



HOKKAIDO UNIVERSITY

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A CONTRIBUTION TO THE KNOWLEDGE OF THE ORIBATID FAUNA OF HOKKAIDO*

(ACARI : ORIBATEI)

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Introduction

The Oribatei, forming a large suborder of the order Acari, are widely distributed over the world, containing as many as several thousand described species belonging to 535 genera and 95 families. Most of the species have been known as decomposers of leaf litter in forests. Therefore, it appears that many species of the Oribatei assume an important role in relation to the circulation of material and energy through the soil/vegetation system. Moreover, it is a well-known fact that some species can be used as indicators of environmental conditions.

So far as the writer's investigations go, more than 170 species falling in the Oribatei have been known to occur in Japan. These species have been described by M. Fukui (1958), J. Aoki (1958-1972), etc., being mainly collected from central and south Japan. Recently, the writer (1968-1970) has paid much attention to the role of the Oribatei as decomposers, and has investigated the soil fauna in Hokkaido, where only four species of the Oribatei had been known by the year of 1962. In the present study 106 species belonging to 76 genera and 47 families have been arranged at the writer's disposal, though there may be, of course, many unknown species. Of the 106 species 9 species and 1 subspecies are new to science, the type-specimens of which are deposited in the collection of the National Science Museum, Tokyo. Nineteen other species are new to Japan, being denoted by double asterisks (**) in the next section, and 38 other species new to Hokkaido, being denoted by single asterisk (*). In addition to the 106 species, 30 other species of Oribatid mites are found in the areas investigated. They can not be, however, identified definitely in the present state of the writer's knowledge.

Before going further the present writer wishes to acknowledge her indebtedness to Dr. Chihisa Watanabe of the Hokkaido University, for his kindness in reading through this manuscript. She wishes to express her sincere thanks to Dr. Hans Mori of the same University, for his continual encouragement. She is greatly indebted to Dr. Jun-ichi Aoki, of the National Science Museum, Tokyo, whose valuable suggestion and helpful criticism have increased the importance of this paper. The National Science Museum, Tokyo, allowed her the use of Aoki's card files and of Aoki's private

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collection of reprints. She wants to express her sincere thanks to Dr. Yoshinori Imaizumi, head of Department of Zoology and to Dr. Takehiko Nakane, chief entomologist of Department of Zoology, who kindly gave her the chance to be able to study in the National Science Museum, Tokyo. Several other persons helped her during her work in offering valuable specimens: she mentions her colleagues, Dr. Yoshio Nakamura of National Grassland Research, Tochigi, Mr. Hiroshi Tamura of Biological Institute, Ibaraki University, and Mr. Norimoto Murai of Institute of Plant Development, University of Wisconsin. The writer desires to express her obligation to Dr. Kuniyasu Morikawa and Mr. Kazuo Ishikawa, of Biological Laboratory, Matsuyama Shinonome Junior College, Mr. Keiichi Suzuki, of Tamagawa University, and Mrs. Misaho Fujikawa, who kindly sent material for the writer's use.

Classification

So far as the writer is aware, nineteen superfamilies of Oribatid mites are found in Hokkaido. In the arrangement of genera the writer follows mainly Balogh (1965). In the description of the chaetotaxy she follows the notation used by Balogh (1965) and Aoki (1965e and 1967d). As it is very difficult to determine the species of juvenile mites in the present state of her knowledge, they are excluded from the present work. The specimens examined were collected by means of Tullgren apparatus (see: Fujikawa, 1970a) or floating method.

The sampling localities belong to the following eight provinces in Hokkaido: Oshima-shichô (Os), Hiyama-shichô (Hy), Shiribeshi-shichô (Sh), Ishikari-shichô (Is), Hidaka-shichô (Hd), Kamikawa-shichô (Ka), Sôya-shichô (So) and Tokachi-shichô (To). The following marks are used in the present paper:

- Os-1** Moss, litter, humus and bark of standing trees from a beech forest in Kikonai, 29-XI-1968, Tokuko Fujikawa leg.
- Hy-1** Soil from a grassland of Kamome-Jima in Esashi-chô, 18-VIII-1967, Misaho Fujikawa leg.
- Hy-2** Moss, litter, humus and bark of standing trees from a hatchet-leaved arborvitae (*Thujaopsis dolabrata* var. *hondai* Makino) forest in Kita-Hiyama, 28-XI-1968, T. Fujikawa leg.
- Sh-1** Humus from forest in Raiden, 12-IX-1967, Norimoto Murai leg.
- Sh-2** Moss, litter, humus and bark of standing trees from a beech forest in Kuro-matsunai, 25-26-XI-1968, T. Fujikawa leg.
- Is-1** Bog in Teine-chô, 9-V-1966.
- Is-2** Bog in Teine-chô, 6-8-VI-1966.
- Is-3** Bog in Teine-chô, 19-VII-1966.
- Is-4** Soil from a dry grassland in Kita-Hiroshima, 20-VII-1966.
- Is-5** Soil from a grassland in the campus of Hokkaido University, 21-VII-1966.
- Is-6** Litter and humus of the forest at a higher altitude on Mt. Mombetsu, 4-VIII-1966.
- Is-7** Bog in Teine-chô, 9-VIII-1966.
- Is-8** Litter and humus from an *Abies* forest in Nopporo National Forest, 30-VIII-1966.
- (Is-1-Is-8)** T. Fujikawa leg.)
- Is-9** Soil from a dry grassland in Kita-Hiroshima, 7-IX-1966, Yoshio Nakamura leg.
- Is-10** Litter and humus from an *Abies* forest in Nopporo National Forest, 17-XII-1966.
- Is-11** Litter and humus from an *Abies* forest in Nopporo National Forest, 20-I-1967.
- Is-12** Litter and humus from a broad-leaved forest in Nopporo National Forest, 26-V-1967.
- Is-13** Litter and humus of the forest at a lower altitude on Mt. Soranuma, 28-V-1967.

- Is-14** Litter and humus from a broad-leaved forest in Nopporo National Forest, 30-VII-1967.
- Is-15** Litter and humus from Nopporo National Forest, 30-VIII-1967.
- Is-16** Litter and humus from a wind break of Ishikari-Hama, 20-IV-1968.
- Is-17-Is-26** except for Is-20: Litter and humus from a natural mixed stand of broadleaved and coniferous trees in Higashi-Misumai.
- Is-17** 20-22-V-1968.
- Is-18** 25-VI-1968.
- Is-19** 25-28-VII-1968.
- Is-20** Litter from Ishikari-Hama, 12-13-VIII-1968.
- Is-21** 26-IX-1968.
- Is-22** 17-19-I-1969.
- Is-23** 5-VI-1969.
- Is-24** 7-9-VIII-1969.
- Is-25** 22-23-IX-1969.
- Is-26** 24-I-1970.
- (**Is-10-Is-26** T. Fujikawa leg.)
- Hd-1** Humus from a grassland and a *Quercus* forest in Hidaka-Mombetsu, 12-V-1966, Hiroshi Tamura leg.
- Hd-2** Humus from a grassland and a *Quercus* forest in Hidaka-Mombetsu, 18-XI-1966, H. Tamura leg.
- Ka-1** Litter and humus from a forest in Yamabe-chô, 25-V-1968, T. Fujikawa leg.
- Ka-2** Mountain soil at Mt. Taisetsu (Asahi-dake), 23-VII-1967, T. Fujikawa leg.
- Ka-3** Mountain soil at Mt. Taisetsu (Asahi-dake), 6-11-VII-1970, Kunjyasu Morikawa and Kazuo Ishikawa leg.
- Ka-4** Mountain soil at Mt. Taisetsu (Kuro-dake), 8-VII-1970, K. Morikawa and K. Ishikawa leg.
- So-1** Sarobetsu Moor, 12-14-VII-1966, T. Fujikawa leg.
- To-1** Litter and humus from a forest in Nukabira, 5-VIII-1967, Y. Nakamura leg.
- To-2** Mountain Soil at Mt. Nipesotsu, 1-IX-1967, Y. Nakamura leg.
- To-3** Litter and humus from a forest in Nukabira, 22-IX-1967, Y. Nakamura leg.
- To-4** Moss, litter, humus and bark of standing trees from a Glehn's spruce—moss forest in Mo-Ashoro, 9-XI-1968, T. Fujikawa leg.
- To-5** Moss, litter, humus and bark of standing trees from a Glehn's spruce—grass bamboo forest in Mo-Ashoro, 10-11-XI-1968, T. Fujikawa leg.
- To-6** Moss, litter, humus and bark of standing trees from a Glehn's spruce—reed forest in Mo-Ashoro, 11-XI-1968, T. Fujikawa leg.

I. Superfamily **Hypochthonoidea**

1. Family **Hypochthoniidae**

1. Genus **Hypochthonius** C. L. Koch

Hypochthonius C. L. Koch, 1836, fasc. 3 (19).

Type-species: *Hypochthonius rufulus* C. L. Koch.

(1) ***Hypochthonius rufulus*** C. L. Koch (Fig. 1)

Hypochthonius rufulus C. L. Koch, 1836, fasc. 3 (19); Aoki, 1959 b, p. 133, fig. 3; Aoki, 1965 d, p. 289, figs. 1-4; Fujikawa, 1968, p. 31.

Hypochthonius pallidulus C. L. Koch, 1836, fasc. 3 (20).

Letosoma ovata Nicolet, 1855, p. 395, pl. 2, fig. 5.

Hypochthonius rufulus: Berlese, 1896 a, fasc. 78 (6).

Locality: Nopporo (3 exs., Is-8; 24 exs., Is-11; 11 exs., Is-12 after Fujikawa, 1970 b); Sarobetsu Moor (Fujikawa, 1968); Hidaka-Mombetsu (Tamura et al., 1969); Higashi-Misumai (Nakamura et al., 1970); Mt. Taisetsu (2 exs., Ka-4).

Measurement: Length: 571 (659) 757 μ ; width: 286 (380) 457 μ (by 17 undepressed specimens).

Distribution: Europe; U.S.A.; North Canada; Nepal; U.S.S.R.; Iceland; Japan.

2. Genus *Eohypochthonius* Jacot

Eohypochthonius Jacot, 1938 b, p. 133.

Type-species: *Hypochthonius gracilis* Jacot.

*(2) *Eohypochthonius gracilis gracilis* (Jacot) (Fig. 2)

Hypochthonius gracilis Jacot, 1936 a, p. 251, fig. 9.

Eohypochthonius gracilis: Jacot, 1938 b, p. 133; Aoki, 1961 b, p. 83.

Eohypochthonius gracilis crassisetiger: Fujikawa, 1968, p. 31; Tamura et al., 1969, p. 50.

Eohypochthonius sp.: Nakamura et al., 1970, p. 83.

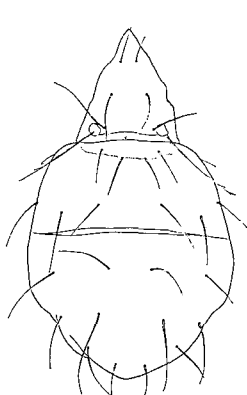


Fig. 1. *Hypochthonius rufulus* C. L. Koch.

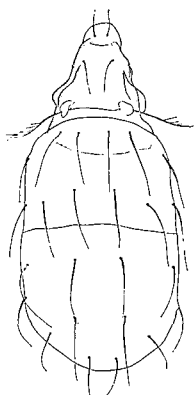


Fig. 2. *Eohypochthonius gracilis gracilis* (Jacot).

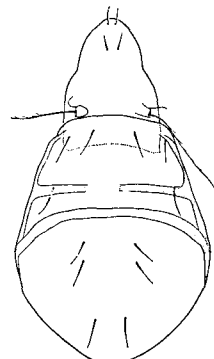


Fig. 3. *Hypochthoniella minutissima* (Berlese).

Locality: Nopporo (5 exs., Is-11; 1 ex., Is-14); Yamabe-chô (1 ex., Ka-1); Ishikari-Hama (3 exs., Is-20); Kuromatsunai (53 exs., Sh-2); Kita-Hiyama (20 exs., Hy-2); Kikonai (2 exs., Os-1).

Measurement: Length: 371 (382) 414 μ ; width: 157 (176) 186 μ (by 12 undepressed specimens).

Distribution: U.S.A.; Peru; Japan.

2. Family *Eniochthoniidae*

Genus *Hypochthoniella* Berlese

Hypochthoniella Berlese, 1910 a, p. 218.

Type-species: *Hypochthonius minutissimus* Berlese.

(3) *Hypochthoniella minutissima* (Berlese) (Fig. 3)

Hypochthonius minutissimus Berlese, 1904 a, p. 252.

Hypochthonius (Hypochthoniella) pallidulus: Berlese, 1910, p. 218.

Hypochthoniella pallidula: Sellnick, 1928, p. 22, fig. 48; Aoki, 1959b, p. 133.

Eniochthonius pallidulus: Grandjean, 1933, p. 32; Aoki, 1962b, p. 179.

Eniochthonius minutissimus: Hammen, 1959, p. 17; Aoki, 1964, p. 387; Fujikawa, 1968, p. 31; 1970b, p. 72; Tamura et al., 1969, p. 50; Nakamura et al., 1970, p. 83.

Hypochthoniella minutissimus: Aoki, 1967c, p. 136.

Hypochthoniella minutissima: Pérez-Íñigo, 1968, p. 194.

Locality: Yamabe-chô (3 exs., Ka-1); Kuromatsunai (22 exs., Sh-2); Esashi-chô (12 exs., Hy-1); Kikonai (11 exs., Os-1), Sarobetsu Moor (Fujikawa, 1968); Hidaka-Mombetsu (Tamura et al., 1969); Higashi-Misumai (Nakamura et al., 1970); Nopporo (1 ex., Is-11 after Fujikawa, 1970b); Mt. Taisetsu (13 exs., Ka-3; 2 exs., Ka-4).

Measurement: Length: 343 (379) 414 μ ; width: 186 (202) 214 μ (by 7 undepressed specimens).

Distribution: Finland; Europe; Nepal; South Argentina; Chile; New Zealand; U.S.S.R.; North Canada; Japan.

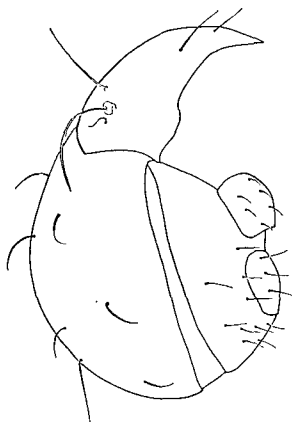


Fig. 4. *Mesoplophora japonica*
Aoki.

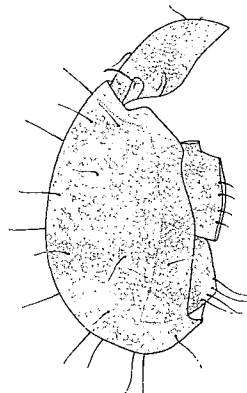


Fig. 5. *Steganocaracus striculus*
(C. L. Koch).

II. Superfamily Mesoplophoroidea

Family Mesoplophoridae

Genus *Mesoplophora* Berlese

Mesoplophora Berlese, 1904c, p. 23.

Type-species: *Mesoplophora michaeliana* Berlese.

* (4) *Mesoplophora japonica* Aoki (Fig. 4)

Mesoplophora japonica Aoki, 1970a, p. 397, figs. 2-4.

Mesoplophora pulchra: Aoki, 1965a, p. 298, fig. 13·11-D; Tamura et al., 1969, p. 50.

Mesoplophora sp.: Nakamura et al., 1970, p. 83; Fujikawa, 1970b, p. 72.

Locality: Hidaka-Mombetsu (Tamura et al., 1969); Higashi-Misumai (Nakamura et al., 1970); Nopporo (1 ex., Is-11 after Fujikawa, 1970b); Kita-Hiyama (2 exs., Hy-2).

Measurement: Length of aspis: 171 (193) 214 μ ; length of notogaster: 257 (279) 300 μ (by 2 undepressed specimens).

Distribution: Japan.

III. Superfamily **Phthiracaroidea**

Family **Phthiracaridae**

Genus ***Steganacarus*** Ewing

Steganacarus Ewing, 1917, p. 125.

Type-species: *Hoplophora anomala* Berlese.

(5) ***Steganacarus striculus*** (C. L. Koch) (Fig. 5)

Hoplophora striculus C. L. Koch, 1836.

Hoploderma stricula: Sellnick, 1928, p. 40, fig. 91.

Hoploderma striculum: Willmann, 1931, p. 190, fig. 346.

Steganacarus striculus: Jacot, 1936 b, p. 183; Aoki, 1962, p. 179; Tamura et al., 1969, p. 50.

Steganacarus striculus: Aoki, 1958 b, p. 174, fig. 4.

Steganacarus senex: Aoki, 1958 b, p. 172, fig. 3; Nakamura et al., 1970, p. 83. (**Syn. nov.**)

Steganacarus sp.: Fujikawa, 1968, p. 31.

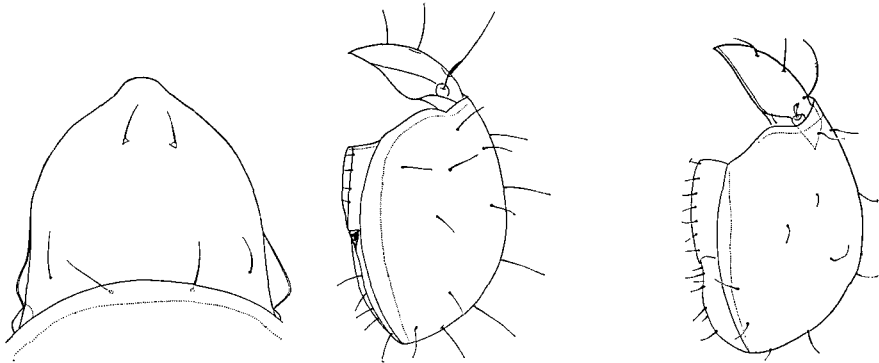


Fig. 6. *Oribotritia berlesii* (Michael), prodorsum.

Fig. 7. *Rhyssotritia ardua* (C. L. Koch).

Fig. 8. *Prototritia aberrans ensifer* Aoki.

