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Notes on the taxonomic status of the genus *Caelius* LEWIS (Coleoptera, Scarabaeidae, Aphodiinae)

[With 25 figs.]

Uwagi o statusie taksonomicznym rodzaju *Caelius* LEWIS (Coleoptera, Scarabaeidae, Aphodiinae)

Abstract. *Caelius denticollis* LEW. is redescribed and combined with the genus *Aegialia* LATR., subgenus *Leptaegialia* BROWN. The remained species previously placed in the genus *Caelius* LEW. are commented and transferred to the genus *Aphodius* ILLIG., subgenus *Paremadus* NAK. Three new species-names are introduced instead of secondary homonyms. *Aphodius* (*Paremadus*) *phulcolikiensis* and *A. (P.) annapurnae* are described as new and included in a key to the 14 known species of this Asian subgenus. Pertinent morphological details of some species are illustrated.

This paper is presented in order to validate changes in the status of the genus *Caelius* established by LEWIS (1895) for one Japanese species *C. denticollis*. The existing literature reveals a diversity of opinion and the lack of definite conclusions as to the position of this genus and validity of some species added to it by various authors from 1895 to the present. A careful review of the literature and of all available material has resulted in the presented reclassification.

I am greatly indebted to Prof. T. NAKANE (Kagoshima University), to Prof. H. F. HOWDEN (Carleton University, Ottawa) and to Dr I. LÖBL (Muséum d'Histoire Naturelle, Genève) for directing the discussed materials into my hands.

The original diagnosis of the genus *Caelius* LEW. and description of *C. denticollis* LEW. cited below, hold good for most of the species of *Aphodiinae* belonging to the different tribes:

"The species for which this genus is established has a corporal outline like *Saprosites*, long and parallel at the sides, and it inhabits the recesses of old trees [...] Head anteriorly semicircular in outline, frontal suture well marked, mentum rather narrow, arched not incised in front, terminal leaflet of the antennal club much less transverse than in *Saprosites*; the anterior and

posterior coxae contiguous, intermediate moderately separated; the pygidium exposed; [...] clypeus anteriorly with a widely arched outline, not emarginate, frontal suture very distinct, with two dusky spots like those in *Aegialia rufa* F. [...] the lateral edge (of pronotum) is obscurely crenulate anteriorly, the crenulations gradually increase in distinctness until they form a series of denticulations round the posterior angles..."

The basic feature, which distinguishes *Aegialiini*-species from other *Aphodiinae* is a shortened clypeus exposing anterior part of labrum and strongly sclerotized scissorial teeth of mandibles (STEBNICKA, 1977). This feature, not emphasized by LEWIS (1895) is in fact the only, that determines a taxonomic status of *Aegialiini* as one of the tribes of *Aphodiinae*, since there are many overlapping characters among various tribes and genera. The accessory features, such as crenate or denticulate margin of pronotum, dentate humeri as well as general shape of the body do not fit *Caelius denticollis* exclusively, but occur among numerous representatives of *Aphodiinae*. It should be mentioned, that a new genus *Caelius* has not been placed by LEWIS in any tribe of *Aphodiinae*. On the other hand, the figure of *denticollis* on the page 382 of his paper might suggest, that this species belongs to *Eupariini*- or *Aegialiini* tribe. In 1922 A. SCHMIDT has assigned a monotypic genus *Caelius* to the tribe *Aphodiini*, basing on the original diagnosis (page 362, description "ex LEWIS"). From the last quotation it can be concluded, that he not examined the type-specimens of *C. denticollis*. The existing status of the genus was accepted by BALTHASAR (1945, 1952, 1956), who described three new species being the typical members of *Aphodiini*. NOMURA and NAKANE (1921) and subsequently NAKANE (1961) expressed an opinion, that *C. denticollis* LEW. should be placed within *Aegialiini*. In 1960 (a, b) one of the BALTHASAR's species *C. nipponensis* was recognized by NAKANE as synonym of *Aphodius (Chilothorax) pallidiligonis* WATERH. The mentioned above statements have been criticized by BALTHASAR (1952, 1964) and rejected without any additional evidence and documentation (see LANDIN, 1965). On page 479 of BALTHASAR's monograph (1964), a key for the identification of *Caelius*-species contains five species including *C. denticollis* LEW., *C. nipponensis* BALTH. (as valid) and *C. testaceus* (*Mozartius testaceus* NOM. et NAK., 1951) known only from Japan so far. In 1967 NAKANE introduced a new subgenus *Paremadus* within *Aphodius* ILLIG. He designated *A. isaburoi* NAK. (described earlier) as the subgeneric type, transferred *A. pallidiligonis* WATERH. from the subgenus *Chilothorax* MOTSCH. and described two new species: *A. (P.) mizo* and *A. (P.) masumotoi*. At the same time PETROVITZ (1967) on the basis of the descriptions erroneously stated, that *A. isaburoi* is a synonym of *C. pallidiligonis* WATERH. and *C. nipponensis* BALTH. Finally, the previous opinions of Japanese authors have been confirmed by NAKANE (1972) after examination of a type-material of some Japanese species deposited in a few European museums.

Although *C. denticollis* LEW. is a famous species about which much has been written, there is very little information concerning its morphology and

almost nothing has been given which would permit the placing it correctly in any system of classification within *Aphodiinae*. For that reason, this species as well as other species in dispute are here presented.

A nomenclatorial and taxonomic arrangement of the species-groups in question is proposed as follows:

Genus: *Aegialia* LATR. (*Aegialiini*)

Aegialia LATREILLE, 1807: 96 (et all. — according to STEBNICKA, 1977);

Caelius LEWIS: 1895: 381, 382; (syn. nov.).

***Aegialia* (*Leptaegialia*) *denticollis* (LEW.) (comb. nov.)**

(Figs. 1—2)

Caelius denticollis LEWIS, 1895: 382, fig. 5; SCHMIDT A., 1922: 362; BALTHASAR, 1952: 234; NAKANE, 1961: 63; BALTHASAR, 1964: 479, 480.

