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Revision of the Oriental species of the genus Namunaria REITTER, 1882 (Coleoptera: Zopheridae, Colydiinae)

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Abstract

The Oriental species of the genus Namunaria REITTER, 1882 are revised. Six species are recognized. Namunaria chinensis sp.n., N. echinata sp.n. and N. mammillaris sp.n. are described. Coxelus birmanicus GROUVELLE, 1896 and Tarphius bhutanensis ŚLIPIŃSKI, 1981 are transferred to Namunaria. A key to the species is included. Namunaria indica GROUVELLE, 1908 is transferred to Bolcocius DAJOZ, 1977. A lectotype is designated for Coxelus birmanicus.

Key words: Coleoptera, Zopheridae, Colydiinae, Namunaria, new species, new combination, lectotype designation, taxonomy.

Introduction

The genus *Namunaria* was erected by REITTER (1882) for the North American species formerly placed in *Coxelus* by HORN (1878). IVIE & ŚLIPIŃSKI (1990) designated *Coxelus guttulatus* LECONTE, 1863 as type species. *Namunaria* belongs to the tribe *Synchitini* as defined by SLIPIŃSKI & BURAKOWSKI (1988).

STEPHAN (1989) listed three North American species in the genus Namunaria. The genus Sympanotus SHARP, 1885, with two described species in Japan and Australia, has been synonymized with Namunaria by ŚLIPIŃSKI & LAWRENCE (1997). GROUVELLE (1908) described Namunaria indica from South India and tentatively assigned it to this genus.

In recent years, intensive field work by several entomologists has yielded a number of specimens of this genus. These collections have prompted this revision of the Oriental species of *Namunaria*. Its presently known geographical distribution is North America, Australia, Japan, China, the Himalayan Region, northern Thailand and Burma.

Methods and Abbreviations

Measurements were taken as follows:

Head width (HW): Across maximum width.

Head length (HL): Along mid line from anterior margin of clypeus to line connecting posterior margins of eyes; surface of head has to be in a plane perpendicular to optical axis.

Total length (TL): From apical margin of clypeus to apex of elytra.

Pronotal width (PW): Across maximum width (excluding denticulations).

Pronotal length (PL): Along mid line from anterior to posterior margin, surface of pronotum has to be in a plane perpendicular to optical axis.

Elytral width (EW): Across maximum combined width.

Elytral length (EL): Along suture including scutellum.

Eye length (EYL): Length of eye in dorsal aspect.



Figs. 1 - 3: Namunaria mammillaris, 1) habitus, 2) labium, setae on mentum partly omitted, 3) maxilla.

- BML The Natural History Museum, London [= British Museum (Natural History)]
- CSK Coll. R. Schuh, Katzelsdorf
- CWM Coll. F. Wachtel, München-Öhnböck
- IZPAN Instytut Zoologii Polska Akademia Nauk, Warszawa
- MHNG Muséum d'Histoire naturelle, Genève
- MSNG Museo Civico di Storia Naturale, Genova
- NMB Naturhistorisches Museum, Basel
- NMP Národní Museum v Praze, Praha
- NMW Naturhistorisches Museum Wien
- SMNS Staatliches Museum für Naturkunde, Stuttgart

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Figs. 4 - 7: Namunaria birmanica: 4) habitus, 5 - 7) procoxal cavities and prosternal process, 5) N. picta, 6) N. mammillaris, 7) N. birmanica.

Check list of the Namunaria species of Asia

- N. bhutanensis (SLIPINSKI, 1981)
- N. birmanica (GROUVELLE, 1896)
- N. chinensis sp.n.

N. mammillaris sp.n.

N. echinata sp.n.

N. picta (SHARP, 1885)

Namunaria REITTER

Namunaria: Reitter 1882: 114. - Stephan 1989: 46. - Ivie & Ślipiński 1990: 9. - Ślipiński & Lawrence 1997: 398.

Coxelus: HORN 1878: 568.

Sympanotus: Sharp 1885: 62. - Dajoz 1977: 84. - Kurosawa & al. 1985: 290, 294. - Ivie & Ślipiński 1990: 8. -Ślipiński & Lawrence 1997: 398.

Type species: Namunaria guttulata (LECONTE, 1863).

Description: TL: 3.0 - 5.3 mm; broadly oval to moderately elongate (TL/EW: 2.3 - 3.0), transversely convex. Vestiture of dorsal surface consisting of squamiform setae or long bristles.

Head not abruptly constricted behind eyes, temples absent. Eyes entire or slightly emarginate, interfacetal setae absent. Antennal grooves well developed, 0.5 - 1.0 times as long as EYL.

Antennae 11-segmented; antennomere 1 stout, antennomere 2 of same width, but longer, antennomere 3 narrower, 1.5 - 2.2 times as long as wide, antennomeres 4 to 9 each shorter than 3, subsequently becoming wider, antennal club 2-segmented, apical antennomere as wide as or slightly narrower than preapical one. Antennomeres 2 to 9 each with a ring of 6 - 10 fine long hairs; antennomeres 3 and 9 with some irregularly distributed additional hairs; antennomere 10 densely pubescent with similar hairs and additionally with ring of short, dense setae at apical rim; antennomere 11 similarly pubescent with additional short, dense setae on apical half.

Mouthparts (Figs. 2, 3). Mentum wider than long. Labium wider than long, its apex straight or slightly convex; labial palpi 3-segmented. Maxillary palpi 4-segmented; galea of normal type; lacinia with sclerotized hook at its inner edge. Mandibles bidentate.

Pronotum transversely convex; disc flattened, shallowly concave in middle; lateral margins more or less explanate and crenulate or dentate; anterior angles prominent. Prothoracic venter without antennal cavities; prosternal process wider than procoxal cavity; procoxal cavities closed or narrowly open (Figs. 5 - 7).

