>Golunda ellioti</i>	10	1 ♂, 56 ♀

LOCALITIES: *Jammu & Kashmir*: Udhampur: Dehari; Rajauri: Naushera. *Himachal Pradesh*: Mandi: Gutkar. *Uttar Pradesh*: Chamoli: Radki.

Notes: This is a distinct species awaiting description.

18. *Echinolaeps echidninus* (= *Laelaps echidnina*)

A cosmopolitan species found on commensal *Rattus* (*Rattus*) spp., but occasionally found on non-commensal species. It is not known to bite man and is never found on birds. The records from mammals other than *Rattus* probably represent accidental associations (Mitchell *et al.* 1966, Strandtmann and Wharton 1958).

Present records:

Host	No. of coll.	Specimens coll.
<i>Rattus rattus</i>		
<i>gangutrianus</i>	202	10 ♂, 1769 ♀, 1N
<i>Rattus nitidus</i>	12	82 ♀
<i>Rattus rattoides</i>	1	1 ♀
<i>Rattus fulvescens</i>	6	202 ♀
<i>Rattus rattus</i>	5	79 ♀
<i>Rattus</i> sp.	26	6 ♂, 279 ♀
<i>Rattus rattus</i>		
<i>brunneusculus</i>	4	9 ♀
<i>Tatera indica</i>	2	2 ♀
<i>Mus musculus</i>	2	1 ♂, 3 ♀
<i>Suncus murinus</i>	6	9 ♀

LOCALITIES: *Jammu & Kashmir*: Udhampur: Phalata, Dehari; Rajauri: Naushera; Doda:

Khilani. *Himachal Pradesh*: Kulu: Jibi; Kangra: Dadh, Dharamshala, Nurpur, Baghany, Dugadda at Hamirpur (900 m); Mandi: Mandi (1050 m); Mahasu: Jagatkhana; Bilaspur: Ballu at Ghumarwin. *Uttar Pradesh*: Naini Tal: Bhim Tal, Sat Tal (1400 m), Dugada, Basutia, Dogaon, Nandpur (400 m), Dwan, Garjia, Bilaspur (1400 m), Bhowali (1650 m), Ranibag; Almora: Sukhidhang, Chalthi, Silagadi, Loharkhet (1750 m), Bageshwar (750 m); Pithoragarh: Tadigaon (1550 m), Dharchula, Aat at Gocher, Kuity, Tejam (950 m), Lilam (2000 m), Gocher (950 m), Pithoragarh (1800 m); Pauri: Narkota, Raitoli, Gugadda, Dalmisain, Hanumanti; Chamoli: Galdam, Radki, Sunyala, Guliyo (1050 m), Debal (1350 m), Bagrigad, Didoli, Sonla, Nandprayag (900 m), Phata (1700 m); Dehra Dun: Dehra Dun (600 m), Ramgarh, Sahasradhara, Asarodi (620 m); Tehri: Munikireti, Ghansali; Uttarkashi: Basunga (1050 m), Uttarkashi, Jnanasu (1050 m), Kathnaur, Sukrala. *West Bengal*: Darjeeling: Tashiding; Jalpaiguri: Chunabhatti (170 m).

Notes: As many as 93 specimens of this mite were collected from one individual of *Rattus rattus gangutrianus* and 115 specimens from a *Rattus fulvescens*.

19. *Macronyssus kumaonicus*

The species is new to science and was described in a separate paper (Bhat 1973a).

20. *Ornithonyssus bacoti*

A cosmopolitan mite associated with rodents, particularly Muridae (Strandtmann and Wharton 1958).

Present records:

Host and Habitat	No. of coll.	Specimens coll.
<i>Rattus rattus</i>		
<i>gangutrianus</i>	14	7 ♂, 12 ♀, 47N
<i>Rattus nitidus</i>	4	4 ♀, 1N
<i>Rattus rattoides</i>	9	9 ♀, 23N
<i>Rattus</i> sp.	7	8 ♀, 17N
<i>Rattus niviventer</i>	1	1N
<i>Rattus rattus</i>		
<i>rufescens</i>	5	3 ♂, 1 ♀, 4N
<i>Bandicota bengalensis</i>	1	4N
<i>Alticola roylei</i>	1	1N
<i>Mus musculus</i>	11	1 ♂, 8 ♀, 11N
<i>Mus platythrix</i>	1	1N
<i>Suncus murinus</i>	3	3 ♀, 1N
Chicken coops	1	1 ♂, 50 ♀, 1N

