New and noteworthy scarab beetles from Asia and America (Coleoptera Lamellicornia)

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Abstract: New morphological or nomenclatural data and/or distributional records for 35 species of the lamellicorn beetles of the genera *Ancognatha*, *Dipelicus*, *Heterogomphus* (Dynastinae), *Adoretosoma*, *Anomala*, *Dalatamala*, *Didrepanephorus*, *Parastasia*, *Popillia*, *Rhombonyx* and *Trichanomala* (Rutelinae), *Ochodaeus* (Ochodaeinae), *Odontotrypes* and *Phelotrupes* (Geotrupinae) are presented. Thirteen new synonyms are established. Two new species, *Eutheola paraguayensis* (Dynastinae) and *Onthophagus andreji* (Scarabaeinae) are described. The poorly known Indochinese ruteline beetles *Anomala planelytra* and *Trichanomala tonkinensis* stat. nov. are redescribed; the lectotype for *T. tonkinensis* is designated.

Key words: Coleoptera, Scarabaeoidea, Oriental, Neotropical, morphology, systematics, distribution, new species, new synonyms, lectotype designation.

Introduction

During the course of identification of various scarab beetles in my collection, I found several new synonymies, new species, new distributional records and new morphological data extending the diagnostic criteria of the certain taxa; some of these discoveries are presented in this paper. The specimens studied are housed in the following collections: cAP – my collection, IEE, Moscow, will be deposited in the Zoological Museum, Moscow University; cAG – private collection of A.A. Gorodinski, Moscow; cCZ – collection of Carsten Zorn, Gnoien; MNHN – Paris Museum; ZMB – Berlin Museum.

Taxonomic descriptions and notes

Ancognatha scarabaeoides ab. *unduavica* (Prokofiev, 2012)

Remarks: In some areas of Peru and Bolivia this black form of *A. scarabaeoides* Erichson, 1847 is much more abundant than the typical variegated form. See Prokofiev (2013a) for taxonomic discussion.

Adoretosoma atritarse (Fairmaire, 1891)

Remarks: Three subspecies, *A. a. atritarse*, *A. a. dalatmontis* Prokofiev, 2012, and *A. a. erubescens* Machatschke, 1955, are recognized (Prokofiev, 2012a). Following Lin (1981), other authors had included Xizang into the range of *A. a. erubescens* (Zorn, 2006; Prokofiev, 2012a). However, the shape of the male genitalia figured by Lin (1981: fig. 6) indicates that his material belongs to the nominotypical subspecies. Thus, the distribution of *A. a. erubescens* should be restricted to Assam only (at present state of knowledge).

Anomala anguliceps Arrow, 1917

Anomala siamensis (non Nonfried, 1891): Paulian, 1959: 16(50), figs. 110-112.
Anomala corneola Lin, 2002: 394-395 (original description). NEW SYNONYMY.
Remarks: A comparison of the large series of beetles from Myanmar (Kachin state), North and Central Laos, Vietnam (Tonkin, Langbian) and Yunnan (cAP, cCZ, MZB) shows no differences between them. This species is recorded for Dalat Plateau (Lam Dong province) for the first time; it is quite abundant in the central part of these highlands, but is absent on the eastern escarpments.

Paulian (1959) misidentified this species with *A. siamensis* according to his drawings of the male genitalia, but actually both species are present at least in Laos.

***Anomala angusta* Arrow, 1912**

Remarks: During examination of numerous specimens from Sikkim and Nepal (ZMB, cAG, cAP), I found in this species several characters, unusual for the genus, but never mentioned before. Surprisingly, some of them reflect the features of the newly described aberrant monotypic genus *Dalatamala* (Prokofiev, 2013b). First of all, the labrum of *A. angusta* is well visible from above, though somewhat less produced than in *D. araneipes* Prokofiev, 2013. Also there are several undescribed and unrelated Oriental species of *Anomala* having a more or less produced labrum, although in all cases much less so than in *Dalatamala* (C. Zorn, in litt). In addition, after examination of the various species of the poorly known genus *Spinanomala* Ohaus, 1910 (cCZ, ZMB, cAP, MNHN), I found that the labrum is somewhat produced (sometimes very slightly) in all of them. The labrum somewhat produced is characteristic for *Glenopopillia* Lin, 1980 (*G. rufipennis* Lin, 1980 (cAP) has been studied), but this genus seems to be more derived having the anterior margin of the labrum deeply and broadly concave. Thus, this character appears to be more distributed within Oriental anomalines and shows some further development, but maximally expressed in *Dalatamala*.

Some additional features of *A. angusta* include the clypeus broadly rounded, parabolic, and lacking the anterior angles, but much broader than the clypeus of *Dalatamala*. Both sexes possess the elytral epipleura posteriorly diminishing and bearing the well-developed setae along all its length; a strongly carinate abdomen; the presence of the medial sulcus of the pronotum; the last joint of the mandibular palpi similarly broadened and with a well-developed impression bearing microsensillae; a densely setose pygidium, and antennal club being somewhat shorter than the pedicel. The females of *A. angusta* lack the epipleural callosities. Some of these features are sharply different from those in *D. araneipes* having a strong and peculiar sexual dimorphism; thus, these species cannot be congeneric, despite the some aforementioned similarities. Certain characters listed in the original diagnosis of *Dalatamala* (Prokofiev, 2013b) seem to be plesiomorphic and more or less distributed within *Anomala*. For instance, the elongate first joint of fore tarsi in the males is variably distributed within the different lineages of *Anomala*. The presence of an oval impression on the last joint of the maxillary palpi is characteristic for many ruteline species and even for Melolonthinae; sometimes it is further modified, i.e. the flat depression replaced by the deep triangular groove in *A. cupripes* (Hope, 1839) (personal observation). The elongated basal joint of the fore tarsi is also found in some *Anomala* spp. (i.e., *A. russiventris* Fairmaire, 1893; *A. esmeralda* Prokofiev, 2013; etc.). Thus, the diagnosis of *Dalatamala* should be emended.

Emended diagnosis of *Dalatamala* Prokofiev, 2013: clypeus parabolic, as long as wide; labrum horizontal, produced before the clypeus, well-visible from above; striking sexual dimorphism: male antennal club enlarged; apical two-thirds of male elytral margin with a specialized setosity (see Prokofiev, 2013b: fig. 5); females with strong elytral callus. For other characters, see Prokofiev (2013b).

***Anomala aureoflava* Arrow, 1917**

Remarks: This species has been described as having the uniformly testaceous coloration (Arrow, 1917). However, my specimens from Yunnan, China (3 males, Lijiang city env., alt. 2700 m, 10.06.1998, A.A. Gorodinski leg.) possess a variably developed dark pattern on the elytra (Figs. 1-3), which causes confusion in identification using Arrow's key (op. cit.). In the other respects they are identical with uniformly coloured specimens from Nepal and North India. The shape of the parameres is slightly variable (Figs. 4-6) but lies in the variability range. C. Zorn (in litt.) kindly

informed me that only specimens from Sichuan and northern Yunnan are darkened, while specimens from Xishuanbanna, south Yunnan, as well as from Assam, Meghalaya and Burma are pale (all of my specimens from Nepal are also uniformly pale). It is not clear at present if this a valid reason for the separation of the two subspecies or not.

Females of *A. aureoflava* and *A. variegata* Hope, 1831 (unicolorous form) are hardly separable, but *A. aureoflava* seems to be more oval in shape, and the vaginal palpi of *A. variegata* are narrower, with tips bearing denticles which are not developed in *A. aureoflava*.

***Anomala bilunata* Fairmaire, 1888**

Anomala bilunata Fairmaire, 1888: 341 (original description).
Anomala bilunulata (lapsus): Paulian, 1959: 45, figs. 92-95; Prokofiev, 2013c: 107, fig. 44.
Blithopertha taitungensis Kobayashi, 1987: 28 (original description), NEW SYNONYMY.
Blithopertha senooi Kobayashi, 1987: 29 (original description), NEW SYNONYMY.
*Anomala sororterti*a Prokofiev, 2013c: 105, figs. 38-43 (original description), NEW SYNONYMY.

Remarks: This is a very variable species distributed from Sichuan and Taiwan to the Himalayan foothills in northern India and throughout Indochina. Formerly it was not reported from Taiwan, however, there are five species assigned to *Blithopertha* here (Yu *et al.*, 1998), which seem to be very close to *A. bilunata*, and two of them are undoubtedly conspecific with it. I have studied four specimens from Wufong township, Taiwan (cAP), which show no differences with the numerous Indochinese samples. I was unable to study *A. polyanor* Ohaus, 1916, *A. takasagoensis* (Sawada, 1941), **stat. nov.**, and *A. tarowana* (Sawada, 1941) **stat. nov.**, which appear to be very close to *A. bilunata* too, but it was said that these species have bidentate fore tibiae. *A. takasagoensis* seems to be different species, but it is not so clear for the other two. The third tooth in *A. bilunata* is very poorly developed sometimes; thus, this difference can be ambiguous. Further study is required for the confirmation of the distinction between *A. polyanor* and *A. tarowana*.