Type locality: Japan, Honshu (Miynoshita, Kiga, Nikko).

Material: 5 specimens compared with the type-material; Honshu, Kanagawa Pref., Ooyama (800 m), 18 IV 1972 (coll. T. NAKANE).

Complementary description. Body rufous, antennal clubs yellow. Head twice as wide as long, shortened clypeus exposing mouthparts, surface closely, finely punctate, frontal suture feebly impressed with two darkened spots on each side; terminal segment of maxillary palpus widest at basal third, very minutely pubescent. Pronotum about half as long as elytra, sides evenly arcuate, distinctly crenate to denticulate near anterior and posterior angles, basal marginal line strong; surface punctures dense, mixed very fine and coarse. Elytra subdepressed, parallel-sided, narrower than the pronotum, humeri strongly dentate. Legs slender; hind tibia four times as long as wide, tibial spurs slender, nearly equal in length, hind tarsus about three-fourths as long as the tibia; first posterior tarsal segment shorter than the upper tibial spur and shorter than the next three segments combined. Stylus of female as in fig. 2.

Remarks. *Aegialia denticollis* LEW. is a typical member of the subgenus *Leptaegialia* BROWN, containing hitherto four species distributed in North America (STEBNICKA, 1977). This species apparently endemic in Japan, resembles *A. (L.) humeralis* BROWN very closely, however, in *A. denticollis* the punctation of the head is less dense, pronotal punctures more close and hind legs are noticeably thinner than in *A. humeralis*. Aedeagus is not illustrated because of the lack of male specimens in the material examined.

Genus: *Aphodius* ILLIG. (*Aphodiini*)

Subgenus: *Paremadus* NAK.

Paremadus NAKANE, 1967: 4; 1972: 424.

Type species: *A. (P.) isaburoi* NAK.

Diagnosis (according to NAKANE, somewhat modified). Body oblong oval, strongly or moderately convex, basic colour black or blackish brown, elytra mostly lighter than the fore body, sometimes spotted. Head without tubercles, often with an obsolete trace of elevation just in front on the middle, clypeus slightly emarginate, sides straight or arcuate toward genae; mouth organs not visible from directly above, scissorial part of mandibles and labrum membranous. Pronotum more or less strongly convex, anterior edge immargined, sides slightly arcuate in front, often emarginate just before posterior angles and finely crenate; base distinctly margined, often emarginate near posterior angles and slightly lobed at middle, the basal marginal line finely to coarsely crenate. Scutellum small, triangular. Elytra oval, convex, often margined at base, humeri always denticulate, in some species humeral tubers vanishing (wings reduced). Middle and hind tibia rather thin, apical setae short, unequal in length, apical spurs thin; terminal spur of fore tibia in male often slightly curved at the tip.

Known distribution. The mountainous regions of Japan, China, North India and Nepal.

Affinity. The species belonging to this subgenus are close to the species of the subgenus *Phalacronothus* MOTSCH. (= *Orodalus* MULS. et REY). The differences are evident chiefly in the shape of pronotum as well as in the facies of species of both subgenera.

***Aphodius (Paremadus) isaburoi* NAK.**

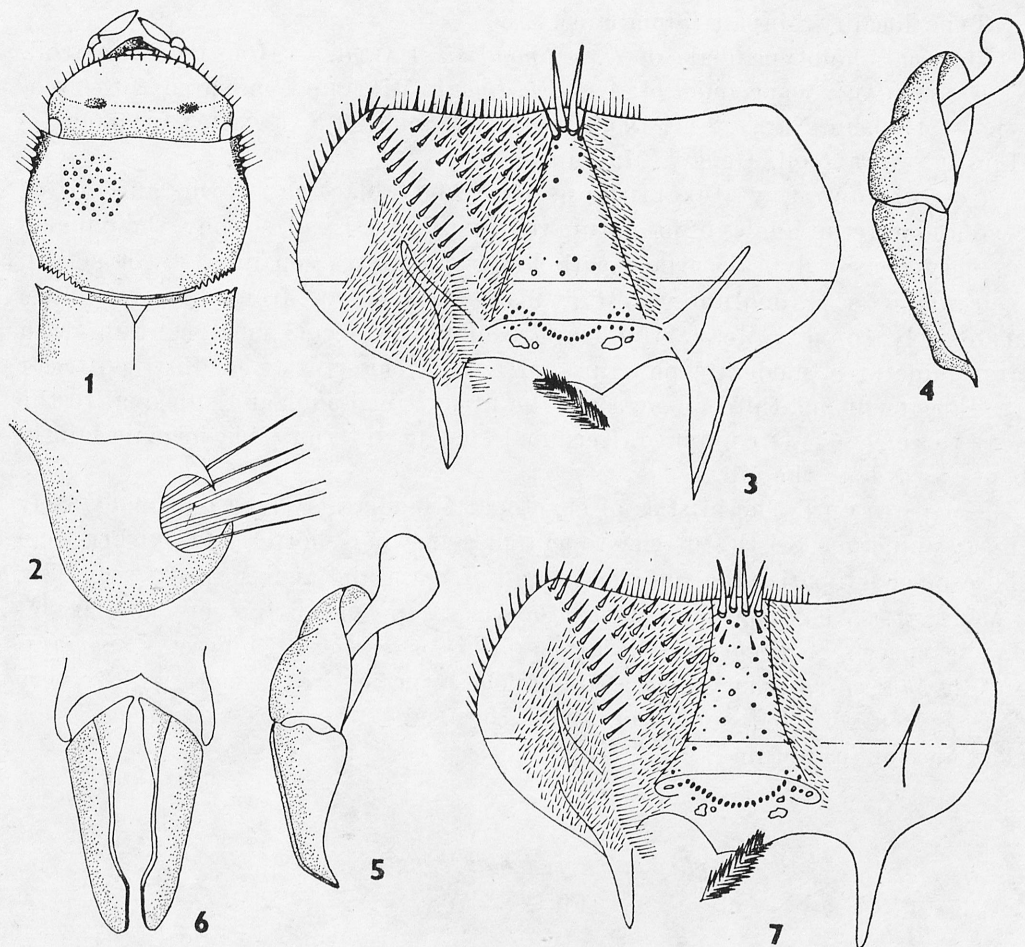
(Figs. 3—4)

Aphodius isaburoi NAKANE, 1956: 119 (*Emadus?*); BALTHASAR, 1964: 201 (*Orodalus?*); NAKANE, 1967: 2, 4 (*Paremadus*).

