

Genus	Vol. 15 (3): 391-423	Wrocław, 10 X 2004
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Supplement to the knowledge of ptyctimous mites of Oriental Region (Acari, Oribatida)

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ABSTRACT. A supplement to the monograph on ptyctimous mites of Oriental Region (NIEDBAŁA 2000), presents diagnoses of the species described in the papers published after 1998 and a few species described in the papers published before this year. Analysis of a few dozen samples with ptyctimous mites from different areas of Oriental Region has enriched the number of species from the region by 7 species new to science. These new species are: *Mesoplophora (Mesoplophora) frogneri* n. sp., *Apoplophora kapiti* n. sp., *Apoplophora sarawaki* n. sp., *Apoplophora serrata* n. sp., *Apoplophora triquetra* n. sp., *Austrotrititia singaporensis* n. sp., and *Phthiracarus pondoklowii* n. sp. The species *Euphthiracarus meghalayensis* SANYAL, 1988 has been declared conspecific with *Euphthiracarus pakistanensis* HAMMER, 1977 and *Phthiracarus (Archiphthiracarus) hirsutus* FUJIKAWA, 2003 with *Phthiracarus setosus* (BANKS, 1895). From among the 39 already known species, 12 were known only from the original description and these have been subjected to detailed morphological analysis revealing or allowing more accurate specification of some morphological features, included in the redescrptions presented in this paper. New localities have been specified for the following species: *O. chichijimensis*, *E. meghalayensis*, *P. globosus*, and *A.(A.) clavatus*, extending their hitherto geographical ranges. In total the supplement presents 45 species, including 8 Mesoplophoridae, 16 Euphthiracaroidae, and 21 Phthiracaroidae.

Keys words: acarology, taxonomy, Acari, Ptyctima, Oriental Region, new species, new records, new synonyms.

INTRODUCTION

The paper is a supplement to the monograph on the ptyctimous mites of Oriental Region (NIEDBAŁA 2000). It presents diagnoses of the species described in the papers published after 1998 and a few species described in the papers published before this date but unavailable to me for different reasons.

Moreover, having published the monograph on the ptyctimous mites of Oriental Region (NIEDBALA 2000), I have been given access to a few dozen samples containing these mites from different localities in the following countries: Thailand, Cambodia, Vietnam, Taiwan, Malaysia, and Singapore. Analysis of the samples revealed species new to science whose descriptions are included.

Some of the already known species were known only from their original descriptions and they have been subjected to a detailed morphological analysis. The analysis has revealed or permitted more accurate specification of some morphological features, whose descriptions are provided.

All measurements are given in micrometers.

Abbreviations:

CNCI – Canadian National Collection of Insects, Biosystematics Research Institute, Ottawa;

FMHD – The Field Museum, Chicago.

LIST OF NEW LOCALITIES

India, Tumkur District, 75 km NW Bangalore, Devarayadurga, 1000 m, 6 Aug. 1986, mixed litter under *Cassia siamea*, *Lantana*, *Eucalyptus*, sandy soil, leg. V. BEHAN, VB 127/128, CNC.

Thailand, Prachuap Kiri Khan, Siamese Bay, litter from bushes. 25 VIII 2001, leg. W. NIEDBALA; 100 km NE from Chiang Mai, litter from primary forest, 14 VIII 2001, leg. W. NIEDBALA.

Cambodia, Angkor Wat, litter from secondary forest, 29 VIII 2001, leg. W. NIEDBALA.

Vietnam, Tam Dao, 900-1300 m, litter in rain forest, 05 IV 1997, leg. J. POMORSKI; Do San, seashore, rock sward, 900-1300 m, 12 IV 1997, leg. J. POMORSKI.

Taiwan, Shan-Lin-chi (Nanton Hsien), 1600 m, 16 V 1990, leg. L. LeSAGE, CNC.

Malaysia, Borneo, Sabah, Mt. Kinabalu N.P., Poring Hot Springs, 480 m, 8 V 1987, leg. A. SMETANA CNC; Mt. Kinabalu N.P., above Poring Hot Springs, 520 m, 9 V 1987, leg. A. SMETANA CNC; Mt. Kinabalu N.P., Por. H.S. area below Langanan Fall, 800 m, 12 V 1987, leg. A. SMETANA CNC; Mt. Kinabalu N.P., area below Langan Fall, 850 m, 12 V 1987, leg. A. SMETANA CNC; Mt. Kinabalu N.P., Hq. at Livagu Rv., 1500 m, 18 V 1987, leg. A. SMETANA CNC; Mt. Kinabalu N.P., Hq. at Livagu Rv., 1500 m, 21 IV 1987, leg. A. SMETANA CNC; Mt. Kinabalu N.P., Hq. at Livagu Rv., 1500 m, 25 IV 1987, leg. A. SMETANA CNC; Mt. Kinabalu N.P., Hq. Bukir Ular Trail, 1700 m, 29 IV 1987, leg. A. SMETANA CNC; Mt. Kinabalu N.P., summit trail, 1890 m, leg. A. SMETANA CNC; Mt. Kinabalu N.P., summit trail Pondok Ubah, 2050 m, 26 IV 1987, leg. A. SMETANA CNC; Mt.

Kinabalu N.P., summit Tr. Pondok Lowii 2300-2400 m, 28 IV 1987, leg. A. SMETANA CNC; Mt. Kinabalu N.P., below Layang Layang, 2590 m, 1 V 1987, leg. A. SMETANA CNC; as above, 2595 m; Mt. Kinabalu N.P., Paka Cave, 2997 m, 6 V 1987, leg. A. SMETANA CNC; Mt. Kinabalu N. P., Laban Rata, 3200-3250 m, 4 V 1987, leg. A. SMETANA CNC; Mt. Kinabalu N.P., above Gunting Lagadan, 3 400 m, 19 V 1987, leg. A. SMETANA CNC; Mt. Kinabalu N.P., base St. Johns Peak, 3950-4000 m, 20 V 1987, leg. A. SMETANA CNC.

Malaysia, Borneo, Sarawak, Kapit Dist. Sunga, Baleh, Sunga, Mengiong, near Ng. Tekalit, 13 XI 1971, hilly rainforest, conc. litter under fig tree, leg. K. FROGNER FMHD 71-125; Sarawak, Kapit Dist., near Ng. Tekalit, 27 XI 1971, hilly rainforest, bark assoc. with bleeding insect hole in tree, leg. K. FROGNER FMHD 71-145; Sarawak, Kapit Dist., near Ng. Tekalit, 5 I 1972, fallen rotten fruit, leg. K. FROGNER FMHD 72-215; Sarawak, Kapit Dist., near Ng. Tekalit, 5 I 1972, woodborer frass, leg. K. FROGNER FMHD 72-222; Sarawak, Kapit Dist., near Ng. Tekalit, 7 I 1972, frass u. stump bark, leg. K. FROGNER FMHD 72-227; Sarawak, Kapit Dist., near Ng. Tekalit, 12 I 1972, woodborer frass, leg. K. FROGNER FMHD 72-232; Sarawak, Kapit Dist., near Ng. Tekalit, 7 II 1972, woodborer frass, leg. K. FROGNER FMHD 72-279; Sarawak, Kapit Dist., near Ng. Tekalit, 17 III 1972, buttress litter, leg. K. FROGNER FMHD 72-330; Sarawak, Kapit Dist., near Ng. Tekalit, 17 III 1972, woodborer frass, leg. K. FROGNER FMHD 72-331; Sarawak, Kapit Dist., near Ng. Tekalit, 19 III 1972, flower litter, leg. K. FROGNER FMHD 72-336; Sarawak, Kapit Dist., near Ng. Tekalit, 19 III 1972, flower & rotten fruit litter, leg. K. FROGNER FMHD 72-337; Sarawak, Kapit Dist., near Ng. Tekalit, 20 III 1972, buttress litter, leg. K. FROGNER FMHD 72-342; Sarawak, Kapit Dist., near Ng. Tekalit, 22 III 1972, woodborer frass, leg. K. FROGNER FMHD 72-345; Sarawak, Kapit Dist., near Ng. Tekalit, 22 III 1972, buttress litter, leg. K. FROGNER FMHD 72-348; Sarawak, Kapit Dist. Sunga; Baleh, Sunga, Mengiong, near Ng. Tekalit, 13 XI 1971, hilly rainforest, conc. litter under fig tree, leg. K. FROGNER FMHD 72-350; Sarawak, Kapit Dist., near Ng. Tekalit, 17 III 1972, flower litter, leg. K. FROGNER FMHD 72-329; Sarawak, Kapit Dist., near Ng. Tekalit, 12 II 1972, leaf litter, leg. K. FROGNER FMHD 72-314.

Malaysia, Kuala Lumpur, 20 mi NE Kuala Lumpur, Ulu Gombak For. Res., 13 IV 1981, Brtam palm litter, leg. J. KETHLEY FMHD 81-278; Malaysia, Kuala Lumpur, 20 mi NE Kuala Lumpur, Ulu Gombak For. Res., 13 IV 1981, thorny palm litter, leg. J. KETHLEY, M. NADCHATRAM and R.A. HASSAN FMHD 81-280.

Singapore, Botanical Gardens, 8 IV 1981, forest floor litter & buttress litter, leg. J. KETHLEY FMHD 81-274; Singapore, Bukit Timah, Bukit Timah Nat. Res., 11 IV 1981, forest floor litter, leg. J. KETHLEY FMHD 81-275; Singapore, Bukit Timah Nat. Res., 11 IV 1981, litter on logs, leg. J. KETHLEY FMHD 81-276; Singapore, Labrador Park, 21 IV 1981, sea shore leaf litter, leg. J. KETHLEY FMHD 81-283.

REVIEW OF SPECIES

***Mesoplophora (Mesoplophora) frogneri* n. sp.**

(Tab. I, figs 1-4)

DESCRIPTION. Measurements of holotype: prodorsum: length 190, width 126, height 70.8, sensillus 88.5, setae: interlamellar 78.4, lamellar 53.1, rostral 50.6, exobothridial 10.1; notogaster: length 253, width 202, height 169, setae: c_1 and d_1 70.8, e_1 78.4, genital plate 53.1x30.4, anal plate 58.2x27.8, distance between genital and anal plates - 25.3. Small species. Colour grey-brown. Prodorsum with distinct lateral carina. Sensilli long, baciliform, smooth, similar to notogastral setae. Setae filiform, interlamellar longest, exobothridial short, smaller than diameter of bothridia. Notogaster with long, baciliform, smooth setae. Setae of row c remote from anterior border, setae c_3 less than other setae. Eight pairs of ventral setae short, smooth. Seven pairs of genital setae with formula: 6: 1. Two pairs of anal setae present.

MATERIAL. Holotype: Malaysia, Sarawak, Kapit Dist., near Ng. Tekalit, 17 III 1972, buttress litter, leg. K. FROGNER; one paratype: Sarawak, Kapit Dist., near Ng. Tekalit, 5 I 1972, fallen rotten fruit, leg. K. FROGNER; one paratype: Sarawak, Kapit Dist., near Ng. Tekalit, 27 XI 1971, hilly rainforest, bark assoc. with bleeding insect hole in tree, leg. K. FROGNER; five paratypes: Sarawak, Kapit Dist., near Ng. Tekalit, 7 II 1972, woodborer frass, leg. K. FROGNER. Holotype and three paratypes in FMHD, four paratypes in DATE.

ETYMOLOGY. The specific epithet is in honour of the collector, Karl FROGNER.

DIAGNOSIS AND COMPARISON. The new species has sensillus similar to that of *Mesoplophora (P.) japonica* AOKI, 1970 but has only 2 pairs of anal setae, 8 instead of 10 pairs of ventral setae and longer and stronger notogastral setae.

DISTRIBUTION. Malaysia, Sarawak, perhaps an endemic species.

***Apoplophora kapiti* n. sp.**

(Tab. I, figs 5-8)

DESCRIPTION. Measurements of holotype: prodorsum: length 328, width 263, height 162, sensillus 131, setae: interlamellar 126, lamellar 131, rostral 75.9, exobothridial 60.7; notogaster: length 454, width 364, height 328, setae: c_1 139, c_3 109, e_1 121, genital plate 68.3x106, anal plate 101x55.7, distance between genital and anal plates - 139. Colour brown light and dark. Body chagrined, only borders of notogaster slightly striated. Prodorsum with fine sensilli covered with 20 short barbs. Interlamellar setae thickest covered with 10 barbs, other setae with 6-8 barbs. Notogaster with 8 pairs of barbed (6-8 barbs) setae. Setae c_3 approximately as long as other setae and situated nearer anterior border than setae c_1 and c_2 . Ventral region with 7 pairs of ventral setae, rough; only 3 posterior setae covered with small barbs. Anterior pair of ventral setae situated nearer genital plates than

anal plates. Two pairs of antero-lateral setae as long as other ventral setae. Genital plates with 6 pairs and anal plates with 4 pairs of smooth setae.

