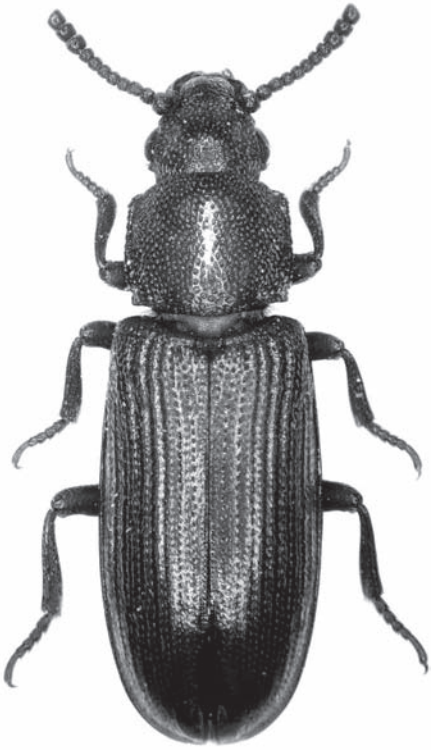
PL ISSN 0867-1710

POLISH TAXONOMICAL SOCIETY

INTERNATIONAL JOURNAL
OF INVERTEBRATE TAXONOMY

Genus



VOL. XXV, FASC. 3 2014

BIOLOGICA SILESIAE

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WROCŁAW POLAND

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Manuscript submission: Dr. Lech Borowiec, Department of Biodiversity and Evolutionary Taxonomy, Przybyszewskiego 63/77, 51-148 Wrocław, Poland, e-mail: genus@biol.uni.wroc.pl.

The fascicle is available in PDF format: www.biol.uni.wroc.pl/cassidae/genus.html.

Title sponsored by the Ministry of Education and Science, Warsaw
(Tytuł dofinansowany przez Ministerstwo Nauki i Szkolnictwa Wyższego, Warszawa)

(Nakład 300 egz.)

PL ISSN 0867-1710

Genus	Vol. 25(3): 341-350	Wrocław, 30 IX 2014

Description of the female of *Cornigamasus ocliferius* Skorupski et Witaliński, 1997 with a key to *Cornigamasus* species (Parasitiformes: Mesostigmata: Gamasida: Parasitidae)

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Abstract. This contribution provides a description of the female of a rare mite species, *Cornigamasus ocliferius* Skorupski et Witaliński, from Poland. The description of the common *C. lunaris* by Micherdziński (1969) is revisited to indicate that the female he described actually belongs to *C. ocliferius*. Both females and males of *C. ocliferius* exhibit an unusual character: the loss of an ambulacrum and claws on tarsus I, despite their deutonymphs possessing complete tarsi I. In addition, a key to *Cornigamasus* species is provided.

Key words: acarology, taxonomy, Mesostigmata, Parasitidae, *Cornigamasus ocliferius*, female.

Cornigamasus ocliferius Skorupski et Witaliński, 1997 is a rare species known from one male (Skorupski & Witaliński 1997) specimen and ten deutonymphs (Witaliński et al. 2005) collected in southern Poland in and around the *locus typicus* in Pieniny Mountains. In recent years four additional deutonymphs of *C. ocliferius* as well as two males and two females were found in localities other than the *locus typicus*. The aim of this study is to provide complementary data on the unknown female of this species.

Cornigamasus ocliferius Skorupski et Witaliński, 1997

Figs 1-9, 12,13

Diagnosis

Female. Tarsus of 1st pair of legs ends with many setae including sensory ones, but an ambulacrum with claws and pulvilli is absent. Coxa III without posteroventral

protuberance. Endogynium elongated axially, its width much smaller than the distance between bases of paragynial setae, with an arcuate thickening within the anterior part and circular, possibly porous area located posteriorly. Posterior endogynial margin narrow and not forming internally directed teeth or protrusions. Podonotal shield (fig. 1) with 5 and opisthonotal (fig. 2) with 2 pairs of stout, terminally pilose setae.

Differential Description

Female. A detailed description of the *C. ocliferius* female has been provided by Micherdziński (1969: 437; his prep. no 71a-d, examined) who mistakenly described it as a female of *C. lunaris* (Berlese), so only some characters are mentioned here to indicate differences from other *Cornigamasus* species. The *C. ocliferius* female is narrow and elongated, roughly rectangular in outline and rounded caudally (fig. 3). When alive it is olive-yellowish in colour, with a wide and dark brown gnathosoma due to internally located heavily sclerotized chelicerae. Dimensions of idiosoma: length 815–830 µm, width 420 µm (prep. nos 2410A, 2412), 967 x 567 µm (Micherdziński 1969). Lengths of tarsi I and tarsi IV in females, males and deutonymphs of *C. ocliferius* versus *C. lunaris* are presented in Table I.

Table 1. Length of tarsi I and tarsi IV (ambulacrum not included) in *C. lunaris* (Berlese) and *C. ocliferius* Skorupski et Witaliński in micrometers. Number of measured specimens in parentheses.

species	stage	length of Ta I	length of Ta IV
C. lunaris	male (2)	194-212	191-202
C. ocliferius	male (2)	175-194	181-212
C. lunaris	female (2)	194-199	194-204
C. ocliferius	female (2)	183	181-191
C. lunaris	deutonymph (7)	157-183	157-180
C. ocliferius	deutonymph (4)	149-160	147-160

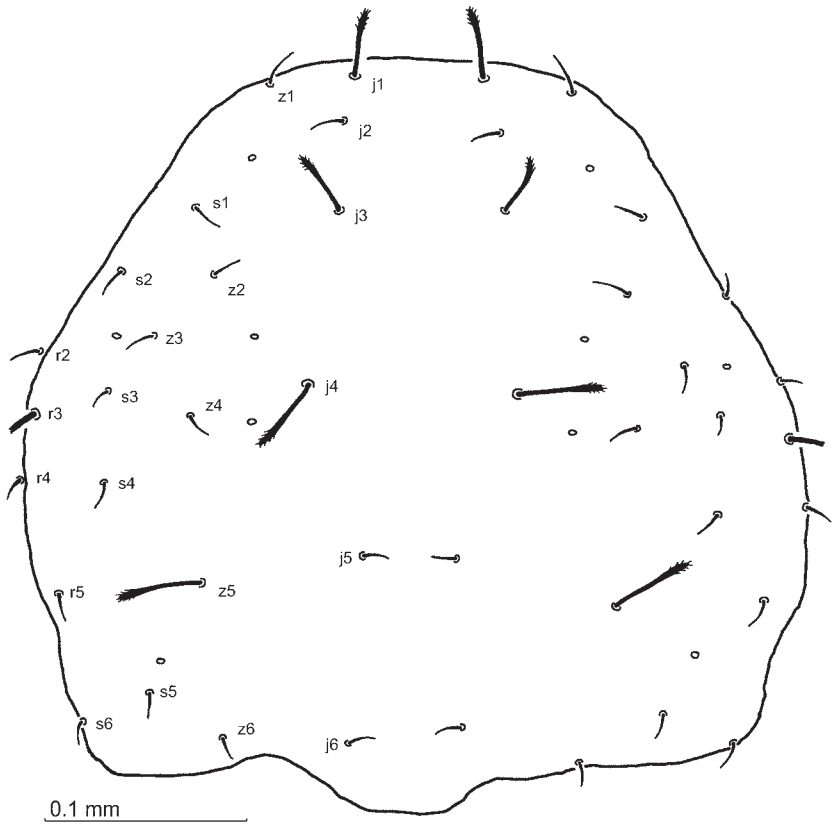
Dorsal side (figs 1, 2). Podonotal shield bears 22 pairs of setae including setae *r2* and *r4* which can be located on the shield or on flexible cuticle close to the shield margin. There are 5 stout (club-shaped) and terminally pilose setae (*j1, j3, j4, z5* and *r3*). Setation and pore distribution are similar to those in *C. lunaris,* but seta *j3* in *C. ocliferius* is stout and club-shaped whereas in *C. lunaris* it is simple. Female of *C. karachiensis* (Anvarullach et Ali Khan, 1969) possesses 6 pairs of stout podonotal setae; it is necessary to note that structures described and documented by the authors as characteristic macrochaetae located randomly on legs are in fact fungal spores rather than setae. *C. oulaensis* Ma, 1986 (=*C. lunaroides* Ma, 1986*) has 22 pairs of typical, thin podonotal setae.

*Ma (2005) considered *C. lunaroides* Ma, 1986 as a junior homonym of *Cornigamasus lunarioides* Athias-Henriot, 1980 and proposed a new species name *Cornigamasus oulaensis*.

The opisthonotal shield in *C. ocliferius* (fig. 2) is relatively small and bears 9 setae pairs with 2 pairs (*Z1* and *Z3*) stout and terminally pilose. On flexible cuticle emerging from the opisthonotum there are 14 pairs of setae of which 10 pairs are stout and terminally pilose. In other species the opisthonotal shield is fitted with either twelve pairs of setae, three of which are stout in *C. lunaris* (Holzmann 1969; Hyatt 1980), twelve pairs of simple setae (*C. oulaensis*), or eight pairs with two stout pairs in *C. karachiensis.*

Ventral side (fig. 3). Presternal plates are ellypsoidal and evidently larger than in *C. lunaris* in which they are small and wedge-shaped. The sternal shield is not reticulated, its anterior margin shows a shallow incision, whereas the posterior margin is irregularly truncate and axially concaved. In *C. lunaris* the marginal portions of the sternum are reticulated. In both species, sternal setae *st1* and *st3* are inconspicuous while setae *st2* are thicker and shorter.

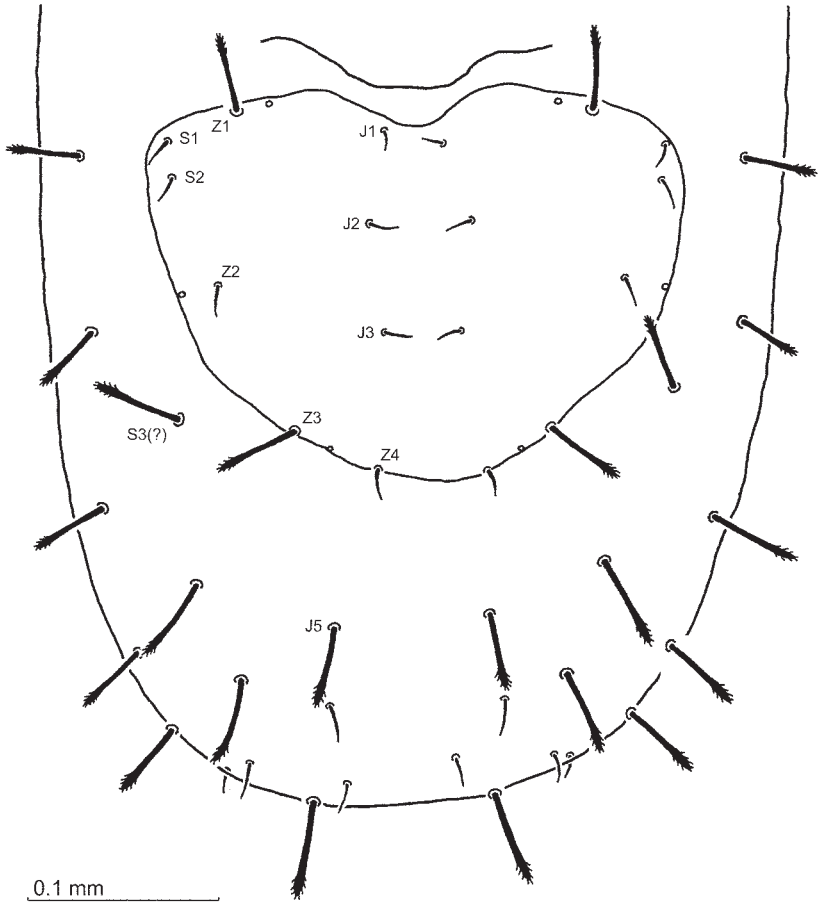
Genital region (figs 3, 4). Paragynia are inconspicuous. Epigynial plate terminates anteriorly with a narrow and long central prong, whereas posteriorly it is separated



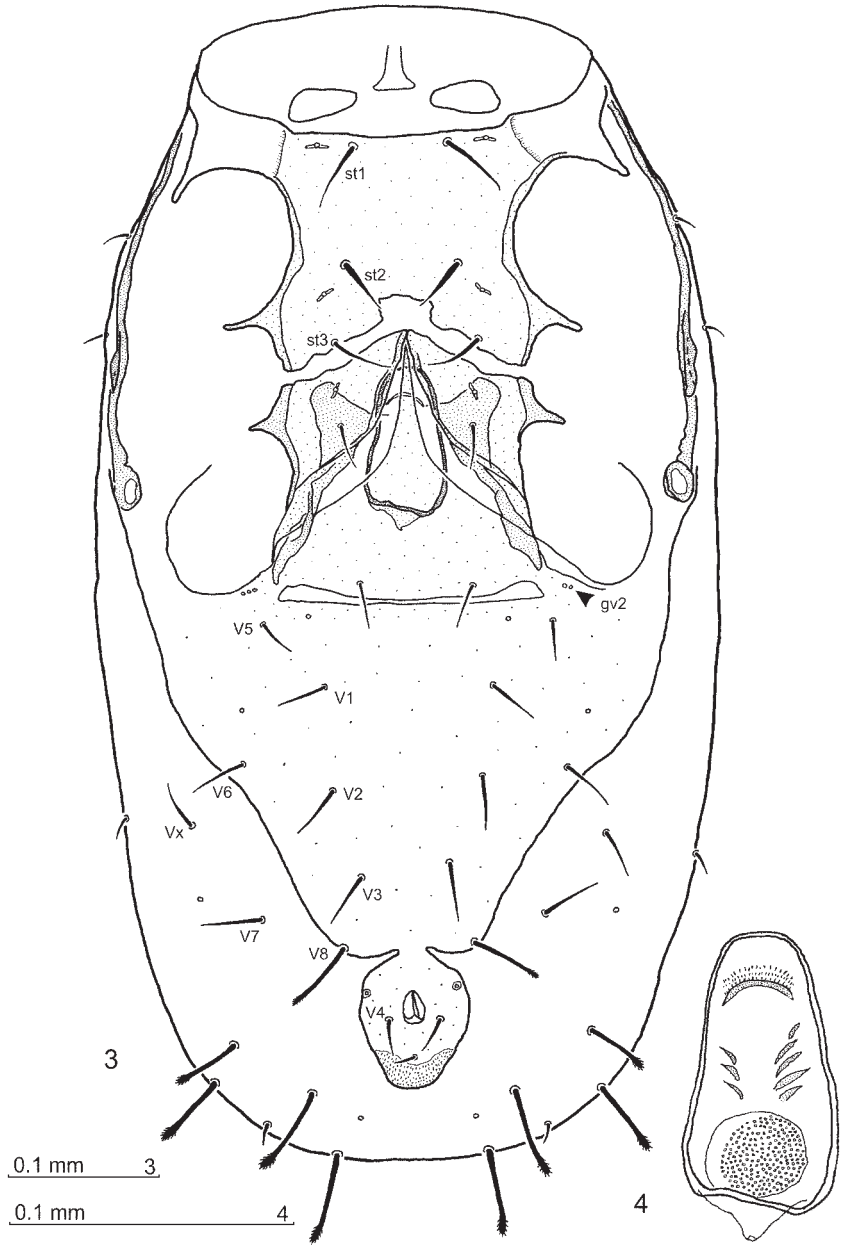
1. *Cornigamasus ocliferius* Skorupski et Witaliński, female (slide no. 2412). Dorsal side of idiosoma – podonotal shield

from the opisthogastric shield only in the central part; laterally, the epigynial shield and opisthogaster are fused in the region of the *gv2* pores. The width of the elongated endogynium (fig. 4) is much smaller than distance between bases of paragynial setae. Its narrow margin is well pronounced. In the anterior part of the endogynium an arcuate thickening is visible, whereas there is a circular porous (?) area close to the endogynium's posterior pole. The posterior endogynial pole forms a fine triangular lamella protruding caudally. In *C. lunaris* the endogynium is approximately as long as it is wide and its posterior margin usually forms two internally directed dents of which the left one (in ventral view) is larger.

The opisthogastric shield is narrowed caudally and fused with a small perianal plate by a narrow band of cuticle. In *C. ocliferius* it bears 6 pairs of setae of which the posteriormost pair (*V8*) is stout, whereas in *C. lunaris* the opisthogastric shield bears 7 pairs of setae with one stout seta located posteriorly.

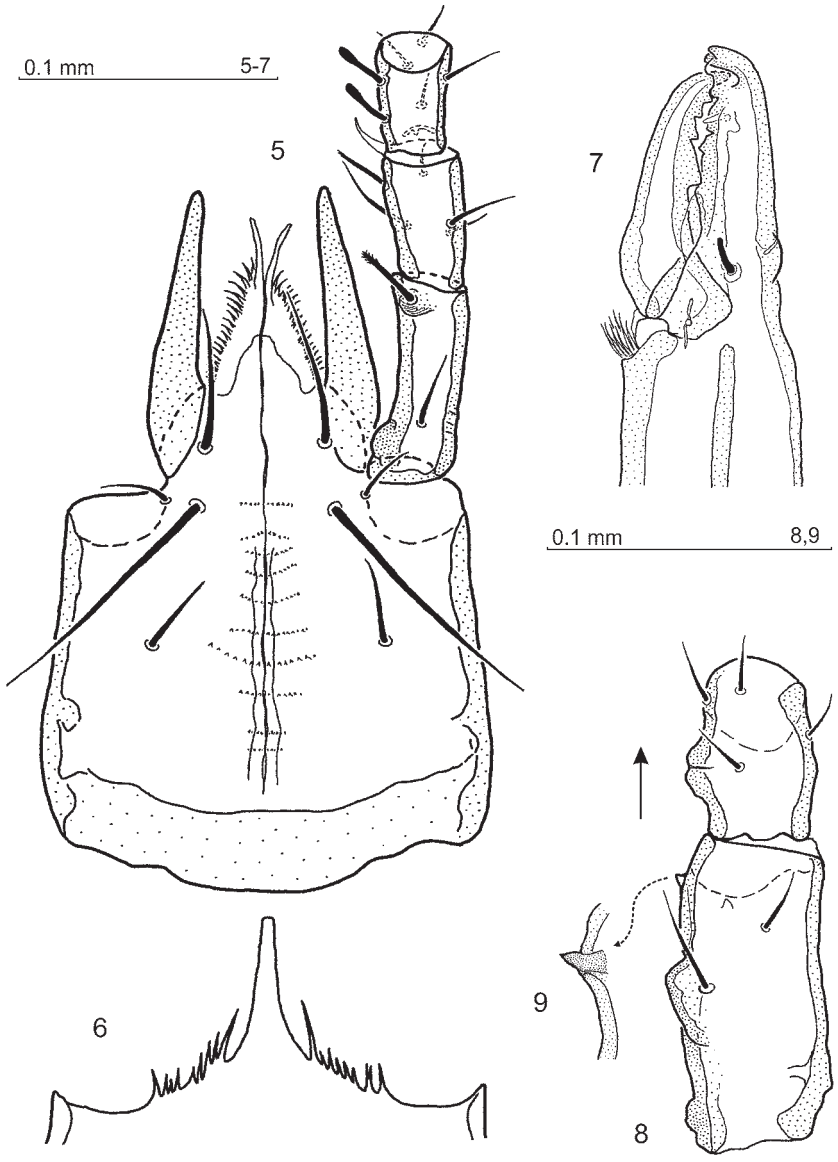


2. *Cornigamasus ocliferius* Skorupski et Witaliński, female (slide no. 2412). Dorsal side of idiosoma – opisthonotal shield



3, 4. *Cornigamasus ocliferius* Skorupski et Witaliński, female (slide no. 2412). 3 – ventral side of idiosoma, 4 – endogynium

Gnathosoma (fig. 5). Hypognathal groove with 9-10 poorly visible rows of denticles (up to 12 very weakly visible rows in *C. lunaris*). Hypostomatic and palpcoxal setae simple; of these the internal posterior hypostomatics are 3-4 times longer than



5-9. *Cornigamasus ocliferius* Skorupski et Witaliński, female (slide no. 2410A). 5 – ventral side of gnathosoma, 6 – gnathotectum, 7 – chelicera abaxially, 8 – coxa and trochanter of leg I. Arrow is at anterolateral side, 9 – one of two teeth close to distal margin of coxa I from another perspective

the external ones. Gnathotectum (fig. 6) indistinguishable from that of *C. lunaris*, i.e. a long smooth central prong with truncated apex emerges from a denticulate base.

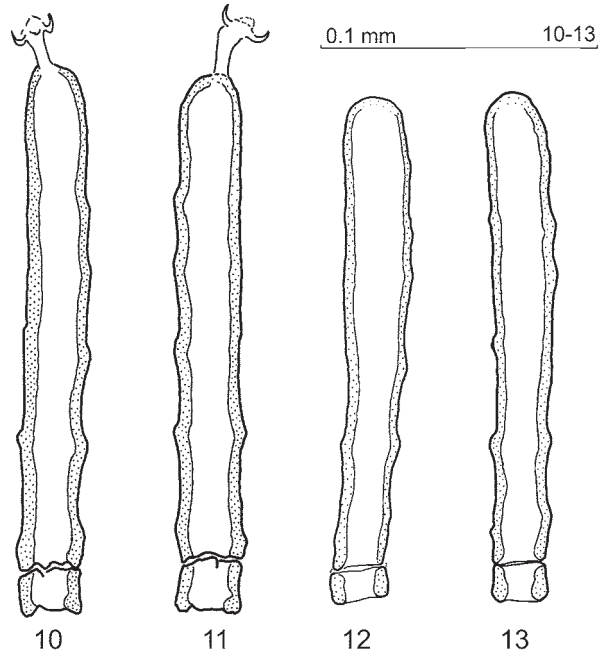
Chelicera (fig. 7). On the abaxial side, the fixed digit bears 3 teeth in front of the *pilus dentilis* – including an apical one followed by two others; behind the *pilus dentilis* are two poorly pronounced teeth. Close to the apex of the fixed digit, one tooth on the adaxial side forms a concavity which accommodates the tip of the movable digit. The movable digit has 4 well pronounced teeth followed by a pointed digit tip. Arthrodial membrane inconspicuous; abaxial seta short and rounded apically.

Pedipalps. Trochanter (fig. 5) with seta *v1* simple, seta *v2* pilose distally and positioned on a tubercle. Proximal end of trochanter with tubercles positioned adaxially. The anterolateral seta on the palp femur is nearly simple, only with apical pilosity. Distally, the palp femur possesses a large, arcuate lamellar protrusion directed adaxially. Anterolateral setae *al1* and *al2* on palp genu are wider apically.

Legs II-IV and their chaetotaxy are inconspicuous; coxa III lack a posteroventral protuberance present in *C. lunaris*. Leg I is conspicuous due to its tarsus which is slightly club-shaped in outline (figs 10-13) and the ambulacrum with claws and pulvilli, located on tarsus I in all other parasitid species, is absent.

Remarks on Biology, Distribution and Morphology/Taxonomy

Cornigamasus ocliferius is an uncommon species since only several specimens have been found in southern and central Poland (Micherdziński 1969; Skorupski &



10-13. Tarsi I in outline in *Cornigamasus lunaris* (Berlese) (10, 11) and *Cornigamasus ocliferius* Skorupski et Witaliński (12, 13) in dorsal perspective. 10 – male (slide 2417), 11 – female (slide 2417), 12 – male (slide 2399), 13 – female (slide 2412)

Witaliński 1997; Witaliński et al. 2005; this study). It should be emphasized, however, that Karg (1993: 460) documented two types of leg II in *C. lunaris*; one of them (p. 483, fig. 406b) as well as the genital region of the female from a German population (p. 474, fig. 390a), are indicative of *C. ocliferius* (Skorupski & Witaliński 1997). If so, this species also occurs in Germany. Quite recently, the ocurrence of *C. ocliferius* in Egypt has been reported by Negm in a poster presentation during the 14th International Congress of Acarology (Negm 2014).

Unfortunately, there is still no evidence for the explanation proposed by Witaliński and co-workers (2005) who suggested that the scarcity of this species is due to a strictly nidicolous existence in rodent nests from which it is only occasionally transported on fur to rodent-invaded haystacks or similar places.

The most taxonomically intriguing aspect of the morphology of *C. ocliferius* is a lack of an ambulacrum on the tarsi of legs I. This character has not been described in other *Cornigamasus* species or from other Parasitidae, but is typical for, e.g. Macrochelidae. However, a tendency for reduction of the ambulacrum of the first leg is apparent in *Cornigamasus*, since the ambulacra in *C. lunaris* adults are evidently smaller than in *Cornigamasus* deutonymphs (including *C. ocliferius*) as well as other Parasitidae species. This seems to support a trend in Parasitidae to use the first pair of legs primarily as sensory appendages (Hyatt 1980). On the other hand it is surprising that such important and divergent characters as the presence or absence of ambulacrum can occur in closely related species.

KEY TO *CORNIGAMASUS* SPECIES

[*Cornigamasus* comprises 8 species: *C. imitans* Athias-Henriot, 1980 (deutonymph only), *C. karachiesis* (Anvarullah et Ali Khan, 1969) (female only), *C. lunariformis* Athias-Henriot, 1980 (deutonymph only), *C. lunarioides* Athias-Henriot, 1980 (deutonymph only), *C. lunaris* (Berlese, 1882) (deutonymph, female, male), *C. ocliferius* Skorupski et Witaliński, 1997 (deutonymph, female, male), *C. oulaensis* Ma, 1986 (= *C. lunaroides* Ma, 1986) (deutonymph, female, male), and *C. quasilunaris* Athias-Henriot, 1980 (deutonymph only)]

Females:

1. Tarsus I devoid of ambulacrum with claws and pulvilli. Podonotum with 5 and opisthonotum with 2 pairs of stout, club-shaped setae and additional 10 pairs of stout setae extending out of opisthonotum on a flexible cuticle. Endogynium elongated, its width much smaller than distance between bases of paragynial setae, internally directed dents on posterior endogynial margin absent .... *C. ocliferius* Skorupski et Witaliński, 1997
–. Tarsus I ending with ambulacrum. Endogynium subspherical or elongated ..... 2.
2. All dorsal setae stout and brush-shaped. The anterior margin of sternum wavy, presternal platelets small. Epigynial central prong very narrow and long. Endogynium subspherical, its width is larger than distance between bases of paragynial setae; posterior endogynial margin with triangular elevation located centrally and directed anteriad ..... *C. oulaensis* Ma, 1986 (= *C. lunaroides* Ma, 1986)
–. Podonotum with 4 or 6 pairs of stout setae, the other setae simple ..... 3.

3. Podonotum with 4 pairs and opisthonotum with 3 pairs of enlarged setae. Epigynium with elongated central prong. Endogynium subspherical with width equal or larger than distance between bases of paragynial setae; endogynial posterior margin forms two dents of quite different size ..... *C. lunaris* (Berlese, 1882)
–. Podonotum with 6 pairs and opisthonotum with 2 pairs of enlarged setae; additional 11 pairs of stout setae extending out of opisthonotum on a flexible cuticle; epigynium regularly triangular with sinuous lateral margins; endogynium roughly rectangular and narrow, its width smaller than distance between bases of paragynial setae ..... *C. karachiensis* (Anvarullah et Ali Khan, 1969)

Males:

1. Tarsus I devoid of ambulacrum with claws and pulvilli. Dorsum with 5 stout setae in front and 4 stout setae behind transversal dorsal suture (including pair at rear body margin). Genu I with a characteristic low protrusion on anterolateral side, femur II with one small conical main spur only .. *C. ocliferius* Skorupski et Witaliński, 1997
–. Tarsus I ending with ambulacrum ..... 2.
2. All dorsal setae stout and brush-shaped. Femur II with large curved main spur and small axillary spur; genu II and tibia II each bear one small spur ..... *C. oulaensis* Ma, 1986 (= *C. lunaroides* Ma, 1986)
–. Dorsum with 5 pairs of stout setae in front and 5 pairs behind transversal dorsal suture (including pair at rear body margin). Femur II with large curved main spur and small axillary spur; genu II and tibia II each bear one small spur .... *C. lunaris* (Berlese, 1882)

Deutonymphs:

1. Podonotum bears 18 pairs of setae ..... 2.
–. Podonotum bears 19 or 20 pairs of setae, opisthonotum with 12 pairs of setae ..... 6.
2. Opisthonotum with 8 or 9 pairs of setae; mobile digit of chelicera with 5 teeth ..... 3.
–. Opisthonotum with 12 pairs of setae; mobile digit of chelicera with 3 teeth ..... 4.
3. Opisthonotum with 8 pairs of setae ..... *C. lunariformis* Athias-Henriot, 1980
–. Opisthonotum with 9 pairs of setae .... *C. ocliferius* Skorupski et Witaliński, 1997
4. Tibia II simple, without convexity on anterolateral margin. Tarsus IV length 160-170 µm ..... *C. quasilunaris* Athias-Henriot, 1980
–. Tibia II with convexity on anterolateral side ..... 5.
5. Tarsus IV length up to 180 µm ..... *C. lunaris* (Berlese, 1882)
–. Tarsus IV length 215-225 µm ..... *C. lunarioides* Athias-Henriot, 1980
6. Podonotum bears 19 pairs of setae ..... *C. imitans* Athias-Henriot, 1980
–. Podonotum bears 20 pairs of setae .... *C. oulaensis* Ma, 1986 (= *C. lunaroides* Ma, 1986)

Material Examined

2 females of *C. ocliferius* (slides no. 2410A and 2412) and 2 deutonymphs (slides no. 2413 and 2426) collected on 1st Sept. 2012 in a decaying large haystack on grassland on the Jagiellonian University Campus, Kraków – Ruczaj, southern Poland. GPS coordinates N 50° 1.776'; E 19° 54.183'; alt. ca. 207 m a.s.l.

1 male of *C. ocliferius* (slide no. 2411) collected *ibid.*

1 male of *C. ocliferius* (slide no. 2399) collected on 7th August 2012 in decaying grass close to coniferous forest in Klikuszowa, southern Poland. GPS coordinates N 49° 32.192'; E 19° 58.477'; alt. ca. 780 m a.s.l.

1 female of *C. ocliferius* from the collection of Prof. Wiktor Micherdziński (deposited in the Zoological Museum of the Jagiellonian University, Kraków, slide no. 71 a-d), collected by E. Rokicki in October 1961 in Kampinoska Forest near Warsaw, Poland, and mistakenly determined as *Parasitus lunaris* (Berlese) (Micherdziński 1969).

2 deutonymphs of *C. ocliferius* (slides no. 2395 and 2398) collected on 10th August 2012 in decaying litter and fodder from domestic rabbit culture in Jaszczurowa/Świnna Poręba, southern Poland. GPS coordinates N 49° 47.978'; E 19° 34.325'; alt. ca. 316 m a.s.l.

All material collected by the author in 2012 is in the author's collection.

Acknowledgements

The author wishes to thank Dr. Maciej Pabijan, Institute of Zoology, Jagiellonian University, for English correction of the MS.

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Witaliński, W., Skorupski, M., Juvara-Bals, I., 2005. Deutonymph of *Cornigamasus ocliferius* Skorupski et Witaliński, 1997 (Acari: Gamasida: Parasitidae). Genus, **16**: 145-153.

Genus	Vol. 25(3): 351-355	Wrocław, 30 IX 2014

Salticidae from the Himalayas. First description of the female *Chinattus validus* (Xie, Peng & Kim, 1993) (Araneae: Salticidae)[1]

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Abstract. Hitherto unknown female of the species *Chinattus validus* (Xie et al. 1993) is described and a new diagnosis based on both sexes is provided. *C. validus* is reported for the first time from the Himalayas.

Key words: arachnology, taxonomy, jumping spiders, new record, Nepal, Bhutan.

INTRODUCTION

The genus *Chinattus* was established by Logunov (1999), by the exclusion of the species allocated in the genus *Habrocestoides* Prószyński 1992, and comprises 12 species (Platnick 2014). *Chinattus* is related to *Habrocestum* Simon 1876, and *Phintella* Bösenberg & Strand 1906 (Logunov 1999). *C. validus* was described as *Habrocestoides validus* by Xie, Peng, Kim in 1993, and later by Peng & Xie (1995) from Hunan Province (China). Until now the state of knowledge of *C. validus* was incomplete, because of lack of information on a female. The species has not been previously recorded from the Himalayas.

The aim of this study is to redefine the species and describe the female for the first time, providing diagnostic drawings and photos.

[1]Results of the Himalaya Expeditions of J. Martens, No. 280. - For No. 279 see: Chinese Birds 5, 2014

MATERIAL AND METHODS

Material was provided by Naturmuseum und Forschungsinstitut Senckenberg, Frankfurt a. M. (SMF), and Naturhistorisches Museum, Basel (NHMB). A Nikon D5100 digital camera, attached to the stereomicroscope Nikon SMZ 1000 and Helicon Focus software were used for photographing specimens. Measurements are given in millimeters millimeters, and were taken using MultiScan software.

Abbreviations used: AEW – anterior eye width, ag – accessory glands, AL – abdomen length, ALE – anterior lateral eyes, AME – anterior medial eyes, CH – cephalothorax height, CL – cephalothorax length, ClypH – clypeus height, co – copulatory openings, CW – cephalothorax width, DAM – diameter of anterior medial eyes, e – embolus, EFL – eye field length, F – female, id – insemination ducts, L – leg, M – male, m – metatarsus, PEW – posterior eye width, PLE – posterior lateral eyes, PME – posterior median eyes, rta – retrolateral tibial apophysis, s – spermathecae, t – tarsus.

Chinattus validus (Xie, Peng & Kim, 1993)

(Figs 1–14)

Habrocestoides v. Xie et al. 1993: 25; *H. v*. Peng & Xie, 1995: 62, 64; *C. v*. Logunov 1999: 148.

Material

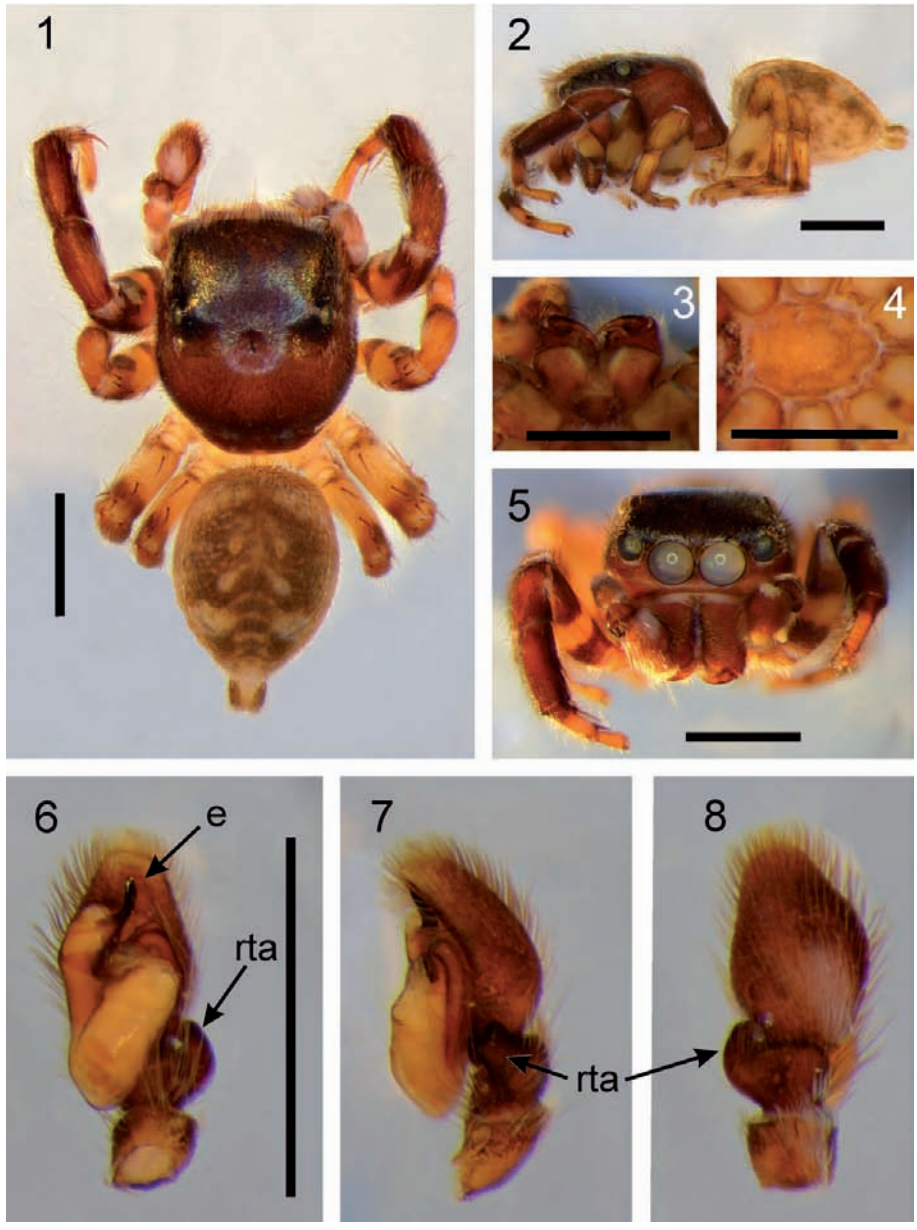
Bhutan: 2F, 2M (NHMB), Changra, 18 km S Tongsa, 1900 m, 22 Jun. 1972; Nepal: 1F (SMF), Taplejung Distr., between Hellok and lower Gunsa Khola, 1620–2000 m, tree-rich cultural land, 18 May 1988, Martens & Schawaller; 1M (SMF), Lamjung Distr., Marsyandi, 1100–1250 m, cultural land with trees, Bahundanda, 10 April 1980, Martens & Ausobsky; 1M (SMF), Gorkha Distr., Darondi Khola below Barpak, 1500–1800 m, cultural land, *Gebüsch*, 12 Aug. 1983, Martens & Schawaller; 1M (SMF), Taplejung Distr., Kabeli Khola, Yamputhin, 1650–1800 m, cultural land mixed forest/*Bambus*, 3–4 Sept. 1983, Martens & Daams; 1F (SMF), Gorkha/Dhading Distr., Gorlabesi – Dhoban, 30 Jul. 1983, 1000–1100 m, mixed forest in gorges, Martens & Schawaller; 1F (SMF) Taplejung Distr., Gunsa Khola, [near] Kibla and Amjilesa 2400–2600 m, Berlese, deciduous forest 12 Sept.1983, Martens & Schawaller.