Locality: Mo-Ashoro (319 exs., To-4; 857 exs., To-5; 42 exs., To-6); Kuromatunai (188 exs., Sh-2); Kita-Hiyama (189 exs., Hy-2); Kikonai (101 exs., Os-1); Sarobetsu Moor (Fujikawa, 1968); Hidaka-Mombetsu (2 exs., Hd-2; Tamura et al., 1969); Higashi-Misumai (Nakamura et al., 1970; Fujikawa, 1970a); Nopporo (12 exs., Is-11 after Fujikawa, 1970b); Yamabe-chô (7 exs., Ka-1); Ishikari-Hama (63 exs., Is-20); Mt. Taisetsu (131 exs., Ka-3; 20 exs., Ka-4).

Measurement: Length of aspis: 100 (132) 171 μ ; length of notogaster: 328 (346) 386 μ (by 4 undepressed specimens).

Distribution: Europe; Canada; Japan.

IV. Superfamily **Euphthiracaroidea**

1. Family **Oribotritiidae** Grandjean

Genus ***Oribotritia*** Jacot

Oribotritia Jacot, 1924, p. 83.

Type-species: *Hoplophora decumana* C. L. Koch.

** (6) **Oribotritia berlesei** (Michael) (Fig. 6)

Phthiracarus berlesei Michael, 1898, p. 93.

Oribotritia berlesei: Märkel, 1964, p. 19, figs. 1-2.

Oribotritia sp.: Nakamura et al., 1970, p. 83.

Diagnosis: Sensillus filiform, almost of the same thickness wholly, being not pectinated, and spindle-shaped at tip. Rostral, lamellar and interlamellar setae fine and shorter than sensillus. Notogaster with 14 pairs of setae. Genital plate with 8 setae. Anal plate with 1 seta situated much anteriorly. Three pairs of adanal setae and 2 pairs of aggenital setae present.

Locality: Yamabe-chô (2 exs., Ka-1); Mo-Ashoro (3 exs., To-4); Higashi-Misumai (Nakamura et al., 1970).

Measurement: Length of aspis: 700 μ ; length of notogaster: 1471 μ .

Distribution: England; France; Japan.

2. Family **Euphthiracaridae**

1. Genus **Rhysotritia** Märkel & Mayer

Rhysotritia Märkel & Mayer, 1959, p. 327.

Type-species: *Hoplophora ardua* C. L. Koch.

(7) **Rhysotritia ardua** (C. L. Koch) (Fig. 7)

Hoplophora ardua C. L. Koch, 1841, fasc. 32 (15).

Pseudotritia ardua: Jacot, 1930, p. 243, pl. 38, figs. 44-45; Aoki, 1958b, p. 172, fig. 2.

Rhysotritia ardua: Märkel & Mayer, 1959, p. 327, fig. 8b; Märkel, 1964, p. 69, fig. 15; Aoki, 1961b, p. 83.

Rhysotritia sp.: Fujikawa, 1968, p. 31; Nakamura et al. 1970, p. 83; Fujikawa, 1970b, p. 72.

Locality: Yamabe-chô (7 exs., Ka-1); Mo-Ashoro (30 exs., To-4; 82 exs., To-5; 7 exs., To-6); Kuromatsunai (42 exs., Sh-2); Kita-Hiyama (95 exs., Hy-2); Kikonai (64 exs., Os-1); Sarobetsu Moor (Fujikawa, 1968); Hidaka-Mombetsu (Tamura et al., 1969); Higashi-Misumai (Nakamura et al., 1970; Fujikawa, 1970a); Nopporo (Fujikawa, 1970b); Otoineppu, Oketo (Fujikawa, 1970c); Mt. Taisetsu (3 exs., Ka-4).

Measurement: Length of aspis: 143 (219) 257 μ ; length of notogaster: 314 (425) 489 μ (by 3 undepressed specimens).

Distribution: Europe; North America; Finland; U.S.S.R.; Japan.

2. Genus **Prototritia** Jacot

Prototritia Jacot, 1938a, p. 114.

Type-species: *Prototritia canadaris* Jacot.

* (8) **Prototritia aberrans ensifer** Aoki (Fig. 8)

Prototritia aberrans ensifer Aoki, 1969b, p. 27, figs. 1-5.

Locality: Mo-Ashoro (5 exs., To-4; 11 exs., To-5). A second record from Japan.

Measurement: Length of aspis: 157 μ ; length of notogaster: 286 μ .

Distribution: Japan.

V. Superfamily **Perlohmannoidea**

1. Family **Perlohmanniidae**

Genus **Perlohmannia** Berlese

Perlohmannia Berlese, 1916b, p. 176.

Type-species: *Lohmannia insignis* Berlese.

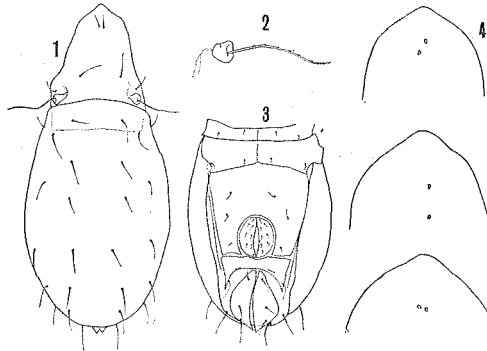


Fig. 9. *Epilohmannia spathulata* Aoki—1. Dorsal side.—2. Sensillus.—3. Ano-genital region.—4. Variation of rostral margins and arrangement of rostral setae (only their insertions are shown).

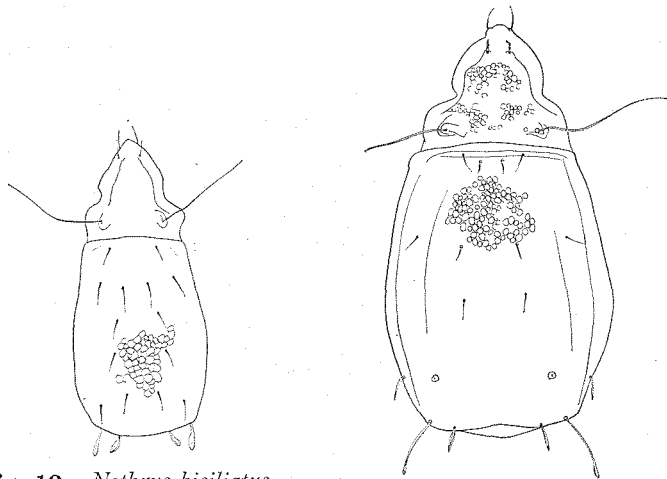


Fig. 10. *Nothrus biciliatus*
C. L. Koch.

Fig. 11. *Nothrus silvestris* Nicolet.

(9) ***Perlohmannia gigantea*** (Aoki)

Apolohmannia gigantea Aoki, 1960a, p. 507, figs. 1-3.

Perlohmannia gigantea: Fujikawa & Aoki, 1969, p. 225.

Locality: Higashi-Misumai (Fujikawa & Aoki, 1969; Nakamura et al., 1970); Oketo (Fujikawa, 1970c).

Distribution: Japan.

(10) ***Perlohmannia coiffaiti*** Grandjean

Perlohmannia coiffaiti Grandjean, 1961, p. 604, figs. 1-3; Fujikawa & Aoki, 1969, p. 220, figs. 1-7.

Locality: Sarobetsu Moor, Nopporo, Mt. Soranuma, and Mo-Ashoro (Fujikawa & Aoki, 1969); Oketo (Fujikawa, 1970c); Mt. Taisetsu (7 exs., Ka-3; 21 exs., Ka-4).

Distribution: France; Japan.

2. Family **Epilohmanniidae**

Genus ***Epilohmannia*** Berlese

Epilohmannia Berlese, 1916b, p. 176.

Type-species: *Lohmannia cylindrica* Berlese.

* (11) ***Epilohmannia spathulata*** Aoki (Fig. 9)

Epilohmannia spathulata Aoki, 1970a, p. 399, figs. 5-8.

Epilohmannia sp.: Fujikawa, 1970a, p. 43; Nakamura et al., 1970, p. 83.

Supplementary description: Rostral setae fine and longer than their mutual distance; either the left seta or the right seta inserted far anteriorly than the opposite one (Fig. 9). Normally, three pairs of aggenital setae are present, except that one specimen has 3-4 pairs.

Locality: Kikonai (24 exs., Os-1).

Measurement: Length: 657 (744) 957 μ ; width: 286 (337) 414 μ (by 43 undepressed specimens).

Distribution: Japan.

VI. Superfamily **Nothroidea**

1. Family **Nothridae**

Genus ***Nothrus*** C. L. Koch

Nothrus C. L. Koch, 1836, fasc. 2 (17, 18).

Type-species: *Nothrus palustris* C. L. Koch.

(12) ***Nothrus biciliatus*** C. L. Koch (Fig. 10)

Nothrus biciliatus C. L. Koch, 1841; Aoki, 1961b, p. 83; Aoki, 1965a, p. 304, fig. 13.

Nothrus silvestris Nicolet, 1855, p. 458, pl. 7, fig. 4.

Nothrus anauniensis: Canestrino & Fanzago, 1876, p. 102.

Angelia silvestris: Berlese, 1896a, p. 26.

Camisia biciliata: Trägårdh, 1902, p. 10.

Nothrus borussicus: Fujikawa, 1968, p. 31.

Locality: Mo-Ashoro (10 exs., To-4; 14 exs., To-5); Kuromatsunai (10 exs., Sh-2); Kita-Hiyama (2 exs., Hy-2); Kikonai (2 exs., Os-1); Sarobetsu Moor (Fujikawa, 1968); Hidaka-Mombetsu (Tamura et al., 1969), Higashi-Misumai (Nakamura et al., 1970); Nopporo (4 exs., Is-11 after Fujikawa, 1970b); Nishi-Shibetsu, Oketo (Fujikawa, 1970c); Mt. Taisetsu (8 exs., Ka-3).

Measurement: Length: 629 (686) 771 μ ; width: 286 (326) 414 μ (by 5 undepressed specimens).

Distribution: Finland; Europe; Algeria; Lapland; Greenland; Iceland; U.S.S.R.; New Zealand; Japan.

* (13) *Nothrus silvestris* Nicolet (Fig. 11)

Nothrus silvestris Nicolet, 1855, p. 458, pl. 7, fig. 4; Aoki, 1969a, p. 120, figs. 3-6

Angelia silvestris: Berlese, 1896a, p. 26.

Locality: Mt. Taisetsu (4 exs., Ka-2; 17 exs., Ka-3; 5 exs., Ka-4); Ishikari-Hama (1 ex., Is-20); Mo-Ashro (51 exs., To-4; 8 exs., To-6).

Measurement: Length: 843 (880) 957 μ ; width: 443 (477) 514 μ (by 14 undepressed specimens).

Distribution: Europe; Scandinavia; U.S.S.R.; Algeria; Jan Mayer Is.; Mexico; Japan.

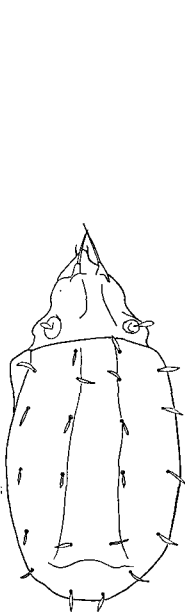


Fig. 12. *Camisia lapponica* (Trägårdh).

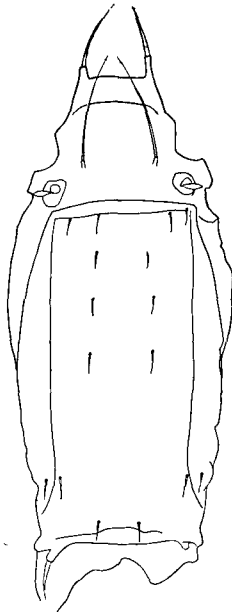


Fig. 13. *Camisia biurus* (C. L. Koch).

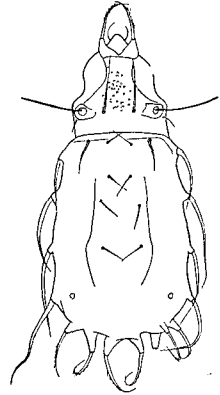


Fig. 14. *Heminotrus paolianus* Berlese var. *longisetosus* Willmann.

2. Family **Camisiidae**

1. Genus ***Camisia*** von Heyden

Camisia von Heyden, 1826, p. 612.

Type-species: *Notaspis segnis* Hermann.

Key to the species

- 1 (4) Hysterosoma with apophyses posteriorly.
- 2 (3) Notogastral setae C₃, D₃, E₂ and F₂ long, as long as breadth of notogaster. *C. spinifer* (C. L. Koch)
- 3 (2) Notogastral setae C₃, D₃, E₂ and F₂ short. *C. biurus* (C. L. Koch)
- 4 (1) Hysterosoma without apophyses posteriorly.
- 5 (6) Posterior portion of notogaster concave. *C. segnis* (Hermann)
- 6 (5) Posterior portion of notogaster convex. *C. lapponica* (Trägårdh)

(14) *Camisia segnis* (Hermann)

Notaspis segnis Hermann, 1804, p. 94, pl. 4, fig. 8.

Nothrus bicarinatus: Berlese, 1885, fasc. 17 (4).

Camisia segnis: Grandjean, 1936, p. 38, figs. 1-2; Hammen, 1952, p. 31; Aoki, 1960 b, p. 137, fig. 1; Fujikawa, 1968, p. 31.

Locality: Sarobetsu Moor (Fujikawa, 1968); Mt. Taisetsu (6 exs., Ka-4).

Distribution: Iceland; Europe; Algeria; Chile; Peru; Japan.

*(15) *Camisia lapponica* (Trägårdh) (Fig. 12)

Nothrus lapponicus Trägårdh, 1910, p. 526, figs. 306-311.

Platynothenrus lapponicus: Willmann, 1931, p. 112, figs. 71-72.

Camisia lapponica: Sellnick, 1928, p. 20; Aoki, 1959 b, p. 132.

Camisia sp.: Nakamura et al., 1970, p. 83.

Locality: Mo-Ashoro (17 exs., To-4; 77 exs., To-5; 6 exs., To-6); Kuromatsunai (3 exs., Sh-2); Kita-Hiyama (1 ex., Hy-2); Higashi-Misumai (Nakamura et al., 1970); Mt. Taisetsu (14 exs., Ka-3; 1 ex., Ka-4).

Measurement: Length: 671 (703) 729 μ ; width: 300 (339) 357 μ (by 5 undepressed specimens).

Distribution: Greenland; Finland; Sweden; Swiss; Germany; Austria; Canada; Nepal; Lapland; Japan.

(16) *Camisia biurus* (C. L. Koch) (Fig. 13)

Nothrus biurus C. L. Koch, 1839, fasc. 30 (2).

Camisia biurus: Sellnick & Forsslund, 1955, p. 479, fig. 9; Aoki, 1962 b, p. 179; Nakamura et al., 1970, p. 83.

Locality: Mo-Ashoro (31 exs., To-4; 19 exs., To-5; 11 exs., To-6); Kita-Hiyama (2 exs., Hy-2); Higashi-Misumai (Nakamura et al., 1970); Nopporo (Fujikawa, 1970 b); Mt. Taisetsu (9 exs., Ka-3; 3 exs., Ka-4).

Measurement: Length: 957 (1080) 1157 μ ; width: 429 (449) 471 μ (by 5 undepressed specimens).

Distribution: Europe; U.S.S.R.; Canada; Japan.

*(17) *Camisia spinifer* (C. L. Koch)

Nothrus spinifer C. L. Koch, 1836, fasc. 2 (18).

Camisia spinifer: Willmann, 1931, p. 110, fig. 62; Aoki, 1962 b, p. 179.

Locality: Mo-Ashoro (4 exs., To-4; 1 ex., To-5; 4 exs., To-6).

Measurement: Length: 900 μ ; width: 457 μ .

Distribution: Europe; Greenland; North America; North Africa; Jones Island; U.S.S.R.; Japan.

2. Genus *Heminothrus* Berlese

Heminothrus Berlese, 1913 b, p. 98.

Type-species: *Nothrus tragionii* Berlese.

*(18) *Heminothrus paolianus* Berl. var. *longisetosus* Willmann (Fig. 14)

Heminothrus paolianus Berlese var. *longisetosus* Willmann, 1925, p. 9, fig. 4; Aoki, 1958 a, p. 121, fig. 1.

Locality: Mo-Ashoro (4 exs., To-4; 12 exs., To-6).

Measurement: Length: 600 (629) 657 μ ; width: 243 (267) 300 μ (by 3 undepressed specimens).

Distribution: Norway; Sweden; Finland; Greenland; Germany; U.S.S.R.; Japan.

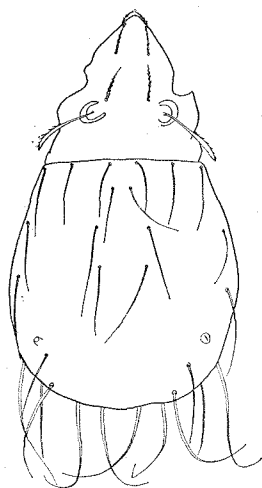


Fig. 15. *Platynothrus thori*
(Berlese).

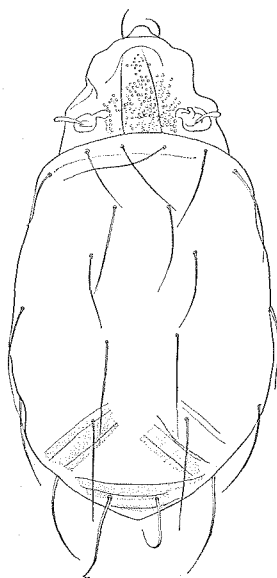


Fig. 16. *Platynothrus capillatus*
(Berlese).

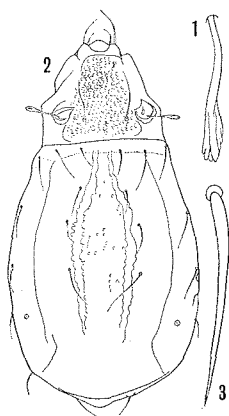


Fig. 17. *Platynothrus peltifer*
japonensis subsp. nov.
—1. Sensillus.—2. Dorsal
side.—3. Notogastral seta.

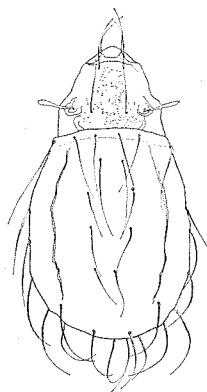


Fig. 18. *Platynothrus yama-*
sakii (Aoki).

3. Genus *Platynothrus* Berlese

Platynothrus Berlese, 1913b, p. 99.