Type locality: Japan, Honshu (Nara, 500—1000 m).

Material: 2 specimens compared with holotype; Honshu, Nara, Mt Kasuga, 18 XI 1956, T. SHIBATA (coll. T. NAKANE); 8 specimens — Honshu, Nara (coll. Geneva Museum).

Complementary description. Fore body black, anterior of head, sides of pronotum and elytra reddish brown; humeral tubers, sutural intervals and preapical area often lighter than the remained part of elytra. Punctuation of the head very dense, larger anteriorly, the punctures on the sides separated by one their diameter. Pronotum widest at middle when viewed from directly above, strongly convex. Metasternum, abdomen and femora shagreened, metasternum and femora coarsely, densely punctate. First posterior tarsal segment one-third



Figs. 1—2. *Aegialia* (*Leptaegialia*) *denticollis* LEW., 1 — fore body, 2 — stylus. Figs. 3—4. *Aphodius* (*Paremadus*) *isaburoi* NAK., 3 — epipharynx, 4 — aedeagus laterally. Figs. 5—7. *A. (P.) pallidiligonis* WATERH., 5 — aedeagus laterally, 6 — aedeagus dorsally, 7 — epipharynx

longer than the upper tibial spur and equal to the next three segments combined. Terminal spur of anterior tibia of male slightly bent inward at the tip.

Remarks. *A. isaburoi* resembles *A. mizo* and *A. masumotoi* much more closely and the characters of external morphology separating these species may be unclear.

***Aphodius (Paremadus) pallidiligonis* WATERH.**

(Figs. 5—7, 17)

Aphodius pallidiligonis WATERHOUSE, 1875: 87; SCHMIDT A., 1922: 165, 191 (*Volinus*); BALTHASAR, 1964: 222, 258, 259 (*Volinus?*); NAKANE, 1967: 4; 1972: 424 (*Paremadus*); *Aphodius pallidigonis*: PETROVITZ, 1967: 393 (*Volinus*); *Caelius pallidigonis*: PETROVITZ, 1967: 393; *Caelius nipponensis*: BALTHASAR, 1956, 70; 1964: 259, 479, 481.

Type locality: Japan (Simabara).

Material: holotype male of *C. nipponensis* BALTH. — Honshu, Nara (coll. V. BALTHASAR); 1 specimen of *A. pallidiligonis* WATERH. compared with holotype — Honshu, Nara, 22 III 1953, T. NAKANE (coll. T. NAKANE); 1 specimen — Honshu, Nara (coll. Geneva Museum).

Complementary description. Fore body blackish brown, anterior of head and anterior angles of pronotum reddish brown. Head shining, the punctures very dense, clypeal surface with larger punctures separated by less than their diameter. Pronotum widest at base when viewed from directly above, moderately convex. Metasternum and femora alutaceous, metasternum with large punctures, moderate punctures of femora closer at knee. First posterior tarsal segment one-third longer than the upper tibial spur and subequal to the next three segments combined. Terminal spur of anterior tibia in male faintly bent inward at the tip.

Epipharynx. The bristles of chaetoparia moderately long and moderately thick; numerous bristles of chaetopodium somewhat shorter and thicker than those of chaetoparia, the remained setae of paria and pedium short and thin.

Affinity. This species belongs to the group containing very similar Japanese species *A. isaburoi*, *A. mizo* and *A. masumotoi*, Chinese *A. nomurai* and *A. phulcoiensis* sp. n. from Nepal. These species are characterized by very dense, often wrinkled punctation of the head and by very close punctures on the sides of pronotum.

Aphodius (Paremadus) mizo NAK.

(Figs. 8—10)