Diagnosis

According to Peng & Xie (1995) males differs from *C. sinensis* by structure of pedipalp: the shape of tegulum, slender embolus (fig. 6), and robust tibial apophysis (figs. 6–8). The female of *C. validus* could be recognize by very characteristic internal structure of epigynum, from similar *C. chichila* Logunov 2003, can be separated by short insemination ducts and arrangement of duct-like spermathecae (fig. 14).Description

Male (figs. 1-8). Xie *et al.* (1993) and Peng & Xie (1995) gave a *description* of the male holotype and diagnostic drawings; in the present paper we provide images of male to provide more data useful for identification of the species.

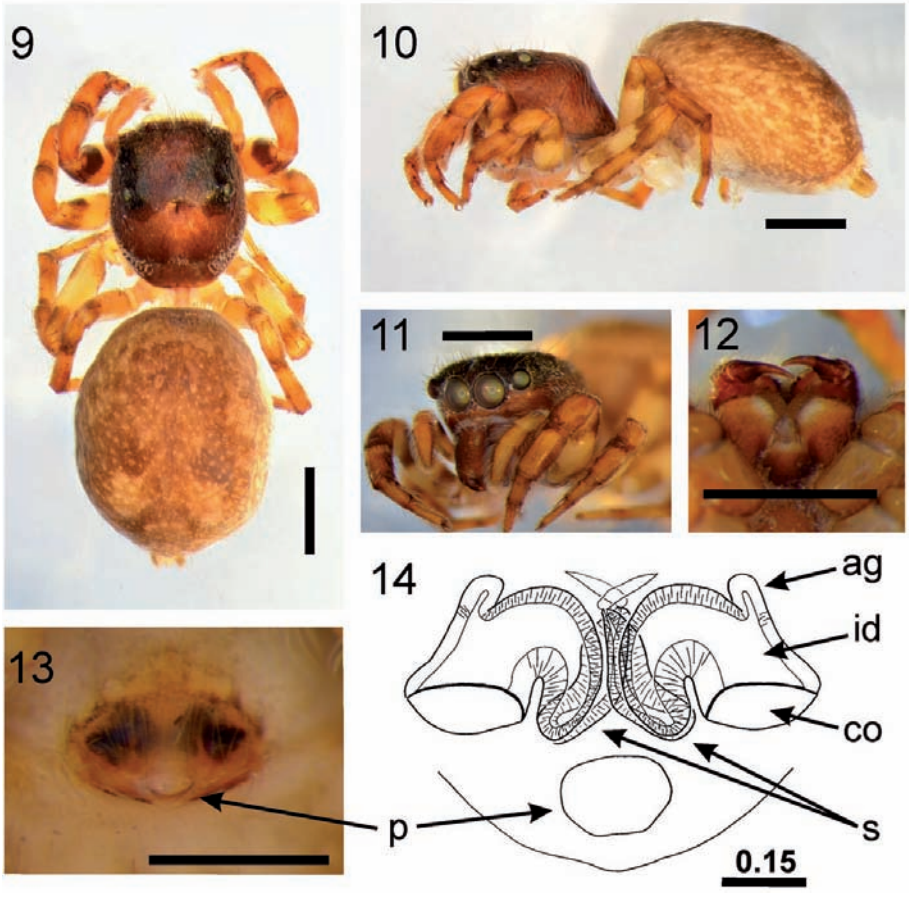
Female. Cephalothorax brown, rounded (outline from above), its upper surface smooth; sides covered by white hairs (fig. 9), posterior thoracic slope distinctive (fig.



1-8. *Chinattus validus*, male: 1. Dorsal view. 2. Lateral view. 3. Cheliceral dentition, endites and labium. 4. Sternum. 5. Frontal view. 6. Palpal organ, ventral view. 7. Palpal organ, retro-lateral view. 8. Palpal organ, dorsal view. Scales 1.00 mm

10). Eyes surrounded by black circle. Eye field trapezoid, wider than long. PME closer to PLE than ALE. Fovea visible.

Abdomen grey-brown with lighter pattern of lines and small spots (fig. 9). Spinnerets light-brown. Clypeus narrower (18%) than AME diameter, light-brown, covered with long white hairs (fig. 11). Chelicerae subvertical and small, brown, with papillate anterior surface (fig. 11); promargin with two teeth, retromargin with single tooth (unidentate). Maxillae and labium light-brown, with lighter tips (fig. 12). Sternum oval, light-brown. Venter light-brown with small grey spots. Palps pale-yellow. Epigynum with posterior pocket (after Logunov 1999), copulatory openings well separated, insemination ducts wide, spermathecae duct-like. Accessory glands well visible, short (fig. 14). Legs pale-yellow to brownish, with darker distal parts. First legs the strongest, ventral spination: tI: 2-2-2; mI: 2-2. Legs II light-brown; ventral spination: tII: 2-2-2, mII: 2-2. Other legs light-brown. Leg formula 1-4-2-3.



9–14. *Chinattus validus*, female: 9. Dorsal view. 10. Lateral view. 11. Frontal view. 12. Cheliceral dentition, endites and labium. 13. Epigyne, ventral view. 14. Vulva. Scales 1.00 mm; scale on drawing as in figure

Measurements: CL 1.88, CW 1.59, CH 1.05, EFL 0.86, AEW 1.30, PEW 1.26, AL 2.93, AW 2.32, DAM 0.39, ClypH 0.07, LI 3,96, LII 3,53, LIII 4,62, LIV 4,54.

Remarks. Specimens from the Himalayas were collected in subtropical and evergreen deciduous forests, 1100–2000 m a. s. l.

ACKNOWLEDGEMENTS

We are grateful to Prof. WANDA WESOŁOWSKA (Uniwersytet Wrocławski) for useful comments on the paper.

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Walckenaeria incisa (O.P.-Cambridge) − a rare European species, new to Poland (Araneae: Linyphiidae)

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Abstract. *Walckenaeria incisa* (O. P.-Cambridge, 1871) is a rare spider species occurring only in Europe. In Poland, the first females of the species were collected in thermophilous thickets along the middle of the Bug River valley and in a very dry and transformed riparian forest in the Lower Vistula valley. The paper presents diagnostic images of *Walckenaeria incisa* – the body and female reproductive organs.

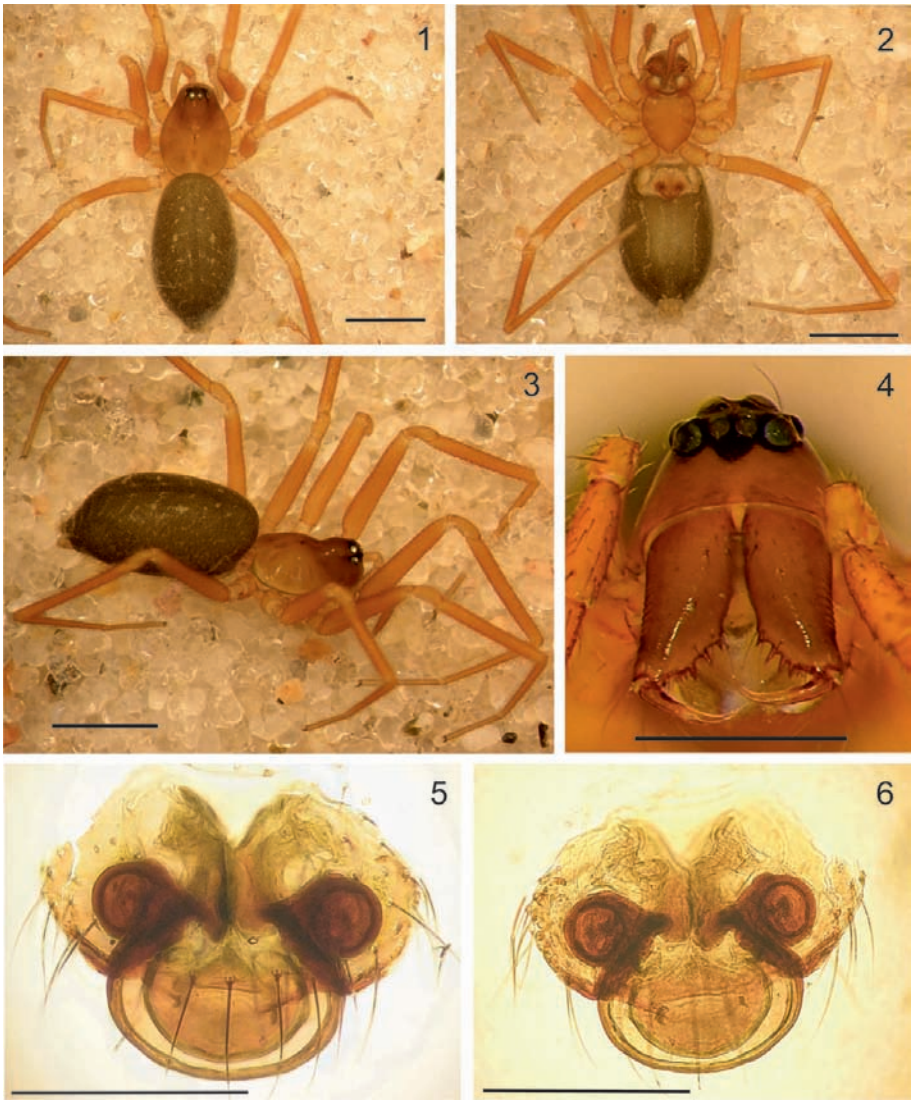
Key words: arachnology, faunistics, *Walckenaeria incisa,* deciduous forests, deciduous bushes, river valleys, Poland.

INTRODUCTION

The family Linyphiidae contains a relatively large number of genera and species; most of them occur in the Palearctic (Tanasevitch 2011, Platnick 2014). The genus *Walckenaeria* belongs to one of the largest genera in the family and includes 199 species and subspecies distributed mostly in the Nearctic. So far, 71 species from the genus have been identified in Europe (Helsdingen 2013, Platnick 2014).

Like most representatives of Linyphiidae, spiders in this genus are small – the body size ranges from 1.5 to 4 mm in length (Wunderlich 1972, Růžička & Bryja 2000, Nentwig et al. 2014). In Europe, species from the *Walckenaeria* genus occur most frequently in various types of forest and on oligo- and mesotrophic peat bogs, in litter and moss layer (Wunderlich 1972, Hänggi et al.1995, Platen et al. 1999).

Walckenaeria incisa (O. P.-Cambridge, 1871) is a rare spider species known only from Europe (Platnick 2014). The species has so far been recorded in: Great Britain, France, Belgium, the Netherlands, Denmark, Germany, Switzerland, Sweden, Lithuania, Ukraine, Slovakia, Hungary, and Greece (Helsdingen 2013, Scharff & Gudik-Sřrensen 2011, Tanasevitch 2011, Nentwig et al. 2014). The purpose of this paper is to present the distribution and habitat preferences of *Walckenaeria incisa* in Poland and Europe and to present, for the first time, diagnostic images of the body and female reproductive organs.



1-6. *Walckenaeria incisa*: 1 – female dorsal, 2 – female ventral, 3 – female lateral, 4 – eyes and chelicerae, 5,6 – epigyne

MATERIAL AND METHODS

Two females of *Walckenaeria incisa* were collected at two sites in Poland, at the edges of the valleys of large lowland rivers – the Bug River and the Vistula River (Fig. 1-6).

Site 1

1 female – 09-21 July 2007, Gnojno, Podlasie Bug Gorge Landscape Park (N52°16'55'' E 23°08'05''); thermophilic scrub *Rhamno-Cornetum sanguinei*; Barber pitfall traps; leg./ det. Izabela Hajdamowicz

The material was collected during research conducted from March to November 2007 in the Bug River valley using Barber pitfall traps and a sweep net.

The site was located at the edge of the river valley, on a steep slope covered with an impoverished and terminal form of thermophilous thickets, corresponding to the plant community of deciduous forest (Fig. 7). The layer of shrubs consisted of *Quercus robur*, *Cornus sanguinea, Corylus avellana,* and *Populus tremula* also occurred as single trees. In a sparse herb layer, *Dryopteris filix-mas* dominated, which is a species characteristic of deciduous forests. In herb and thicket fringe communities occurred: *Anemone sylvestris*, *Sedum maximum* and *Primula veris* (Fig. 8). The thickets bordered on mixed forest with some admixture of *Pinus sylvestris*, and psammophilous grasslands.

Site 2

1 female – 03 March 2013, the lower Vistula valley, Bydgoszcz, "Park Milenijny" (Millennium Park) (N53°08'41'' E18°09'39''); scattered deciduous tree layer; sifted leaf litter; leg./det. Tomasz Rutkowski

The research in the "Millennium Park" was conducted mainly in winter 2013 and 2014 using an entomological sifter and Barber pitfall traps.

The site was located at the edge of the Vistula River valley with southern and eastern exposure, in the city park situated at a flooded clay excavation pit, on a very dry and transformed habitat of riparian forest (Fig. 9). Open forest canopy on the slope was composed of *Populus alba* and other species of deciduous trees from the genus *Acer* sp. and *Betula* sp., as well as *Robinia pseudacacia* and *Alnus glutinosa* on the shore of

7-9. Collecting site of *Walckenaeria incisa*

the reservoir. *Sambucus nigra* occurred in the shrub layer, while *Urtica* sp. and *Galium* sp. dominated in the herbaceous layer. The shores of the water body were covered with reed beds of *Phragmites australis*. At the slope, the park is adjacent to housing and wide streets. The habitat was transformed as a result of land drainage.

DESCRIPTION AND MORPHOMETRICS OF FEMALES

Site 1 −1 female

Due to poor preservation of the specimen collected in the Bug River valley, it was possible to measure only carapace and sternum. Length of carapace: 1.10mm, width of carapace: 0.86mm. Length of sternum: 0.71mm, width of sternum: 0.62mm.

Site 2 – 1 female

The total length 2.97mm. Carapace smooth yellow-brown with darker radial stripes 1.10mm long, 0.90mm wide (Fig. 1). The head region elevated (Fig. 3). Abdomen yellow-grey. Sternum smooth yellow-brown 0.72mm long, 0.62mm wide (Fig. 2). Promargin of chelicera with 4 teeth, retromargin with 5 very small teeth (Fig. 4).

Legs yellow-brownish in colour. Position of trichobothrium on metatarsus: Leg I – 0.44; Leg II – 0.43; Leg III – 0.40; Leg IV – 0.52.

DISCUSSION

The body structure of the females collected, and particularly the diagnostic traits related to the structure of sexual organs, clearly indicate their affiliation with *Walckenaeria incisa* (O. P.-Cambridge, 1871). The best diagnostic trait is semicircular shape of the wide epigyne with a clearly thickened rim and the system of spermathecae and internal canals of female reproductive organs – vulva (Wiehle 1960, Roberts 1987, Nentwig et al. 2014). Other traits supporting the identification include: yellow, orange and brown colours of the body, the elevated eye field on the cephalothorax, the number of teeth on chelicerae and the location of trichobothria on the first pair of legs. Also the size of the body and of the cephalothorax, the length of legs and their segments do not differ from the data presented in the literature (Wiehle 1960, Wunderlich 1970, Roberts 1987, Gnelitsa 2002, Nentwig et al. 2014). The length of the female body ranges from 2.5 mm in Ukraine (Gnelitsa 2002) and 2.75 in Great Britain (Roberts 1987) to 3.5 mm in Central Europe (Wunderlich 1970, Nentwing et al. 2014). The body length of the female from western Poland has an intermediate value, ca. 3 mm. Nevertheless, based on the data from the western parts of the range of *Walckenaeria incisa* and few data on the species size from the eastern portion of its range, one can assume that the body size of this species is smaller on the borderlines of its range.

Numerous studies on the occurrence of spiders in the countries of Western and Central Europe have been conducted (Prószyński & Staręga 1971, 1997, Hängi et al. 1995, Gajdoš et al. 1999, Spider and Harvestman Recording Scheme 2014), and thus it can be concluded that the araneofauna of this region is well researched (Blick et al. 2004, Helsdingen 2013). In Europe, *Walckenaeria incisa* has been recorded mainly from lowlands, and occasionally river valleys of uplands or mountains. Most

of records, i.e. about 110 sites are known from Great Britain (Harvey et al. 2002, Spider and Harvestman Recording Scheme 2014). Significantly fewer sites (ca. 40) were reported from Germany, mainly in the northern part of the country (Staudt 2014). Sites of the species occurrence are, however, very dispersed and only singletons were caught. For this reason, the species is still considered to be rare in both countries and has been included in lists of rare and endangered species (Platen et al. 1999, Harvey et al. 2002, Spider and Harvestman Recording Scheme 2014). In western France, as in Great Britain, the species has the status of the highest rarity (Pétillon et al. 2008). Single sites of *Walckenaeria incisa* were found in the Netherlands (Helsdingen 1999, Tutelaers 2012), Denmark (Scharff&Gudik-Sřrensen 2012), Lithuania (Biteniekytė & Relys 2008), Hungary (Samu & Szinetár 1999), Slovakia (Gajdoš et al. 1999), Ukraine (Gnelitsa 2002) and Greece (Tanasevitch 2011). In Poland, the species is also very rare – only two sites with single specimens have been found so far. It appears that the number of reported sites of *Walckenaeria incisa* decreases in Europe from the west to east, and in the northern and southern direction from central Europe, which indicates a relationship of this species with warm and humid climate.

Due to the fact that only single specimens of *Walckenaeria incisa* were found at most sites, it is difficult to define precisely habitat preferences of this species. Nevertheless, the largest number of findings was reported from forests. In Great Britain, the species is most common in deciduous but also coniferous and mixed forests, on heathlands, heath peat bogs and grasslands, the latter often developed after forest logging (Spider and Harvestman Recording Scheme 2014). There is only one case known with more numerous findings, in "open ancient woodland" of the deciduous forest habitat (Harvey et al. 2002). "Ancient woodland" is a well preserved, natural fragment of forest in Great Britain, characterised by high species diversity and presence of many rare and endangered species (Rackham 2008). In Germany, *Walckenaeria incisa* is thought to be a stenotopic species associated with well preserved, moderately humid deciduous forests with *Fagus sylvatica, Fraxinus excelsior, Ouercus* sp., *Ulmus* sp. from the warm period ca. 6000 years ago, from the Atlantic period (Platen et al. 1999). In Poland, the habitats of the species were dry riparian mixed forest and thermophilic thickets resembling the forest. In the eastern part of the range, the species occurs mainly in deciduous forests, whereas in the western part of the range with more humid climate it also occurs in open areas.

It is likely that the sites of *Walckenaeria incise* in deciduous forests and thickets in Poland and in other parts of Europe are relic sites from the Atlantic period. In river valleys, particularly in Eastern Europe, natural deciduous forests still occur, both at the river bed and at the edges of valleys, and they act as important ecological migration corridors. The Polish sites of *Walckenaeria incisa* are located in regions with valuable natural assets, proving their well-preserved status (Gacka-Grzesikiewicz 1995, Głowacki et al. 2002). The site in the Bug River valley is located in the Podlasie Bug Gorge Landscape Park and at the Natura 2000 SPA and SAC, where particularly well-preserved willow-poplar, elm-ash and oak riparian forests, as well as xerothermic oak forest and thermophilic thickets, occur in nature reserves (Głowackiet al. 2002). Bug River valley is also a region of great spider species richness, including species very rare

in Europe (reviewed in: STARĘGA 2003, HAJDAMOWICZ & STAŃSKA 2006; OLESZCZUK et al. 2011). The site in the lower Vistula valley is located near the Vistula LP and in the immediate vicinity of the Natura 2000 SPA and SAC with thermophilous communities on the valley slopes, with well-preserved willow-poplar and elm-ash alluvial forests at the river bed, which are also under a nature reserve conservation plan (GACKA-GRZESIKIEWICZ 1995). Also other, rare in Europe, species of spiders were found in this region (T. RUTKOWSKI unpubl. data).

We can assume that *Walckenaeria incisa* can spread along the river valleys, covering available, optimal habitats of moderately wet forests and thickets. On the other hand, due to the lack of natural habitats, it can also occur in other habitats with similar conditions of moisture, temperature and insolation.

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Plaumanniola simplicissima n. sp. from Bolivia (Coleoptera: Staphylinidae: Scydmaeninae)

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Abstract. *Plaumanniola simplicissima* n. sp. is described and illustrated. This is the third species of this unusual genus of the tribe Plaumanniolini, and the present finding extends the range of *Plaumanniola* to the central part of Bolivia (hitherto known only from southern and northern Brazil). The new species seems to be the least morphologically modified *Plaumanniola*, showing relatively weakly broadened head, only slightly flattened legs and long antennae, not so compact as in the previously known congeners.

Key words: entomology, taxonomy, Coleoptera, Staphylinidae, Scydmaeninae, Plaumanniolini, *Plaumanniola*, new species, Nearctic, Bolivia.

INTRODUCTION

The enigmatic genus *Plaumanniola* Costa Lima, 1962 was recently reviewed and the morphology of its only genus *Plaumanniola* Costa Lima, 1962 was described and discussed (Jałoszyński 2013). Costa Lima (1962) originally placed *Plaumanniola* in Ptinidae, in a new subfamily Plaumanniolinae. Lawrence & Reichardt (1966) re-examined a paratype of the type species of *Plaumanniola*, *P. sanctaecatharinae* Costa Lima, 1962, and recognized this taxon as a member of ant-like stone beetles (at that time a family Scydmaenidae), where it still belongs, in the tribe Plaumanniolini of Scydmaenitae (Newton & Franz 1998).

Plaumanniola sanctaecatharinae was initially known only from the type locality in the Brazilian state Santa Catarina. Later Lenko (1972) recorded the same species from São Paulo state, provided a habitus illustration of the beetle and gave some new ecological observations regarding a possible myrmecophily of *Plaumanniola* as a putative inquiline of the ant genus *Octostruma* Forel. Later Franz (1990) redescribed

P. sanctaecatharinae on the basis of specimens from Amazonas state. Jałoszyński (2013) found this redescription based on a misidentified new species, and described *P. regina* Jałoszyński, 2013. Another total habitus illustration presented by O'Keefe (2000, 2005) was also found to show a misidentified species and not *P. sanctaecatharinae* (Jałoszyński 2013).

In a sample of Scydmaeninae collected in Bolivia and sent to me for study I found a new species of *Plaumanniola*. It differs from the two previously described in much less compact body, which is not as strongly broadened as that of *P. sanctaecatharinae* and *P. regina*. The head is rather moderately modified, not extremely broadened as in those two species, and also the antennae are strikingly long. If the previously known species of this genus are indeed myrmecophiles, as postulated by Costa Lima (1962), Lenko (1972) and O'Keefe (2000), and their stout bodies with broad heads enabling them to curl into a ball, the short and compact antennae and broadened and flattened legs are adaptations toward living within ant colonies, then the new species may show an early stage of developing such modifications, or losing them. In any case, this discovery remarkably broadens the range of the morphological diversity of *Plaumanniola*.

METHODS

The studied specimen, originally preserved in ethanol, was dissected and dry-mounted. The aedeagus was mounted in Canada balsam. Habitus images were taken by a Nikon Coolpix 4500 camera mounted on a Nikon Eclipse 1500 stereoscopic microscope, translucent structures in transparent mounts were photographed by a KY-F75U (JVC) camera mounted on a Leica M205 C microscope. Image stacks were processed using COMBINE ZP (Hadley 2010). Details of morphology were figured by a freehand drawing, with exact proportions and general shapes sketched from photographs. Morphological terms are used after Jałoszyński (2013). The measurements and abbreviations used in the descriptive part are as follows:

AeL - length of aedeagus;

AnL - length of antennae measured in ventral view, to include antennal base concealed under anterior margin of frontoclypeal region;

BL - body length, a sum of lengths of head, pronotum and elytra measured separately;

EI - elytral index, length of elytra divided by their combined width;

EL - length of elytra measured along suture, from base to apex;

EW - maximum width of elytra, combined;

HW - width of head, including eyes;

HL - length of head measured in dorsal view from anterior margin of frontoclypeal region to the posterior margin of vertex;

PL - length of pronotum measured along midline;

PW - width of pronotum.

The type material is deposited in the private collection of S. B. Peck, Ottawa, Canada (cSBP; later it will be deposited in the Canadian Museum of Nature insect collection).

TAXONOMY

***Plaumanniola simplicissima* n. sp.**

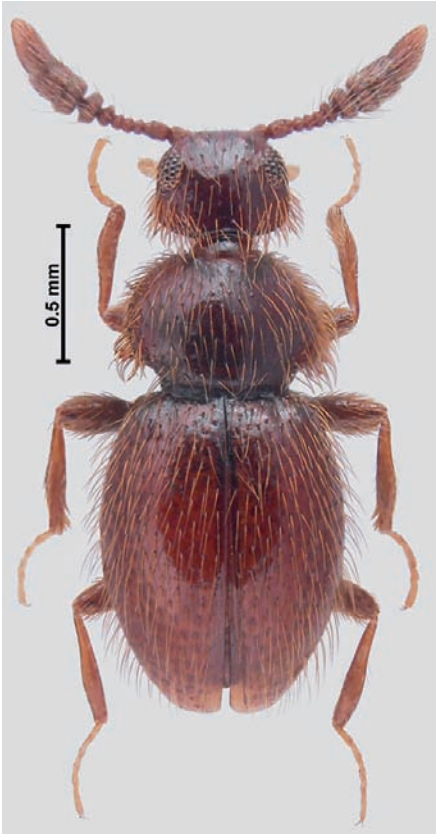
(Figs. 1-7)

Name derivation

The name *simplicissima* (Latin "the simplest") refers to the weakly modified body of the new species compared to previously known ones.

Diagnosis

Male: BL < 2 mm; antennae thickened from antennomere VII; tempora about as long as eyes; head in dorsal view weakly broadening posteriorly; each paramere with three setae.



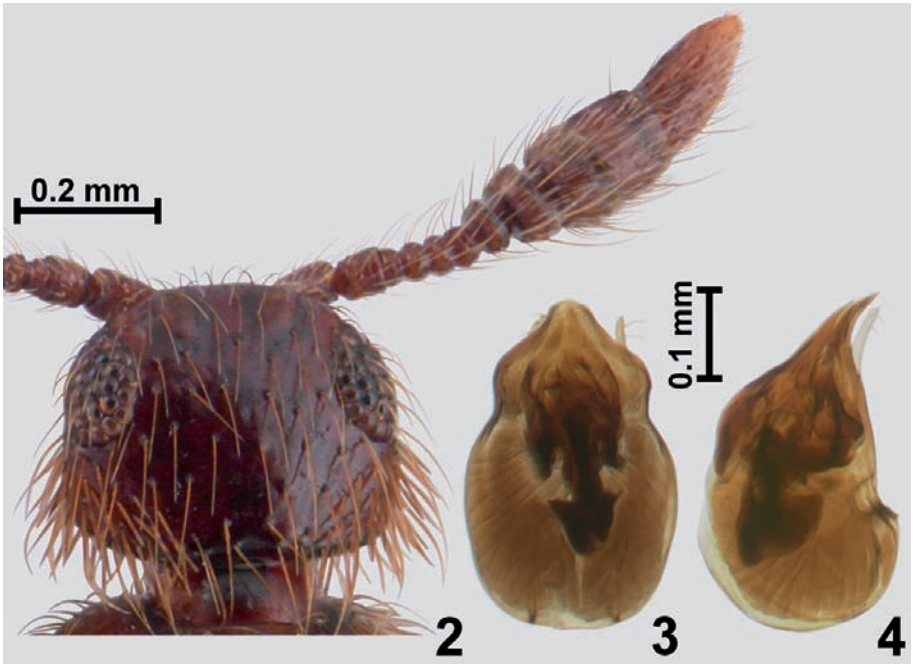
1. *Plaumanniola simplicissima* n. sp., dorsal habitus of holotype male

Description

Male (Figs. 1-6). Body (Fig. 1) moderately stout and convex, dark brown, covered with vestiture slightly lighter than cuticle. BL 1.80 mm.

Head (Fig. 2) in dorsal view subtrapezoidal but only slightly narrowing anteriorly, strongly flattened, broadest at posterior margin of vertex, HL 0.25 mm, HW 0.45 mm; vertex strongly transverse and only weakly, evenly convex with arcuate posterior margin; tempora about as long as eyes in dorsal view; frons posteriorly confluent with vertex, in middle between eyes slightly more convex than on side; supraantennal tubercles indistinctly demarcated from surrounding areas and low but distinct; compound eyes moderately large, with deeply emarginated posterior margin. Vertex and frons glossy, covered with sparse and small setiferous punctures with sharp and slightly raised margins, separated by spaces as long as 3-5 puncture diameters; punctures on tempora distinctly denser. Setae on head dorsum sparse and long, curved and suberect, directed posteriorly; tempora and posterior margin of vertex with dense bristles and setae. Antennae short, strongly thickening distally from antennomere VI, AnL 0.75, antennomeres as in Fig. 2. All antennomeres covered densely with long, suberect setae.

Pronotum distinctly more convex than head, approximately oval, broadest near middle; PL 0.48 mm, PW 0.70 mm. Anterior and lateral margins confluent, anterior pronotal corners not marked; anterior margin arcuate and slightly concave just behind head; lateral margins strongly rounded; posterior pronotal corners barely discernible,



2-4. *Plaumanniola simplicissima* n. sp., head in dorsal view (2); aedeagus in ventral (3) and lateral (4) views

strongly obtuse; base of pronotum in middle strongly and abruptly projecting posteriorly, forming short and broad subtrapezoidal lobe over base of elytra demarcated laterally by obtuse angles; posterior pronotal margin nearly straight. Punctures as small and distinct as those on vertex and frons but denser, separated by spaces 2-3 times as wide as puncture diameters; setae sparse in middle and distinctly denser on sides of pronotum, moderately long, suberect.

Elytra more convex than pronotum, oval, broadest slightly anterior to middle; EL 1.08 mm, EW 0.85 mm, EI 1.26. Punctures slightly larger and deeper than those on pronotum, separated by spaces 2-3 times as wide as puncture diameters; setae similar to those on head and pronotum but slightly longer and more erect.

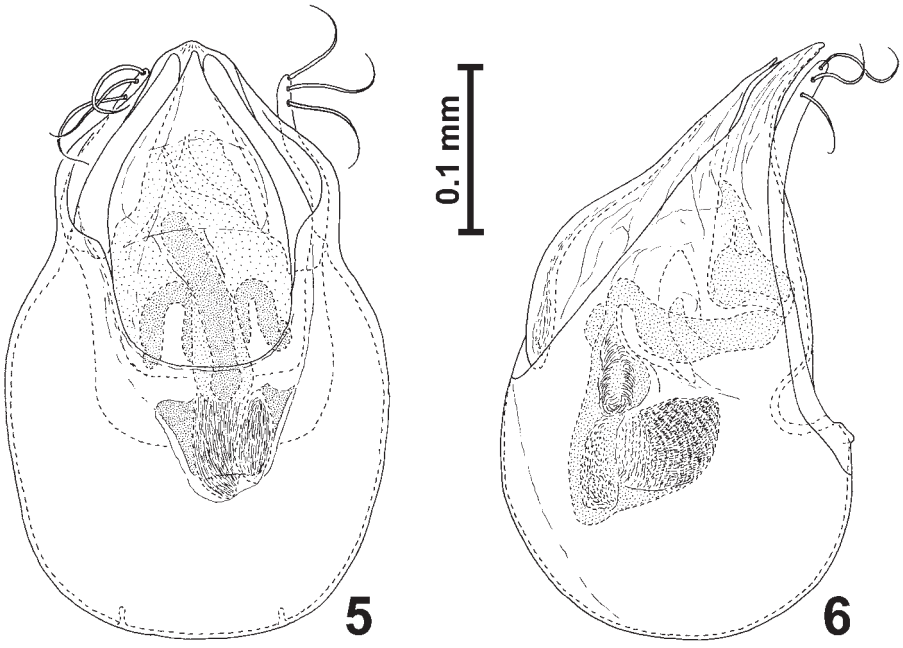
Legs short and robust; all tibiae broadest near distal third and slightly flattened only in proximal half or less; protibiae distinctly and mesotibiae slightly curved inwards in distal third; metatibiae nearly straight.

Aedeagus (Figs. 3-6) pear-shaped; AeL 0.35 mm; median lobe in ventral view with subtrapezoidal apical part; internal armature complex and partly asymmetrical, with darkly sclerotized and massive median structures; parameres slender, in lateral view curved, each with one apical and two subapical setae.

Female. Unknown.

Type material

Holotype (male), two labels: "**BOLIVIA:** Cochabamba Dept. / Est. Biol. Sacta, / Univ. Mayor S. Simeon, 300 m / S17º06.48' W64º46.94', 16-27.xii.2005 / rainforest

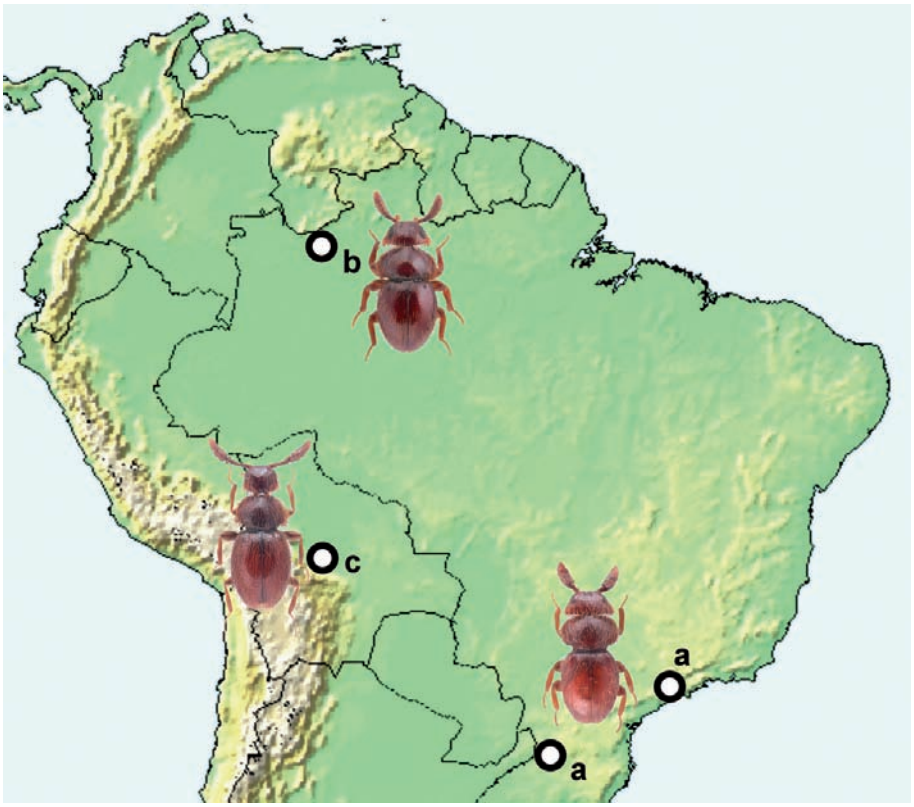


5-6. *Plaumanniola simplicissima* n. sp. Aedeagus in ventral (5) and lateral (6) views

FIT / leg. S. & J. Peck, 05-47" [white, printed], "*PLAUMANNIOLA* / *simplicissima* m. / det. P. JAŁOSZYŃSKI, '14 / HOLOTYPUS' [red, printed] (cSBP).

Distribution

Central Bolivia (Fig. 7).



7. Distribution of *Plaumanniola*. *Plaumanniola sanctaecatharinae* Costa Lima (a), *P. regina* Jałoszyński (b) and *P. simplicissima* n. sp. (c)

Remarks

This is the smallest and most slender species of *Plaumanniola*, readily identifiable on the basis of the general body shape, long antennae and weakly broadened head.

Acknowledgments

My thanks go to Vasily Grebennikov (Canadian Food Inspection Agency, Ottawa, Canada) for sending me interesting specimens from his and Steward Peck's collection.

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Genus	Vol. 25(3): 373-375	Wrocław, 30 IX 2014

Supplementary remarks on the taxonomic structure of the genus *Chrysodema* C.G. (Coleoptera: Buprestidae)

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Abstract. Having become aware of the overlooked designation of type-species for the genus *Chrysodema* C.G. made it necessary to introduce some corrections to my earlier publication (Hołyński 1993): new name for the subgenus originally considered nominotypical and modification of the key.

Key words: entomology, nomenclature, new name, classification, Buprestidae, *Chrysodema* C.G.

The almost cosmopolitan (only marginally in neotropics) subtribe **Chalcophorina Lac. (Buprestinae: Buprestini** – Hołyński 1993) contains 7 genera, 3 of them known to occur in the Indo-Pacific Region (traditional Oriental plus Wallacea, New Guinea, and tropical-subtropical Oceania eastwards to *ca.* 130^{0}W – Hołyński 2009). Two E-Asian species (Kurosawa 1974) of mainly Holarctic *Chalcophora* Dej., as well as six (Peng 1995 – some of them of doubtful validity) of sino-japanese *Nipponobuprestis* Obb. (perhaps but a subgenus of *Chalcophora* Dej.), do not extend beyond its northernmost areas, so only the speciose [estimations vary from 48 (Lander 2003) through *ca*. 80 (my unpublished preliminary revision) to 100 (Bellamy 2003) spp.] and widely (from India and Ceylon to Bonin, Mariana and Solomon Is.) distributed *Chrysodema* C.G. significantly represents the subtribe in the Region, making – besides the **Chrysochroina Cast.** (*Chrysochroa* Dej., *Cyphogastra* Deyr., *Iridotaenia* Deyr., &c.) or *Belionota* Esch. – one of the most impressive "trade-marks" of the Indo-Pacific buprestid fauna.