Scutellum present. Elytra with 9 rows of punctures, scutellary striole present or absent; intervals without costae, but in some species with gibbosities. Epipleura complete or almost complete.

Mesocoxae separated by 0.3 - 0.6 of coxal cavity width; metasternum longer (winged species) or shorter (wingless species) than ventrite 1. Intercoxal process of ventrite 1 acute or narrowly rounded; ventrite 5 with deep preapical groove. Ventrites 3 and 4 in male with irregularly distributed pores in addition to setiferous punctures; pores of variable diameter, corresponding to sclerotized structures (tubercles or pits) on internal side of abdomen.

Outer apical angle of all tibiae simple, without teeth or spines; all tarsi 4-segmented, segments 1 to 3 of equal length, segment 4 as long as the 3 preceding together; claws simple.

Aedeagus well sclerotized, except for ventral side of phallobasis; basal piece shorter than half of total length of aedeagus; parameres of elongate conical shape, separated at ventral side, dorsally separated by sclerotized triangular lamella, which covers median lobe in dorsal aspect; median lobe long, parallel-sided or widened in middle, weakly sclerotized.

Differential Diagnosis: Within the tribe Synchitini, the genus Namunaria shows affinities to Notocoxelus ŚLIPIńSKI & LAWRENCE, 1997, Franzorphius SCHUH, 1998, and Niphopelta REITTER, 1882. In Franzorphius the procoxal cavities are widely open in contrast to Namunaria in which the procoxal cavities are closed or narrowly open. Niphopelta has narrowly open procoxal cavities but differs from Namunaria in having the apex of the prosternal process without lateral expansions, flat eyes and elongate, subcylindrical body. In Notocoxelus the interfacetal setae are present and the temples prominent, almost dividing the eye posteriorly.

Key to the Asian species of Namunaria

1	Base of elytral interval 3 with elongate gibbosity
-	Base of elytral interval 3 flat or slightly convex (<i>N. chinensis</i>), elytra with patches of pale, squamiform setae additional to ordinary rows of setae
2	Elytral setae very long, bristle-like echinata
-	Elytral setae shorter, elongate squamiform
3	Elytra with gibbosities on interval 5
-	Elytra without gibbosities on interval 5 birmanica
4	Apical gibbosity on elytral interval 3 weakly developed or absent, strial setae 1.5 - 2.0 times as long as setae on intervals

SCHUH: The Oriental species of Namunaria (ZOPHERIDAE: Colydiinae)

- 5 Patches of pale, squamiform setae on elytra each situated on small gibbosity chinensis
- Patches of pale, squamiform setae on elytra not situated on small gibbosities picta

Namunaria picta (SHARP)

(Figs. 5, 8, 11, 12, 18 - 21, 30)

Namunaria picta (SHARP, 1885): ŚLIPIŃSKI & LAWRENCE 1997: 400. Sympanotus pictus SHARP 1885: 62. - DAJOZ 1977: 85. - KUROSAWA & al. 1985: 290, 294. - IVIE & ŚLIPIŃSKI 1990: 8.

Type material: Holotype (BML, examined, sex not determined): "Oyayama, Higo \ Japan G. Lewis 1910-320".

Description: TL: 3.2 - 5.2 mm. Moderately elongate (TL/EW: 2.5 - 2.7), subparallel, transversely convex, piceous brown to black, tarsi and antennae brown, club darkened in some specimens; outline of body as in Fig. 8. Dorsal sculpture granulate without any gibbosities; dorsal vestiture consisting of brown and white squamiform setae; each elytron with five or six patches of scales.

Head transverse (HW/HL: 1.4 - 1.7). Lateral margins slightly convex, slightly expanded in front of eyes, anterior margin at each side of clypeus with rectangular emargination; anterior margin of clypeus straight. Dorsal side of head almost flat. Sculpture consisting of large granules, each bearing short seta; granules large on frons and posterior part of clypeus, separated by 0.3 - 0.6their diameter, small and more sparsely set on anterior half of clypeus. Setae squamiform, dark brown or white, directed apicad, of uniform size and shape similar to setae of elytral intervals; setae on clypeus white, more elongate than those on frons. Eyes large (HW/EYL: 3.5 - 3.8) convex; facets small. Temples absent. Basal part of head capsule finely granulate, separated from frons by an indistinct, transverse impression just behind eyes. Antennal grooves 0.5 times as long as EYL, obliquely directed ventrad. Antennae with antennomere 1 1.2 times as long as wide; antennomere 2 of same width, 1.5 - 1.6 times as long as wide; antennomere 3 narrower than 2, 1.5 - 2.0 times as long as wide; antennomeres 4 to 8 of same width (length to width ratios: 4: 1.0 -1.3; 5: 1.2 -1.5; 6: 1.0 -1.2; 7: 1.1 -1.4; 8: 0.8 -1.0; antennomere 9 conical, 0.9 -1.3times as long as wide; antennomere 10 1.6 - 1.7 times as wide as 9, 1.4 - 1.5 times as wide as long; antennomere 11 subglobular, apex convex, 0.8 - 1.0 times as wide as 10, 1.0 - 1.1 times as wide as long.