Recently I described *A. sororterti*a from Dalat Highlands, Viet Nam; it was said that this species is very similar to *A. bilunata*, but is more parallel-sided; also the punctation of the pronotum is coarser in this new species, and there are some differences in the color pattern. Later I discovered similar specimens also from Dalat in the Ohaus collection (ZMB) with specimens of *A. bilunata*. In this collection I had also found a female from Sichuan (Mt. Tatsienlu) having a rougher punctation than the type series of *A. sororterti*a, and a female labelled "Phedong, R.P. Desgodins", which is even more parallel-sided that the specimens from Dalat. Also I received a large series of *A. bilunata* from Laos (Khammouane prov.) (cAP), and the variations in the color pattern, punctation and body shape in these specimens cover both the types of *A. bilunata* and *A. sororterti*a. The coloration varies from fully black to fully testaceous, with all intermediate variations in development of the black pattern on the dorsal surface; thus, there are no reasons to separate any forms by coloration. The punctation is also variable, and even the shape of the male parameres shows some variations in depth (in lateral view), in degree of roundness of the distal tips, and in the development of the lateral trough of the parameres.

A very close species, *A. nigrovaria* Arrow, 1917, described from Burma, appears to be indistinguishable externally except for the bidentate protibiae, but has clearly different male genitalia. All the specimens in the Ohaus collection identified as *A. nigrovaria* actually belong to *A. bilunata*. The specimens from Tonkin (MNHN) and Thailand (cCZ) are similar to the type of *A. nigrovaria*, but with parameres having a straight (vs. distinctly concave) ventro-distal margin, and with a basal plate having lateral teeth much less developed (vs. strongly pronounced and sharply recurved backward in the type of *A. nigrovaria*) (Figs. 7, 8). It is probable, that the Indochinese specimens are not conspecific with *A. nigrovaria*, but represent an undescribed form.

***Anomala birmana* (Heller, 1891) (stat. nov.)**
Remarks: When I reviewed the *dalmanni*-group (Prokofiev, 2012b), I was unable to examine this species, which also appears to be its member. However, later I examined a female from the Ohaus collection (Karen Hills, Burmah 4000, Doherty, ZMB) (Figs. 9, 10) and a series of *Pseudosinghala rugosifrons* Heller, 1891 (a synonym) from northern Laos (cCZ, few now in cAP). These specimens are very similar to *A. dalmanni* Gyllenhall, 1817 in appearance, but differ from all the other members of the *dalmanni*-group in the rounded posterior angles of the pronotum.
Anomala conjuncta Arrow, 1901 from India also belongs to this group, but differs from the other members in the color pattern (Figs. 11-13).

***Anomala collotra* Zhang et Lin, 2008**
Remarks: I have examined 14 specimens from South Sichuan, env. Xichang city, alt. 1600 m, 12.06.2009, leg. A.A. Gorodinski (cAP, cAG) (Figs. 14-17). This is a new province record for this species. The specimens from Sichuan do not fully agree with the original description of this species (Zhang & Lin, 2008), particularly in the absence of the medial pronotal furrow, strongly reduced yellow coloration on the underside and pygidium (a narrow ring of yellow spots apically on pygidium, and only the uppermost parts of the abdominal sternites with faint yellow luster) and slight differences in the outlines of the male parameres (see Figs. 15, 18). In addition, the elytra are grass-green without or with a very slight yellow tint in contrast to that usually much more pronounced in the specimens from Laos and Myanmar. However, it should be noted that some specimens from Khammouane province of Laos exhibit considerable variations in the development of the yellow color on the elytra and pygidium, and in some cases they are almost fully green. The specimens from Laos used for comparison (cAP, cCZ) much more correspond to the original description except the absence of the pronotal sulcus. Dr. Carsten Zorn (in litt.) has brought to my attention that only few his specimens possess the pronotal sulcus. The shape of the parameres may slightly vary individually, as their outlines in Figs. 15-18 do not fit fully with the original figure of Zhang and Lin, but these differences are very obscure. All the aforementioned differences may represent a geographic variability, but inadequate material does not allow any final conclusion. In addition, 3 males and 5 females from Myanmar, Kachin state, Mt. Emaw Bum (cAP) were studied (a new country record); they are identical to the specimens from Laos.

***Anomala dalatensis* Frey, 1971**
Remarks: This species was formerly known from the highlands of Dalat (= Langbian) Plateau only, where it is moderately frequent (personal observations). However, I have collected 3 males and 2 females from Ba Ho, 30 km north of Nha Trang, 12-13.06.2012, at light. This place is situated not far from the seacoast; thus, this species inhabits the coastal lowlands and agricultural lands also, and probably is more widespread.

***Anomala decorata* Kirsch, 1875**
Remarks: This species was described from Sumatra; however, 3 males were collected from Vietnam, Binh Thuan prov., ca. 45 km SW Phan Thiet, My Thanh vill., 11˚05.530′ N, 107˚54.450′ E, alt. 180 m, monsoon forest, 13-16.05.2012, at light, A.M. Prokofiev leg. See Figs. 19-23.

***Anomala densa* Arrow, 1917**
Remarks: My specimens from Yunnan (Meng-la) and Vietnam show conspicuous variations in the shape of the basal plate of the male genitalia (Figs. 24-27). All the specimens from southern Central

Vietnam (Khan Hoa prov.: Ba Ho, 30 km N Nha Trang, and Binh Thuan prov.: 30 km SW Phan Thiet) possess a very shallow basal plate with a ventral concave profile whereas the specimens from Phu Quoc Island (southernmost Vietnam) have a very deep basal plate. The specimens from Yunnan (Meng-la county) possess the basal plate generally shallow, but somewhat more variable than in the mainland Vietnamese specimens. Thus, there are no evident gradients in deepness of the basal plate from north to south, i.e. no clinal variation.. Furthermore, some most deviated specimens from Meng-la and from Phu Quoc appear to be nearly identical and close to Fig. 26. There are no other differences between the forms with the different aedeagi. I speculate that these differences exhibit interpopulation variability rather than the existence of cryptic species. However, this problem requires further study. Paulian (1959: (63)29, figs. 145-147) described the specimens from the mainland (Chim Huyen and Tuyen Quang in central Tonkin) and figured the same aedeagus as described herein for the Phu Quoc specimens (Fig. 27). The MNHN materials include the specimens from Lao Cai and "Cochinchina" also, but their genitalia were not studied. *A. densa* was originally described from Burma (= Myanmar); unfortunately, Arrow (1917) figured the ventral view of the aedeagus only, but his figure is slightly different from the structures in the Indochinese specimens. The similar but much less pronounced situation is also known for *A. cupripes* Hope, 1839 (C. Zorn, in litt.).

***Anomala francottei* Sabatinelli, 1997**

Remarks: This species (Figs. 28-32) was described from northern Thailand. *A. speciosa* Lin, 1999 from Yunnan, Meng-la, is a synonym. I have studied the specimens from Thailand (Namuang) (cCZ) and Meng-la (cAP) and compared them with a series of beetles collected in Dalat Mts., Bi Doup – Nui Ba National Park, Hon Giao pass and westward to Giang Ly at altitudes of 1500-1625 m (cAP). I was unable to find any differences between the specimens from all these localities; thus, *A. francottei* appears to be widely distributed in mountainous Indochina. *A. laticlypea* Lin, 1999 seems to be a very similar species differing in minor (but stable) details of genitalic structure (Figs. 33, 34), coloration, etc; however, in Meng-la county both species co-occur together which supports their species status.

"*Anomala*" *graminea* Ohaus, 1905

Remarks: This bizarre species is commonly treated as a member of the "*hirsutula*-group" (Paulian, 1959; Miyake, 1994; Lin, 1996) due to a well-developed pilosity on the dorsal surface. The "*hirsutula*-group" is an easily defined assemblage (i.e., Lin, 1996) though its monophyly is not well-corroborated at present (C. Zorn, in litt.), but "*A.*" *graminea* is sharply different from the rest of the species. Its dense pubescence is clearly non-similar to those in the "*hirsutula*-group", but resembles the pubescence in some chafers (Fig. 35). The presence of the prosternal process is another distinctive feature; it has quite an unusual shape, narrowed in the basal half (Fig. 36).The labrum is somewhat exposed before the clypeus, and the clypeus forms a blunt (close to right) angle with frons. The latter character in not characteristic for *Anomala* though it is known for some *Mimela* species, but less pronounced. The aedeagus is of very peculiar shape (Fig. 37, 38). "*Anomala*" *graminea* does not belong to *Anomala*, though its relations to *Mimela* cannot be excluded. But this taxon most probably forms a separate genus, though further researches are required for exclusion of its position within any *Mimela* lineages (although it is very probably that *Mimela* at present sense is as paraphyletic as *Anomala* s. lato).