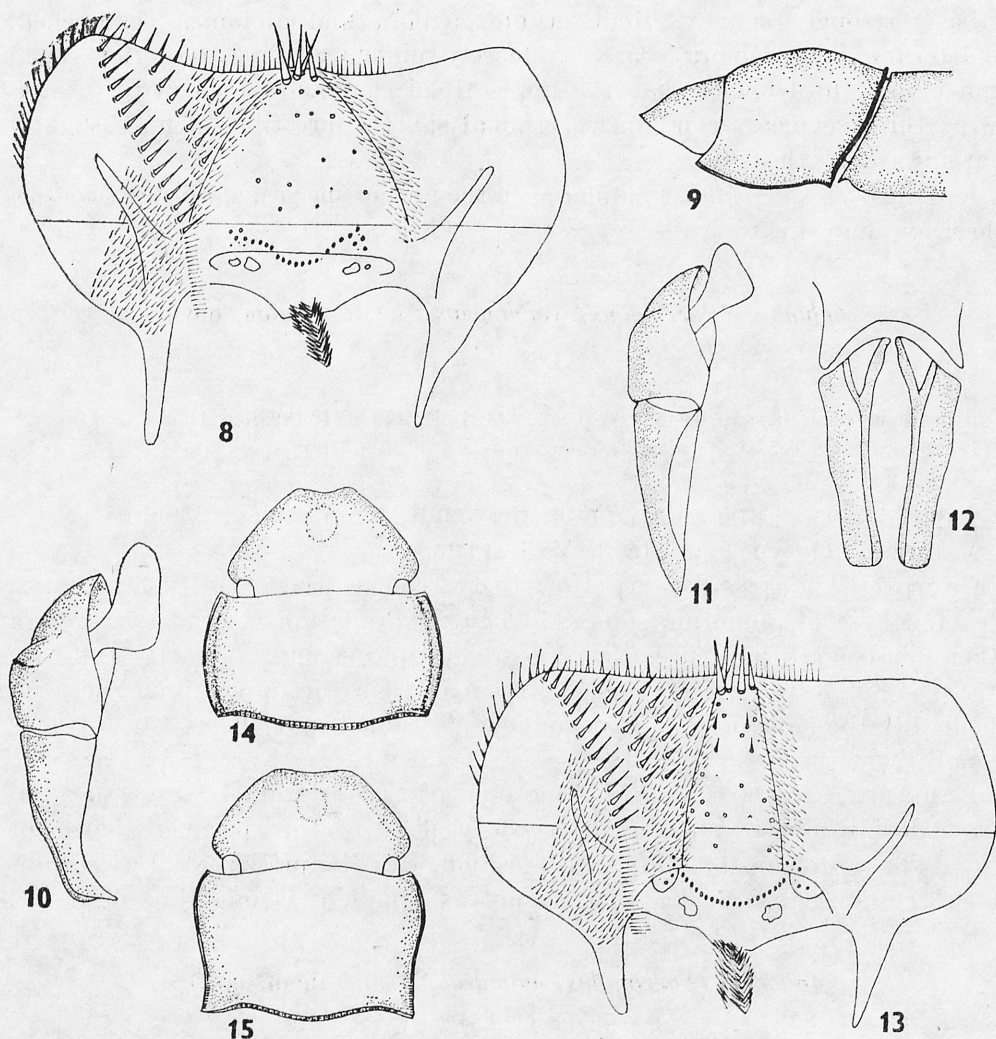
Aphodius mizo NAKANE, 1967: 2—3 (*Paremadus*).

Type locality: Japan, Honshu (Minoo, Osaka; Tohnomine, Kasuga, Nara).

Material: 2 paratypes (coll. T. NAKANE).

Complementary description. Fore body black, anterior of head, sides of pronotum and elytra reddish brown, humeral tubers, elytral intervals near scutellum and preapical area of elytra lighter. Pronotum widest at middle, moderately to strongly convex. Metasternum, femora and abdomen shagreened, metasternum and femora coarsely, densely punctate. First posterior tarsal segment one-third longer than the upper tibial spur and subequal to the following three segments combined. Terminal spur of fore tibia of male slightly bent inward at the tip.

Epipharynx. The facies similar as in *A. isaburoi* and *A. pallidiligonis*, however, short and thin bristles of paria and pedium less numerous, epitormal sclerome otherwise shaped.



Figs. 8—10. *Aphodius (Paremadus) mizo* NAK., 8 — epipharynx, 9 — fore body, 10 — aedeagus laterally. Figs. 11—13. *A. (P.) masumotoi* NAK., 11 — aedeagus laterally, 12 — aedeagus dorsally, 13 — epipharynx. Figs. 14—15. Fore body: 14 — *A. (P.) yenpingensis* STEBN., 15 — *A. (P.) nomurai* STEBN.

Aphodius (Paremadus) masumotoi NAK.

(Figs. 11—13)

Aphodius masumotoi NAKANE, 1967: 3 (*Paremadus*).

Type locality: Japan, Honshu (Sagami-Oyama, Miyagase, Aiko, Kanagawa).

Material: 1 paratype (coll. T. NAKANE).

Complementary description. Black, anterior of head, sides of pronotum, sutural intervals and apex of elytra reddish brown. Pronotum widest

at base, strongly convex. Metasternum, femora and abdomen shagreened, metasternum and femora coarsely, densely punctate. First posterior tarsal segment one-third longer than the upper tibial spur and subequal to the following three segments combined. Terminal spur of fore tibia of male slightly bent inward at the tip.

Epipharynx. The facies similar as in the former species; epitormal sclerome otherwise shaped.

Aphodius (Paremadus) yenpingensis STEBN. (nom. nov.)

(Fig. 14)

Caelius chinensis BALTHASAR, 1945: 106; 1952: 233; 1964: 479, 481, 482, nec *Aphodius chinensis*: HAROLD, 1861: 105 [= *Aphodius elongatulus* FABRICIUS, 1801].

Type locality: China, Prov. Fukien (vicinity of Yenping, 2300 m).

Material: holotype male (coll. V. BALTHASAR).

Complementary description. Body reddish brown, anterior of head, sides and base of pronotum somewhat lighter. Pronotum widest at base with rather dense large punctures, basal marginal line strong, distinctly concave. First posterior tarsal segment one-third longer than the upper tibial spur and subequal to the next three joints combined. Terminal spur of fore tibia of male strongly bent inward at the tip.

Remarks. I have examined a material of *Caelius* from BALTHASAR's collection during my stay in Prague in the year 1973. The specimens have not been available for examination in connection with the present study well now the descriptions and illustrations are not as complete as might be desirable.

Aphodius (Paremadus) nomurai STEBN. (nom. nov.)

(Fig. 15)

Caelius sulcatus BALTHASAR, 1952: 232, 233; 1964: 479, 480, nec *Scarabaeus sulcatus*: FABRICIUS, 1792: 24 [= *Aphodius subterraneus* (LINNAEUS, 1758)] nec *Aphodius sulcatus*: IL-LIGER, 1804 et auctorum [= *Aphodius frater* MULSANT et REY, 1870].

Type locality: China, Prov. Fukien (Kwatun, 2300 m).

Material: holotype male (coll. V. BALTHASAR).

Complementary description. Body strongly convex, fore body black, elytra reddish brown with preapical spots. Pronotum widest at base, basal marginal line strong, distinctly concave, sides of pronotum densely punctate. First posterior tarsal segment nearly twice as long as the upper tibial spur and somewhat longer than the next three segments combined. Terminal spur of fore tibia of male slightly bent inward at the tip.

Remarks. This species is renamed in honor of Dr Sizumu NOMURA dead for a few years past.