Type-species: *Nothrus peltifer* C. L. Koch.

Key to the species

- 1 (2) Postero-marginal setae K_1 , PN_1 and PN_2 medium-sized, strongly curved along or toward the posterior margin. *P. peltifer japonensis* subsp. nov.
- 2 (1) Postero-marginal setae K_1 , PN_1 and PN_2 very long, whip-like and winding.
- 3 (4) Sensillus seta-like, pointed at tip; seta E_1 just reaching the insertion of PN_2
. *P. thori* (Berlese).
- 4 (3) Sensillus clavate, more or less thickened distally; seta E_1 extending beyond the insertion of PN_2 .
- 5 (6) Posterior end of notogaster broadly rounded; setae C_1 and D_1 extending beyond the insertion of D_2 and E_1 , respectively; distance between PN_2 and PN_2 far wider than that between D_2 and D_2 , more than 2 times the latter; interlamellar setae very long, extending beyond the tip of rostrum. *P. yamasakii* (Aoki)
- 6 (5) Posterior end of notogaster somewhat pointed; setae C_1 and D_1 not extending beyond the insertion of D_2 and E_1 , respectively; distance between PN_2 and PN_2 as long as that between D_2 and D_2 ; interlamellar setae not so long, reaching half-way of the length of prodorsum.
. *P. capillatus* (Berlese)

** (19) *Platynothrus thori* (Berlese) (Fig. 15)

Angelia thori Berlese, 1904b, p. 275.

Heminothrus thori: Berlese, 1913b, p. 99, fig. 83.

Platynothrus thori: Sellnick & Forsslund, 1955, p. 521, figs. 23-25.

Locality: Teine-chô (1 ex., Is-1; 6 exs., Is-7); Kita-Hiroshima (11 exs., Is-9); Nopporo (2 exs., Is-15); Mo-Ashoro (3 exs., To-4; 1 ex., To-6); Mt. Taisetsu (9 exs., Ka-3; 1 ex., Ka-4).

Measurement: Length: 786 (863) 957 μ ; width: 471 (514) 571 μ (by 5 undepressed specimens).

Distribution: Europe; North Canada; Lapland; Iceland; Finland; Greenland; Japan.

Remarks: The specimens examined well agree with the description of this species given by Sellnick & Forsslund (1955), though the present specimens are smaller in size than the Swedish ones.

** (20) *Platynothrus capillatus* (Berlese) (Fig. 16)

Angelia capillata Berlese, 1914, p. 132, pl. 2, fig. 25.

Locality: Higashi-Misumai (1 ex., Is-19; 5 exs., Is-22; 3 exs., Is-23; 1 ex., Is-24; 1 ex., Is-25); Kikonai (5 exs., Os-1).

Measurement: Length: 1029 (1036) 1043 μ ; width: 529 (543) 557 μ (by 2 undepressed specimens).

Distribution: Hungary; Italy; Austria; Japan.

Remarks: The specimens examined differ from the original description in the distance between C_2 and C_3 as well as that between C_1 and C_2 , and the distance between E_2 and F_2 about 1.25 times of that between C_3 and D_3 .

(21) *Platynothrus peltifer japonensis* subsp. nov. (Fig. 17)

Material examined: Holotype (NSMT-Ac-7400): Glehn's spruce forest in Mo-Ashoro, 9-XI-1968, T. Fujikawa leg.; 17 paratopotypes: the same data as holotype. The type-series is deposited in the National Science Museum, Tokyo.

Measurement: Length: 714 (774) 986 μ ; width: 386 (418) 557 μ (by 7 undepressed specimens).

Remarks: The present subspecies differs from the nominate subspecies in the smaller body size, in the clavate sensilli and in the inner ridges of notogaster, which reach to the anterior margin of the notogaster.

(22) *Platynothrus yamasakii* (Aoki) (Fig. 18)

Heminothrus yamasakii Aoki, 1958a, p. 123, fig. 2.

Platynothrus yamasakii: Aoki, 1959b, p. 132; Tamura et al., 1969, p. 52.

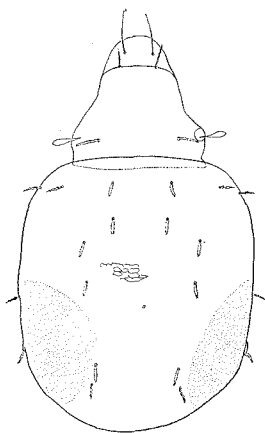


Fig. 19. *Trhypochthonius tectorum* (Berlese).

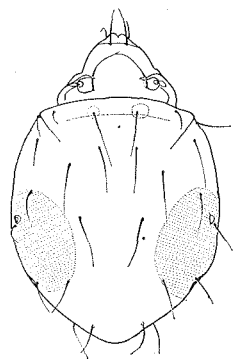


Fig. 20. *Trhypochthonius excavatus* Willmann.

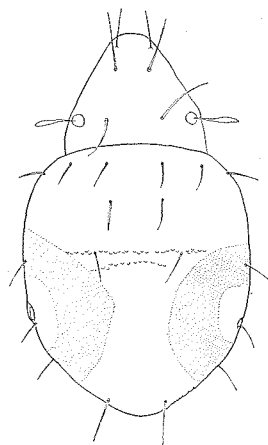


Fig. 21. *Trhypochthonius japonicus* Aoki.

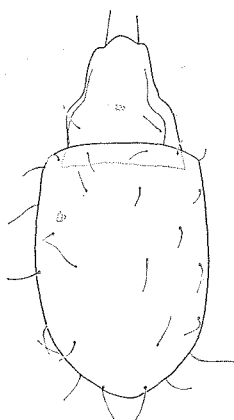


Fig. 22. *Malaconothrus pygmaeus* Aoki.



Fig. 23. *Trimalaconothrus grandis* Hammen.

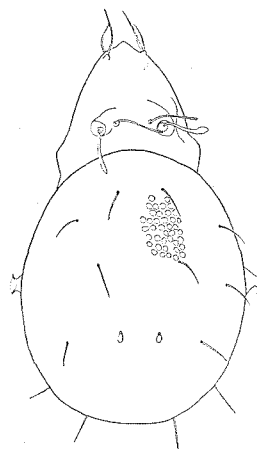


Fig. 24. *Hermanniella punctulata* Berlese sensu Aoki.

Locality: Sarobetsu Moor (1 ex., So-1); Ishikari-Hama (1 ex., Is-16; 3 exs., Is-20); Yamabe-chô (10 exs., Ka-1); Kuromatsunai (2 exs., Sh-2); Hidaka-Mombetsu (Tamura et al., 1969); Higashi-Misumai (Nakamura et al., 1970); Nopporo (5 exs., Is-11 after Fujikawa 1970b); Otoineppu, Oketo (Fujikawa, 1970c); Mt. Taisetsu (8 exs., Ka-4).

Measurement: Length: 629 (686) 729 μ ; width: 343 (365) 386 μ (by 9 undepressed specimens).

Distribution : Nepal ; Japan.

3. Family **Trhypochthoniidae**

Genus **Trhypochthonius** Berlese

Trhypochthonius Berlese, 1904c, p. 27.

Type-species: *Hypochthonius tectorum* Berlese.

Key to the species

- 1 (2) Notogastral setae various in shape and length. *T. japonicus* Aoki
2 (1) All notogastral setae of the same shape and length.
3 (4) Notogastral setae short and rough. *T. tectorum* (Berlese)
4 (3) Notogastral setae long and smooth. *T. excavatus* (Willmann)

*(23) **Trhypochthonius tectorum** (Berlese) (Fig. 19)

Hypochthonius tectorum Berlese, 1896b, fasc. 78 (8).

Trhypochthonius tectorum: Berlese, 1904c, p. 27; Lombardini, 1936, p. 50; Aoki, 1959b, p. 133, fig. 4.

Locality : Nopporo (8 exs., Is-15).

Measurement : Length : 586 μ ; width : 343 μ .

Distribution : Europe ; Iceland ; Canada ; Nepal ; Greenland ; Japan.

*(24) **Trhypochthonius excavatus** (Willmann) (Fig. 20)

Camisia excavata Willman, 1919, p. 553, fig. 3.

Trhypochthonius excavata: Sellnick, 1928, p. 9.

Trhypochthonius excavatus: Willmann, 1931, p. 104, fig. 36; Aoki, 1970a, p. 407.

Locality : Mo-Ashoro (9 exs., To-6).

Distribution : Europe ; New Zealand ; Chile ; Japan.

*(25) **Trhypochthonius japonicus** Aoki (Fig. 21)

Trhypochthonius japonicus Aoki, 1970a, p. 404, figs. 18-20.

Locality : Mo-Ashoro (7 exs., To-4; 7 exs., To-5; 35 exs., To-6); Oketo (Fujikawa, 1970c).

Measurement : Length : 500 (540) 614 μ ; width : 300 (331) 386 μ .

Distribution : Japan.

4. Family **Malaconothridae**

1. Genus **Malaconothrus** Berlese

Malaconothrus Berlese, 1904c, p. 24.

Type-species : *Nothrus monodactylus* Michael.

*(26) **Malaconothrus pygmaeus** Aoki (Fig. 22)

Malaconothrus pygmaeus Aoki, 1969a, p. 123, figs. 12-14.

Malaconothrus globiger: Fujikawa, 1968, p. 31.

Locality : Mo-Ashoro (4 exs., To-4; 2 exs., To-6); Sarobetsu Moor (Fujikawa, 1968); Mt. Taisetsu (5 exs., Ka-3).

Measurement : Length : 386 (393) 400 μ ; width : 171 (179) 186 μ (by 2 undepressed specimens).

Distribution : Japan.

2. Genus *Trimalaconothrus* Berlese

Trimalaconothrus Berlese, 1916c, p. 336.

Type-species : *Malacothonthrus (T.) industriatus* Berlese.

** (27) *Trimalaconothrus grandis* Hammen (Fig. 23)

Trimalaconothrus grandis Hammen, 1952, p. 28, fig. 3.

Locality : Mo-Ashoro (29 exs., To-4 ; 12 exs., To-6).

Measurement : Length : 629 (667) 729 μ ; width : 343 (370) 400 μ (by 10 undepressed specimens).

Distribution : Netherlands ; Japan.

Remarks : The specimens examined well agree with the original description except that they are somewhat larger than those from Netherlands.

5. Family *Nanhermanniidae*

1. Genus *Nanhermannia* Berlese

Nanhermannia Berlese, 1913b, p. 100.

Type-species : *Nothrus nanus* Nicolet.

*(28) *Nanhermannia nana* (Nicolet)

Nothrus nanus Nicolet, 1855, p. 458, pl. 7, fig. 5.

Hermannia nana : Michael, 1888, p. 455, pl. 43, figs. 1-7.

Nanhermannia sp. : Fujikawa, 1970b, p. 74 ; 1970c, p. 210.

Locality : Yamabe-chô (1 ex., Ka-1) ; Mo-Ashoro (191 exs., To-4 ; 13 exs., To-5 ; 4 exs., To-6) ; Kuromatsunai (2 exs., Sh-2) ; Kikonai (1 ex., Os-1) ; Nopporo (Fujikawa, 1970b) ; Otoineppu, Oketo (Fujikawa, 1970c) ; Mt. Taisetsu (12 exs., Ka-3 ; 3 exs., Ka-4).

Distribution : Europe ; Lapland ; North America ; Chile ; U.S.S.R. ; Peru ; Nepal ; Japan.

2. Genus *Cyrthermannia* Balogh

Cyrthermannia Balogh, 1958, p. 3.

Type-species : *Cyrthermannia tuberculata* Balogh

(29) *Cyrthermannia parallela* (Aoki)

Nanhermannia parallela Aoki, 1961a, p. 66, fig. 3.

Cyrthermannia parallela : Aoki, 1964, p. 387 ; Tamura et al., 1969, p. 52.

Locality : Hidaka-Mombetsu (Tamura et al., 1969).

Distribution : Japan.

VII. Superfamily *Hermannielloidea*

Family *Hermanniellidae*

Genus *Hermanniella* Berlese

Hermanniella Berlese, 1908, p. 11.

Type-species : *Hermannia granulata* Nicolet.

*(30) ***Hermanniella punctulata*** Berlese sensu Aoki (Fig. 24)

Hermanniella punctulata Belese, 1908, p. 12; Aoki, 1965 c, p. 125, fig. 1.

Hermanniella sp.: Aoki, 1965 a, p. 307, figs. 13-26.

Locality: Mo-Ashoro (2 exs., To-4; 1 ex., To-6).

Measurement: Length: 557 μ ; width: 329 μ .

Distribution: Holland; Sicilia; Japan.

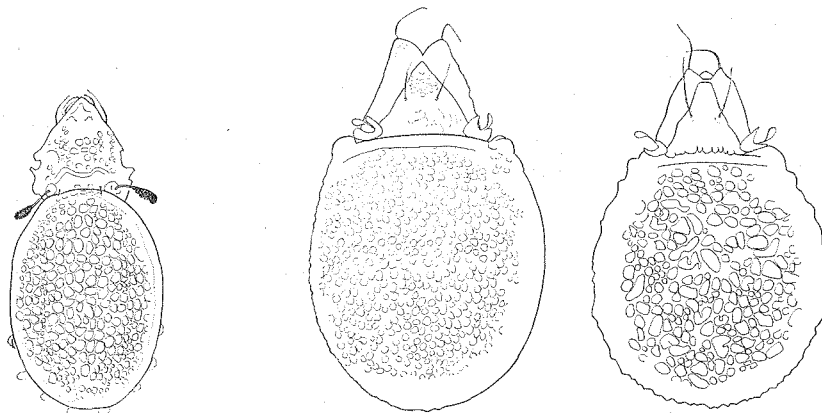


Fig. 25. *Pedrocortesella japonica*
Aoki et Suzuki.

Fig. 26. *Cepheus cepheiformis*
(Nicolet).

Fig. 27. *Cepheus latus*
(C. L. Koch).

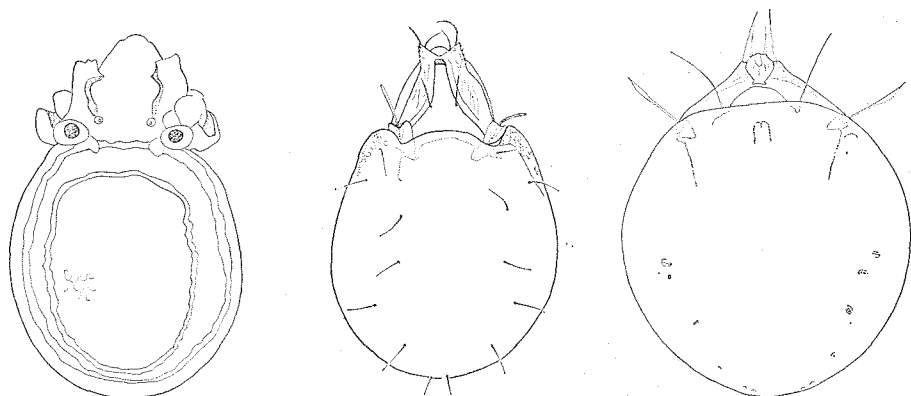


Fig. 28. *Ommatocephus* sp.

Fig. 29. *Sphdrocephus*
dentatus spec. nov.

Fig. 30. *Gustavia microcephala*
(Nicolet).

VIII. Superfamily **Gymnodamaeoida**

1. Family **Plateremaeidae**

Genus ***Pedrocortesella*** Hammer

Pedrocortesella Hammer, 1961, p. 38.

Type-species: *Pedrocortesella pulchra* Hammer.

*(31) ***Pedrocortesella japonica*** Aoki & Suzuki (Fig. 25)

Pedrocortesella japonica Aoki & Suzuki, 1970, p. 117, figs. 1-9.

Locality: Kuromatsunai (7 exs., Sh-2); Kita-Hiyama (11 exs., Hy-2). A second record from Japan.

Measurement: Length: 400 (432) 457 μ ; width: 200 (214) 229 μ (by 5 undepressed specimens).

Distribution: Japan.

2. Family **Gymnodamaeidae**

Genus ***Allodamaeus*** Banks

Allodamaeus Banks, 1947, p. 118.

Type-species: *Allodamaeus cwingi* Banks.

(32) ***Allodamaeus adpressus*** Aoki & Fujikawa

Allodamaeus adpressus Aoki & Fujikawa, 1971 b, p. 115, figs. 1-5.

Eremaeus sp. 1; Nakamura et al., 1970, p. 83.

Locality: Kita-Hiyama (5 exs., Hy-2 after Aoki et Fujikawa, 1971 b); Mo-Ashoro (1 ex., To-5); Ishikari-Hama (2 exs., Is-20); Higashi-Misumai (Nakamura et al., 1970); Mt. Taisetsu (1 ex., Ka-3).

Distribution: Japan.

IX. Superfamily **Cepheoidea**

Family **Cepheidae**

1. Genus ***Cepheus*** C. L. Koch

Cepheus C. L. Koch, 1836.

Type-species: *Cepheus latus* C. L. Koch.

* (33) ***Cepheus cepheiformis*** (Nicolet) (Fig. 26)

Tegeocranus cepheiformis Nicolet, 1855, p. 465, pl. 9, fig. 1.

Cepheus cepheiformis: Sellnick, 1928, p. 28, fig. 65; Aoki, 1959 b, p. 133.

Locality: Higashi-Misumai (2 exs., Is-17).

Measurement: Length: 757 μ ; width: 571 μ .

Distribution: Europe; U.S.S.R.; Japan.

(34) ***Cepheus latus*** (C. L. Koch) (Fig. 27)

Tegeocranus latus C. L. Koch, 1836, fasc. 3 (11).

Cepheus latus: Sellnick, 1928, p. 28; Aoki, 1959 b, p. 133; Fujikawa, 1970 b, p. 72.

Locality: Yamabe-chô (2 exs., Ka-1); Mo-Ashoro (2 exs., To-4; 4 exs., To-5); Kuromatsunai (8 exs., Sh-2); Kita-Hiyama (2 exs., Hy-2); Kikonai (5 exs., Os-1); Higashi-Misumai (1 ex., Is-26); Nopporo (Fujikawa, 1970 b).

Measurement: Length: 643 (757) 867 μ ; width: 486 (564) 671 μ (by 4 undepressed specimens).

Distribution: Europe; U.S.A.; U.S.S.R.; Japan.

2. Genus ***Ommatocephus*** Berlese

Ommatocephus Berlese, 1913 b, p. 98.