MATERIAL. Holotype and one paratype: Malaysia, Sarawak, Kapit Dist., near Ng. Tekalit, 22 III 1972, buttress litter, leg. K. FROGNER; one paratype: Sarawak, Kapit Dist., near Ng. Tekalit, 19 III 1972, flower litter, leg. K. FROGNER; two paratypes (1 tritonymph): Sarawak, Kapit Dist., near Ng. Tekalit, 20 III 1972, buttress litter, leg. K. FROGNER; three paratypes: Sarawak, Kapit Dist., near Ng. Tekalit, 19 III 1972, flower & rotten fruit litter, leg. K. FROGNER; one paratype: Sarawak, Kapit Dist. Sunga; Baleh, Sunga, Mengiong, near Ng. Tekalit, 13 XI 1971, hilly rainforest, conc. litter under fig tree, leg. K. FROGNER; 1 paratype: Malaysia, Kuala Lumpur, 20 mi NE Kuala Lumpur, Ulu Gombak For. Res., 13 IV 1981, thorny palm litter, leg. J. KETHLEY, M. NADCHATRAM and R.A. HASSAN. Holotype and 5 paratypes in FMHD, 4 paratypes in DATE.

ETYMOLOGY. The specific name refers to Kapit District in Sarawak.

DIAGNOSIS AND COMPARISON. Setae c_3 of notogaster as long as other setae. Anterior pair of ventral setae situated nearer genital plates than anal plates. Two pairs of antero-lateral setae as long as other ventral setae. *Apoplophora ornatissima* MAHUNKA, 1988 (= *Apoplophora pantotrema* (BERLESE, 1913)) from Sabah has the antero-lateral setae very short. *Apoplophora solomonensis* NIEDBALA, 1998 from Solomon Islands has short setae c_3 of notogaster and different arrangement of antero-lateral setae of ventral region.

DISTRIBUTION. Malaysia, Sarawak, perhaps an endemic species.

***Apoplophora pantotrema* (BERLESE, 1913)**

NEW LOCALITIES: Vietnam, Tam Dao, 900-1300 m, litter in rain forest, 05 IV 1997, leg. J. POMORSKI, 1 specimen; Malaysia, Kuala Lumpur, 20 mi NE Kuala Lumpur, Ulu Gombak For. Res., 13 IV 1981, Brtam palm litter, leg. J. KETHLEY, 2 specimens; Malaysia, Kuala Lumpur, 20 mi NE Kuala Lumpur, Ulu Gombak For. Res., 13 IV 1981, thorny palm litter, leg. J. KETHLEY, M. NADCHATRAM and R.A. HASSAN, 1 specimen.

DISTRIBUTION. An Oriental species.

***Apoplophora phalerata* NIEDBALA, 2000**

NEW LOCALITIES: Malaysia, Sarawak, Kapit Dist., near Ng. Tekalit, 20 III 1972, buttress litter, leg. K. FROGNER, 1 specimen; Sarawak, Kapit Dist., near Ng. Tekalit, 17 III 1972, flower litter, leg. K. FROGNER, 2 specimens; Sarawak, Kapit Dist., near Ng. Tekalit, 12 II 1972, leaf litter, leg. K. FROGNER, 1 specimen; Sarawak, Kapit Dist. Sunga, Baleh, Sunga, Mengiong, near Ng. Tekalit, 13 XI 1971, hilly rainforest, conc. litter under fig tree, leg. K. FROGNER, 2 specimens; Sabah, Mt. Kinabalu N.P., Poring Hot Springs, 480 m, 8 V 1987, leg. A. SMETANA, 1 specimen; Mt. Kinabalu N.P., below Layang Layang, 2595 m, 1 V 1987, leg. A.

SMETANA, 11 specimens; Mt. Kinabalu N.P., below Layang Layang, 2590 m, 1 V 1987, leg. A. SMETANA, 15 specimens; Mt. Kinabalu N.P., above Poring Hot Springs, 520 m, 9 V 1987, leg. A. SMETANA, 3 specimens; Mt. Kinabalu N.P., Hq. at Livagu Rv., 1500 m, 25 IV 1987, leg. A. SMETANA, 1 specimen; Mt. Kinabalu N.P., summit trail, 1890 m, leg. A. SMETANA, 10 specimens; Mt. Kinabalu N.P., summit trail Pondok Ubah, 2050 m, 26 IV 1987, leg. A. SMETANA, 15 specimens; Mt. Kinabalu N.P., Por. H.S. area below Langanan Fall, 800 m, 12 V 1987, leg. A. SMETANA, 1 specimen

DISTRIBUTION. An Oriental species.

***Apoplophora sarawaki* n. sp.**

(Tab. II, figs 1-3)

DESCRIPTION. Measurements of holotype: prodorsum: length 348, width 263, height 151, sensillus 152, setae: interlamellar 109, lamellar 114, rostral 119, exobothridial 68.3; notogaster: length 444, width 358, height 298, setae: c_1 and e_1 109, d_1 126, anal plate 96.1x53.1, distance between genital and anal plates - 139. Colour light brown or yellow. Surface of prodorsum punctated, lateral side finely striated. Notogaster and ventral region covered with irregular patterns within the cuticle, notogaster anteriorly chagrined and posteriorly ornamented. Prodorsum with setae stronger than sensilli, all sparsely covered with small spines. Notogaster with 8 pairs of setae sparsely covered with small spines. Setae c_3 situated nearer anterior margin than setae c_1 and c_2 . Ventral region with 7 pairs of setae sparsely covered with small spines except antero-lateral pair of fine and smooth setae. Six pairs of genital and four pairs of anal smooth setae present.

MATERIAL. Holotype (in FMHD): Malaysia, Sarawak, Kapit Dist., near Ng. Tekalit, 5 I 1972, fallen rotten fruit, leg. K. FROGNER; one paratype (in DATE): Sarawak, Kapit Dist., near Ng. Tekalit, 12 I 1972, woodborer frass, leg. K. FROGNER.

ETYMOLOGY. The name of the new species refers to the Sarawak state.

DIAGNOSIS AND COMPARISON. The new species is similar to *A. ornata* NIEDBAŁA, 2000 in the ornamentation of body surface, but all setae are significantly longer, especially exobothridial setae, almost three times longer than diameter of bothridia.

DISTRIBUTION. Malaysia, Sarawak, perhaps an endemic species.

***Apoplophora serrata* n. sp.**

(Tab. II, figs 4-6)

DESCRIPTION. Measurements of holotype: prodorsum: length 495, width 303, height 227, sensillus 185, setae: interlamellar and lamellar 126, rostral 109, exobothridial 65.8; notogaster: length 606, width 510, height 505, setae: c_1 109, d_1 and e_1 139; anal plate 70.8x40.5, distance between genital and anal plates - 75.9. Colour yellow, surface of body punctated, only prodorsum finely striated dorsally. Prodorsum with short, serrated setae; exobothridial setae slightly longer than

diameter of bothridia. Sensilli thinner than setae, long, smooth. Notogaster with 8 pairs of serrated setae; setae c_3 nearer the anterior margin than setae c_1 and c_2 . Ventral region with 8 pairs of rough setae. Antero-lateral setae of unequal length, anterior considerably shorter than posterior. Six pairs of smooth genital and four pairs of rough anal setae present.

MATERIAL. Holotype (in FMHD): Malaysia, Sarawak, Kapit Dist., near Ng. Tekalit, 12 I 1972, woodborer frass, leg. K. FROGNER.

ETYMOLOGY. The specific epithet is derived from Latin *serratus* and alludes to the serrated setae of body.

DIAGNOSIS AND COMPARISON. The new species is similar to *A. phalerata* NIEDBALA, 2000 from India and Indonesia but is easily distinguishable by the smooth sensilli and the antero-lateral setae of ventral region unequal in length.

DISTRIBUTION. Malaysia, Sarawak, perhaps an endemic species.

Apoplophora spinosa MAHUNKA, 1987

NEW LOCALITIES: Sarawak, Kapit Dist., near Ng. Tekalit, 27 XI 1971, hilly rainforest, bark assoc. with bleeding insect hole in tree, leg. K. FROGNER, 1 specimen; Sabah, Mt. Kinabalu N.P., above Poring Hot Springs, 520 m, 9 V 1987, leg. A. SMETANA, 3 specimens; Mt. Kinabalu N.P., area below Langan Fall, 850 m, 12 V 1987, leg. A. SMETANA, 1 specimen.

DISTRIBUTION. An Oriental species.

Apoplophora triquetra n. sp.

(Tab. III, figs 1-7)

DESCRIPTION. Measurements of adult holotype: prodorsum: length 190, width 162, height 96.1, sensillus 119, setae: interlamellar 78.4, lamellar 70.8, rostral 81.0, exobothridial 50.6; notogaster: length 298, width 238, height 190, setae: c_1 88.5, d_1 121, e_1 129, anal plate 63.2x35.4, distance between genital and anal plates – 88.5. Colour yellow-grey. Prodorsum with irregular ornamentation dorsally and chagrined anteriorly, posteriorly and laterally. Surface of notogaster with mosaic of triangular arrangements. Ventral region covered with irregular ornamentation. Prodorsum with long sensilli and setae, densely (40-50) covered with small spines. Notogaster with long, strong setae densely (50-60) covered with small spines. Setae c_2 remote from anterior border more than setae c_1 and c_3 . Ventral region with 6 pairs of setae. One pair pf anterior setae thin and smooth, other setae thicker and rough. Six pairs of smooth genital setae and 4 pairs of rough anal setae present.

Measurements of tritonymph: prodorsum: length 293, width 222, height 151, sensillus 126, setae: interlamellar, lamellar and rostral 75.9, exobothridial 50.6;

notogaster: length 373, width 313, height 278, setae: c_1 88.5, d_1 81.0, e_1 63.2, genital plate 68.3x30.4, anal plate 55.7x17.7. Colour light yellow. Surface of prodorsum chagrined. Surface of notogaster covered with irregular ornamentation as surface of dorsal part of adult. Sensilli and setae shorter than setae of adult, covered with small spines not so numerous (20-25) as setae of adult. Number and arrangement of notogastral setae as in adult form. Arrangement of ventral setae 2: 4. Two pairs of genital setae, one pair of anal and three pairs of adanal setae present.

MATERIAL. Holotype (in FMHD) and two paratypes as tritonymphs (in DATE): Malaysia, Sarawak, Kapit Dist., near Ng. Tekalit, 17 III 1972, buttress litter, leg. K. FROGNER.

ETYMOLOGY. The specific epithet *triquetrus* is Latin for "triangular" and alludes to the shape of elements of notogaster ornamentation.

DIAGNOSIS AND COMPARISON. The new species is easily distinguishable from congeners by the arrangement of triangular elements on the surface of notogaster. Tritonymph of *A. pantotrema* (BERLESE, 1913) (NIEDBAŁA 1984) has one pair of ventral and one pair of genital setae more than tritonymph of the new species.

DISTRIBUTION. Malaysia, Sarawak, perhaps an endemic species.

***Oribotritia asiatica norikoe* SUZUOKA, 1983**

DIAGNOSIS (description of the subspecies is in Japanese and has been translated by Dr. S. SHIMANO). Measurements: length of prodorsum, 500, length of notogaster 1150; length of interlamellar setae 178, of lamellar setae 60, of rostral setae 130, sensillus 135.

Colour dark brown. Prodorsum small foveolate and notogaster smooth. Sensilli simple, strip like; dorsal setae of prodorsum barbed. Notogaster with 14 pairs of setae; 8 pairs of genital, 3 pairs of aggenital, 3 pairs of anal and 3 pairs of adanal setae present. Legs tridactylous.

LOCALITY. Japan, Iigatake, Tokuchi-machi, Saba-gun, Yamaguchi prefecture, 18 XII 1980, leg. H. Suzuoka.

REMARK. Fig. 7 of Suzuoka paper presenting the body does not display any morphological details. As follows from the description, i.e. the ratio of the interlamellar to lamellar setae, the presence of 3 pairs of aggenital, anal and adanal setae, this species is very similar to *Oribotritia fennica* FORSSLUND and MÄRKEL, 1963.

DISTRIBUTION. The species known hitherto only from Japan.

***Oribotritia bulbifer* (MAHUNKA, 1987)**

NEW LOCALITY: Sabah, Mt. Kinabalu N.P., Poring Hot Springs, 480 m, 8 V 1987, leg. A. SMETANA, 1 specimen.

DISTRIBUTION. An Oriental species.

***Oribotritia chichijimensis* AOKI, 1980**

NEW LOCALITY: Taiwan, Shan-Lin-chi (Nanton Hsien), 1600 m, 16 V 1990, leg. L. LESAGE, 2 specimens.

DISTRIBUTION. The species known hitherto only from Japan.

***Indotritia javensis* (SELLNICK, 1923)**

NEW LOCALITIES: Malaysia, Sarawak, Kapit Dist., near Ng. Tekalit, 12 I 1972, woodborer frass, leg. K. FROGNER; Kapit Dist. Sunga, Baleh, Sunga, Mengiong, near Ng. Tekalit, 13 XI 1971, hilly rainforest, conc. litter under fig tree, leg. K. FROGNER, 2 specimens; Kapit Dist., near Ng. Tekalit, 12 I 1972, woodborer frass, leg. K. FROGNER, 1 specimen; Kapit Dist., near Ng. Tekalit, 7 II 1972, woodborer frass, leg. K. FROGNER, 6 specimens; Kapit Dist., near Ng. Tekalit, 5 I 1972, woodborer frass, leg. K. FROGNER, 2 specimens; Sabah, Mt. Kinabalu N. P., Hq Bukir Ular Trail, 1700 m, 29 IV 1987, leg. A. SMETANA, 1 specimen.

DISTRIBUTION. An Oriental species.