LOCALITIES: *Jammu & Kashmir*: Ladakh: Kargil; Baramulla: Marder, Rampore. *Himachal Pradesh*: Chamba: Salooni, Dikrond at Tissa, Shekari (1540 m); Kangra: Baghany, Lad (900 m), Dugadda (900 m), Jintnu (1000 m); Kulu: Naggar, Rashala, Palchan; Mandi: Gutkar, Jogindernagar (1250 m); Mahasu: Sirhan Samala at Rohru (1600 m), Jagatkhana; Bilaspur: Ballu at Ghumarwin, Bakrol (800 m); Sirmaur: Moginand (500 m). *Uttar Pradesh*: Naini Tal: Dugada, Mukteshwar; Almora: Kalika; Pithoragarh: Aat, Milam; Chamoli: Sinhdhara at Joshimath (1800 m), Dogilbita, Baniakund (2500 m), Gwaldam; Dehra Dun: Satyanarayan; Tehri: Ghansali; Uttarkashi: Uttarkashi, Jnanasu, Sukhi, Kuthnaur, Sukrala.

21. *Ornithonyssus bursa*

The species has been commonly known as tropical fowl mite and is tropicopolitan in distribution. Commonly found on birds and rarely on mammals in peridomestic surroundings (Strandtmann and Wharton 1958).

Present records:

Host and Habitat	No. of coll.	Specimens coll.
Chicken coops	1	3 ♀
<i>Psittacula himalayana</i>	2	4 ♀
<i>Rattus rattoides</i>	1	2 ♀
<i>Rattus rattus</i>		
<i>gangutrianus</i>	1	1 ♀
<i>Rattus</i> sp.	1	1 ♀
<i>Dendrocitta himalayana</i>	1	2 ♀
<i>Aegithalos concinna</i>	1	1 ♀
<i>Zoothera</i> sp.	1	1 ♂, 1 ♀

LOCALITIES: *Jammu & Kashmir: Baramulla: Marder. Himachal Pradesh: Chamba: Kalatop; Mindi: Gutkar; Kulu: Bhuin; Kangra: Dugadda, Hamirpur, Lad. Uttar Pradesh: Chamoli: Dogalbita, Baniakund.*

22. *Ornithonyssus sylviarum*

The species has been known in the temperate regions of all the continents on mammals and birds (Strandtmann and Wharton 1958).

Present records:

Host	No. of coll.	Specimens coll.
<i>Pycnonotus leucogenys</i>	1	2 ♀
<i>Rattus nitidus</i>	1	2 ♀

LOCALITIES: *Himachal Pradesh: Mandi: Mandi. Uttar Pradesh: Uttarkashi: Jnanasu.*

Notes: This is the first record of this species from India and appears to be rare in Indian area.

23. *Ornithonyssus* sp.

The identity of 2 ♀ and 1N collected from *Herpestes auropunctatus* at Bandipore, Baramulla district, Jammu & Kashmir on 2 Nov. 1969 has yet to be determined. The specimens come close to *O. bursa* but differ from it by the broader scutum.

24. *Sauronyssus* sp.

Records:

Host	No. of coll.	Specimens coll.
<i>Agama tuberculata</i>	23	28 ♂, 4 ♀, 57N

LOCALITIES: *Himachal Pradesh: Kinnaur: Wangtu (2040 m), Pooh (2700 m); Kulu: Naggar; Mahasu: Pipty. Uttar Pradesh: Pithoragarh: Lilam, Thalkedar (2600 m), Bogdyar (2850 m), Khela (1400 m); Chamoli: Loharjungdhar (2400 m).*

Notes: Very little information has been available on the acarines of Indian reptiles. This is a virgin field for acarologists.

25. *Hirstionyssus musculi*

The species has been known from Rodent genera *Apodemus*, *Clethrionomys*, *Microtus*, *Micromys* and *Rattus* in Europe and Asia (Strandtmann and Wharton 1958).