Pronotum (PW/PL: 1.17 - 1.42), widest at anterior 0.3, narrower than elytra. Lateral margins convex in anterior half, almost straight in posterior half. Anterior angles acute, produced apicad; posterior angles blunt. Anterior margin regularly convex, sinuate near anterior angles; subapical sulcus straight, sharply impressed on lateral declivity, shortly interrupted on disc. Pronotal base convex, not sinuate near posterior angles; subbasal sulcus narrow, deep. Disc transversely convex with shallow, oval impression along anterior 0.6 of midline; lateral portions narrowly explanate at posterior angles, gradually becoming more widely explanate anteriorly, at middle of lateral margin explanate area about as wide as protibia. Sculpture consisting of large, convex granules, separated by 0.5 times their diameter, bearing two types of squamiform setae; major setae situated along anterior and lateral margins (white or darkbrown), around median impression, posterior to that impression in shape of a reverse V and at each lateral declivity forming two indefinite patches (mostly white setae); minor setae smaller, brown, situated on remaining areas. Edge of lateral margins in lateral aspect narrow, less than 0.5 times as wide as protibia, denticulate (about 12 - 17 denticles).

Prosternum and proepisterna sculptured like pronotal surface, each granule bearing short, hairlike seta; hairs on median part of prosternum longer than on proepisterna. Prosternal process almost flat, densely granulate, its apex almost straight. Procoxal cavities closed (Fig. 5). Scutellum transverse, trapezoidal, roughly sculptured.

Elytra parallel-sided (EL/EW: 1.52 - 1.83), transversely convex, without gibbosities; humeral calli present; lateral margins denticulate in humeral region, crenulate apically, not explanate; apically elytra jointly rounded. Striae 1, 2, 8 and 9 indistinctly connected at apex or ending separately, stria 3 connected to 4 and 7 at apex, stria 5 connected to 6. Scutellary strioles consisting of approximately 8 - 10 punctures. Strial punctures deep, separated longitudinally by narrowly elongate, sometimes cariniform granule bearing squamiform seta (Figs. 11, 12). Strial setae elongate squamiform (on average 75 μ m long, 25 μ m wide), white or dark brown. Intervals shiny, slightly wider than striae, flat. Setae on intervals more distinctly lancet-shaped, slightly shorter and narrower, set in rows on interval 1, at apex of interval 3 and irregularly at elytral base. Each elytron with six patches of depressed, white squamiform setae; patches arranged in two more or less undulate transverse rows, one just in front of middle and other one just behind it; patches situated on intervals 3, 5 and 7; anterior patch on interval 7 indistinct or absent in some specimens. In addition to patches with more or less definite areas of white strial setae (scutellar region, humeral callus, between the patches forming transverse bands, on apical declivity forming transverse band); extent of white areas variable. Epipleura complete, distinctly granulate. Wings present.

Metasternum longer than ventrite 1, median line impressed on apical 0.6, sculpture as on prosternum. Length ratio of ventrites: 1: 2.0; 2: 1.3; 3: 1.2; 4: 1.0; 5: 1.2. Sculpture consisting of small, irregular granules, more densely set on ventrite 1, becoming gradually sparser and smaller on apical ventrites. Granules bearing long, thick, white hairs or narrowly elongate squamiform setae. Male with large pores on ventrites 3 and 4; pores irregularly distributed, 0.5 - 1.0 times as wide as granules.

Legs moderately long; femora surpassing lateral margins of body, setae white, squamiform at apical third; tibiae straight, oval in cross-section, setae squamiform at external side.

Aedeagus (Figs. 18 - 21) elongate, parallel-sided, 3.5 times as long as wide; phallobasis dorsally convex; parameres 1.7 times as long as phallobasis, more or less parallel-sided; median lobe parallel-sided, long, widened at base.

Variability: In Nepalese specimens antennomere 9 more elongate, 0.9 - 1.1 times as long as wide; pronotum comparatively broader (PW/PL: 1.32 - 1.42), lateral margins with smaller, less obvious denticles, squamiform setae on disc and elytra semierect; abdominal setation hair-like. In Chinese specimens (particularly from the province of Fujian) these characters are intermediate between Nepalese and Japanese specimens.

Additional material examined: 4 exs. (BML): Japan: without precise locality; 2 exs. (CSK): Japan: Honshu, Nishitama, Hammura, 24.IX.1978, leg. Mills; 4 exs. (SMNS, CSK): Nepal, Sankhua Sabha Distr., Arun Valley, Chichila 1900 - 2000 m, *Quercus* forest, bushes near village, 18.-20.VI.1988, leg. J. Martens & W. Schawaller; 1 ex. (SMNS): Nepal, Sankhua Sabha Distr., Arun Valley, between Chichila and Bothebas, 2000 - 1850 m, 20.VI.1996, leg. J. Martens & W. Schawaller; 1 ex. (NMB): Nepal, Sankhua Sabha Distr., Arun Valley, between Chichila and Bothebas, 2000 - 1850 m, 20.VI.1996, leg. J. Martens & W. Schawaller; 1 ex. (NMB): Nepal, Sankhua Sabha Distr., Arun Valley, Chichila - Mure, 1950 - 2000 m, 1.VI.1983, leg. M. Brancucci; 1 ex. (SMNS): Nepal, Panchthar Distr., Dhorpar Kharka, 2700 m, 13.-16.IV.1988, leg. J. Martens & W. Schawaller; 2 exs. (MHNG, IZPAN): Nepal, Koshi Prov., forest NW Kuwapani, 2250 m, 24.IV.1984, leg. I. Löbl & A. Smetana; 2 exs. (NMP): China, "Fokien" [= Fujian province], Tai Ningli; 1 ex. (NMB): China, Yünnan, 25 km E Zhongdian, 3300 - 4000 m, 12.-14.VII.1995, leg. Bolm [= pseudonym]; 2 exs. (NMB): China, Yünnan, Jizu Mts., 2500 - 3100 m, 30.V.-3.VI.1993, leg. Bolm; 1 ex. (NMP): China, Sichuan, Chongqing.

Distribution (Fig. 30): Japan: Honshu and Kiushu. China: Yünnan, Sichuan, Fujian. Eastern Nepal.