Aphodius (Paremadus) phulkokiensis n. sp.

(Figs. 18—20)

Holotype female and paratype female: Nepal, distr. Kathmandu, Phulkoki (2600 m), 22 IV 1982, A. SMETANA (coll. H. F. HOWDEN, Ottawa).

Description. Length 3.7 and 4.0 mm, greatest width 1.7 and 1.9 mm. Body oblong oval, moderately shining; fore body black, anterior of head and sides of pronotum brownish, elytra brown with yellow or mixed yellow and darker spots, legs reddish brown. Head moderately convex, clypeus rounded each side of shallow median emargination, sides nearly straight and faintly emarginate before small, obtuse genae; middle of clypeus slightly convex, edge finely reflexed, frontal suture fine, impressed; surface with dense, moderately coarse punctures, clypeal sides lengthwise wrinkled. Pronotum widest at middle, convex with two foveae discernible on each side and a trace of furrow at middle near base; sides invisible from directly above, anterior angles rounded, edge narrowly margined, arcuate, minutely crenate before obtuse, not protrudent posterior angles; base sinuate, slightly emarginate near posterior angles, basal marginal line strong, concave, distinctly crenate by rather large punctures; surface punctures mixed very fine and moderately coarse, the later separated by one to three their diameters throughout. Scutellum triangular, minutely alutaceous. Elytra convex, widest behind the middle, faintly margined basally, finely but sharply dentate at shoulders, humeral tubers marked; striae rather deep with distant punctures distinctly crenating inner margins of the intervals; intervals convex, more convex at apex, three lateral intervals more convex than those on the disc; all intervals shining with very minute, scattered punctures. Metasternum shagreened, convex, coarsely punctate. Abdominal sterna opaque, shagreened with a row of short, yellow hairs. Middle and hind femora narrow, shagreened, the punctures similar as those of metasternum, concentrated in posterior half, each bearing very short yellow hair; lateral teeth of fore tibia small, apical spur straight and acute; middle and hind tibia slender, transverse ridges distinct, apical setae short, subequal in length, apical spurs short and thin; first posterior tarsal segment one-third longer than the upper tibial spur and shorter than the next three segments combined.

Epipharynx. The setae of chaetoparia moderately long and moderately thick; numerous bristles of chaetopedium somewhat shorter and thicker than those of chaetoparia, the remained setae of paria and pedium short and thin.

Remarks. See under *A. pallidiligonis* WATERH. Male unknown.

Aphodius (Paremadus) zojilae (STEBN.) (comb. nov.)

(Fig. 16)

Caelius zojilae STEBNICKA, 1981: 326, figs. 10—12; 1983: 318.

Type locality: India, Ladakh (Zojila, 3300—3500 m).

***Aphodius (Paremadus) mahriensis* (STEBN.) (comb. nov.)**

Caelius mahriensis STEBNICKA, 1983: 318, 319, figs. 1—3.

Type locality: India, Himachal Pradesh (Mahri, 3000—3200 m).

Remarks. *A. mahriensis* and *A. zojilae* constitute a second group of species characterized by elytra egg-shaped, widest at middle and strongly margined at base, by vanishing humeral tubers and brachypterous wings.

***Aphodius (Paremadus) yaralensis* STEBN. (nom. nov.)**

(Figs. 21—22)

Caelius nepalensis PETROVITZ, 1968: 37, 38; STEBNICKA, 1983: 318, nec *Aphodius nepalensis* BALTHASAR, 1965 et auct.

Type locality: Nepal (Yaral; Mingbo, 4100—4500 m).

Material: 2 paratypes (Geneva Museum).

Complementary description. Body moderately convex, fore body brownish black, elytra reddish brown or yellowish brown, lighter in basal two-thirds. Pronotum widest at middle, sides visible from directly above, surface punctures mixed very fine to moderate, the latter separated by one or two times their diameter. Metasternum and femora shining, rather densely and coarsely punctate, abdomen minutely shagreened. First posterior tarsal segment twice as long as the upper tibial spur and subequal to the following three segments combined. Terminal spur of anterior tibia in both sexes straight and acute.

***Aphodius (Paremadus) bagmatiensis* STEBN. (comb. nov.)**

Caelius bagmatiensis STEBNICKA, 1983: 318, 320, figs. 4—6.

Type locality: Nepal, Bagmati (Tarke Ghyang, 3000—3400 m).