***Mesotritia indica* SANYAL, 1988**

(Tab. IV, figs 1-3)

DIAGNOSIS. Measurements. Length of body 552, prodorsum: length 310, width 195, setae: interlamellar and rostral 34, lamellar 40; notogastral setae 34-40. Prodorsum with one pair of lateral carinae; sensilli short, slightly thickened with blunt head, setae short, smooth. Notogaster with fine lines of striation, setae short. Six pairs of minute genital setae and two pairs of longer aggenital setae located in the middle of plates; one pair of anal and three pairs of adanal setae present; setae *ad*₁ longer than other setae.

LOCALITY. India, Meghalaya, Shilong, 1929 m, pine forest, one specimen (SANYAL 1988).

REMARK. This species is easily distinguishable by the striation of notogaster and localisation of aggenital setae in the middle of aggenital plates.

DISTRIBUTION. India, probably an endemic species.

***Austrotritia saraburiensis* AOKI, 1965**

NEW LOCALITY: Vietnam, Do San, seashore, rock sward, 900-1300 m, 12 IV 1997, leg. J. POMORSKI, 6 specimens.

DISTRIBUTION. An Oriental species.

***Austrotritia singaporensis* n. sp.**

(Tab. IV, figs 4-8)

DESCRIPTION. Measurements of holotype: prodorsum: length 404, width 288, height 126, sensillus 164, setae: interlamellar 106, lamellar 70.8, rostral 53.1; notogaster: length 722, width 535, height 540, setae: c_1 116, h_1 and ps_1 121,; genitoaggenital plate 91.1x65.8 anoadanal plate 197x63.2. Colour light brown. Prodorsum with two pairs of lateral carinae. Sensilli long, strong, smooth. Interlamellar setae erect, stout, rough, lamellar and rostral setae faint, smooth, exobothridial setae vestigial. Notogaster with stout and rough setae, only setae ps_1 faint and slender. Seven pairs of genital setae with formula 4: 3; two pairs of aggenital setae present, setae ag_2 considerably longer than setae ag_1 . One pair of anal and three pairs of adanal setae present. Setae ad_3 located anteriorly of anal setae. Lyrifissures iad situated between setae ad_2 and ad_3 . Chaetome of legs (without tarsi): I: 1-4-5(2)-5(1); II: 1-4-4(1)-3(1); III: 3-2-3(1)-3(1); IV: 3-2-3(1)-3(1). Tarsi heterotridactylous.

MATERIAL. Holotype and 4 paratypes: Singapore, Botanical Gardens, 8 IV 1981, forest floor litter & buttress litter, leg. J. KETHLEY; holotype and 2 paratypes in FMHD, 2 paratypes in DATE.

ETYMOLOGY. The species is named after the Singapore State.

DIAGNOSIS AND COMPARISON. The new species is similar to pantropical species *A. lebronneci* (JACOT, 1935) in the double lateral carinae of prodorsum but it is distinguishable by the longer sensilli, 7 pairs of genital setae and different arrangement of adanal setae.

DISTRIBUTION. Singapore, probably an endemic species.

***Euphthiracarus cathayanus* MAHUNKA, 2000**

(Tab. V, figs 1-8)

DIAGNOSIS. Measurements: length of prodorsum 173-184, length of notogaster setae 300-326, height of notogaster 214-230. Body covered with large alveoles. Prodorsum with two pairs of lateral carinae, upper one thicker than lower one; sensilli long, swollen in distal end and covered with blunt spines; setae very short, spinose distally (except exobothridial setae), the length of interlamellar setae shorter than distance between interlamella and lamellar setae; interlamellar setae longer and thicker than the remaining ones. Notogaster with short setae distinctly spinose in distal part. Nine pairs of genital setae with arrangement: 6: 3, 3 pairs of setae anteriorly of suture kag smaller than posterior setae; two pairs of minute, equal in length aggenital setae. Legs monodactylous.

LOCALITY. China, Hong Kong, New Territories, 750 m, soil under *Persea* sp., 3 specimens (MAHUNKA 2000).

REMARK. This species is easily distinguishable by the faveolate sculpture of the body and very short prodorsal setae, interlamellar setae shorter than the distance between interlamellar and lamellar setae.

DISTRIBUTION. Hong Kong, probably an endemic species.

***Euphthiracarus foveolatus* AOKI, 1980**

NEW LOCALITY: Vietnam, Tam Dao, 900-1300 m, litter in rain forest, 05 IV 1997, leg. J. POMORSKI, 1 specimen.

DISTRIBUTION. The species known hitherto only from Japan.

***Euphthiracarus pakistanensis* HAMMER, 1977**

(Tab. VI, figs 1-3)

Euphthiracarus meghalayensis SANYAL, 1988 **syn. nov.**

The following characters indicate that *E. meghalayensis* is conspecific with *E. pakistanensis*: surface of body faveolate, two pairs of lateral carinae of prodorsum, 5 anterior genital setae considerably shorter than 4 posterior, arrangement and length of aggenital setae.

Locality of *E. meghalayensis*: India, Meghalaya, Shillong, 1929 m, pine forest, 3 specimens (SANYAL 1988).

DISTRIBUTION. Species known from Pakistan and India.

***Rhysotritia ardua* (C.L. KOCH, 1841)**

NEW LOCALITIES: India, Tumkur District, 75 km NW Bangalore, Devarayadurga, 1000 m, 6 Aug. 1986, mixed litter under *Cassia siamea*, *Lantana*, *Eucalyptus*, sandy soil, leg. V. BEHAN, 1 specimen.

Cambodia, Angkor Wat, litter from secondary forest, 29 VIII 2001, leg. W. NIEDBALA, 1 specimen.

DISTRIBUTION. A semicosmopolitan species.

***Rhysotritia comteae* MAHUNKA, 1983**

NEW LOCALITIES: Malaysia, Kuala Lumpur, 20 mi NE Kuala Lumpur, Ulu Gombak For. Res., 13 IV 1981, Brtam palm litter, leg. J. KETHLEY, 1 specimen; Kuala Lumpur, 20 mi NE Kuala Lumpur, Ulu Gombak For. Res., 13 IV 1981, thorny palm litter, leg. J. KETHLEY, M. NADCHATRAM and R.A. HASSAN, 2 specimens.

DISTRIBUTION. A pantropical species.

***Rhysotritia corletti* MAHUNKA, 2000**

(Tab. VII, figs 1-7)

DIAGNOSIS. Measurements. Length of prodorsum 260-271, length of notogaster 524-550, height of notogaster 360-366. Surface of body punctate. Prodorsum with one pair of lateral carinae with distal end like indistinct fork; sensilli and setae as in *R. ardua*, sensilli with narrow pedicel and swollen head covered with small

spines, setae (except exobothridial ones) erect, covered with small spines in distal half. Notogastral setae baciliform, spinose distally. Nine pairs of genital and two pairs of aggenital setae present. Legs heterotridactylous.

LOCALITY. China, Hong Kong, New Territories, 750 m, soil under *Persea* sp., 2 specimens (MAHUNKA 2000).

REMARK. This species is similar to *R. ardua* (C.L.KOCH, 1841) and *R. comteae* MAHUNKA, 1983. Fundamental character of this species is the presence of indistinct fork in distal end of lateral carinae of prodorsum.

DISTRIBUTION. Hong Kong, probably an endemic species.

***Rhysotritia sinensis* (JACOT, 1923)**

(Tab. VIII, figs 1-3)

Rhysotritia ardua jinyunia LI, CHEN and LI, 1990 **syn. nov.**

DIAGNOSIS. All characters as *R. ardua* (C.L.KOCH, 1841), only the legs are monodactylous. The species differs from *R. aokii* NIEDBAŁA, 2000 by the aggenital setae arranged in a vertical row.

Let me repeat what I indicated in NIEDBAŁA (2000), namely that I suspect that *R. rasile* MAHUNKA, 1982 and *R. spiculifera* MAHUNKA, 1991 are conspecific with this species.

NEW LOCALITY: Malaysia, Kuala Lumpur, 20 mi NE Kuala Lumpur, Ulu Gombak For. Res., 13 IV 1981, Brtam palm litter, leg. J. KETHLEY, 1 specimen.

DISTRIBUTION. An Oriental species.

***Sumatrotritia murphyi* MAHUNKA, 1999**

(Tab. VIII, figs 4-7)

This species was described from Singapore. I have found one specimen from almost the same locality. I have noted a few additional morphological features.

DIAGNOSIS. Measurements of a single specimen. Prodorsum: length 328, width 232, height 116, sensillus 106, setae: interlamellar 53.1, lamellar 111, rostral 86.0; notogaster: length 631, width 40.9, height 439, setae: c_l 126, d_l 78.4, h_l 83.5, ps_l 70.8; genitoaggenital plate 157x63.2, anoanal plate 273x50.6.

All principal diagnostic characters are exactly as in the description of MAHUNKA (1999): sensilli with fusiform head covered with small spines, rostral and lamellar setae stronger than interlamellar setae, four pairs of genital setae, posterior pairs considerably longer than others. It should be added that aggenital setae are shorter than genital setae and adanal setae are longer than anal setae.

COMPARISON. This species is distinguishable from congeners by the faint interlamellar setae and length of genital setae.

NEW LOCALITY: Singapore, Bukit Timah Nat. Res., 11 IV 1981, litter on logs, leg. J. KETHLEY, one specimen.

DISTRIBUTION. Singapore, probably an endemic species.

***Microtritia tropica* MÄRKEL, 1964**

NEW LOCALITY: Singapore, Botanical Gardens, 8 IV 1981, forest floor litter & buttress litter, leg. J. KETHLEY, 1 specimen.

DISTRIBUTION. A Pantropical species.

***Phthiracarus abstemius* NIEDBAŁA, 1989**

NEW LOCALITY: Vietnam, Tam Dao, 900-1300 m, litter in rain forest, 05 IV 1997, leg. J. POMORSKI, 1 specimen.

DISTRIBUTION. Vietnam, probably an endemic species.

***Phthiracarus globosus* (C.L.KOCH, 1841)**

NEW LOCALITY: Sabah, Mt. Kinabalu N. P., Laban Rata, 3200-3250 m, 4 V 1987, leg. A. SMETANA, 1 specimen.

DISTRIBUTION. Holarctic species probably introduced to Sabah.

***Phthiracarus obscurus* NIEDBAŁA, 1986**

NEW LOCALITIES: Sabah, Mt. Kinabalu N.P., Hq. at Livagu Rv., 1500 m, 21 IV 1987, leg. A. SMETANA, 1 specimen; Mt. Kinabalu N.P., base St. Johns Peak, 3950-4000 m, 20 V 1987, leg. A. SMETANA, 7 specimens

DISTRIBUTION. An Oriental species.

***Phthiracarus ornatus* MAHUNKA, 1991**

(Tab. IX, figs 1-5)

Phthiracarus (Archiphthiracarus) ornatus MAHUNKA, 1991

This species was described from Sabah. In the recent samples I have found some specimens from almost the same localities. I have noted a few additional morphological features.

DESCRIPTION. Measurements of a single specimen: prodorsum: length 398, width 252, height 131, sensillus 32.9, setae: interlamellar 75.9, lamellar 65.8, rostral 43.0, exobothridial 50.6; notogaster: length 656, width 475, height 459, setae: c_1 , h_1 and ps_1 70.8; genitoaggenital plate 167x252, anoadanal plate 404x187.

Colour brown, grey brown or dark brown. Surface of body punctated. Prodorsum with lateral carinae very long; median carina robust; lateral side covered with longitudinal striation; sigillar fields normally developed; sensilli short, fusiform, pointed distally; setae filiform; $in > le > ex > ro$. Notogaster with 15 pairs of short, filiform and flagelliform setae; vestigial setae f_1 located anteriorly of h_1 setae; all lyrifissures ia , im , ip and ips present. Formula of genital setae: 4+3: 2; anoadanal plates with 5 pairs of setae, setae ad_1 and ad_2 vestigial; anal setae longer than ad_3 setae. Chaetome of legs complete; setae d of femora I long and remote from distal end of article.

DIAGNOSIS. Presence of median carina of prodorsum, short setae and vestigial setae f_1 located anteriorly of h_1 setae distinguish this species from congeners.

LOCALITIES. Borneo, Sabah, Mt. Kinabalu N.P., summit Tr. Pondok Lowii 2300-2400 m, 28 IV 1987, leg. A. SMETANA, 5 specimens; Mt. Kinabalu N.P., below Layang Layang, 2590 m, 1 V 1987, leg. A. SMETANA, 8 specimens, as above, 2595 m, 4 specimens; Mt. Kinabalu N.P., above Gunting Lagadan, 3 400 m, 19 V 1987, leg. A. SMETANA, 5 specimens; Mt. Kinabalu N. P., Hq. Livagu Rv, 1 500 m, 18 V 1987, leg. A. SMETANA, 1 specimen; Mt. Kinabalu N.P., Poring Hot Springs, 480 m, 8 V 1987, leg. A. SMETANA, 1 specimen.

DISTRIBUTION. Borneo, Sabah, probably an endemic species.

***Phthiracarus pondoklowii* n. sp.**

(Tab. X, figs 1-5)

DESCRIPTION. Measurements of holotype: prodorsum: length 384, width 267, height 136, sensillus 63.0, setae: interlamellar 106, lamellar 81.0, rostral 83.5, exobothridial 55.7; notogaster: length 747, width 535, height 576, setae: c_1 114, h_1 88.5, ps_1 116; genitoaggenital plate 167x126 anoadanal plate 252x111. Colour brown dark and light. Surface of body punctated. Prodorsum with dorsal and lateral fields well visible. Lateral carinae very long. Sensilli short, fusiform. Setae slender, $in > ro > le > ex$. Notogaster with 15 pairs of short and slender setae. All four pairs of lyrifissures ia , im , ip and ips present. Vestigial setae f_1 located anteriorly of h_1 setae. Formula of genital setae is 4+3: 2. Anoadanal plates with 5 pairs of setae, setae ad_1 and ad_2 minuscule and considerably shorter than other setae. Chaetome of legs complete; setae d of femora I long and remote from distal end of article.