Type-species: *Cepheus ocellatus* Michael.

(35) ***Ommatocepheus*** sp. (Fig. 28)

Ommatocepheus sp.: Fujikawa, 1970b, p. 72.

Locality: Nopporo (Fujikawa, 1970b).

Remarks: The genus *Ommatocepheus* is small, containing only 3 species, *O. ocellatus* (Michael, 1882) from England, *O. pulcherrimus* Berlese, 1913b, from Italy, and *O. clavatus* Woolley & Higgins, 1964, from U.S.A. The present species can not be identified exactly, for the specimens examined are too incomplete to come to a definite conclusion.

3. Genus ***Sphodrocepheus*** Woolley & Higgins

Sphodrocepheus Woolley & Higgins, 1963, p. 143.

Type-species: *Sphodrocepheus tridactylus* Woolley & Higgins.

(36) ***Sphodrocepheus dentatus*** spec. nov. (Fig. 29)

Prodorsum: Lamellae well developed, but not broadly fused with each other on the median line, connected by translamella, projecting anteriorly far beyond the tip of rostrum, which is not visible in dorsal aspect. Lamellar setae weakly barbed and shorter than their mutual distance. Rostral setae weakly barbed. Interlamellar setae long and glabrous, the tips being sharply pointed and the mutual distance about 1/3 as long as the setae themselves. Sensillus of the same thickness wholly, roughened, being not spindle-shaped at tip.

Notogaster: Slightly longer than broad; the anterior border moderately arched medially, with a notch inside the humeral projection on each side. Six pairs of straight, smooth setae situated rather marginally on dorsal side; ta and r_3 situated laterally.

Anogenital region: Anal and genital apertures separated from each other, the interspace being shorter than the diameter of the latter. These apertures provided with 2 and 6 pairs of fine setae, respectively. Three pairs of adanal and 1 pair of aggenital setae present. All legs monodactyle.

Material examined: Holotype (NSMT-Ac-7401): Higashi-Misumai, 26-IX-1968, T. Fujikawa leg.; paratopotype: the same data as holotype. The type specimens are deposited in the National Science Museum, Tokyo.

Measurement: Length: 700 (707) 714 μ ; width: 471 (479) 486 μ (by 2 undepressed specimens).

Remarks: The present species is distinguishable from *S. mitratus* Aoki (1967b) from central Japan and *S. tridactylus* Woolley & Higgins (1963) from North America by the dentate lamellae, the monodactyle legs, and the long sensillus.

X. Superfamily **Zetorchestoidea**

Family **Gustaviidae**

Genus ***Gustavia*** Kramer

Gustavia Kramer, 1879, p. 16.

Type-species: *Leiosoma microcephala* Nicolet.

*(37) ***Gustavia microcephala*** (Nicolet) (Fig. 30)

Leiosoma microcephala Nicolet, 1855, p. 443, pl. 6, fig. 4.

Gustavia sol: Kramer, 1879, p. 16.

Gustavia microcephala: Willmann, 1931, p. 157, fig. 233; Aoki, 1959b, p. 133.

Gustavia sp.: Nakamura et al., 1970, p. 83.

Supplementary description: Rostral setae long, distinctly longer than their mutual distance, being situated on lamella-like lists. Lamellae broad and long with a short translamella: lamellar seta nearly twice as long as free cusp of lamella. Interlamellar setae longer than their mutual distance. Sensillus long, spindle-shaped, expanded medially. Two pairs of anal setae and 6 pairs of genital setae present. All legs tridactyle.

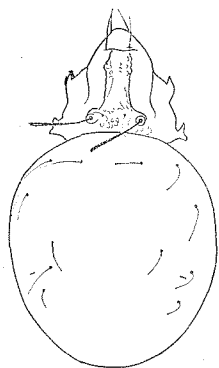


Fig. 31. *Eremaeus tenuisetiger*
Aoki.

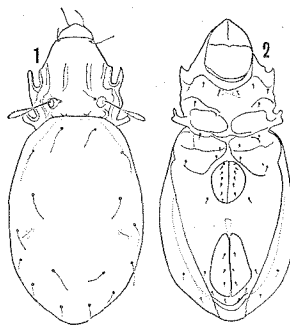


Fig. 32. *Eremaeus elongatus* spec. nov.—1.
Dorsal side.—2. Ventral side.

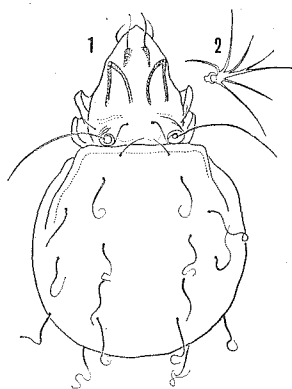


Fig. 33. *Eremobelba japonica* Aoki—1.
Dorsal side.—2. Epimeral seta.



Fig. 34. *Fosseremus quadripartitus*
Grandjean.

Locality: Mt. Soranuma (1 ex., Is-13); Ishikari-Hama (1 ex., Is-16; 3 exs., Is-20); Yamabe-chô (3 exs., Ka-1); Higashi-Misumai (Nakamura et al., 1970).

Measurement: Length: 471 (518) 557 μ ; width: 400 (432) 457 μ (by 4 undepressed specimens).

Distribution: Europe; U.S.S.R.; Japan.

XI. Superfamily **Eremaeidea**

1. Family **Eremaeidae**

Genus **Eremaeus** C. L. Koch

Eremaeus C. L. Koch, 1836, heft 3.

Type-species: *Eremaeus hepaticus* C. L. Koch.

*(38) ***Eremaeus tenuisetiger*** Aoki (Fig. 31)

Eremaeus tenuisetiger Aoki, 1970a, p. 409, figs. 31-34.

Eremaeus sp.: Fujikawa, 1970b, p. 72.

Eremaeus sp. 2: Nakamura et al., 1970, p. 83.

Locality: Nukabira (9 exs., To-3); Mo-Ashoro (1 ex., To-4); Kuromatsunai (3 exs., Sh-2); Kikonai (1 ex., Os-1); Nopporo (Fujikawa, 1970b); Higashi-Misumai (Nakamura et al., 1970).

Measurement: Length: 571 (698) 786 μ ; width: 329 (392) 442 μ .

Distribution: Japan.

(39) ***Eremaeus elongatus*** spec. nov. (Fig. 32)

Prodorsum: Rostral setae 4/5 in length of lamellar setae, thin and finely barbed; rostral setae weakly bending inward. Lamellae thin and short, parallel with each other. A faint transverse rostral ridge present. Interlamellar setae barbed and short, shorter than rostral setae. Bothrydia remote from each other, their mutual distance about 4/5 of the length of sensillus. Sensillus densely barbed. Four prodorsal condyles (*co. pl* and *co. pm*) nearly equal in size, rounded and equally spaced from one another.

Notogaster: Hysterosoma oval, about 1.5 times as long as wide, somewhat narrowed posteriorly, the surface being smooth, with 10 pairs of fine, almost glabrous notogastral setae. Lyrifissure *im* large and aligned obliquely.

Ano-genital region: Genital aperture about 1.25 times as long as wide, its corners well rounded; along the median margin 6 genital setae arranged, except in one specimen with 7 setae on the right side. Aggenital setae situated lateroposterior to the level of the posterior margin of genital opening. Interspace between genital and anal apertures as long as width of the former. Anal aperture distinctly becoming wider posteriorly; anal plate with 3 setae. Three pairs of adanal setae present.

Material examined: Holotype (NSMT-Ac-7402): Glehn's spruce-moss forest in Mo-Ashoro, 9-XI-1968, T. Fujikawa leg.; 15 paratopotypes: the same data as holotype. The type-series is deposited in the National Science Museum, Tokyo.

Measurement: Length: 442 (521) 586 μ ; width: 200 (269) 329 μ (by 16 undepressed specimens).

Remarks: The new species is related to *E. valkanovi* Kunst, 1957, and *E. kühneli* (Mihelčić, 1963), from which they differ in the large, thick sensilli and the elongate body.

2. Family **Megeremaeidae**

Genus **Megeremaeus** Higgins & Woolley

Megeremaeus Higgins & Woolley, 1965, p. 259.

Type-species: *Megeremaeus montanus* Higgins & Woolley.

(40) *Megeremaeus expansus* Aoki & Fujikawa

Megeremaeus expansus Aoki & Fujikawa, 1971 a, p. 110, figs. 1-17.

Locality: Mo-Ashoro (Aoki & Fujikawa, 1971 a).

Distribution: Japan.

3. Family **Amerobelbidae**

Genus *Grypoceramerus* Suzuki & Aoki

Grypoceramerus Suzuki & Aoki, 1970, p. 207.

Type-species: *Grypoceramerus acutus* Suzuki et Aoki.

*(41) *Grypoceramerus acutus* Suzuki & Aoki

Grypoceramerus acutus Suzuki et Aoki, 1970, p. 208, figs. 1-11.

Locality: Kita-Hiyama (1 ex., Hy-2). A second record from Japan.

Measurement: Length: 314 μ ; width: 164 μ .

Distribution: Japan.

4. Family **Eremobelbidae**

1. Genus *Eremobelba* Berlese

Eremobelba Berlese, 1908, p. 9.

Type-species: *Eremaeus leprosus* Haller.

(42) *Eremobelba japonica* Aoki (Fig. 33)

Eremobelba japonica Aoki, 1959 a, p. 7, fig. 5; Fujikawa, 1970 a, p. 43.

Locality: Kita-Hiroshima (1 ex., Is-4); Mt. Mombetsu (1 ex., Is-6); Ishikari-Hama (1 ex., Is-16; 11 exs., Is-20); Yamabe-chô (6 exs., Ka-1); Kuromatsunai (17 exs., Sh-2); Higashi-Misumai (Nakamura et al., 1970; Fujikawa, 1970 a); Nopporo (Fujikawa, 1970 b); Oketo (Fujikawa, 1970 c).

Measurement: Length: 614 (679) 843 μ ; width: 386 (443) 543 μ (by 51 undepressed specimens).

Distribution: Japan.

Remarks: Since this species was originally described from Miyazaki Prefecture, Japan, it has been recorded from Kagoshima Prefecture, East Japan, Sado Island and Hokkaido. Having examined a lot of specimens from Hokkaido, it is found that the epimeral setae and hypostomal setae are forked, and that the anal plates have 2 pairs of setae in normal, but three specimens have exceptionally 3 setae on the left side of the anal plate.

2. Genus *Eremulus* Berlese

Eremulus Berlese, 1908, p. 10.

Type-species: *Eremulus falgelliger* Berlese.

*(43) *Eremulus avenifer* Berlese

Eremulus avenifer Berlese, 1913 b, p. 96, fig. 77; Aoki, 1961 c, p. 76, fig. 2.

Locality: Kita-Hiyama (7 exs., Hy-2).

Measurement: Length: 386 (412) 429 μ ; width: 214 (246) 257 μ (by 4 undepressed specimens).

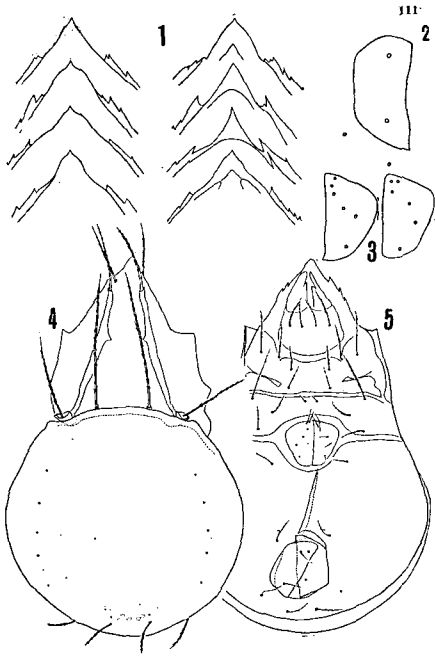


Fig. 35. *Ceratoppia bipilis* (Hermann)
 —1. Variation of rostral margin.
 —2. Anal plate.—3. Genital plate.
 —4. Dorsal side.—5. Ventral side.

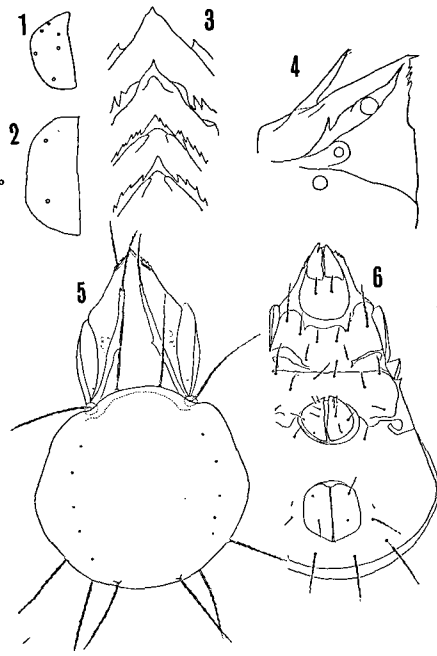


Fig. 36. *Ceratoppia sexpilosa* Willmann
 —1. Genital plate.—2. Anal plate.
 —3. Variation of rostral margin.
 —4. Lateral side of rostrum.—5.
 Dorsal side.—6. Ventral side.

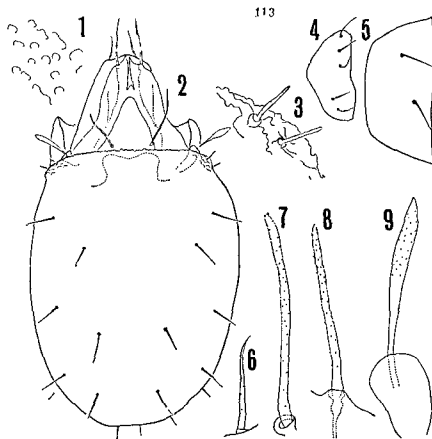


Fig. 37. *Xenillus clypeator* Rob.-Desv.—1. Structure of notogastral surface.—2. Dorsal side.—3. Humeral region.—4. Genital plate.—5. Anal plate.—6. Rostral seta.—7. Interlamellar seta.—8. Lamellar seta.—9. Sensillus.

Distribution: Java; Italy; Japan.

3. Genus *Fosseremus* Grandjean

Fosseremus Grandjean, 1954, p. 339.

Type-species: *Dameosoma laciniatum* Berlese.

*(44) *Fosseremus quadripertitus* Grandjean (Fig. 34)

Fosseremus quadripertitus Grandjean, 1965, p. 343, figs. 1-8; Aoki, 1970a, p. 412.

Fosseremaeus laciniatus: Aoki, 1961b, p. 75, fig. 1.

Damaecolus laciniatus: Aoki, 1962b, p. 179.

Locality: Higashi-Misumai (2 exs., Is-17); Kuromatsunai (2 exs., Sh-2); Kita-Hiyama (8 exs., Hy-2); Kikonai (1 ex., Os-1).

Measurement: Length: 229 (229) 229 μ ; width: 129 (129) 129 μ (by 2 undepressed specimens).

Distribution: New Zealand; Europe; Japan.

XII. Superfamily Liacaroidea

1. Family Metrioppiidae

Genus *Ceratoppia* Berlese

Ceratoppia Berlese, 1908, p. 7.

Type-species: *Notaspis bipilis* Hermann.

Key to the species

- 1 (2) Hypostoma with 2 pairs of setae. *C. bipilis* (Hermann)
- 2 (1) Hypostoma with 1 pair of setae.
- 3 (4) Notogaster with 3 pairs of long setae. *C. sexpilosa* (Willmann)
- 4 (3) Notogaster with 2 pairs of setae. *C. quadridentata* (Haller)

(45) *Ceratoppia bipilis* (Hermann) (Fig. 35)

Notaspis bipilis Hermann, 1804, p. 95.

Ceratoppia bipilis: Schweizer, 1922, p. 66; Fujikawa, 1970a, p. 43

Supplementary description: The ratio of the length of rostral, lamellar and interlamellar setae is about 1.0:1.2:3.1. Notogaster has 2 pairs of short setae. The adanal seta *ad*₃ and the adanal fissure *iad* are situated anterolateral to anal plate. The anal plates have normally 2 pairs of setae, but one specimen has exceptionally 1 seta on the right side of anal plate. The hypostoma has 2 pairs of setae.

Locality: Mt. Mombetsu (1 ex., Is-6); Mo-Ashoro (69 exs., To-4; 2 exs., To-5; 14 exs., To-6); Kuromatsunai (1 ex., Sh-2); Kita-Hiyama (1 ex., Hy-2); Higashi-Misumai (Nakamura et al., 1970; Fujikawa, 1970a); Nopporo (Fujikawa, 1970b); Mt. Taisetsu (1 ex., Ka-4).

Measurement: Length: 757 (837) 927 μ ; width: 500 (532) 586 μ (by 14 undepressed specimens).

Distribution: Europe; North Africa; Novaya Zemlya; Greenland; U.S.A.; Canada; U.S.S.R.; Japan.

** (46) *Ceratoppia sexpilosa* Willmann (Fig. 36)

Ceratoppia sexpilosa Willmann, 1938, p. 151; Hammer, 1967b, p. 17, fig. 6.

Locality: Mt. Nipesotsu (1 ex., To-2); Mo-Ashoro (25 exs., To-4; 6 exs., To-5; 18 exs., To-6); Kuromatsunai (20 exs., Sh-2); Kikonai (2 exs., Os-1); Mt. Taisetsu (18 exs., Ka-3; 10 exs., Ka-4).

Measurement: Length: 671 (727) 743 μ ; width: 414 (431) 471 μ (by 8 undepressed specimens).

Distribution: Hungary; Belgium; Japan.

Remarks: The specimens examined well agree with Hammer's redescription (1967) of *C. sexpilosa* except that the adanal fissure *iad* is situated at level of mid-distance along the length of the anal aperture, and that the adanal seta *ad*₃ is situated nearly at the level of the anal seta *an*₁. The genital plates have normally 6 pairs of setae, but one specimen has exceptionally 5 setae on the left side of the genital plate. Three pairs of adanal setae present normally, but one specimen has exceptionally 2 setae on the right side. The ratio of the length of rostral, lamellar and interlamellar setae is about 1.0 : 1.5 : 2.8.

*(47) ***Ceratoppia quadridentata*** (Haller)

Notaspis quadridentatus Haller, 1880.

Ceratoppia quadridentata: Balogh, 1943, p. 58, pl. 11, fig. 3.