***Aphodius (Paremadus) langtangicus* (STEBN.) (comb. nov.)**

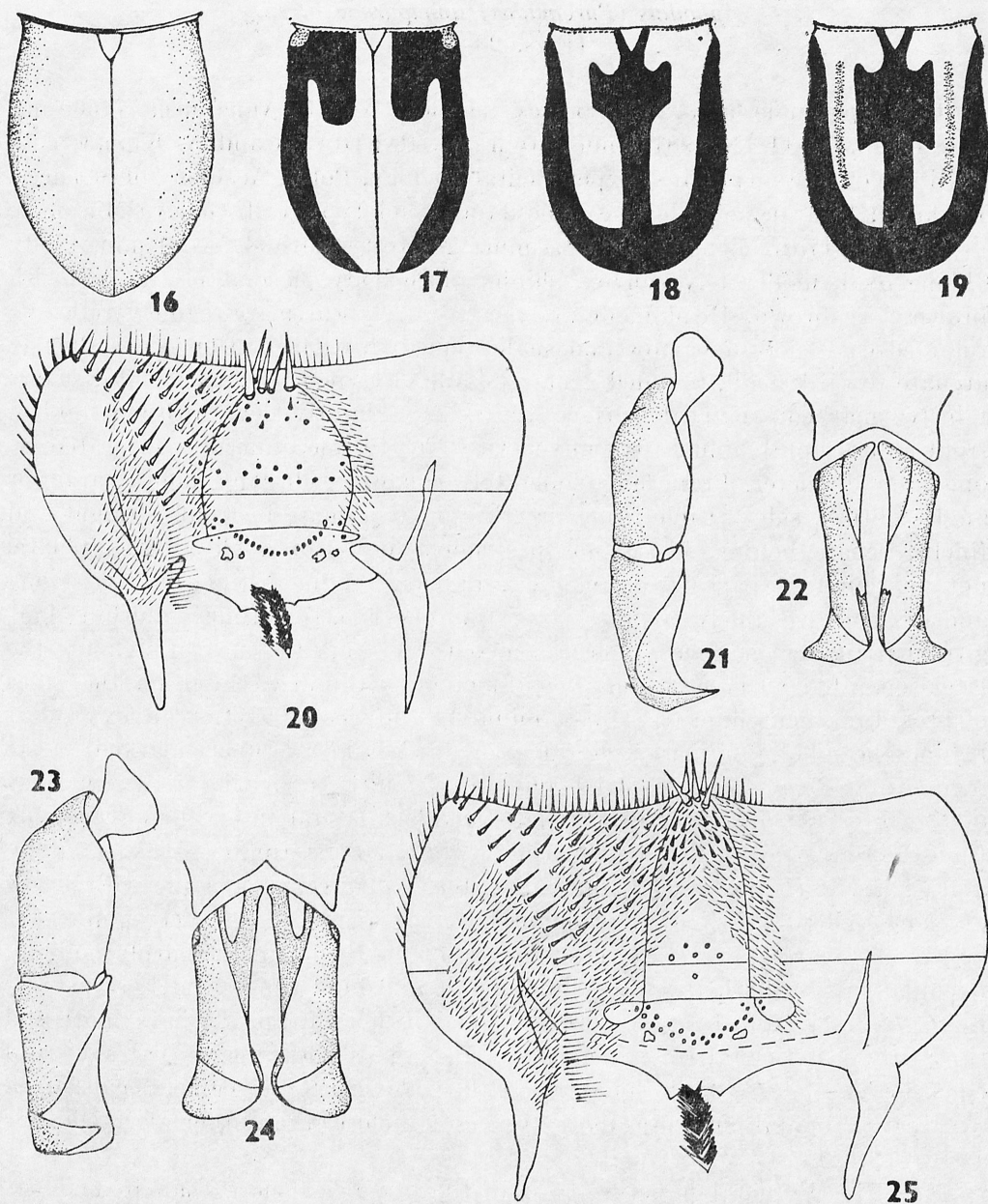
Caelius langtangicus STEBNICKA, 1983: 319, 321, figs. 7—8.

Type locality: Nepal, Langtang (Laurobinyak, 3850 m).

***Aphodius (Paremadus) yangricus* (STEBN.) (comb. nov.)**

Caelius yangricus STEBNICKA, 1983: 319, 321, 322, figs. 9—10.

Type locality: Nepal, Bagmati (Yangri, 4150 m).



Figs. 16—17. Elytra: 16 — *Aphodius (Paremadus) zojilae* (STEBN.), 17 — *A. (P.) pallidiligonis* WATERH. Figs. 18—20. *A. (P.) phulcokiensis* n. sp., 18, 19 — elytra, 20 — epipharynx. Figs. 21—22. *A. (P.) yaralensis* STEBN., 21 — aedeagus laterally, 22 — aedeagus dorsally. Figs. 23—25. *A. (P.) annapurnae* n. sp., 23 — aedeagus laterally, 24 — aedeagus dorsally, 25 — epipharynx

Aphodius (Paremadus) annapurnae n. sp.

(Figs. 23—25)

Holotype male and 2 paratypes females: Nepal, Annapurna (4000 m), base camp, 7—11 IX 1981, under stones, J. PAWŁOWSKI and A. KUŠKA (coll. Institute of Systematic and Experimental Zoology, Polish Academy of Sciences, Kraków); 1 paratype male, the same data as holotype (coll. Geneva Museum).

Description. Length 3.6—4.4 mm, greatest width 1.7—2.1 mm. Body oblong oval, moderately convex, shining, fore body piceous, elytra yellowish brown, legs brown. Head moderately convex, clypeal margin finely reflexed, rounded each side of narrow and shallow median emargination, sides slightly arcuate toward small, rounded genae; middle of clypeus convex, frontal suture faintly marked; clypeal surface alutaceous, faintly lengthwise wrinkled, front and occiput shining with mixed very fine to fine punctures separated by one their diameter. Pronotum moderately convex, widest at middle, anterior angles obtuse, sides visible from directly above, arcuate in front, straight and finely crenate before obtuse, not protrudent posterior angles; base arcuate, not emarginate near posterior angles, basal marginal line distinct but not strong and not concave, finely crenate; disc with very fine, sometimes vanishing longitudinal furrow; surface punctures mixed very fine to fine throughout, the later separated by two to four their diameters on the disc, closer on the sides of pronotum. Scutellum triangular, minutely alutaceous. Elytra convex, widest behind the middle, humeri very finely dentate, humeral tubers marked; striae moderately deep, shallow strial punctures faintly crenating inner margins of the intervals; intervals nearly flat, only last lateral interval more convex than the remained; surface shining, impunctate. Metasternum convex, minutely alutaceous, finely punctate. Abdominal sterna shagreened, opaque with a row of short yellow hairs. Middle and hind femora narrow, minutely alutaceous and finely, scarcely punctate; lateral teeth of fore tibia small, sharply pointed, terminal spur in both sexes straight; middle and hind tibia slender, transverse ridges distinct, apical setae short, subequal in length, apical spurs short and thin; first posterior tarsal segment twice as long as the upper tibial spur and equal in length or a trifle longer than the following three segments combined.

Male. Pronotal punctures more distinct and closer than in female. Aedeagus as in figs. 23, 24.

Female. Pronotal punctures less distinct and less close than in male.

Epipharynx. The numerous setae of chaetopodium moderately long and moderately thick, the same length and thickness as those of chaetoparia; the remaining setae of paria and pedium short and thin.