***Anomala itoi* Miyake, 1994**

Anomala cyathophalla Prokofiev, 2014: figs. 15-20 (original description), NEW SYNONYMY.

Remarks: Describing *A. cyathophalla* I overlooked the publication of Miyake (1994) with the erection of *A. itoi* also from North Vietnam. Comparing the original descriptions of these species I establish the following synonymy: *Anomala cyathophalla* Prokofiev, 2014 = *Anomala itoi* Miyake, 1994, **syn. nov.**

***Anomala planelytra* Paulian, 1959**

Material: Holotype, male (see note), Tonkin, Tuyen Quang, leg. Rau (MNHN); additional non-type specimens: 2 males, Tonkin, coll. Le Moult (ZMB); 1 female, Tonkin, leg. Langue, 1886 (ZMB).

Note: This species was formerly known only by the male holotype (Figs. 39-43), which was erroneously attributed to a female in the original description (Paulian, 1959). There are no mention of this species in the literature other than that of the original description. Recently I discovered three more specimens (misidentified as *A. punctulicollis*) in the Ohaus collection, including a previously unknown female. On this basis, I redescribe this very imperfectly known species herein.

Description: Males (Figs. 39-47). Length 16.5-17 mm; greatest width 8 mm. Elongate ovoid, moderately convex, black, shining, antennae reddish-brown, pilosity pale. Clypeus transverse, with rounded subrectangular front angles and moderately raised anterior margin, very finely and densely punctured; front and vertex densely punctured, punctures being much larger than on clypeus and slightly larger than on pronotum; frontoclypeal suture complete, convex. Antennal club longer than segments 2-6 combined; last joint of maxillary palpi elongately fusiform. Pronotum 1.9 times as broad as long, broadest nearly at mid-length, with sides much more convergent anteriad than posteriad; front angles pointed, hind angles obtuse; basis completely bordered. Pronotum regularly and uniformly densely and finely punctured. Sides of pronotum possessing few sparse long hairs along lateral border. Basis of pronotum shorter than basis of elytra. Scutellum somewhat irregularly punctured except a smooth area near apex. Elytra nearly parallel-sided, 1.3 times as long as broad; punctate rows clearly impressed and interspaces moderately convex; second interspace broad, with two secondary ribs; fourth interspace with a secondary rib; interspaces very finely and scarcely punctate except the second one which is roughly, irregularly and densely punctured. Lateral margin of elytra forming a narrow shelf disappearing at the level of fourth abdominal sternite; epipleura long, with a row of setae; membranous apical border extremely narrow. Propygidium partly exposed, moderately densely punctured by transversely extended dots becoming somewhat denser and roundish toward the sides. Pygidium distinctly bulging before the apical quarter, with impressed areas on each side at base, densely but not coarsely rugo-punctate. Outer margin of pygidium bearing very long and sparse erect hairs in several rows. Sterna coarsely and densely punctured, covered with rather short, adpressed hairs. Disc of metasternum shallowly concave, with a longitudinal groove in middle at anterior half, very finely and scarcely punctate. Prosternal and mesometasternal processes absent. Abdominal sternites tightly and coarsely punctate; each but last sternite possessing a transverse row of adpressed setae becoming much sparser mesially; at uppermost point these setae arranging in several rows on very short distance. Last abdominal sternite with a row of rather dense setae along posterior margin. Sides of abdominal sternites non-carinate. Fore tibia bidentate, teeth pointed; inner spur orientated forward and downward, attached at the level of basal tooth. Fore tarsi missing in all of the known specimens. Outer middle claw cleft. Parameres of very peculiar shape (Figs. 42-46).

Female. Length 16.5 mm, greatest width 8 mm. Black with cherry-brown tint. Puncturation of pronotum somewhat larger than that of head. Pronotum with a weak medial groove in anterior half. Sides of elytra weakly callose before mid-length, lacking a marginal shelf. Pygidium more flattened. Anterior tooth of fore tibiae very broad, apically dilated, with truncate anterior margin;

basal tooth rounded; inner spur much longer than in male, orientated forward and laterad, attached behind level of basal tooth. Last joint of fore tarsi not thickened, with a very weak submedial tooth. Inner fore claw cleft. For the rest, as for the male.

Differential diagnosis: Very similar externally to *A. punctulicollis* Fairmaire, 1893, but the latter species is dark metallic-green in color and possesses very different male genitalia (Figs. 48, 49). There are no species similar in the male genitala to *A. planelytra*. *A. triancistris* Lin, 1999 (not studied) seems to be most resembling in this respect, but only distantly.

***Anomala pygidialis* Kirsch, 1876**

Remarks: This species was not known with certainty from the islands in the Geelvink Bay, where two very similar species occur (*A. biakensis* Zorn, 2007, Biak I., and *A. bruggei* Zorn, 2007, Yapen I.), although its type locality is "Rubi, in the south of Geelvinksbai" (Zorn, 2007). However, I had collected 4 females from Yapen Barat, Rosbori vill., 14.11.2012, which belong to this species; thus, its presence at least on Yapen I. cannot be doubted.

***Anomala violaceipennis mariposa* Prokofiev, 2012 (stat. nov.)**

Remarks: During a brief acquaintance with the New World *Anomala* samples in the collections of MNHN and ZMB, I found a very puzzling situation with the species named as *A. violacea* Burmeister, 1844, *A. violaceipennis* Blanchard, 1851 and *A. mariposa* Prokofiev, 2012. Two former names are usually treated as synonyms; however, this attribution is clearly wrong. *A. mariposa* was described as a member of the "*microcephala*-Gruppe" of Ohaus (1897) being different from the other members of this group in the tridentate fore tibiae and in the swollen mesosternal process separated from the metasternum by a groove.

It should be noted that the specimens identified by F. Ohaus as "*Anomala violacea*" in MNHN and ZMB belong to a different species. The MNHN specimens possess a short, blunt and tumid but well-developed mesometasternal process identical to those in *A. microcephala* Burmeister, 1844 and other species grouped within *Callistethus* Blanchard 1851(1850). I was unable to see the type of *A. violacea*, but Burmeister (1844: 265) described the aforementioned type of the mesometasternal process and the bidentate fore tibiae for this species. Thus, the MNHN specimens belong to *A. violacea*, and this species is close to *A. microcephala*.

The ZMB samples include the specimens identified as "*Anomala violacea*" and "*Anomala violacea* ssp. *violaceipennis*" and the types of *A. violacea* var. *viridis* Ohaus, 1902. I was unable to locate the Blanchard's type of *A. violaceipennis* in MNHN, but ZMB samples include the specimens labeled "m.d. Type vergi Paris 16.XI.97 Sta. Cathar." These specimens share no any disagreements with the Blanchard's (1851) original description of *A. violaceipennis*. All the specimens agree in all the principal characters with the type series of *A. mariposa* but are sharply different from the true *A. violacea* Burm. in the structure of the metasternal process, the tridentate fore tibiae, etc.

As a result, *A. violaceipennis* should be removed from the synonymy of *A. violacea* and *A. mariposa* should be downgraded as a subspecies of this species (see below). I do not redescribe *A. violaceipennis* here because nearly all of its characters well agree with the original description of *A. mariposa* (Prokofiev, 2012c), though according the ZMB series there are some characters being more variable: coloration, punctation of the scutellum (sometimes rather uniform) and in the second interspace of the elytra, pilosity of the uppersides of the abdominal sternites (sometimes absent), degree of length of the hairs on the sterna and their distribution on the mesosternum. The coloration varies from reddish brown to black with or without a weak bluish or greenish tint (but var. *viridis* is much more metallic-green).

The nominotypical subspecies is known from eastern Brazil (Santa-Catharina, Minas Gerais and Rio Grande do Sul), while *A. v. mariposa* is distributed in Peru, Bolivia and Ecuador. I have no data

that these subspecies possess a disjunct distribution, or their ranges are contacting, but the latter variant seems to be most possible. The main differences between the nominotypical subspecies and *A. v. mariposa* are the shape of the male parameres, which are distinctly shorter and with the shorter spine-like dorsally-oriented processes in the nominotypical form (see Figs. 50-54). Though these differences are quite small, they are very stable and well separate the western and eastern populations. In addition, the irregular punctures in the second interspace of the elytra are usually present at the base or at the basal quarter only in the nominotypical from, while they occupy not less than basal half of the length of the elytron (sometimes nearly up to the apex) in *A. v. mariposa*. However, I examined a specimen from Santa-Catharina, which has several rows of punctures distributed nearly to the apex of the second interspace; thus, this character is not present in 100% of cases.