Biology: Larvae of this species have been found under bark of dead oaks in Japan (HAYASHI 1972). According to label data, this species has been found in *Quercus* forest and *Rhododendron-Lithocarpus* forest in Nepal at altidudes of 1850 - 4000 m.

Namunaria chinensis sp.n. (Figs. 10, 13, 22, 23, 30)

Type material: Holotype & (NMW): "China: Yünnan: Heishui 35 km N Lijiang, 1. - 19.7.1992".

Paratypes (4 exs.): 1 ex. (MHNG) with same locality data as holotype; 1 φ (NMW) "China: Yünnan: Yulongshan Nat. Res. 50 km N Lijiang, 24. - 29.6.1993"; 2 exs. (NMP, IZPAN) "China centralis, Szechwan, Chung King" [= Sichuan, Chongqing, W Chengdu].

Diagnosis: TL: 4.15 - 5.30 mm. TL/EW: 2.45 - 2.70.

Head: HW/HL: 1.3 - 1.5. Lateral margins expanded in front of eyes; head width across antennal insertions almost as great as head width across eyes. Dorsal side of head with well-marked frontoclypeal impression, particularly distinct laterally. Setae procumbent. Eyes slightly convex. Antennae with antennomere 2 1.3 - 1.6 times as long as wide; antennomere 3 1.6 - 1.9 times as long as wide; antennomere 4 to 8 of same width (length to width ratios: 4: 1.1 - 1.4; 5: 1.2 - 1.3; 6: 1.0 - 1.2; 7: 1.0 - 1.1; 8: 1.0 - 1.1); antennomere 9 1.0 - 1.2 times as wide as long; antennomere 10 1.5 - 1.6 times as wide as 9, 1.4 - 1.5 times as wide as long; antennomere 11 subglobular, apex convex, 0.9 - 1.0 times as wide as 10, 1.0 - 1.2 times as wide as long.

Pronotum (Fig. 10) (PW/PL: 1.4 - 1.5) widest in front of middle, as wide as elytra. Lateral margins regularly convex. Anterior angles acute, produced apicad; posterior angles obtuse. Disc with shallow, oval impression along anterior 0.6 of midline and additional minor impressions; lateral portions widely explanate, at mid-length of lateral margin explanate area approximately twice as wide as protibia. Setae more or less uniform, procumbent, positions of brown and white setae with same color pattern as in *N. picta*. Edge of lateral margins with 18 - 22 denticles.

Elytra parallel-sided (EL/EW: 1.54 - 1.73), base of interval 3 slightly convex. Lateral margins narrowly explanate (about 0.3 times as wide as metatibia), crenulate, marginal setae curved, procumbent. Strial setae elongate squamiform as in Fig. 30 (on average 80 - 85 μ m long, 20 μ m wide), white or brown, procumbent, setae of stria 1 directed laterad in most specimens. Setae on intervals similar, set in dense row on interval 1 (mixed with some smaller setae of same shape), sparsely on intervals 5 and 7 and base and apex of interval 3. Each elytron with four patches of accumulated setae (of same shape as strial setae); each patch set on small, round gibbosity. Arrangement of patches on gibbosities along posterior transverse row identical to *N. picta*; on anterior transverse row only patch on interval 5 positioned on gibbosity, patches on intervals 3 and 7 indistinct or absent. Three additional patches of variable extent (on flat or slightly convex surface) on apical declivity on intervals 3 and 5, and on interval 9 in prolongation of posterior transverse row of patches. In addition to patches with condensed white setae on humeral calli and base of interval 3, single white setae sparsely and irregularly distributed.

Sculpture of ventrites consisting of small, irregular granules, densely set on ventrite 1, becoming gradually smaller and sparser on apical ventrites; setation hair-like. Males with large pores on ventrites 3 and 4.

Legs long; femora surpassing lateral body margins by one femoral diameter.

Aedeagus (Figs. 22, 23) with elongate conical parameres; parameres 1.2 times as long as phallobasis.

Differential diagnosis: Namunaria chinensis is similar to N. picta but can be recognized easily by the following differences: Lateral margins of head more expanded in front of eyes; eyes less convex. Pronotum broader; posterior angles obtuse; lateral portions widely explanate. Each elytron with four patches of setae; each patch set on small, round gibbosity; strial setae narrower; lateral elytral margin narrowly explanate. Legs longer. Males with more sparsely set pores on ventrites 3 and 4.

Distribution (Fig. 30): China: Yünnan and Sichuan.

Biology: No data available.

Etymology: The species is named in reference to its known distribution.

Namunaria birmanica (GROUVELLE) (comb.n.) (Figs. 4, 7, 14, 24, 25, 30)

Coxelus birmanicus GROUVELLE 1896: 30.

Type material: Lectotype δ (MSNG, examined) (by present designation): "Tenasserim M. Mooleyit 1800 - 1900m Fea. Marzo 1887 \ Typus \ birmanicus Grouv \ Coxelus birmanicus ty Grouv (Grouvelles hand) \ Coxelus birmanicus Grouv. \ Museo Civico di Genova \ Lectotypus Coxelus birmanicus Gr. S.A. Slipinski 1990 \ Lectotypus Coxelus birmanicus Grouvelle, 1896 des. Schuh 1998 (red)\ Namunaria birmanica (Grouvelle, 1896) (comb. nov.) det. Schuh 1998".

Paralectotypes (3 $\delta\delta$) (MSNG, examined): "Tenasserim M. Mooleyit 1800 - 1900m Fea. Marzo 1887 \ Syntypus Coxelus birmanicus Grouvelle, 1896 \ Museo Civico di Genova \ Paralectotype Coxelus birmanicus Gr. S.A. Slipinski 1990 \ Paralectotypus Coxelus birmanicus Grouvelle, 1896 des. Schuh 1998 (red)\ Namunaria birmanica (Grouvelle, 1896) (comb. nov.) det. Schuh 1998".