Locality: Mt. Taisetsu (1 ex., Ka-3; 2 exs., Ka-4).

Distribution: Europe; U.S.S.R.; Alaska; Japan.

2. Family **Liacaridae**

Genus ***Liacarus*** Michael

Liacarus Michael, 1898, p. 40.

Type-species: *Oribata nitens* Gervais.

Key to the species

- 1 (2) Sensillus short, clavate. *L. clavatus* Fujikawa & Aoki
- 2 (1) Sensillus not clavate, but baciliform or lanceolate.
- 3 (4) Sensillus baciliform. *L. bacillatus* Fujikawa & Aoki
- 4 (3) Sensillus lanceolate.
- 5 (6) Translamella without a median mucro. *L. contiguus* Aoki
- 6 (5) Translamella with a median mucro.
- 7 (8) Mucro of translamella not extending beyond tips of lamellar cusps.
. *L. yezoensis* Fujikawa & Aoki
- 8 (7) Mucro of translamella strongly extending beyond tips of lamellar cusps.
. *L. acutidens* Aoki

(48) ***Liacarus clavatus*** Fujikawa & Aoki

Liacarus clavatus Fujikawa & Aoki, 1970, p. 158, figs. 1-5.

Locality: Mo-Ashoro (Fujikawa & Aoki, 1970).

Distribution: Japan.

(49) ***Liacarus yezoensis*** Fujikawa & Aoki

Liacarus yezoensis Fujikawa & Aoki, 1970, p. 160, figs. 6-8.

Locality: Mo-Ashoro (Fujikawa & Aoki, 1970).

Distribution: Japan.

(50) *Liacarus acutidens* Aoki

Liacarus acutidens Aoki, 1965b, p. 1, fig. 1; Fujikawa & Aoki 1970, p. 161, figs. 9-10.

Locality: Higashi-Misumai; Mo-Ashoro (Fujikawa & Aoki, 1970).

Distribution: Japan.

(51) *Liacarus contiguus* Aoki

Liacarus contiguus Aoki, 1969a, p. 126, figs. 20-25; Fujikawa & Aoki, 1970, p. 162, figs. 11-12.

Locality: Higashi-Misumai, Mo-Ashoro, Oketo, Kuromatsunai, Kita-Hiyama, and Kikonai (Fujikawa & Aoki, 1970).

Distribution: Japan.

(52) *Liacarus bacillatus* Fujikawa & Aoki

Liacarus bacillatus Fujikawa & Aoki, 1970, p. 163, figs. 13-15.

Locality: Mo-Ashoro (Fujikawa & Aoki, 1970); Mt. Taisetsu (13 exs., Ka-3; 11 exs., Ka-4).

Distribution: Japan.

3. Family **Xenillidae**

Genus *Xenillus* Robineau-Desvoidy

Xenillus Robineau-Desvoidy, 1839, p. 455.

Type-species: *Xenillus clypeator* Robineau-Desvoidy.

(53) *Xenillus clypeator* Robineau-Desvoidy (Fig. 37)

Xenillus clypeator Robineau-Desvoidy, 1839, p. 455; Woolley & Higgins, 1966, p. 202, fig. 1; Fujikawa, 1970b, p. 75.

Supplementary description: Light brown-coloured. Rostrum broadly rounded. Rostral setae filiform. Lamellae as long as propodosoma. Translamella present, with a small mucro. Rostral, lamellar and interlamellar setae minutely barbed, ratio in length being about 1.0 : 2.3 : 2.7. Insertion of lamellar seta situated on center of distal tip of lamellar cusp. Sensillus clavate, barbed. Notogaster with two pairs of humeral setae on shoulders. Dorsal and ventral integuments pitted. Anal plate larger than genital plate, with 2 pairs of anal setae. Three pairs of adanal setae; distances $ad_1 - ad_1 > ad_2 - ad_3 > ad_1 - ad_2$. One pair of aggenital setae present. Genital plate with 5 pairs of setae. All legs tridactyle.

Locality: Nopporo (1 ex., Is-11 after Fujikawa, 1970b).

Measurement: Length: 814 μ ; width: 500 μ .

Distribution: France; Japan.

4. Family **Astegistidae**

Genus *Cultroribula* Berlese

Cultroribula Berlese, 1908, p. 9.

Type-species: *Notaspis juncta* Michael.

Key to the species

- 1 (2) Sensillus club-shaped, not pointed at tip. *C. elongata* spec. nov.
- 2 (1) Sensillus spindle-shaped at tip.

- 3 (4) Lamellae with a fused portion. *C. tridentata* Aoki
 4 (3) Lamellae without a fused portion. *C. lata* Aoki

* (54) ***Cultroribula lata*** Aoki (Fig. 38)

Cultroribula lata Aoki, 1961 a, p. 67, fig. 5; Hammer, 1966, p. 93, fig. 124.

Locality: Nopporo (2 exs., Is-12); Mo-Ashoro (1 ex., To-5); Kuromatsunai (1 ex., Sh-2); Mt. Taisetsu (4 exs., Ka-3; 3 exs., Ka-4).

Measurement: Length: 229 μ ; width: 157 μ .

Distribution: New Zealand; Japan.

Remarks: After this species was originally described from Japan, a further detailed redescription of it was given by Hammer (1966). Judging from these descriptions, it may be considered that this species is somewhat variable in the form of the rostrum and in the number of the genital setae as follows: (1) Rostrum with a fissure which has a broad opening behind it in Hammer's description, narrow in the original description and trimucronate in the present specimens; (2) Genital plate has 4 pairs of setae in the original description, but 5 pairs in Hammer's description and 6 pairs in the present specimens.

* (55) ***Cultroribula tridentata*** Aoki (Fig. 39)

Cultroribula tridentata Aoki, 1965 b, p. 3, fig. 2.

Locality: Higashi-Misumai (1 ex., Is-21; 1 ex., Is-22); Mo-Ashoro (2 exs., To-4; 6 exs., To-5); Kuromatsunai (21 exs., Sh-2); Kita-Hiyama (1 ex., Hy-2); Kikonai (2 exs., Os-1).

Measurement: Length: 214 (257) 357 μ ; width: 129 (171) 214 μ (by 4 undepressed specimens).

Distribution: Japan.

Remarks: The specimens examined well agree with the original description of this species, but they differ from the specimens from the type-locality by the following points: (1) Fused portion of lamella as long as cusp; (2) Notogaster wider anteriorly than posteriorly; and (3) Genital plate with 5 or 6 pairs of setae.

(56) ***Cultroribula elongata*** spec. nov. (Fig. 40)

Prodorsum: Rostrum tripartite at tip with deep incisions, the middle part protruding, pointed at tip. Rostral setae smooth and long, distinctly longer than their mutual distance, being situated on an inconspicuous apophysis. Lamellae 2/3 as long as propodosoma. Anterior portion of lamellae fused. Lamellar cusp as long as fused portion of lamellae. Lamellar setae smooth, longer than rostral setae, reaching anterior margin of rostrum. Interlamellar setae short, thin and smooth. Insertions of interlamellar setae situated beneath anterior margin of notogaster. Exobothridial setae moderately long. Sensillus club-shaped.

Notogaster: Hysterosoma elongate, the ratio of width to length of the hysterosoma about 0.73. Anterior border of hysterosoma straight, with prominent humeral projections. Notogaster with 9 pairs of smooth and short setae, one of which is situated on the humeral region.

Ventral side: Anal aperture slightly longer than wide, provided with 2 pairs of anal setae well spaced. Genital plates with 4 pairs of setae, separated from anal aperture at the distance equal to the half of length of genital aperture. All legs

monodactyle.

Material examined: Holotype (NSMT-Ac-7403): Glehn's spruce—reed forest in Mo-Ashoro, 11-XI-1968, T. Fujikawa leg. The type specimen is deposited in the National Science Museum, Tokyo.

Measurement: Length: 257 μ ; width: 129 μ .

Remarks: The new species is clearly distinguished from any other congeneric species by the tripartite rostrum, the strong, club-shaped sensilli, the hysterosoma with prominent shoulders, and the elongate notogaster.

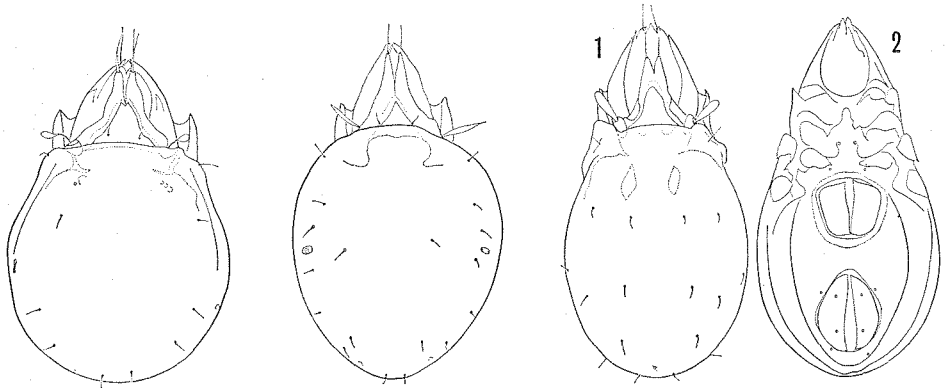


Fig. 38. *Cultroribula lata* Aoki.

Fig. 39. *Cultroribula tridentata* Aoki.

Fig. 40. *Cultroribula elongata* spec. nov. —1. Dorsal side.—2. Ventral side.

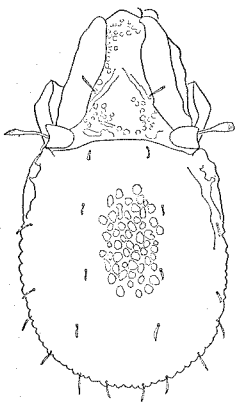


Fig. 41. *Carabodes peniculatus* Aoki.

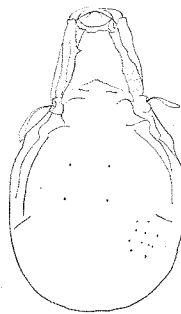


Fig. 42. *Tectocephus velatus* Michael.

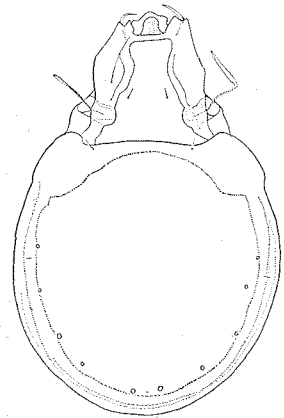


Fig. 43. *Nemacepheus dentatus* Aoki.

5. Family Tenuialidae

Genus *Hafenferrefia* Jacot

Hafenferrefia Jacot, 1939, p. 325.

Type-species: *Galumna nitidula* Banks.

(57) ***Hafenferrefia translamellata*** Aoki & Fujikawa

Hafenferrefia translamellata Aoki & Fujikawa, 1969, p. 216, figs. 1-7.

Locality: Sarobetsu Moor (Aoki & Fujikawa, 1969 b).

Distribution: Japan.

XIII. Superfamily **Carabodoidea**

1. Family **Carabodidae**

Genus ***Carabodes*** C. L. Koch

Carabodes C. L. Koch, 1836.

Type-species: *Carabodes coriaceus* C. L. Koch.

*(58) ***Carabodes peniculatus*** Aoki (Fig. 41)

Carabodes peniculatus Aoki, 1970 a, p. 417, figs. 47-54.

Locality: Mo-Ashoro (1 ex., To-6).

Distribution: Japan.

*(59) ***Carabodes rimosus*** Aoki

Carabodes rimosus Aoki, 1959 c, p. 159, fig. 2.

Locality: Mo-Ashoro (1 ex., To-6).

Distribution: Japan.

2. Family **Tectocephidae**

1. Genus ***Tectocephus*** Berlese

Tectocephus Berlese, 1913 a, p. 93.

Type-species: *Tegeocranus velatus* Michael.

(60) ***Tectocephus velatus*** (Michael) (Fig. 42)

Tegeocranus velatus Michael, 1883, p. 313, pl. 31, figs. 6-9.

Tectocephus velatus: Berlese, 1896 a; Haarløv, 1952, p. 424; Aoki, 1961 b, p. 83; Aoki, 1962 a, p. 14.

Locality: Ishikari-Hama (1 ex., Is-20); Mo-Ashoro (15 exs., To-4; 374 exs., To-5; 8 exs., To-6); Kuromatsunai (1 ex., Sh-2); Kita-Hiyama (28 exs., Hy-2); Kikonai (37 exs., Os-1); Kamikawa (Aoki, 1962 a); Sarobetsu Moor (Fujikawa, 1968); Hidaka-Mombetsu (Tamura et al., 1969); Higashi-Misumai (Nakamura et al., 1970; Fujikawa, 1970 a); Nopporo (6 exs., Is-10; 7 exs., Is-11 after Fujikawa, 1970 b); Otoineppu, Nishi-Shibetsu (Fujikawa, 1970 c); Mt. Taisetsu (67 exs., Ka-3; 88 exs., Ka-4).

Measurement: Length: 257 (290) 314 μ ; width: 143 (171) 186 μ (by 15 undepressed specimens).

Distribution: Europe; Scandinavia; Iceland; Lapland; Greenland; North America; Japan.

Remarks: The specimens examined well agree with Haarløv's (1952) description and figure, but the body is somewhat smaller in size than that in the description. The ventral plate of this species has 2 pairs of anal setae, 3 pairs of adanal setae, large adanal fissures *iad* situated in front of anal aperture, 1 pair of aggenital setae, and 5 or 6 pairs of genital setae, of which the anterior 2 genital setae are arranged

transversely on the anterior margin of the plate.

2. Genus *Nemacepheus* Aoki

Nemacepheus Aoki, 1968, p. 117.

Type-species: *Nemacepheus dentatus* Aoki.

***(61) *Nemacepheus dentatus* Aoki (Fig. 43)**

Nemacepheus dentatus Aoki, 1968, p. 117, figs. 1-5.

Locality: Higashi-Misumai (2 exs., Is-17; 1 ex., Is-19; 3 exs., Is-21; 1 ex., Is-22); Mo-Ashoro (2 exs., To-5); Kuromatsunai (9 exs., Sh-2); Kita-Hiyama (2 exs., Hy-2); Kikonai (5 exs., Os-1).

Measurement: Length: 293 (306) 329 μ ; width 171 (189) 200 μ (by 4 undepressed specimens).

Distribution: Japan.

Remarks: The specimens examined well agree with the original description, differing, however, from the latter in the smaller body size, the latero-ventral margin of the rostrum with 8 teeth, and the notogaster with fissure *im*.

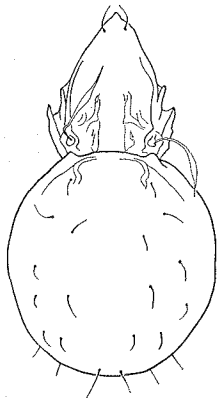


Fig. 44. *Oppia nova* (Oudemans).

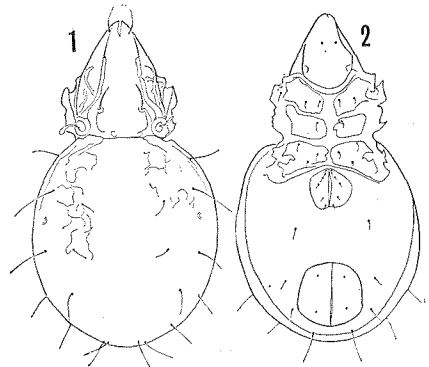


Fig. 45. *Autogneta japonica* spec. nov.—1. Dorsal side.—2. Ventral side.

XIV. Superfamily **Oppioidea**

1. Family **Oppiidae**

1. Genus ***Oppia*** C. L. Koch

Oppia C. L. Koch, 1836, Heft 3.

Type-species: *Oppia nitens* C. L. Koch.

(62) *Oppia nova* (Oudemans) (Fig. 44)

Eremaeus novus Oudemans, 1902, p. 36.

Oppia nova: Hammen, 1952, p. 51, fig. 6a; Aoki, 1961 b, p. 83; Tamura et al., 1969, p. 50.

Locality: Yamabe-chô (2 exs., Ka-1); Ishikari-Hama (1 ex., Is-20), Mo-Ashoro (998 exs., To-4; 743 exs., To-5; 1911 exs., To-6); Kuromatsunai (1089 exs., Sh-2); Kita-Hiyama (174 exs., Hy-2); Kikonai (512 exs., Os-1); Hidaka-Mombetsu (Tamura et al.,

1969); Higashi-Misumai (Fujikawa, 1970a; Nakamura et al., 1970); Nopporo (Fujikawa, 1970b); Otoineppu, Nishi-Shibetsu, Oketo (Fujikawa, 1970c); Mt. Taisetsu (347 exs., Ka-3; 106 exs., Ka-4).

Measurement: Length: 286 (328) 357 μ ; width: 171 (178) 186 μ (by 84 undepressed specimens).

Distribution: Europe; Japan.

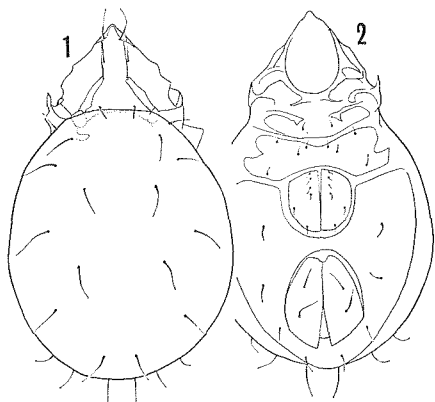


Fig. 46. *Oribella castanea* (Hermann)—1. Dorsal side.—2. Ventral side.

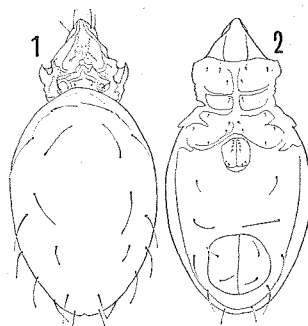


Fig. 47. *Allosuctobelba simplex* spec. nov.—1. Dorsal side.—2. Ventral side.

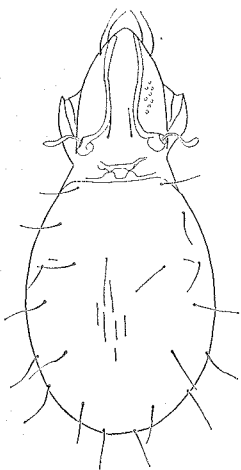


Fig. 48. *Dolicheremaeus elongatus* Aoki.