Traditionally (*e.g.* Kerremans 1909) the genus *Chrysodema* C.G. was divided into four subgenera: *Pseudochrysodema* Snd., *Gelaeus* Wath., *Chrysodema* C.G. s.str. and

Thymedes WATH.; some later authors (KUROSAWA 1979, VOLKOVITSH 2001) ascribed full generic rank to all of them, and such treatment has been followed in the influential catalogue of BELLAMY (2003), who (despite the Russian author's own warning against such interpretation ["*It is vital to note that I do not suggest a new classification of the Buprestidae, because in my opinion the creation of a natural classification based on a single character system is impossible*"]) uncritically accepted his phenetic arrangement of antennal structures as taxonomic classification. In my opinion the differences separating the above-mentioned taxa from one another (as well as from *Tamamushia M.C.*, originally described as a distinct genus), are no more (often less) pronounced than those between some groups within *Chrysodema* C.G. s.str., therefore I (HOŁYŃSKI 1994) not only retained the broad interpretation of the genus, but further extended it by inclusion of MIWA & CHÛJÔ's (1935) taxon and distinguished two more subgenera: *Leganya sg.n.* and *Mitshekia* sg.n. In so doing, I accepted *Buprestis radians* BDV. as the type of *Chrysodema* C.G., having overlooked the earlier designation of *Chrysodema sonnerati* C.G. by KUROSAWA (1982). Unfortunately, *C. sonnerati* C.G. is a rather "aberrant" species, making (together with *C. lewisi* SND.) a distinctive circle not showing the diagnostic characters of what I considered the nominotypical subgenus. Whether they should be classified as con-subspecific with *C. smaragdula* (OL.) (in which case *Mitshekia* HOŁ., typified by the latter, would become a younger synonym) or should be kept separated (as I tentatively do), remains unclear, but anyway *Chrysodema* C.G. s.str. *sensu* HOŁYŃSKI (1994) has been left without valid name and the main purpose of this paper is to provide one:

***Marcsikiella* nom. nov.**

Chrysodema C.G. s.str. *sensu* HOŁYŃSKI (1994) *nec* KUROSAWA (1982).

Type-species *Buprestis radians* BOISDUVAL 1835.

Marcsikiella n.n. is only a substitute name, so its type-species and diagnosis remain as for *Chrysodema* C.G. s.str. *sensu* HOŁYŃSKI (1994). More exact delimitation is, however, needed between the nominotypical subgenus (*sensu* KUROSAWA 1982) and *Mitshekia* HOŁ. – this is done below in the form of modified key:

KEY TO SUBGENERA OF THE GENUS *CHRYSODEMA* C.G.

1(6) Laterobasal foveae of pronotum large, round, laterally delimited by sharp and high supramarginal ridge. Antennal setae much shorter than width of antennomeres.
2(3) Elytra with prominent subhumeral denticle ..... *Pseudochrysodema* SND.
3(2) No distinct subhumeral denticle
4(5) 2.-5. elytral costae joined at *ca.* apical third ..... *Leganya* HOŁ.
5(4) 5. costa always separate throughout, 2. and 4. also separate or joined to 3. only behind apical fourth ..... *Marcsikiella* n. n.
6(1) Pronotal foveae, if distinct, more or less irregular, not reaching supramarginal ridge, or antennal setae subequal to or longer than width of joints

7(12) Lateral carinae of pronotum do not reach anterior angle
8(9) Subhumeral denticle of elytra prominent ..... *Gelaeus* WATH.
9(8) Elytra without distinct subhumeral denticle
10(11) Perimarginal dfp vitta deep, regular, at least in apical half of elytra. Elytral disk without discal dfp foveae. 2.-4. costae lacking or very inconspicuous .....*Chrysodema* G.G. s.str.
11(10) Elytra without appreciable perimarginal dfp vitta, and/or with distinct discal foveae, and/or costae prominent ..... *Mitshekia* HOŁ.
12(7) Lateral pronotal carinae entire
13(14) Elytra with depressed dfp pattern (lateral band or large patches) .... *Thymedes* WATH.
14(13) Elytra evenly sculptured ..... *Tamamushia* M.C.

Except speciose, widely distributed *Marcsikiella* n.n. and *Mitshekia* HOŁ. all the remaining subgenera are small (1 to 9 spp.) groups of restricted distribution: *Pseudochrysodema* SND. inhabits various Micronesian islands, *Leganya* HOŁ. New Guinea, *Gelaeus* WATH. Lesser Sundas, *Thymedes* WATH. Philippines and *Tamamushia* M.C. Bonin Is., only *Chrysodema* G.G. s.str. occupies two widely disjunct (relictual?) areas: Ceylon (*C. sonnerati* C.G.) and Japan (*C. lewisi* SND.).

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Genus	Vol. 25(3): 377-386	Wrocław, 30 IX 2014

Three new species-group taxa of the subgenus *Cyalithus* Ths. of the genus *Philocteanus* Deyr. (Coleoptera: Buprestidae)

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Abstract. Two new species and one new subspecies of the subgenus *Cyalithus* Ths. are described.

Key words: entomology, taxonomy, new taxa, Indo-Pacific Region, *Philocteanus* Deyr.

The name *Aprosopus* Deyr. was given (Deyrolle 1864) to a new genus erected to include the simultaneously described new Bornean species. The name has been later (Thomson 1864) changed (due to homonymy), but the "genus" (currently known as *Cyalithus* Ths., and only recently – Hołyński 2009 – recognized as a subgenus of *Philocteanus* Deyr.) was considered monotypic for several decades, until Bourgoin (1925) provided a "*diagnose péliminaire*" for the second species (*Aprosopus fouqueti* Brg.) [somewhat earlier – Bourgoin 1922 – described *Aprosopus vitalisi* Brg. does not belong here and has been later (Hołyński 1981) made (under synonymous name *Szentendreya gezai* Hoł.) the type-species of *Szentendreya* Hoł.] and then Descarpentries (1948) supplemented the list with *Cyalithus cohici* Desc. Thus, together with the originally included *Aprosopus rugifrons* Deyr., the subgenus has been hitherto known to contain three monotypic species, and its area of distribution to extend from Borneo to Cochinchine and Laos.

Some time ago C.L. Bellamy sent me for study various SE-Asian buprestids including – among other very interesting material, partly elaborated in my earlier publication (Hołyński 2011) – 12 specimens of *Cyalithus* Ths. Closer examination revealed that they represent four taxa, three of them new; these, supplemented with some additional material from other collections, are described below.

CONVENTIONS AND ABBREVIATIONS

Labels of type-specimens are quoted as exactly as possible, including *italics* and *handwriting* (both represented in my text by *italics*), CAPITAL LETTERS, SmallCaps and framing.

Collection names are abbreviated as follows:

CLBC = Charles L. Bellamy, Sacramento, USA;
CSCA = California State Collection of Arthropods, Sacramento, USA;
KBIN = Koninklijk Belgisch Instituut voor Natuurwetenschappen, Bruxelles, Belgium;
RBH = Roman B. Hołyński, Milanówek, POLAND;
USNM = Smithsonian Institution: National Museum of Natural History, Washington, USA.

Besides, the following abbreviations are used in morphological descriptions:

dfp = "dense-and-fine punctulation" or "densely-and-finely punctulate"; refers to the type of sculpture occurring mainly in depressed areas (foveae, sulci), and consisting of fine, dense, regular punctulation on usually distinctly microsculptured background, covered with dense pubescence and frequently pulverulent;
L = length;
W = width;
BW = basal width;
AW = apical width;
LW = width below;
UW = width above;
H = width of head with eyes;
V = width of vertex between eyes;
≈ = approximately equal to.

DESCRIPTIONS

Philocteanus (*Cyalithus*) *philippinensis* Hołyński sp. n. (Fig. 3)

Material examined

Holotype: "Samar, Baker, Island" [*sic!*] "CYALITHUS RUGIFRONS (H. Deyrolle) det. FISHER, cf. KINGSOLVER 1983" "Ex. Coll. C.L.Bellamy (CLBC)" [purplish label] [♂ CSCA].

Paratypes: "Island Samar, Baker" [1♀ RBH: BPkib]; "Island Sibuyan, Baker" [1♀ USNM]; "Dapitan, Mindanao, Baker" [1♀ USNM].

Additional material: none.

Description

Holotype: Male 11.5×4 mm. Dorsal side dark bronzed-brown with some purplish shine (especially on front), only mandibles at base, epistome, sides of front before eyes, sides and (less bright) median line of pronotum and outermost intercosta of elytra

(separated from disk with a cupreous stripe) green; ventral side entirely green, only anteriormost part of metasternum (between mesocoxae) and apical part of intercoxal process of 1. sternite non-metallic testaceous; legs green; antennae piceous-brown with greenish shine on basal joints; labrum piceous-brown. Pronotum glabrous, head, elytra and ventral side with very short, dense, erect (head and prosternal process) or semirecumbent (otherwise), rather inconspicuous (especially on prosternum) whitish pubescence; femoral brushes not prominent.

Epistome very broadly arcuately emarginate, microsculptured, impunctate at middle and rather coarsely punctured on sides, separated from front by transverse (deep on sides, totally vanishing at middle) sulcus. Front trapezoidal, nearly as long as wide (LW:UW:L.≈1.1:1.0:1); shallowly depressed at middle, longitudinally convex on outer fourths (biconvex in dorsal aspect), median striola very fine; supraantennal carinae practically lacking; frontal punctation moderately coarse but very dense (subconfluent); vertex moderately wide (V:H≈0.6). Antennae long, reaching pronotal base; 1. joint somewhat fusiform, *ca.* 4× longer than thick; 2. globular, slightly narrower and nearly equidimensional; 3. triangular, slightly wider than 1. and *ca.* 3× longer than 2., not quite twice longer than wide; 4. -10. of similar width but progressively shorter (10. *ca.* as wide as long); 11. of similar dimensions to 10. but obovate with somewhat pointed inner distal angle.

Pronotum transverse, trapezoidal (BW:AW:L≈1.6:1.3:1); basal margin broadly arcuate on median 2/3, meeting lateral, obliquely backwards directed portions at obtuse but distinct angle; basal angles definitely acute; sides biarcuately convergent from base to very well developed apical "collar"; anterior margin nearly straight. Disk almost evenly convex except for deep (but interrupted at middle) preapical ("collar"-) sulcus, deep and broad transverse depression centered at basal third on each side, pair of deep punctiform pits delimiting central fourth of base, and another very small and inconspicuous pair accentuating angular bend between median arcuate and lateral oblique part of basal margin. Punctation fine, very dense at sides, rather sparse on disk, leaving impunctate stripe along midline; spaces between punctures conspicuously densely micropunctulate. Lateral carina straightly inclined in basal half, then bent arcuately downwards, sharp in basal 3/4. Scutellum minute but touching pronotal base.

Elytra *ca*. 2.1× longer that wide. Sides rounded at humeri, without subhumeral angularities, then subparallel to basal fifth, shallowly sinuate to midlength and arcuately converging to narrowly separately rounded apices; lateroapical margin distinctly, sharply denticulate (sutural denticle rather prominent but not larger than others). 1. (sutural) and 2. costa distinct in apical half, 3. and 4. almost imperceptible, 5. well developed from basal fifth to near apex; punctation rather fine, in irregular rows, with interspersed finer punctures; microsculpture very fine, inconspicuous.

Anterior margin of prosternum straight; proepisterna almost smooth except for fine microsculpture; prosternal process broad, slightly convex, coarsely and sparsely punctured without lateral distinctively sculptured stripes or sulci. Metasternal punctation moderately coarse at middle, finer on sides, median stria almost imperceptible; metacoxae without denticle, transversely (deeply in median, shallowly in lateral part) depressed across midlength. Punctation of first sternite moderately coarse, sparse

at middle, otherwise abdomen finely (only apical part of anal segment coarser) and rather densely punctulated, extensive spaces on sides dfp; 3.-5. sternites with deep lateral depressions; apical margin of anal segment broadly rounded with very small but conspicuous indentation at middle.

Variability: Paratypes (female) somewhat larger (13-14.5×4.5-5 mm.); antennae shorter (reaching only to *ca.* basal third of pronotal sides); green colouration of head, pronotum and elytra almost totally reduced (in specimen from Sibuyan also ventral side almost totally dark-bronzed), with sides of elytra broadly cupreous; parts of metasternum and 1. sternite, testaceous in male holotype, in female paratypes are less extensive and dark-bronzed; apex of anal sternite narrowly to subacuminately rounded without incision

Geographical distribution

Philippines: Sibuyan, Samar, Mindanao.

Remarks

Deceptively similar to *P.* (*C.*) *rugifrons* (Deyr.) which differs mainly in colouration (epistome and anterior part of front bright cupreous-red, elytra reddish-bronzed – only in one specimen of the nominotypical race approaching dark brown colouration of Philippinean species, but even there the purplish-cupreous tinge is appreciable) and some details of structure (front less deeply depressed, pronotum somewhat more transverse, 5. elytral costa poorly developed).

Philocteanus (*Cyalithus*) *rugifrons* ssp. *continentalis* Hołyński ssp. n. (Fig. 5)

Material examined

Holotype: "LAOS Vientiane, Lao Pako, 28-30.v.2002, D. Farbiak" "Cyalithus fouqueti (Bourgoin, 1925), det. C.L. Bellamy 2003" "Ex. Coll. C.L.Bellamy (CLBC)" [purplish label] [♀ (CSCA)].

Paratypes: "Aprosopus H. Deyr. rugifrons HD., *Malacca*" "*Cyalithus rugifrons H.D., comparé à un exemp. typique*, Théry det." [1 ♀ (KBIN)]**;** "Coll. R. I. Sc. N. B., Laos:, 700-800 m., Phen Khao Khonai, rec.: A. Baudon, 1965" [1 ♀ (KBIN)]; "Laos: Phou Khao Khouai, ca. 750 m." [1 ♀ (RBH: BPdqc)]; "MALAYSIA, Tapah Hills, IV. 1990" "Ex. Coll. C.L.Bellamy (CLBC)" [purplish label] [RBH: BPkfh]; "Coll. Dr A.Frh. v.Hoscheck, Malakka ┤ Sammlung Cl. Müller ├" "638" [1 ♀: (RBH: BPkig)].

Additional material: 1 ♀.

Description

Holotype: Female 14.5×5 mm. Epistome dark golden; front dark (almost black, only side margins brighter) bluish-green; pronotum cupreous (darker at base) with blackish-green "collar", narrow lateral margins and bottoms of some punctures; elytra rather dark bronzed with green epipleura and very narrow (somewhat wider apically) lateral margin and inconspicuous cupreous lateroapical stripe; ventral side aeneous-

green; antennae (with bronzed-brown lobes) and legs green; labrum testaceous-brown. Pronotum glabrous; elytra with very short, recumbent, hardly discernible white pubescence; that on ventral side somewhat more apparent; on head very short but conspicuous, dense, erect; no femoral brushes but hind edge of metatibiae with dense row of short erect yellowish setae.

Epistome broadly arcuately emarginate, microsculptured, impunctate at middle and coarsely punctured on sides, separated from front by rather inconspicuous (deeper on sides, totally vanishing at middle) transverse sulcus. Front trapezoidal, nearly as long as wide (LW:UW:L.1.2:1.0:1); shallowly transversely depressed in lower half, biconvex in dorsal aspect, median sulcus coarse, smooth at bottom; supraantennal carinae practically lacking; frontal punctation moderately coarse but very dense (subconfluent); vertex rather wide (V:H≈0.5). Antennae moderately long, not reaching pronotal base; 1. joint somewhat fusiform, *ca.* 4× longer than thick; 2. globular, slightly narrower and nearly equidimensional; 3. triangular, slightly wider than 1. and *ca.* 3× longer than 2., not quite twice longer than wide; 4. -10. somewhat wider and progressively shorter (10. *ca.* as wide as long); 11. of similar dimensions to 10. but obovate.

Pronotum transverse, trapezoidal (BW:AW:L≈1.6:1.3:1); basal margin broadly arcuate on median 2/3, meeting lateral, obliquely backwards directed portions at obtuse but distinct angle; basal angles definitely acute; sides almost straightly convergent from base to apical fourth, then narrowly rounded to very well developed apical "collar"; anterior margin nearly straight. Disk almost evenly convex except for deep (but interrupted at middle) preapical ("collar"-) sulcus, broad but shallow and inconspicuous depression on each side, prescutellar pit, and pair of very small and inconspicuous pits at angular bend between median arcuate and lateral oblique part of basal margin. Punctation rather fine, very dense at sides, much sparser on disk, leaving almost impunctate stripe along midline; spaces between punctures conspicuously densely microsculptured. Lateral carina straightly inclined in basal half, then bent arcuately downwards, sharp in basal 3/4. Scutellum minute but touching pronotal base.

Elytra ≈2.1× longer that wide. Sides rounded at humeri, without subhumeral angularities, then subparallel to basal fifth, shallowly sinuate to midlength and arcuately converging to almost jointly rounded apices; lateroapical margin distinctly, sharply denticulate (sutural denticle rather prominent but not larger than others). Costae distinct, 1.-4. very slightly, 5. markedly elevated; punctation rather coarse in basal and lateral parts, much finer to very fine medioapically, inner rows regular, outer confused with interspersed not much finer punctures; microsculpture very fine, inconspicuous.

Anterior margin of prosternum straight; proepisterna almost smooth except for fine microsculpture; prosternal process broad, slightly convex, finely and sparsely punctured without lateral distinctively sculptured stripes or sulci. Metasternal punctation very fine and sparse at middle, somewhat coarser and denser on sides, median stria fine; metacoxae without denticle, transversely depressed across midlength. Punctation of abdomen fine and sparse at middle, denser laterally; lateral depressions rather shallow, no distinct dfp spaces; lateroapical margin of anal sternite distinctly explanate, apex acuminate.

Variability: Paratypes (all females) vary mainly in size (12.5-16×4-5.5 mm.) and elytral colouration (from bright cupreous to dark plumbeous-brown, with or without cupreous latero- and suturo-apical stripe); apex of anal sternite in some subacuminately rounded.

Geographical distribution

Known from mid-western Laos and Peninsular Malaya, so probably occurs throughout Malay and southern part of Indochinese Peninsulae. A specimen (not included among paratypes) labelled "Borneo" but showing characteristics of this rather than the Bornean (nominotypical) race and almost identical to one from Laos, has been probably mislabelled.

Remarks

Somewhat larger on the average than *P.* (*C.*) *rugifrons* (Deyr.) s.str., which differs also in darker (cupreous-red) epistome, predominantly blackish-green pronotum, conspicuous purplish tinge of elytra, deeper and larger pronotal depressions, finer pronotal sculpture, and some minor details. To this taxon may belong some or all Laotian specimens recorded by Baudon (1966) as *Cyalithus cohici* Desc., although much larger size (21.5×7.7 mm.), details of colouration (vertex "*rouge feu*", "*dessous ... a reflets cuivreux*"), pronotum with regularly rounded lateral margins and maximum width at basal third, of the Cochinchinean type of the latter (according to the original description – Descarpentries 1948), makes its taxonomic identity with *P.* (*C.*) *r. continentalis* ssp. n. very unlikely. Yet another indochinese [*terra typica* Cochinchine, Baudon (1966) reports it also from Laos] species is the (also unknown to me in nature and very poorly described – Bourgoin 1925) small (12.5×4.2 mm.) *P.* (*C.*) *fouqueti* (Brg.) whose "*elytris nigro-violaceis, lateribus stricte viridi-metallicis*" also seem to preclude the synonymy with the hereby described race, but the fact that all three specimens recorded are males makes the taxon somewhat suspect (generally in this subgenus males are much rarer than females).

Philocteanus (Cyalithus) escutellatus Hołyński sp. n. (Fig. 2)

Material examined

Holotype: "MALAYSIA: Sabah, Crocker Range, Mt. Trus Madi, 1000m., N05^{0}33'00" E116^{0}31'00", vi. 2007, S. Chew, coll. " "Ex. Coll. C.L.Bellamy (CLBC)" [purplish label] [♂ (CSCA)].

Paratypes: "MALAYSIA: Sabah, Crocker Range, Mt. Trus Madi, 1000m., N05^{0}33'00" E116^{0}31'00", 20.iv. 2007, S. Chew, coll. " "Ex. Coll. C.L.Bellamy (CLBC)" [purplish label] [1 ♀ (CLB)]**;** "MALAYSIA: Sabah, Crocker Range, Mt. Trus Madi, 1000m" "N05^{0}33'00" E116^{0}31'00", 20. iii-28. iv. 2006, S. Chew, coll." "Ex. Coll. C.L.Bellamy (CLBC)" [purplish label] [1 ♀: (RBH: BPkfg)].

Additional material: none.

Description

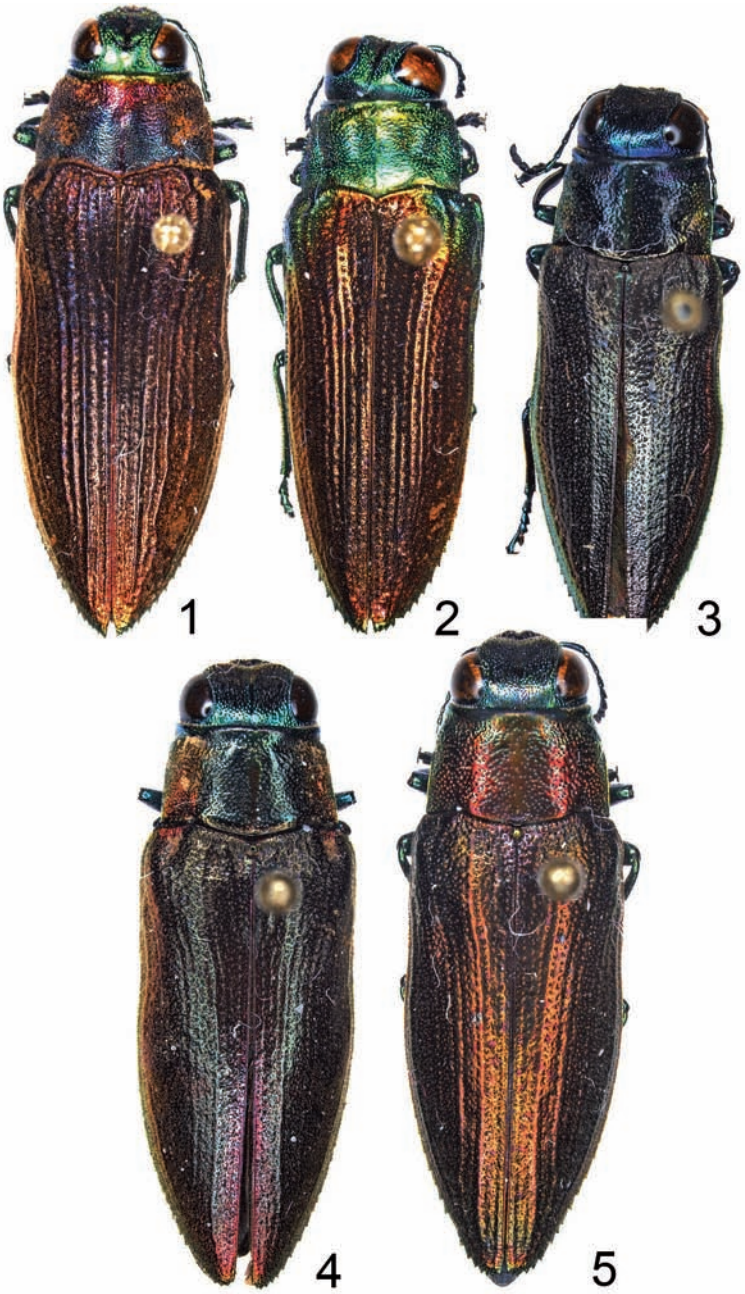
Holotype: Male 15.5×5 mm. Head (except blackish bottom of median groove), pronotum, humeral region and very narrow (almost vanishing behind midlength but again more conspicuous at apex) lateral margin of elytra, epipleura, ventral side, legs and antennae (except blackish lobes of triangular joints) bright green with some bluish tinge; elytra otherwise bright cupreous-red; labrum brown. Dorsal (including front) pubescence extremely short and hardly discernible, ventral not much more distinct except for sparse, long but very thin, erect additional setae on abdomen; no femoral brushes.

Epistome deeply emarginate with acutely protruding lateral angles, microsculptured, impunctate, separated from front by rather inconspicuous and irregular (because of coarse punctation) transverse sulcus. Front trapezoidal, definitely longer than wide (LW: UW:L.0.8:0.6:1); frontal depression rather deep, angular as seen from above, sharply delimited by paraboloidal furrow, very coarsely and densely irregularly punctured; median groove very coarse and deep; vertex narrow (V:H≈0.3), finely and not very densely punctulate. Antennae moderately long, reaching somewhat behind midlength of pronotal sides; 1. joint fusiform, *ca.* 3× longer than thick; 2. subconical, slightly narrower than 1. and somewhat longer than wide; 3. triangular, as long and wide as 1.; not quite twice longer than wide; 4. -10. of the same width but progressively shorter (10. *ca.* as wide as long); 11. ovate, somewhat smaller than 10.

Pronotum transverse, trapezoidal (BW:AW:L≈1.7:1.4:1); basal margin rather deeply bisinuate; basal angles slightly acute; sides almost straight and subparallel (very slightly rounded and very slightly convergent) in basal 3/5 (up to this point lateral carinae clearly visible from above, here abruptly turning roundedly inwards), immediately again turning subparallel and roundedly convergent to very sharply marked "collar"; anterior margin nearly straight. Disk almost evenly convex except for deep (discernible even at middle) preapical ("collar"-) sulcus, conspicuous depression on each side, and pair of very small and inconspicuous prescutellar pits. Punctation rather coarse, very dense, irregularly confluent at sides, much finer and sparser on disk, impunctate stripe along midline very narrow and inconspicuous, slightly elevated; microsculpture very fine. Lateral carina slightly (more strongly at anterior end) bent arcuately downwards, sharp to apical sixth. Scutellum invisible.

Elytra 2.2× longer that wide. Sides rounded at humeri, without subhumeral angularities, then subparallel to basal fifth, shallowly sinuately convergent to midlength and arcuately so to jointly rounded apices; lateroapical margin distinctly, sharply denticulate. Costae 1. -4. inconspicuous, slightly elevated, 5. rather prominent; each elytron with 10 (scutellar not counted, 9. and 10. anteriorly confluent) not very coarsely punctured striae (inner 5 regular and continuously depressed, outer shallower and partly confused); interstriae impunctate; suture carinately elevated from basal fourth to apex; micropunctulation hardly appreciable at middle, very conspicuous on sides.

Anterior margin of prosternum straight; proepisterna almost smooth except for fine microsculpture; prosternal process broad, slightly convex, finely and sparsely punctured without lateral distinctively sculptured stripes or sulci. Metasternal punctation fine and very sparse at middle, still finer but denser on sides, median stria fine; metacoxae



1. *Philocteanus* (*Cyalithus*) *escutellatus* sp.n. PT ♀ – Borneo: Sabah ; 2. *P.* (*C.*) *escutellatus* sp.n. HT ♂ – Borneo: Sabah; 3. *P.* (*Cyalithus*) *philippinensis* sp.n. HT ♂ – Philippines: Samar; 4. *P.* (*Cyalithus*) *rugifrons* (Deyr.) s.str. ♀ – Borneo: Sabah; 5. *P.* (*Cyalithus*) *rugifrons continentalis* ssp.n. HT ♀ – Laos: Prov. Vientiane

without denticle, deeply transversely depressed across midlength. Intercoxal process of 1. sternite smooth, otherwise punctation of abdomen moderately fine and not very dense at middle, almost totally vanishing laterally; lateral depressions deep; anal sternite with conspicuous subtriangular depression before apex, apical margin deeply arcuately emarginated; small anal plate medially depressed.

Variability: Paratypes (females) differ in size (16-18.5×5.5-6.5 mm.), proportions (L:W≈2.9 *vs. ca.* 3.1 in male holotype), colouration (front with indefinite blackish spot at middle; no green on pronotum – except sides of "collar" – and elytra; pronotum concolorous with elytra or darker, purplish-black in basal half); less sharply – but still clearly – delimited frontal depression; width of vertex (V:H≈0.4); smooth median line on pronotum lacking or almost so; apically wider (as wide at midlength as in basal fifth) elytra; distinct dense, recumbent, short golden pubescence of ventral side but less conspicuous, shorter and sparser erect setae on abdomen; rounded apex of anal sternite.

Geographical distribution

Known only from type-series collected in Sabah (NE-Borneo).

Remarks

Lack of visible scutellum, depressed elytral striae, and narrow vertex make *P.* (*C.*) *escutellatus* sp.n. unmistakable among representatives of the subgenus [except, perhaps, *P.* (*C.*) *fouqueti* (Brg.), known to me only from the original "*diagnose péliminaire*" and to my knowledge never redescribed]; also very distinctive is the contrasting colouration of [unfortunately, unknown for *P.* (*C.*) *r. continentalis* ssp. n. and *P.* (*C.*) *cohici* (Desc.)] male and entirely or at least predominantly green head with well delimited frontal depression; deeply emarginated epistome with acutely protruding lateral angles.

With the addition of the new taxa described herein, the subgenus *Cyalithus* Ths. is currently considered to comprise 5 species (+ 1 non-nominotypical subspecies) known from scattered (reflecting rather the distribution of collectors than that of the beetles) localities in Laos (prov. Sayaboury, Vientiane, Borikhane), Cochinchine, Malay Peninsula, Borneo (Sabah, Upper Mahakam Vy.) and Philippines (Sibuyan, Samar, Mindanao). Two of these taxa – *P.* (*C.*) *fouqueti* (Brg.) and *P.* (*C.*) *cohici* (Desc.) – remain unknown to me and clarification of their true identity needs examination of the types; I hope to get access to them before having finished the review of the entire genus *Philocteanus* Deyr. (now in the moderately advanced stage of preparation)

KEY TO SPECIES AND SUBSPECIES OF THE SUBGENUS *CYALITHUS*

1(8) Length of body below 19 mm.
2(3) Dorsal side violaceous-black with green border ..... ***fouqueti* (Bourg.)**
3(2) Dorsal side (or at least elytra) predominantly cupreous-bronzed, rarely blackish-brown but without violaceous tinge
4(7) Scutellum visible; vertex wide: V:H≈0.5; elytral striae superficial

5(6) Dorsal side blackish-brown with cupreous lateral bands, front violaceous-black with (esp. in males) narrowly green anterior margin and midline .... ***philippinensis* sp.n.**

6(5) Dorsal side predominantly cupreous-bronzed; front above epistome cupreous ..... ***rugifrons* (Ths.)**

a(b) Pronotum blackish, with more or less developed traces of smooth median carinula ..... ***rugifrons* (Ths.) s.str.**

b(a) Pronotum cupreous-bronzed, no traces of median carinula .... ***rugifrons continentalis* ssp.n.**

7(4) Scutellum invisible; V:H≈0.3; elytral striae deeply depressed .. ***escutellatus* sp.n.**

8(1) Length of body above 20 mm ..... ***cohici* (Desc.)**

Acknowledgements

I am greatly indebted to the authorities of the Koninklijk Belgisch Instituut voor Natuurwetenschappen (Brussels) and National Museum of Natural History, Smithsonian Institution (Washington), and especially to the late Charles L. Bellamy, for loan of material; and to Piotr Ślipiński for the photographs.

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Genus	Vol. 25(3): 387-391	Wrocław, 30 IX 2014

A new species of the genus *Iridotaenia* Deyr. (Coleoptera: Buprestidae)

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Abstract: A new New Guinean species of the genus *Iridotaenia* Deyr. is described, apparently belonging to the *Gressitti*-circle of the subgenus *Euiridotaenia* Hol.

Key words: entomology, taxonomy, new species, New Guinea, *Iridotaenia Deyr.*

The subtribe **Chrysochroina Cast.** contains several speciose genera of large and often colourful beetles, the most attractive elements of the Indo-Pacific buprestid fauna, but nevertheless since Kerremans' (1908, 1909, 1910) monograph only one – *Chrysochroa* Dej. (Hołyński 2009) – of them has been revised at the species level and can be considered relatively well known. The taxonomic (to say nothing of phylogenetic) relationships within *Philocteanus* Deyr., *Paracupta* Deyr., *Metataenia* Thy. or *Cyphogastra* Deyr, remain nebulous and correct identification of even common species is impossible without study of type material. The genus *Iridotaenia* Deyr. – 6 subgenera with *ca.* 70 known species (including 2 subgenera with 4 species extralimital: E-African) – is one of such poorly understudied taxa in urgent need of modern revision: in the last hundred years only two catalogues (Obenberger 1926 and Bellamy 2008), a subgeneric review (Hołyński 2001) and some descriptions (Hołyński 2001, Sainval 1998, 2002; Leonard 2013 – the latter concerning Ethiopian fauna) have been published.

Some years ago (Hołyński 2001) I described a distinctive New Guinean (Central Prov.: Waigani swamp) member of the most speciose subgenus *Euiridotaenia* Hol. as *I. quadrivitta* Hol., hitherto the only representative of the *Gressitti*-circle adorned with contrastingly coloured elytral dfp vittae. In 2012 my Swedish colleague, Ulf Nylander, sent me for study pictures and then the actual specimen of evidently closely related taxon which will be described below.

Collections are abbreviated as:
FRS = Forest Research Station, Bulolo, NEW GUINEA
UN = Ulf Nylander, Valbo, SWEDEN

In addition, the following abbreviations are used in morphological descriptions:
dfp = "dense-and-fine punctulation" or "densely-and-finely punctulate"; refers to the type of sculpture occurring mainly in depressed areas (foveae, sulci), and consisting of fine, dense, regular punctulation on usually distinctly microsculptured background, covered with dense pubescence and frequently pulverulent;
L = length;
W = width;
BW = basal width;
AW = apical width;
H = width of head with eyes;
V = width of vertex between eyes.

Iridotaenia (*Euiridotaenia*) *congruens* Hołyński sp. n.

Material examined

Holotype: "Pt. Moresby, C.P., 7/79" "1211, U.Nylander" [green label] [♀ (UN)].

Additional material: 1 ♂.

Description

Holotype: Female 23.5×7. Piceous-black above and below, only anterior portion of epipleura and depressed dfp parts of elytral vittae dull cupreous-bronzed (anterior, sculpturally unmodified parts with only faint cupreous tinge) and lateral dfp patches on sternites shining red viewed from some angles. Body almost totally glabrous, only lateral parts of abdomen covered with short recumbent pubescence.

Epistome broadly, rather deeply, arcuately emarginated between slightly acute lateral angles, microsculptured, separated from front by rather deep arcuate depression; supraantennal carinulae sharp but very irregular, long, directed steeply upwards; periocular ridges practically absent; frontal depression broadly paraboloidal, delimited above by well defined but not ridged fronto-vertical border; surface coarsely, rather densely, irregularly punctured; median groove thin but deep, entire but not prolonged to vertex; punctation of vertex fine and sparse; eyes prominent, distinctly protruding beyond outline of head; V:H≈0.45. Antennae short, reaching somewhat beyond pronotal base; 1. antennomere fusiform, *ca.* 2.5× longer than thick; 2. globular, definitely thinner; 3. again club-shaped but somewhat flattened, somewhat thinner and twice shorter than 1. or 2.; 4. triangular, as long as 3. but wider, slightly longer than wide; 5. slightly shorter, as long as wide; 6.a little bit shorter; 7.-11 missing.

Pronotum trapezoidal (BW:AW:L≈1.4:1.1:1), basal margin shallowly irregularly bisinuate, posterior angles slightly acute, sides almost perfectly straight from basal to

apical sixth (slightly rounded at base, forming inconspicuous "collar" at apex), apical margin shallowly but distinctly bisinuate. Median sulcus prominent, deep, with sharply angular bottom, rather narrow anteriorly but widened and deepened before scutellum; lateral depressions also in form of deep and narrow non-dfp sulci in basal third, then becoming broad and shallow and not reaching beyond midlength. Punctation of disk fine and sparse, on sides also fine but denser, on laterobasal protuberances (between lateral sulci and side margin) somewhat coarser but again sparse; lateral carinae short, reaching to *ca.* 1/3 of pronotal length, then running in form of smooth elevations margined from below by fine stria reaching to apical third. Scutellum small, trapezoidal, as wide as long, medially sulcate.

Elytra (L:W≈2.4) obliquely truncated at humeri, with inconspicuously indicated subhumeral protuberances, sides subparallel (very slightly divergent) to midlength, then roundedly tapering to apical sixth and slightly sinuately so [elytra slightly caudate] to narrowly separately rounded apices; lateral margins sharply denticulate in apical fourth, denticles at very apex dense but fine. Punctation coarse, in irregular rows; elytral vitta rather deeply depressed and dfp in apical 2/5 , totally disappearing (marked only by inconspicuously golden colouration) anteriorly; additional (very shallow and not distinctly dfp) vitta runs close to lateral margin; epipleura narrow but distinct all along.

1, 2. *Iridotaenia* (*Euiridotaenia*) *congruens* sp.n. HT ♀ – N. Guinea: Pt. Moresby: 1 – dorsal, 2 – ventral

Anterior margin of prosternum shallowly but distinctly sinuate between broadly rounded lateral lobes; proepisterna smooth; prosternal process wide, flat, very sparsely and not coarsely punctured, backward divergent sides neither striate nor rimmed. Metasternum deeply grooved medially, finely and very sparsely punctulate on median part, densely on sides and metepisterna; no metacoxal denticle. All sternites regularly convex; punctation moderately coarse and sparse at middle, finer at sides, dfp in extensive latral (not depressed) patches; anal sternite almost twice longer than penultimate, sides markedly sinuate all along, apex narrowly subtruncate.

Variability: Male unknown, unless one [collected in Centr. Pr.: Kokoda Trail: Wisilogo Vill. [?=Vesilogo: 9°22'S-147°25'E, *ca.* 30 km. ENE Pt. Moresby], 700 m., 24 II 1973] cursorily examined by me in 1988 in Bulolo (FRS) belonged here. According to my notes, it was "*19×6 mm., brownish-black above with violaceous shine on pronotum, ventral side similar; elytral vittae apically cupreous, depressed and dfp, in basal half blackish-green, non-depressed and normally sculptured; from midlength to ca. apical fourth runs additional, less conspicuous (but also depressed and of modified sculpture) vitta between the "main" one and elytral sides; pronotal* [lateral] *depressions sharply cut, elongately ovate, tiny, placed in shallow and poorly delimited depressions reaching to near apical margin; pronotal sides almost straightly convergent; elytra not caudate, sides rounded to very apex*".

Geographical distribution

SE New Guinea. Known for sure only from the holotype collected in Port Moresby; the specific identity of the male from Wisilogo (see above) remains uncertain.