MATERIAL. Holotype and 32 paratypes: Borneo, Sabah, Mt. Kinabalu N.P., summit Tr. Pondok Lowii 2300-2400 m, 28 IV 1987, leg. A. SMETANA; 15 paratypes: Mt. Kinabalu N.P., below Layang Layang, 2590 m, 1 V 1987, leg. A. SMETANA; 20 paratypes: as above, 2595 m; 84 paratypes: Mt. Kinabalu N.P., above Gunting Lagadan, 3 400 m, 19 V 1987, leg. A. SMETANA; 2 paratypes: Mt. Kinabalu N. P., Hq. Livagu Rv, 1 500 m, 18 V 1987, leg. A. SMETANA; 1 paratype: Mt. Kinabalu N.P., Hq. at Livagu Rv., 1500 m, 25 IV 1987, leg. A. SMETANA; 1 paratype: Kinabalu N.P., above Poring Hot Springs, 520 m, 9 V 1987, leg. A.

SMETANA; 3 paratypes: Mt. Kinabalu N.P., Paka Cave, 2997 m, 6 V 1987, leg. A.

SMETANA; 3 paratypes: Mt. Kinabalu N.P., Paka Cave, 2997 m, 6 V 1987, leg. A.

SMETANA. Holotype and 88 paratypes in FMHD, 73 paratypes in DATE.

ETYMOLOGY. The specific epithet refers to the locality of holotype at Pondok Lowii Trail in Sabah.

DIAGNOSIS AND COMPARISON. The new species is similar to Palearctic species *P. lentulus* (C.L.KOCH, 1841) and Oriental species *P. invenustus* NIEDBALA, 2000 but is distinguishable by presence of 4 pairs of lyrifissures of notogaster and minuscule adanal setae ad_1 and ad_2 .

DISTRIBUTION. Sabah, probably an endemic species.

***Phthiracarus pygmaeus* BALOGH, 1958**

NEW LOCALITY: Singapore, Botanical Gardens, 8 IV 1981, forest floor litter & buttress litter, leg. J. KETHLEY, 1 specimen.

DISTRIBUTION. A Pantropical species.

***Phthiracarus setosus* (BANKS, 1895)**

Phthiracarus (*Archiphthiracarus*) *hirsutus* FUJIKAWA, 2003 **syn. nov.**

All characters indicate that *P. (A.) hirsutus* is conspecific with *P. setosus*.

NEW LOCALITY: Japan, Aomori Prefecture, Shirakami-sanchi World Heritage Area, surface layer of forest floor (620 m above sea), 3 X 1999, leg M. SATO, Y NAKAMURA and T. FUJIKAWA. 12 specimens (FUJIKAWA 2003).

DISTRIBUTION. An Holarctic species.

***Plonaphacarus aculeatus* (MAHUNKA, 1995)**

(Tab. XI, figs 1-6)

Hoplophthiracarus (*Plonaphacarus*) *aculeatus* MAHUNKA, 1995

This species was described from Brunei. In the recent samples I have found some specimens from nearby Sarawak. I have noted a few additional morphological features.

REDESCRIPTION. Measurements of a single specimen: prodorsum: length 338, width 237, height 121, sensillus 81.0, setae: interlamellar 192, lamellar 78.4, rostral 81.0, exobothridial 30.4; notogaster: length 641, width 449, height 419, setae: c_1 215, h_1 233, ps_1 240; genitoaggenital plate 152x106 anoadanal plate 197x96. Colour brown, light. Surface of body covered with strong alveoles. Prodorsum with short lateral carinae; dorsal field with anterior incision, lateral fields longer than dorsal; sensilli long, rough with fusiform head covered with small spines; setae (except exobothridial) thick, conical, stout, covered with small spines in distal half. Notogaster with 28-32 pairs of setae (never 40 pairs as

calculated by MAHUNKA 1995), stout, covered with small spines in distal half; additional setae in rows *c*, *h* and *ps*; only lyrifissures *ia* visible; setae *h* of mentum shorter than distance between them. Formula of genital setae: 4+2: 3; setae *ad*₁ and *ad*₂ considerably longer than other setae of anoanal plates; all setae rough. Setae *d* of femora I stout and located almost at the end of article.

NEW LOCALITIES: Sarawak, Kapit Dist., near Ng. Tekalit, 5 I 1972, fallen rotten fruit, leg. K. FROGNER, 1 specimen; Sarawak, Kapit Dist., near Ng. Tekalit, 17 III 1972, buttress litter, leg. K. FROGNER, 1 specimen; Kapit Dist., near Ng. Tekalit, 17 III 1972, woodborer frass, leg. K. FROGNER, 1 specimen; Kapit Dist. Sunga; Baleh, Sunga, Mengiong, near Ng. Tekalit, 13 XI 1971, hilly rainforest, conc. litter under fig tree, leg. K. FROGNER, 1 specimen. Kapit Dist., near Ng. Tekalit, 12 I 1972, woodborer frass, leg. K. FROGNER, 1 specimen; Kapit Dist., near Ng. Tekalit, 22 III 1972, woodborer frass, leg. K. FROGNER, 1 specimen.

DISTRIBUTION. Nothern Borneo, probably an endemic species.

***Plonaphacarus dispar* NIEDBAŁA, 200**

NEW LOCALITY: Sabah, Mt. Kinabalu N.P., Poring Hot Springs, 480 m, 8 V 1987, leg. A. SMETANA, 4 specimens.

DISTRIBUTION. Borneo, probably an endemic species.

***Plonaphacarus kugohi* (AOKI, 1959)**

NEW LOCALITIES: Thailand, 100 km NE from Chiang Mai, litter from primary forest, 14 VIII 2001, leg. W. NIEDBAŁA, 1 specimen; Singapore, Botanical Gardens, 8 IV 1981, forest floor litter & buttress litter, leg. J. KETHLEY, 6 specimens; Singapore, Bukit Timah Nat. Res., 11 IV 1981, litter on logs, leg. J. KETHLEY, 3 specimens; Bukit Timah, Bukit Timah Nat. Res., 11 IV 1981, forest floor litter, leg. J. KETHLEY, 8 specimens; Malaysia, Sarawak, Kapit Dist., near Ng. Tekalit, 12 II 1972, leaf litter, leg. K. FROGNER, 1 specimen; Sarawak, Kapit Dist., near Ng. Tekalit, 17 III 1972, buttress litter, leg. K. FROGNER, 2 specimens; Sarawak, Kapit Dist., near Ng. Tekalit, 7 I 1972, frass u. stump bark, leg. K. FROGNER, 1 specimen; Sabah, Mt. Kinabalu N.P., Poring Hot Springs, 480 m, 8 V 1987, leg. A. SMETANA, 2 specimens; Mt. Kinabalu N.P., below Layang Layang, 2590 m, 1 V 1987, leg. A. SMETANA, 4 specimens; Mt. Kinabalu N.P., Hq. at Livagu Rv., 1500 m, 21 IV 1987, leg. A. SMETANA, 1 specimen; Mt. Kinabalu N.P., sumit trail Pondok Ubah, 2050 m, 26 IV 1987, leg. A. SMETANA, 2 specimens

DISTRIBUTION. A Pantropical species.

***Plonaphacarus* (?) *punctatus* (MONDAL and KUNDU, 1988)**

(Tab. XII, figs 1,2)

DIAGNOSIS. Measurements. Prodorsum: length 347-360, height 144-162, sensilli 70-81, setae: interlamellar 124-134, lamellar 53-58, rostral 28-32; notogaster:

length 644-653, height 545-635, setae 92-144. Prodorsum densely punctate, foveolated anterodorsally, lateral carinae short; sensilli with long, narrow pedicel and rounded head; interlamellar setae long, erect, stout, barbed in distal half, lamellar setae finely barbed distally, rostral setae erect, smooth. Notogaster densely punctate with setae erect, barbed. Nine pairs of genital setae in two rows with formula 4: 5; adanal setae ad_1 and ad_2 longer than other setae of anoadanal plates.

LOCALITIES. India, West Bengal, Darjeeling, 2100-2300 m, Tonglu and Ghum-Simana forest range, 4 specimens (MONDAL and KUNDU 1988).

REMARK. According to the arrangement of genital setae this species belongs to the genus *Plonaphacarus* NIEDBALA, 1986. In my opinion this species is conspecific with *Plonaphacarus kugohi* (AOKI, 1959), only lamellar setae are different, barbed distally. Without careful analysis of the type it is difficult to take a final decision.

DISTRIBUTION. India, probably an endemic species.

***Hoplophthiracarus bengalensis* SANYAL, 1992**

(Tab. XII, figs 3,4)

DIAGNOSIS. Measurements. Prodorsum: length 332, height 149, sensilli 63, setae: interlamellar 109, lamellar 21, rostral 34; notogaster: length 548, height 415. Body punctate but prodorsum posteriorly and notogaster foveolate, lateral carinae short; sensilli with slender stalk and with swollen head; interlamellar setae erect, stout, barbed distally, lamellar setae shorter than rostral setae, smooth, rostral setae short, smooth. Notogastral setae covered with small spines in distal half, blunt at tip. Nine pairs of genital setae arranged in one line; adanal setae ad_1 and ad_2 longer than other setae of anoadanal plates.

LOCALITY. India, West Bengal, Birbhum, litter, 5 specimens (SANYAL 1992).

REMARK. According to the arrangement of genital setae this species belongs to the genus *Hoplophthiracarus* JACOT, 1933. It is very similar to *H. concinuus* NIEDBALA, 1982 or *H. pakistanensis* (HAMMER, 1977). Probably it is conspecific with one of them.

DISTRIBUTION. India, probably an endemic species.

***Hoplophthiracarus tropicus* MONDAL and KUNDU, 1988**

(Tab. XIII, figs 1,2)

DIAGNOSIS. Measurements. Prodorsum: length 265-270, height 112-117, sensilli 68-103, setae: interlamellar 103-121, lamellar 22-25, rostral 23-27; notogaster: length 517-531, height 432-472, setae 68-117. Body coarsely foveolate. Prodorsum with short lateral carinae; sensilli slender with rounded head; setae barbed distally, interlamellar setae erect, stout, lamellar and bent rostral setae similar in length. Notogaster with erect, stiff and barbed setae. Nine pairs of genital setae arranged in one line; adanal setae ad_1 and ad_2 longer than other setae of anoadanal plates.

LOCALITIES. India, West Bengal, Darjeeling, 350-3000 m, Tonglu and Singalila forest range, 12 specimens (MONDAL and KUNDU 1988)

REMARK. According to the arrangement of genital setae this species belongs to the genus *Hoplophthiracarus* JACOT, 1933. It is very similar to *H. concinuus* NIEDBAŁA, 1982 and *H. pakistanensis* (HAMMER, 1977). Probably it is conspecific with one of them.

DISTRIBUTION. India, probably an endemic species.

***Austrophthiracarus sarawaki* NIEDBAŁA, 2000**

NEW LOCALITY: Malaysia, Sarawak, Kapit Dist., near Ng. TEKALIT, 19 III 1972, flower litter, leg. K. FROGNER, 1 specimen.

DISTRIBUTION. Sarawak, probably an endemic species.

***Arphthi-carus sentus* (NIEDBAŁA, 1989)**

NEW LOCALITIES: Vietnam, Do San, seashore, rock sward, 900-1300 m, 12 IV 1997, leg. J. POMORSKI, 1 specimen; Tam Dao, 900-1300 m, litter in rain forest, 05 IV 1997, leg. J. POMORSKI, 1 specimen.

DISTRIBUTION. An Oriental species.

***Atropacarus (Hoplophorella) cucullatus* (EWING, 1909)**

NEW LOCALITY: Sarawak, Kapit Dist., near Ng. Tekalit, 20 III 1972, buttress litter, leg. K. FROGNER, 2 specimens.

DISTRIBUTION. A Pantropical species.

***Atropacarus (Hoplophorella) hamatus* (EWING, 1909)**

NEW LOCALITY: Singapore, Labrador Park, 21 IV 1981, seashore leaf litter, leg. J. KETHLEY, 1 specimen.

DISTRIBUTION. A Pantropical species.

***Atropacarus (Hoplophorella) sabahnus* (MAHUNKA, 1991)**

(Tab. XIII, figs 3-8)

Hoplophorella sabahna MAHUNKA, 1991

This species was described from Sabah. In the new set of samples I have found one specimen from almost the same locality. I have noted a few additional morphological features.

DIAGNOSIS. Measurements of a single specimen: prodorsum: length 364, width 237, height 146, sensilli 37.9, setae: interlamellar 111, lamellar 27.8, rostral 45.5; notogaster: length 661, width 454, height 465, setae: c_1 104, h_1 106, ps_1 101;

genitoaggenital plate 177x139, anoadanal plate 253x142. Colour orange-red. Surface of body strongly foveolate. Prodorsum without lateral carinae; lateral sides covered with fine striation; sigillar fields and posterior furrows well developed; sensilli short with rounded head, covered with small spines; interlamellar setae stout covered with small spines in distal half; lamellar and rostral setae rough. Exobothridial setae vestigial. Notogastral setae stout, covered with small spines in distal half; setae c_3 situated near anterior border; vestigial setae f_1 located slightly anteriorly of h_1 setae; two pairs of lyrifissures ia and im present; setae h of mentum nearly equal to distance between them. Formula of genital setae: 5: 4; anoadanal plates with 5 pairs of setae; setae ad_1 and anal setae equal in length; setae ad_2 long and equilateral, even at distal end. Chaetome of legs complete; distal end of setae d of femora I bifurcated and located in the middle of article.