Present records:

Host	No. of coll.	Specimens coll.
<i>Rattus rattoides</i>	11	7 ♂, 48 ♀, 17N
<i>Apodemus flavicollis</i>	57	10 ♂, 211 ♀, 28N
<i>Mus musculus</i>	23	4 ♂, 34 ♀, 4N
<i>Alticola roylei</i>	10	18 ♀, 12N

LOCALITIES: *Jammu & Kashmir: Ladakh: Kargil, Honaki (2800 m), Bodhkharbu (3250 m), Dumgal (2500 m), Drass, Fraw, Baru (Kargil); Anantnag: Mondilan (2250 m), Pehalgam; Baramulla: Chektreran near Tangmarg, Rampore. Himachal Pradesh: Chamba: Sindwadi, Tindi; Lahul & Spiti: Keylong, Chhetru (3450 m), Thiro, Yongkirting (2700 m); Kulu: Palchan; Mahasu: Jeorit, Baghi; Kinnaur: Kalpa, Sangla, Rakcham, Chitkul. Uttar Pradesh: Pithoragarh: Relkote, Munshiari, Milam; Chamoli: Badrinath.*

Notes: The specimens were compared with

identified material from Russia and were found identical with them. This is the first record of this species from India.

26. *Steatonyssus javensis javensis*

The species was earlier recorded from Maharashtra (Prasad 1974) and Pakistan (Allred 1969).

Present record:

Host	No. of coll.	Specimens coll.
<i>Pipistrellus</i> sp.	1	1 ♀, 2N

LOCALITY: Jammu & Kashmir: Udhampur: Phalata.

27. *Steatonyssus* sp. 1

A total number of 11 nymphs were collected from the following species of Chiropteran hosts. The specific identity of the specimens could not be determined due to the lack of adequate associated adult material and the inadequacy of the literature on the immature stages.

Records:

Host	No. of coll.	Specimens coll.
<i>Rhinolophus pearsoni</i>	1	3N
<i>Scotophilus healthi</i>	2	1 ♀, 6N
<i>Pipistrellus mimus</i>	2	2N

LOCALITIES: Uttar Pradesh: Naini Tal: Haldwani, Ramnagar; Pauri: Narkota. Himachal Pradesh: Simla: Malkumajara.

28. *Steatonyssus* sp. 2

Present record:

Host	No. of coll.	Specimens coll.
<i>Mus platythrix</i>	1	1 ♀

LOCALITY: Jammu & Kashmir: Udhampur: Phalata.

Notes: The species could not be placed under any known species. Apparently this is a new taxon.

29. *Steatonyssus* sp. 3

Present record:

Host	No. of coll.	Specimens coll.
<i>Pipistrellus babu</i>	1	4 ♂, 3 ♀, 7N

LOCALITY: Uttar Pradesh: Almora: Sukhi-dhang.

Notes: The species closely resembles *S. javensis javensis* (Oudemans, 1914), but differs from it by having divided peritremal plate. The earlier record of *S. javensis javensis* from *Pipistrellus babu* needs confirmation.

30. *Pellonyssus passeri*

The species was first described from *Passer domesticus* in United States (Clark and Yunker 1956).

Present records:

Host	No. of coll.	Specimens coll.
<i>Passer domesticus</i>	3	1 ♂, 17 ♀, 26N
<i>Pycnonotus leucogenys</i>	1	2 ♀
<i>Cuculus canorus</i>	1	1 ♂, 2 ♀

LOCALITIES: Jammu & Kashmir: Ladakh: Pratapgunj (2750 m) near Kargil. Himachal Pradesh: Mandi: Mandi. Uttar Pradesh: Uttarkashi: Kuthnaur, Sukrala.

Notes: The senior author of this communication has examined specimens from *Ploceus philippinus* (Weaver bird) collected around Poona and specimens of *Pellonyssus passeri* collected from *Passer domesticus* at College Park, Md., U.S.A. All these specimens including the present collections are identical and

they conform with the description of *Pellonyssus passeri*. This is the first record of this species from India.

31. *Pellonyssus* sp.

1 ♀ and 1N, collected from a Munia (*Lonchura* sp.), Phalata, Udhampur, Jammu & Kashmir, 27 Nov. 69.