Remarks

Apparently closely related to *I. quadrivitta* Hoł. which, however, clearly differs in somewhat wider and flatter body, definitely metallic blue elytral colouration, much more contrasting and almost entirely depressed main elytral vitta, inconspicuous and concolorous abdominal dfp patches, longer antennae (all joints up to 8. longer than wide), more "wavily" convergent pronotal sides, wide and flat intervals between puncture rows of elytra. Together with *I. quadrivitta* Hoł. (also SE New Guinea) and *I. gressitti* Hoł. (Solomon Is.) the new species comprises a small group of species characterized mainly by deep median sulcus and deep but narrow lateral depressions (all without extensive dfp spaces) on pronotum and strongly convex profile of abdomen.

Acknowledgements

I am greatly indebted to my friend, Ulf Nylander, for making the type-specimen and excellent photographs available for description, as well as for many years of collaboration. In Bulolo I enjoyed the hospitality and help of the head of the Forest Research Station, Hywell Roberts.

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Genus	Vol. 25(3): 393-402	Wrocław, 30 IX 2014

New subgenus and three new species of the genus *Metataenia* Théry (Coleoptera: Buprestidae)

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Abstract. Three new species of *Metataenia* Théry are described: erection of a new subgenus, *Metachuckia* sg. n., was needed to accommodate *M. extranea* sp. n. from Luzon, while *M. pilosa* sp. n. and *M. quoqueversa* sp. n. (both from New Guinea) represent *Metataenia* Théry s. str.

Key words: entomology, taxonomy, new taxa, Indo-Pacific Region, Coleoptera, Buprestidae, *Metataenia.*

The genus *Metataenia* Théry was erected by Théry (1923) for simultaneously described *M. meeki* Théry (later – Hołyński 1997 – recognized as junior synonym of *Paracupta meecki* Kerr. and designated as the type-species), *M. quadrimaculata* Théry, *M. insulicola* Théry, and *M. purpurascens* Théry. In the following years various authors named several additional taxa, and recently (Hołyński 2009) the concept of the genus has been markedly expanded with inclusion of *Mroczkowskia* Hoł., *Papuodema* Obb. and some other groups previously considered to belong to *Paracupta* Deyr., *&c.* to become, with *ca*. 60 known species in 13 subgenera, one of the most speciose groups of the Indo-Pacific **Chrysochroina Cast.** Many years ago I received a specimen, bearing Bílý's identification label "*Chrysodema instabilis Deyr. var.*" but evidently not belonging to that taxon (or even to the subtribe **Chalcophorina Lac.** at all), being easily recognizable as a member of the "paracuptoid lineage" (Hołyński 2009) of the **Chrysochroina Cast.** Closer examination revealed that it must be classified as a new species of *Metataenia* Théry *s.l.*, but the "incongruent" combination of characters prevents its inclusion into any known subtaxon; herein it is described as the type-species of a new, monotypic subgenus. Another distinctive specimen in my collection, a relatively large black beetle superficially resembling some *Paracupta* Deyr. but apparently be-

longing to the *Quadriplagis*-circle of *Metataenia* THÉRY s. str., has been long awaiting description [to be sure, the two above-mentioned new species, and some others recently discovered, seem to blur the distinction between *Metataenia* THÉRY and *Paracupta* DEYR., so perhaps the old system combining them in single genus will prove the best reflection of the natural relationships?]. Moreover, some time ago C.L. BELLAMY sent me for study various SE-Asian buprestids including – among other very interesting material, partly elaborated in my earlier publication (HOŁYŃSKI 2011) – another new species of this genus; its description is also provided below.

CONVENTIONS AND ABBREVIATIONS

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Additionally, the following abbreviations are used in morphological descriptions:

dfp = "dense-and-fine punctulation" or "densely-and-finely punctulate"; refers to the type of sculpture occurring mainly in depressed areas (foveae, sulci), and consisting of fine, dense, regular punctulation on usually distinctly microsculptured background, covered with dense pubescence and frequently pulverulent;
L = length;
W = width;
BW = basal width;
AW = apical width;
H = width of head with eyes;
V = width of vertex between eyes;
≈ = approximately equal to.

Metachuckia sg. n.

Type-species: *Metataenia extranea* sp. n. Gender: feminine.

General characteristics

Monotypic, therefore subgeneric characters are those of the type-species (see below). The (plesiomorphic? convergent?) combination of traits typical of various supraspecific taxa makes it very different from any of them: medially subcarinate pronotum (what probably misled Bílý to place the specimen in the chalcophorine genus *Chrysodema* C.G.) distinguishes it from all subgenera except *Papuodema* Obb.; lateral elytral dfp band (characteristic rather of the nominotypical subgenus of *Paracupta* Deyr.) from all but *Marginicupta* Hol.; lack of pronotal and abdominal dfp spaces seems to occur otherwise only in some species of *Mroczkowskia* Hol.; unusually elongated body, entirely dark legs, and weak but discernible discal costae on elytra are (separately!) shared with but few representatives of other subgroups of *Metataenia* Théry.

Remarks

Besides the odd morphology, the other peculiarity of *Metachuckia* sg. n. is its geographical distribution: the only known specimen has, according to the label, been collected in northern Philippines – rather unexpected locality for a *Metataenia* Théry, a genus of (like the "paracuptoid lineage" in general) Melanesian origin, whose no other representative extends to the NW beyond New Guinea! If the occurrence on Luzon is real (*i.e.* if neither mislabelling nor artificial introduction has been involved), *Metachuckia sg.n.* may be an example of "palaeomelanesian" (Hołyński 2001) taxa which, using the drifting terranes of the Melanesian and Caroline (=West Pacific – de Boer 1995) Arcs (see *e.g.* Hall 2002 for palaeogeographic reconstructions), reached as far north as Philippines [*Maoraxia* Obb. (Hołyński 2001) or *Melobasina* Kerr. (Hołyński 2011) may serve as other buprestid examples]. The curious combination of possibly plesiomorphic features – suggesting relative phylogenetic antiquity and long separate evolution – does not seem incongruent with such scenario.

Metataenia (*Metachuckia*) *extranea* sp. n. (Fig. 1)

Material examined

Holotype: "*Mountain province, PHILIPPINES, VII 1986*" "*Chrysodema instabilis Deyr. var.*, Det. Sv. Bílý" [♀ (RBH: BPksd)].

Additional material: none.

Description

Holotype: Female 23.5×7.5 mm. Elongated, somewhat flattened dorsally; piceous-black with only anterior parts of head, scutellum, elytral dfp sulci, sides of ventral surface, first antennomere, and legs (including basal joints of pro- and metatarsi – otherwise tarsi dark bluish-green) bright cupreous-red. No distinct pilosity on dorsal side

except for the lateral dfp bands on elytra; that on ventral surface rather inconspicuous, whitish, short, recumbent, sparse.

Epistome very short, broadly and shallowly emarginated at middle, with some coarse punctures along base, separated from front by transverse combination of rather deep but narrow sulcus and sharp but somewhat irregular ridge; supraantennal carinulae sharp but short; frontal depression very well developed, extending laterally from one ocular border to another and longitudinally far above the level of upper ends of eyes, broadly triangularly deepened on anterior third, almost smooth ("frontal mirror") except for evenly scattered, inconspicuous, fine, sparse, shallow punctures; median groove coarse and deep anteriorly, shallower and narrower towards vertex; punctulation of vertex very fine and sparse; eyes prominent, distinctly protruding beyond outline of head, which nevertheless remains somewhat narrower than anterior pronotal margin; V:H≈0.5. Antennae slender, long, reaching to near pronotal base; 1. antennomere fusiform, *ca.* 4× longer than thick; 2. subcylindrical, somewhat longer than wide, slightly narrower and 4× shorter than 1.; 3. as long as 1., still thinner (except at very apex) than 2., almost cylindrical; 4.-10. triangular, somewhat wider apically than 1., 4. almost as long as 3., others progressively shorter (10. twice shorter than 4., c*a.* 1.5× longer than wide) and more rhomboidal; 11. asymmetrically subovate, *ca.* as long as 7.

Pronotum trapezoidal (BW:AW:L≈1.6:1.1:1), basal margin very shallowly bisinuate, posterior angles sharply acute; sides strongly, almost straightly convergent from base to distinct "collar"; apical margin straight at middle and very shallowly sinuate on each lateral third. Surface regularly convex except for laterally deep but at middle broadly interrupted "collar"-sulcus, deep but irregular (not dfp) laterobasal depressions, and indistinct prescutellar foveola; median line neither sulcate nor elevated but impunctate and somewhat irregularly bordered with stripes of rather fine but dense punctation, thus making the appearance of median ridge; disk otherwise rather sparsely, sides again very densely and much coarser punctured; lateral carinae relatively long, reaching to *ca.* anterior third of pronotal length. Scutellum roundedly trapezoidal, wider than long, as wide as two interstriae, impunctate, sulcate along midline.

Elytra (L:W≈2.35) obliquely truncated at humeri, then very shallowly sinuately subparallelsided to midlength and arcuately tapering to just before very indistinctly "caudate" apices; no subhumeral denticles; lateroapical margins sharply denticulate. Punctation on discal surface moderately coarse, confluent into almost regular striae; 1., 3., and 6. interstria slightly costately elevated posteriorly; lateral striae confused; sharply developed, depressed dfp stripe runs along sides from base to apical sixth, extending inwards to what should be 9. stria and bordered laterally with prominent costa; space between costa and lateral margin narrowly sulciform in basal half, widened (as wide as dfp stripe) and finely densely punctulate behind; similarly widened and punctulate is apical part of 3. interstria; epipleura practically non-existent.

Proepisterna rather coarsely and not very densely punctured; anterior margin of prosternum swollen; prosternal process narrow, parallelsided, deeply sulcate, coarsely and densely punctured median part barely wider than smooth and shining convex lateral rims. Metasternum deeply sulcate along midline of the anterior (before arcuate metaventral suture) part, very finely and sparsely punctulate on flat median surface,

somewhat denser on lateral "slopes" and metepisterna; no metacoxal denticle. First sternite deeply sulcate along midline of intermetacoxal process, almost imperceptibly so in posterior half; abdominal punctation rather fine and sparse medially, very fine and dense (but not forming clearly dfp spots even in small but rather deep lateral depressions); anal sternite rather shallowly triangularly notched at apex.

Geographical distribution

Known only from the holotype, allegedly collected in the Mountain Province of Philippines (central Luzon), but this is rather unexpected locality should be treated with caution, especially so that the specimen seems to have been originally obtained from a "dealer". To my knowledge, no other species of *Metataenia* Théry – indeed, except for *Iridotaenia* Deyr. no other member of the "paracuptoid lineage" of the **Chrysochroina Cast.** – has been known to occur to the NW of Lydekker's Line.

Remarks

The combination of pseudocarinate (flat and impunctate) midline of pronotum, lack of pronotal or abdominal dfp pattern, lateral dfp bands on elytra, *&c*., make this species unmistakable among *Metataenia* Théry.

Metataenia Théry s. str.

Metataenia Théry, 1923: 216.

Metataenia (s. str.) *quoqueversa* sp. n. (Fig. 3)

Material examined

Holotype: "R. VOORHOEVE, Nieuw Guinea, Tami rivier, Hollandia 1930" [♀ RBH: BPiun].

Additional material: none.

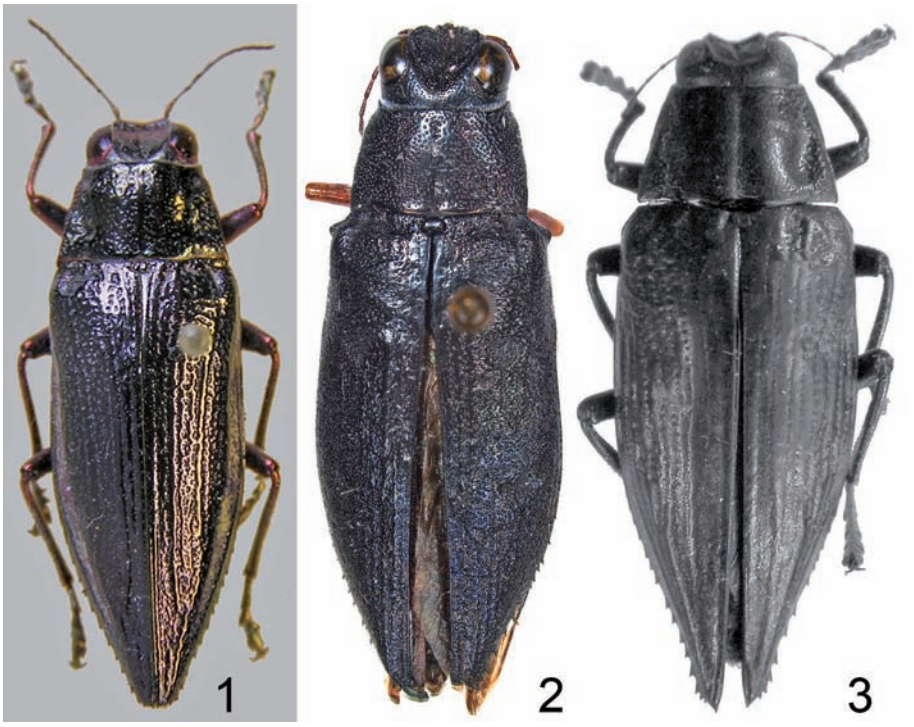
Description

Holotype: Female 27×9.5. Entirely piceous-black above and below (with slight bluish shine here and there, especially on femora and sides of undersurface), only labrum and tarsi yellow-testaceous and antennae (except dark blue 1. joint) brownish-ferrugineous. Body above glabrous; very short, recumbent pubescence on sides of sternum and abdomen; meso- and metafemoral brushes composed of very dense but very short white setae.

Epistome arcuately emarginated between sharply acute lateral angles, microsculptured, impunctate, separated from front by deep transversely arcuate sulcus; supraantennal carinulae sharp but short, directed steeply upwards (almost parallel to each other), ending at level of mid-height of eyes, somewhat inwards of the lower termination of also prominent and sharp but short periocular ridges, which extend straightly upwards to slightly beyond upper ocular margins; frontal depression broadly semiellyptic, almost impunctate, delimited by very finely punctulate (almost dfp) sulcus starting at anterior

margin between eye and supraantennal carina and running inwards of periocular ridge not quite reaching its upper end, then arcuately around along frontovertical border to meet opposite lateral branch; anterior hollow triangular, limited laterodorsally by pair of oblique lustrous elevations; median groove entire, coarse and deep; punctation of vertex fine and rather sparse; eyes but slightly protruding beyond outline of head; V:H≈0.5. Antennae slender; 1. antennomere fusiform, *ca.* 4× longer than thick; 2. globular, as long as thick, much thinner and 3× shorter than 1.; 3. almost cylindrical but somewhat flattened and distinctly thickened at obliquely truncated apex, *ca*. as wide as 1. but somewhat longer; 4. elongately triangular, shorter but wider than 3., 3× longer than wide; 5.-7. of width subequal to 4. but progressively more rhomboidal and shorter; distal antennomeres missing.

Pronotum subtrapezoidal (BW:AW:L≈1.6:1.1:1), basal margin very shallowly bisinuate, with subangular median lobe and slightly acute posterior angles; sides almost imperceptibly biarcuate with arcs meeting at basal 2/5, "collar" short and hardly appreciable; apical margin straight between slightly produced anterior angles. Surface somewhat irregularly convex, with deep and sharp entire median sulcus and deep rounded laterobasal foveae prolonged anterad (to *ca*. apical third) by shallower cuneate



1. *Metataenia* (*Metachuckia* sg. n.) *extranea* sp.n. HT ♀ – Philippines: Luzon: Mt. Prov.; 2. *Metataenia* (s. str.) *pilosa* sp. n. HT ♀ – N. Guinea: Wau; 3. *Metataenia* (s. str.) *quoqueversa* sp. n. HT ♀ – N. Guinea: Tami Riv.

depressions and bordered from sides with elevated ridges close to, and parallel with, basally (to apical third) sharp, almost straight lateral carinae; punctation fine and sparse on disk, becomes much coarser and dense, irregular anterolaterally, traces of dfp in foveae. Scutellum transversely trapezoidal, slightly depressed at middle, microsculptured without distinct punctulation.

Elytra (L:W≈2.2) obliquely truncated at humeri, without appreciable indication of subhumeral denticles, then sides very slightly divergent to somewhat before midlength, arcuately narrowed to apical fourth and sinuately so to definitely caudate apices; margins in narrowed parts sharply denticulate, denticles progressively larger backwards, apical almost spiniform; in profile elytra strongly convex in basal 2/3, concave apically, what gives them definitely "hump-backed", "paracuptoid" appearance. Each elytron with two shallow, rather inconspicuous, normally sculptured midlateral depressions at midlength and basal fourth; striae progressively deeper and coarser punctured from sutural (inner two very fine, superficial, sparsely and finely punctulate) to lateral (deep, with almost confluent coarse punctures), 4.-7. in basal fourth abruptly turning outwards and confused; no distinct costae, only 1., 3., and 5. interstria somewhat elevated in apical half; there 2. and 4. interval inconspicuously dfp, otherwise surface between striae smooth with but very fine microsculpture; epipleura very narrow and inconspicuous basally, non-existent behind midlength.

Ventral profile of sternum straight, of abdomen strongly convex. Anterior margin of prosternum straight, definitely behind protruding anterior angles of pronotum; proepisterna dfp except smooth elevated and sparsely punctured band along middle; prosternal process broadly and deeply sulcate in apical half, with but very narrow and shallow, inconspicuous stria anteriorly, surface otherwise covered with fine and rather sparse punctulation vanishing backwards. Metasternum broadly depressed along middle, punctulation on disk very fine and sparse, almost as fine but dense on sides, metepisterna and metacoxae; no metacoxal denticle. First sternite broadly and deeply depressed on intercoxal process, rather shallowly behind, second normally convex; abdominal punctation fine and sparse medially, still finer but denser towards sides; lateral depressions on sternites rather deep, normally punctulate; lateroapical parts of anal sternite become much coarser and denser punctured, midline with shallow sulciform foveola before roundedly subtruncated apex.

Geographical distribution

New Guinea (river Tami flows into the Pacific just on the western side of the present Indonesian-Papuan border). Known only from the holotype.

Remarks

"Hump-backed" dorsal profile, definitely caudate elytra, lack of distinct dfp spots, make the new species unmistakable. The closest relative seems to be, also New Guinean, *M. quadriplagis* Obb., but – beyond the above-mentioned characters – black rather than dark bronzed dorsal colouration, entirely dark tibiae, shorter tarsi, very fine inner elytral striae *&c*. clearly differentiate them.

Metataenia (s. str.) *pilosa* sp. n. (Fig. 2)

Material examined

Holotype: "NEW GUINEA: NE, Wau m, *II* 19*74*" "*P-23*" "Ex. Coll. C.L.Bellamy (CLBC)" [purplish label] [♀ (CSCA)].

Additional material: none.

Description

Holotype: Female 17×6 mm. Sides of ventral surface dark bronzed, otherwise piceous-black with faint bronzed tinge on front and pronotum; labrum, antennae and legs entirely yellow-testaceous, only apices of proximal and lobes of distal antennomeres darker brown). Body conspicuously pubescent: pilosity short recumbent on elytra, longer semierect on (especially sides of) pronotum, long semierect on abdomen, long erect on sternum and front; meso- and metafemoral brushes not conspicuous: composed of long, erect, but soft, thin and not dense white setae.

Epistome deeply emarginated, microsculptured, with some relatively coarse punctures on sides, separated from front by rather deep transverse depression; supraantennal carinulae sharp but short, directed obliquely upwards; periocular ridges prominent but also short, developed only along upper margins of eyes, separated from supraantennal carinae by long non-elevated spaces at middle of ocular margins and from one another by also not ridged fronto-vertical border; frontal depression broadly paraboloidal, coarsely and densely punctured; median groove coarse and deep, limited somewhat below the upper margin of frontal depression by short transverse smooth relief; punctation of vertex much finer and sparser; eyes prominent, distinctly protruding beyond outline of head, making it somewhat wider than anterior pronotal margin; V:H≈0.5. Antennae slender, long, reaching somewhat beyond pronotal base; 1. antennomere fusiform, *ca.* 4× longer than thick; 2. globular, almost as thick but 4× shorter than 1.; 3. almost cylindrical but distinctly thickened at apex, somewhat thinner and shorter than 1.; 4. subequal to 3. in length but slightly wider apically, flattened, very elongately triangular, at tip as wide as 1.; 5. minimally wider again but slightly shorter (*ca.* 2.5× longer than wide); 6.-10. of width subequal to 5. but progressively shorter (10. *ca.* 1.5× longer than wide) and more rhomboidal; 11. very elongately fusiform, pointed apically, *ca.* as long as 3. or 4.

Pronotum subtrapezoidal (BW:AW:L≈1.7:1.3:1), basal margin very shallowly bisinuate, posterior angles slightly acute, sides strongly regularly arcuate from base to distinct "collar", apical margin straight at middle and shallowly sinuate on each lateral third. Surface regularly convex except for only laterally discernible transverse preapical ("collar") groove and inconspicuous (shallow at middle, deepened in basal third and somewhat behind anterior margin) and irregular median sulcus; disk coarsely but rather sparsely, sides still coarser and very densely punctured; lateral carinae short, reaching to *ca.* 1/3 of pronotal length. Scutellum trapezoidal, twice wider than long, as wide as two interstriae, impunctate.

Elytra (L:W≈2.2) subparallelsided behind humeri, then slightly widened to mid-length and arcuately tapering to jointly rounded apices; subhumeral denticles very

prominent; lateroapical margins sharply denticulate. Punctation very irregular, extremely dense and confluent into transverse wrinkles on sides, somewhat sparser at middle; striae marked only as inconspicuous shallowly depressed stripes on sutural half, completely disappearing laterally; two very indistinct depressions on each elytron – one broader, somewhat closer to suture than to side margin, at basal fourth, and one smaller, closer to side, at apical third – represent dfp spots; epipleura practically non-existent.

Proepisterna finely and not very densely punctured, rather deeply depressed at procoxae and at hind margin; prosternal process narrow, deeply sulcate, finely but densely punctured median part barely wider than smooth and shining convex lateral rims. Metasternum finely and very sparsely punctulate on flat median part, denser on lateral "slopes", very densely on metepisterna; no metacoxal denticle. First sternite distinctly, second inconspicuously sulcate along midline; abdominal punctation sparse, rather coarse medially, very fine towards sides; lateral dfp areas on sternites well differentiated, deeply depressed; anal sternite with dense brush of brownish hair before deeply notched apex.

Geographical distribution

New Guinea. Known only from the holotype collected at Wau (Morobe Pr.).

Remarks

This species apparently belongs to the very poorly known *Gilvogeniculata*-circle, but combination of prominent pilosity, markedly rounded sides and inconspicuous median sulcus of pronotum, practically lacking striae and costae on elytra, and entirely yellow legs makes it easily recognizable.

Acknowledgements

I am greatly indebted to Piotr Ślipiński for the image of *M. pilosa* sp.n. and to Miłosz Mazur for the advice enabling a photographic bungler to make tolerably informative pictures and for additional processing of *M. extranea* image. The late C.L. Bellamy, to whom this paper is dedicated and on whose material it has been partly based, deserves special thanks for many explanations and advices provided throughout the three decades of our cooperation.

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Genus	Vol. 25(3): 403-414	Wrocław, 30 IX 2014

Description of three new subgenera and two new species of *Paracupta* Deyr. (Coleoptera: Buprestidae)

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Abstract. A reassessment of the internal structure of the genus *Paracupta* Deyr., with description of two new species and three new subgenera, is presented.

Key words: entomology, taxonomy, classification, new taxa, Oceania, *Paracupta* Deyr.

Paracupta Deyr. includes many big, bright, attractive beetles, and nevertheless remains the least studied large genus of the **Chrysochroina Cast.**: since Kerremans' (1909) monograph no comprehensive revision has appeared, and consequently its internal and external relationships remain hopelessly confused. Until the third decade of the 20th century it was considered broadly, including most of the species currently classified in *Metataenia* Théry. Théry's (1923) description of the latter genus initiated the process of separation of one group after another from *Paracupta* Deyr. into separate genera or transferring them into *Metataenia* Théry, but this was done *ad hoc*, incoherently, and resulted in a rather chaotic situation. Some years ago I (Hołyński 2009) made the first step towards clarification of these problems: in frames of the general taxonomical, zoogeographical and evolutionary review of the subtribe **Chrysochroina Cast.** the content and – consequently – diagnosis of the genus was drastically changed, and subdivision into three (one new) subgenera proposed.

So, as currently conceived, the genus contains *ca.* 20 or 30 species distributed between Moluccas and Samoa, with one species in Australia. Long ago, at the occasion of my first visit to the Bitish Museum (Natural History), I found a series of beetles from Rennell Is., classified in that collection as *Paracupta isabellina* Kerr. but evidently representing a different, albeit related, species. I prepared the description immediately,

but for various reasons it has remained unpublished until now. Additionally, among the buprestids borrowed from the Bernice P. Bishop Museum (Honolulu) there is a highly distinctive small beetle showing morphological features precluding the possibility to classify in any of the hitherto known subgenera. It was the need to formally introduce these two new species that gave a stimulus for further work, which in turn revealed the necessity of comprehensive reassessment of the subgeneric classification – the present paper, with description of four new subgenera, is the result.

CONVENTIONS AND ABBREVIATIONS

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Additionally, the following abbreviations are used in morphological descriptions:

dfp = "dense-and-fine punctulation" or "densely-and-finely punctulate"; refers to the type of sculpture occurring mainly in depressed areas (foveae, sulci), and consisting of fine, dense, regular punctulation on usually distinctly microsculptured background, covered with dense pubescence and frequently pulverulent;
L = length;
W = width;
BW = basal width;
AW = apical width;
H = width of head with eyes;
V = width of vertex between eyes;
≈ = approximately equal to.

KEY TO THE SUBGENERA OF *PARACUPTA*

1(2) Body strikingly gibbose: elytra strongly convex at base, ventral profile deeply concave at mesocoxae (distinct re-entrant angle between metasternum and downwards inclined prosternum). At least median sulcus of pronotum very well developed, deep ..... ***Gibbicupta* Hoł.**

2(1) Dorsal profile may appear humped (strongly convex anterior part of elytra) but pro-metasternal angle always convex or, if nearly straight (with only some sinuation at mesosternum), pronotal sulci fine, linear, shallow

3(6) Pronotum with 5 longitudinal sulci and/or tarsi and antennae dark. Body strikingly elongated (L:W<2.9), not flattened dorso-ventrally

4(5) Pronotum with 5 longitudinal sulci. Antennae and usually tarsi yellow-testaceous ..... ***Paracupta* Deyr. s. str.**

5(4) Pronotum trisulcate. Antennae and tarsi dark with metallic sheen ..... ***Chalcotaenia* Deyr.**

6(3) Pronotum with (usually fine) median sulcus and pair of laterobasal depressions. Body relatively wider (L:W>3.0), dorsoventrally flattened

7(10) Odd (1st, 3rd, 5th, and 7th.) discal elytral interstriae prominently costate, separated by depressed even (2nd, 4th, 6th) intervals.

8(9) Body black. Fifth (perimarginal) elytral costa evanescent (at most traces discernible in basal half), 8th-10th intervals transformed into lateral pulverulent dfp band ..... ***Callicupta* sg. n.**

9(8) Bright green. Fifth (perimarginal) elytral costa (on 9th interstria) normally developed (similar to discal four) ..... ***Callistroma* Frm.**

10(7) Odd (1st, 3rd, 5th, and 7th) discal elytral interstriae similar to even (2nd, 4th, 6th) intervals

11(12) Ninth interstria flat. Elytral sides with well developed pulverulent dfp band ..... ***Eucupta* sg. n.**

12(11) Ninth interstria convex. No dfp band on elytral sides

13(14) All interstriae similarly developed. Prosternal process regularly convex, finely and sparsely punctulate ..... ***Bojasinskia* Hoł.**

12(11) Ninth inerstria markedly elevated, careniform, much more prominent than others. Prosternal process broadly depressed and coarsely punctate ..... ***Miragemma* sg. n.**

Sg. *Gibbicupta* Hoł.

Gibbicupta Hołyński, 2009: 265-266.

Type-species: *Buprestis helopioides* Boisduval, 1835.

Well characterized in Hołyński (2009), no need for any significant modification except for removal of mistakenly included *P. prasina* (Heer) and *P. tibialis* Snd.

Sg. *Paracupta* Deyr. s. str.

Paracupta Deyrolle, 1864: 33.

Type-species: *Buprestis xanthocera* Boisduval, 1835.

After separation of *Chalcotaenia* Deyr., *Callicupta* sg. n., *Eucupta* sg. n., and *Miragemma* sg. n., only three species known to me remain in the nominotypical subgenus: Moluccan *P. xanthocera* (Bdv.), widely distributed on Solomon Is. *P. isabellina* Kerr., and the new species from Rennell I.

KEY TO SPECIES OF THE SUBGENUS *PARACUPTA*

1(2) Prosternal process regularly convex. All intercostal spaces on elytra coarsely punctate ..... ***P.* (s. str.) *xanthocera* Deyr.**
2(1) Prosternal process medially sulcate. Outer intercostal spaces dfp, without coarse punctures
3(4) Blackish brown, at most ventral side and dfp depressions greenish. 4th primary costa joins 3rd in apical part, more or less distinct secondary costa between them not extending thus far ..... ***P.* (s. str.) *rennelli* sp. n.**
4(3) Dark green. 3rd and 4th costae separated throughout, 3rd intercosta (secondary costa) separates them extending beyond their ends ... ***P.* (s. str.) *isabellina* Kerr.**

Paracupta (s. str.) *rennelli* sp. n. (Fig. 9)

Material examined

Holotype: „"SOLOMON IS.: Rennell I., Hutuna. 20-24. x. 1953. J.D.Bradley." [underlining orange] "RENNELL I. Expedition. B.M. 1954-222." [♀ (BMNH)]

Paratypes: "SOLOMON IS.: Rennell I., Hutuna. 17-19. x. 1953. J.D.Bradley." "RENNELL I. Expedition. B.M. 1954-222." [1♀ (BMNH)]; "SOLOMON IS.: Rennell I., Hutuna. 6. xi. 1953. J.D.Bradley." "RENNELL I. Expedition. B.M. 1954-222." [1♀ (BMNH)]; "SOLOMON IS.: Rennell I., Hutuna. 6. xi. 1953. J.D.Bradley." "RENNELL I. Expedition. B.M. 1954-222." "Paracupta isabellina Kerr., J. Balfour-Browne det. XI. 1958" [1♀ (BMNH)]; "SOLOMON IS.: Rennell I., Hutuna. 8. xi. 1953. J.D.Bradley." "RENNELL I. Expedition. B.M. 1954-222." [1♀ (RBH: BPenz)]; "SOLOMON IS.: Rennell I., Teuhungano. 26-28. xi. 1953. J.D.Bradley." "RENNELL I. Expedition. B.M. 1954-222." [2♀ (RBH: BPeo-, eoa)] [*on all labels* "SOLOMON IS." *underlined with orange*]

Description

Holotype *[in bracketed italics characters not checked on holotype, added (according to three paratypes in RBH) at home when holotype was no more available]***:** Female 31×10.5 mm. Ventral surface and depressed dfp areas of head, pronotum and elytra dull golden-green; elevated lustrous parts of dorsal side dark violaceous-brown with green bottoms of coarse punctures. Traces of yellow pulverulence discernible

in depressions of dorsal side, ventral dfp areas contrastingly pulverulent with white; labrum, palpi, 3.-11. antennal joints, and soles of tarsi pale yellow, basal two antennomeres and remaining parts of legs metallic dull green.

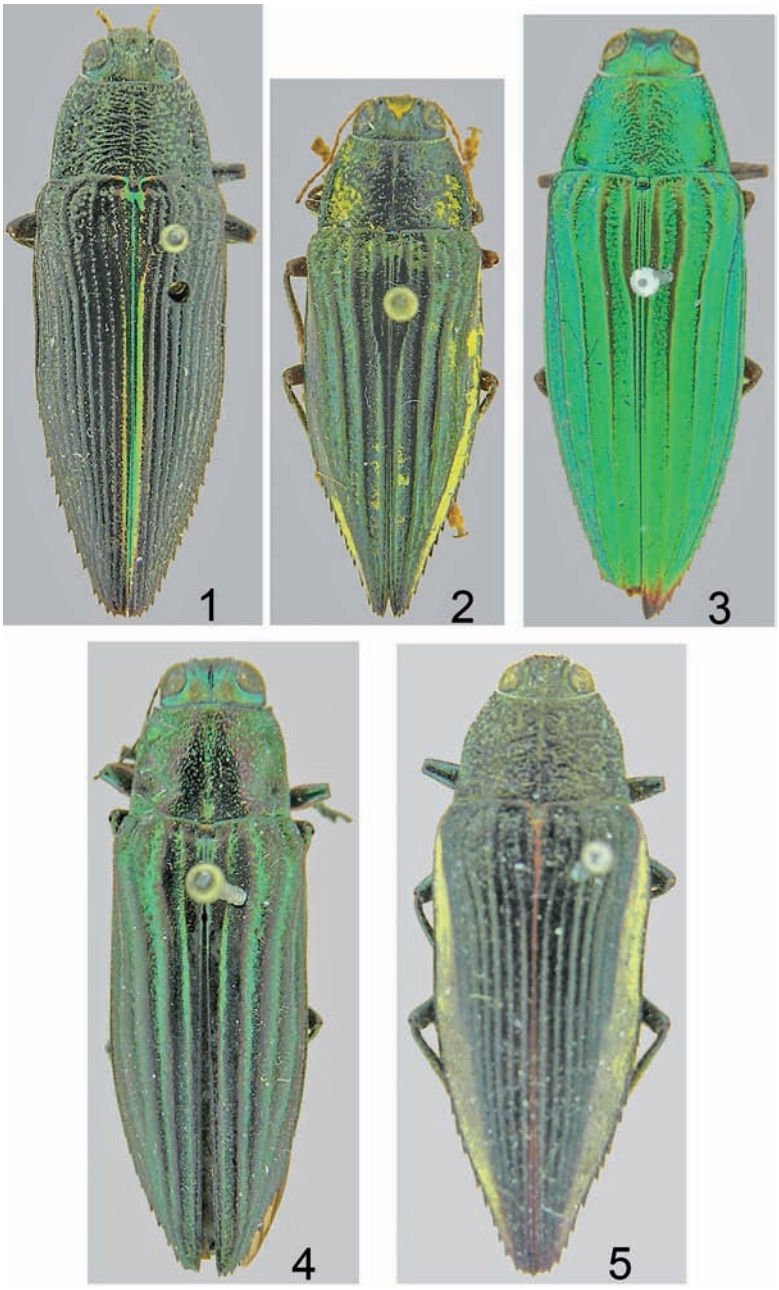
Labrum *ca.* as long as epistome but more deeply emarginated, with strongly convergent sides and dense apical brush of setae. Posterior margin of epistome almost parallel to anterior but a bit more angulose at middle, lateral ridges strongly divergent, anterior angles sharply acute; surface smooth and glabrous except for transverse row of setae associated with deep punctures. Front trapezoidal with upper width subequal to length; sides strongly divergent; deep and broad transverse sulcus just behind epistome, narrower furrows border inner margins of antennal cavities and eyes; main frontal depression uneven, with pair of tubercles on sides of distinct median stria, transverse elevation behind them, deep rounded fovea in anterior part, and two oblique on sides; bottom of these foveae densely and finely punctate, otherwise frontal punctulation coarser but rather sparse, becoming somewhat denser but finer on vertex. *[Eyes flat, following the outline of head, sides convergent from base]*.

Pronotum transversely subtrapezoidal, widest at base W:L≈1.6:1; apical margin distinctly, somewhat bisinuately (with median lobe very inconspicuous) emarginate, anterior angles acute; sides strongly convergent, trisinuately (with broad sinus at middle and narrower two at anterior and posterior angles) rounded; base shallowly but distinctly bisinuate. Disk with five longitudinal dfp sulci: deep and regular along median line, two broader but broken on each side; rest of prontal surface rather uneven, coarsely but not very deeply, iregulary punctate. Scutellum quadrangular, longitudinally depressed, with distinct median stria.

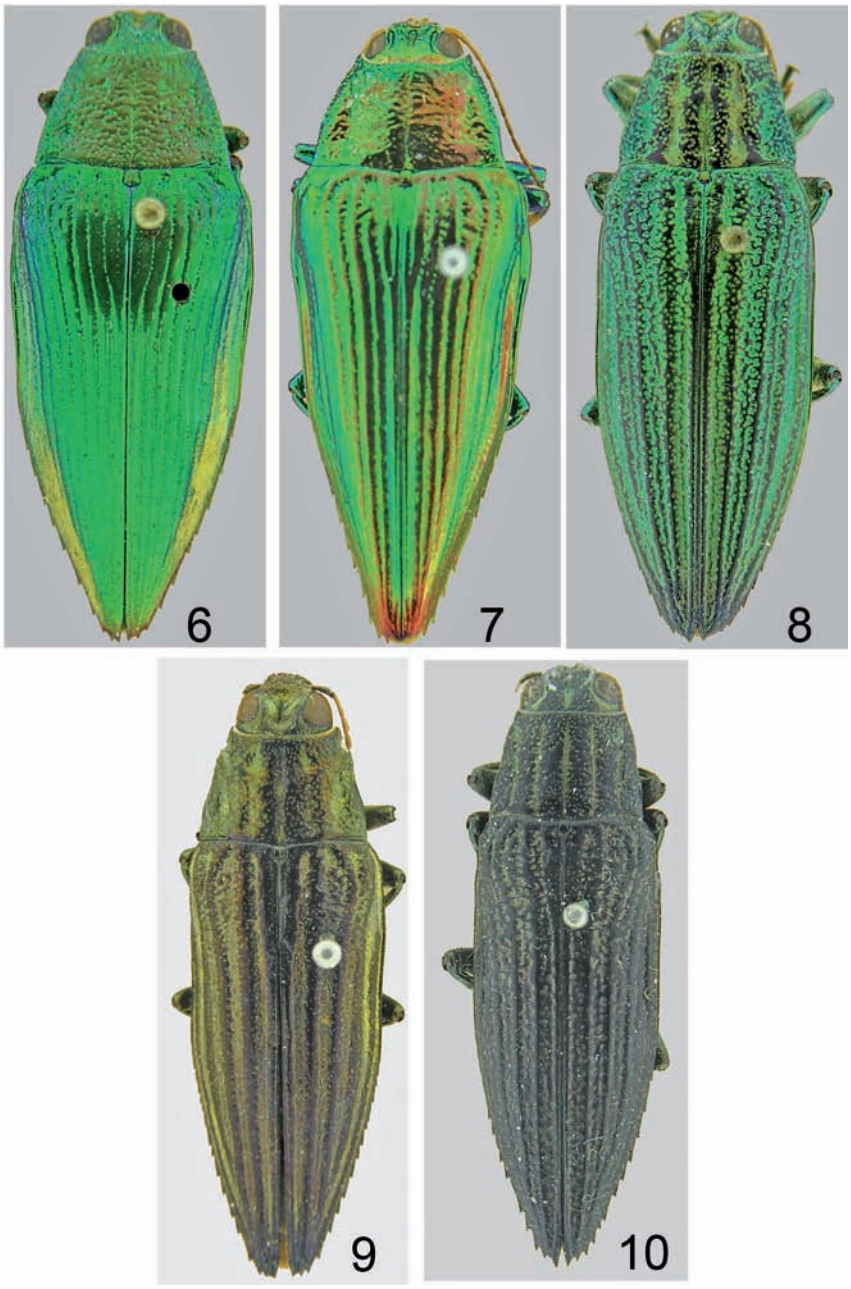
Elytra elongate (L:W≈2.3), almost parallelsided in basal half, narrowly tapering posteriorly, with lateroapical margins rather strongly dentate. Costae highly elevated, almost smooth (punctulation very fine and very sparse), 4. joins 3. at apical fifth; intercostal surfaces dfp, 2. and 3. with traces of intercostae in form of indistinct rows of irregular tubercles.