NEW LOCALITY: Borneo, Sabah, Mt. Kinabalu N.P., Paka Cave, 2997 m, 6 V 1987, leg. A. SMETANA, one specimen.

DIAGNOSIS. This species is well distinguishable by the shape of sensilli and setae ad_2 of anoadanal plates.

DISTRIBUTION. Borneo, Sabah, probably an endemic species.

***Atropacarus (Hoplophorella) singularis* (SELLNICK, 1959)**

NEW LOCALITY: Thailand, Prachuap Kiri Khan, Siamese Bay, litter from bushes. 25 VIII 2001, leg. W. NIEDBALA.

DISTRIBUTION. A Pantropical species.

***Atropacarus (Hoplophorella) vitrinus* (BERLESE, 1913)**

NEW LOCALITIES: India, Tumkur District, 75 km NW Bangalore, Devarayadurga, 1000 m, 6 Aug. 1986, mixed litter under *Cassia siamea*, *Lantana*, *Eucalyptus*, sandy soil, leg. V. BEHAN, 1 specimen; Thailand, Prachuap Kiri Khan, Siamese Bay, litter from bushes. 25 VIII 2001, leg. W. NIEDBALA, 6 specimens.

DISTRIBUTION. A Pantropical species.

***Atropacarus (Atropacarus) clavatus* AOKI, 1980**

NEW LOCALITY: Thailand, Prachuap Kiri Khan, Siamese Bay, litter from bushes. 25 VIII 2001, leg. W. NIEDBALA, 1 specimen.

DISTRIBUTION. The species known hitherto only from Japan.

SUMMARY

The paper is a supplement to the monograph on the ptyctimous mites of Oriental Region (NIEDBALA 2000). It presents diagnoses of the species described in

the papers published after 1998 and a few species from the papers published before this date, which were not available to me earlier.

A list of new localities from India, Thailand, Cambodia, Vietnam, Taiwan, Malaysia, and Singapore is given. On the basis of this new material seven species new to science have been described: *Mesoplophora* (*Mesoplophora*) *frogneri* n. sp., *Apoplophora* *kapiti* n. sp., *Apoplophora* *sarawaki* n. sp., *Apoplophora* *serrata* n. sp., *Apoplophora* *triquetra* n. sp., *Austrotrititia* *singaporensis* n. sp., and *Phthiracarus* *pondoklowii* n. sp. The species *Euphthiracarus* *meghalayensis* SANYAL, 1988 has been found conspecific with *Euphthiracarus* *pakistanensis* HAMMER, 1977, and *Phthiracarus* (*Archiphthiracarus*) *hirsutus* FUJIKAWA, 2003 with *Phthiracarus* *setosus* (BANKS, 1895).

From among 39 already known species, 12 were known only from the original description so they have been subjected to a detailed morphological analysis revealing or allowing more accurate specification of some morphological features, included in the redescriptions presented in this paper.

New localities for the following species: *O. chichijimensis*, *E. meghalayensis*, *P. globosus*, and *A.(A.) clavatus* have extended their hitherto known geographical ranges. In total the supplement presents 45 species: 8 Mesoplophoridae, 16 Euphthiracaroidae, and 21 Phthiracaroidae.

ACKNOWLEDGEMENTS

I am much grateful to Dr. P.P. PARILLO and Dr. D. SUMMERS from FMHD, Dr. V.M. BEHAN PELLETIER from CNCI, and Prof. J. POMORSKI from Zoological Institute, Wrocław University for the loan of the material used in this study.

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Table I. 1-4. *Mesoplophora (Mesoplophora) frogneri* n. sp. (holotype). 1 – prodorsum with anterior part of notogaster, dorsal view; 2 – prodorsum with anterior part of notogaster, lateral view; 3 – ventral region; 4 – notogaster, lateral view; 5-8. *Apoplophora kapiti* n. sp. (holotype). 5 – prodorsum, dorsal view; 6 – prodorsum, lateral view; 7 – ventral region; 8 – notogaster, lateral view

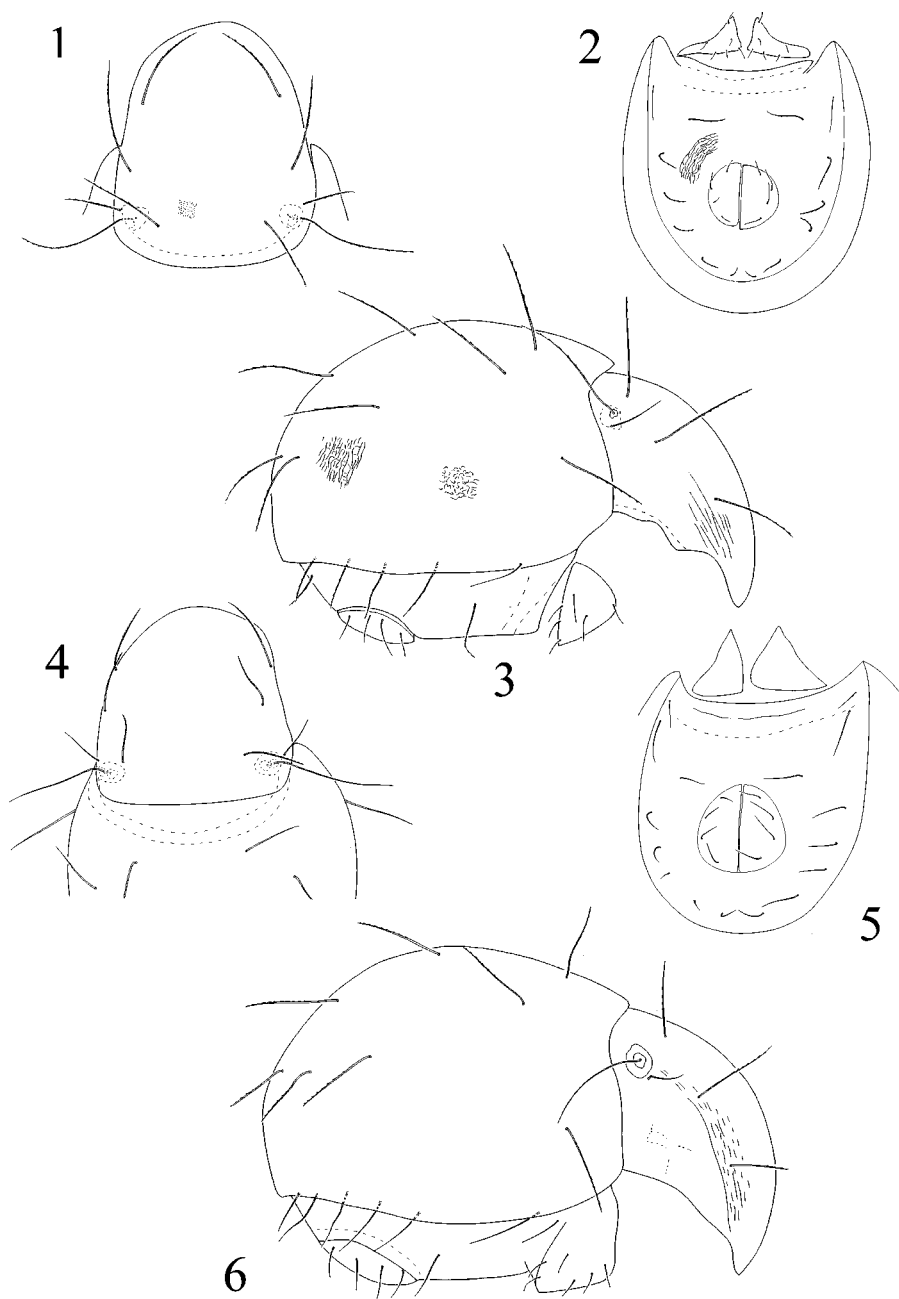


Table II. 1-3. *Apoplophora sarawaki* n. sp. (holotype). 1 – prodorsum, dorsal view; 2 – ventral region; 3 – lateral view of body; 4-6. *Apoplophora serrata* (holotype). 4 – prodorsum with anterior part of notogaster, dorsal view; 5 – ventral region, 6 – lateral view of body

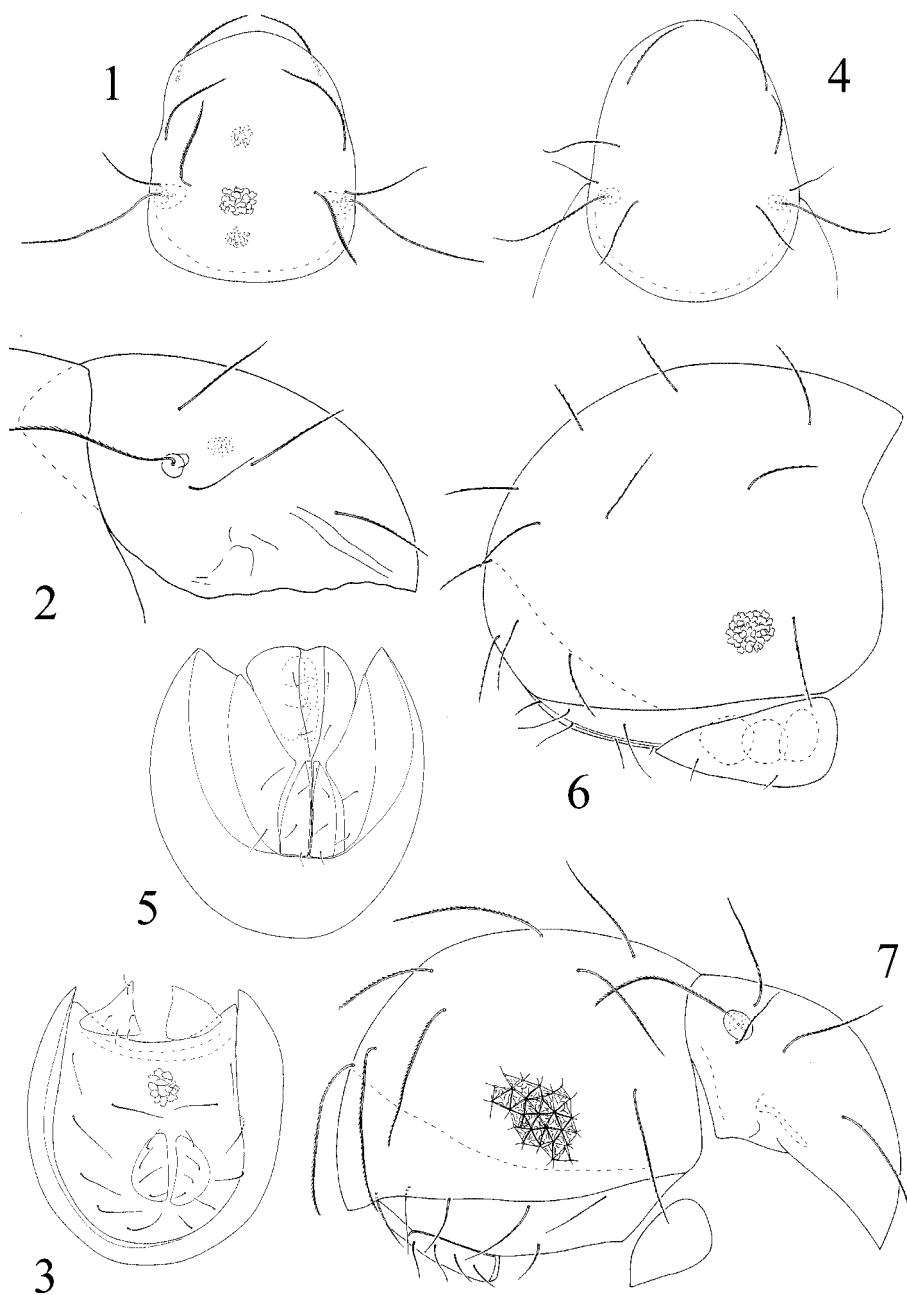


Table III. 1-7. *Apoplophora triquetra* n. sp. 1, 3, 7 adult (holotype); 2, 4-6 tritonymph. 1 – prodorsum, dorsal view, 2 – prodorsum, lateral view, 3 – ventral region, 4 – prodorsum, dorsal view, 5 – ventral region, 6 – notogaster, lateral view, 7 – lateral view of body