A. v. var. *viridis* Ohaus, 1902 is a green color morph of the nominotypical subspecies; thus, the following synonymy should be proposed: *Anomala violacea* var. *viridis* Ohaus, 1902 = *Anomala violaceipennis violaceipennis* Blanchard, 1851 (**syn. nov.**). In addition, within "*A. violacea*" samples in Ohaus collection (ZMB) I have studied several specimens with strong green luster from Paraguay, Horqueta, which possess bidentate fore tibiae and very different aedeagi in the males. The green specimens "var. *viridis*" from the "Amazones" are identical to the latters. I am unable to identify this species (probably new). *A. viridicollis* Burmeister, 1844 from Ecuador and Columbia is not a subspecies of *A. cincta* Say, 1835, but a distinct species related to *A. violaceipennis*, from which it can be distinguished by the impressed slope of the mesosternum between the middle coxae and the by the somewhat different parameres (Figs. 55, 56). Further study may determine the reasons for downgrading this taxon to the subspecific level. *Anomala polychalca* Bates, 1888 seems to be not more than a dark morph of *A. cincta* (**syn. nov.**).

Though in the original description I classified *A. mariposa* as a member of the "*microcephala*-Gruppe", it seems to be more correct that *A. violaceipennis* and its subspecies form their own group differing from the "*microcephala*-Gruppe" and other Neotropical *Anomala* in the shape of the mesosternal process, in the tridentate fore tibiae and in the structure of the male parameres.

***Anomala viridimicans* Benderitter, 1929**

Remarks: Application of this name to a concrete species is uncertain. Benderitter (1929) described it from two females which appear to be lost (C. Zorn, in litt.). Formerly I described two females from Cochinchine (MNHN) as representatives of this species (Prokofiev, 2014); however, later I discovered a series of beetles (Figs. 57-59) from the Ohaus collection (ZMB), which belong to a different species but fit much more to the original description of Benderitter. All of these beetles originated from Hong Kong; thus, some doubts for their conspecifity with *A. viridimicans* are existing. Two MNHN specimens (on loan to Zorn) mentioned in my paper (Prokofiev, 2014) belong to the same species as the ZMB material. Clearly *A. viridimicans* sensu Prokofiev (2014) and *A. viridimicans* sensu Ohaus belong to different, unrelated species, and the latter belongs to the *aulax*-group, fide Prokofiev (2013d, 2014). However, it is not clear to which species the name "*viridimicans*" should be applied. The Ohaus materials more correspond to the original description, but their locality creates some doubts that it is the same species and excludes a possibility for designation of the neotype.

***Didrepanephorus ohbayashii* Nagai, 2004**

Didrepanephorus pilosus Bouchard, 2007: 63, figs. 1-4 (original description), NEW SYNONYMY.

Remarks: Although the original description of *D. pilosus* notes the differences in pilosity and in shape of the male parameres between these two nominal species (Bouchard, 2007: 64), actually they are indistinguishable. A series of beetles from Laos (Khammouane prov.) shows the variations

in the development of the pilosity and of the lateral lobe of the right paramere, which cover both these nominal taxa. As a consequence, I propose the aforementioned synonymy.

***Dipelicus fastigatoides* Prokofiev, 2012**

Remarks: The photographs of the male genitalia (Figs. 60, 61) are published for the first time. Recently I had opportunity to examine the type series of *D. fastigatus* Endrody, 1969 from Java (3 males, 3 females, ZMB). Surprisingly, these specimens (Figs. 62-66) appear not identical with the specimens from Mt. Agropuro, Java (cAP) used for comparison in the original description of *D. fastigatoides* (Prokofiev, 2012d). Thus, a new comparison should be presented.

The parameres of *D. fastigatus* are almost as deep as in *D. fastigatoides* in lateral view, but the phallobase is much more gracile (Figs. 60, 62); its depth is approximately two times less than the height of the parameres (vs. barely equal in *D. fastigatoides*); the apices of the parameres are somewhat more pronounced and narrow, with tips being more pointed. The plate-like expansions of the apices of the parameres are somewhat better developed in *D. fastigatoides* (Figs. 61, 64). The pygidium is narrower in both sexes of *D. fastigatus*, i.e. males have the pygidium in the mid-line as long as the lateral quarters, while in *D. fastigatoides* the length of the pygidium in the lateral quarters is much shorter than the mid-line. The pygidium possesses several transverse rows of long hairs along its base in both sexes of *D. fastigatus*, while it is almost bare in *D. fastigatoides*, with only few very short hairs at the basal corners. The sculpture of the sides of the pronotum is similar in front and behind of the lateral horns in *D. fastigatoides*, with rugules forming a reticulate appearance and few short transverse crests, while in *D. fastigatus* such sculpture is developed in front of the lateral horns only, being replaced behind by long and sharp transverse crests (Figs. 65, 66). The arrangement of the stridulatory crests in the type specimens of *D. fastigatus* is almost the same as described for the *Dipelicus* specimens from Mt. Agropuro (Prokofiev, 2012d).

The taxonomic position of "*Dipelicus fastigatus*" specimens reported from Celebes and Sumbawa (Endrody, 1969, 1985) requires re-investigation; it is very probable that this species actually represents a complex of cryptic species on each island with at least two species on Java. Unfortunately, I have not enough specimens for the final conclusion.

***Eutheola paraguayensis* Prokofiev, sp. nov.**

Material: Holotype, male, Paraguay, Alto Parana Dep., Limoy, 18.11.2011. Paratypes, 2 females, the same data as for the holotype.

Description: Male, holotype (Fig. 67). Length 13 mm, greatest width 6.3 mm. Black with dark cherry-red tint; tarsi, antennae and palpi dark reddish-brown; pilosity reddish. Clypeus transverse, isosceles trapezoidal, with lateral sides strongly convergent toward apex; anterior margin straight, lacking teeth; outer margins raised. Frontal suture carinate though somewhat flattened in middle. Clypeus, frons and anterior part of vertex coarsely transversely rugose; posterior part of vertex smooth with fine shallow and very sparse punctures. Outer margin of mandibles broadly rounded, as well as apex. Antennae 10-jointed, with small 3-jointed club. Last joint of mandibular palpi elongate and narrowed toward apex. Pronotum 1.7 times as broad as long, with maximum width in middle; sides broadly rounded, somewhat more convergent anteriorly, than posteriorly; basis not bordered; posterior angles very broadly rounded, indistinct; anterior angles sharp. Puncturation of pronotum much sparser on disc than on sides; punctures being quite large and coarse on disc, becoming much finer toward anterior border and smaller and denser toward sides; all points simple, rounded. Scutellum large, triangular, with minute sparse poorly traceable points. Elytra very weakly dilated caudally, 1.35 times as long as broad, sides concave behind the humeri. Double rows of punctures on disc of elytra more or less masquerading by the similarly punctate interspaces; all punctures simple and rounded, somewhat larger than on pronotum. Humeral and apical knobs very

weak. Propygidium glabrous, rather finely punctated and with microsculpture. Pygidium very weakly convex, glabrous except a row of hairs at apex, roughly and tightly punctured by round points becoming smaller toward the sides and apex. Prosternal process finger-like, with apex bluntly pointed, hairy. Sterna glabrous, not densely and somewhat irregularly covered with large annulate points; disc of metasternum almost smooth. Abdominal sternites coarsely rugo-punctate in upper parts, becoming nearly smooth mesially, with a transverse row of short and sparse setae disappearing in the middle, except posteriormost sternite, which is short, glabrous and nearly completely finely rugo-punctate; upper parts of abdominal sternites non-carinate. Fore tibiae tridentate; teeth large and pointed; two apical teeth being much closer to each other than basal tooth; internal spur strong, inserted immediately in front of basal tooth, slightly not reaching to tip of apical tooth; fore tarsi gracile. All claws simple, acuminate, thin. Hind tibiae moderately expanded and slightly curved toward the apex, with two short oblique carinae dorsally only; apex with 14 pointed bristles; spurs narrow. Aedeagus, as per Figs. 68, 69.

Female. Length 13-14 mm, greatest width 6-6.5 mm. Pronotum 1.6-1.7 times as broad as long; elytra 1.3-1.4 times as long as broad; sides of elytra lacking any callosities. Anal palpi subtriangularly ovoid, with apices densely setose.

Differential diagnosis: The genus *Eutheola* Bates, 1888 contains 7 valid species (Endrody, 1985; Prokofiev, 2012c), though *E. sibericana* Prokofiev, 2012 may not belong to this genus. *E. sinyaevi* Prokofiev, 2012 is identical with *Dyscinetus rugifrons* (Burmeister, 1847). This new species can be easily distinguished from the other species for which the males are known in the shape of the parameres lacking the ventral tooth but with characteristically S-shaped lateral margins of the tips in the frontal view. In the other respects, the newly described species is most similar to *E. humilis* (Burmeister, 1847), but differs in the broadly rounded (vs. distinctly concave) outer margin of the mandibles, in the somewhat more carinate frontoclypeal suture, in the larger and coarser punctation of the pronotum and in the less discernible punctate rows in comparison with the interspace punctation of the elytra, in the narrow prosternal process and in the more distant basal tooth of the fore tibia.