[Prosternum conspicuously convex in profile]; prosternal process shallowly longitudinally depressed, coarsely punctate along median line, almost smooth on sides; punctation of lateral slopes of median part of prosternum coarse, dense, irregular. Median parts of metasternum, metacoxae and abdomen, as well as posterior margins of sternites sparsely and rather finely punctate, lustrous; lateral parts dfp and pulverulent. *[Basal sternite regularly convex]*. Deep trapezoidal apical incision of anal sternite flanked with acute-angled, *[longitudinally carinate]* lobules; before the incision, *[to both sides of inconspicuous (only apically developed) median carina]*, pair of short longitudinal depressions; *[sides of anal sternite regularly rounded, without distinct preapical sinuation]*.

Paratypes: Only females known. 27-33.5×9-12 mm. Colouration of elytra sometimes cupreous rather than greenish in dfp and with distinct purplish shine on elevations; median parts of underside usually more or less golden-cupreous; general outline of (always trisinuate) pronotal sides vary from rather strongly rounded to almost straight; prosternal process in some specimens only anteriorly depressed; otherwise like holotype.



1. *Paracupta* (*Bojasinskia*) *kleinschmidti* Frm. ♀ – Fiji: Viti Levu; 2. *P.* (*Callicupta*) *kioana* sp. n. HT ♀ – Fiji: Kioa I.; 3. *P.* (*Callistroma*) *samoensis* Snd. ♀ – Samoa; 4. *P.* (*Chalcotaenia*) *lamberti* (C.G.) ♀ – Australia: Queensland; 5. *P.* (*Eucupta*) *flaviventris* (Heer) ♀ – Fiji



6. *Paracupta* (*Eucupta*) *prasina* (Heer) ♀ – Fiji; 7. *P.* (*Miragemma*) *tibialis* Snd. ♀ – Fiji: Koro I.; 8. *P.* (s. str.) *isabellina* Kerr. ♀ – Solomon Is.: Russell I.; 9. *P.* (s. str.) *rennelli* sp. n. PT ♀ – Solomon Is.: Rennell I.; 10. *P.* (s. str.) *xanthocera* Deyr. ♀ – Moluccas: Batjan I.

Geographical distribution

Known only from Rennell Islands, where it replaces Solomonese *P. isabellina* Kerr.

Remarks

Differs from *P. isabellina* Kerr. in various, but not always easy to describe, details [in brackets characters of *P. isabellina* Kerr.]: more lustrous [distinctly microsculptured] body; generally bronzed-brown [dull- or blackish-green] colouration (even if – as in holotype – dfp parts are greenish, this colour is not conspicuous in „total view"); entirely yellow labrum [lateral lobes – except in San Cristoval specimen – brownish-black] and 3.-11. antennomeres [poriferous lobes dark-brown]; much more marked pronotal „collar", delimited dorsally by transverse row of deep [shallow and inconspicuous] foveolate depressions in longitudinal dfp sulci; much more prominent, nearly smooth [at least inner coarsely punctate] elytral costae; barely – not at all in basal half – appreciable [at least laterally rather well developed all along] intercostae; not prominently but more or less distinctly carinate [regularly convex] median line and regularly arcuate [deeply sinuate – except in San Cristoval ex. – before apex] sides of anal sternite; its shortly but sharply carinate [no trace of carinae] apical lobes. Moluccan *P. xanthocera* Deyr., despite similar outlook and colouration, is easily recognizable by very narrow and regular pronotal sulci, coarsely punctate elytral intercostal spaces, flat (without median depression) and uniformly sparsely punctate prosternal process.

Sg. *Chalcotaenia* Deyr.

Chalcotoenia [sic!] Deyrolle, 1864: 12.

Type-species: *Chrysodema lamberti* Castelnau & Gory, 1835.

Deyrolle (1864) described this – for him extralimital – genus "*seulement pour l'ordre*", including it only in the key to the genera of "*CHRYSODEMIDES*" with the laconic note that it has "*pour le type Chr. Lamberti, Hope, d'Australie*". Later authors (*e.g.* Saunders 1872, Thomson 1878) included here several other, mainly Australian species, making it a kind of "waste-basket" for taxa supposedly more or less related to *Chrysodema* C.G. The dismembering of the conglomerate started at the beginning of the 20th century, when Kerremans (1903) separated some of its representatives into *Pseudotaenia* Kerr. After removal of *Cyphogastrella* Théry (Théry 1926) and *Chalcophorotaenia* Obb. (Obenberger 1928) the genus became monotypic again. My own concept of the genus also varied: while in the "reassessment" of buprestid classification (Hołyński 1993) I accepted Obenberger's still broad (1926) arrangement from the *Coleopterorum Catalogus*, four years later (Hołyński 1997), having realized that the type-species is related to *Paracupta xanthocera* (Bdv.) and *P. isabellina* Kerr. rather than to *Chalcophorotaenia* Obb., I accepted Obenberger's taxon as a subgenus of *Chalcoplia* Ths. and considered the newly composed *Chalcotaenia* Deyr. a subgenus of *Paracupta* Deyr. At that time I "tacitly" considered *Buprestis helopioides* Bdv. as the type-species of the latter genus, but shortly thereafter Bellamy (1998)

formally designated *B. xanthocera* Bdv., what made *Chalcotaenia* Deyr. (in my new interpretation) nomenclatorically synonymous with *Paracupta* Deyr. – as they were described in the same paper, an action of first reviser was needed to establish their relative priority, and in this way I (Hołyński 2009) attached the seniority to the latter name. At present, acknowledging the significant distinctness between *P. lamberti* (C.G.) and the *P. xanthocera* (Bdv.)-group, I find it justified to taxonomically separate them, and so *Chalcotaenia* Deyr. becomes monotypic once again, this time at the subgeneric level (however, closer examination of some species attributed traditionally to *Chalcophorotaenia* Obb. [*e.g. C. martini* (Kerr.) or *C. elongata* (Wath.)] may reveal that in fact they also belong here).

Sg. *Callicupta* sg. n.

Type-species: *Paracupta kioana* sp. n. Gender: feminine.

Monotypic taxon, so subgeneric characteristics do not differ from those of the type-species. Non-gibbose body in combination with deep median sulcus and broad but medially indefinite laterobasal depressions of pronotum, as well as prominent costae and wide marginal dfp band of elytra, suffice to clearly define the taxon and distinguish it from others.

Paracupta (*Callicupta*) *kioana* sp. n. (Fig. 2)

Material examined

Holotype: "FIJI: Kioa I: S coast to center, 0-60 m, 4. X. 1979" "M.K.Kamath, S.N.Lal, G,A. & S.L. Samuelson Colls., BISHOP Museum, Acc. #1979.387"" "*PARACUPTA sp.?*, Det. C.L.Bellamy 1989" [♀ (BPBM)]

Additional material: none.

Description

Holotype: Female 20×6.5 mm. Ovate, not gibbose (both dorsal and ventral profile convex) somewhat flattened. Black with greenish elytral interstriae and greenish sheen on sternum; labrum, epistomal sulci and antennae yellow-testaceous, legs somewhat darker ferrugineous. No distinct pubescence on elevated parts of surface, that on dfp very short, whitish, rather inconspicuous.

Epistome deeply arcuately emarginated at middle, deeply arcuately transversely sulcate, separated from front by prominent but not sharp ridge fully divided into two by short but deep median longitudinal branch of epistomal sulcus; supraantennal carinulae short, oblique; frontal depression triangular, entirely covered with clayey-yellowish pulverulence, sharply delimited by own steep external walls but without elevated marginal carinae, not extending laterally to ocular borders but prolonged as not much shallower sulcus to far above the level of upper ends of eyes; lateral margin of front with deep narrow groove running along entire median and upper margins of eye; punctulation of vertex moderately fine and very sparse; eyes not distinctly protruding

beyond outline of head; V:H≈0.43. Antennae slender, long, reaching to near pronotal base; 1. antennomere fusiform, *ca.* 4× longer than thick; 2. subcylindrical, somewhat longer than wide, much narrower and 4× shorter than 1.; 3. as long as 1., still thinner (except at very apex) that 2., almost cylindrical; 4.-10. subrhomboidal, somewhat wider apically than 1., 4. almost as long as 3., others progressively shorter (10. twice shorter than 4., c*a.* 1.5× longer than wide) and more rhomboidal; 11. asymmetrically subovate, *ca.* as long as 7.

Pronotum trapezoidal (BW:AW:L≈1.6:1.1:1), basal margin almost imperceptibly bisinuate, posterior angles very slightly acute; sides arcuately convergent from base to apex, no distinct "collar"; apical margin very shallowly bisinuate. Surface regularly convex except for rather deep median sulcus, broad but shallow, irregular (not dfp), only from sides clearly delimited laterobasal depressions narrowly prolonged anterad to *ca.* apical third, and separated from lateral margins by elevated, narrowly parallel-sided, densely and rather coarsely punctate space; disk coarsely but rather sparsely punctate, sculpture of lateral depressions very coarse and transformed into irregular mixture of foveolae and elevated granules; lateral carinae arcuate, not sharp but entire. Scutellum roundedly trapezoidal, wider than long, as wide as two innermost interstriae, convex, impunctate.

Elytra (L:W≈2.2) obliquely truncated at humeri, subparallelsided in basal third, shallowly arcuate to apical fourth, then cuneately tapering to narrowly jointly rounded apices; no subhumeral denticles; lateroapical margins sharply denticulate with three denticles at the very apex much finer. Each elytron with 4 prominent entire costae, 5. (prelateral) costa almost totally lacking (traces discernible in basal half); intercostae poorly developed at base, completely vanishing in apical ¾; 1. (sutural) costa abruptly widened at basal fourth, "splitted" there by sharply engraved periscutellar stria; other costae bordered from both sides with dense rows of fine punctures; costae impunctate; intercostal spaces narrow, concave, dfp; wider (merged by disappearance of 5. costa) 4+5 intercostal space forms distinct lateral pulverulent dfp band. Epipleura only below humeri somewhat wider, otherwise linearly narrow throughout.

Sides of sternum and abdomen widely dfp, with some fine reliefs on middle of proepisterna and lustrous elevation separating inner from outer part of metacoxae; elevated parts of ventral surface sparsely, rather finely punctate. Anterior margin of prosternum very shallowly emarginated; prosternal process slightly widened behind procoxae, deeply sulcate, coarsely and densely punctate median part *ca*. as wide as smooth and shining convex lateral rims. Metasternum deeply sulcate along midline of the anterior (before arcuate metaventral suture) part; no metacoxal denticle. First sternite deeply sulcate along midline, sulcus vanishing before apical margin; anal sternite sharply triangularly notched at apex.

Geographical distribution

Fiji: Kioa I. (offshore the southeastern peninsula of Vanua Levu). Known only from the holotype.

REMARKS

The combination of black colouration, definitely convex ventral profile, prominent elytral costae, and wide lateral dfp band distinguishes the new species from other known species of *Paracupta* DEYR.

Sg. *Callistroma* FRM.

Callistroma FAIRMAIRE, 1877: 153.

Type-species: *Callistroma oxypyra* FAIRMAIRE, 1877 [=*Paracupta samoensis* SAUNDERS, 1874].

Monotypic, well known taxon, the easternmost representative of the genus. Traditionally treated as a separate genus, but – as I (HOŁYŃSKI 2009) have shown – fitting comfortably in *Paracupta* DEYR. Median carina on anal sternite, often quoted as diagnostic for the "genus", is absent in male.

Sg. *Eucupta* sg. n.

Type-species: *Buprestis flaviventris* HEER, 1868. Gender: feminine.

Characterized by coarsely and densely punctate pronotum with linearly narrow median sulcus and nearly absent laterobasal depressions, elytra with deep regular discal striae and broad lateral pulverulent dfp band. Ventral profile definitely convex or [*P.* (*E.*) *prasina* (HEER)] at most approximately straight (prosternum not inclined downwards) with some sinuation at mesosternum. Two species [*P. flaviventris* (HEER) and *P. prasina* (HEER)] are now available to me for examination, but judging from descriptions some others [*P. albilatera* FRM., perhaps *P. evansi* THY.) also belong here. The relatively strongly gibbose body of *P.* (*E.*) *prasina* (HEER) is confusing: it might reflects some affinity to sg. *Gibbicupta* HOŁ. but convergence seems to be the more likely explanation. All known species inhabit Fiji Is.

Sg. *Bojasinskia* HOŁ.

Bojasinskia HOŁYŃSKI, 2009: 266-267.

Type-species: *Buprestis kleinschmidti* FAIRMAIRE, 1878.

Originally (mainly because of apparently misleading results of phylogenetic analysis) tentatively described as a separate genus, but subgeneric status within *Paracupta* DEYR. better reflects its true position. Previously included *P. flaviventris* (HEER) is hereby removed to *Eucupta* sg.n., but on the other hand *P. leveri* THY. from Vanikoro I. should be included, so the known distribution area of the subgenus appears as disjunct.

Sg. *Miragemma* sg. n.

Type-species: *Paracupta tibialis* Saunders, 1872. Gender: feminine.

Monotypic Fijian subgenus, characterized by narrow median sulcus, deep but irregular and poorly delimited laterobasal depressions and coarse irregular punctation of pronotum; cuneate, slightly humped, regularly and deeply striate elytra with prominently costate 9. interstria; convex ventral profile, broad but shallow, coarsely punctate median depression of prosternal process. The perimarginal costa "replacing" dfp band on otherwise regularly striated elytra is unique in the genus.

Acknowledgements

I am greatly indebted to Choukri Mousaab Haj Darwich and Jacek Kurzawa for generous gifts of equipment enabling me to take photographs of tolerable quality, and to Miłosz Mazur for the technical processing of these pictures.

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Europs insterburgensis sp. nov., a new root-eating beetle from Baltic amber (Coleoptera: Monotomidae)

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Abstract. The extinct representative of the family Monotomidae Laporte, 1840 is described from Baltic amber. *Europs insterburgensis* sp.nov. differs from other representatives of the genus by the wide head, by the coarsely punctate forebody, by the uniform body color and by antennal proportions.

Key words: entomology, taxonomy, Coleoptera, Monotomidae, *Europs insterburgensis*, new species, Baltic amber, Tertiary, Eocene.

INTRODUCTION

Root-eating beetles (Monotomidae Laporte, 1840) is a family of small (1.5-6.0 mm) predaceous or mycophagous cucujoid beetles, distributed worldwide. There are currently 33 genera with about 250 described species (Slipinski et al. 2011), divided into two subfamilies: Rhizophaginae Redtenbacher, 1845 and Monotominae Laporte, 1840 (Bouchard et al. 2011). The family of the root-eating beetles has been known from Baltic amber. The fossil representatives of Monotomidae are rather rare in the collections of Baltic amber: one specimen is known from Copenhagen museum, five specimens are deposited in Berlin museum, two specimens in Warsaw museum (Kulicka & Slipinski 1996), and one specimen in Gdańsk collection (Kubisz 2001). No extinct species and genera of Monotomidae from Baltic amber have been described (Alekseev 2013).

The genus *Europs* Wollaston, 1854 includes about 50 described extant species distributed in North and South Americas, Asia, Africa and Madagascar. The taxonomy of the genus is poorly studied, no subgenera (except one disputable taxon *Monotopion*

Reitter, 1884 from Japan) have been recognized and the genus has never been revised (Bousquet 2003a). Five other extant species of the genus occur in the Palaearctic region (Jelínek 2007): *E. temporis* Reitter, 1884 [Japan, Far East]; *E. duplicatus* Wollaston, 1862 [Canary Islands]; *E. impressicollis* Wollaston, 1854 [Canary and Madeira Islands]; *E. indicus* Grouvelle, 1903 [India]; *E. alutaceus* Champion, 1924 [India]. The recent beetles of the genus are found under bark of dead trees or are associated with cultivated plants and possibly feed on spores of ascomycetes. The genus *Europs* Wollaston was also recorded from Baltic amber: in Klebs (1910, p. 241) as belonging to family Nitidulidae and in Spahr (1981, p.35) as belonging to family Cucujidae.

In the current paper a new species of Monotomidae, from Eocene Baltic amber, assigned to the recent genus *Europs* Wollaston, 1854, is described, illustrated and compared with the recent Holarctic species.

MATERIAL AND METHODS

The beetle inclusion is preserved in a polished piece of amber, yellowish in color, without supplementary fixation. The amber piece is relatively large and elongate (52 x 30 x 10 mm) and was obtained from a commercial source in in Kaliningrad in February 2013. It has been polished by hand, thus allowing dorsal and lateral views of the included beetle. Additional inclusions of obvious animal origins are represented by: one larva of Coleoptera (possibly of the same monotomid beetle), one winged ant, one other Hymenoptera and one small spider. The syninclusions of plant and possibly plant origin are also present: there are a few stellate hairs (possibly from the buds of an oak) as well as leaf-like fragments of (possibly) a lichen. The piece is deposited in the private collection of the author (Kaliningrad, Russia). The type will be deposited in the Paleontological Institute, Russian Academy of Science (Moscow) for permanent preservation.

Photos were taken with a Zeiss AxioCamICc 3 digital camera mounted on a Zeiss Stemi 2000-cstereomicroscope. Illustrations were made based on free–hand drawing during examination of the original specimen.

The following measurements were made using an ocular micrometer in a stereoscopic microscope at 56x: maximum width of head, including eyes (WH); maximum width of pronotum in the first fourth of its length (WP); length of pronotum along midline (LP); length of elytra from posterior extremity of scutellum to tip of elytron (LE). The following sources were used for the generic attribution and comparison with recent species: Nikitsky (1986), Bousquet (2003a), Bousquet (2003b).

TAXONOMY

Family Monotomidae Laporte, 1840
Subfamily Monotominae Laporte, 1840
Tribe Europini Sen Gupta, 1988
Genus *Europs* Wollaston, 1854

***Europs insterburgensis* sp.nov.**

(Figs. 1-2)

MATERIAL EXAMINED

Holotype Nr. AWI-077, possible female (one exposed tergite of abdomen, short and truncate temples); a complete beetle with distal parts of left posterior wing partly exposed from under the apex of elytron. The beetle inclusion is slightly damaged: the elytra and disc of pronotum are asymmetrically impressed and slightly deformed, because of thermal processing of the amber piece in an autoclave.

TYPE STRATA

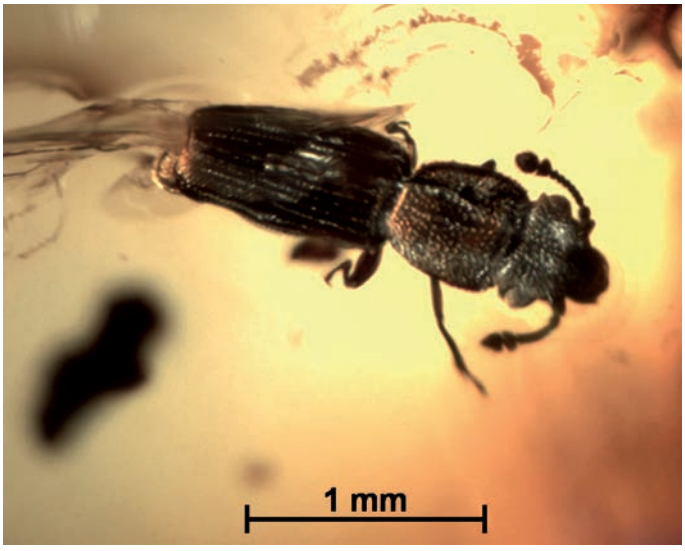
Baltic Amber. Eocene.

TYPE LOCALITY

Baltic Sea coast, Yantarny settlement [formerly Palmnicken], the Kaliningrad region, Russia.

DIFFERENTIAL DIAGNOSIS

The new species may be assigned to *Europs* WOLLASTON because of the following morphological characters: head without antennal grooves, procoxae slightly transverse and rounded, antenna with 3-segmented club (apparently 2-segmented), pronotal disc with impunctate median zone, elytral disc with punctures arranged in longitudinal rows, first visible abdominal sternite without median plaque bearing setae. The author assumes that the inflexed part of elytron has three rows of punctures but the lateral or



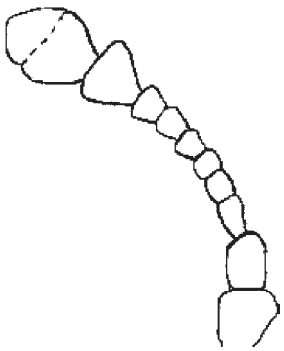
1. *Europs insterburgensis* sp. nov., habitus in dorsal view

latero-ventral view is impossible for this inclusion and the beetle is slightly deformed. It is difficult to separate the genera *Europs* WOLLASTON and *Aneurops* SHARP, 1900 on the base of a female specimen (the females of both species are morphologically very close to each other and have no median plaque on the first ventrite). According to BOUSQUET (2003a) the North American representatives of *Europs* have the total length 1.8-2.9 mm, whereas two described species of *Aneurops* (from southwestern US/Mexico and from Guatemala) are comparatively larger and have the body length 2.2-4.7 mm. The length of our specimen (2.1 mm) allows assigning of the fossil to *Europs* species.

The new species differs from extant congeners by wide head, uniformly dark body color, coarse punctation of pronotum and head. *Europs insterburgensis* sp.nov. resembles recent *Europs temporis* REITTER, 1884, but can be easily separated from that species by wide head, uniform body color, round punctures on pronotum, elytra with indistinct setae, longer body and by antennal proportions (longer third antennomere, wider second antennomere). A new species can be distinguished from *E. striatulus* FALL, 1907 by shorter elytra, from *E. flavidus* BOUSQUET, 2003 by wider head and not narrowly furrowed lateral margins of pronotum, from *E. frugivorus* BLATCHLEY, 1928 by punctation of pronotum not aligned in shape of horseshoe, from *E. fervidus* BLATCHLEY, 1928 by more dense and coarse punctation of the head , from *E. pallipennis* (LECONTE, 1861) by lesser body size and absence of impunctate median area on the front, from *E. sulcicollis* BOUSQUET, 2003 by absence of paired grooves on the pronotal disc. Unfortunately, the coxal bead of the first ventrite is invisible due to hind legs position.

DESCRIPTION

General. Body elongate, flattened, glabrous (Fig. 1). Body length = 2.1 mm, LP = 0.55, WP = 0.5 mm, WH = 0.5 mm, LE = 0.85 mm; pygidial length 0.14 mm. Colouration uniformly dark brown. Pubescence: setae on upper surface of body indistinct at 56x, tarsi and antennae with fine pubescence. *Head*. WH/WP = 1; front coarsely and dense punctured, the punctation on the frons is slightly finer than on the pronotum. The area between eyes with flat depression. Eyes convex, large and prominent, finely facetted. Temples short, 0.25x longitudinal diameter of eye, truncate. Antennae (Fig.



2. *Europs insterburgensis* sp. nov., antenna

2) reach the 1/3 of pronotal length; with 3-segmented antennal club (the club seems to be 2-segmented because fused antennomeres X and XI); antennomere IX transverse, as wide as antennomeres X and XI; scape (first antennomere) broader than segments II-VIII; antennomere III slightly shorter than antennomere II and longer than antennomeres IV-VIII. *Pronotum* slightly elongate (LP/WP=1.1); lateral margins not furrowed, more or less parallel, slightly convergent posteriorly; lateral sides crenulated; anterior angles rounded, not protruding; disc without grooves, rather flat; smooth, longitudinal, median impunctate area narrow (as wide as diameters of 2-2.5 punctures), about some width in anterior and posterior half; pronotal punctation round, irregular, coarse and dense on disc and on sides (slightly denser as on head surface); microsculpture indistinct. *Elytra* bare (without visible accumbent setae at 56x), each with rows of punctures forming striae, relatively short (LE/LP = 1.56), widest just before middle, truncated at the apex, exposing one abdominal tergite. Hind wings present. Scutellum oval, longitudinal, without setae. *Abdomen* 5-segmented, last visible sternite without modifications, densely and finely punctured; first ventrite without median setigerous plaque; the coxal bead of first ventrite obscured by hind legs. Tergite finely punctured. *Legs* with tarsal formula 4-4-4; femora wide; tibiae slightly curved. Ultimate tarsomere longer than all previous together.

Derivatio nominis

The species name is derived from Insterburg, the German name of the town Chernyakhovsk in Kaliningrad Region (Russia), the birthplace of the author.

DISCUSSION

The age of the Baltic amber ranges from Early to Late Eocene. During the millions of years comprising Middle and Late Eocene large amounts of resin were transported by rivers from Fennoscandia into marine Baltic deposits. Single pieces of Baltic amber are therefore not assignable to specific strata and horizons. The sediments containing the majority of Baltic amber in the Kaliningrad area are 47–38 million years old (Ritzkowski 1999).The Baltic amber forests grew in Eocene Scandinavia in a temperate to subtropical climate. Members of an arctotertiary flora of a circumboreal temperate climatic zone such as deciduous trees and members of a palaeotropical flora with evergreen trees and numerous palms grew together in this area (Dörfelt & Schmidt 2007.). The fauna of Coleoptera from Baltic amber has also the mixed (temperate-subtropical) character with affinities to the contemporaneous Oriental region, Mediterranean region, western and eastern North American coasts and lesser to Australian and Neotropical areas. The current distribution of *Europs* genus suggests that *Europs insterburgensis* sp.nov. was a subtropical element of the Eocene Baltic fauna.

Acknowledgements

I am obliged with my many thanks to Dr. Pavel I. Alekseev (St. Petersburg, Russia) for preparing the habitus photo of the specimen and to Dr. Yves Bousquet (Ottawa,

Canada) for literature dealing with North American Monotomidae. The study was supported by the Russian Foundation for Basic Research, project No 14-04-00262.

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Genus	Vol. 25(3): 421-424	Wrocław, 30 IX 2014

Zavaljus brunneus (Gyllenhal, 1808) – a beetle species new to the Polish fauna (Coleoptera: Erotylidae)

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Abstract. *Zavaljus brunneus* (Gyllenhal, 1808) (Erotylidae) was found in the Browsk District, Białowieża Primeval Forest, NE Poland. Beetles were reared from a log of a sun-exposed dead Eurasian aspen (*Populus tremula*). The species is a kleptoparasite associated with prey stored in nests of crabronid wasps (Hymenoptera, Crabronidae). Nests of wasps were located in old galleries of *Leptura thoracica* (Creutzer) (Coleoptera, Cerambycidae). *Zavaljus brunneus* is a new species to the Polish fauna.

Key words: entomology, faunistics, Coleoptera, Erotylidae, *Zavaljus*, new record, Białowieża Primeval Forest, Poland.

INTRODUCTION

The genus *Zavaljus* Reitter, 1880, formerly belonging to the family Languriidae as *Eicolyctus* Sahlberg, 1919, is now placed in the family Erotylidae, subfamily Xenoscelinae, and is represented by one Palaearctic species (Węgrzynowicz 2007), *Zavaljus brunneus* (Gyllenhal, 1808). It is a very rare beetle throughout its range and so far has been reported from Finland (Hyvärinen et al. 2006), Latvia (Telnov 2004, Tamutis et al. 2011), Sweden (Lundberg & Gustafsson 1995), the European part of Russia, and Slovakia (Węgrzynowicz 2007).

MATERIALS AND METHODS

To investigate insects associated with decomposing wood of Eurasian aspen (*Populus tremula* L.) we collected a log broken off from apical part (about 20 meters above the ground) of a freshly felled sun-exposed *P. tremula*. The tree was located in a small clearing in fresh broadleaved forest on the edge of the vast area of Białowieża Primeval Forest, NE Poland. This area is a managed, 85 years old, stand with Scots pine *Pinus sylvestris* L. as the dominant species, and admixture of Norway spruce *Picea abies* (L.) H. Karst, silver birch *Betula pendula* Roth, pedunculate oak *Quercus robur* L. and Eurasian aspen *P. tremula* (fig. 1).

RESULTS

As a result of rearing efforts, 10 individuals of *Z. brunneus* were obtained (fig. 2). The label data are as follows: Białowieża Forest: Browsk District: Pasieki ad Narewka (UTM: FD96), larvae 23 XI 2012, imagines ex. cult. indoors 1 – 15 III 2013, leg. J. Hilszczański, T. Jaworski and R. Plewa.

1. Habitat of *Zavaljus brunneus*

It is worth mentioning that the same wood of aspen was also inhabited by other beetle species: *B. bipunctatus*, *Cerylon histeroides* (F.) (Cerylonidae), *Latridius assimilis* (Mannerheim) (Latridiidae), and *Rusticoclytus rusticus* (L.) (Cerambycidae). Adult of another rare beetle, *Neomida haemorrhoidalis* (F.) (Tenebrionidae), was also found in the substrate.

DISCUSSION

The biology of *Z. brunneus* is insufficiently known. The literature data and our observations suggest that the species prefers standing dead trees with dried yet dense wood. The preferred biotopes are strongly sun-exposed trees and trees damaged by fire (Lundberg 1966). *Zavaljus brunneus* develops in wood of deciduous trees: poplar *Populus* L. spp., birch *Betula* L. spp., alder *Alnus* L. spp. and maple *Acer* L. spp., inhabited by various species of the family Crabronidae (Hymenoptera) (Palm 1948, 1951, Lundberg 1966). Wasps often use galleries of beetles to build their nests – in our case those of *Leptura* (*Macroleptura*) *thoracica* (Creutzer) (Cerambycidae). Crabronid females care for the offspring by providing them with food, which mainly consists of insects or arachnids. The victims are not killed but paralyzed and die after some time

2. *Zavaljus brunneus* (Gyllenhal, 1808), habitus dorsal (scale = 1 mm)

(SKIBIŃSKA 2004). For its development, *Z. brunneus* uses the food accumulated by wasps and is thus recognized as kleptoparasite (PALM 1951, LUNDBERG 1966). This form of feeding is a very rare phenomenon among European Coleoptera and few examples of such strategy were reviewed by SIITONEN & JONSSON (2012), e.g.: *Dermestes palmi* SJÖBERG (Dermestidae) associated with ants (Formicidae) and *Quedius dilatatus* (F.) (Staphylinidae) associated with true wasps (Vespidae).

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Genus	Vol. 25(3): 425-432	Wrocław, 30 IX 2014

Additions to paleotropical *Bruchidius* associated with Desmodieae (Coleoptera: Chrysomelidae: Bruchinae)

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Abstract. Three species of Bruchinae are reported for the first time from Vietnam as feeding in seeds of members of leguminous tribe Desmodieae (Fabaceae - Faboideae). Two of them are new to science and described in genus *Bruchidius*: *B. hoangi* and *B. madaguiensis*. A redescription of *B. minutissimus* (Motschulsky) is also provided.

Key words: entomology, taxonomy, Coleoptera, Bruchinae, new species, Desmodieae, *Alhagi, Dendrolobium, Desmodium*.

INTRODUCTION

Desmodieae are a leguminous tribe of Faboideae (or Papilionoideae) with numerous members in tropical regions; it is composed of 27 genera, of which *Desmodium* and *Lespedeza* are the largest. About 190 Desmodieae species are present in Vietnam according to Pham-Hoàng Hô (2002). Recent contributions by Delobel (2010a, b) for Asian Desmodieae and Chan et al. (2011) for world *Desmodium* have unveiled an unsuspected diversity of Bruchinae associated with this large group of plants.

I report here on three *Bruchidius* species reared from pod samples of *Dendrolobium lanceolatum*, *Desmodium gangeticum* and *Tadehagi triquetrum* that were collected in Vietnam. This brings the number of seed beetles species known to be associated with Desmodieae in Vietnam to sixteen, and to nineteen (or twenty) species for Asia as a whole. Techniques used for sample collection and rearing were similar to those described earlier (Delobel & Delobel 2003). Leguminous host plants were identified using the Flora of Vietnam (Pham-Hoàng Hô 2002), and botanical names were updated according to ILDIS (2014); I am greatly indebted to Dr. H. Ohashi (Tohoku University Herbarium, Sendai), who identified samples of *D. gangeticum* from Madagui. Abbreviations used: MNHN, Muséum national d'Histoire naturelle, Paris; CBAD, author's collection.

SPECIES DESCRIPTION

Bruchidius hoangi n. sp.

Type material

Holotype: Male, VIETNAM, Ba Ria – Vung Tau Province, Phuoc Buu, Ho Coc, 14.ii.2011, ex *Dendrolobium lanceolatum*, H. & A. Delobel coll., MNHN. Paratypes: 4 males, 5 females, same data as holotype, one male dissected, genitalia in drop of DMHF, MNHN (7), CBAD (2).

Description

Length (pronotum-pygidium): 1.6-2.0 mm; width: 1.1-1.3 mm.

Body stout, thick, pygidium subvertical. Integument almost entirely black; antenna testaceous, except segments 8-10 with apex, and apical half of last segment, darkened, four anterior legs testaceous to light brown, with last tarsal segment black; posterior legs black, except tarsal segments 2-4 partly or entirely brown.

Vestiture dense, made of scaly setae well covering integument, greyish, yellowish and light brown; pronotum disc with mixed yellowish and greyish setation, whitish laterally and on prescutellar lobes, last visible tergite white, with denser setation on basal triangle, along midline and on sides. On elytra, brownish setae form small patches: two on interval 3, 7 and 9, and less conspicuous areas on remaining intervals.

Male. Head short, eyes moderately bulging, maximum head width 1.46 times width behind eyes; eyes separated by 0.18 times head width including eyes; face short and narrow, with distance between posterior rim of eyes and apex of clypeus / distance between eyes = 4.0; eye shallowly cleft, width at bottom of sinus composed of 8 ommatidia; carina on frons well defined, interocular tubercule absent. Punctation of face dense, rather shallow, clypeus shining. Antenna (Fig. 1) moderately elongated, measuring about 70% body length (excluding head); antennal segments 1-3 submoniliform, 4-10 slightly widened towards apex, 1.2 to 1.3 times longer than wide, 11 oval (L/W = 1.8). Length of antennomeres: 1.8; 1.0; 1.5; 1.9; 2.0; 2.0; 2.2; 1.9; 1.9; 2.0; 3.3.

Pronotum subtrapezoidal, slightly campaniform, with greatest width at base (W/L = 1.32), its sides almost straight, not expanded behind eyes, with shallow oblique impression on sides of basal lobe. Pronotum disc with punctures strong and dense, ocellate, coalescent. Elytra 1.1 times longer than combined width, their sides convex; disc slightly concave basally; two tubercles at base of striae 3 - 5. Striae on disc deep, with large punctures; interstriae with strong microsculpture, on shining background.

Hind femur moderately incrassate, mesoventral margin with strong acute preapical denticle; hind tibia strongly widened towards apex, its carinae well defined; tibial mucro about 1.5 times longer than width of tarsomere 1 at base; lateral denticle about one third mucro length, and dorsal denticles inconspicuous.

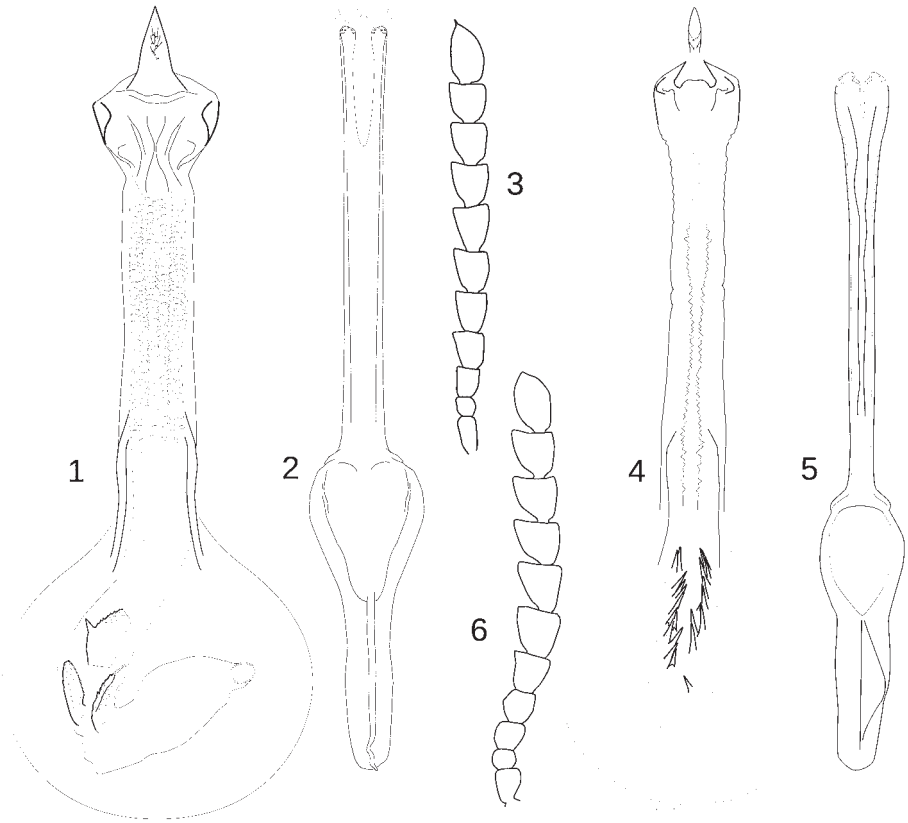
Abdomen telescoped, ventrite 1 with a very small patch of denser setation in basal angle, ventrite 5 emarginated, half as long medially as sternite 4; last visible abdominal tergite shield-shaped, slightly longer than wide, with apex not turned under.