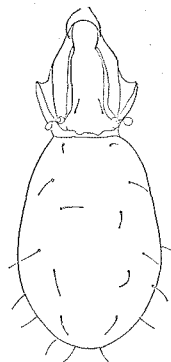


Fig. 49. *Fissicepheus (P.) amabilis* Aoki.

2. Genus *Quadroppia* Jacot

Quadroppia Jacot, 1939, p. 323.

Type-species: *Notaspis quadricarinata* Michael.

(63) *Quadroppia quadricarinata* (Michael)

Notaspis quadricarinata Michael, 1888, p. 385, pl. 31, figs. 13-15.

Dameosoma quadricarinatum: Sellnick, 1928, p. 35.

Oppia quadricarinata: Willmann, 1931, p. 128, fig. 131; Aoki, 1959b, p. 133.

Quadroppia quadricarinata: Hammer, 1968, p. 15, fig. 12; Aoki, 1969a, p. 135; Fujikawa, 1968, p. 31.

Locality: Higashi-Misumai (1 ex., Is-17; 2 exs., Is-19; 17 exs., Is-22); Mo-Ashoro (7 exs., To-4; 12 exs., To-5); Kuromatsunai (68 exs., Sh-2); Kita-Hiyama (8 exs., Hy-2); Kikonai (33 exs., Os-1); Sarobetsu Moor (Fujikawa, 1968); Mt. Taisetsu (5 exs., Ka-3; 1 ex., Ka-4).

Measurement: Length: 171 (183) 186 μ ; width; 100 (111) 114 μ (by 5 undepressed specimens).

Distribution: Europe; Iceland; Greenland; North Canada; New Zealand; Japan.

2. Family **Autognetidae**

Genus ***Autogneta*** Hull

Autogneta Hull, 1916, p. 381.

Type-species: *Notaspis longilamellata* Michael.

(64) ***Autogneta japonica*** spec. nov. (Fig. 45)

Prodorsum: Rostrum roundly pointed with a large apical notch. Rostral setae weakly incurved, barbed, inserted near lateral margins of propodosoma, extending anteriorly beyond tip of rostrum. Lamellae long, narrow, parallel-sided, originating at posterolateral margins of propodosoma near bothrydium, incurved medially slightly anterior to insertions of interlamellar setae, extending anteriorly in parallel fashion. Lamellar setae smooth and as long as their mutual distance, inserted in distal tips of lamellae. Interlamellar setae strong, smooth and shorter than their mutual distance. Sensillus clavate, pointed at apex. Prodorsal condyles small and rounded.

Notogaster: Yellow coloured and oval, longer than width, with nearly straight dorso-sejugal suture, slightly expanding shoulders at antero-lateral margin behind bothrydium. Ten pairs of notogastral setae smooth and long, nearly 0.25 times as long as length of hysterosoma. Mutual distance $ms-ms > ti-ti$.

Ano-genital region: Genital aperture with 6 setae and an oblique stripe between g_2 and g_3 . Genital aperture separated from anal aperture for the distance about 1.5 times the length of genital aperture. Anal plate as long as wide, bearing 2 setae.

Material examined: Holotype (NSMT-Ac-7404): Beech forest in Kuromatsunai, 25-XI-1968, T. Fujikawa leg. The type specimen is deposited in the National Science Museum, Tokyo.

Measurement: Length: 343 μ ; width: 186 μ .

Remarks: The present species is closely related to *A. dalecarlica* Forsslund (1947), from which it differs in having the strong interlamellar seta, in the notogastral setae ms and r_1 above the level of r_3 and r_2 , respectively, in the prodorsum without a rostral ridge, and in the long notogastral setae.

3. Family **Thyrisomidae**

This family is new to Japan.

Genus ***Oribella*** Berlese, 1908

Oribella Berlese, 1908, p. 9.

Type-species: *Notaspis pectinata* Michael.

** (65) *Oribella castanea* (Hermann) (Fig. 46)

Notaspis castanea Hermann, 1804.

Oribella castanea: Willmann, 1931, p. 133, fig. 154.

Prodorsum: Rostrum with a pointed apex. Rostral setae smooth, longer than their mutual distance and weakly incurved. Lamellae, which are less than half as long as propodosoma, of equal thickness wholly and strongly inclined. Lamellar setae smooth and straight, as long as lamellae. Interlamellar setae strong and short, situated below anterior margin of hysterosoma.

Notogaster: Widely ovate, smooth. Ten pairs of notogastral setae smooth and as long as rostral setae.

Ventral side: Genital and anal plates large, nearly touching. Genital plate with 6 setae, g_1 and g_2 in lateral side, and g_3 — g_6 in median line. One pair of aggenital, 3 pairs of adanal and 2 pairs of anal setae present. Epimeral plate not separated medially. Epimeral plates III and IV fused. All legs monodactyle.

Locality: Kuromatsunai (1 ex., Sh-2); Kita-Hiyama (4 exs., Hy-2).

Measurement: Length: 371 μ ; width: 243 μ .

Distribution: Europe; Japan.

4. Family **Suctobelbidae**

1. Genus *Suctobelba* Paoli

Suctobelba Paoli, 1908, p. 72.

Type-species: *Notaspis trigona* Michael.

*(66) *Suctobelba singularis* Strenzke

Suctobelba singularis Strenzke, 1950, p. 342; Aoki, 1962a, p. 13.

Locality: Nopporo (1 ex., Is-15); Higashi-Misumai (2 exs., Is-21; 1 ex., Is-22); Mo-Ashoro (4 exs., To-5); Mt. Taisetsu (3 exs., Ka-3).

Distribution: Sweden; Japan.

2. Genus *Allosuctobelba* Moritz

Allosuctobelba Moritz, 1970.

Type-Species: *Suctobelba grandis* Paoli.

*(67) *Allosuctobelba grandis* (Paoli)

Suctobelba grandis Paoli, 1908, p. 78, pl. 4, fig. 32; Aoki, 1970a, p. 422, figs. 57-66.

Locality: Higashi-Misumai (1 ex., Is-17; 3 exs., Is-19); Mt. Taisetsu (2 exs., Ka-3).

Measurement: Length: 450 μ ; width: 229 μ .

Distribution: Italy; France; Japan.

(68) *Allosuctobelba simplex* spec. nov. (Fig. 47)

Prodorsum: Rostrum rounded, without rostral teeth. Rostral setae fine and smooth, weakly curved inwards. Median part of prodorsum with irregular tubercles. Sensillus incurved and barbed.

Notogaster: Oval, a little narrower anteriorly and posteriorly. Hysterosoma an-

teriorly without teeth. Eleven pairs of notogastral setae smooth and long.

Ventral side: Anal plate large, as long as wide; 2 pairs of anal setae separated from each other. Three pairs of adanal setae long; ad_3 situated anterolateral to anal plate. One pair of aggenital setae present. Genital plate small, longer than wide. The interspace between anal plate and genital plate as long as length of the former. Genital plate with 6 setae, of which g_3 — g_6 arranged along the median margin of genital aperture.

Material examined: Holotype (NSMT-Ac-7405): Beech forest in Kikonai, 29-XI-1968, T. Fujikawa leg. The type-specimen is deposited in the National Science Museum, Tokyo.

Measurement: Length: 640 μ ; width: 310 μ .

Remarks. The present species is closely allied to *Allosuctobelba grandis* (Paoli), from which it differs in the genital plate with 6 setae and the rostrum without a tooth.

5. Family **Otocepheidae**

Subfamily **Tetracondylinae**

1. Genus ***Dolicheremaeus*** Jacot

Dolicheremaeus Jacot, 1938c, p. 51.

Type-species: *Dolicheremaeus rubripedes* Jacot.

*(69) ***Dolicheremaeus elongatus*** Aoki (Fig. 48)

Dolicheremaeus elongatus Aoki, 1967d, p. 313, figs. 18-23.

Locality: Noppero (1 ex., Is-10); Yamabe-chô (1 ex., Ka-1); Kita-Hiyama (8 exs., Hy-2).

Measurement: Length: 600 μ ; width: 286 μ .

Distribution: Japan.

Remarks: The specimens examined well agree with the original description, but in them the mutual distance between ad_2 and ad_3 is wider than that between ad_2 and ad_2 .

2. Genus ***Fissicepheus*** Balogh et Mahunka

Fissicepheus Balogh et Mahunka, 1965b, p. 52.

Type-species: *Fissicepheus elegans* Balogh et Mahunka.

*(70) ***Fissicepheus (Psammocephus) amabilis*** Aoki (Fig. 49)

Fissicepheus (Psammocephus) amabilis Aoki, 1970b, p. 593, figs. 23-27.

Locality: Kita-Hiyama (1 ex., Hy-2). A second record from Japan.

Measurement: Length: 686 μ ; width: 286 μ .

Distribution: Japan.

XV. Superfamily **Pelopoidea**

Family **Pelopidae** Ewing

Genus ***Eupelops*** Ewing

Eupelops Ewing, 1917, p. 126.

Type-species: *Pelops uraceus* C. L. Koch.

** (71) *Eupelops claviger* (Berlese) (Fig. 50)

Pelops claviger Berlese, 1916a, p. 53.

Eupelops sp. 1, 2: Fujikawa, 1970b, p. 72.

Locality: Mt. Mombetsu (1 ex., Is-6); Kuromatsunai (2 exs., Sh-2); Kikonai (3 exs., Os-1); Higashi-Misumai (2 exs., Is-22; 8 ex., Is-24); Nopporo (Fujikawa, 1970 b).

Measurement: Length: 586 (602) 771 μ ; width: 457 (505) 586 μ (by 12 undepressed specimens).

Distribution: Italy; Sweden; Japan.

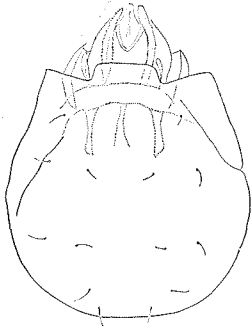


Fig. 50. *Eupelops claviger* (Berlese).

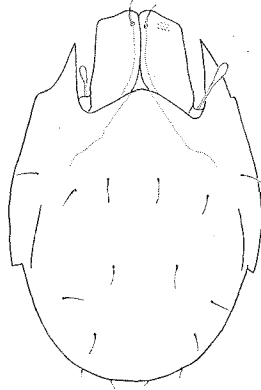


Fig. 51. *Achipteria curta* Aoki.

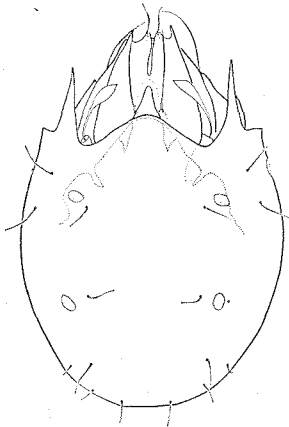


Fig. 52. *Parachipteria distincta* (Aoki).

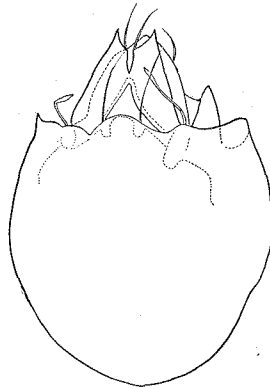


Fig. 53. *Anachipteria achipterooides* (Ewing).

XVI. Superfamily **Oribatelloidea**

1. Family **Achipteriidae**

1. Genus **Achipteria** Berlese

Achipteria Berlese, 1885, p. 127.

Type-species: *Oribata nitens* Nicolet, 1855.

*(72) **Achipteria curta** Aoki (Fig. 51)

Achipteria curta Aoki, 1970 b, p. 597, figs. 32-36.

Locality: Higashi-Misumai (10 exs., Is-17); Mt. Taisetsu (15 exs., Ka-4).

Measurement: Length: 543 (611) 729 μ ; width: 371 (416) 500 μ (by 7 undepressed specimens).

Distribution: Japan.

2. Genus **Parachipteria** Hammen

Parachipteria Hammen, 1952, p. 107.

Type-species: *Oribata punctata* Nicolet.

*(73) **Parachipteria distincta** (Aoki) (Fig. 52)

Achipteria distincta Aoki, 1959 c, p. 160, fig. 3.

Parachipteria distincta: Aoki, 1967c, p. 136.

Locality: Yamabe-chô (3 exs., Ka-1); Kuromatsunai (40 exs., Sh-2); Kikonai (6 exs., Os-1).

Measurement: Length: 386 (395) 400 μ ; width: 271 (276) 386 μ (by 3 undepressed specimens).

Distribution: Japan.

Remarks: The specimens examined well agree with the original description, from which they differ in the narrower interspace between the lamellar cusps.

3. Genus **Anachipteria** Grandjean

Anachipteria Grandjean, 1932, p. 304.

Type-species: *Anachipteria deficiens* Grandjean.

(74) **Anachipteria achipteroides** (Ewing) (Fig. 53)

Oribatella achipteroides Ewing, 1913 a, p. 119.

Anachipteria achipteroides: Woolley, 1958 a, p. 140, figs. 7-8; Fujikawa, 1970 b, p. 72.

Locality: Noppero (Fujikawa, 1970 b).

Distribution: Minesota; Japan.

2. Family **Oribatellidae**

Genus **Oribatella** Banks

Oribatella Banks; 1895, p. 8.

Type-species: *Oribatella quadridentata* Banks.

*(75) **Oribatella brevicornuta** Jacot (Fig. 54)

Oribatella brevicornuta Jacot, 1934, p. 707, figs. 9-11; Aoki, 1970 a, p. 435, figs. 96-100.

Locality: Yamabe-chô (1 ex., Ka-1); Kuromatsunai (9 exs., Sh-2).

Measurement: Length: 357 (376) 386 μ ; width: 271 (281) 286 μ (by 3 undepressed specimens).

Distribution: U.S.A.; Japan.

3. Family **Tegoribatidae**

1. Genus **Tegoribates** Ewing

Tegoribates Ewing, 1917, p. 158.

Type-species: *Tegoribates subniger* Ewing.

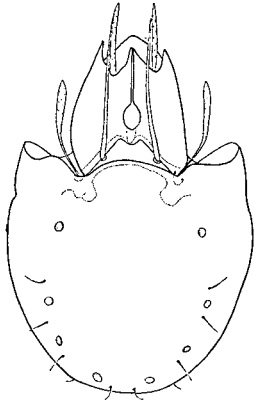


Fig. 54. *Oribatella brevicornuta*
Jacot.

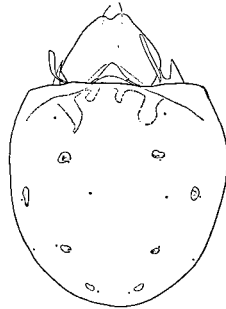


Fig. 55. *Tegoribates trifolius*
spec. nov.

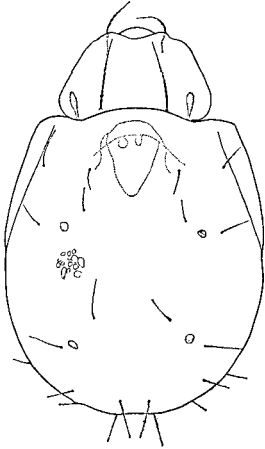


Fig. 56. *Lepidozetes dashidorphi*
Balogh & Mahunka.

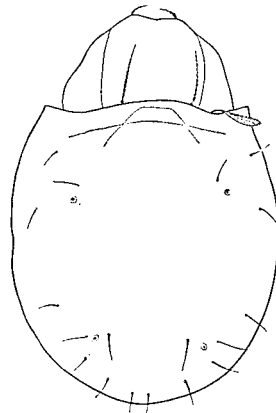


Fig. 57. *Scutozetes lanceolatus*
Hammer.

(76) *Tegoribates trifolius* spec. nov. (Fig. 55)

Prodorsum: Rostrum pointed. Lamellae fused, forming a large plate, with an incision in middle. Lamellar setae smooth, situated on anterior margin of fused lamellae. Interlamellar setae minute, one-fifth as long as lamellar setae. Insertions of interlamellar setae situated on posterior margin of lamellae. Sensillus almost baciliform and smooth.

Notogaster: Hysterosoma almost as broad as long, posteriorly broadly rounded and anteriorly with margin straight. Four pairs of comparatively large areae porosae,

oval or circular in shape; *Aa* appear to be slightly larger than the rest. Notogastral setae hardly visible, but ten pairs of their insertion pores present.

Ano-genital region: Anal aperture a little wider than long, with lateral sides anteriorly convergent; 2 pairs of minute anal setae present. Adanal seta ad_2 situated closer to ad_1 than to ad_3 ; ad_3 located at a level a little behind *iad*. Lyrifissure *iad* aligned parallel with lateral margin of anal aperture. Genital aperture distinctly wider than long, being separated from anal aperture with interspace about as long as the latter; anterior genital setae g_4-g_6 arranged transversely on anterior margin of plate; mutual distances as $g_2-g_2 > g_1-g_1 = g_3-g_3$. All legs monodactyle.

Material examined: Holotype (NSMT-Ac-7406): Sarobetsu Moor, 12-VII-1966, T. Fujikawa leg.; 1 paratopotype: the same data as holotype. The type series is deposited in the National Science Museum, Tokyo.

Measurement: Length: 300 μ ; width: 229 μ .

Remarks: The present species differs from any other congeneric species in having a smaller body size, minute interlamellar setae, long baciliform sensilli, and monodactyle legs.

2. Genus *Lepidozetes* Berlese

Lepidozetes Berlese, 1910b, p. 386.

Type-species: *Lepidozetes singularis* Berlese.

** (77) *Lepidozetes dashidorphi* Balogh & Mahunka (Fig. 56)

Lepidozetes dashidorphi Balogh & Mahunka, 1965a, p. 462, figs. 20-21.

Locality: Mo-Ashoro (1 ex., To-4); Hidaka-Mombetsu (2 exs., Hd-2).

Measurement: Length: 443 μ ; width: 271 μ .

Distribution: Mongolia; Japan.

3. Genus *Scutozetes* Hammer

Scutozetes Hammer, 1952, p. 62.

Type-species: *Scutozetes lanceolatus* Hammer.

This genus is new to Japan.

** (78) *Scutozetes lanceolatus* Hammer (Fig. 57)

Scutozetes lanceolatus Hammer, 1952, p. 62, figs. 99; Balogh & Mahunka, 1965a, p. 452, figs. 1-2.