Description: TL: 3.1 - 4.3 mm. Moderately elongate (TL/EW: 2.69 - 2.96), subparallel, transversely convex, reddish brown to dark brown, tarsi and antennae reddish; habitus as in Fig. 4. Dorsal sculpture granulate. Elytra each with elongate gibbosity at base of interval 3; dorsal vestiture consisting of yellow and gray squamiform setae.

Head transverse (HW/HL: 1.4 - 1.6). Lateral margins strongly convex, expanded in front of eyes, anterior margin slightly convex. Dorsal side of head flat, frons laterally deflexed, depressed at inner margins of eyes. Sculpture consisting of large granules, each bearing short seta; granules most distinct on posterior part of frons, gradually becoming lower and more flat-topped anteriorly, separated by approximately 0.5 their diameter. Setae yellowish, directed apicad, of variable size and shape, short and predominantly hair-like on vertex and between eyes, 2 - 3 times longer and squamiform on lateral portions of head in front of eyes. Eyes small (HW/EYL: 4.7) round, convex, facets large. Temples absent. Antennal grooves very broad, as long as EYL. Antennae with antennomere 1 1.1 times as long as wide; antennomere 2 of same width, 1.3 times as long as wide; antennomere 3 narrower than 2, 1.8 times as long as wide; antennomeres 4 to 6 of same width (length to width ratios: 4: 1.1; 5: 1.0; 6: 1.0); antennomeres 7 and 8 slightly increasing in width (width to length ratios: 7: 1.2; 8: 1.3); antennomere 10 conical, broadly truncate, 1.5 times as wide as 9, 2.1 times as wide as long; antennomere 11 transversely oval, apex just slightly convex, 0.8 times as wide as 10, 1.4 times as wide as long.

Pronotum (PW/PL: 1.17 - 1.33), widest in middle, as wide as elytra. Lateral margins slightly convex in anterior 0.85, more strongly convex in posterior 0.15, converging apicad and basad to same extent. Anterior angles acute, produced apicad; posterior angles obtuse. Anterior margin strongly convex with shallow emargination in middle, deeply sinuate near anterior angles; subapical sulcus irregular, deeply impressed on lateral declivity, obsolete on disc. Pronotal base produced backwards, shallowly sinuate near posterior angles; subbasal sulcus narrow, deep. Disc transversely convex, slightly depressed along mid-line; lateral portions broadly explanate. Sculpture consisting of large, convex granules, separated by 0.5 times their diameter, bearing seta, leaving irregular narrowly-elongate area along apical 0.6 of mid-line smooth and shiny. Setae yellow, squamiform, of similar shape and size (in holotype on average 75 μ m long, 20 μ m wide), irregularly directed. Edge of lateral margins in lateral aspect as thick as width of protibia, denticulate, fringed with two rows of setae.

Prosternum densely set with round, large granules, bearing short, hair-like seta. Prosternal process shallowly bisinuate at apex, lateral margins slightly elevate, median part flat. Procoxal cavities externally narrowly open (Fig. 7).

Scutellum small, transverse, roughly sculptured.

Elytra subparallel (EL/EW: 1.54 - 1.66), widest at 0.7 of EL, transversely convex, basal part of interval 3 raised forming elongate gibbosity; basal margin concave between these gibbosities, oblique to humeral angles, which are accentuated by one or more denticles; lateral margins denticulate or crenulate, not explanate; apically elytra jointly rounded. Striae 1, 2 and 9 ending separately at apex, stria 3 connected to 8, stria 4 connected to 7, stria 5 connected to 6 at apex. Scutellary strioles consisting of approximately 5 punctures. Strial punctures deep, separated longitudinally by elongate, flat-topped granule bearing short, yellow seta (Fig. 14). Strial setae elongate, squamiform (in lectotype on average 100 μ m long, 25 μ m wide), yellow or light gray, erect. Intervals shiny, slightly wider than striae, flat, interval 3 in basal half slightly widened and convex in large specimens. Setae on intervals sparse, similar to strial setae, erect, forming short rows on interval 1 (at middle and apex), interval 3 (at 0.4 and 0.6 of its length), interval 7 (at 0.6 of its length). Epipleura strongly narrowing from base to posterior margin of metasternum, almost parallel-sided from ventrite 1 to 2, there as wide as metatibia, narrowing again apicad but not reaching sutural angle, sparsely granulate. Wings absent.

Metasternum as long as ventrite 1, median line impressed on apical 0.6, sculpture as on prosternum. Length ratio of ventrites: 1: 2.7; 2: 1.9; 3: 1.6; 4: 1.0; 5: 1.9. Sculpture consisting of flattened granules of irregular, elongate shape, each bearing hair-like seta on its apical part, granules most flattened on ventrite 3 and 4. In male ventrites 3 and 4 with pores partly arranged in short, irregular rows; size of pores similar to size of setiferous punctures.

Legs moderately long, robust; femora surpassing lateral margins of body, setae squamiform at apical third; all tibiae straight, oval in cross-section, setae squamiform at external side.

Aedeagus (Figs. 24, 25) elongate subparallel, 4.2 times as long as wide; phallobasis dorsally convex; parameres 1.2 times as long as phallobasis, elongate conical, converging towards apex, becoming parallel-sided again shortly before reaching apex; median lobe short, 0.6 times as long as total length of aedeagus, widened at middle.

Distribution (Fig. 30): Only known from the type locality. Myanmar: Kayin State, Mount Mulayit.

Biology: No data available.