Genitalia: Median lobe (Fig. 2) of moderate length, moderately stout (maximum width excluding basal hood / total length = 0.16), greatly widened apically; basal hood small, not emarginate; ventral valve large, subtriangular, moderately sclerotized, bearing a median group of 6 setae; dorsal valve braced by a wide sclerotized ring; internal sac lined with poorly sclerotized blunt tubercules on ventral wall of endophallus, and small teeth on dorsal wall; distally smooth, with three large sclerites bearing rows of minute denticles, the proximal one with a large straight tooth; gonopore large, ring-shaped. Basal strut (Fig. 3) with narrow keel; lateral lobes fused on one fourth of their length; apex of parameres with 6 small setae.

Female. Similar to male, but ventrite 5 not emarginated, longer than ventrite 4. Antennae shorter and darker than in male.

ETYMOLOGY

The species is dedicated to Tran Cong Hoang, for his keen and helpful interest in the discovery of new Vietnamese seed beetles.



1-6. Male *Bruchidius*: 1-3 – *B. hoangi* n. sp.; 4-6 – *B. madaguiensis* n. sp.; 1, 4 – median lobe; 2, 5 – lateral lobes and tegminal strut; 3, 6 – antenna

Host plants

Reared from seeds of *Dendrolobium lanceolatum* (Dunn) Schindl., a small tree present in Cambodia, Southern China, Laos, Thailand, and Vietnam (Ohashi 1973).

Discussion

In Delobel's key (2010), it would run to *B. phuanensis* Delobel, but it is smaller, with smaller and less conspicuous dark spots than the latter; in addition, the internal sac of *B. phuanensis* is devoid of large dented sclerites.

Distribution

Vietnam

***Bruchidius madaguiensis* n. sp.**

Type material

Holotype: Male, VIETNAM, Lâm Đồng *Province*, Đạ Huoai, KDL Madagui, ex *Desmodium gangeticum*, 11.i.2012, H. & A. Delobel, genitalia on cardboard, MNHN. Paratypes, 19 males, 13 females, same data as holotype, three males dissected, genitalia in drop of DMHF, MNHN (28), CBAD (4); 2 males, 1 female, same data but 15.ii.2012, MNHN.

Description

Length (pronotum-pygidium): 1.4-1.6 mm; width: 0.8-1.0 mm.

Body stout, rather thick, pygidium subvertical. Integument black, with four basal antennal segments testaceous, segment 5 darkened, anterior leg testaceous from femur base, median leg from femur apex; posterior leg black, except tarsal segments 1-4 partly reddish, particularly on underside.

Vestiture made of thin whitish, yellowish and dark brown setae, not completely covering integument; pronotum disc dark yellowish with a narrow white midline, its sides mostly white, interstriae 1-2 yellowish, on elytra, dark spots follow the usual pattern and form a well-defined black area at base on interstriae 3-8 and on intervals 5-10, just beyond middle; elytral apex black on internal half, whitish on external half; white setae are particularly dense on prescutellar lobe and along the longitudinal midline on pronotum, on pronotum sides, on two elongated spots on elytral interstria 3; they also form an acute triangle at base of last visible tergite.

Male. Head short; eyes strongly bulging, maximum head width about 1.4 times width behind eyes; eyes separated by 0.19 times head width including eyes; face moderately wide, with distance between posterior rim of eyes and apex of clypeus / distance between eyes = 3.6; eye deeply cleft, width at bottom of sinus composed of 4-5 ommatidia; carina on frons well defined, interocular tubercule strong, shining. Face alutaceous, with scattered puctures. Antenna (Fig. 4) long, measuring 67% body length; antennal segments 1-3 submoniliform, 4 subtriangular, following segments subserrate, eccentric, 11 oval (L/W = 1.8). Length of antennomeres: 1.7; 1.0; 1.3; 1.6; 1.9; 2.3; 2.3; 2.2; 2.2; 2.2;3.2.

Pronotum subtrapezoidal, slightly campaniform, with greatest width at base (W/L = 1.4), its sides feebly convex in middle, not expanded behind eyes; regularly convex in side view, without oblique impression on sides of basal lobe; cuticle with small, dense, coalescent and ocellate punctures on shagreened background. Elytra 1.1 times longer than combined width, their sides convex, maximum width beyond middle; disc not flattened; tubercle at base of interstriae 3 and 4 well developed, with minute teeth. Striae on disc narrow, stria 1 conspicuously deeper; interstriae wide and flat, with strong microsculpture.

Hind femur moderately incrassate; mesoventral margin with small, acute preapical denticle; hind tibia apically strongly widened, with dorsomesal and ventral carinae complete, other carinae barely discernible; mucro 1.2 times longer than width of tarsomere 1 at base; lateral denticle obtuse, about 1/3 mucro length, and dorsal denticles minute.

Abdomen strongly telescoped ventrally, with ventrite 5 emarginate, medially inconspicuous; ventrite 1 basally with an elongated, poorly defined patch of dense white setae. Last visible abdominal tergite shield-shaped, 1.1 times longer than wide at base, strongly convex, though with apex not turned under.

Genitalia: Median lobe (Fig. 5) elongated, thin, slightly widened apically (maximum width excluding basal hood / total length = 0.11); basal hood moderately wide, not emarginate; ventral valve strong, acutely triangular, with apex pointed, bearing two central groups of 2 setae; dorsal valve braced by a narrow sclerotized ring; internal sac lined with strands of small weakly sclerotized tubercles; saccus with two rows of large spines; distal bulb with thin multifid spicules, gonopore subcicular. Basal strut (Fig. 6) with a large and transparent keel; lateral lobes cleft to 10% their length; apex of parameres with a small conical expansion and six setae.

Female. Similar to male, but last visible tergite slanted about 20°, almost flat; base of ventrite 1 without area of dense white setation; last ventrite 3 times longer on midline than ventrite 4.

Etymology

This species is named after its locus typicus, the Madagui forest resort (Khu Du Lịch Rừng), 11°25’44”N, 107°34’43”E in Lâm Đồng Province.

Host plants

Larvae develop in the seeds of a local population of *Desmodium gangeticum* (L.) DC. with hairy stem and very short petioles (Ohashi, *in litt.*); the species is common throughout the tropical regions of the Old World, including Australia (ILDIS 2012).

Discussion

In Arora’s key (1980), this species would run to *B. mussooriensis* Arora, a beetle with uniform pubescence, median lobe with three sclerotized plates and truncated ventral valve. In Delobel’s key (2010b), it would run to *B.anderssoni*, a species with slightly lighter dorsal vestiture (in particular, basal and apical black elytral markings more extended in *B. madaguiensis*), with large sclerotized plates in saccus. Male genitalia in *madaguiensis* bear some similarities with those of *B. phuanensis* and *B.*

meibomiaca as the saccus have none of the large sclerites seen in other species of the group. *B. anderssoni* is known to feed in the larval stage in seeds of the same host plant as *B. madaguiensis*: *D. gangeticum* (Delobel, 2010b).

Distribution
Vietnam.

Bruchidius minutissimus (Motschulsky)

Bruchus minutissimus Motschulsky, 1858: 97.
Bruchidius minutissimus (Motschulsky): Vazirani, 1975: 747.

Studied material
2 males, 1 female, VIETNAM, Lâm Đồng Province, Di Linh, Gung Ré forest, pk 17 QL28, 26.xii.2011, ex *Tadehagi triquetrum*, H. & A. Delobel, CBAD.

Redescription
Length (pronotum-pygidium): 1.3-1.6 mm; width: 0.8-1.0 mm.

Body stout, thick, pygidium subvertical. Integument almost entirely black; base of antenna lightened (segments 2-3 testaceous, 1 and 4 brown), anterior (from middle of femur) and median legs (from extreme apex of femur) testaceous, with last tarsomeres darkened.

Vestiture made of whitish, yellowish and olive brown setae; white setae are denser on basal lobes of pronotum, on short fasciae at middle and second third of third interstria. Pronotum olive brown on disc (except short median line), whitish laterally, last visible tergite white. On elytra, dark setae form a large transverse stripe a little behind middle on interstriae 3 to 10, and two circular spots before and beyond white fascia of third and fourth interstria; apex black, with a few white setae.

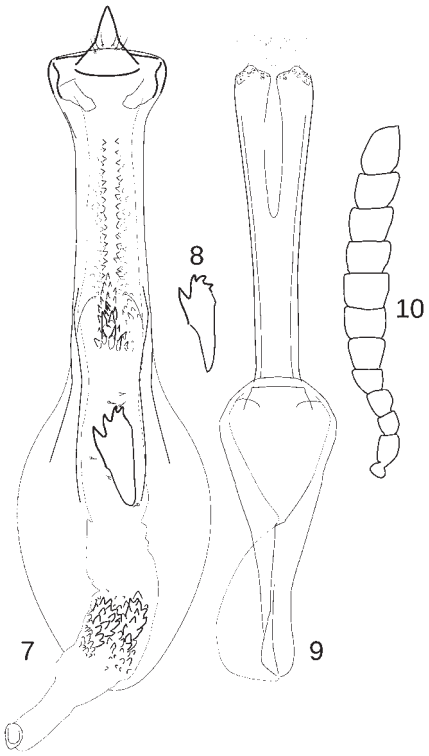
Male. Head short, wide; eyes moderately bulging, maximum head width 1.38 times width behind eyes; eyes separated by 0.25 times head width including eyes; face short and wide, with distance between posterior rim of eyes and apex of clypeus / distance between eyes = 2.66; eye deeply cleft, width at bottom of sinus composed of 4 ommatidia; carina on frons strong and wide, interocular tubercule shining. Punctation of face dense, rather shallow, clypeus strongly alutaceous. Antenna (Fig. 7) short, measuring about half body length (excluding head); antennal segments 1 to 3 submoniliform, 4 slightly widened towards apex, about as long as wide, 5-10 slightly transverse, 11 oval (L/W = 1.5). Length of antennomeres: 1.4; 1.0; 1.2; 1.2; 1.5; 1.6; 1.7; 1.6; 1.7; 1.7; 2.8.

Pronotum narrowly slightly campaniform, with greatest width at base (W/L = 1.32), its sides almost straight, not expanded behind eyes, with shallow oblique impression on sides of basal lobe. Pronotum disc with punctures strong and very dense, ocellate, coalescent. Elytra 1.1 times longer than combined width, their sides convex; disc flattened; a tubercle at base of striae 3 and 4, with a minute tooth visible at base at base

of stria 4. Striae on disc wide, with strong punctures basally; interstriae with strong microsculpture, coriaceous on disc. Hind femur moderately incrassate, mesoventral margin with small acute preapical denticle; hind tibia apically strongly widened, its carinae hardly discernible; apex of tibia with mucro longer than width of tarsomere 1 at base; lateral denticle about half mucro length, and dorsal denticles minute.

Abdomen strongly telescoped, with ventrite 5 emarginated, as long medially as sternite 4; ventrite 1 basally with a large patch of dense short setae. Last visible abdominal tergite shield-shaped, slightly longer than wide, with apex not turned under.

Genitalia: Median lobe (Fig. 8) of moderate length, moderately stout (maximum width excluding basal hood / total length = 0.17), subcylindrical, widened apically; basal hood small, not emarginated; ventral valve subtriangular, moderately sclerotized, bearing two lateral groups of 3 setae; dorsal valve braced by a wide sclerotized ring; internal sac basally lined with moderately sclerotized blunt tubercles; saccus smooth, with a large roof-like sclerite Fig. 9) ending proximally in four teeth, distally two heaps of sclerotized teeth; gonopore large, ring-shaped. Basal strut (Fig. 10) with wide transparent keel; lateral lobes fused on 47% their length; apex of parameres with 7-8 setae.



7-10. Male *Bruchidius minutissimus* (Mots.): 7 – median lobe; 8 – internal sac sclerite, variation; 9 – lateral lobes and tegminal strut; 10 – antenna

Female. Similar to male, but ventrite 5 not emarginated, longer than ventrite 4. Antennae shorter and darker than male.

Host plants

Reared from seeds of *Tadehagi triquetrum* (L.) H. Ohashi (Leguminoseae, Fabaceae, Desmodieae). This species is widespread in Southern and Southeastern Asia, and in Australia, introduced in Réunion and Mauritius islands (ILDIS 2012). Strangely, Kumar *et al.* (2010) report this insect as feeding on the leaves of jambolan (*Syzygium cumini* (L.) Skeels) in India.

Discussion

External and genital morphology is quite similar with that of *B. brincki* and *B. nebulatus*. Like *B. hoangi, B. minutissimus* is characterized by a saccus showing proximally an odd sclerite (roof or gutter-shaped) and a pair of strong, dented sclerites distally to the former, as in most species associated with Desmodieae (Delobel 2010a, b).

Distribution

India, Vietnam.

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Genus	Vol. 25(3): 433-440	Wrocław, 30 IX 2014

Two new *Bruchus* species from the Iranian highlands, with biological data (Chrysomelidae: Bruchinae)

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Abstract. Description of two *Bruchus* species from the highlands of Western and Northern Iran: *Bruchus nikdeli* reared from *Vicia canescens* seeds, and *Bruchus barimanii* reared from *Vicia canescens variegata (= V. persica)* seeds.

Key words: entomology, taxonomy, new species, Bruchinae, *Bruchus*, Iran.

Bruchus is a medium-sized genus of Bruchinae, with 37 species (including two *incertae sedis*) recognized by Anton (2010) in the "Catalogue of Palaearctic Coleoptera". A large number of species listed as *Bruchus* in Udayagiri & Wahdi's "Catalogue of Bruchidae" (1989) have since been or should be moved to other genera, mainly to *Bruchidius* (in particular, many African *Bruchidius* species were described by Pic as *Bruchus*). In fact, no true *Bruchus* occurs outside the Palearctic region, except for a few cosmopolitan or accidentally introduced species. *Bruchus* species are well characterized by a combination of four main morphological features: sides of pronotum usually with a pair of teeth, apex of middle tibia modified in males, aedeagus straight, and presence of a specialized genital plate (eighth abdominal sternite).

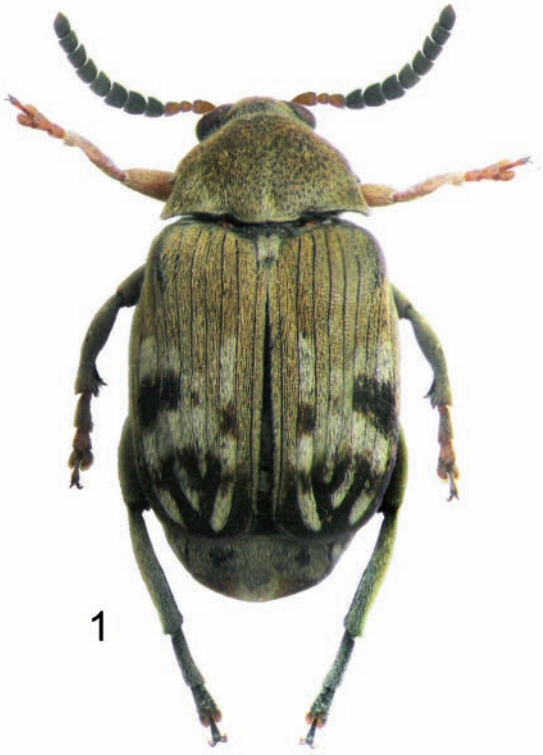
After Borowiec's pioneering work (1988) on *Bruchus* species groups, a combined analysis of molecular data and shape variation of the eighth abdominal sternite was performed on 25 *Bruchus* species by Kergoat & Alvarez (2008). It showed that these species cluster into seven phylogenetic groups, namely the *affinis, atomarius, loti, rufipes, tristis, pisorum,* and *brachialis* species groups. *Bruchus* species usually feed in

Vicieae seeds (genera *Lathyrus, Vicia* and *Lens*), and their diet breadth is very narrow (Delobel & Delobel 2006). Two remarkable *Bruchus* specimens were reared from seeds of *Vicia canescens* Labill. collected on the slopes of Mt. Sahand in the vicinity of Maraghe, Azarbaijan province. A second species was reared from *Vicia persica* Boiss., which is usually considered to be a synonym of *Vicia canescens* Labill. subsp. *variegata (*Willd.)P.H.Davis (Davis 1970, Pakravan 2000). Infested seeds were collected in the Alborz mountain range near the village of Poloor (or Polur), Mazandaran province. Both seed beetles are new to Science, and are described hereafter.

***Bruchus nikdeli* sp. nov.**

Type material

Holotype: Male, "IRAN, Azarbaijan, Maraghe-Sahand, 19.vi.2011, ex *Vicia canescens*, M. Nikdel coll." "*Bruchus nikdeli* n.sp., Delobel & Sadhegi des. 2013", dissected (Delobel 02413), MNHN. Paratype, male, same data as holotype, dissected (Delobel 02513), MNHN.

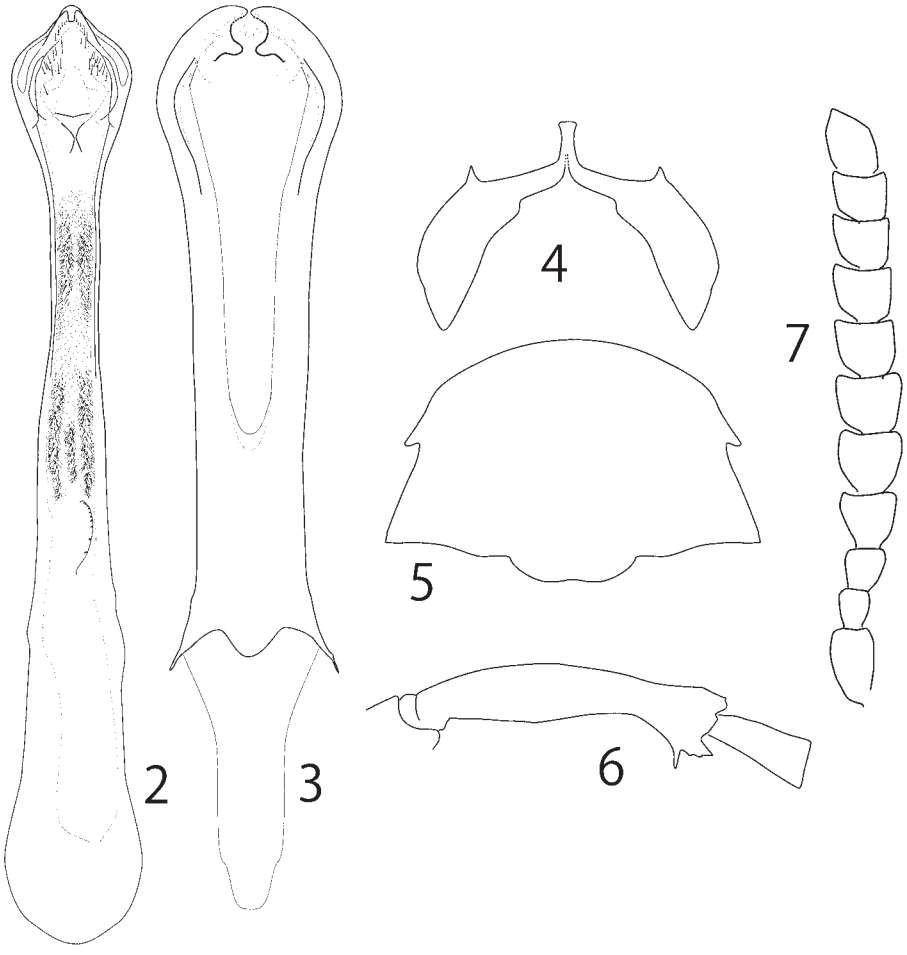


1. Male of *Bruchus nikdeli*, habitus

Description

Length: 2.2 (PT)- 4.1 (HT) mm; width: 1.1(PT)- 2.3 (HT) mm.

Body (Fig. 1) black, except three basal antennal segments, fore legs from middle of femur, mesotarsi and very briefly mesotibial apex, reddish-orange. Dorsal vestiture thin and long, dense to very dense, yellowish grey to light olive; postocular lobes and a circular spot on temple with dense white setae; elytra with whitish (white in holotype) elongated spot on interval 5, interrupted by two black spots, and apex of intervals 3, 5-7, and 9; dark (black in holotype) rounded spot beyond middle of elytral side, surrounded by whitish or white setation, rest of elytral apex dark or black; pygidium yellowish-grey, with a pair of large lateral, ill-defined dark spots; ventral vestiture thin, light greyish to white.



2-7. Male of *Bruchus nikdeli*: 2 – median lobe; 3 – lateral lobes and tegminal strut; 4 – eighth ventrite; 5 – pronotum; 6 – mesotibia; 7 – antenna

Male. Head short, eyes moderately bulging, separated by 0.24 times head width including eyes; face wide, distance between posterior rim of eyes and apex of clypeus / distance between eyes = 3.1; ocular sinus two thirds length of eye, width at bottom of sinus composed of 8 ommatidia; frontal carina absent. Punctation of face very dense, small, rugose, apex of clypeus straight. Antenna (Fig. 7) measuring 0.4 times body length; antennal segments 1-3 submoniliform, 4 subtriangular, 5-10 subserrate, slightly wider than long, 11 apically pointed (L/W = 1.7). Length of antennomeres: 1.8: 1; 1.1; 1.4; 1.5; 1.4; 1.4; 1.3; 1.3; 1.2; 1.9.

Pronotum (Fig. 5) moderately transverse (W/L = 1.55), broadly semicircular, lateral tooth near middle, well developed, sticking backwards; cervical sulcus visible only laterally; basal lobe sulcate, oblique impression on sides of basal lobe. Disc convex, shining with very dense punctuation, partly foveolate and coalescent. Elytra distinctly wider than pronotal base, 1.2 times longer than combined width, their sides convex, maximum width beyond middle; no teeth at base of striae; humeral callus moderate; striae on disc thin and sharp; interstriae flat, with thin puncation on alutaceous background.

Mesofemur broadened, mesotibia (Fig. 6) short, arcuate and bisinuate on mesal side, widened apically into a bifid plate, distal point a strong hook pointing distally, recess between denticles about as large as maximum width of first mesotarsal segment. Hind femur moderately incrassated; mesoventral margin with well-defined preapical notch; apex of hind tibia with mucro much longer than lateral and dorsal denticles, measuring about 0.4 apical width of tibia.

Abdomen with ventrite 5 emarginated. Last visible abdominal tergite shield-shaped, slightly longer than wide at base, with apex convex, slightly turned under.

Genitalia: Median lobe (Fig. 2) of moderate length, slender (maximum width excluding basal hood / total length = 0.13), apically widened; basal hood hardly sclerotized, long and slender, not emarginate; ventral valve strongly sclerotized, subovate, strongly curved ventrally, with blunt apex, bearing two lateral groups of about 18 setae, 4-5 of which very small; internal sac with two distinct masses of dense spicules, separated by an almost smooth area with numerous sensillae; a curved dentate sclerite towards apex. Basal strut (Fig. 3) transparent; lateral lobes cleft to 68% their length; apex of parameres strongly bowed, highly modified, with strongly sclerotized dented plate, transparent wing and numerous setae of different types. Eighth tergite (Fig. 4) strongly sclerotized, wide, with apical margin thickened and dented.

Female. Unknown

Etymology

The species is dedicated to its first collector, Mostafa Nikdel, Agricultural and Natural Resource Center of East Azarbaijan (Iran).

Host plants

Larvae develop in the seeds of *Vicia canescens* Labillardière (Leguminoseae, Fabaceae, Vicieae), a montane species native to Western Asia (Iran, Iraq, Turkey,

Lebanon). To the best of our knowledge, no seed beetle was ever reared from *V. canescens* seeds.

Discussion

Differs from closely related *B. barimanii* in the following features: elytron with striking colour pattern, mesotibia strongly curved, with a strong hooked denticle oriented distally; antenna slightly shorter and stouter, with 6th segment 1.12 times wider than long (slightly longer than wide in *barimanii*); eighth ventrite with a single pair of teeth.

Distribution

Mountains of North Western Iran, between 2800 and 3400 m. a.s.l.

***Bruchus barimanii* sp. nov.**

Type material

Holotype: Male, "IRAN, Mazandaran, Amol, Polor, 30.vi.2010, ex *Vicia persica,* H. Barimani coll." "*Bruchus barimanii* n.sp., Delobel & Sadhegi des. 2013", MNHN. Paratypes, 3 males, 7 females, same data as holotype, two males dissected (Delobel 03613 & 03713), MNHN.

Description

Length: 4.0- 4.5 mm; width: 1.8-2.3 mm.

Body black, except two basal segments of antenna (in some specimens only one, rarely also base of third), fore legs from base or middle of femur, reddish-orange. Dorsal vestiture dense, head yellowish grey on vertex and frons, whitish on clypeus; postocular lobes and a circular spot on temple with dense white setae; pronotum yellowish to orange, with base lighter, scutellum whitish, elytra uniformly dull yellowish-orange, with slightly lighter elongated spots visible in some specimens on intervals 5 and 7; pygidium light grey, with yellowish lateral areas; ventral vestiture whitish.

Male. Head short, eyes moderately bulging, separated by 0.29 times head width including eyes; distance between posterior rim of eyes and apex of clypeus / distance between eyes = 2.3; ocular sinus three quarters length of eye, width at bottom of sinus composed of 5-6 ommatidia; frontal carina absent. Punctation of face very dense, small, rugose, apex of clypeus straight. Antenna (Fig. 13) measuring almost half body length; antennal segments 1-3 submoniliform, 4 subtriangular, 5-10 subserrate, 4-6 slightly longer than wide, 11 apically pointed (L/W = 1.7). Length of antennomeres: 1.8: 1; 1.3; 1.6; 1.9; 1.7; 1.6; 1.6; 1.5; 1.4; 2.3.

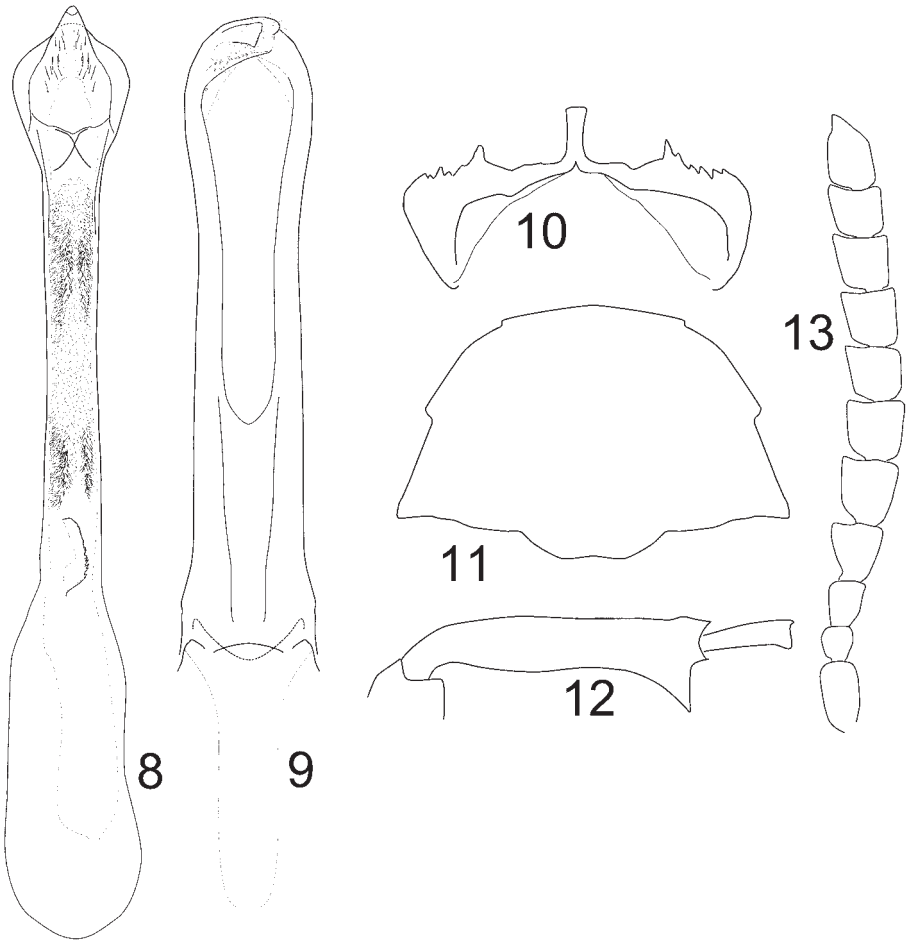
Pronotum (Fig. 11) moderately transverse (W/L = 1.57), broadly semicircular, strong lateral tooth near middle; cervical sulcus well visible laterally; basal lobe sulcate, oblique impression very faint on sides. Disc convex, shining, with very dense punctuation, partly foveolate and coalescent. Elytra distinctly wider than pronotal base, 1.1 times longer than combined width, their sides convex, maximum width at basal third; no teeth at base of striae; humeral callus moderate; striae on disc thin and sharp;

interstriae flat, with thin puncation on alutaceous background.

Mesofemur broadened, mesotibia (Fig. 12) slightly bisinuate on mesal side, widened apically into a bifid plate with distal tooth much smaller than proximal denticle, recess between them slightly wider than maximum width of first mesotarsal segment. Hind femur moderately incrassated; mesoventral margin with well-defined preapical notch; apex of hind tibia with mucro much longer than lateral and dorsal denticles, measuring about 0.3 apical width of tibia.

Abdomen with ventrite 5 emarginated. Last visible abdominal tergite shield-shaped, slightly longer than basal width, with apex stongly bulging, slightly turned under.

Genitalia: Median lobe (Fig. 8) of moderate length, slender (maximum width excluding basal hood / total length = 0.12), apically widened; basal hood hardly sclerotized, long and slender, not emarginated; ventral valve strongly sclerotized, subovate,



8-13. Male of *Bruchus barimanii*: 8 – median lobe; 9 – lateral lobes and tegminal strut; 10 – eighth ventrite; 11 – pronotum; 12 – mesotibia; 13 – antenna

recurved, with blunt apex, bearing two lateral groups of about 15 setae; internal sac with two distinct masses of dense spicules, separated by a large smooth area bearing sensillae; towards apex a curved sclerite with strong teeth in distal half only. Basal strut transparent; lateral lobes cleft to 64% their length; apex of parameres (Fig. 9) highly modified, with a strongly sclerotized plate, a transparent wing and numerous setae of different types. Eighth tergite (Fig. 10) strongly sclerotized, wide, with apical margin thickened and dented.

Female. Similar to male, usually a little larger (length = 4.5 mm, width = 2.4 mm). Ventrite 5 not emarginated, last visible tergite without apical boss, but with two wide lateral depressions in apical half, setation converging towards median longitudinal ridge.

Etymology

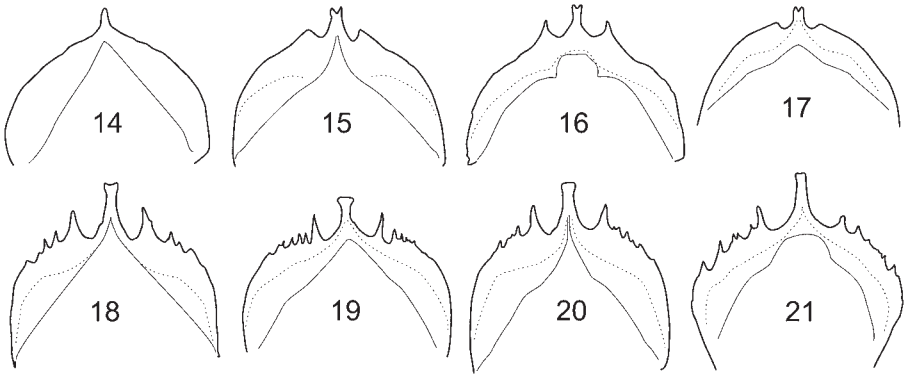
The species is dedicated to its first collector, Hassan Barimani, Agricultural and natural resource Center of Mazandaran province, Iran.

Host plants

Larvae develop in the seeds of *Vicia canescens* Labillardière subsp. *variegata (*Willd.)P.H.Davis., also known as *V. persica* Boiss.

Discussion

Specimens in this taxon could represent mere color forms of *B. nikdeli* because external differences are rather tenuous. Clear differences in genital morphology however point to the existence of a distinct species. *B. barimanii* also shows strong morphological similarities with *B. lugubris* Fähr., the type (not seen) of which is a female from Western Iran with three basal segments of antenna and apex of front tibia testaceous, rest of body and appendages being entirely black. Elytral vestiture in *B. lugubris* is a mixture of brown and white setae (Fähraeus 1839), whereas it is homogeneously yellowish in the new species.



14-21. Species-group *Bruchus rufipes*, eighth ventrite of male: 14 – *griseomaculatus*; 15 – *loti;* 16 – *rufipes*; 17 – *luteicornis*; 18 – *libanensis*; 19 – *sibiricus*; 20 – *occidentalis*; 21 – *lugubris*

DISTRIBUTION

Alborz (or Elburz) mountain range, Northern Iran.

CONCLUSION

The shape of the eighth abdominal sternite in the two new species (Fig. 4 & 10), although distinct, shows some similarity with members of the *rufipes* species group, which comprises (Fig. 16-21) *Bruchus libanensis* ZAMPETTI*, B. lugubris, B. luteicornis* ILLIGER, *B. occidentalis* LUKJANOVITSCH & TER-MINASSIAN*, rufipes* HERBST*, sibiricus* GERMAR*,* and (with doubt) *griseomaculatus* GYLLENHAL (Fig. 14). *Bruchus loti* PAYKULL (Fig. 15) may also belong to the same group, but its status is not fully resolved (KERGOAT & ALVAREZ 2008). Main traits supporting the placement of *nikdeli* and *barimanii* within the *rufipes* group include the following (see BOROWIEC 1988): pronotal teeth near middle of side, mesotibial plate ending in two sharp teeth, metatibial mucro distinctly longer than rest of coronal denticles, median lobe slender, its apex widened, internal sac with two distinct groups of dense spicules. A crescent-shaped dented sclerite is met, not only in the internal sac of members of the *rufipes* group, but in the *atomarius* group as well. It is however absent in *B. griseomaculatus*, a presumptive member of the group. It is also worth mentioning here that *B. nikdeli* and *B. barimanii*, as most members of the r*ufipes* group (DELOBEL & DELOBEL 2006), feed on *Vicia* seeds.

ACKNOWLEDGMENTS

The authors thank Klaus-Werner ANTON (Emmendingen, Germany), for his enlightening remark on one of the new species.

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Genus	Vol. 25(3): 441-449	Wrocław, 30 IX 2014

Two new species of the genus *Achaenops* Suffrian, 1857 from Western Cape, South Africa (Coleoptera: Chrysomelidae: Cryptocephalinae)

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Abstract. Two new species of the genus *Achaenops* Suffrian, 1857, *A. thoracicus* sp. n. and *A. tablensis* sp. n. from the Western Cape Province of South Africa, are described and illustrated. *Achaenops thoracicus* differs from all other species in the genus by the puncturation of its pronotum, inflated prothorax, and extended fore tarsi in males. Males of *A. tablensis* show characteristic extended, lobate genae. The genus *Achaenops* is known from South Africa only

Key words: entomology, taxonomy, Chrysomelidae, Cryptocephalinae, Cryptocephalini, Achaenopina, Afrotropical, South Africa.

INTRODUCTION

The sub-tribe Achaenopina Clavareau, 1913, of the leaf beetle subfamily Cryptocephalinae, includes only the genus *Achaenops* Suffrian, 1857 and is endemic to southern Africa. *Achaenops* was described by monotypy and remained relatively unknown until recently, when it was shown to be more diverse and distributed predominantly in the Western Cape Province (Schöller 2006; 2013; 2014a). *Achaenops* spp. can be readily distinguished, from species of *Cryptocephalus* Geoffroy, 1762 of similar size, by their bordered basal pronotal margin and from *Acolastus* Gerstaecker, 1855 spp. it can be distinguished by their broad prosternal process (Schöller 2014b). In this contribution, two new species are described from the Western Cape Province of South Africa, bringing the total number of described species in the genus to 13.

MATERIALS AND METHODS

Included in this study are specimens located in the following collections:

BMNH = The Natural History Museum, London, United Kingdom (M. Barclay);
ZMHB = Museum für Naturkunde, Leibniz-Gemeinschaft, Berlin, Germany (J. Frisch and M. Uhlig);
NHRS = Naturhistoriska Riksmuseet, Stockholm, Sweden (J. Bergsten);
SANC = South African National Collection of Insects, Pretoria, South Africa (E. Grobbelaar).

Label data are cited *verbatim* for type specimens. A double forward slash (//) separates data from different labels, and a single forward slash (/) separates data from different lines on the same label. The data are printed, unless otherwise stated, and the author's remarks are presented in brackets: (ink) = preceding data are hand-written, and [white] = white label. Paratypes are individually labelled, and listed in the text as follows: number of specimens, sex, and collection in which they are housed. The paratype number is on the reverse side of this label. Dried adults were softened in hot water prior to dissection. The abdomen was then dissected from the thorax in water, and its contents were removed. They were subsequently soaked in cold 10% KOH for 1 hour and then rinsed in distilled water. The aedeagus, spermatheca, and gut containing the kotpresse were dissected from the rest of the tissue. Eye length was measured in lateral view, and the interocular space in frontal view at the narrowest point. All measurements were made using an ocular grid mounted on a stereomicroscope (20 × magnification for the body length; 40-70 × magnification for the remaining measurements). Habitus photographs were taken with a Nikon D5100 digital camera, and then stacked with Combine Z software.

Observed variation within a species has been recorded as follows: size [mm] (mean ± standard deviation (max., min., n)).