Remarks. *A. annapurnae* n. sp. belongs to the third group containing very closely similar species such as *A. yaralensis*, *A. bagmatiensis*, *A. langtangicus* and *A. yangricus*, characterized by moderately dense to scattered punctures of the pronotum and by not strong basal marginal line. These species were found in the Himalayas, 3000—4500 m over the sea level.

Key for the identification of *Paremadus* — species

1. Length of the body 2.6 mm; lateral margin of pronotum concave and reflexed; elytral intervals strongly convex, nearly carinate. South China *A. (P.) yepingensis* STEBN.
- Length of the body more than 3.0 mm; lateral margin of pronotum not concave and not reflexed; elytral intervals moderately convex or flat, never carinate 2.
2. Elytra widest at middle (Fig. 16), distinctly margined at base; three lateral intervals subopaque, humeral tubers vanishing 3.
- Elytra widest behind the middle (Figs. 17—19), faintly margined at base; three lateral intervals shining, humeral tubers marked 4.
3. Base of pronotum near posterior angles distinctly emarginate, basal marginal line wide, somewhat concave, posterior angles sharp and protrudent; pronotal disc with scattered, moderately coarse punctures. Elytral intervals minutely alutaceous. North India *A. (P.) zojilae* (STEBN.)
- Base of pronotum almost contiguously arcuate, not emarginate near posterior angles, basal marginal line strong but narrow, somewhat concave, posterior angles obtuse, not protrudent; pronotal disc with dense, moderately coarse punctures. Elytral intervals shining. North India *A. (P.) mahriensis* (STEBN.)
4. Elytra blackish brown or brown with well defined, yellow or reddish yellow spots 5.
- Elytra blackish brown, reddish brown or brown without yellow or reddish yellow, well defined spots 7.
5. Elytra blackish brown with reddish yellow spots between 1-th and 5-th intervals before apex; intervals minutely alutaceous, less shining than the forebody. Median basal area of pronotum with rather large and deep, densely punctate longitudinal furrow. South China *A. (P.) nomurai* STEBN.
- Elytra brown with yellow or reddish yellow spots on the middle of each elytron (Figs. 17—19), intervals shining like as the fore body. Median basal area of pronotum without trace of furrow or with shallow concavity at base 6.
6. Sides of pronotum visible when viewed from directly above, pronotum widest at base, basal marginal line fine, not concave, finely crenate. Japan *A. (P.) pallidilgonis* WATERH.
- Sides of pronotum invisible from directly above, pronotum widest at middle, basal marginal line strong, concave, coarsely crenate. Nepal *A. (P.) phulcokiensis* n. sp.
7. Elytra blackish brown or reddish brown, humeral tubers, sutural intervals and preapical area often lighter than the remained part of elytra. Basal marginal line of pronotum strong, distinctly concave, pronotal sides more or less emarginate before right-angled, protrudent posterior angles

- (Fig. 9); the punctures on the sides of pronotum separated by less than their diameter 8.
- Elytra reddish brown or yellowish brown, sometimes lighter at apex. Basal marginal line of pronotum not strong, very faintly concave, pronotal sides arcuate or straight toward obtuse, not protrudent posterior angles; the punctures on the sides of pronotum separated by one to three times their diameter 10.
8. Elytral intervals flat, minutely alutaceous. Median basal area of pronotum with longitudinal, punctate furrow. Paramerae of male aedeagus curved ventrally at apex (Fig. 10). Japan *A. (P.) mizo* NAK.
- Elytral intervals more or less convex, not alutaceous. Median basal area of pronotum without longitudinal furrow. Paramerae of male aedeagi straight or curved ventrally at apex 9.
9. Clypeal surface alutaceous, pronotum widest at middle. Paramerae of male aedeagus curved ventrally and bent downward at apex (Fig. 4). Japan *A. (P.) isaburoi* NAK.
- Clypeal surface not alutaceous, pronotum widest at base. Paramerae of male aedeagus straight (Fig. 11). Japan *A. (P.) masumotoi* NAK.
10. Base of pronotum very finely, inconspicuously margined and faintly crenate by very fine punctures. Nepal *A. (P.) yaralensis* STEBN.
- Base of pronotum not strongly but distinctly margined and crenate by large punctures 11.
11. First segment of posterior tarsus as long as the upper tibial spur. Elytra 2.0 times length of pronotum. Nepal *A. (P.) yangricus* (STEBN.)
- First segment of posterior tarsus twice as long as the upper tibial spur or one-third longer. Elytra more than 2.0 times length of pronotum 12.
12. First segment of posterior tarsus one-third longer than the upper tibial spur. Elytra 2.4 times as long as pronotum. Nepal *A. (P.) bagmatiensis* (STEBN.)
- First segment of posterior tarsus twice as long as the upper tibial spur. Elytra 2.2 or 2.6 times as long as pronotum 13.
13. Elytral intervals strongly convex apically, elytral striae with large, deep punctures at apex. Elytra near 2.2 times as long as pronotum. Nepal *A. (P.) langtangicus* (STEBN.).
- Elytral intervals faintly convex apically, the punctures of elytral striae vanishing at apex. Elytra near 2.6 times as long as pronotum. Nepal. *A. (P.) annapurnae* n. sp.