Etymology: This species is named from the country where the type series was collected.

***Heterogomphus olsoufieffi* (Prokofiev, 2012) stat. rev.**

Remarks: Formerly I described this species as *Golofa* (*Mixogolofa*) *olsoufieffi*, but now I reclassify it within *Heterogomphus* Burmeister, 1847 (Prokofiev, 2012c, 2013a). *H. olsoufieffi* is very similar to the hornless form of *H. rugicollis* Prell, 1912, but is apparently different in the following respects: (1) parameres wholly bare (vs. pilose at apices in *H. rugicollis*); (2) pygidium with a broad band of long erect hairs (vs. sparsely setose in *H. rugicollis*); (3) probably shorter prosternal process in *H. olsoufieffi*. On these grounds I retain *H. olsoufieffi* as a valid species. The additional remarks on the synonymy of the genera *Heterogomphus*, *Ancognatha* and *Dyscinetus* were published by Prokofiev (2013a).

***Ochodaeus coomani* Paulian, 1945 and *Ochodaeus* sp. prope nova**

Remarks: Within the samplings of *Ochodaeus* from Dalat Mts. and adjoining coastal areas of southern Viet Nam two forms can be recognized. Two male specimens from Binh Thuan prov. (My Thanh village, 45 km SW from Phan Thiet) fully correspond to Paulian's (1945) original description of *O. coomani*. However, two males collected in Ba Ho (30 km N Nha Trang, Khanh Hoa prov.) are different from the aforementioned specimens in the following respects: (1) medial sulcus of pronotum absent (vs. present in the basal half of pronotum); (2) pectinated spur of mesotibia having 6 denticles of which only the first one being much smaller than the remainder (vs. posterior three denticles being larger than the anterior three ones in *O. coomani*); (3) frontoclypeal

suture somewhat convex, with a rather distinct medial depression posteriorly, having more sparse punctation than the neighbouring parts of the frons and clypeus (vs. frontoclypeal suture straight, somewhat higher and lacking a distinct depression posteriorly); (4) inner apical angle of protibia produced into a very short spine, only about one-quarter of the inner spur in length (vs. long, about one-half of the inner spur in length); (5) metafemoral spine shorter and broader, more lamellate (vs. distinctly spine-shaped); (6) profemur with much less developed distoventral lamina, and (7) elytral punctation being slightly more transversely wrinkled. The specimens from Ba Ho are very similar with the specimens from Cambodia identified by late O.N. Kabakov as *O. barbei* Petrovitz, 1972 (cAG); however, the latter species differs in the complete absence of the armament of the femora as well as the inner apical protrusion of the fore tibia (Petrovitz, 1972). A single female from My Thanh shows the same shape of the frontoclypeal suture and the sculpture as the males of *O. coomani* but lacks the posterior pronotal sulcus. I have no females from Ba Ho for comparison. It is very probable, that the specimens from Ba Ho represent a new species but further comparison with the extralimital Oriental species is required for verification.

***Odontotrypes radiosus* (Fairmaire, 1895)**

Odontotrypes pauma Kral et al., 2001: 34 (original description), NEW SYNONYMY.

Remarks: The geotrupine genus *Odontotrypes* is a species-rich assemblage distributed in the mountain regions of China, Himalayas and adjoining areas; many species are flightless and local. However, it seems that the species diversity, as well as restriction of the areas of distribution is overestimated at present. As the laparostict scarabs are out of my primary interest, I do not plan to review this group; however, I was able to study a rich geotrupine collection of A.A. Gorodinski (Moscow), and I found the numerous problems with an identification of the beetles using the recent revision of Kral *et al*. (2001). For example, I had studied a series of *O.* cf. *gongga* Kral *et al.*, 2001 from Luding (cAP, cAG) which possesses an elytral sculpture as described in the original description, but the pronotum sculptured similarly to *O. yulong* Kral *et al.* (2001) from Yunnan, though these differences are the only diagnostic ones for these two species (Kral *et al.*, 2001: 8). It should be also noted that the variations in the shape of the male genitalia within a single species were not discussed in Kral *et al.* (2001), but my observations indicate that they are quite pronounced sometimes, and the minor differences observed in the figures in the aforementioned paper actually represent the variations observed in a single population. It is also probable that a limitation of the distribution for many species is overestimated despite their flightless appearance.

There is a mention of the differences in the coloration and the pronotal and elytral sculpture between *O. pauma* and *O. radiosus* as diagnostic for these species (Kral *et al*., 2001: 34, 40). However, I had examined about a hundred specimens from Luhuo, Zheduo, Xinduqiao, Maerkang and Riqikah (Sichuan, cAG & cAP), and I found many uncorrelated differences in these features within a single population. The structure of the male genitalia is also variable and does not correlate with the black or multicolored specimens, or with the variations in pronotal/elytral sculpture. First of all, the black or multicolored specimens seem to be color variations and the numerous variants in the sculpture or in the shape of the aedeagi variably occur in both black and multicolored specimens. The beetles from a single locality usually (but not always) belong to one color morph, i.e. beetles from Luhuo are black, but those from Maerkang or Riqikah are predominantly multicolored; however, the bright rainbow specimens are always rare, and most of the "multicolored beetles" are actually black with variously developed purplish (or bluish-and-purplish) luster. Further, the pronotum possesses the very variable development of the punctation and luster in both black and multicolored forms. The elytral sculpture is variable in the presence or absence and in a development of the punctures and fine reticulate rugosities; in some specimens the punctures

tends to arrange into the irregular and incomplete striae. However, the latter specimens are quite common within my multicolored specimens contrary to the data of Kral *et al.* (2001). The specimens examined are strikingly variable in size (12 to 18 mm), but there are no other differences separating the different size classes, except the rounded (vs. angulate) apex of the left ventral lobe of the phallobase in one smallest male, which seems to be "a difference", but which is not confirmed in the other specimens. The shape of the parameres and the position and development of the basal process of the right paramere are variable from specimen to specimen. I found no any supports for the separation of the black and multicolored specimens as different species, but I found that the small differences in the structural characters reported by Kral *et al.* (2001: 34, 40) actually represent the individual variations; as a consequence, I synonymize *O. pauma* with *O. radiosus*.

***Odontotrypes semenowi* (Reitter, 1887)**

Odontotrypes nikodymi Kral et al., 2001: 70 (original description), NEW SYNONYMY.

Remarks: A detailed comparison between several dozen specimens from Qinghai and Sichuan (cAP, cAG), including those identified by J. Schneider as *O. nikodymi* (cAG) found no differences. All the features (size, development of miscrosculpture and degree of shining, development of eye tubercle, minor differences in male genitalia, etc) are variable both in the specimens from Qinghai and from Sichuan. Thus, I see no reasons for separation of *O. nikodymi*.

***Onthophagus* (*Onthophagiellus*?) *andreji* Prokofiev, sp. nov.**

Material: Holotype (Figs. 70, 71), male, Nepal, Koshi, Dharan env., alt. 350 m, 05.05.2013, leg. A.A. Gorodinski (cAP). Paratypes, 2 males, 1 female, the same data as for the holotype (cAG).

Description of holotype: Length 5 mm, greatest width 2.5 mm. Black with reddish-brown tint, sterna, abdomen and legs more reddish-brown; mouthparts reddish-brown; antennae reddish-brown with pale club; broadly oval; setose dorsally and ventrally; pilosity pale. Clypeus ogival, rounded in front; ocular lobes strongly rounded externally; clypeofrontal carina or suture absent; vertex with indistinct, weakly bituberculate carina; eyes almost completely divided. Head simply, deeply, but not densely punctured; punctures being larger on clypeus, ocular lobes, sides of vertex and in front of tubercles on vertex. Pronotum strongly convex, simple, coarsely and densely punctured by moderate-sized simple points. Elytra moderately densely and coarsely punctured; intervals flat; seventh stria complete, more curved than sixth stria and not fully parallel to it; seventh interspace being 1.5 times wider than the sixth one. Pygidium coarsely and moderately densely punctured. Metasternum with hardly traceable tubercle in front. Fore tibia gracile, quadridentate; fourth teeth minute, hardly traceable; second joint of hind tarsi less than one-quarter of first joint.

Variations: Length 4.5-5 mm. Sometimes entirely black or with very faint green luster on pronotum. Sexes externally weakly distinguishable. Females with frontal carina and with punctation on head better developed.