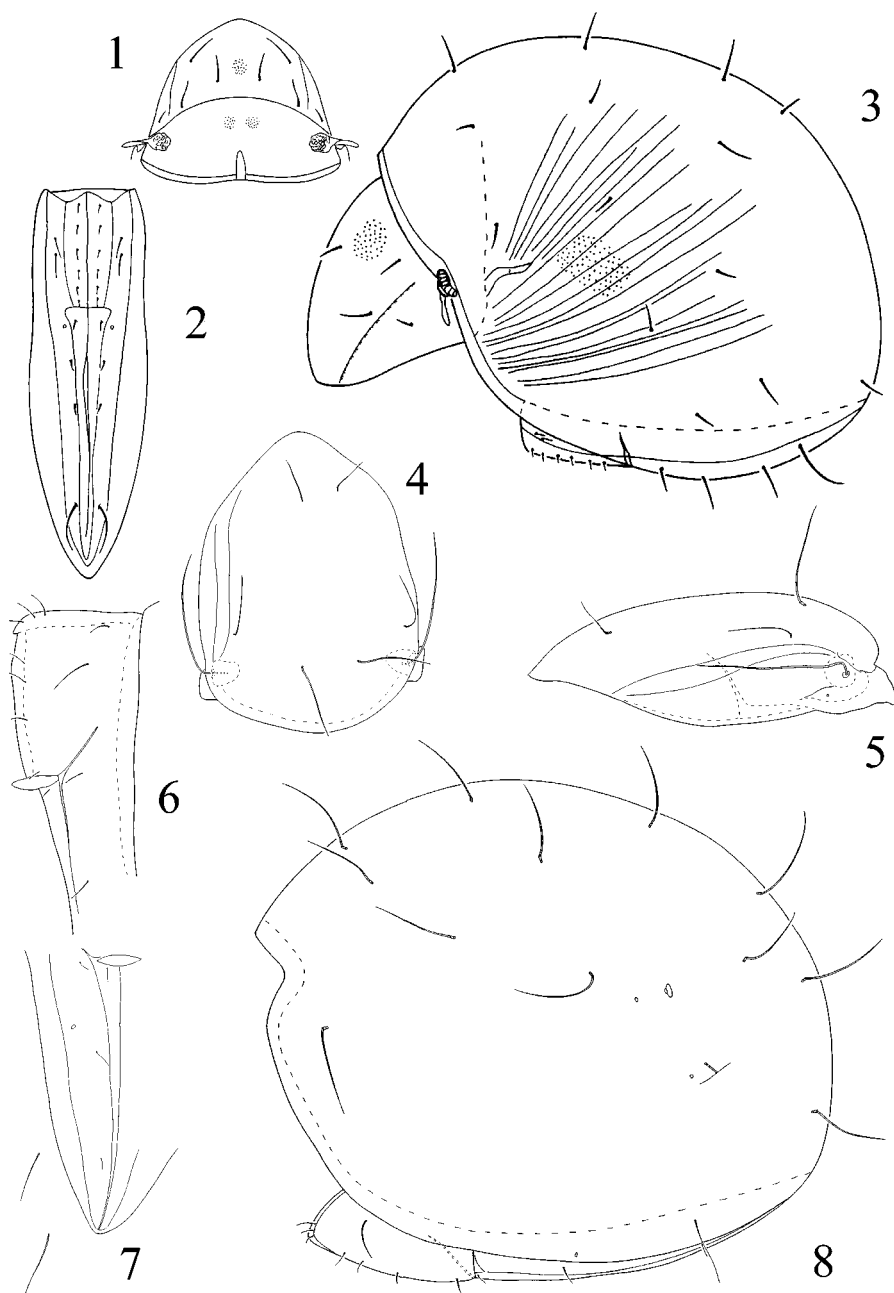


Table IV. 1-3. *Mesotritia indica* Sanyal, 1988 (after Sanyal 1988). 1 – prodorsum, dorsal view, 2 – ventral region, 3 – lateral view of body; 4-8. *Austrotritia singaporensis* n. sp. (holotype) 4 – prodorsum, dorsal view, 5 – prodorsum, lateral view, 6 – genitoaggenital plates, 7 – anal and adanal plates, 8 – notogaster, lateral view

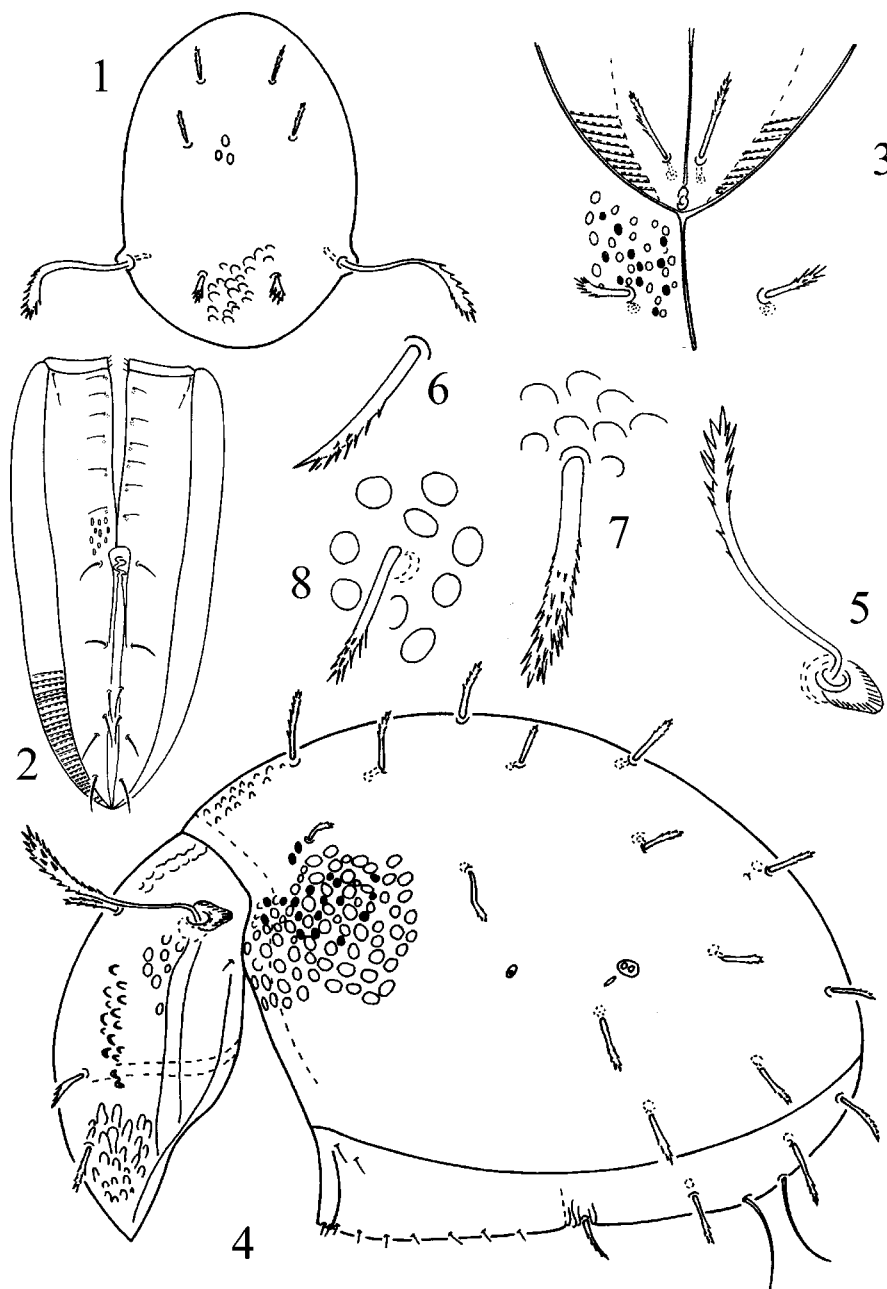


Table V. 1-8. *Euphthiracarus cathayanus* Mahunka, 2000 (after Mahunka 2000). 1 – prodorsum, dorsal view, 2 – ventral region, 3 – terminal fissure, 4 – lateral view of body, 5 sensillus, 6 – rostral seta, 7 – interlamellar seta, 8 – seta *cp*

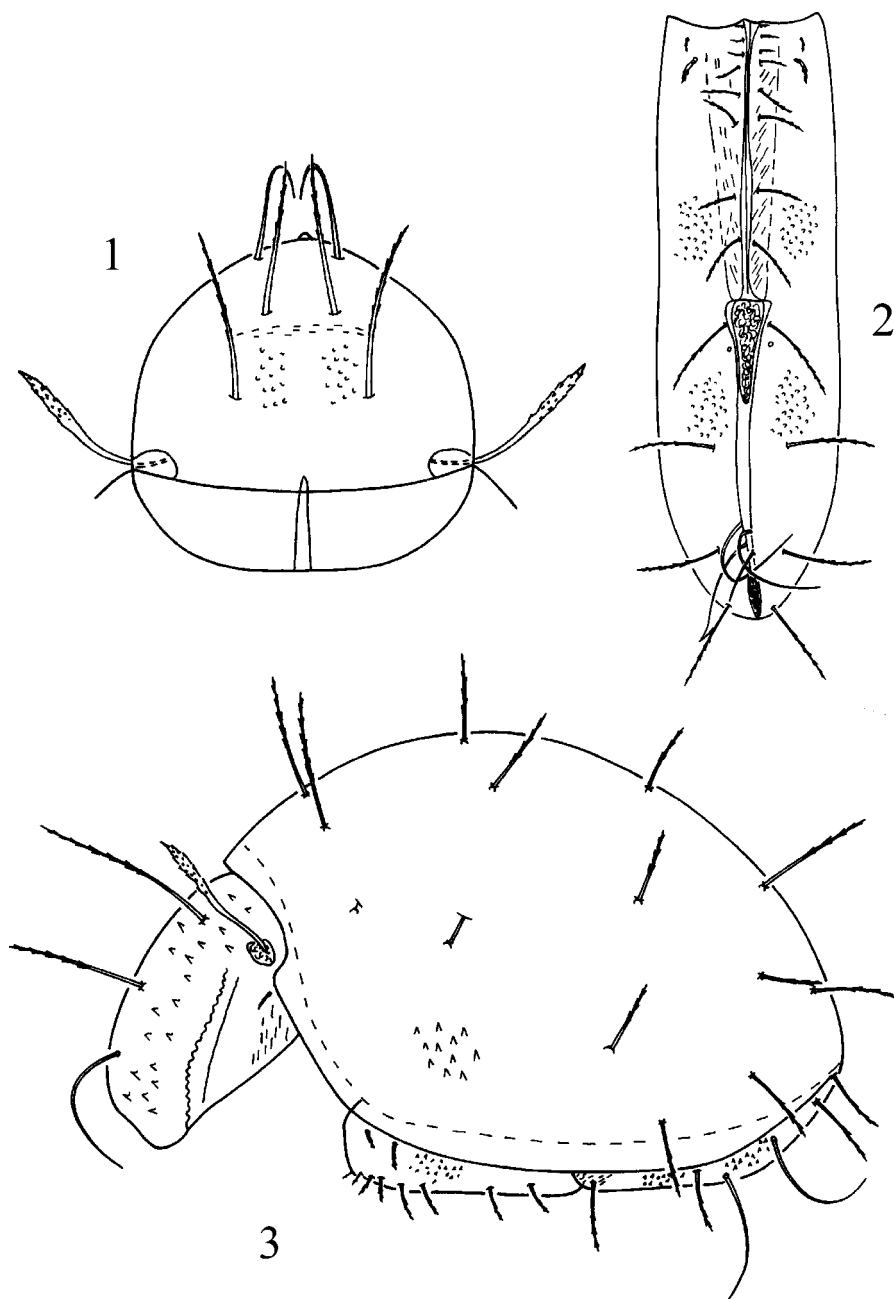


Table VI. 1-3. *Euphthiracarus meghalayensis* Sanyal, 1988 - syn. nov. of *Euphthiracarus pakistanensis* Hammer, 1977 (after Sanyal, 1988). 1 - prodorsum, dorsal view, 2 - ventral region, 3 - lateral view of body

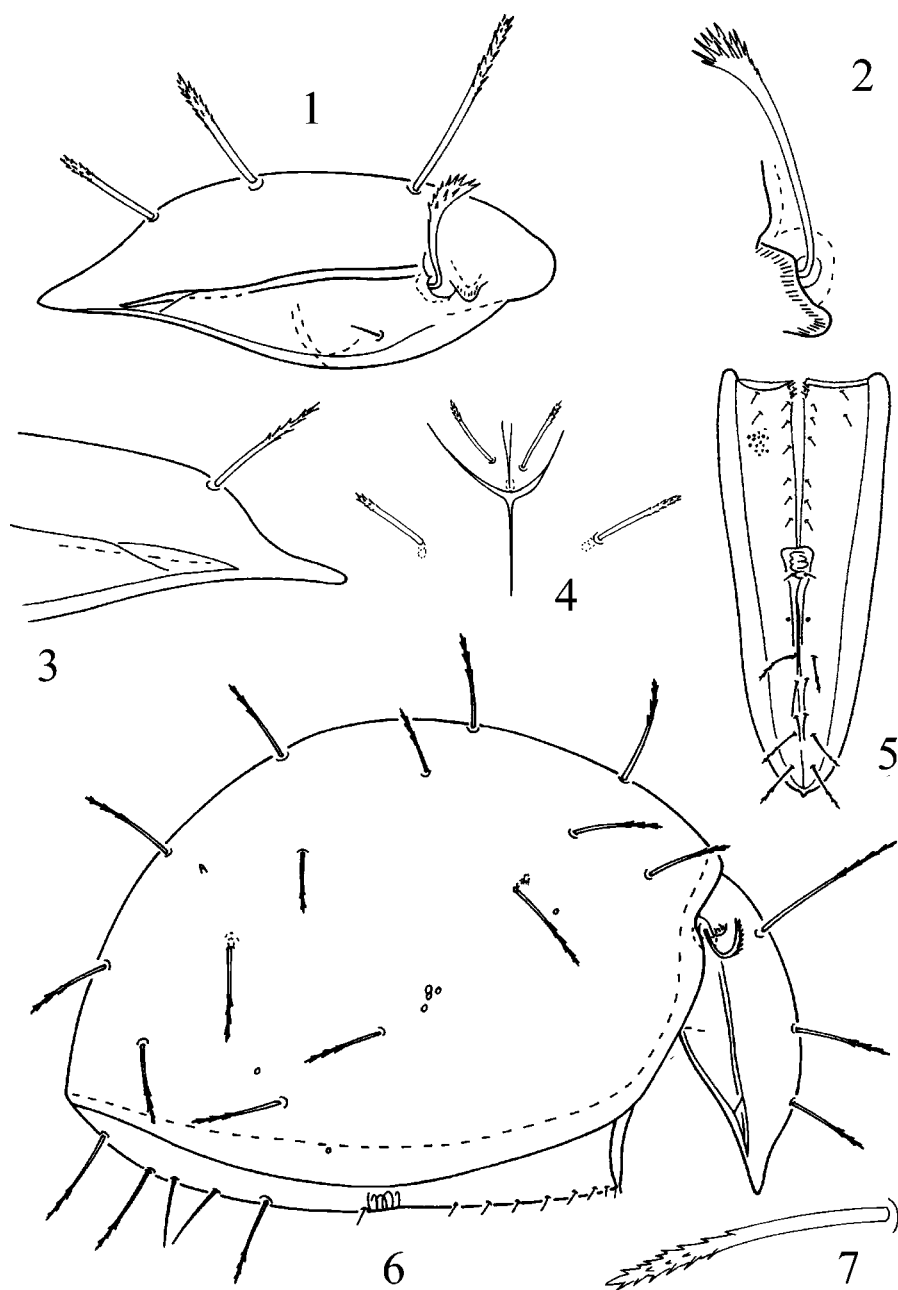


Table VII. 1-7. *Rhyssotritia corletti* Mahunka, 2000 (after Mahunka 2000). 1 – prodorsum, lateral view, 2 – sensillus, 3 – rostrum, 4 – terminal fissure, 5 – ventral region, 6 – lateral view of body, 7 – seta c_1