Namunaria echinata sp.n. (Figs. 9, 15, 26, 27, 30)

Type material: Holotype ♂ (MHNG, dissected into many parts, in alcohol): "Thailand: Chiang Mai, Doi Inthanon, 2500m, 23.10.1986, Schwendiger [= Schwendinger]".

Paratype q (MHNG): "Thailand: Chiang Mai, Doi Inthanon, 2500m, 9.11.1985, Burckhardt & Löbl".

Description of external characters of paratype: TL: 3.0 mm. Moderately elongate (TL/EW: 2.3), subparallel, transversely convex, dark brown, legs, antennae and labrum reddish; outline of body as in Fig. 9. Dorsal sculpture granulate with elongate gibbosities at base of elytral intervals 3; dorsal vestiture consisting of brown bristle-like setae.

Head transverse (HW/HL: 1.5). Lateral margins moderately convex, slightly expanded in front of eyes, anterior margin straight. Dorsal side of head flat. Sculpture consisting of large granules, each bearing erect, bristle-like seta (half as long as on elytra); granules convex, largest on posterior part of frons, gradually becoming smaller anteriorly, separated by 0.5 - 1.0 their diameter. Eyes small (HW/EYL: 5.0) round, slightly convex, facets large. Temples absent. Antennal grooves broad, as long as EYL. Antennae with antennomere 1 1.2 times as long as wide; antennomere 2 of same width, 1.4 times as long as wide; antennomere 3 narrower than 2,

2.1 times as long as wide; antennomeres 4 to 7 of same width (length to width ratios: 4: 1.2; 5: 1.1; 6: 0.9; 7: 0.8); antennomere 8 slightly wider, 1.3 times as wide as long; antennomere 9 asymmetrical, transitional in width between 8 and 10, 1.7 times as wide as long; antennomere 10 conical, broadly truncate, 1.5 times as wide as 9, 1.9 times as wide as long; antennomere 11 transversely oval, apex subtruncate, 0.9 times as wide as 10, 1.3 times as wide as long.

Pronotum (PW/PL: 1.3), widest at beginning of posterior 0.3, slightly narrower than elytra. Lateral margins slightly convex in anterior 0.75, more strongly convex in posterior 0.25, converging apicad and basad to same extent. Anterior angles acute, produced apicad; posterior angles marked by a rectangular denticle. Anterior margin convex with shallow emargination in middle, sinuate near anterior angles; subapical sulcus narrow, impressed on lateral declivity, obsolete on disc. Pronotal base produced backwards, subbasal sulcus narrow, inconspicuous. Disc transversely convex; lateral portions broadly explanate. Sculpture consisting of large, convex granules, separated by 0.2 - 0.5 times their diameter, bearing bristle-like seta, leaving irregular, narrowly-elongate area along mid-line smooth and shiny. Bristles brown, erect, on disc on average 100 μ m long, 10 μ m wide, on lateral margins on average 170 μ m long, 10 μ m wide. Edge of lateral margins in lateral aspect as thick as width of protibia, denticulate (about 10 denticles along margin), fringed with two to three rows of bristles; denticles acute, large.

Prosternum densely set with round granules, bearing short, hair-like seta. Lateral portions of proepisterna slightly concave. Prosternal process shallowly bisinuate at apex, lateral margins slightly elevated, median part flat. Procoxal cavities externally narrowly open.

Elytra subparallel (EL/EW: 1.43), widest at 0.5 of EL and at humeral angles, transversely convex, basal part of interval 3 raised, forming elongate gibbosity; humeral calli absent; basal margin concave between these gibbosities, concave from there to humeral angles; lateral margins denticulate, not explanate; apically elytra jointly rounded. Stria 9 ending separately at apex, stria 1 connected to 2, stria 3 connected to 8, stria 4 connected to 7, stria 5 connected to 6 at apex. Scutellary strioles absent. Strial punctures deep, separated longitudinally by narrow, elongate granule (about 3 times as long as wide) bearing seta. Strial setae bristle-like (in holotype on average 170 μ m long, 10 μ m wide), brown, erect (Fig. 15). Intervals shiny, as wide as strial punctures, flat and smooth (except on gibbosities), interval 3 in basal 0.2 slightly widened and strongly convex, forming elongate gibbosity. Additional small gibbosities on interval 3 (at 0.6 of its length) and on interval 5 (at 0.4 of its length); gibbosities set with round granules each bearing bristle-like seta of same shape as strial setae. Epipleura strongly narrowing from base to posterior margin of metasternum, almost parallel-sided from ventrite 1 to 3, there as wide as metatibia, narrowing again apicad but not reaching sutural angle, sparsely granulate. Wings absent.

Metasternum as long as ventrite 1, without impressed median line. Length ratio of ventrites: 1: 2.7; 2: 1.6; 3: 1.5; 4: 1.0; 5: 2.2. Sculpture on median part of ventrite 1 consisting of large granules, lateral parts smooth and shiny; sculpture on median part of ventrite 2 consisting of reduced granules and irregular longitudinal furrows, lateral parts smooth and shiny; sculpture on medio-basal part of ventrite 3 with remnants of furrows and sparse punctures, lateral and apical parts smooth and shiny; ventrite 4 smooth and shiny, ventrite 5 with small granules on apical and lateral parts. Integument hair-like, sparse. In male (paratype) apico-lateral portion of ventrite 3 with group of approximately 10 scattered pores; ventrite 5 near apical margin with irregular, transverse row of approximately 20 pores; size of pores similar to size of setiferous punctures.

Legs short; femora hardly surpassing lateral margins of body; all tibiae straight, oval in crosssection, setae elongate-squamiform at external side.

Aedeagus (holotype; Figs. 26, 27) elongate subparallel, 6.2 times as long as wide; phallobasis dorsally convex; parameres 1.9 times as long as phallobasis, elongate conical, converging towards apex, becoming parallel-sided again shortly before reaching apex; median lobe short, 0.6 times as long as total length of aedeagus.