Differential diagnosis: The shortened second joint of the hind tarsi is a diagnostic feature of the subgenus *Onthophagiellus* Balth. (Balthazar, 1963; Kabakov, 1994). However, *O. andreji* differs from the only mainland species of this subgenus, *O. crassicollis* Boucomont, 1914, in the seventh elytral stria being somewhat curved instead of almost straight and parallel to the sixth one, and in the seventh interval being approximately 1.5 times wider than the sixth one (vs. seventh and sixth intervals equal in *O. crassicollis*). No Indian or South-East Asian mainland species of *Onthophagus* s. lato having these features combined, are known to me. As the shape of the seventh stria is quite important feature in the taxonomy of *Onthophagus*, the subgenus *Onthophagiellus* may become non-monophyletic with inclusion of *O. andreji*. On the other hand, this feature is less expressed than in other species (i.e. seventh stria is not strongly curved in the new species, but gently convex), so this difference may express further development of this feature within a common lineage. I

cannot prefer one or another hypothesis, but I tentatively assign this species to *Onthophagiellus*, as it fully agrees with the diagnosis given by Kabakov (1994: 308), and well correspond with the structural characters of the type species, *O. crassicollis* (specimens from South Vietnam were used for comparison).

Ethymology: This species is named in honour of Andrej Alexandrovich Gorodinski (Moscow), an outstanding collector of the laparostict (and other) beetles.

***Parastasia novoguineensis* Ohaus, 1898**

Parastasia assimilis Ohaus, 1901: 126 (original description), NEW SYNONYMY.

Parastasia gymnopleuridis Prokofiev, 2012c: 19, figs. 31-34 (original description), NEW SYNONYMY.

Remarks: I have studied holotype and "cotype" of *P. novoguineensis* (ZMB), lectotype and 3 paralectotypes of *P. assimilis* (ZMB), holotype of *P. gymnopleuridis* (cAP), one specimen from Yapen I., Rosbori vill. (cAP) and 2 specimens from Madang prov., Baiteta (cCZ). All these specimens appear to represent a single quite variable species; thus, the aforementioned synonymy can be established. The shape of the parameres in the type specimens of *P. assimilis* and *P. novoguineensis* are not so different as depicted by Kuijten (1992: figs. 11-13 and 201-203), and generally similar in shape with *P. gymnopleuridis*. *P. assimilis* has parameres somewhat more curved at the tips and with a larger striated to granulated zone on their lateral surfaces in comparison with *P. novoguineensis* and *P. gymnopleuridis*; the parameres in *P. gymnopleuridis* are somewhat longer than in other two nominal species. However, these differences are so slight and probably represent individual variations rather than specific characters. The holotype of *P. gymnopleuridis* has conspicuously more convex interspaces between the elytral punctures and also weaker punctation of the pronotum. But the shape of the elytral interspaces seems to be variable – although those are almost flat in the type specimens of *P. assimilis* and *P. novoguineensis*, they are more or less convex in the other three specimens studied (though less so than in the holotype of *P. gymnopleuridis*). Thus, the main diagnostic feature of the latter seems to be unstable. The coloration is very variable. A female from Rosbori has much smaller size than the other specimens examined (10.5 vs 12-13 mm), but in the color pattern and shape of the elytral interspaces it is intermediate between the types of *P. novoguineensis* and *P. gymnopleuridis*. Two specimens from Madang also show quite variable convexity of the interspaces between elytral punctures. On this ground I prefer to synonymize *P. assimilis* and *P. gymnopleuridis* with *P. novoguineensis* (**syn. nov.**).

***Parastasia nigriceps incostans* Fairmaire, 1879**

Parastasia medvedevi Prokofiev, 2012c: 20, figs. 35-38 (original description), NEW SYNONYMY.

Remarks: Dr. Carsten Zorn (in litt.) has pointed to the identity of my new species *P. medvedevi* with another New Guinean taxon, *P. nigriceps incostans*. The detailed comparison of the descriptions provided by Fairmaire (1879) and Kuijten (1992) for *P. n. incostans* with the type series of *P. medvedevi* confirms this synonymy. The holotype of *P. medvedevi* shares the longer parameres in relation to phallobase, than it was figured by Kujiten (op. cit: figs. 185, 189); however, those seem to be less so long in the male paratype, and all the other features are the same in these species. Thus, *P. medvedevi* is conspecific with *P. n. incostans*.

***Phelotrupes laevifrons* (Jekel, 1866)**

Remarks: The specimens from Maoxian (Sichuan) are quite different in the shape of the male genitalia from the drawings based on the specimens from Gansu in Kral *et al.* (2001: figs. 111-112), especially in the left lobe being distally produced into a long and straight process. There are some differences in the shape and punctation of the clypeus also. These differences seem to be

pronounced, but a studying of the numerous specimens from the several localities in Sichuan (cAP, cAG) indicates that they are not stable and are not well-correlated with each other. Thus, the variations in the key diagnostic characters in *Phelotrupes* can be much more obvious than they are indicated in the literature.

***Popillia cyanea* Hope, 1831 and *Popillia mutans* Newman, 1838**

Remarks: The only differences between these species reported by various authors (Paulian, 1959; Lin, 1998) is a degree of impression of the striate rows of the elytra. However, I was unable to find any differences in this feature within the specimens from whole area of distribution of both these taxa (ZMB, MNHN, cAP, cAG). The drawings of the male aedeagi (Paulian, 1959; Berlov *et al*., 1989) are ambiguous; however, a direct comparison of the Himalayan specimens (which should be true "*cyanea*") with the specimens from Peking and Russian Far East (which can be "*mutans*" only) reveals the slight differences in the paramere structures confirming a separation of these species. The aedeagus is slightly broader in *P. mutans*. The sides of the parameres are smoothly rounded in *P. mutans*, but rather impressed below, with more or less carinate transition in *P. cyanea* (Figs. 72-79). The lateral profile of the parameres is more smoothly declining in *P. cyanea*. All the other minor differences occurring from specimen to specimen are a subject of the intraspecific variations.
In addition, I had found a patch of hairs at the tip of the mesometasternal process in most specimens of *P. cyanea*. Clearly, this patch can be easily eroded and lost in museum specimens, but I had never seen it in the specimens of *P. mutans*. Due to the slight differences between the aforementioned taxa, it will be better to consider them as subspecies, if their ranges are not overlapping (this is not clear for me at present). *Popillia mutans* is very common in the highlands of Dalat Mountains (elevation 1500 m or more, rare at lower elevations, until 700 m). A green-violet morph rarely occurs together with the typical blue- to dark-violet beetles. Also the specimens with a dark cherry-red tint on the apical parts of the elytra were found. Paulian (1959) mistakenly reported *P. histeroidea* Gyllenhal, 1817 as a similar species lacking hairy patches on the pygidium, but actually they are present. *P. histeroidea* exhibits considerable variations in the density and roughness of the punctation at anterolateral parts of the pronotum and in the length of second elytral stria.

***Rhombonyx testaceipes ussuriensis* Medvedev, 1949**

Anomala costifera (non Reitter, 1895): Prokofiev, 2012c: 15, figs. 25, 26; 2013d: 553 (in list of comparative materials).

Remarks: Re-analysis of the specimens formerly identified by me as *A. costifera* Reitter, 1895 reveals that they are identical with *Rhombonyx ussuriensis* Medvedev, 1949; thus the proposed differences between *A. aulax* (Wiedemann, 1823) and *A. costifera* (Prokofiev, 2012c, 2013d) were based on misidentification. *R. ussuriensis* is probably no more than a synonym of *Mimela* (= *Rhombonyx*) *testaceipes* (Motschulsky, 1860); however, having no specimens from Japan for direct comparison at present, I accept the concept of Berlov *et al.* (1989), who separated the mainland population as a distinct subspecies because of slight differences in size and coloration. The specimens from the Russian Far East identified by late O.N. Kabakov as *A. costifera* (cAG) also belong to *R. t. ussuriensis*.

***Trichanomala tonkinensis* (Ohaus, 1908) (stat. nov.)**

Material: Lectotype (male, present designation: Figs. 80, 81) and 4 paralectotypes, Mt. Mauson 2-300' Fruhstorfer (ZMB). One specimen from the Ohaus collection bears a type label, but does not belong to this species and has a geographical label "Hong Kong". I believe that this specimen was mislabeled.