Notes: The species closely resembles *P. viator* (Hirst, 1921) in many respects; but differs from it by having proportionately longer anterior sternal setae, which are approximately three times longer than the length of the sternal plate. The anterior pair of sternal setae in *P. viator* is as long or slightly longer than the length of sternal plate.

32. *Liponyssoides muris*

The species has been recorded from Africa and Asia ex rodents (Strandtmann and Wharton 1958).

Present records:

Host	No. of coll.	Specimens coll.
<i>Rattus rattus</i>		
<i>gangutrianus</i>	3	1 ♂, 4 ♀, 2N
<i>Suncus murinus</i>	3	3 ♀
<i>Passer rutilans</i>	1	1 ♀

LOCALITIES: Jammu & Kashmir: Doda: Bhadarwah. Uttar Pradesh: Naini Tal: Navkuchia Tal, Dugada; Pithoragarh: Aat, Kuity; Dehra Dun: Satyanarayan.

Notes: The authors have examined several other populations of this species. The species obviously differs from *Liponyssoides* (= *Allo-dermanyssus*) *sanguineus* and has a distinct identity.

33. *Liponyssoides sanguineus*

A very common parasite of rodents with a wide geographic range including North Africa,

Asia and North America (Strandtmann and Wharton 1958). Recently it was recorded from Pakistan (Allred 1969).

Present records:

Host	No. of coll.	Specimens coll.
<i>Rattus rattus</i>		
<i>gangutrianus</i>	14	8 ♂, 18 ♀, 27N
<i>Rattus rattoides</i>	15	9 ♀, 17N
<i>Rattus nitidus</i>	3	1 ♂, 5 ♀
<i>Rattus rattus</i>		
<i>rufescens</i>	2	1 ♀, 6N
<i>Rattus</i> sp.	4	1 ♀, 4N
<i>Bandicota bengalensis</i>	1	1N
<i>Apodemus flavicollis</i>	17	6 ♂, 43 ♀, 61N
<i>Mus musculus</i>	22	1 ♂, 24 ♀, 27N
<i>Alitcola roylei</i>	4	1 ♂, 5 ♀, 12N
<i>Suncus murinus</i>	7	2 ♂, 6 ♀, 9N
<i>Passer domesticus</i>	1	1N
<i>Pycnonotus cafer</i>	1	2N

LOCALITIES: Jammu & Kashmir: Ladakh: Kargil, Dumgal, Fraw, Leh, Bodhkhharbu (3400 m); Doda: Bhadarwah, Khilani; Udhampur: Phalata. Himachal Pradesh: Chamba: Rakh, Sindwadi (3000 m), Tissa; Lahul & Spiti: Keylong, Yongkirting, Kaza (3650 m), Morang; Kangra: Baghany, Dugadda at Hamirpur; Mandi: Gutkar; Simla: Simla, Dassumajara, Malkumajara, Pud at Nalagarh (600 m); Mahasu: Nirith, Sarhan, Gangtoli at Rohru, Chool, Darhar, Jagat-Khana, Jeori, Bhagi; Sirmur: Moginand. Uttar Pradesh: Almora: Gania Deoli (1800 m); Chamoli: Guliyo, Dogalbita; Dehra Dun: Satyanarayan; Tehri: Ghansali; Uttarkashi: Jnanasu.

34. *Dermanyssus gallinae*

The common fowl mite found in temperate and tropical zones. Apparently an obligate parasite of birds (Strandtmann and Wharton 1958).

Present records:

Host	No. of coll.	Specimens coll.
<i>Passer domesticus</i>	2	2 ♀
<i>Parus major</i>	1	2 ♀
<i>Rattus</i> sp.	1	1 ♀

LOCALITIES: Jammu & Kashmir: Ladakh: Pratapgunj (2700 m), Kargil. Himachal Pradesh: Chamba: Pukhri (1150 m).

35. *Dermanyssus* sp.

1 ♀ ex *Dendrocopos auriceps* was collected at Naggar, Kulu Dist., Himachal Pradesh on 20 Apr. 1968. The identity of the specimen has not yet been determined.

36. *Myonyssus* sp.

A single female specimen was collected from *Ochotona roylei* at Salgran (2650 m), Chamba Dist., Himachal Pradesh on 20 Sept. 1968.