Figs. 8 - 17: 8) Namunaria picta (specimen from Nepal), outline of body, showing patches of squamiform setae on elytra (punctured line), 9) N. echinata, outline of body, appendages omitted on left side, showing marginal setae, 10) N. chinensis, outline of pronotum, showing arrangement of dorsal impressions and limit of explanate lateral portions, 11 - 17) squamiform setae on elytra, 11) N. picta (specimen from Japan), 12) N. picta (specimen from Nepal), 13) N. chinensis, 14) N. birmanica, 15) N. echinata, 16) N. mammillaris, 17) N. bhutanensis.

Distribution (Fig. 30): Known only from the type locality.

Biology: No data available.

Etymology: Echinus (Latin) - sea-urchin. Named in reference to the spinose appearance.

Namunaria mammillaris sp.n. (Figs. 1, 2, 3, 6, 16, 28, 29, 30)

Type material: Holotype δ (SMNS): "Nepal (369), Taplejung Distr., descent from Pass Deorali to Hellok 2800 - 2600m, mature mixed forest, 17.5.1988 leg. J. Martens & W. Schawaller".

Paratypes (7 exs.): 3 o o (SMNS, CSK) "Nepal (359), Taplejung Distr., Lassetham NW Yamputhin, 3300 - 3500m, mature Abies-Rhododendron forest, 6.-9.5.1988 leg. J. Martens & W. Schawaller"; 1 & (SMNS) "Nepal (414), Sankhua Sabha Distr., Arun Valley, Chichila, 1900 - 2000m, Quercus forest, bushes near village, 18-20.6.1988 leg. J. Martens & W. Schawaller"; 1 & (SMNS) "Nepal (421), Dolakha Distr., SW Kalinchok Mt., 3100m, mature mixed forest, 19.-23.4.1995 leg. J. Martens & W. Schawaller"; 1 ex. (IZPAN) "Nepal NE, Barahbise crête Jardang, 3250m, 28.10.1981 leg. Cassagnau 7"; 1 ex. (IZPAN) "Nepal NE, Barahbise Amatal Khola, 3100m, ss/Tingsang La, 27.10.1981 leg. Cassagnau 1",

Description: TL: 3.0 - 4.2 mm. Moderately elongate (TL/EW: 2.3 - 2.7), transversely moderately convex, reddish brown to dark brown; habitus as in Fig. 1. Dorsum with two gibbosities on pronotum and eight gibbosities on elytra; dorsal vestiture consisting of yellowish brown squamiform setae of different shapes.

Head transverse (HW/HL: 1.5 - 1.7). Lateral margins not expanded in front of eyes, anterior margin slightly convex. Dorsal side of head flat. Sculpture consisting of dense, large, flat-topped granules, each bearing short seta; granules separated by less than 0.5 their diameter; anterior margin of clypeus and labrum smooth and shiny. Setae directed apicad, short and hair-like on frons, squamiform on lateral portions of head in front of eyes, elongate squamiform on apical margin of clypeus. Eyes small (HW/EYL: 4.5 - 5.2) round, slightly convex, facets large. Temples absent. Antennal grooves very broad, slightly longer than EYL. Antennae with antennomere 1 and 2 1.2 times as long as wide; antennomere 3 narrower than 2, 1.6 times as long as wide; antennomere 8 slightly wider, 1.3 times as wide as long; antennomere 9 wider than 8, 1.6 times as wide as long; antennomere 10 trapezoidal in outline, slightly asymmetric, 1.8 times as wide as 9, 1.9 times as wide as long.

Pronotum (PW/PL: 1.2 - 1.3), widest near middle, almost as wide as elytra. Lateral margins convex. Anterior angles acute, produced apicad; posterior angles acute, tooth-like, pointing basad. Anterior margin strongly convex, sometimes with shallow emargination in middle, produced over vertex of head nearly as far as anterior angles, deeply sinuate near anterior angles; subapical sulcus irregular, consisting of transverse row of partly confluent, deep punctures. Pronotal base slightly convex, slightly sinuate near posterior angles; subbasal sulcus irregular, deep, almost interrupted in middle. Disc transversely convex, with two admedian gibbosities, depressed along mid-line; lateral portions broadly explanate and slightly concave, particularly in large specimens. Sculpture consisting of large granules, separated approximately by 0.5 times their diameter, bearing seta, leaving an irregular narrowly-elongate area along apical 0.6 of midline smooth and shiny; granules of variable shape, elongate on lateral declivity; explanate portions shiny with scattered, small granules and deep, round punctures. Setae brownish yellow, squamiform, of two different shapes; major setae on average 90 μ m long, 20 μ m wide, situated along lateral and anterior margins, on admedian gibbosities and region posterior to them; minor setae on average 35 μ m long, 15 μ m wide, situated on remaining areas. Edge of lateral margins denticulate, with two rows of setae, narrower than width of protibia.

Prosternum and proepisterna with large granules, bearing short, hair-like seta. Prosternal process shallowly bisinuate at apex, lateral margins slightly elevate, median part slightly convex. Procoxal cavities externally almost closed, lateral expansions of prosternal process meeting medio-basal tips of proepisterna just at posterior margins of procoxae (Fig. 6).

Scutellum reduced, small, triangular.