REFERENCES

- BALTHASAR V. 1945. De uno genere et nonnullis *Aphodiinarum* speciebus novis. Cas. čsl. Spol. ent., Praha, **42**: 104—115.
- BALTHASAR V. 1952. Die Coprophagen der chinesischen Provinz Fukien. (II Teil). Acta ent. Mus. Nat. Pragae, Praha, **28**: 223—236.
- BALTHASAR V. 1956. Einige neue laparostictae Scarabaeiden. Ent. Bl. Biol. Syst. Käfer, Berlin, **52**: 66—73.
- BALTHASAR V. 1964. Monographie der *Scarabaeidae* und *Aphodiidae* der palaearktischen und orientalischen Region. *Coleoptera: Lamellicornia, Aphodiidae*. Prag, 3, 652 pp.
- FABRICIUS J. Ch. 1792. Entomologia Systematica. Hafniae, 1, 538 pp.
- FABRICIUS J. Ch. 1801. Systema *Eleutheratorum* secundum ordines, genera, species adiectis, synonymis, locis, observationibus, descriptionibus. Kiliae, 1, XXIV+506 pp.
- HAROLD E. v. 1861. Beiträge zur Kenntniss einiger coprophagen Lamellicornien (Zweites Stück). Berl. ent. Z. Berlin, **5**: 92—115.
- ILLIGER K. 1804. Zusätze, Berichtigungen und Bemerkungen zu FABRICII Systema *Eleutheratorum*. Tomus II. Mag. Insektenk., Braunschweig, 3: 146—180.
- LANDIN B. O. 1965. Dr. V. BALTHASAR'S Monographie der *Scarabaeidae* und *Aphodiidae* der palaearktischen und orientalischen Region, 1—3. A critical review. Opusc. ent., Lund, **30**: 175—182.
- LATREILLE P. A. 1807. Genera *Crustaceorum* et *Insectorum* secundum ordinem naturalem in familias disposita, iconibus exemplisque. Tomus secundus, Parisiis et Argentorati, 280 pp.
- LEWIS G. 1895. On the Lamellicorn *Coleoptera* of Japan, and notices on others. Ann. Mag. nat. Hist., London, **16**: 374—408.
- LINNAEUS C. 1758. Systema Naturae per regna tria naturae, secundum Classes, Ordines, Genera, Species, cum characteribus, differentiis, synonymis, locis. Editio Decima, Reformata. Tomus I. Holmiae, IV+824 pp.
- MULSANT E., REY Cl. 1870. Description de quelques nouvelles espèces d'Aphodiens (Coléoptères Lamellicornes). Opusc. Ent., Paris, **14**: 203—221.
- NAKANE T. 1956. Neue Aphodiinen aus Japan. Insecta matsum., Sapporo, **20**: 119—124.
- NAKANE T. 1960a. On the *Scarabaeidae* of Japan (VI). Ent. Rev. Japan, Osaka, **12** (1): 20—33.
- NAKANE T. 1960b. Descriptions of New Forms of *Lamellicornia* from Japan (*Coleoptera*). Ent. Rev. Japan, Osaka, **12** (1): 1—6.
- NAKANE T. 1961. On the *Scarabaeidae* of Japan (VII). Ent. Rev. Japan, Osaka, **12** (2): 50—63.
- NAKANE T. 1967. Descriptions of Few New Forms of the Genus *Aphodius* ILLIGER from Japan (*Col.*, *Scarab.*). Ent. Rev. Japan, Osaka, **19** (1): 1—4.
- NAKANE T. 1972. Notes on the Synonymy and on Some Types of Japanese *Coleoptera* in Certain European Collections, I: *Lamellicornia* (*Insecta*). Bull. Nat. Sci. Mus., Tokyo, **15** (3): 421—428.
- NOMURA S., NAKANE T. 1951. On some new and remarkable species of *Aphodiinae* from Japan and Formosa. Kontyû, Tokyo, **19** (2): 35—47.
- PETROVITZ R. 1967. Neue und verkannte *Aphodiinae* aus allen Erdteilen (*Col.*, *Scarab.*). Ent. Arb. Mus. Georg FREY, Tutzing, **18**: 388—403.
- PETROVITZ R. 1968. *Scarabaeidae* aus Indien und Nepal (*Coleoptera*). Z. Arbeitsg. österr. Ent., Wien, **20** (1—3): 35—38.
- SCHMIDT A. 1922. *Aphodiinae*. Das Tierreich. Berlin-Leipzig, 45, XXXVI+614 pp.
- STEBNICKA Z. 1977. A Revision of the World Species of the Tribe *Aegialiini* (*Col.*, *Scarab.*, *Aphod.*). Acta zool. cracov., Kraków, **22** (11): 397—506.
- STEBNICKA Z. 1981. *Aphodiinae* from the Himalayas, Assam and Sri-Lanka (*Col.*, *Scarab.*). Entomol. Basil., Basel, **6**: 319—327.

- STEBNICKA Z. 1983. New Species of *Caelius* LEW. (*Col.*, *Scarab.*, *Aphod.*) from Himalayas. *Rev. suisse Zool.*, Genève, 90 (2): 317—323.
- WATERHOUSE C. O. 1875. On the Lamellicorn *Coleoptera* of Japan. *Trans. ent. Soc. Lond.*, London, 1: 71—116.

STRESZCZENIE

Praca zawiera opisy dwu nowych gatunków z Nepalu łącznie z kluczem do oznaczania i uzupełniającymi uwagami odnośnie do 14 azjatyckich, górskich gatunków, objętych aktualnie restytuowanym podrodzajem *Paremadus* NAK., w ramach rodzaju *Aphodius* ILLIG. z plemienia *Aphodiini*. Osiem z wymienionych gatunków, opisanych poprzednio w rodzaju *Caelius* LEW., zostało przeniesionych do rodzaju *Aphodius* ILLIG. i przedstawionych w nowej kombinacji, przy czym trzy gatunki otrzymały nowe nazwy w miejsce wtórnych homonimów. Nazwa rodzajowa *Caelius* LEW. została uznana za synonim *Aegialia* LATR. w wyniku przeanalizowania odnośnej literatury i zbadania gatunku typowego *Caelius denticollis* LEW. Gatunek ten, prawdopodobnie endemiczny w Japonii, jest blisko spokrewniony z nearktycznymi gatunkami z podrodzaju *Leptaegialia* BROWN i należy do plemienia *Aegialiini*. Dotychczasowa, błędna klasyfikacja wymienionych gatunków powstała na skutek niewłaściwego zinterpretowania przez poszczególnych autorów oryginalnej diagnozy rodzaju *Caelius*, podanej przez LEWISA (1895).

Redaktor pracy: prof. dr J. Pawłowski