Description: Black; sides of pronotum and abdomen usually with a reddish-brown tint; legs mostly reddish-brown. Elytra with two pairs of orange spots: a pair of longitudinally elongate or rectangular ones at sides of scutellum, and a pair of rounded ones in middle. Pronotum weakly transverse, with maximal width slightly before its mid-length. Sides of pronotum much more convergent anteriorly than posteriorly. Pronotum roughly irregularly punctate, with punctures somewhat variable in depth and density, but never transversely rugulose. Posterior angles of pronotum blunt and rounded. Apical humps of elytra strongly protruding behind, especially in males. Sutural angle of elytra angulate in males, without any denticle; simply rounded in females. Females with lateral callosity of elytra very weakly developed. Elytral epipleura bare. Propygidium roughly punctate, not covered by elytra. Pygidium not produced posteriorly, not convex in both sexes, with a very delicate reticulate rugosity. Epimeres well-visible from above, between pronotum and elytra. Mesosternal process scarcely developed, swelling-like, separated from metasternum by a well-developed suture. Sterna rather densely covered by well-developed adpressed pale hairs; these hairs are much shorter and sparser on posterior coxae. Uppersides of abdominal sternites with dense patches of pale hairs; below, sternites with several rows of very sparse and short hairs disappearing in middle. Basal tooth on protibiae well-developed in both sexes. Aedeagus, as per Figs 82-84.

Remarks: Though originally this species was described within *Spilopopillia* Kraatz, 1892, this species is sharply different from the members of this genus in the shape of the pronotum, elytra and pygidium, in the well-developed second tooth of the protibia in both sexes, in the shape of male genitalia, etc. This species is now reclassified within the genus *Trichanomala* Arrow, 1917, though it probably differs from the type species, *T. fimbriata* (Newman, 1841) in the absence of the long hairs along the margin of the pronotum (but few thin hairs are occasionally present on the sides of pronotum in some specimens of *T. tonkinensis*). However, these hairs are also absent in the other Indochinese species classified as *Trichanomala* (Prokofiev, 2012c). On the other hand, they can be erased in old museum specimens. The female described earlier as an unknown female of *T. callosa* (Fairmaire, 1888) (Prokofiev, 2012c: 22, 33, fig. 42) appears to be close or identical with *Spinanomala dentipennis* (Lin, 1966). I have examined three syntypes of *Singhala callosa* (MNHN), although many characters different from my female may represent the sexual dimorphism, at least two of them (labrum slightly produced before the clypeus and mesepimera not visible from above in the female specimen) are clearly not this case. C. Zorn (in litt.) confirmed *S. callosa* as the mislabeled specimens of the New World genus *Strigoderma* Burmeister, 1844; this seems to be correct. The color pattern and the shape of the male genitalia can easily distinguish *T. tonkinensis* from the rest of *Trichanomala* spp.

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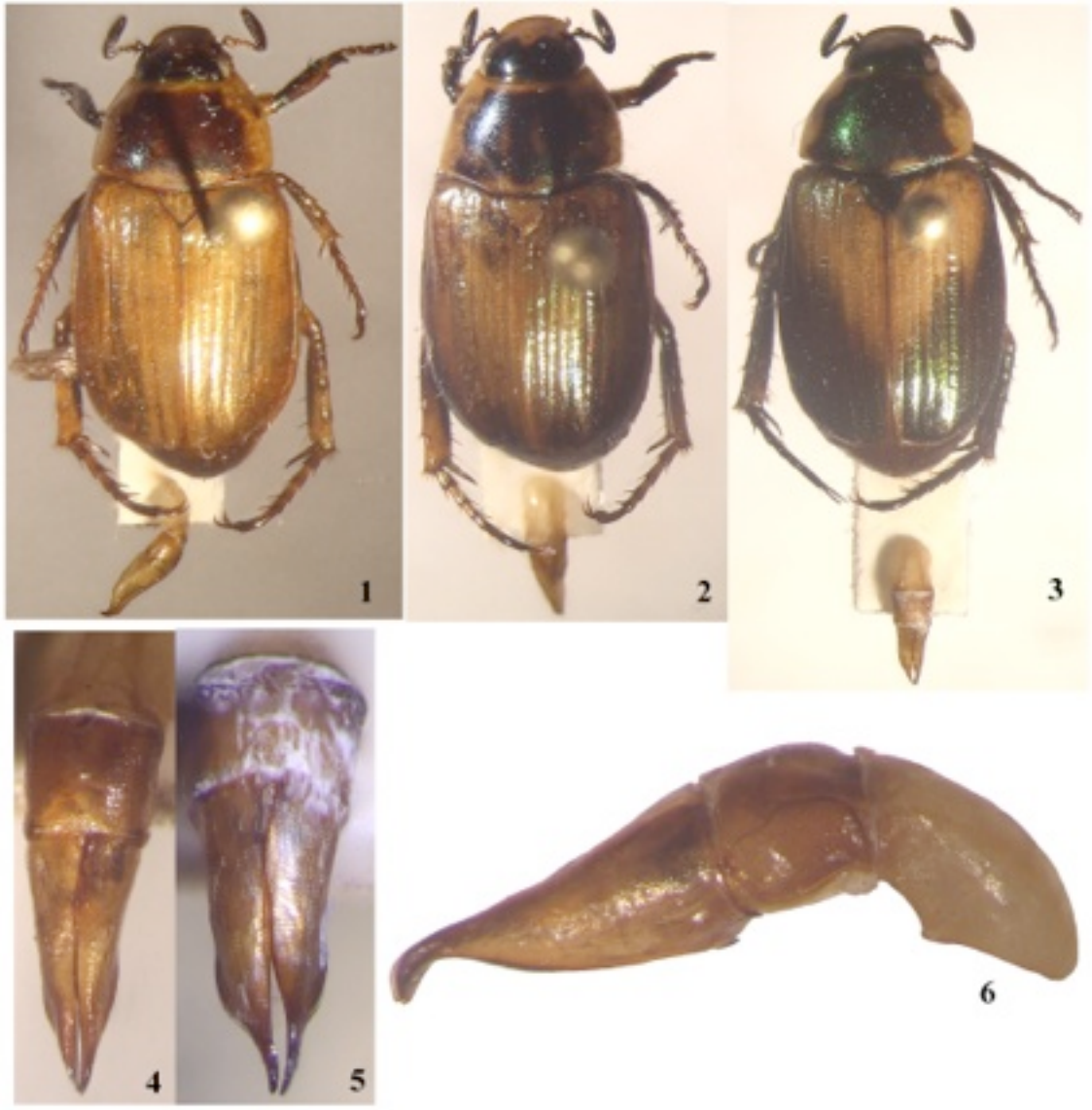
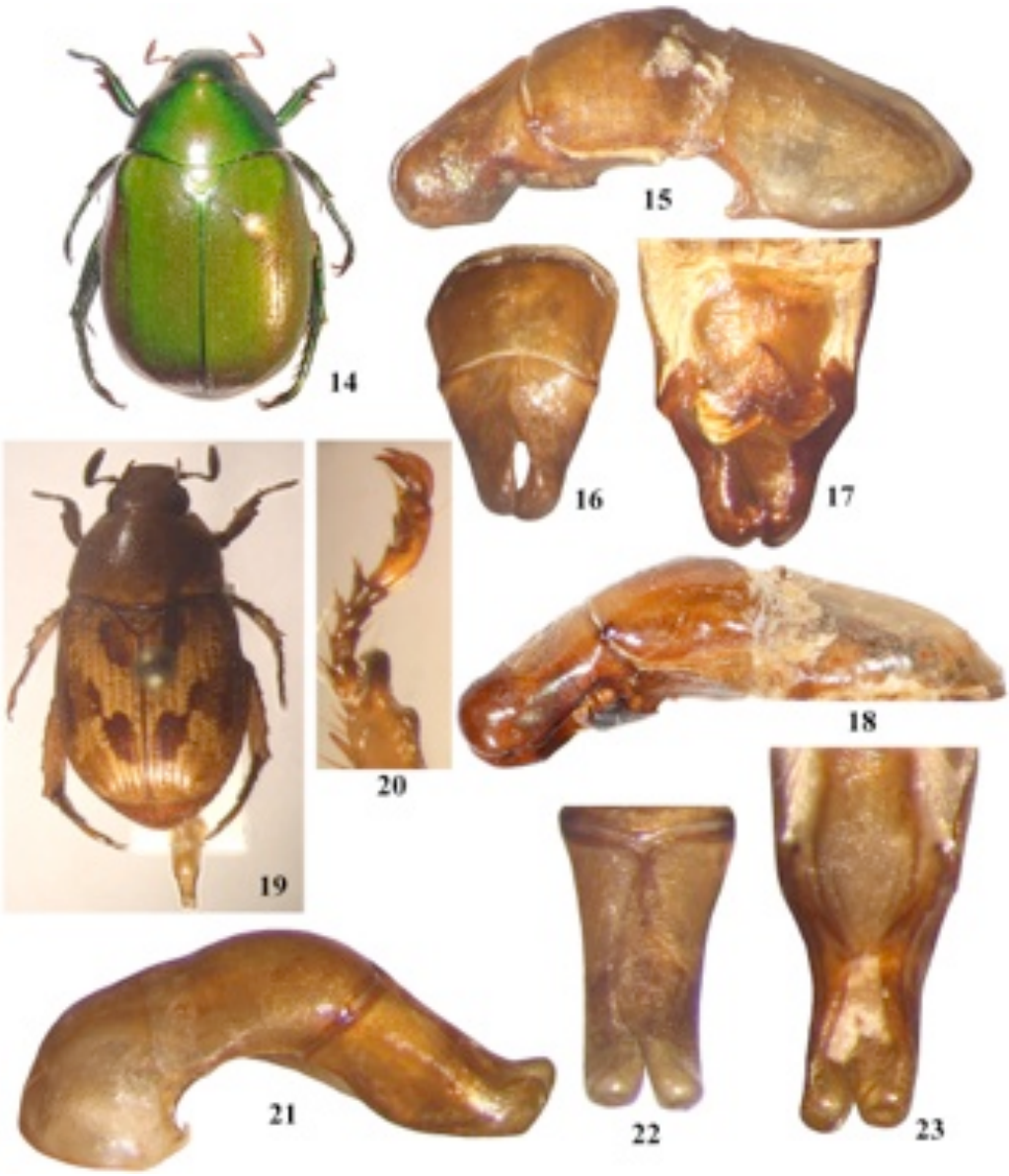