Elytra subparallel (EL/EW: 1.36 - 1.51), widest at 0.6 of EL, transversely convex, basal part of

intervals 3 raised, forming elongate gibbosities; each elytron with three additional, round gibbosities; basal margin concave between these gibbosities; humeral angles rounded, denticulate, turned upwards in lateral aspect, the area between it and the base of stria 5 concave; lateral margins sparsely denticulate or crenulate, not explanate; elytral apex obtusely angled. Stria 1 ending separately at apex, stria 2 connected to 9 at apex, stria 3 connected to 8, stria 4 connected to 7, stria 5 connected to 6. Scutellary strioles absent. Strial punctures deep, separated longitudinally by elongate granule bearing brownish yellow seta (Fig. 16). Setae squamiform, of three different shapes: 1) major setae like those on pronotum, erect, situated on every second or third strial granule, on denticles of elytral margin and on gibbosities; 2) intermediate setae 35 -50 μ m long, 15 - 20 μ m wide, densely set on sutural interval (except base and apex) and gibbosities, sparsely set on intervals 3, 5, 7 and 9; 3) minor setae on average 25 μ m long, 15 μ m wide, situated on remaining strial granules. Intervals shiny, slightly wider than striae, widened at positions of gibbosities, neighbouring intervals narrowed there. Each elytron with elongate gibbosity on base of interval 3; positions of round gibbosities at 0.7 the length of interval 3, at 0.4 the length of interval 5, at 0.6 the length of interval 7. Epipleura smooth, shiny, strongly narrowing from base to posterior margin of metasternum, almost parallel-sided from ventrite 1 to 2, there slightly narrower than metatibia, from there narrowing again apicad, ending at apex of ventrite 4, sparsely granulate. Wings absent.

Metasternum short, 0.8 times as long as ventrite 1, without impressed median line but with smooth, semicircular cavity between metacoxae, sculpture as on prosternum. Length ratio of ventrites: 1: 2.2; 2: 1.4; 3: 1.3; 4: 1.0; 5: 1.6. Sculpture consisting of flat-topped, round granules, separated by 0.5 to 1.0 their diameters, each bearing hair-like seta on its apical part. Ventrites 1 and 2 granulate only at base and median part, ventrites 3 and 4 granulate at base and much more sparse and finer at median part, ventrite 5 granulate in apical half. In male apical half of ventrite 3 and all of ventrite 4 with very small, irregularly distributed pores.

Legs relatively long, slender; all tibiae straight, oval in cross-section, setae squamiform at external side.

Aedeagus (Figs. 28, 29) elongate, 4.2 times as long as wide; phallobasis dorsally convex; parameres 1.6 - 1.7 times as long as phallobasis, elongate conical, slightly convex in middle (dorsal aspect) arcuately narrowing towards apex; median lobe 0.9 times as long as total length of aedeagus, widened at middle.

Distribution (Fig. 30): East Nepal, Himalayan region, 1900 - 3500 m.

Biology: Collected in Abies-Rhododendron and Quercus forests.

Etymology: Mammillaris, derivative of mamma (Latin) - breast. Named in reference to its gibbose appearance.

Namunaria bhutanensis (SLIPINSKI) comb.n.

(Figs. 17, 30)

Tarphius bhutanensis ŚLIPIŃSKI 1981: 425.

Type material: Holotype o (NMB, examined): "Bhutan, Dorjula, 3100m, 21.9.1976, Dorjee Khandu".

Diagnosis: Namunaria bhutanensis is very similar to N. mammillaris.

Habitus and coloration as in *N. mammillaris* (TL: 4.1 mm, TL/EW: 2.56), proportions of pronotum and elytra within the range of *N. mammillaris*.

Lateral margins of head above antennal insertions less expanded, apical third of antennomere 1 visible in dorsal aspect. Antennomeres 3 - 5 slightly shorter than in N. mammillaris.

Admedian gibbosities on pronotum less convex; posterior angles less produced backwards.



Figs. 18 - 29: 18 - 19) Namunaria picta (specimen from Nepal), 18) aedeagus, dorsal aspect, 19) aedeagus, lateral aspect, 20 - 21) N. picta (specimen from Japan), 20) aedeagus, dorsal aspect, 21) aedeagus, lateral aspect, 22 - 23) N. chinensis, 22) aedeagus, dorsal aspect, 23) aedeagus, lateral aspect, 24 - 25) N. birmanica, 24) aedeagus, dorsal aspect, 25) aedeagus, lateral aspect, 26 - 27) N. echinata, 26) aedeagus, dorsal aspect, 27) aedeagus, lateral aspect, 28 - 29) N. mammillaris, 28) aedeagus, dorsal aspect, 29) aedeagus, lateral aspect.

Elytra more convex; lateral margins at anterior 0.6 of their length not visible in dorsal aspect. Gibbosities on base of intervals 3 and gibbosities on intervals 5 less convex, apical gibbosities on intervals 3 and 7 almost absent.

Dorsal vestiture generally shorter (Fig. 17).



Fig. 30: Geographical distribution of Namunaria spp.

All tibiae shorter.

Distribution (Fig. 30): Known only from the type locality.

Biology: No data available.

Species formerly included in Namunaria

Bolcocius indicus (GROUVELLE, 1908) comb.n.: Examination of the two syntypes of Namunaria indica proved that this species belongs to the genus Bolcocius DAJOZ, 1977.

Zusammenfassung

Die Arten der Gattung Namunaria REITTER, 1882 der Orientalischen Region werden revidiert. Die Gattung enthält sechs Arten in dieser Region. Namunaria chinensis sp.n., N. echinata sp.n. und N. mammillaris sp.n. werden beschrieben. Coxelus birmanicus GROUVELLE, 1896 und Tarphius bhutanensis ŚLIPIŃSKI, 1981 werden zu Namunaria transferiert. Ein Bestimmungsschlüssel für die Arten wird erstellt. Namunaria indica GROUVELLE, 1908 wird zu Bolcocius DAJOZ, 1977 transferiert. Ein Lectotypus wird für Coxelus birmanicus designiert.

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