Locality: Higashi-Misumai (1 ex., Is-22).

Distribution: North Canada; Mongolia; Japan.

Remarks: This genus is represented only by the type-species, *S. lanceolatus* Hammer, living in North Canada and Mongolia. The specimen examined well agrees with the original description, but the interlamellar setae are shorter than those of the original description.

XVII. Superfamily Ceratozetoidea

1. Family Ceratozetidae

1. Genus *Ceratozetes* Berlese

Ceratozetes Berlese, 1908.

Type-species: *Oribata gracilis* Michael.

Key to the species

- 1 (4) Rostrum incised.
- 2 (3) Rostrum with a large incision. *C. mediocris* Berlese
- 3 (2) Rostrum with two incisions. *C. imperatorius* Aoki
- 4 (1) Rostrum not incised.
- 5 (6) Sensillus with a head long and thick. *C. kumadai* (Aoki), comb. nov.
- 6 (5) Sensillus filiform and barbed. *C. thienemanni* Willmann

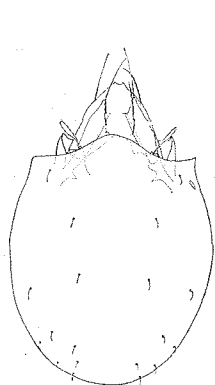


Fig. 58. *Ceratozetes mediocris* Berlese.

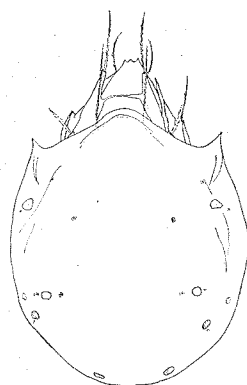


Fig. 59. *Ceratozetes imperatorius* Aoki.

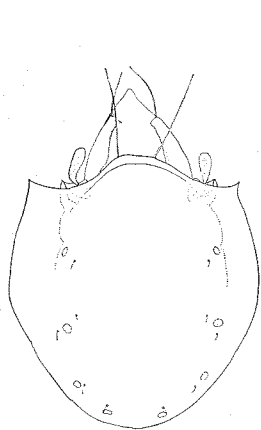


Fig. 60. *Ceratozetes kumadai* (Aoki) comb. nov.

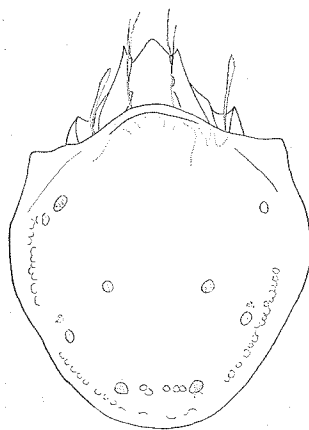


Fig. 61. *Ceratozetes thienemanni* Willmann.

*(79) *Ceratozetes mediocris* Berlese (Fig. 58)

Ceratozetes mediocris Berlese, 1908, p. 4; Aoki, 1970a, p. 437, figs. 101-104.

Ceratozetes japonicus: Nakamura et al., 1970, p. 83.

Locality: Hidaka-Mombetsu (1 ex., Hd-1); Teine-chô (9 exs., Is-2); Noppero (1 ex., Is-14); Yamabe-chô (9 exs., Ka-1); Higashi-Misumai (2 exs., Is-19); Ishikari-Hama (31 exs., Is-20); Mo-Ashoro (87 exs., To-4; 2 exs., To-5); Kuromatsunai (54 exs., Sh-2); Kita-Hiyama (1 ex., Hy-2); Kikonai (7 exs., Os-1); Higashi-Misumai (Nakamura et al.,

1970); Mt. Taisetsu (1 ex., Ka-3; 1 ex., Ka-4); Nukabira (1 ex., To-1).

Measurement: Length: 400 (450) 486 μ ; width: 257 (289) 314 μ (by 19 undepressed specimens).

Distribution: Europe; New Zealand; Japan.

(80) *Ceratozetes imperatorius* Aoki (Fig. 59)

Ceratozetes imperatorius Aoki, 1963, p. 221, figs. 7-8; Tamura et al., 1969, p. 53.

Locality: Teine-chô (2 exs., Is-2); Ishikari-Hama (34 exs., Is-20); Hidaka-Mombetsu (Tamura et al., 1969); Higashi-Misumai (Nakamura et al., 1970); Nopporo (Fujikawa, 1970 b); Mt. Taisetsu (1 ex., Ka-4).

Measurement: Length: 686 (714) 757 μ ; width: 514 (538) 571 μ (by 3 undepressed specimens).

Distribution: Japan.

Remarks: The specimens examined well agree with the original description, from which they differ, however, in having a complete translamella.

(81) *Ceratozetes kumadai* (Aoki), comb. nov. (Fig. 60)

Ocesobates kumadai Aoki, 1965 b, p. 8, fig. 5; Fujikawa, 1970 b, p. 73.

Locality: Raiden (6 exs., Sh-1); Mo-Ashoro (1 ex., To-4); Kuromatsunai (3 exs., Sh-2); Kita-Hiyama (8 exs., Hy-2); Kikonai (18 exs., Os-1); Nopporo (Fujikawa, 1970 b).

Measurement: Length: 257 (268) 286 μ ; width: 186 (200) 214 μ (by 5 undepressed specimens).

Distribution: Japan.

** (82) *Ceratozetes thienemanni* Willmann (Fig. 61)

Ceratozetes thienemanni Willmann, 1943.

Locality: Teine-chô (1 ex., Is-2).

Measurement: Length: 414 μ ; width: 328 μ .

Distribution: Greenland; Sweden; Lapland; Argentina; Canada; Japan.

Remarks: The specimen examined differs from the European form in having the lamellar cusps relatively widely separated.

2. Genus *Diapterobates* Grandjean

Diapterobates Grandjean, 1936, p. 77.

Type-species: *Sphaerozetes numerosus* Sellnick.

Key to the species

- 1 (2) Rostrum with a prominent tuberosity on dorsum near anterior end. *D. humeralis* (Sellnick)
- 2 (1) Rostrum without a prominent tuberosity.
- 3 (4) Notogaster with 13 pairs of setae. *D. variabilis* Hammer
- 4 (3) Notogaster with 14 pairs of setae. *D. pusillus* Aoki

(83) *Diapterobates humeralis* (Hermann) (Fig. 62)

Notaspis humeralis Hermann, 1804, p. 92, pl. 4, fig. 5.

Sphaerozetes numerosus Sellnick, 1924, p. 67, figs. 2-5.

Murcia numerosa: Sellnick, 1928, p. 11.

Trichoribates numerosus: Willmann, 1931, p. 16, fig. 274.

Diapterobates humeralis: Grandjean, 1936, p. 77, fig. 8; Fujikawa, 1970b, p. 72.

Trichoribates numerosa: Buitendijk, 1945, p. 386.

Locality: Noppero (Fujikawa, 1970b).

Distribution: North Canada; Europe; U.S.S.R.; Japan.

** (84) *Diapterobates variabilis* Hammer (Fig. 63)

Diapterobates variabilis Hammer, 1955, p. 20, fig. 17.

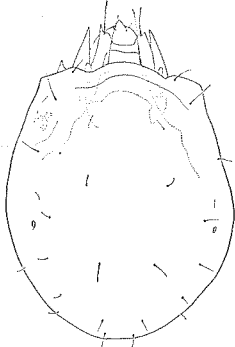


Fig. 62. *Diapterobates humeralis* (Hermann).

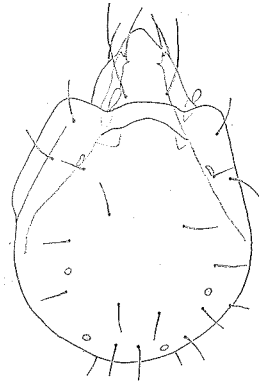


Fig. 63. *Diapterobates variabilis* Hammer.

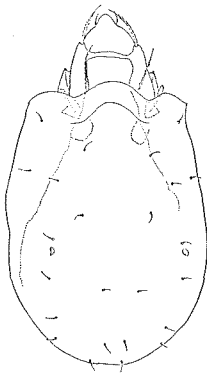


Fig. 64. *Diapterobates pusillus* Aoki.

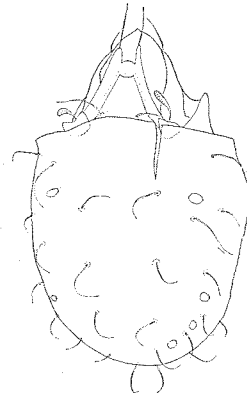


Fig. 65. *Melanozetes meridianus* Sellnick.

Locality: Mo-Ashoro (1 ex., To-6).

Measurement: Length: 500 μ ; width; 343 μ .

Distribution: Alaska; Japan.

*(85) *Diapterobates pusillus* Aoki (Fig. 64)

Diapterobates pusillus Aoki, 1969a, p. 136, figs. 40-41.

Locality: Mo-Ashoro (15 exs., To-4; 63 exs., To-6); Kikonai (1 ex., Os-1).

Measurement: Length: 343 (378) 400 μ ; width: 214 (237) 257 μ (by 9 undepressed specimens).

Distribution: Japan.

3. Genus *Melanozetes* Hull

Melanozetes Hull, 1916, p. 392.

Type-species: *Oribates mollicomus* C. L. Koch.

*(86) *Melanozetes meridianus* Sellnick (Fig. 65)

Melanozetes meridianus Sellnick, 1928, p. 12; Aoki, 1969a, p. 139, figs. 42-45.

Melanozetes meridionalis: Sellnick, 1929, p. 348, figs. 14-15.

Locality: Mo-Ashoro (12 exs., To-5; 1 ex., To-6); Kuromatsunai (41 exs., Sh-2); Kikonai (11 exs., Os-1); Mt. Taisetsu (62 exs., Ka-3).

Measurement: Length: 471 (495) 500 μ ; width: 300 (312) 329 μ (by 6 undepressed specimens).

Distribution: Europe; North America; Greenland; U.S.S.R.; Japan.

Remarks: The specimens examined differ from the original description and redescriptions of *M. meridianus* in the following characters: (1) Body size smaller than in European or Canadian specimens, but larger than in specimens from Honshu. (2) Rostrum pointed. (3) Areae porosae of notogaster larger. (4) Translamella complete and various in shape. (5) Genital setae variable in number, i.e. 4, 5 or 6 pairs.

2. Family *Mycobatidae*

1. Genus *Mycobates* Hull

Mycobates Hull, 1916, p. 395.

Type-species: *Oribata parmelliae* Michael.

** (87) *Mycobates parmelliae* (Michael) (Fig. 66)

Oribata parmelliae Michael, 1884, p. 265, pl. 12, figs. 1-5.

Notaspis parmelliae: Oudemans, 1900, p. 154.

Mycobates parmelliae: Sellnick, 1928, p. 12, fig. 18.

Supplementary description: Lamellar setae barbed. Interlamellar setae long, almost reaching rostrum. Sensillus slenderly club-shaped, bending at right angles at one third from the base and directed inwards. Proximal third of sensillus covered by a large scale. Tutorium with fine teeth at tip. Genua I, II and femora I, II with tooth.

Locality: Mo-Ashoro (67 exs., To-4; 625 exs., To-5; 15 exs., To-6); Kuromatsunai (2 exs., Sh-2); Kikonai (1 ex., Os-1); Mt. Taisetsu (10 exs., Ka-4).

Measurement: Length: 314 (340) 400 μ ; width: 200 (213) 257 μ (by 39 undepressed specimens).

Distribution: Finland; Europe; North America; Japan.

2. Genus *Punctoribates* Berlese

Punctoribates Berlese, 1908, p. 6.

Type-species: *Oribates punctum* C. L. Koch.

(88) *Punctoribates manzanoensis* Hammer (Fig. 67)

Punctoribates manzanoensis Hammer, 1958, p. 92, fig. 113; Fujikawa, 1970b, p. 73.

Locality: Teine-chô (5 exs., Is-2); Nopporo (Fujikawa, 1970 b).

Measurement: Length: 400 (410) 429 μ ; width: 343 (352) 371 μ (by 3 undepressed specimens).

Distribution: Argentina; Japan.

3. Genus *Jugatala* Ewing

Jugatala Ewing, 1913 b, p. 130.

Type-species: *Jugatala tuberosa* Ewing.

** (89) *Jugatala tuberosa* Ewing (Fig. 68)

Jugatala tuberosa Ewing, 1913 b, p. 130; Woolley, 1958 b, p. 266, figs. 14-15.

Jugatala sp.: Nakamura et al., 1970, p. 83; Fujikawa, 1970 b, p. 75.

Locality: Mo-Ashoro (1 ex., To-6); Higashi-Misumai (Nakamura et al., 1970); Nopporo (Fujikawa, 1970 b).

Distribution: North America; Japan.

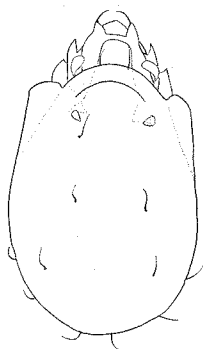


Fig. 66. *Mycobates parmeliae* (Michael).

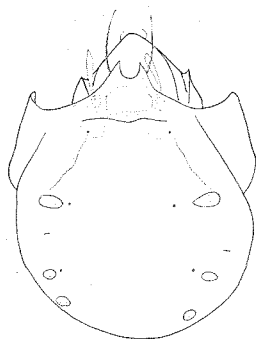


Fig. 67. *Punctoribates manzanoensis* Hammer.

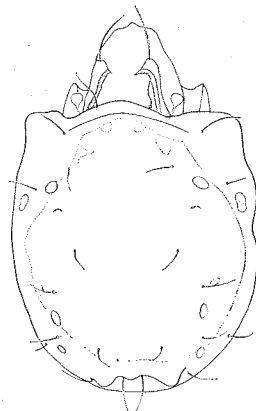


Fig. 68. *Jugatala tuberosa* Ewing.

3. Family Chamobatidae

Genus *Chamobates* Hull

Chamobates Hull, 1916, p. 386.

Type-species: *Oribata cuspidata* Michael.

*(90) *Chamobates pusillus* (Berlese) (Fig. 69)

Oribates pusillus Berlese, 1895.

Chamobates pusillus: Sellnick, 1928, p. 14.

Chamobates sp.: Fujikawa, 1970 b, p. 72; Nakamura et al., 1970, p. 83.

Locality: Yamabe-chô (1 ex., Ka-1); Mo-Ashoro (34 exs., To-5); Kuromatsunai (3 exs., Sh-2); Nopporo (Fujikawa, 1970 b); Higashi-Misumai (Nakamura et al., 1970); Mt. Taisetsu (2 exs., Ka-3).

Measurement: Length: 471 (511) 543 μ ; width: 343 (376) 400 μ (by 10 undepressed specimens).

Distribution: Europe; Japan.

4. Family **Mochlozetidae**

Genus **Unguizetes** Sellnick

Unguizetes Sellnick, 1925, p. 473.

Type-species: *Unguizetes triplicatulus* Grandjean.

This genus is new to Japan.

** (91) ***Unguizetes clavatus*** Aoki (Fig. 70)

Unguizetes clavatus Aoki, 1967a, p. 195, figs. 9-13.

Locality: Kikonai (25 exs., Os-1); Higashi-Misumai (4 exs., Is-26).

Measurement: Length: 871 (979) 1086 μ ; width: 729 (786) 843 μ (by 2 undepressed specimens).

Distribution: Thailand; Japan.

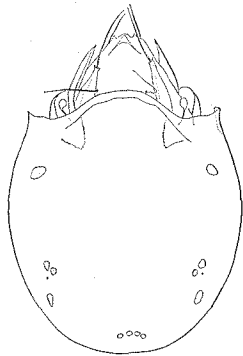


Fig. 69. *Chamobates pusillus* (Berlese).

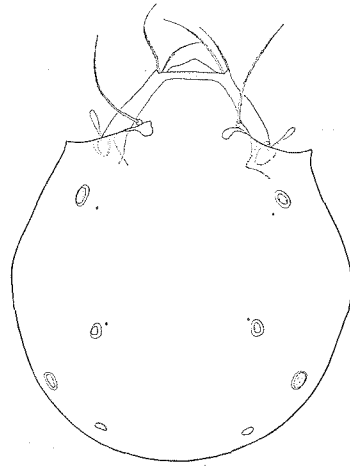


Fig. 70. *Unguizetes clavatus* Aoki.

Remarks: The specimens examined well agree with the original description, from which they differ in the larger body size and the irregular arrangement of the genital setae. The anal plate has normally 2 pairs of anal setae, but one specimen has exceptionally 1 seta on the right side of the anal plate.

XVIII. Superfamily **Galumnoidea**

1. Family **Parakalummidae**

1. Genus **Neoribats** Berlese

Neoribates Berlese, 1914, p. 127.

Type-species: *Oribates roubali* Berlese.

(92) ***Neoribates aurantiacus*** (Oudemans) (Fig. 71)

Galumna aurantiaca Oudemans, 1914, p. 36.

Neoribates aurantiaca: Sellnick, 1928, p. 9, fig. 9.

Neoribates aurantiacus: Willmann, 1931, p. 178, fig. 305; Aoki, 1966, p. 272, figs. 34-39; Fujikawa, 1970b, p. 73.

Locality: Higashi-Misumai (1 ex., Is-19; 1 ex., Is-21; 1 ex., Is-22); Ishikari-Hama (2 exs., Is-20); Mo-Ashoro (6 exs., To-4; 3 exs., To-6); Kikonai (1 ex., Os-1); Nopporo (Fujikawa, 1970b); Mt. Taisetsu (11 exs., Ka-4).

Measurement: Length: 486 (493) 543 μ ; width: 300 (314) 371 μ (by 16 undepressed specimens).

Distribution: Europe; North Canada; Japan.

2. Genus *Protokalumma* Jacot

Protokalumma Jacot, 1929, p. 5.

Type-species: *Oribata depressa* Banks.

(93) *Protokalumma parvisetigerum* Aoki

Protokalumma parvisetigerum Aoki, 1965b, p. 10, fig. 6; Fujikawa, 1970b, p. 73.

Locality: Nopporo (Fujikawa, 1970b).

Distribution: Japan.

2. Family Galumnidae

1. Genus *Galumna* von Heyden

Galumna von Heyden, 1826, p. 216.

Type-species: *Notaspis alatus* Hermann.