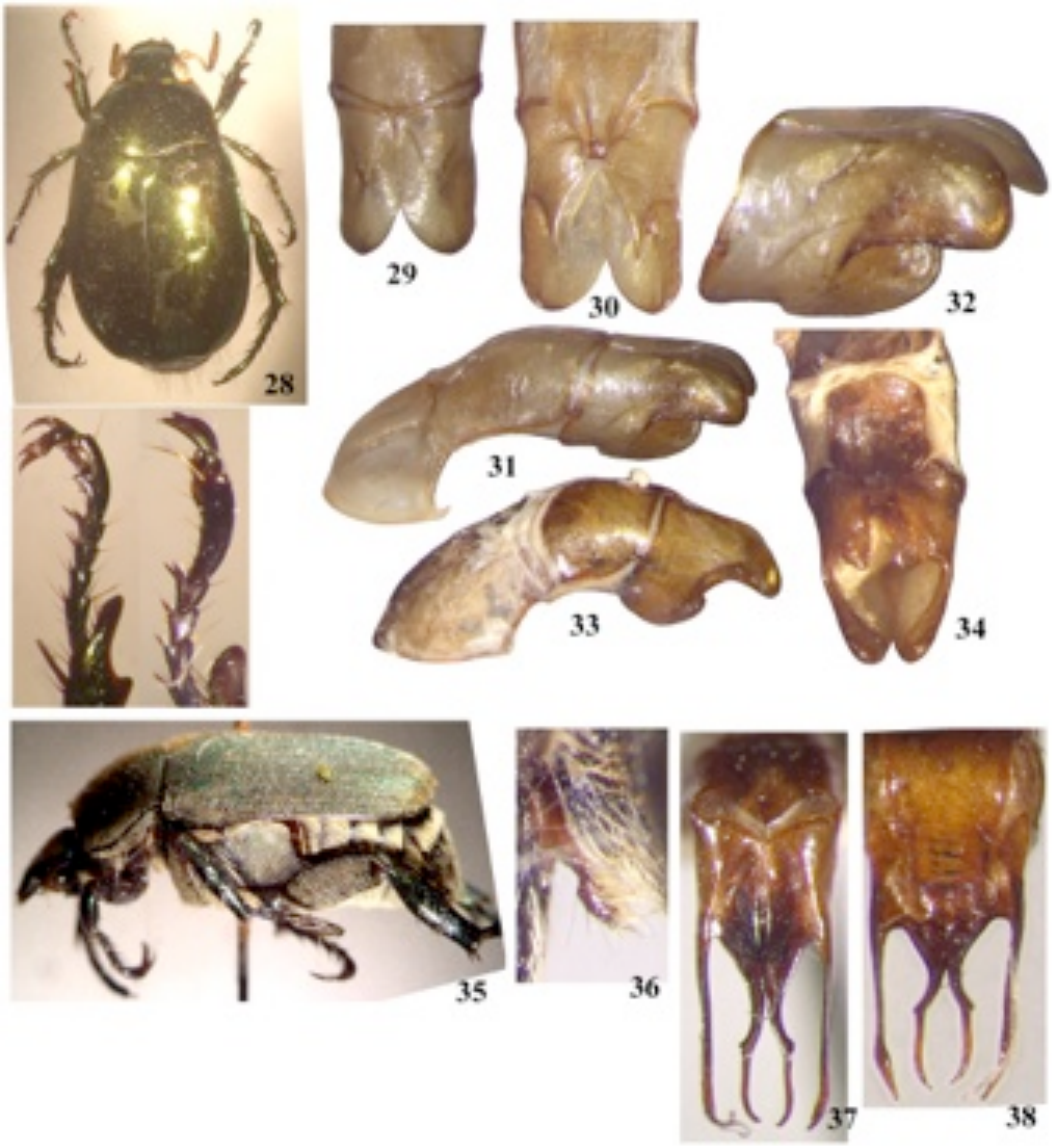
Figs. 1-6. *Anomala aureoflava*, Yunnan, Lijiang: 1-3 – dorsal view; 4, 5 – parameres, frontal view (variations); 6 – aedeagus, lateral view.

Figs. 7-13. *Anomala nigrovaria*, type, aedeagus, lateral view (7); *A.* sp. cf. *nigrovaria*, Thailand, aedeagus, lateral view (8); *A. birmana*, Karen Hills (9 – dorsal view, 10 – lateral view), and *A. conjuncta* (11, 12 – dorsal view, variations of color pattern; 13 – lateral view).



Figs. 14-23. *Anomala collotra* (14-18) and *A. decorata* (19-23): 14-17 – specimen from Sichuan (14 – dorsal view; 15 – aedeagus, lateral view; 16 – aedeagus, dorsal view; 17 – aedeagus, ventral view); 18 – specimen from Laos, aedeagus, lateral view; 19 – dorsal view; 20 – protarsus of male; 21-23 – aedeagus in lateral, dorsal and ventral view, southern Vietnam.

Figs. 24-27. *Anomala densa*, variations in shape of aedeagus: 24 – Vietnam, 30 km SW Phan Thiet city; 25 and 26 – Yunnan: Mengla; 27 – Vietnam, Phu Quoc I.



Figs. 28-38. *Anomala francottei* (28-32), *A. latyclypea* (33, 34) and "*A.*" *graminea* (35-38): 28 – dorsal view; 29, 37 – aedeagus, dorsal view; 30, 34, 38 – aedeagus, ventral view; 31, 33 – aedeagus, lateral view; 32 – parameres, frontolateral view; 35 – lateral view; 36 – prosternal process.

Figs. 39-49. *Anomala planelytra* (39-47) and *A. punctulicollis* (48, 49): 39-43 – holotype (39 – dorsal view; 40 – lateral view; 41 – labels pinned with holotype; 42 – aedeagus, lateral view; 43 – parameres, frontal view); 44-47 – male specimen from ZMB (44 – aedeagus, dorsal view; 45 – aedeagus, ventral view; 46 – parameres, lateral view; 47 – dorsal view); 48 – aedeagus, lateral view, right side; 49 – aedeagus, lateral view, left side.

Figs. 50-59. *Anomala v. violaceipennis* (50-52: 50 and 51 – types of var. *viridis*, St.-Catharina; 52 – nominate color form from Rio Grande do Sul), *A. v. mariposa*, Peru (53, 54), *A. viridicollis*, Obidos – 1904-1905, M.H. de Mathan, Mus Goeldi Para (ZMB) (55, 56), and *A. viridimicans* sensu Ohaus, Hong Kong (57-59): 50, 54, 55, 58 – aedeagus, dorsal view; 51-53, 56, 59 – aedeagus, lateral view; 57 – dorsal view.

Figs. 60-69. *Dipelicus fastigatoides*, holotype, aedeagus (60, 61), *D. fastigatus*, syntype (62-66), and *Eutheola paraguayensis* sp. n., holotype (67-69): 60, 62, 68 – aedeagus, lateral view; 61, 64, 69 – parameres, frontal view; 63 – aedeagus, ventral view; 65, 66 – sculpture at posterior angles of pronotum; 67 – dorsal view.

Figs. 70-84. *Onthophagus* (*Onthophagiellus*) *andreji* sp. n., holotype (70, 71), *Popillia cyanea*, Assam, Shillong, compared with type (72-75), *P. mutans*, Peking (76-79), and *Trichanomala tonkinensis*, lectotype (80-84): 70, 80 – dorsal view; 71, 81 – lateral view; 72, 76, 82 – aedeagus, dorsal view; 73, 77, 84 – aedeagus, lateral view; 74, 78, 83 – aedeagus, ventral view; 75, 79 – aedeagus, frontal view.