37. *Eulaelaps indiscretus*

This species was described ex *Apodemus flavicollis*, *Crocidura* sp. and *Rattus* from Pakistan by Allred (1969).

Present records:

Host	No. of coll.	Specimens coll.
<i>Rattus rattoides</i>	2	1 ♂, 7 ♀
<i>Rattus fulvescens</i>	1	1 ♀
<i>Apodemus flavicollis</i>	31	3 ♂, 78 ♀
<i>Alticola roylei</i>	1	1 ♀
<i>Suncus murinus</i>	1	1 ♀

LOCALITIES: Jammu & Kashmir: Baramulla: Rampore. Himachal Pradesh: Chamba: Tindi; Mahasu: Ratanadi at Baghi, Sungri; Kinnaur: Sangla, Rakcham, Chitkul. Uttar Pradesh: Naini Tal: Mukteshwar; Pauri: Dogadda; Chamoli: Badrinath.

Notes: The species has a wide ecological range from tropical to alpine in distribution. This is the new record in India.

38. *Eulaelaps stabularis*

This is the oldest known species under the genus. The species has a very wide distribution and has been recorded from North Africa, Europe, Asia and North America. The recorded hosts include several species of rodents, insectivores and birds (Strandtmann and Wharton 1958).

Present records:

Host & habitat	No. of coll.	Specimens coll.
<i>Rattus rattoides</i>	9	1 ♂, 13 ♀
<i>Rattus rattus</i>	2	3 ♀
<i>Rattus rattus</i> <i>gangutrianus</i>	1	1 ♀
<i>Rattus rattus</i> <i>rufescens</i>	1	1 ♀
<i>Rattus</i> (Millardia) <i>meltada</i>	1	1 ♀
<i>Bandicota bengalensis</i>	1	1 ♀
<i>Apodemus flavicollis</i>	20	3 ♂, 27 ♀
<i>Mus musculus</i>	24	30 ♀
<i>Mus platythrix</i>	1	1 ♀
<i>Mus</i> sp.	1	1 ♀
<i>Alticola roylei</i>	4	4 ♀
<i>Suncus murinus</i>	1	2 ♀
Cattle shed	3	1 ♂, 14 ♀, 13N

LOCALITIES: Jammu & Kashmir: Ladakh: Kargil, Dumgal, Drass; Anantnag: Pehalgam; Baramulla: Rampore, Chektreran, Sopore, Marder; Doda: Bhadarwah, Khilani; Udhampur: Dehari. Himachal Pradesh: Chamba: Salooni, Tindi; Lahul & Spiti: Keylong, Thiro, Chhetru; Kangra: Baijnath; Kulu: Palchan at Manali, Naggar, Largi; Mahasu: Pipty and Rachauli near Rampur, Dukolad, Khotkai, Chool near Khotkai, Ratanadi near Baghi, Sun-

gri, Baghi; *Kinnaur*: Sangla, Baring-Suring near Sangla (2700 m), Chitkul, Rakcham. *Uttar Pradesh*: *Naini Tal*: Mukteshwar; *Pauri*: Dogadda; *Chamoli*: Badrinath.

Note: This is the new record in India.

39. *Haemogamasus gyrinodes*

The species was described from Pakistan ex *Alticola roylei*.

Present record: 1 ♀, ex *Apodemus flavicollis*, Chitkul (3400 m), Kinnaur, Himachal Pradesh, 22 June 1970.

Note: This is the new record of this mite in India.

40. *Haemogamasus nidiformes*

The species was described and recorded from Europe and Asia — U.S.S.R., ex *Microtus gregalis* by Eregetova (Strandtmann and Wharton 1958). Recorded from Pakistan by Allred (1969) and from Turkey by Garrett and Allred (1971).

Present records:

Host	No. of coll.	Specimens coll.
<i>Rattus rattoides</i>	3	6 ♀
<i>Rattus fulvescens</i>	1	1 ♀
<i>Alticola roylei</i>	1	1 ♀
<i>Apodemus flavicollis</i>	5	7 ♀, 1N
<i>Mus musculus</i>	1	1 ♀
<i>Ochotona roylei</i>	1	1N
<i>Suncus murinus</i>	1	1 ♂, 2 ♀
<i>Crocidura</i> sp.	1	1 ♀

LOCALITIES: *Jammu & Kashmir*: Baramulla: Chektreran. *Himachal Pradesh*: *Kulu*: Vaisista at Manali; *Lahul & Spiti*: Chhetru, Thiro; *Mahasu*: Ratanadi at Baghi, *Kinnaur*: Sangla, Chitkul. *Uttar Pradesh*: *Naini Tal*: Mukteshwar, Latoli, *Pithoragarh*: Milan; *Chamoli*: Dogalbita, Baniakund.