(94) *Galumna longiporosa* spec. nov. (Fig. 72)

Prodorsum: Rostral and lamellar setae thin, with fine tips, and nearly smooth wholly. Interlamellar setae only half as long as rostral setae and curving inwards. Lamellae half as long as prodorsum. Sensillus curved backwards, pointed, lanceolate and only slightly broader towards tip, the distal half being unilaterally hairy on the posterior margin, tapering towards the end. Border line between propodosoma and hysterosoma indistinct. Three areae porosae on each side; *Aa* broadest posteriorly, tapering anteriorly; *A*₁ elliptic; *A*₂ and *A*₃ fused, very long and narrow. Notogastral setae hardly visible, with 10 pairs of insertion pores.

Ano-genital region: Anal aperture slightly wider than long, the lateral margins being somewhat convergent forward; distance between anal setae *an*₁ and *an*₁ a little shorter than that between *an*₂ and *an*₂. Adanal setae *ad*₁ and *ad*₂ inserted behind posterior margin of aperture; mutual distance between *ad*₁ and *ad*₁ usually somewhat longer than that between *ad*₁ and *ad*₂; *ad*₃ situated close to *iad* which is short and inconspicuous. Genital aperture a little wider than long, with 6 pairs of setae, of which the anterior 3 pairs are arranged along the anterior margin. Interspace between anal and genital apertures nearly as long as width of the former.

Material examined: Holotype (NSMT-Ac-7407): Glassland in Teine-chô, 19-VII-1966, T. Fujikawa leg.; 2 paratopotypes: the same data as holotype. The type-series is deposited in the National Science Museum, Tokyo.

Measurement; Length: 714 μ ; width: 543 μ .

Remarks: The present species is related to *G. hudsoni* Hammer, 1952, from

which it differs in the larger body size and the notogaster with areae porosae A_3 .

2. Genus *Pergalumna* Grandjean

Pergalumna Grandjean, 1936, p. 94.

Type-species: *Oribates nervosus* Berlese.

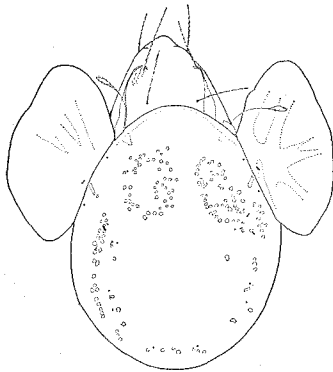


Fig. 71. *Neoribates aurantiacus* (Oudemans).

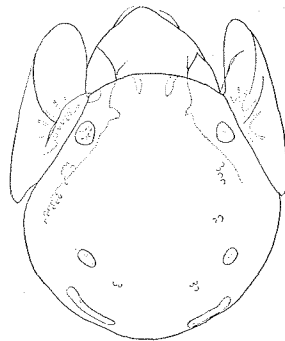


Fig. 72. *Galumna longiporosa* spec. nov.

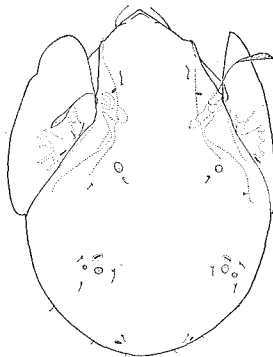


Fig. 73. *Pergalumna duplicata nipponica* Aoki.

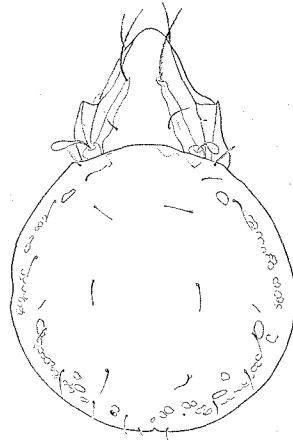


Fig. 74. *Oribatula tibialis* (Nicolet).

(95) *Pergalumna duplicata nipponica* Aoki (Fig. 73)

Pergalumna duplicata nipponica Aoki, 1966, p. 264, figs. 16-21; Fujikawa, 1970b, p. 73.

Trichogalumna lunai: Aoki, 1962a, p. 13.

Pergalumna sp.: Nakamura et al., 1970, p. 83.

Locality: Shintoku-chô (Aoki, 1962a); Yamabe-chô (2 exs., Ka-1); Higashi-Misumai (2 exs., Is-19 after Nakamura et al., 1970); Ishikari-Hama (4 exs., Is-20); Nopporo (Fujikawa, 1970b); Mt. Taisetsu (1 ex., Ka-3).

Measurement: Length: 371 μ ; width; 271 μ .

Distribution; Japan.

XIX. Superfamily **Oribatuloidea**

1. Family **Oribatulidae**

1. Genus **Oribatula** Berlese

Oribatula Berlese, 1896 b, fasc. 79 (12).

Type-species: *Notaspis tibialis* Nicolet.

(96) **Oribatula tibialis (Nicolet) (Fig. 74)

Notaspis tibialis Nicolet, 1855, p. 449, pl. 3, fig. 8.

Oribatula tibialis: Willmann, 1931, p. 155, fig. 225.

Locality: Higashi-Misumai (1 ex., Is-18)

Distribution: Europe; Finland; Lapland; Greenland; North America; Iceland; U.S.S.R.; Japan.

(97) **Oribatula venusta** Berlese

Oribatula venusta Berlese, 1908; Fukui, 1958, p. 175, figs. 1-6.

Locality: Tsukisappu, Bibai, and Yobetsu (Fukui, 1958).

Distribution: Italy; Japan.

2. Genus **Eporibatula** Sellnick

Eporibatula Sellnick, 1928, p. 17.

Type-species: *Eremaeus rauschenensis* Sellnick.

(98) **Eporibatula tuberosa** spec. nov. (Fig. 75)

Prodorsum: Rostrum protruding. Rostral setae long, somewhat longer than their mutual distance, inserted on lateral margins of rostrum; proximal half of rostral setae conspicuously pilose. Lamellae equally broad throughout and half as long as propodosoma, a little inclining. Lamellar seta barbed, as long as their mutual distance. Interlamellar setae barbed and a little larger than lamellar seta. Sensillus with head fusiform and barbed, appearing to be rather clavate in dorsal view.

Notogaster: Hysterosoma oval, being a little narrower at the anterior margin than on the middle part; posterior margin of hysterosoma with four tuberosities; shoulder rounded with a short rough seta. Areae porosae small and round. Thirteen pairs of notogastral setae smooth and rather long.

Ventral side: Anal aperture as long as wide, normally provided with 2 pairs of anal setae, but one specimen has exceptionally only one seta on the right side of anal plate. Three pairs of adanal nearly as long as anal ones; distances $ad_2 - ad_3 > ad_1 - ad_2$; ad_3 located far from anal aperture. Genital aperture as long as wide. Genital plates with 4 pairs of setae. All legs tridactyle.

Material examined: Holotype (NSMT-Ac-7408): Higashi-Misumai, 26-IX-1968, T. Fujikawa leg.; 14 paratopotypes: the same data as holotype. The type-series is deposited in the National Science Museum, Tokyo.

Measurement: Length: 414 (464) 514 μ ; width: 214 (244) 286 μ .

Remarks: The present species is distinguished from any other congeneric species

by the posterior margin of the notogaster with four tuberosities, by the protruding rostrum and by the larger body size.

3. Genus *Incabates* Hammer

Incabates Hammer, 1961, p. 108.

Type-species: *Incabates nudus* Hammer.

** (99) *Incabates angustus* Hammer (Fig. 76)

Incabates angustus Hammer, 1967 a, p. 43, fig. 57.

Supplementary description: Rostrum rounded and protruding. Rostral setae barbed, longer than their mutual distance, situated laterally. Lamellae long and narrow, situated near lateral sides, and slightly tapering towards tip. Lamellar setae 3/4 as long as lamellae, thin and smooth, situated on tip of lamellae. Interlamellar setae as long as lamellar setae, curved, and longer than their mutual distance. Sensillus with a thin stalk and a clavate head. Anterior margin of hysterosoma strongly arched in the middle and reaching anterior border of bothrydium. Ten pairs of notogastral setae curved. Genital plates with 4 pairs of setae, and anal plates with 2 pairs of setae. Fissure *iad* situated on the anterior third of anal field. All legs tridactyle.

Locality: Kita-Hiyama (6 exs., Hy-2).

Measurement: Length: 286 (366) 414 μ ; width: 157 (175) 200 μ (by 5 undepressed specimens).

Distribution: New Zealand; Japan.

Remarks: The specimens examined differ from the original description in having the sensilli with rather clavate head.

4. Genus *Scheloribates* Berlese

Scheloribates Berlese, 1908, p. 2.

Type-species: *Zetes latipes* C. L. Koch.

(100) *Scheloribates laevigatus* (C. L. Koch)

Zetes laevigatus C. L. Koch, 1836.

Scheloribates laevigatus: Willmann, 1931, p. 160, fig. 237; Aoki, 1961 b, p. 83; Aoki, 1962 a, p. 13; Nakamura et al., 1970, p. 83.

Locality: Higashi-Misumai (Nakamura et al., 1970).

Distribution: Europe; Japan.

(101) *Scheloribates latipes* (C. L. Koch) (Fig. 77)

Zetes latipes C. L. Koch, 1841.

Scheloribates latipes: Sellnick, 1928, p. 16, fig. 30; Aoki, 1962 a, p. 13; Tamura et al., 1969, p. 51.

Locality: Teine-chô (2 exs., Is-2; 77 exs., Is-3); Kita-Hiroshima (1 ex., Is-4); Sapporo (22 exs., Is-5); Raiden (2 exs., Sh-1); Ishikari-Hama (31 exs., Is-20); Mo-Ashoro (18 exs., To-4; 61 exs., To-5; 85 exs., To-6); Kuromatsunai (9 exs., Sh-2); Kita-Hiyama (6 exs., Hy-2); Kikonai (1 ex., Os-1); Hidaka-Mombetsu (Tamura et al., 1969); Shintokuchô (Aoki, 1962 a); Higashi-Misumai (Nakamura et al., 1970); Nopporo (Fujikawa,

1970b); Mt. Taisetsu (21 exs., Ka-3; 152 exs., Ka-4).

Measurement: Length: 429 (433) 500 μ ; width: 257 (281) 300 μ (by 68 undepressed specimens).

Distribution: Europe; Japan.

5. Genus *Zygoribatula* Berlese

Zygoribatula Berlese, 1916c, p. 317.

Type-species: *Oribatula connexa* Berlese.

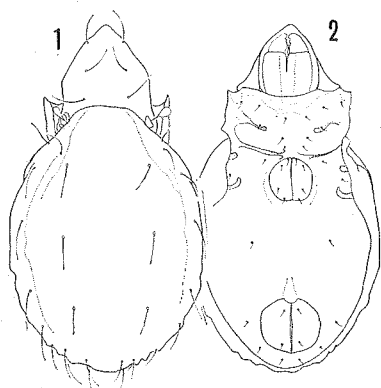


Fig. 75. *Eporibatula tuberosa* spec. nov.
—1. Dorsal side.—2 Ventral side.

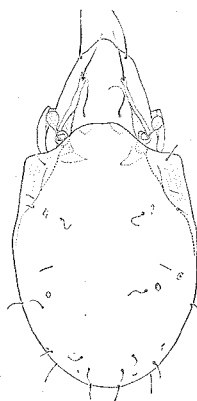


Fig. 76. *Incabates angustus*
Hammer.

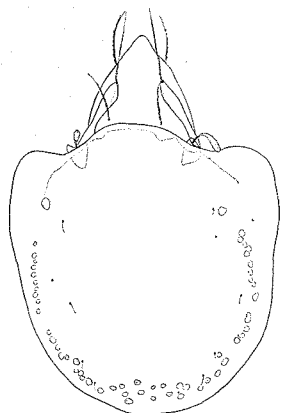


Fig. 77. *Scheloribates latipes*
(C. L. Koch).

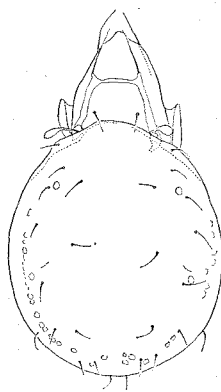


Fig. 78. *Zygoribatula laubieri*
Travé.

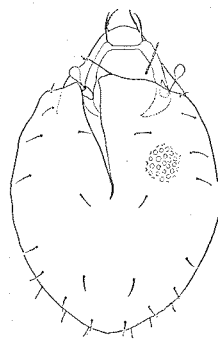


Fig. 79. *Zygoribatula marina* spec. nov.

** (102) *Zygoribatula laubieri* Travé (Fig. 78)

Zygoribatula laubieri Travé, 1961, p. 329, fig. 5.

Supplementary description: Rostrum protruding, but not pointed. Lamellae half as long as propodosoma. Lamellar cusp rounded and short. Translamella complete and narrow. Rostral, lamellar and interlamellar setae weakly barbed, the ratio in their length about 1.6 : 2.0 : 1.0. Sensillus club-shaped, the head being set with tiny hairs. Hys-

terosoma rounded, longer than its breadth, broadest behind the middle, the anterior end being somewhat projecting in an arch. Shoulders projecting a little beyond outline of hysterosoma, with a short humeral hair. Notogastral setae short and smooth.

Locality: Mo-Ashoro (9 exs., To-6).

Measurement: Length: 343 (359) 371 μ ; width: 186 (200) 229 μ (by 4 undepressed specimens).

Distribution: France; Japan.

(103) *Zygoribatula marina* spec. nov. (Fig. 79)

Prodorsum: Rostrum broadly round. Lamellae 2/3 as long as propodosoma, being almost equally thick wholly, jointed just behind their tips by broad translamella. Rostral, lamellar and interlamellar setae barbed and the same in length. Sensillus with head club-shaped.

Notogaster: Hysterosoma oval. Shoulder projecting a little beyond outline of hysterosoma, with a very short and barbed shoulder seta. Ten pairs of notogastral setae smooth and short. Surface indistinctly areolate.

Ano-genital region: Anal aperture large, as long as wide, with 2 pairs of setae. Three pairs of adanal setae smooth; distances $ad_2-ad_3 > ad_1-ad_2 > ad_1-ad_1$; ad_3 located in front of anal aperture. Aggenital setae *ag* separated from each other by a distance as long as ad_3-ad_3 . Genital aperture separated from anal aperture by a distance twice as long as the former; 4 pairs of genital setae present. All legs tridactyle.

Material examined: Holotype (NSMT-Ac-7409): Ishikari-Hama, 13-VIII-1968, T. Fujikawa leg.; 4 paratopotypes: the same data as holotype. The type-series is deposited in the National Science Museum, Tokyo.

Measurement: Length: 429 (460) 471 μ ; width: 257 (291) 314 μ (by 5 undepressed specimens).

Remarks: The present species differs from any other congeneric species in the notogaster with indistinct areolate surface, the short sensilli and the thick interlamellar setae.

2. Family **Haplozetidae**

1. Genus ***Peloribates*** Berlese

Peloribates Berlese, 1908, p. 3.

Type-species: *Oribata peloptoides* Berlese.

** (104) *Peloribates muscicola* Hammer (Fig. 80)

Peloribates muscicola Hammer, 1961, p. 107, fig. 102.

Locality: Kita-Hiyama (1 ex., Hy-2).

Measurement: Length: 390 μ ; width: 270 μ .

Distribution: Peru; Japan.

2. Genus ***Protoribates*** Berlese

Protoribates Berlese, 1908, p. 1.

Type-species: *Oribates dentatus* Berlese.

(105) *Protoribates lophotrichus* (Berlese) (Fig. 81)

Oribates lophotrichus Berlese, 1904c, p. 27.

Protoribates lophotrichus: Willmann, 1931, p. 160, figs. 239; Aoki, 1965b, p. 12; Tamura et al., 1969, p. 52.

Locality: Mo-Ashoro (2 exs., To-6); Kita-Hiyama (3 exs., Hy-2); Kikonai (2 exs., Os-1); Hidaka-Mombetsu (Tamura et al., 1969); Nopporo (Fujikawa, 1970b).

Measurement: Length: 529 μ ; width: 314 μ .

Distribution: Europe; Japan.

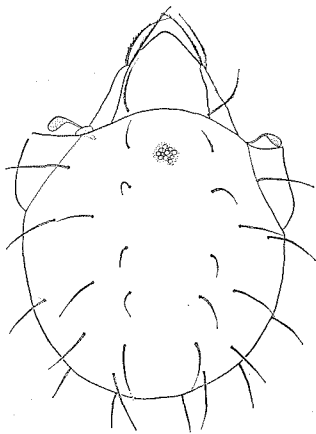


Fig. 80. *Peloribates muscicola*
Hammer.

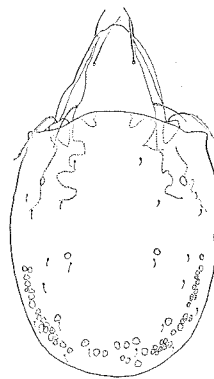


Fig. 81. *Protoribates lophotrichus*
(Berlese).

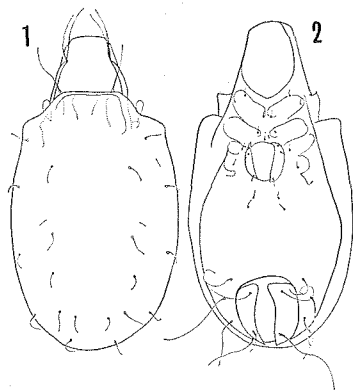


Fig. 82. *Truncopes optatus* Grandjean—1. Dorsal side.—2. Ventral side.

3. Family **Truncopidae**

This family is new to Japan.

Genus *Truncopes* Grandjean

Truncopes Grandjean, 1956, p. 203.

Type-species: *Truncopes optatus* Grandjean.

**106) *Truncopes optatus* Grandjean (Fig. 82)

Truncopes optatus Grandjean, 1956, p. 203; Woolley, 1966, p. 23, figs. 22-23.

Locality: Mo-Ashoro (1 ex., To-4).

Measurement: Length: 470 μ ; width: 230 μ .

Distribution: Morocco; Japan.

Remarks: The specimen examined well agrees with the original description, from which it differs in the sensilli completely covered with coalesced pteromorphs, the formula of epimeral setae (3-2-1-1), the aggenital setae $ag_1 - ag_1 > ag_2 - ag_2$, and the anal seta an_3 located at the level of the anterior margin of anal plate.

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