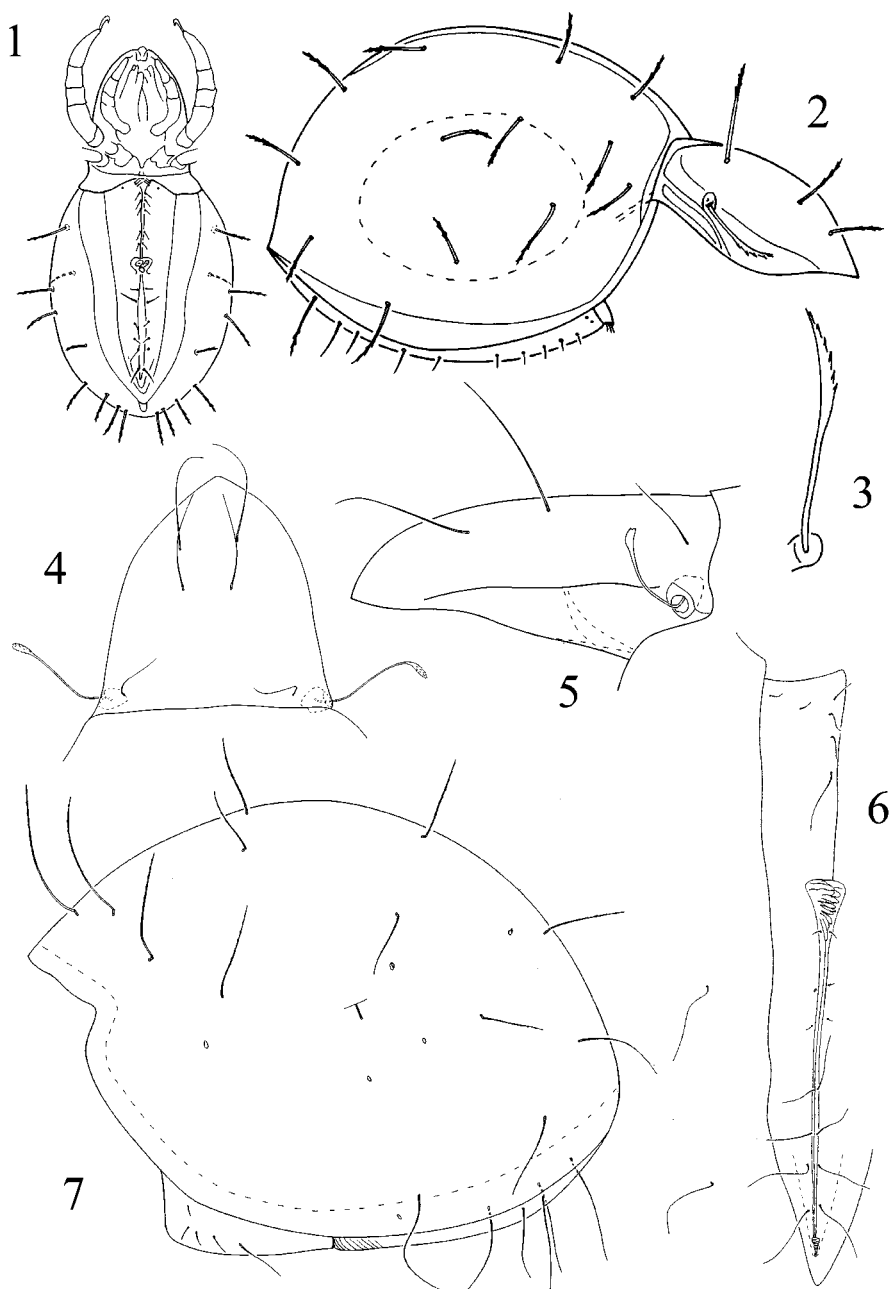


Table VIII. 1-3. *Rhysotritia ardua jinyunia* Li, Chen and Li, 1990 syn. nov. of *Rhysotritia sinensis* (Jacot, 1923) (after Li, Chen and Li, 1990). 1 – ventral view of body, 2 – lateral view of body, 3 – sensillus. 4-7. *Sumatrotritia murphyi* Mahunka, 1999 (specimen from sample FMHD 81-276, Singapore). 4 – prodorsum, dorsal view, 5 – prodorsum, lateral view, 6 – right side of ventral region; 7 – notogaster, lateral view

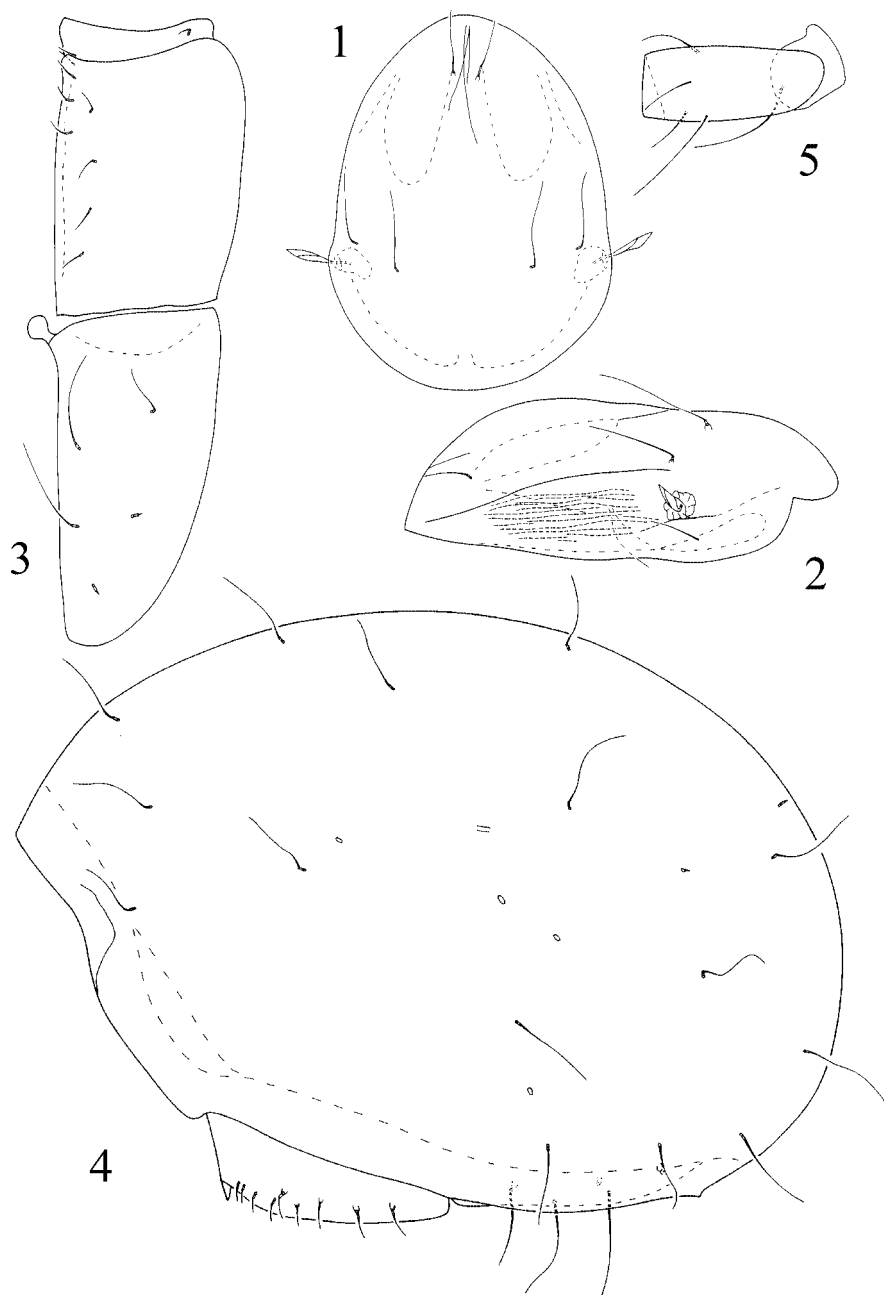


Table IX. 1-5. *Phthiracarus ornatus* Mahunka, 1991 (specimen from Sabah, Mt. Kinabalu, 2 400 m). 1 – prodorsum, dorsal view, 2 – prodorsum, lateral view, 3 – genitoaggenital and anoadanal plates, 4 – notogaster, lateral view, 5 – trochanter and femur of leg I

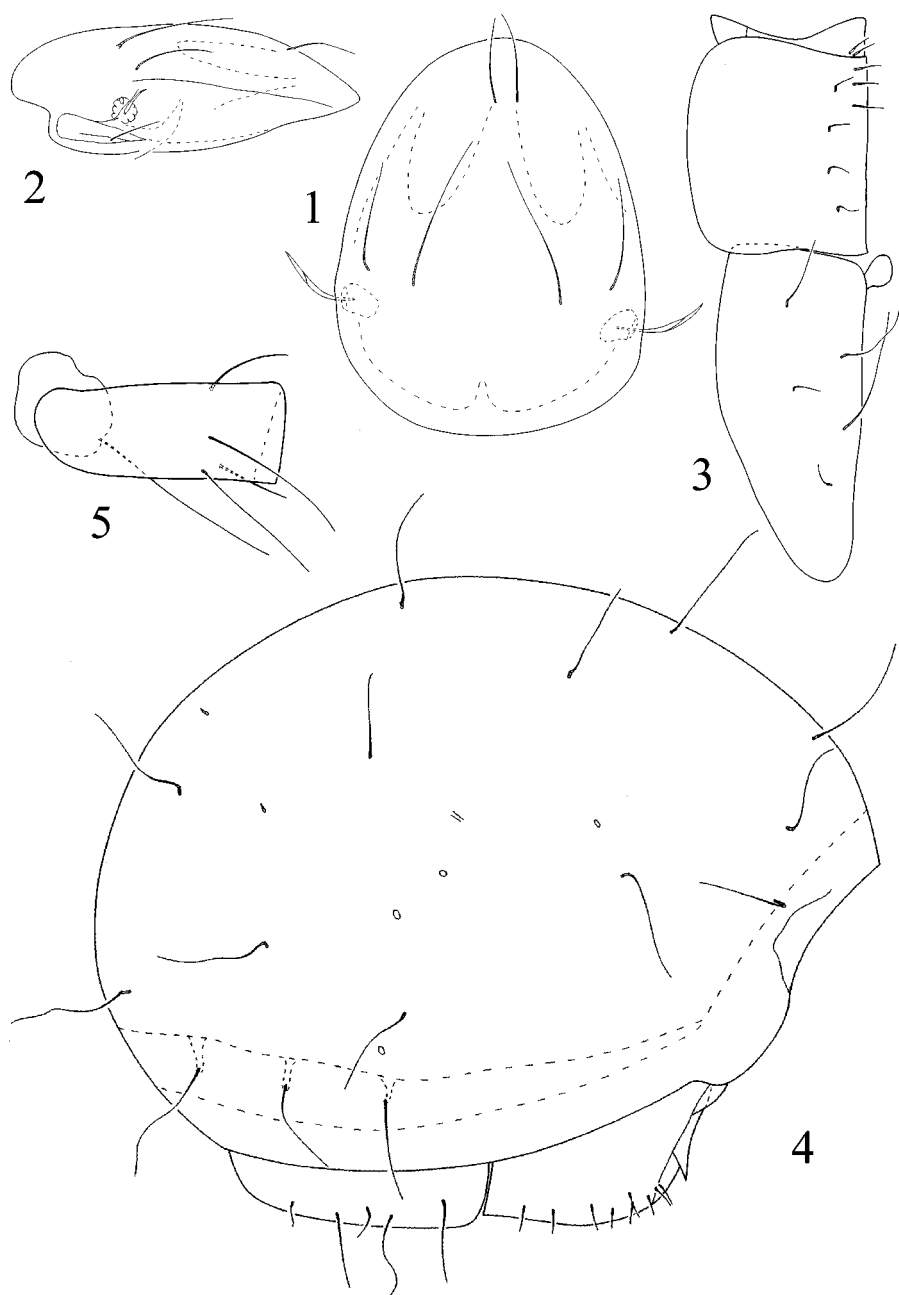


Table X. 1-5. *Phthiracarus pandoklowii* n. sp. (holotype). 1 – prodorsum, dorsal view, 2 – prodorsum, lateral view, 3 – genitoaggenital and anoadanal plates, 4 – notogaster, lateral view, 5 – trochanter and femur of leg I