Note: This is the new record in India.

41. *Tinaminyssus* sp.

Very little information is available on the Rhinonyssid mites of Indian birds. The field remains open for the acarologists.

Present record:

Host	No. of coll.	Specimens coll.
<i>Psittacula cyanocephala</i>	1	10 ♀
<i>Garrulax erythrocephala</i>	1	3 ♀

LOCALITIES: *Himachal Pradesh*: *Mandi*: Gutkar, on 21 May '67. *Uttar Pradesh*: *Chamoli*: Wan (2500 m), on 18 Oct. '67.

42. *Spinturnix pindarensis*

The species was described on the specimens collected from *Myotis siligorensis* in Kumaon and Garhwal regions of Uttar Pradesh during the present survey (Bhat 1973b).

Additional records:

Host	No. of coll.	Specimens coll.
<i>Myotis siligorensis</i>	2	1 ♂, 2 ♀, 1N
<i>Nyctalus leisleri</i>	1	1 ♂

LOCALITIES: *Himachal Pradesh*: *Kulu*: Kothi. *Uttar Pradesh*: *Chamoli*: Dogalbita.

Notes: The specimen from *N. leisleri* slightly differs from the type specimens by the absence of shoulders on the sternal plate, otherwise identical with type specimens in all other characters.

43. *Spinturnix plecotinus*

Described by C. L. Koch (1839) from *Plecotus auritus* in Europe. Since then the species has been recorded from several European countries from the type host-species. There is one record from *Nyctalus noctula* (Rudnick 1960).

Present records:

Host	No. of coll.	Specimens coll.
<i>Plecotus auritus</i>		
<i>homochrous</i>	2	4♂ and 1♀

LOCALITIES: *Himachal Pradesh*: Mahasu: Ratanadi near Baghi. *Uttar Pradesh*: Pithoragarh: Martoli (3500 m).

Notes: This is the first record from *P. a. homochrous* in India.

44. *Spinturnix* sp.

The species closely resembles *Spinturnix paracuminatus* Baker and Delfinado, 1964, described from *Miniopterus* sp. and *Pipistrellus* sp. in Borneo and New Guinea, but differs from it by the absence of tritosternum. The species awaits description.

Present Record:

Host	No. of coll.	Specimens coll.
<i>Pipistrellus babu</i>	1	1♂, 2♀

LOCALITY: *Uttar Pradesh*: Tehri: Ghonti.

45. *Paraperiglischrus rhinolophinus*

This species was first described under the genus *Periglischrus* as *P. rhinolophi* by Hiregaudar and Bal (1956) on the basis of specimens collected from *Rhinolophus rouxi*, and later transferred under the new genus *Paraperiglischrus* and synonymised with the species *P. rhinolophinus* (C. L. Koch, 1841) by Rudnick (1960).

Present record:

Host	No. of coll.	Specimens coll.
<i>Rhinolophus rouxi</i>	1	1♂, 5♀

LOCALITY: *West Bengal*: Darjeeling: Tashiding.

Notes: Apparently several taxa have been included under this species due to the absence of differentiating characters. But the specimens collected from different host species show consistent difference in size. The species appears to be polyvalent and needs revision.

46. *Paraperiglischrus* sp.*Records:*

Host	No. of coll.	Specimens coll.
<i>Hipposideros armiger</i>	1	2♂, 1♀

LOCALITY: *Uttar Pradesh*: Almora: Katarimal.

Notes: The specimens collected from this host are distinctly larger than all the known taxons under the genus and await description.

47. *Ancystropus eonycteris*

The species was described by Delfinado and Baker (1963) ex *Eonycteris robusta* from Mindanao. It is similar to *Ancystropus zeledorii* in general morphology, but the leg I lacks lateral hooks on distal 4 segments; femur I and genu I each with only 1 large ventral projection; and the ventral setae on region above and shield strong and stout.