DESCRIPTION OF TWO NEW SPECIES

Achaenops thoracicus n. sp.

(Figs 1-8)

Etymology

The Latin term *thorax* means chest, the name refers to the large prothorax found in males of this species.

Type specimens

Holotype (male, SANC): SOUTH AFRICA, C.P. / Rooiels 34.18 S / 18.49 E; 24.xii.1989 / B. Grobbelaar [white label] // NATIONAL COLL. / OF INSECTS / Pretoria, S.Afr. [white label] // HOLOTYPUS *Achaenops* / *thoracicus* des. C. Adarkwah & M. Schöller [red label]. 20 paratypes: 4 males (paratype numbers 1-4), 8 females

BMNH (paratype numbers 5-12); 1 male (paratype number 13), 2 females ZMHB (paratype numbers 14-15): Table Mt. / Cape of G. Hope [blue line] / W. Bevins. / 1906-167.; 3 males, 1 female NHRS (paratype numbers 16-19): Afrika // GDeV // Riksmuseum Stockholm [green]; 1 male BMNH (paratype number 20): Cape Province. / Swellendam. / ii.1932 // S. Africa. [blue line] / R.E.Turner / Brit. Mus. / 1932-145.; all paratypes have the following authors label: PARATYPUS *Achaenops* / *thoracicus* n.sp. / des. C. Adarkwah & M. Schöller [red label].

Type locality

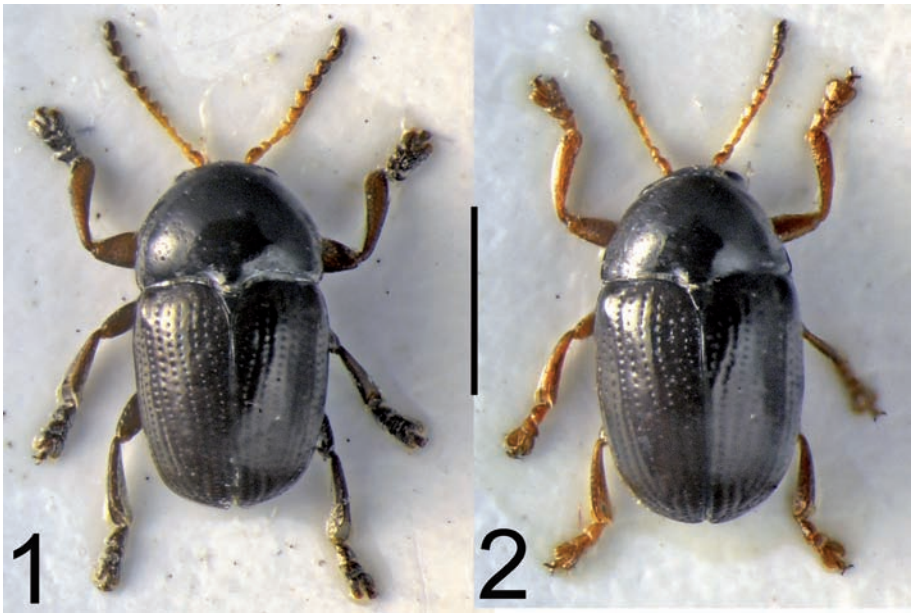
Rooiels, Republic of South Africa, a small settlement about 51.5 km SE of Table Mountain (ca. 34°18'13.49"S 18°48'59.92"E).

Diagnosis

A medium sized dark reddish- to blackish-brown species (Figs 1-2); pronotum impunctate basally anteriad of scutellum, finely punctate anteriorly, coarsely punctate laterally, and not shagreened; elytra regularly punctate striate; clypeus unmodified; and prothorax inflated, as broad as elytra basally in males. Differs from *A. monstrosus* Schöller, 2006 by its smaller size, different puncturation of the pronotum, and unmodified clypeus.

Description

Male, holotype: length 2.05 mm, elytral width at humeri 1.15 mm, pronotal length 0.65 mm and pronotal width 1.15 mm, and length of antenna 1 mm.



1-2. *Achaenops thoracicus* sp.n., habitus: 1 – male, 2 – female. Scale bar = 1 mm

Head. Visible in dorsal view, blackish-brown, shiny, with dense, coarse and deep punctures, finely shagreened; antennae uniformly yellowish brown; labrum brown with pale yellow anterior margin; mandibles brown; labial palpi acute; eyes small with dorsal lobes distant, distance between dorsal lobes 1.5 times eye length, eyes evenly convex, with deep triangular canthus; antenna short 0.45 x body length, antennomeres 5-11 apically expanded, antennae inserted on frons between ventral lobes of eyes.

Thorax. Pronotum blackish-brown and shiny, prothorax dark reddish-brown ventrally; pronotum transverse, broader than base of elytra basally, lateral margins narrow, visible in dorsal view towards posterior angles; posterior angles with an extended setigerous pore, and median lobe of basal margin truncate and slightly raised; impunctate basally anteriad of scutellum, finely punctate anteriorly, and coarsely punctate laterally, not shagreened; intercoxal prosternal process elongate, slightly narrower than width of coxal cavity, anterior margin convex with a broad carina, and truncate basally; hypomeron densely and coarsely punctured; scutellum narrowly triangular, raised above the elytra apically; elytra reddish dark brown, epipleura pale reddish-brown; each elytron with eight regular rows of punctures plus a scutellar and a marginal row, interstices shiny, smooth; legs reddish-brown, fore femora and tibiae yellowish-brown; external edge of tibiae simple, fore tibiae only slightly longer than hind tibiae, and only slightly bent, no tibial spurs; fore tarsi broader than mid- and hind tarsi, tarsal claws small and simple.

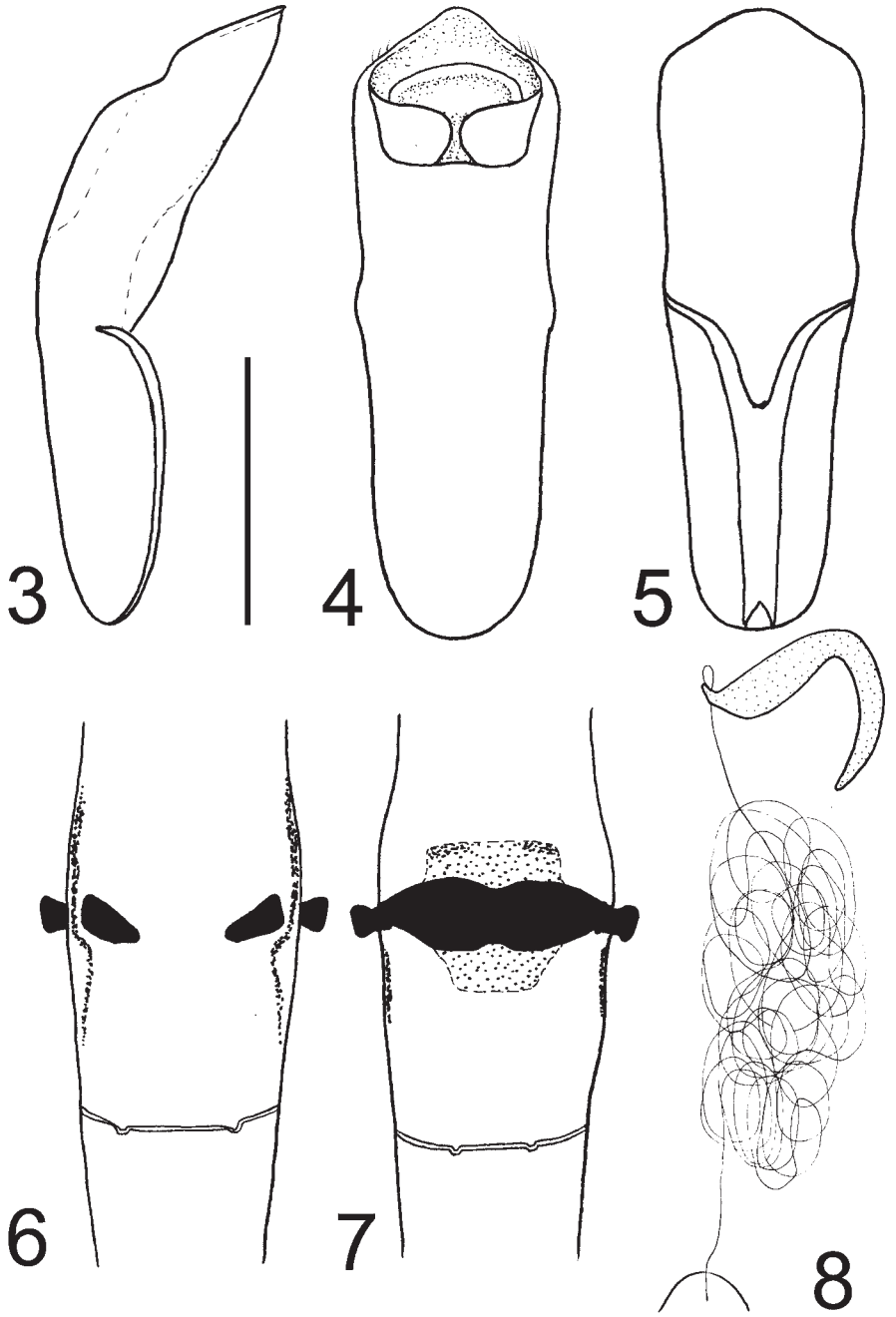
Abdomen. Venter blackish-brown; sternites and pygidium with coarse punctures and short white setae, pygidium shagreened and covered by elytra; aedeagus 0.55 mm long, moderately sclerotized, down-curved towards the apex in lateral view (Fig. 3) and concave ventrally (Fig. 5), apex triangular and symmetrical, with a pair of triangular frenula (sensu Sassi, 2014) and a transverse, semilunar endosclerite visible in the ostium (Fig. 4). Length of aedeagus 0.55 mm, and spiculum gastrale narrowly Y-shaped (Fig. 5).

Female

Head: As in male, but eyes medium-sized, distance between dorsal lobes 1.27 times eye length.

Thorax. Smaller than in male, more attenuate towards apex, sides more straight in dorsal view; legs yellowish brown.

Abdomen. Egg-hollow shallow, apical margin of apical ventrite shallowly convex; spermatheca pale brown, hook-shaped, with pump slightly shorter than reservoir, spermathecal duct emerging from a cone-shaped extension of the reservoir, duct very fine and densely coiled, coiled length ca. 0.5 mm (Fig. 8); kotpresse (= rectal apparatus for forming the faecal pellets covering the eggs, see Erber 1968, Schöller 2008) with small, transversely triangular dorsal sclerites that narrow towards medial fold, dorsal sclerites not attached to sinuose sclerotization of the lateral fold, and no sclerotized areas posterior to dorsal sclerites (Fig. 6); ventral sclerite a broad crosswise band narrowing in the middle and towards either side and broader than the rectum, apodemes small, a pigmented ventral chitinpolster present both distally and proximally of the ventral sclerite, ventral sclerotizsatins of lateral fold present (Fig. 7).



3-8. *Achaenops thoracicus* sp.n.; 3-5 – aedeagus: 3 – lateral, 4 – dorsal, 5 – ventral; 6-7 – kotpresse: 6 – dorsal, 7 – ventral; 8 – spermatheca and spermathecal ductus. Scale bar = 0.2 mm

Variation

Little variation was found in size: length: male: 2.06 mm ± 0.04 (2.10, 2.00, 5); female: 2.18 mm ± 0.04 (2.25, 2.15, 5); width of elytra at humeri: male: 1.15 mm ± 0.01 (1.15, 1.13, 5); female: 1.21 mm ± 0.01 (1.23, 1.20, 5); length of elytron: male: 1.30 mm ± 0.04 (1.35, 1.25, 5); female: 1.51 ± 0.06 (1.60, 1.45, 5); pronotum: length in male: 0.67 mm ± 0.03 (0.70, 0.65, 5), width in male:1.15 mm ± 0.00 (1.15, 1.15, 5); pronotum: length in female: 0.66 mm ± 0.02 (0.70, 0.65, 5), width in female: 1.16 mm ± 0.01 (1.18, 1.15, 5); and length of antenna: male: 0.97 mm ± 0.03 (1.00, 0.95, 5); female: 0.93 mm ± 0.06 (1.03, 0.90, 5).

The distal ventral chitinpolster of the kotpresse is not always pigmented.

Host plant

Unknown.

Distribution

Known from the Western Cape Province only.

***Achaenops tablensis* n. sp.**

(Figs 9-12)

Etymology

The name refers to the collection site of the type series, Table Mountain.

9. *Achaenops tablensis* sp.n., habitus, male. Scale bar = 1 mm

Type specimens

Holotype (male, BMNH): Table Mt. / Cape of G. Hope [blue line] / W. Bevins. / 1906-167.// *Achaenops tablensis* n. sp. / HOLOTYPUS des. C. Adarkwah & M. Schöller [red label].

2 paratypes: 1 male, BMNH (paratype number 1): same label as holotype; 1 male NHRS (paratype number 2) // Afrika // GDeV //; Riksmuseum Stockholm [green]; both paratypes have the following authors label: Paratypus *Achaenops* / *tablensis* n.sp. / des. C. Adarkwah & M. Schöller [red label].

Type locality

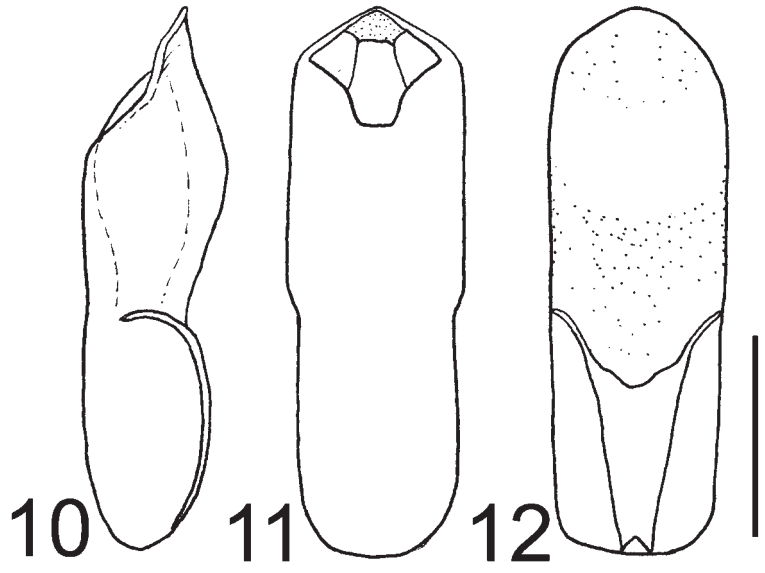
Republic South Africa, Table Mountain, Cape of Good Hope (33°57'S, 18°25'E).

Diagnosis

A medium-sized species with a dark reddish- to blackish-brown head, pronotum, elytra, tarsi and venter, and orangey-brown legs; pronotum short in male and genae extended and lobate (Fig. 9). Differs from *A. dorsalis* Suffrian, 1857 by the colouration of the pronotum and modified gena.

Description

Male, holotype: length 2.30 mm, elytral width at humeri 1.05 mm, elytral length 1.30 mm, pronotal length 0.65 mm and pronotal width 1.05 mm, and length of antenna 1.05.



10-12. *Achaenops tablensis* sp.n.; aedeagus: 10 – lateral, 11 – dorsal, 12 – ventral. Scale bar = 0.2 mm

Head. Visible in dorsal view, shiny, with few sparse coarse punctures, not shagreened, labrum yellowish-brown with dark brown apical margin, mandibles yellowish-brown, gena dark brown, extended and lobate; labial palpi acute; eyes small with dorsal lobes distant, distance between dorsal lobes 2.17 times eye length, eyes evenly convex, with very shallow canthus; antenna short, i.e. 0.47 x body length, antennomeres 1-4 yellowish-brown, antennomeres 5-11 dark brown, antennomeres 7-11 slightly expanded apically, antennae inserted on frons between ventral lobes of eyes.

Thorax. Pronotum blackish-brown and shiny; sub-rectangular and transverse, 1.91 times wider than long, lateral margins carinate and visible in dorsal view; median lobe of basal margin truncate, and slightly raised apically, pronotum feebly convex in lateral view; posterior angles with a setigerous pore; punctures very shallow and coarse, but distinct, very sparse on disc, becoming even more sparse laterally; intercoxal prosternal process elongate, 1.4 times longer than wide, 0.75 times the width of the coxal cavity, anterior and posterior margins straight without a carina; hypomeron impunctate; scutellum triangular, not raised above elytra apically; elytra each with 9 regular rows of fine punctures and a scutellar and a marginal row, striae slightly impressed, interstices shiny and smooth; epipleuron 2/3 the length of the elytron; all femora and tibiae orangey-brown, tarsi dark brown; no tibial spurs, fore tibiae slightly longer than hind tibiae, and slightly curved, claws small and simple.

Abdomen. Sternites with fine punctures and short white setae, last ventrite depressed medially, hind margin of apical visible ventrite truncate, slightly convex, pygidium with fine punctures and short white setae; elytra covering 50% of pygidium; aedeagus well sclerotized, dark brown, bulging ventrally in lateral view (Fig. 10), without a ventral ridge (Fig. 12), parallel sided in dorsal view with a symmetrical triangular tip, a pair of triangular frenula, and a central endosclerite visible in the ostium (Fig. 11), length of aedeagus 0.60 mm, spiculum gastrale broadly Y-shaped (Fig. 12).

Host plant

Unknown.

Distribution

Known from the type locality in the Western Cape Province only.

Acknowledgements

We would like to express our sincere thanks to colleagues mentioned in the 'material and methods' section for allowing us to study the specimens from their respective collections, and Beth Grobbelaar for reviewing and significantly improving the text. MS received funding for the study of specimens housed in NHRS from the European Union's Seventh Framework Programme (FP7/2007-2013) under grant agreement n°226506 (SYNTHESYS)

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Genus	Vol. 25(3): 451-457	Wrocław, 30 IX 2014

Clitenososia vazquezi sp. nov. from Kenya (Coleoptera: Chrysomelidae: Galerucinae)

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Abstract. *Clitenososia. vazquezi* sp. nov. is described from Kenya. A key to adults of the species of *Clitenososia* is presented.

Key words: entomology, taxonomy, Chrysomelidae, Galerucinae, *Clitenososia*, new species, key, Africa, Kenya.

INTRODUCTION

The African genus *Clitenososia* was erected by Laboissière (1931) with *Clitena fulva* Laboissière, 1922 as the type species. The genus comprises three species: besides the genotype also *Clitenososia flava* Laboissière, 1940 and *C. maculicollis* Laboissière, 1931. The genus *Clitenososia* is characterized among Coelomerites by the completely pubescent dorsal surface and the combination of presence of an apical mesotibial spine and absence of an apical spine on the metatibiae.

Through José Miguel Vela I received a series of a hitherto unknown *Clitenososia* collected in Kenya by Xavier Vázquez. This species is characterized by the uniform black colour of the antennae and strong punctation of the upper surface of pronotum and elytra. This species is described herein.

Acronyms

JBCB - Jan Bezděk collection, Brno, Czech Republic;
JMVM - José-Miguel Vela collection, Málaga, Spain;
RBCN - Ron Beenen collection, Nieuwegein, The Netherlands.

DESCRIPTION

Clitenososia vazquezi sp. nov.

1. *Clitenososia vazquezi* sp. nov., habitus (female paratype)

TYPE MATERIAL

Holotype ♂: S. KENYA, Malindi, 23 vii 1991, X. VÁZQUEZ: (RBCN).

Paratypes: S. KENYA, Malindi, 23 vii 1991, X. VÁZQUEZ (2 ♀♀ RBCN, 1 ♂, 3 ♀♀ JMVM, 1 ♀ JBCB). The specimens are provided with red label: HOLOTYPUS (or PARATYPUS) *Clitenososia vazquezi* n. sp., R. BEENEN det 2013.

DESCRIPTION

♂ Length: 8.50-8.75 mm (total length); 8.25-8.45 mm (from the anterior border of the eyes to the tip of the elytra). Macropterous. Marroon coloured, elongate species with black patch on frons and blackish shading of the surface of the pronotum (figure 1). Upper body surface covered with fine pubescence. Underside, legs and antennae black to blackish brown. Underside covered with fine pubescence except postgenal ares of head and episternes of prothorax.

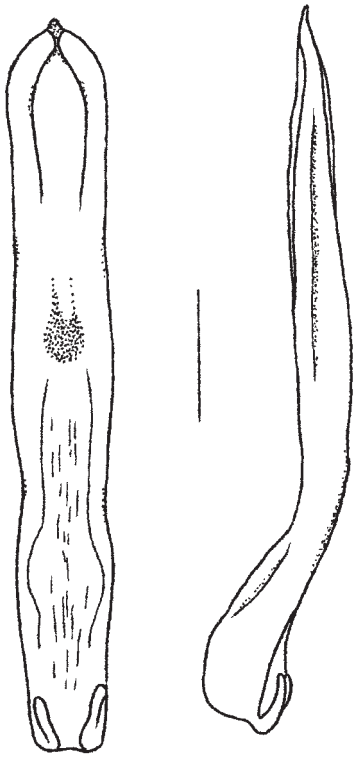
2. *Clitenososia vazquezi* sp. nov., head and pronotum (female paratype)

Head: maximal width of head across the eyes: 1.65-1.90 mm. Vertex with strong punctation, where the space between the punctures is much smaller then the punctures. Frontal tubercles crescent shaped; shining with a few large punctures in the upper parts (posteriad). Setae more or less adpressed. Antennal formula: 10-5-11-15-15-14-13-12-10-9-9.

Pronotum (figure 2): maximal width: 2.50-2.90 mm (at base). Length in the middle: 1.25-1.50 mm. Sides almost parallel; converse in the apical quarter. Basal corners rectangular. Front corners blunt. All borders margined. Upper surface with strong punctation, space between punctures in central part much smaller then the punctures diameter. The pronotum with four shallow depressions: small ones along the middle in front of scutellum and near the front border, and two large ones at each side of the middle.

Scutellum: triangular; with fine punctures.

Elytra: Width over shoulders wider than width of prothorax. Elongate. Shoulders prominent. Behind shoulders almost parallel. Greatest width 3.71-4.15 mm. Upper surface with strong punctation similar to pronotum. Three shallow depressions: a small and elongate one along the suture behind the scutellum and a pair of small circular ones behind it at both sides of the suture. Elytral epipleura punctuate, gradually narrowing and visible until apex.



3. *Clitenososia vazquezi* sp. nov., aedeagus: left ventral view, right lateral view (scale bar = 1 mm)

Underside: Procoxal cavities open posteriorly. Middle tibiae only with apical spur. Tarsi strong. Third segment bilobed. Claws bifid. Apical abdominal sternite with a large equilateral triangular genital groove.

Aedeagus: Elongate. In ventral view parallel, a little constricted at basal third. Apex rounded with small triangular extrusion. In lateral view strongly curved in basal third. (figure 3).

Sexual dimorphism: ♀ larger: length: 11.85-12.85 mm (total length); 11.70-12.15 mm (from the anterior border of the eyes to the tip of the elytra). The females have an oval form with the elytra widened from humera towards the apical third: greatest width across both elytra: 5.80-5.90 mm at posterior third, a body form different from that of the male. Apical margin of last abdominal sternite rounded regularly. All female specimens have underside of body maroon coloured with epimerons almost black.

Variation: the black colour on vertex and pronotum in some specimens with a green metallic sheen.

Condition of the specimens: In the holotype the claw segment of the left protarsus is missing. In the male paratype the apex of the aedeagus fails.

Diagnosis

This new species is similar to *Clitenososia flava* in having antennae predominantly black. It can be separated by the punctation on the pronotum which is strong and dense in *C. vazquezi* sp. nov. and weak and wide apart in *C. flava*. Specimens of *Clitenososia* can be identified with the key below.

Distribution

Kenya.

Etymology

This species is named in honour of Xavier Vázquez (Terassa) who collected the specimens of this new species and who is a much respected specialist in Oedemeridae.

KEY TO THE SPECIES OF *CLITENOSOSIA*

1. Antennae predominantly black ……..…..…… 2.
–. First three antennal segments yellow-red or reddish; subsequent segments black ……..…. 3.
2. Pronotum with superfluous punctation; space between punctures very wide ….....… ***C. flava*** (South Africa, Natal)
–. Pronotum with strong punctures; space between punctures smaller than diameter of punctures ……..…… ***C.vazquezi* sp. nov.** (S Kenya)
3. Pronotum uniformly yellow brown ……..……..… ***C. fulva*** (Ivory Coast)
–. Pronotum with four black dots ……..…….. ***C. maculicollis*** (Togo)

CATALOGUE

Genus *Clitenososia* Laboissière, 1931

Clitenososia Laboissière, 1931: 43, type species *Clitena fulva* Laboissière, 1922, by original designation; Laboissière, 1940: 3; Gressitt & Kimoto, 1963: 438 (junior synonym of *Pyrrhalta* Joannis 1865); Gressitt & Kimoto, 1965: 800 (valid genus, *Clitenosocia* [sic !]); Wilcox, 1971-1975: 45; Seeno & Wilcox, 1982: 99.

Clitenososia flava Laboissière, 1940

Clitenososia flava Laboissière , 1940: 3.
Clitenososia flava: Wilcox, 1971-1975: 46.

Distribution: South Africa: Natal.

Clitenososia fulva (Laboissière, 1922)

Clitena fulva Laboissière, 1922: 5.
Clitenososia fulva: Laboissière, 1931: 44; Laboissière, 1940: 5; Wilcox, 1971-1975: 46.
Clitena fulva: Weidner, 1976: 174.

Distribution: Ivory Coast.

Clitenososia maculicollis Laboissière, 1931

Clitenososia maculicollis Laboissière , 1931: 44.
Clitenososia maculicollis: Laboissière 1940: 5; Wilcox, 1971-1975: 46.

Distribution: Togo

Clitenososia vazquezi sp. nov.

Distribution: Kenya.

Acknowledgements

I thank Xavier Vázquez (Terassa) for the possibility to study the specimens he collected and for the donation of parts of the types, and my dear friend, José Miguel Vela (Málaga), who drew my attention to this unknown species. I express my sincere gratitude to Jan Bezděk (Brno) who made valuable comments to the draft of this manuscript and prepared the photographs.

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Genus	Vol. 25(3): 459-479	Wrocław, 30 IX 2014

A review of *Luperogala* Medvedev & Samoderzhenkov, 1989, with description of a new species from Borneo (Coleoptera: Chrysomelidae: Galerucinae)

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Abstract. The species of *Luperogala* Medvedev & Samoderzhenkov, 1989 are reviewed. Four species, including one new, are treated: *Luperogala clermonti* (Laboissière, 1929) (Vietnam, Laos), *L. mirabilis* Medvedev & Samoderzhenkov, 1989 (Vietnam), *L. malayana* (Medvedev, 2004) (comb. nov., from *Liroetis*, Peninsular Malaysia) and *L. mohamedsaidi* sp. nov. (Borneo). *Luperogala clermonti* is recorded for the first time from Laos and excluded from fauna of Peninsular Malaysia and Borneo. Primary type specimens of all species were examined. Photographs and drawings of habitus, male abdomen, last ventrite of the female, claws and male and female genitalia are presented for all species. A key to the species is provided.

Key words. taxonomy, new species, new combination, Coleoptera, Chrysomelidae, Galerucinae, *Luperogala*, Oriental Region, Borneo

INTRODUCTION

The genus *Luperogala* was proposed for two species described from Vietnam: *L. mirabilis* Medvedev & Samoderzhenkov, 1989 (type species) and *L. paradoxa* Medvedev & Samoderzhenkov, 1989. Recently, Warchałowski (2008) published a description of the male of *Liroetis clermonti* (Laboissière, 1929). Based on peculiar structure of aedeagus he also doubted its position in *Liroetis*. Bezděk (2012) found *Liroetis clermonti* and *Luperogala paradoxa* conspecific and synonymized them.

Recent investigations of Galerucinae fauna from South-east Asia proved that the distribution of *Luperogala*, until recently known only from Vietnam, is in fact much

wider. Due to the transfer of *Liroetis malayanus* to *Luperogala* and the description of a new species, that area is extended to Peninsular Malaysia and Borneo.

MATERIAL AND METHODS

All measurements were made using an ocular grid mounted on MBS-10 stereomicroscope (at 16× magnification for the body length and 32× magnification for the remaining measurements). Photographs of the habitus were taken by Jan Bezděk with Canon EOS 550D digital camera with a Canon MP-E 65 mm objective. Images of the same specimen at different focal planes were combined using Helicon Focus 5.3 software. Photographs of the aedeagi and abdomina were made by Pavel Romantsov with Canon EOS 500D digital camera with combined Canon EF 70-200 mm f/4.0L IS USM and inverted Helios 50mm objectives. Images at different focal planes were combined using Helicon Focus 4.60.3 Pro software.

The material is housed in the following collections:

BMNH – The Natural History Museum, London, Great Britain (Michael Geiser, Max Barclay);
HNHM – Hungarian Natural History Museum, Budapest, Hungary (Otto Merkl);
JBCB – Jan Bezděk collection, Brno, Czech Republic;
JVCJ – Jiří Voříšek collection, Jirkov, Czech Republic;
LMCM – Lev N. Medvedev collection, Moscow, Russia;
NHMB – Naturhistorisches Museum, Basel, Switzerland (Michael Geiser, late Michel Brancucci);
NMPC – National Museum, Prague, Czech Republic (Jiří Hájek);
NMW – Naturhistorisches Museum, Wien, Austria (Harald Schillhammer);
PRCS – Pavel V. Romantsov collection, St. Petersburg, Russia;
SMNS – Staatliches Museum für Naturkunde, Stuttgart, Germany (Wolfgang Schawaller);
UKM – Center for Insect Systematics, Universiti Kebangsaan Malaysia, Bangi, Malaysia (Izfa Riza Hazmi);
ZIN – Zoological Institute of Russian Academy of Sciences, St. Petersburg, Russia (Alexey G. Moseyko);
ZMUH – Zoologisches Institut und Museum, Universität von Hamburg, Hamburg, Germany (Hans Riefenstahl, Kai Schütte).

Exact label data are cited for type material. A forward slash (/) separates different lines and a double slash (//) different labels of data. Additional remarks are in square brackets: [p] – preceding data are printed, [h] – preceding data are handwritten, [w] – white label, and [r] – red label, x/y - number of males/number of females.

TAXONOMY

Luperogala Medvedev & Samoderzhenkov, 1989

Luperogala Medvedev & Samoderzhenkov, 1989, Entomofauna, 10: 454 (Type species: *Luperogala mirabilis* Medvedev & Samoderzhenkov, 1989).

Description

Body large, elongate, length 10.2-14.0 mm. Coloration: dorsum usually pale brown or, in *L. mirabilis*, elytra metallic blue, legs bicolorous, femora pale brown, tibiae and tarsi black or tibiae brown with darkened apex. Pronotum 1.6-1.8 times as wide as long, covered with fine or large punctures, all margins bordered. Elytra densely covered with small contiguous punctures, almost glabrous, epipleura gradually narrowing and disappearing before apex. Mesotibiae always with apical spur, metatibiae usually (except *L. mirabilis*, see Discussion). Claws appendiculate, appendix variable, small, obtuse to large and sharp. Last two ventrites of males strongly modified, ventrite IV with long sword-like process directed posteriorly. Aedeagus with hypertrophic and complicate dorsal process, always longer than aedeagus, opening with cluster of setae.

Diagnosis

Luperogala belongs to a group of genera characterized by aedeagus with a dorsal process starting near the base of aedeagus and directed anteriorly, as tentatively defined by Bezděk (2013). Except *Luperogala*, the group contains the following genera: *Siemssenius* Weise, 1922; *Liroetis* Weise, 1889; *Zangia* Chen, 1976; *Liroetoides* Kimoto, 1989 and *Coeligetes* Jacoby, 1884.

Luperogala differs from all genera in this group in the presence of a large long sword-like process from posterior margin of abdominal ventrite IV directed posteriorly in male which is missing in other genera. *Luperogala* shares anterior coxal cavities open posteriorly with *Siemssenius*, *Liroetis* and *Zangia* but differs with a very long and complicate dorsal process of aedeagus. Last two ventrites of males in *Luperogala* are strongly modified, while in *Siemssenius*, *Liroetis* and *Zangia* abdomina are relatively simple. *Siemssenius* can be also distinguished by unbordered anterior margin of pronotum (bordered in *Luperogala*). The genera *Liroetoides* and *Coeligetes* differ by anterior coxal cavities closed posteriorly (open in *Luperogala*). *Coeligetes* can be differentiated also by strongly transverse pronotum, ca. 2.0–2.3 times as wide as long (1.6-1.8 times in *Luperogala*).

Luperogala clermonti (Laboissière, 1929)

(Figs. 1, 7, 10, 13, 16, 19, 22, 26, 30, 35, 38, 39, 45-48)

Pseudoliroetis clermonti Laboissière, 1929, Ann. Soc. Ent. France 98: 282 (Type locality: Tonkin: Chapa); Wilcox, 1973: 478 (catalogue).

Liroetis clermonti: Kimoto, 1989: 82; Warchałowski, 2008: 695 (description of male); Medvedev, 2010: 202.

Luperogala clermonti: Bezděk, 2012: 394.

Luperogala paradoxa Medvedev & Samoderzhenkov, 1989, Entomofauna, 10: 455 (Type locality: Vietnam, prov. Vinhphu, Tamdao); Bezděk, 2012: 394 (= *clermonti*).

Type material

Pseudoliroetis clermonti. Holotype (female, Fig. 45-46), labelled: „Chapa [w, h] // TYPE [red letters, p] / ♀ [w, h] // Pseudoliroetis / Clermonti m [h] / V. Laboissière -- Dét. [w, p] // Le Moult vend. / via Reinbek / Eing. Nr. 1, 1957 [w, p]“ (in ZMUH).

Luperogala paradoxa. Holotype (male, Fig. 47-48), labelled: „HOLOTYPUS [p] / Luperogala / paradoxa [r, h] // 2. Vietnam, Prov. Vinh-Phu, / Tamdao, 800-1200 m, forest / 12-22.IV.1986, leg. L. MED- / VEDEV, S. GOLOVATCH et al. [w, p]“ (in LMCM); paratypes (1 male, 2 females), labelled: „2. Vietnam, Prov. Vinh-Phu, / Tamdao, 800-1200 m, forest / 12-22.IV.1986, leg. L. MED- / VEDEV, S. GOLOVATCH et al. [w, p] // PARATYPUS [p] / Luperogala / paradoxa [r, h]“ (male in SMNS, 2 female in LMCM).

Additional material examined

VIETNAM: Vini, 2.-10.v.1988, Kováčik leg. (2/0 in JBCB and JVCJ); Tam Dao, 8.-22.v.1990, Dudycha leg. (0/1 in JVCJ); Vinh Phu prov., Tam Dao, 27.v.-8.vi.1986, J. Rybníček leg. (0/1 in LMCM); Vinh Phu prov., Tam Dao, 6.-9.v.1990, P. Pacholátko leg. (0/1 in LMCM); Vinh Phu prov., Tam Dao, 800-1200 m, 19.vi.1986, L. Medvedev leg. (0/1 in LMCM). LAOS: Houa Phan prov., Ban Saluei→Phou Pane Mt., 20°12-13.5´N 103°59.5-104°01´E, 1340-1870 m, 15.iv.-15.v.2008, Lao collector leg. (1/0 in NMPC).

Distribution

Vietnam (Laboissière 1929, Medvedev & Samoderzhenkov 1989, Warchałowski 2008, Medvedev 2010, Bezděk 2012, present paper) and Laos (this study). The records from continental Malaysia (Mohamedsaid 1999b) refer to *Luperogala malayana* (voucher specimens examined) and these from Borneo (Mohamedsaid 1998, 1999a, 1999c, Mohamedsaid & Holloway 1999) to *L. mohamedsaidi* sp. nov.

Main diagnostic characters

Habitus as in Figs. 38 and 39. Body length: 11.5-14.0 mm. Body pale brown, legs with black tibiae and tarsi, antennae black with two or three basal antennomeres pale. Vertex without distinct median line. Pronotum with fine punctation. Meso- and metatibiae with apical spurs (in males very short and poorly visible, in females well developed). Protarsomere I in male elongate, 0.9 times as long as following two tarsomeres combined and three times as long as wide (Fig. 35). Claws in both males and females with small obtuse appendix (Fig. 30). Last ventrite in female with large wedge-shaped incision (Fig. 26).

Male abdomen modified: ventrite IV with large semicircular impression in middle of posterior half, posterior margin with two small teeth at lateral edges of impression; shiny, median appendage starting in the middle of posterior margin of ventrite IV slightly constricted in anterior third, apical half convergent, in lateral view sinuate,

directed ventrally and extreme apex posteriorly. Ventrite V extremely cavitous in middle, lateral parts reduced to two large triangular lateral plates covered with very long setae (Figs. 7, 10, 13, 16, 19).

Aedeagus concave, with widely rounded apex, somewhat extended at apical third. Dorsal process long, vertical, knife-like, in middle with small conical setose brush (Fig. 1).

Spermatheca with large C–shaped cornu, basal part slightly constricted, apex widely rounded, ca. twice wider than nodulus, nodulus transversely ovate, ductus receptaculi without swelling (Fig. 22).

Diagnosis

Luperogala clermonti is similar to *L. malayana* and *L. mohamedsaidi* sp. nov. All three species share similar coloration (body pale brown, legs with black tibiae and tarsi). Both *L. malayana* and *L. mohamedsaidi* sp. nov. differ in pronotum sparsely covered with large deep punctures, distinct median line on vertex and the last ventrite not incised in female, *L. mohamedsaidi* sp. nov. also in completely or almost completely yellow antennae. Males of *L. clermonti* and *L. mohamedsaidi* sp. nov. differ also in different last two ventrites and structure of aedeagus (Figs. 1, 3, 4, 6, 7, 9, 10, 12, 13, 15, 16, 18, 19, 21).

Comments

Pseudoliroetis clermonti was described by Laboissière (1929) based on one female. Later, it was transferred to the genus *Liroetis* by Kimoto (1989). A description of the male was added by Warchałowski (2008). In the same paper, Warchałowski (2008) doubted its classification in the genus *Liroetis* due to the different structure of aedeagus. The comparison of the drawings and photographs of both aedeagus and abdominal appendices of *Luperogala paradoxa* (see Medvedev & Samoderzhenkov 1989) with the description of male of *Liroetis clermonti* in Warchałowski (2008) showed both species identical. Subsequently, Bezděk (2012) synonymized both species and transferred *Liroetis clermonti* to *Luperogala*.