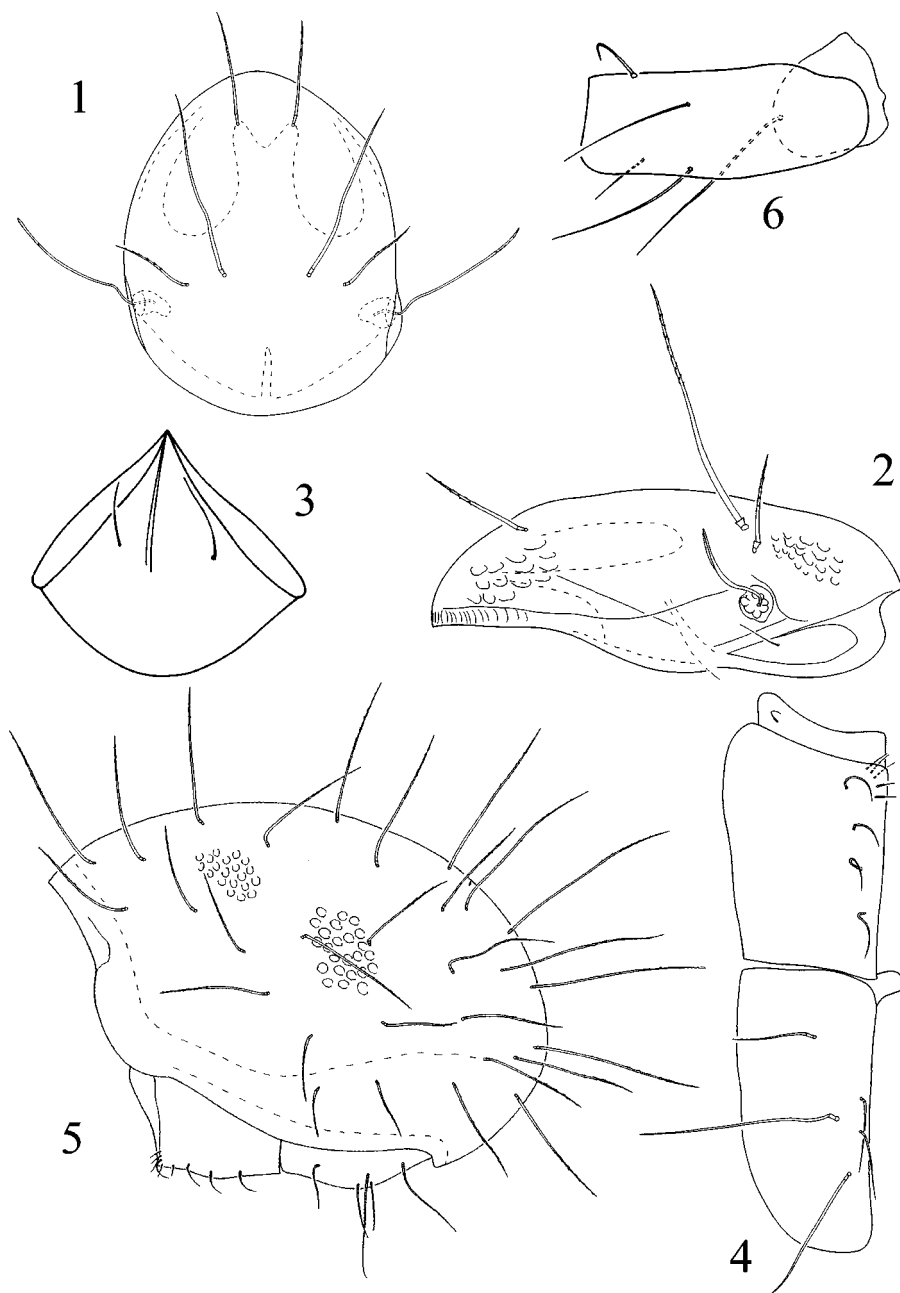


Table XI. 1-6. *Plonaphacarus aculeatus* (Mahunka, 1995) (specimen from sample FMHD 72-215, Sarawak). 1 – prodorsum, dorsal view, 2 – prodorsum, lateral view, 3 – mentum of infracapitulum, 4 – genitoaggenital and anoadanal plates, 5 – notogaster, lateral view, 6 – trochanter and femur of leg I

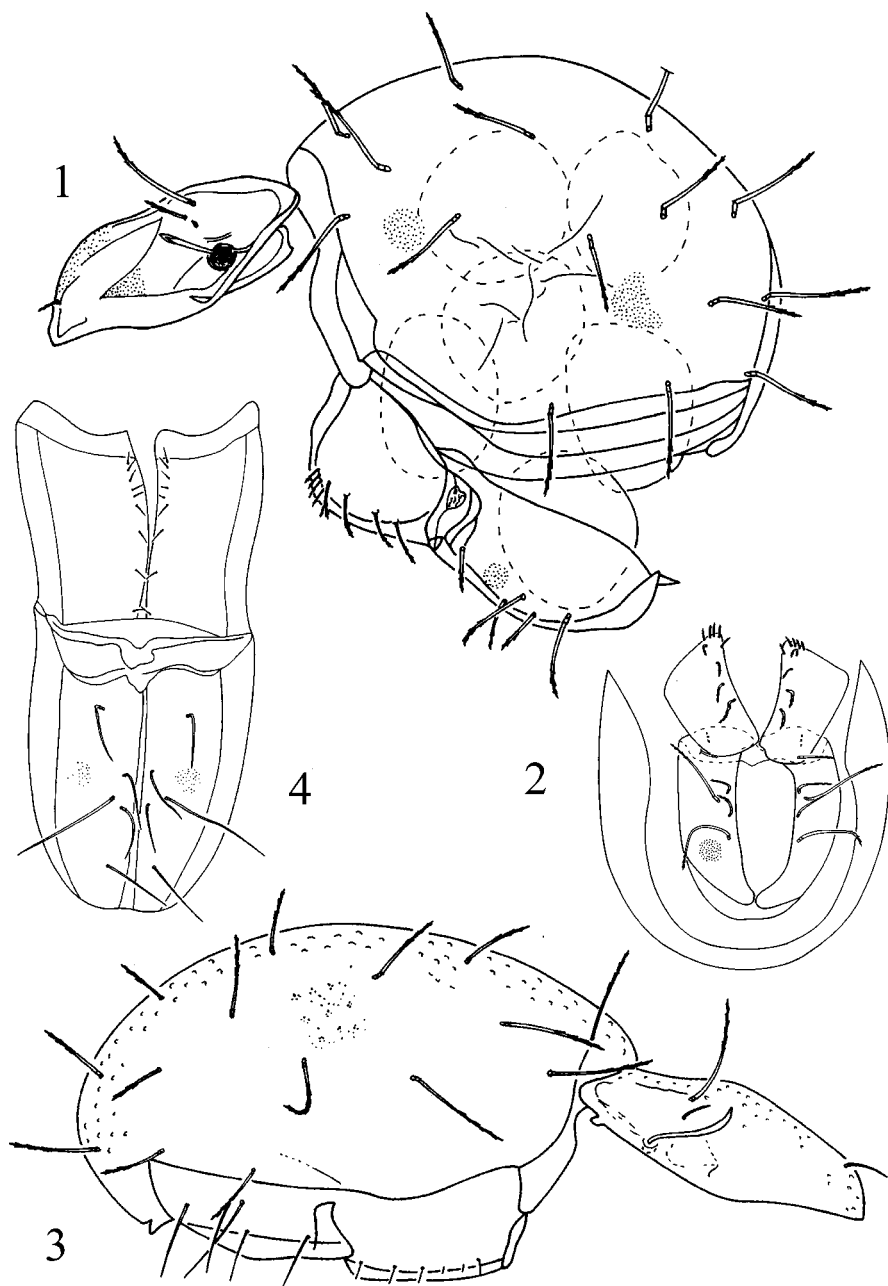


Table XII. 1, 2. *Plonaphacarus* (?) *punctatus* (Mondal and Kundu, 1988) (after Mondal and Kundu 1988). 1 – lateral view of body, 2 – ventral region; 3, 4. *Hoplophthiracarus bengalensis* Sanyal, 1992 (after Sanyal, 1992). 3 – lateral view of body, 4 – ventral region

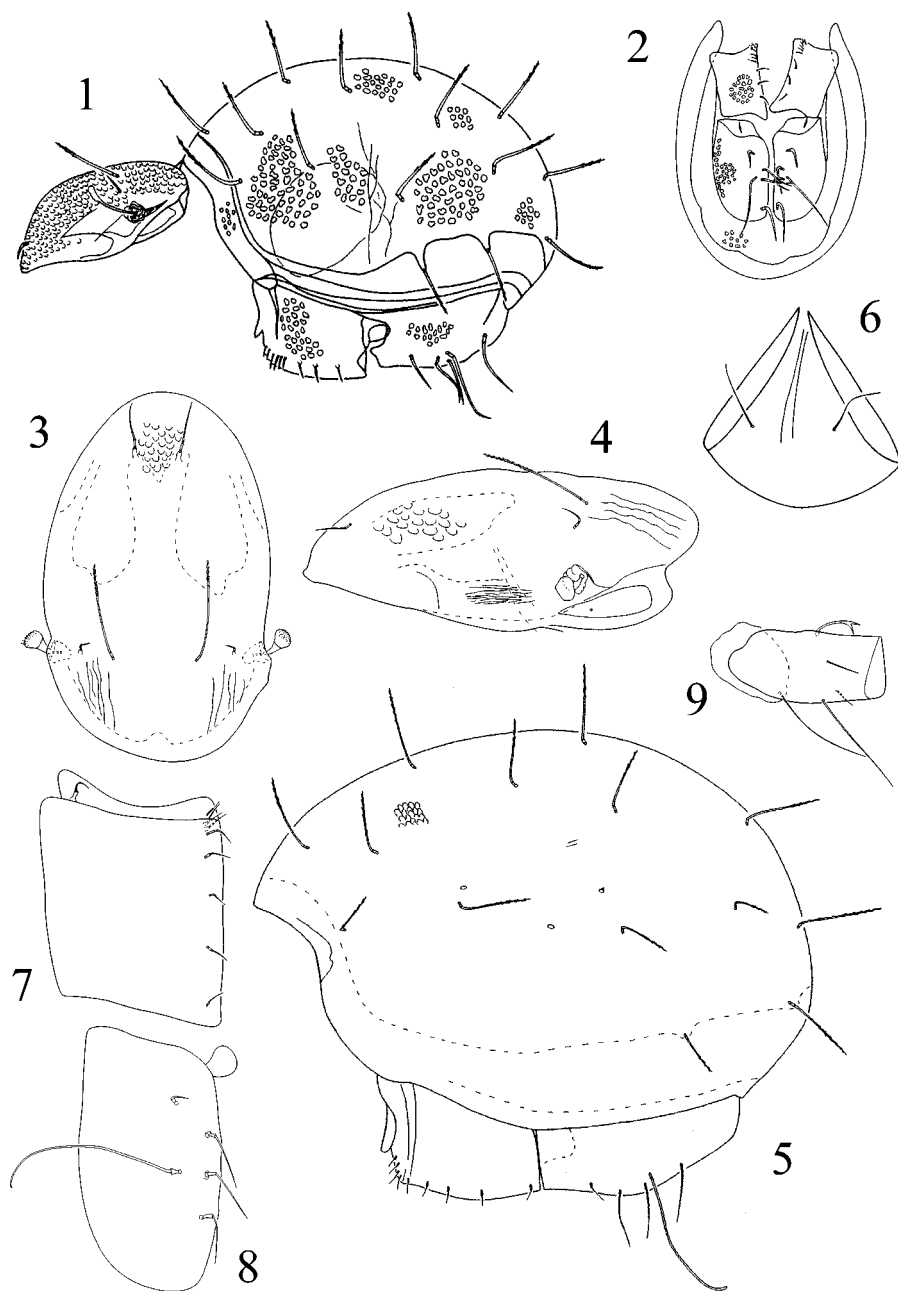


Table XIII. 1, 2. *Hoplophthiracarus tropicus* Mondal and Kundu, 1988 (after Mondal and Kundu 1988). 1 – lateral view of body, 2 – ventral region. 3-8. *Atropacarus (Hoplophorella) sabahnus* (Mahunka, 1991) (specimen from Sabah, Mt. Kinabalu, 2997 m). 3 – prodorsum, dorsal view, 4 – prodorsum, lateral view, 5 – notogaster, lateral view, 6 – mentum of infracapitulum, 7 – genitoaggenital plate, 8 – ano-adanal plate, 9 – trochanter and femur of leg I