Present record:

Host	No. of coll.	Specimens coll.
<i>Eonycteris spelaea</i>	1	2♀

LOCALITY: *Uttar Pradesh*: Pithoragarh: Thal.

Notes: This is the first record of this species in India. *Ancystropus nakatae* described on the basis of a single mutilated female specimen by Prasad (1969b) is identical with *A. eonycteris* and is obviously a synonym.

48. *Ancystropus kanheri*

This species was first described by Hiregaudar and Bal (1956) under the genus *Ancystropus* on the basis of specimens collected from *R. leschenaulti* from India. Delfinado and Baker (1964) recorded this species ex *R. amplexicaudatus* from Philippines, O. Sumba and Solomon Islands; and ex bats from New Guinea. They transferred this species under a new genus *Oncoscelus*. Prasad (1969a) recorded the species from Philippines ex *R. amplexicaudatus*. Domrow (1972) brought back the species under the former genus *Ancystropus* because of its striking similarity to other co-generas. He also recorded this species ex *R. stresemanni* from New Guinea.

Present records:

Host	No. of coll.	Specimens coll.
<i>Rousettus leschenaulti</i>	8	15 ♀, 2N

LOCALITIES: *Himachal Pradesh*: Kulu: Sooma, Bandrol; *Kangra*: Dadh. *Uttar Pradesh*: *Pauri*: Dalmisain; *Almora*: Kapkote; *Pithoragarh*: Thal.

49. *Ancystropus taprobanus*

This species was originally described from *Rousettus seminudus* from Ceylon. Later re-described from *R. leschenaulti* by Hiregaudar and Bal (1956) under the name *A. indicus* and from *Rousettus* sp. by Baker and Delfinado, 1964 under *A. rudnicki*. Prasad (1969a) recorded some more material from New Guinea and Philippines under *A. rudnicki*. Both the latter species are synonymised with *A. taprobanus* by Domrow (1972), who records this species from *R. stresemanni*.

Present records:

Host	No. of coll.	Specimens coll.
<i>Rousettus leschenaulti</i>	16	81 ♀

LOCALITIES: *Himachal Pradesh*: *Kangra*: Dadh; *Kulu*: Sooma, Bandrol; *Mandi*: Gutkar. *Uttar Pradesh*: *Pauri*: Raitoli, Shrinagar, Dalmisain; *Almora*: Kapkote, Kataithbara; *Naini Tal*: Dugada; *Pithoragarh*: Patet, Tejam, Thal.

50. *Ancystropus zeledorii*

Recorded from Egypt and Cyprus ex *Rousettus aegyptiacus*, Uganda ex *Lavia pons rex*, Thailand ex bat, and India ex *R. leschenaulti* (Rudnick, 1960). *A. palawanensis* Delfinado and Baker (1963) is synonymised with *A. zeledorii* by Domrow (1972).

Present records:

Host	No. of coll.	Specimens coll.
<i>Rousettus leschenaulti</i>	22	8 ♂, 59 ♀, 1N
<i>Cynopterus sphinx</i>	10	28 ♀
<i>Sphaerias blanfordi</i>	11	11 ♂, 28 ♀, 6N

LOCALITIES: *Himachal Pradesh*: *Kulu*: Sooma, Bandrol; *Kangra*: Dadh; *Mandi*: Mandi; *Bilaspur*: Ballu. *Uttar Pradesh*: *Naini Tal*: Dugada, Garjia, Haldwani; *Almora*: Kapkote, Khati, Loharkhet, Phaltaniya, Kataithbara; *Pithoragarh*: Dharchula, Kotera, Kuity, Tejam, Dummer, Khela, Thal, Aat; *Pauri*: Dunggripanth, Narkota, Raitoli, Dalmisain; *Chamoli*: Guliyo, Dogalbita; *Sahranpur*: Fatehpur; *Dehra Dun*: Ramgarh, Sahasradhara.

Notes: *C. sphinx* and *S. blanfordi* are the two new hosts recorded.

51. *Meristaspis lateralis*

Recorded from Egypt, Palestine and Cyprus ex *R. aegyptiacus*; from Ceylon ex *R. seminudus* (Rudnick, 1960); from India ex *R. leschenaulti* (Hiregaudar and Bal, 1956); from Yemen ex *Eidolon sebaem* (Rudnick, 1960); from Philippines ex *E. robusta*, *R. amplexicaudatus* and *C. brachyotis*; from New Guinea ex *Rousettus* sp. and on undetermined sp. of bat;

from N. Borneo ex *Tupaia*; and from Timor ex an undetermined host species (Delfinado and Baker, 1963; Baker and Delfinado, 1964); and again recorded from New Guinea ex *R. stresemanni* (Domrow, 1972).

Present records:

Host	No. of coll.	Specimens coll.
<i>Rousettus leschenaulti</i>	29	97 ♂, 171 ♀, 36N
<i>Eonycteris spelaea</i>	2	7 ♀
<i>Cynopterus sphinx</i>	2	1 ♀, 2N
<i>Sphaerias blanfordi</i>	12	8 ♂, 49 ♀, 32N
<i>Pteropus giganteus</i>	1	1 ♀

LOCALITIES: *Himachal Pradesh*: Kulu: Sooma, Bandrol; *Kangra*: Dadh; *Mandi*: Mandi. *Uttar Pradesh*: *Naini Tal*: Dugada; *Almora*: Kapkot, Dhakuri, Loharkhet, Phaltaniya, Kataithbara; *Pithoragarh*: Dharchula, Kuity, Patet, Tejam, Girgaon, Khela, Tawaghat, Thal; *Pauri*: Dungripanth, Narkota, Raitoli, Shrinagar, Dalmisain; *Chamoli*: Dogalbita; *Dehra Dun*: Sahasradhara, Sahaspur.

Notes: New record from *E. spelaea*, *C. sphinx* and *S. blanfordi* in India.

52. *Nothropholaspis* sp.

Nothropholaspis sp. are extremely common and are found in the soil and on invertebrates and vertebrates. Although they are regularly associated with various hosts they are probably not parasitic in the actual sense (Baker and Wharton 1952).

Present records:

Host and habitats	No. of coll.	Specimens coll.
Man	1	1N
Cattle shed	3	17N
Chicken coops	1	1N
<i>Rattus rattus</i>		
<i>gangutrianus</i>	1	1 ♀, 1N
<i>Suncus murinus</i>	1	1 ♀

LOCALITIES: *Himachal Pradesh*: Kulu: Palchan; *Kinnaur*: Chitkul, Baring Suring at Sangla, Sangla, Bilaspur: Deoli. *Uttar Pradesh*: *Pithoragarh*: Aat. *Sikkim*: Gangtok (1500 m).

53. *Boydaia* sp.

27 specimens were collected from the nasal chambers of Blueheaded rock thrush (*Monticola cinclorhynchus*) at Sundargaon (1100 m) near Karnaprayag, Chamoli dist., Uttar Pradesh, on 14th May 1967.

54. *Pterygosoma* sp.

The family Pterygosomidae, for the most part, are parasites of lizards, usually being found beneath the scales of their host. Very little is known about their biology (Lawrence 1935, 1936). Indian Pterygosomidae still awaits systematic study.

Present records:

Host	No. of coll.	Specimens coll.
<i>Agama tuberculata</i>	3	6L, 8N, 13 ♂, 18 ♀

LOCALITIES: *Himachal Pradesh*: Kulu: Naggar. *Uttar Pradesh*: *Pithoragarh*: Lilam, Thalkedar.

DISCUSSION

The present survey lists 54 species of mites, of which 52 are Mesostigmatid mites. A number of species recorded here need confirmation of their identity, some of which are apparently new species.

Among the Mesostigmatid mites most of the species, except Spinturnicidae, *Laelaps* spp. and *Sauronyssus*, did not show a close host specificity at the species level. *Laelaps* spp. have been observed to have some host specificity at the specific or generic level of the host. While the family Spinturnicidae did show a high degree

of host specificity by having associated with one or a few species of Chiropteran hosts.

The species of *Ornithonyssus*, *Steatonyssus*, *Pellonyssus*, *Liponyssoides*, *Dermanyssus* and *Haemogamasus* were found to have fresh blood within them and are obviously haematophagous parasites. Actual blood was not observed in other species of Mesostigmatid mites.

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