Luperogala malayana (Medvedev, 2004), comb. nov.

(Figs. 23, 27, 31, 40, 49, 50)

Liroetis malayanus Medvedev, 2004, Ent. Basil., 26: 330 (Type locality: Malaysia, Tanah Rata Cameron Highlands).

Liroetis clermonti: Mohamedsaid, 1999b: 229 (misidentification).

Type material

Holotype (female, Figs. 49-50), labelled: „Malaysia-Tanah Rata / Cameron Highland / approx. 1450m / 17 March 1988 / leg. G. Hangay [w, p] // Hangay / Collection [w, p] // HOLOTYPUS [p] / Liroetis / malayanus m. [h] / L. Medvedev det. 19 [p] 99 [r, h]“ (in NHMB); 2 paratypes (females), labelled: „Malaysia-Tanah Rata / Cameron Highland / approx. 1450m / 17 March 1988 / leg. G. Hangay [w, p] // Hangay / Col-

lection [w, p] // PARATYPUS [p] / Liroetis / malayanus m. [h] / L. Medvedev det. 19 [p] 99 [r, h]“ (in NHMB and LMCM).

Additional material examined

PENINSULAR MALAYSIA: Pahang, Ringlet, 04°28´N 101°22´E, 12.-30.iv.2007, V. Kremitovský leg. (0/7 in JBCB); Pahang, Fraser´s Hill, 2.ii.1975, OBL (0/1 in UKM); Pahang, Bukit Fraser, 31.viii.-2.ix.2001, Fara & Kamil leg. (0/1 in UKM); Pahang, Cameron Highlands, Tanah Rata vill. env., Gunung Jasar Mt., 04°28.4-7´N 101°21.6-22.1´E, 1470-1705 m, 18.iv.-10.v.2009, J. Hájek leg. (0/1 in NMPC); Pahang, Fraser´s Hill, Silverpark Resort Hotel, h~1300m, N 03°42'57" E 101°44'51", 22.iii.-1.iv.2013, A. Azarov leg. (0/1 in PRCS); Pahang, Cameron Highland, Tanah Rata, from illuminated wuite-washed walls, 23-31.iii.1995, O. Merkl leg. (0/1 in LMCM); Selangor, Puchong, 15.vi.1975, CVC (0/1 in UKM); Selangor, Bukit Kutu, 3.300 ft., at light, 1.x.1932, H. M. Pendlebury leg. (0/1 in BMNH); Perak, Larut Hills, 3.700 ft., at light, 5.ii.1932, H. M. Pendlebury leg. (0/1 in BMNH); Kuala Lumpur, without additional data (0/1 in BMNH); Malacca, 1908, without additional data (0/1 in BMNH).

Distribution

Peninsular Malaysia (Medvedev 2004, present paper). Mohamedsaid (1999b) published *Liroetis clermonti* from provincies Pahang and Selangor, however, we re-identified the voucher specimens as *Luperogala malayana*.

Main diagnostic characters

Habitus as in Fig. 40. Body length: 11.6-13.5 mm (females). Body pale brown, legs with black tibiae and tarsi, antennae black with two, three or four basal antennomeres pale. Vertex with distinct median line. Pronotum sparsely covered with large deep punctures. Meso- and metatibiae with well developed apical spur. Female claws with short sharp appendix reaching half of claw (Fig. 31). Female last ventrite of normal shape with widely obtuse apex (Fig. 27). Male unknown.

Spermatheca with large C–shaped cornu, apex widely rounded, ca. 1.5 wider than nodulus, nodulus transversely ovate, ductus receptaculi without any swelling (Fig. 23).

Diagnosis

In habitus *Luperogala malayana* is closely related to *L. clermonti* and *L. mohamedsaidi* sp. nov. While *L. clermonti* can be easily distinguished by pronotum with fine punctures, vertex without median line, last ventrite with deep wedge-shaped incision and claws with small obtuse appendix, *L. mohamedsaidi* sp. nov. is very similar to *L. malayana*. Separation of both species is complicated by males of *L. malayana* being unknown. Females differ by the coloration of antennae which are completely yellow or with infuscate terminal antennomeres in *L. mohamedsaidi* sp. nov. while black with basal antennomeres pale *L. malayana*, by slightly slenderer tarsi in *L. malayana* and the structure of spermatheca (Figs. 23, 25).

Comments

Medvedev (2004) described this species as *Liroetis malayanus* from three females (holotype and 1 paratype deposited in NHMB and 1 paratype in LMCM). Type specimens from NHMB are in poor condition with missing abdomina and all interior structures of the body (probably caused by larva of Dermestidae). Although only females are known, the tranfer to *Luperogala* is supported by the large body size, pronotum with sparse large punctures and the same type of spermatheca as known in other *Luperogala* species.

Luperogala mirabilis Medvedev & Samoderzhenkov, 1989

(Figs 2, 5, 8, 11, 14, 17, 20, 24, 28, 32, 36, 41, 42, 51, 52)

Luperogala mirabilis Medvedev & Samoderzhenkov, 1989, Entomofauna, 10: 455 (Type locality: Vietnam, prov. Vinhphu, Tamdao); Bezděk, 2012: 394.

Type material

Holotype (male, Figs. 51-52), labelled: „HOLOTYPUS [p] / Luperogala / mirabilis [r, h] // 2. Vietnam, Prov. Vinh-Phu, / Tamdao, 800-1200 m, forest / 12-22.IV.1986, leg. L. MED- / VEDEV, S. GOLOVATCH et al. [w, p] // вырубка [= clearing] [w, p]“ (in LMCM).

Additional material examined

VIETNAM: Vinh Phu Prov., Tam Dao, 1000 m, 17.-30.vi.1999, A. Kallies leg. (0/1 in JBCB); Vini, 2.-10.v.1988, Kováčik leg. (2/0 in JBCB, JVCJ); Vinh Phu Prov., Tam Dao, 6.-9.v.v1990, V. Kubáň leg. (1/0 in PRCS); Vinh Phu prov., Tam Dao, 27.v.-8.vi.1986, J. Rybníček leg. (0/1 in LMCM).

Distribution

Vietnam (Medvedev & Samoderzhenkov 1989, Bezděk 2012).

Main diagnostic features

Habitus as in Figs. 41 and 42. Body length: 10.2-13.4 mm. Body orange to brown, elytra metallic green or blue, antennae orange with gradually darkenned last four to six antennomeres, legs orange with tibiae darkenned in apical half, tarsi darkenned. Vertex without distinct median line. Male antennae distictly longer than body. Pronotum sparsely covered with large deep punctures. Protarsomere I in male short and wide, 0.8 times as long as following two tarsomeres combined and 1.35 times as long as wide (Fig. 36). In both males and females, mesotibiae with short, poorly visible spur, while spur on metatibiae absent. Female last ventrite of normal shape with obtuse subtriangular apex (Fig. 28). Claws with short obtuse appendix (Fig. 32).

Male abdomen modified: posterior margin of ventrite IV with two broad slightly oblique swellings covered with long setae; shiny median appendage starting in middle of posterior margin of ventrite IV convergent, in lateral view only slightly sinuate

and directed posteriorly. Ventrite V is deeply channeled in middle to receive median appendage of ventrite IV (Fig. 5, 8, 11, 14, 17, 20).

Aedeagus concave, subparallel, with obtusangulate apex. Dorsal process thin and long, slightly and gradually extended basally, subapically widened, apex terminated by large umbrella-like structure, oblique in lateral view (Fig. 2).

Spermatheca with large C–shaped cornu, ca. 1.5 wider than nodulus, nodulus transversely ovate, ductus receptaculi with subglobular swelling distally (Fig. 24).

Diagnosis

Luperogala mirabilis is the only species in the genus with metallic green elytra, while all other species have dorsum completely pale brown. In habitus *Luperogala mirabilis* is also similar to *Liroetis viridipennis* Kimoto, 1989 but differs in the coloration of legs which are orange in *Liroetis viridipennis* while the apical halves of tibiae and tarsi are black in *Luperogala mirabilis*. The last visible ventrite in female of *Luperogala mirabilis* is entire while deeply incised in female of *Liroetis viridipennis*.

***Luperogala mohamedsaidi* sp. nov.**

(Figs. 3, 6, 9, 12, 15, 18, 21, 25, 29, 33, 34, 37, 43, 44)

Liroetis clermonti: Mohamedsaid, 1998: 260; Mohamedsaid, 1999a: 129; Mohamedsaid, 1999c: 15; Mohamedsaid & Holloway, 1999: 166 (all misidentifications).

Type locality

Malaysia, Sabah, Trus Madi Mt., N 05°26‘35“, E 116°27‘5“.

Type material

Holotype (male), labelled: „MALAYSIA, N Borneo, Sabah / Trus Madi, Keningau dist., Trus Madi Mt., / 1250m, N 05°26‘35“, E 116°27‘5“ / 17-26.III.2012, P. Romantsov [w, p]“ (in ZIN); 19 paratypes (1 male and 18 females), same data as in holotype (1 male and 10 females in PRCS, 5 females in LMCM. 3 females in ZIN); 4 paratypes (1 male and 3 females), same data but collected 17.III.2012 (in PRCS); 1 paratype (female), same data but collected 16-18.III.2012 (in PRCS); 2 paratypes (females), same data but collected 5.IV.2013 (in PRCS); 1 paratype (female), same data but collected 8.IV.2013 (in PRCS); 1 paratype (female), same data but collected 24.II.2014 (in PRCS); 3 paratype (females), same data but collected 25.II.2014 (in PRCS); 1 paratype (female), same data but collected 28.II.2014 (in PRCS); 1 paratype (female), labelled: “MALAYSIA, N Borneo, Sabah / Trus Madi, Keningau dist., Trus Madi Mt.,/ 1230m, N 05°25’39.4”, E 116°25’43.2” / 09.IV.2013, P. Romantsov [w, p]“ (in PRCS); 1 paratype (female), labelled: “MALAYSIA, N Borneo, Sabah, /~16 км NW Tambunan, / Crocker Range, h~1660m / N 05°48’47”, E 116°20’16” / 13.IV.2013 P. Romantsov leg [w, p]“ (in PRCS); 1 paratype (female), labelled: “MALAYSIA, S Borneo, Sabah, / Nabawan dist., ~7 km N Pensiangan vill., h~530m / N 04°35’16”, E 116°19’27” / 04 .III.2014 P. Romantsov leg“ (in PRCS); 1 paratype (male), labelled: „E-MALAYSIA: Sabah / Kundasang, 1500m / 4.-8.9.1994 / leg. C. L. Li [w, p]“ (in

NMW); 1 paratype (female), labelled: „MALAYSIA, Sabah 1993 / 50km E Kota Kinabalu / Crocker Mts., Gg. Emas / 16.-27.4. leg. I. Jeniš [w, p]“ (in NMW); 1 paratype (female), labelled: „Indonesia / Kalimantan-Timur / Apokayan, Long Ampung / 700 m, Sekundärwald / 10.-25.02.97, leg. C. u. P. Zorn [w, p]“ (in JBCB); 1 paratype (female), labelled: „Malaysia, Sabah, Crocker Range / Gunung Emas, 23.05.1998, / J. Kodada & F. Čiampor Lgt. [w, p]“ (in HNHM); 1 paratype (female), labelled: „Borneo 15-27.4.1993 / Sabah Crocker Mt. / Gunong Emas env. / Jeniš & Štrba leg. [w, p]“ (in JVCJ); 1 paratype (female), labelled: „MALAYSIA-Sabah / GUNUNG EMAS 1993 / Crocker Mts. 22.IV. / leg. Jenis+Strba [w, p]“ (in JVCJ); 1 paratype (female), labelled: „SABAH, Kinabalu Park, / H. Q. (1550m) night [p] / 17-X [h] 198 [p] 7 [h] / Akira Ueda leg. [w, p] // Liroetis / clermonti (Lab.) [h] / det. Mohamedsaid 199 [p] 7 [w, h]“ (in UKM); 1 paratype (female), labelled: „SABAH, Kinabalu Park, / H. Q. (1550m) night [p] / 30-VIII [h] 198 [p] 7 [h] / Akira Ueda leg. [w, p]“ (in UKM); 1 paratype (female), labelled: „SABAH: Gunung / Kinabalu, Sayap / 3-8 Jun 1992 / Zaidi, Ismail, Ruslan [w, p]“ (in UKM); 1 paratype (female), labelled: „Sabah Kundasang / Tmn. Kinabalu / 21.VIII.1988 / Bahiah leg. [w, h]“ (in UKM); 1 paratype (female), labelled: „SABAH: Taman / Kinabalu / 31.VIII.1991 / Salleh - Zaidi [w, h] // at light [w, h]“ (in UKM); 1 paratype (female), labelled: „BORNEO, Sabah / Mount Trus Madi / 14-viii-2005 / Steven Chew leg. / BMNH{E} 2006-36 [w, p]“ (in BMNH); 1 paratype (male), labelled: „SABAH: 1500m / Mt Kinabalu, nr / Kundasang golf / coursse, 17-20.v.1989 / Primary montane for. [w, p] // K. R. Tuck / BM 1989-129 [w, p]“ (in BMNH). The specimens are provided with additional printed red label: ‘HOLOTYPUS [or PARATYPUS], / *Luperogala* / *mohamedsaidi* sp. nov., / J. Bezděk, P. Romantsov / & L. Medvedev det. 2013’.

Description

Body length: males 10.4-11.0 mm (holotype 10.5 mm); females 11.8–14.0 mm.

Male (holotype). Body elongate, subparallel, glabrous, lustrous. Coloration: body almost completely strawy yellow, except apices of mandibles, tibiae and tarsomeres black.

Head glabrous, lustrous. Maxillar palpi long, palpomere II elongated, palpomere III slightly expanded, and palpomere IV small and conical. Eyes large, strongly protruding from outline of head, head with eyes 0.88 times as wide as pronotum. Labrum transverse with anterior margin widely rounded, laterally with two long pale setae. Anterior part of head with sparse large punctures. Frontal ridge flat, parallel, apex triangular. Interocular space 1.33 times as wide as transverse diameter of eye. Frontal tubercles large, subpentagonal, impunctate, slightly elevated, with anterior tips divergent. Genae short. Tubercles separated from each other by thin sulcus which continues through vertex. Interantennal space 1.33 times as wide as transverse diameter of antennal socket. Vertex semiopaque, covered with large punctures (sparsely on disc, densely behind frontal tubercles), with distinct median line. Antennae filiform, 0.85 times as long as body, length ratios of antennomeres 1–11 equal 17-7-14-20-21-22-21-21-20-20-24.

Pronotum transverse, 1.6 times as broad as long, widest at anterior third. Surface lustrous, sparsely covered with large punctures (slightly larger and deeper at sides,

middle of disc with finer punctures). Anterior margin slightly concave, posterior margin widely rounded in middle part, laterally straight and oblique, lateral margins subparallel, slightly convergent posteriorly, anterior quarter rounded. Both anterior and posterior margins thinly bordered, lateral margins with wider borders. Anterior angles triangularly prominent, slightly swollen, posterior angles distinct, rectangular. All angles with setigerous pore bearing long pale seta. Lateral margins with row of sparse short setae. Scutellum glabrous, subtriangular, with widely rounded apex, with several large punctures, bordered with distinct line formed by indistinct confluent punctures.

Elytra lustrous, subparallel, 0.75 times as long as body, twice as long as wide (measured at humeral calli), densely covered with small contiguous punctures, almost glabrous, several short setae visible around humeral calli and on lateral and apical slopes. Humeral calli well developed, convex. Elytral apex rounded but with weakly indicated sutural angles. Epipleura moderately wide at anterior quarter, posteriorly gradually narrowing and disappearing before apex, smooth, with sparse short pale setae along whole length. Macropterous.

Anterior coxal cavities open. Ventral surface semiopaque, prosternum glabrous, meso- and metasternum covered with fine punctures and pale setae. Abdomen modified: ventrite IV with two divergent appendages, each appendage wide and parallel-sided with rounded apex, bases of appendages almost connected in middle of ventrite IV, apices of appendages almost reaching posterior margin of ventrite V. Third, shiny median appendage starts in middle of posterior margin of ventrite IV and is directed posteriorly, its apical part is sinuately bent down. Ventrite V trilobed, in middle with deep depression for insertion of median appendage of ventrite IV, apical margin of middle lobe triangularly bent down (Figs. 6, 9, 12, 15, 18, 21).

Legs moderately long and narrow, semiopaque to shiny covered with long pale semi-adpressed setae. Protibiae without apical spur, meso- and metatibiae with well developed apical spurs. Protarsomere I subtriangularly elongate, apically slightly dilated, 0.75 times as long as two following tarsomeres combined, slightly wider than protarsomere II (Fig. 37). Length ratios of protarsomeres I–IV equal to 12-8-8-12. Metatarsomere I elongate, apically slightly dilated, as long as two following tarsomeres combined, slightly narrower than metatarsomere II. Length ratios of metatarsomeres I–IV equal to 17-9-8-12. Tarsal claws with long sharp appendix reaching ¾ of claw (Fig. 33).

Aedeagus with hypertrophic dorsal process. Apical part subquadrangular, dorsally concave, apical angles sharp and bent down. Middle part dorsally with large globular process, its dorsal hemisphaere densely covered with short setae, ventrolaterally with one short process on each side (Fig. 3).

Female. Body wider than in males. Eyes smaller than in males, head with eyes 0.75 times as wide as pronotum. Antennae shorter than in male, 0.67 times as long as body. Interocular space wider, 1.71 times as wide as transverse diameter of eye. Interantennal space 1.42 times as wide as transverse diameter of antennal socket. Pronotum 1.6–1.7 times as broad as long. Tarsal claws with small sharp appendix reaching half of claw (Fig. 34). Female last ventrite of normal shape with obtuse subtriangular apex (Fig. 29). Spermatheca with large C–shaped cornu, ca. twice wider than nodulus, nodulus

transversely ovate, ductus receptaculi with narow transverse swelling at distal third (Fig. 25).

VARIABILITY

Pronotum of males 1.6–1.7 times as broad as long. Antennae sometimes with infuscate apical antennomeres. Tarsi often paler two apical tarsomeres.

DIAGNOSIS

Having uniformly pale dorsum and legs with black tibiae and tarsi *Luperogala mohamedsaidi* sp. nov. is similar to *L. clermonti* and *L. malayana*. From *L. clermonti* it can be easily distinguished by pronotum covered with large deep punctures (fine punctures in *L. clermonti*), vertex with median line (without median line in *L. clermonti*), claws with sharp appendix (small obtuse appendix in *L. clermonti*) and the structures of both male abdomina and aedeagi (Figs. 1, 3, 4, 6, 7, 9, 10, 12, 13, 15, 16, 18, 19, 21). The females of *L. malayana* (males unknown) are very similar to *L. mohamedsaidi* sp. nov. Both species differ by the coloration of antennae (black with pale basal antennomeres in *L. malayana*, completely yellow or with infuscate terminal antennomeres in *L. mohamedsaidi* sp. nov.), by slightly slenderer tarsi in *L. malayana* and by the structure of spermatheca (Figs. 23, 25). The third *Luperogala* species, *L. mirabilis* from North Vietnam, can be easily distinguished by elytra completely metallic greenish-blue.

ETYMOLOGY

Dedicated to Mohamed Salleh MOHAMEDSAID, an excellent specialist in Malayan Chrysomelidae.

DISTRIBUTION

Malaysia (Sabah), Indonesia (East Kalimantan).

COMMENTS

MOHAMEDSAID (1998, 1999a, 1999c) and MOHAMEDSAID & HOLLOWAY (1999) published the specimens of *Liroetis clermonti* from provincies Sabah and Sarawak. We had the opportunity to re-identify the voucher specimens from Sabah and all refer to *L. mohamedsaidi* sp. nov.

A KEY TO IDENTIFICATION OF *LUPEROGALA* SPECIES

1. Head, pronotum, scutellum and underside orange to brown, elytra metallic blue or green. Tibiae brown with darkenned apical halves. Male antennae longer than body. Male abdomen and aedeagus as in Figs. 2, 5, 8, 11, 14, 17, 20. Spermatheca as in Fig. 24. Vietnam ..... *L. mirabilis*
–. Body completely yellow or yellowish-brown, tibiae and tarsi completely black. Male antennae shorter or as long as body ..... 2.
2. Pronotum covered with fine and shallow punctures. Vertex without impressed median line. Male antennae approximately as long as body. Claws with small obtuse

appendix. Male abdomen and aedeagus as in Figs. 1, 7, 10, 13, 16, 19. Female last ventrite with large wedge-shaped incision (Fig. 26). Spermatheca as in Fig. 22. Vietnam, Laos ..... *L. clermonti*

–. Pronotum sparsely covered with large and deep punctures. Vertex with impressed median line. Male antennae shorter than body. Claws with sharp appendix ... 3.

3. Antennae completely yellow or with infuscate apical antennomeres. Male abdomen and aedeagus as in Figs. 3, 6, 9, 12, 15, 18, 21. Spermatheca as in Fig. 25. Borneo ..... *L. mohamedsaidi* sp. nov.

–. Antennae black except basal antennomeres. Spermatheca as in Fig. 23. Peninsular Malaysia ..... *L. malayana*

DISCUSSION

Based on the open coxal cavities and margined prothorax Medvedev & Samoderzhenkov (1989) placed *Luperogala* near the genera *Liroetis*, *Pseudoliroetis* and *Cneorane* but without any other specification. Bezděk (2012) commented on the generic position of *Luperogala* and one year later (Bezděk 2013) he tentatively defined a group of genera characterised by aedeagus with dorsal process starting near the base of aedeagus (comprising *Luperogala*, *Siemssenius*, *Liroetis*, *Zangia*, *Liroetoides* and *Coeligetes*). Until now only two genera are revised based on the study of primary type material: *Liroetoides* by Bezděk (2013) and *Luperogala* in the present paper. However, the whole generic group badly needs a comprehensive revision on both generic and species levels.

Three exclusively continental genera *Siemssenius*, *Liroetis* and *Zangia* seem to be very close to each other and their relations need further study. *Siemssenius* differs from *Liroetis* by only one character - unbordered anterior margin of pronotum (thinly bordered in *Liroetis*). The question is if such character is enough to separate the genera, particularly in a view of questioning of stability of other frequently used generic characters such as anterior coxal cavities open/closed posteriorly (e.g. Wagner 2003, Reid & Nally 2008 or Beenen & Lee 2010) or split/appendiculate claws (e.g. Zoia 2007, 2012) in Galerucinae or Eumolpinae. *Zangia* was proposed for a species with a broad and spoon-shaped apical spine on metatibiae, however, the description is provides only a very uninformative drawing, thus the validity of *Zangia* also needs verification. Predominatly insular genus *Coeligetes* (occuring also in Peninsular Malaysia) also needs the revision, particularly since there are several undescribed continental species which can prove there is a need for an expanded re-definition of *Coeligetes*.

In *Luperogala* three of important characters are unexpectedly variable. (i) The length of male antennae – in *L. mirabilis* the antennae are longer than the body, in *L. clermonti* ca. as long as the body and in *L. mohamedsaidi* sp. nov. the antennae are distinctly shorter than the body. In females of all four species the antennae reach about half of body length. (ii) In *Luperogala* we detected very surprising differencies in the shape of the claws: *L. clermonti* and *L. mirabilis* have claws with very short obtuse appendix (in both males and females), females of *L. malayana* and *L. mohamedsaidi* sp. nov. have claws with short sharp appendix reaching the half of the claw. Males of

L. mohamedsaidi sp. nov. have the inner branch somewhat longer and thus the claws appear to be split (Figs. 30-34). (iii) Apical spurs on meso- and metatibiae are present in both males and females in *L. clermonti*, *L. malayana* and *L. mohamedsaidi* sp. nov. Contrary, in *L. mirabilis* the spur is present only on mesotibiae while absent on metatibiae (same in both sexes). Presence/absence of metatibial spurs in *Luperogala* may cast doubt on its importance as a generic character (similarly as the above mentioned anterior coxal cavities or claws). However, it is necessary to note that the tibial spurs in some *Luperogala* are very short and visible only in direct ventral view (not visible from lateral or oblique views) and we also cannot exclude that in some specimens the spurs could simply be broken. This topic needs further study in the whole genus-group.

ACKNOWLEDGEMENTS

We would like to thank all curators and colleagues listed above for giving us the opportunity to study the material from their collections.

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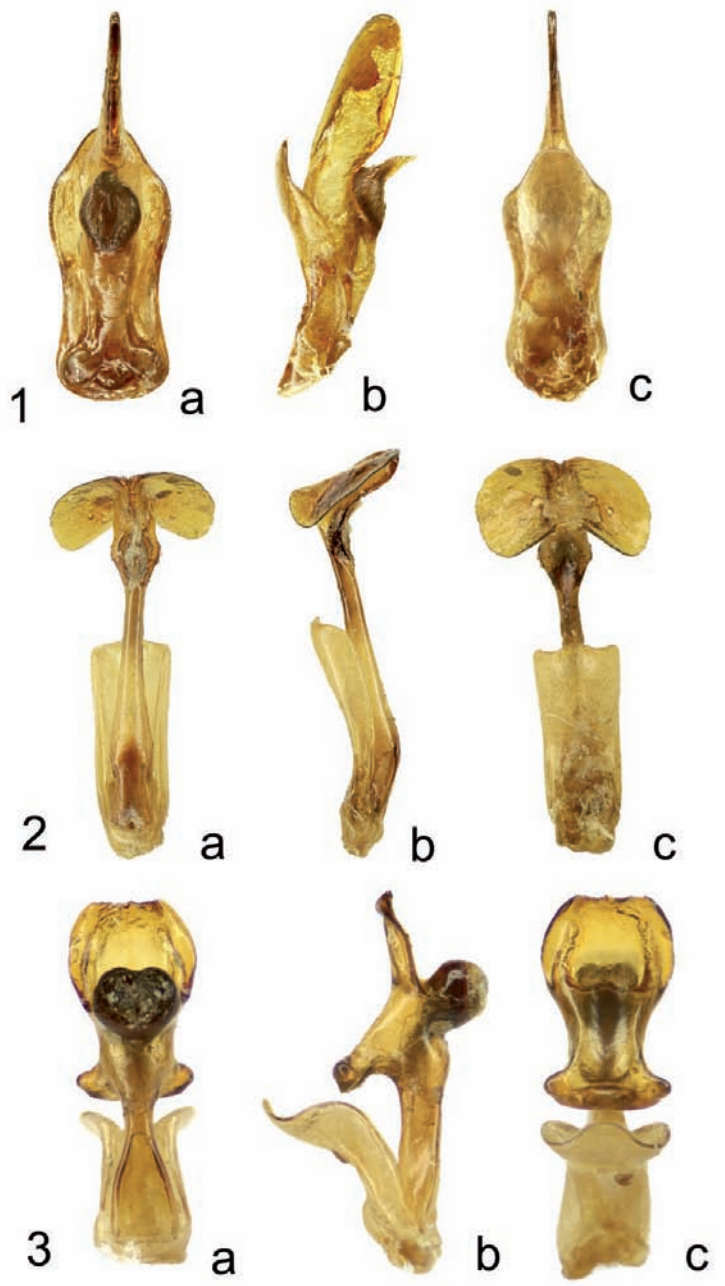
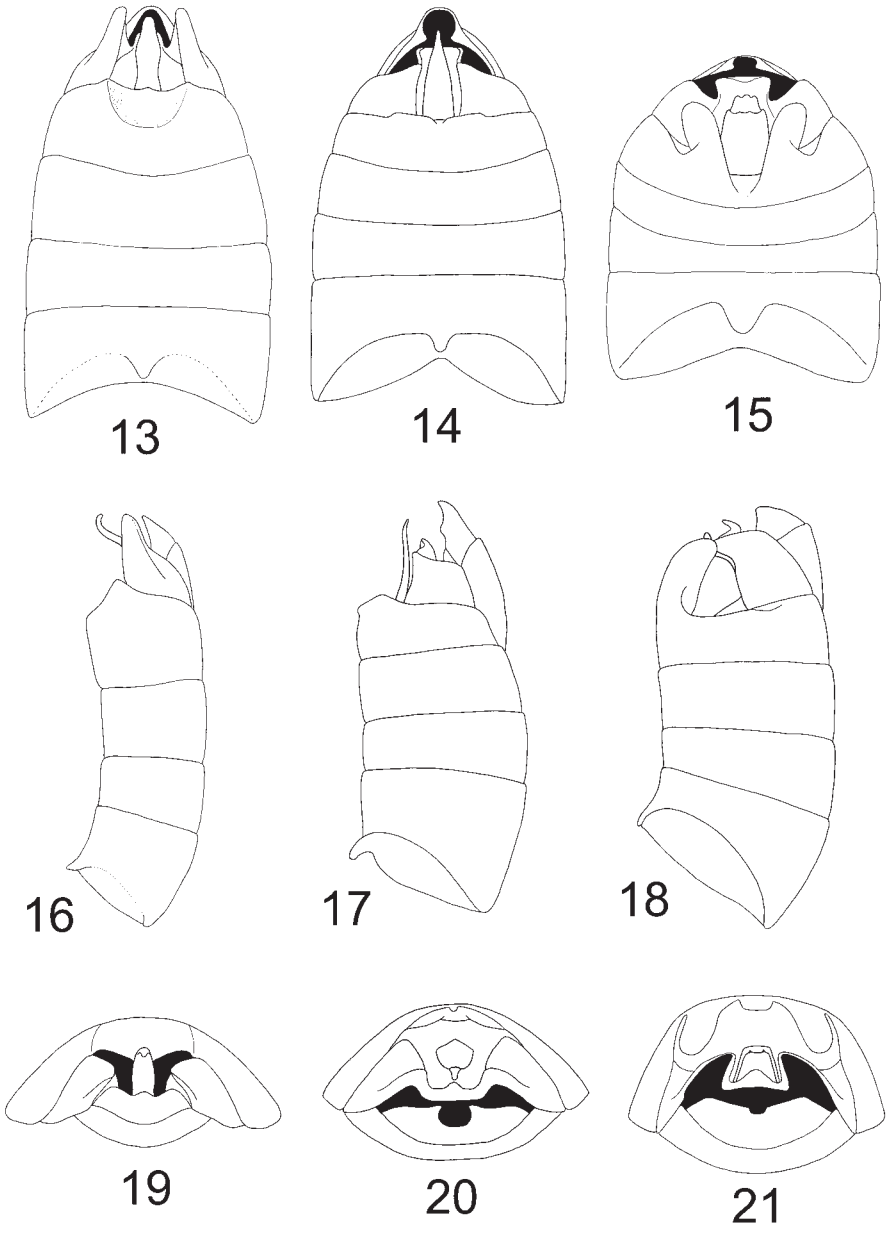
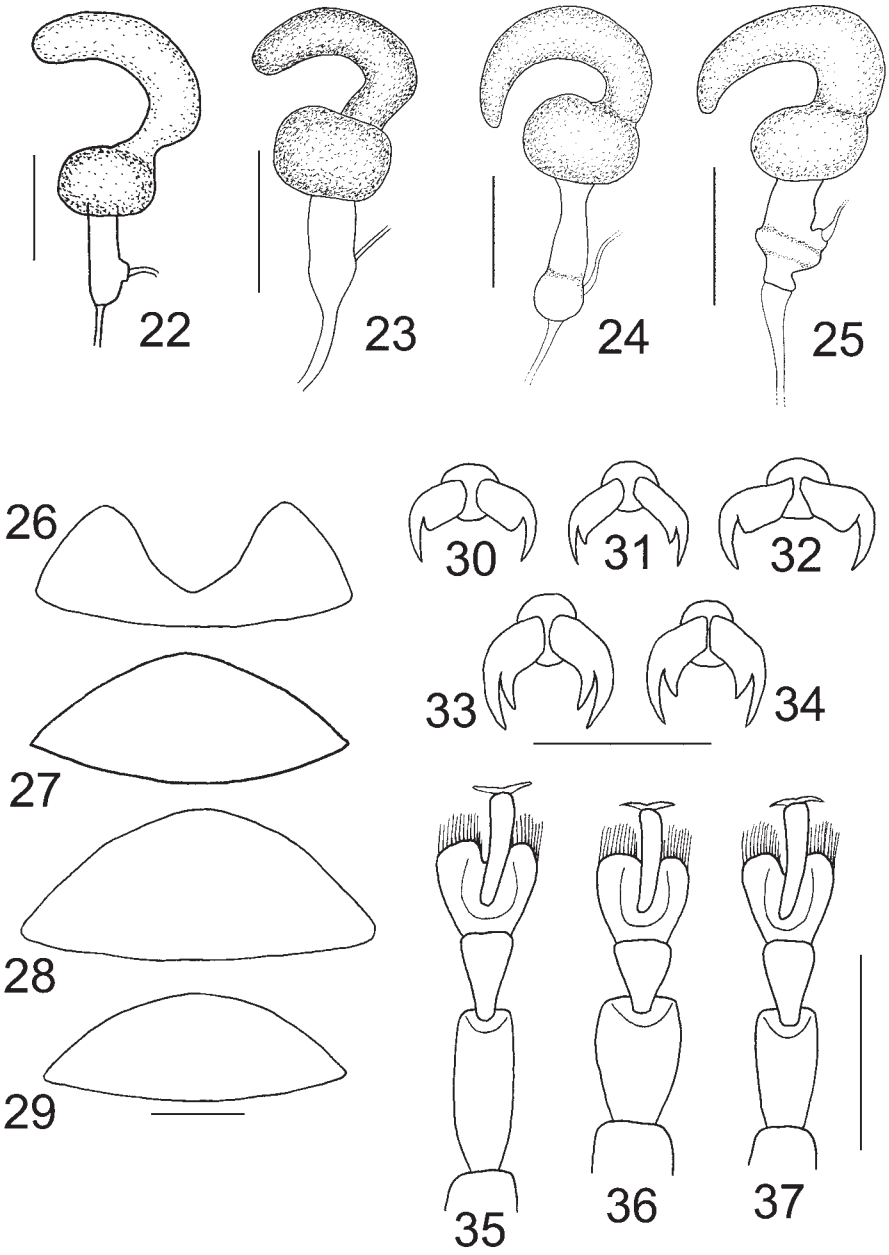


1-3. Aedeagus (a – dorsal view, b – lateral view, c – ventral view): 1 – *Luperogala clermonti*, 2 – *L. mirabilis*, 3 – *L. mohamedsaidi* sp. nov.

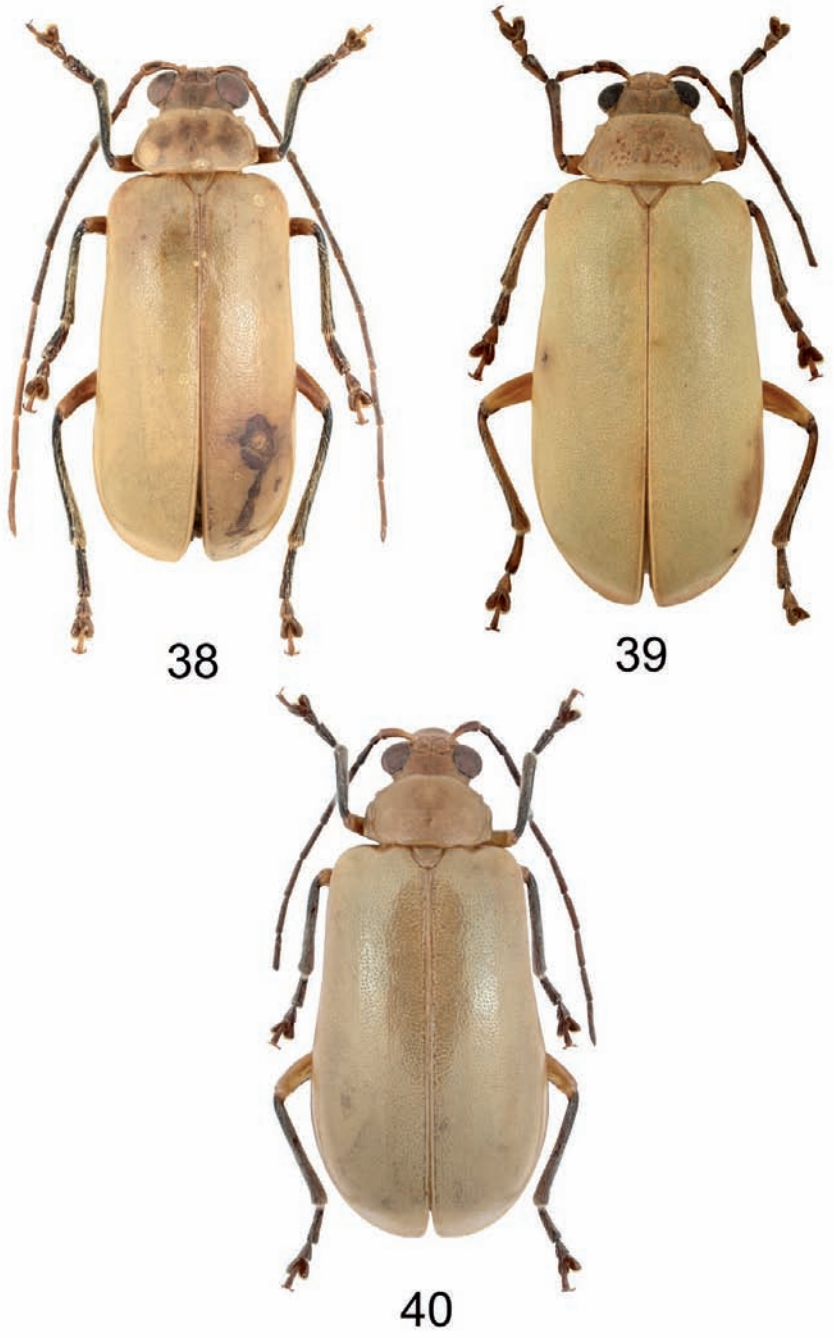
4-12. Male abdomen (4-6 – ventral view, 7-9 – lateral view, 10-12 – ventral view in detail): 4, 7, 10 – *Luperogala clermonti*, 5, 8, 11 – *L. mirabilis*, 6, 9, 12 – *L. mohamedsaidi* sp. nov.



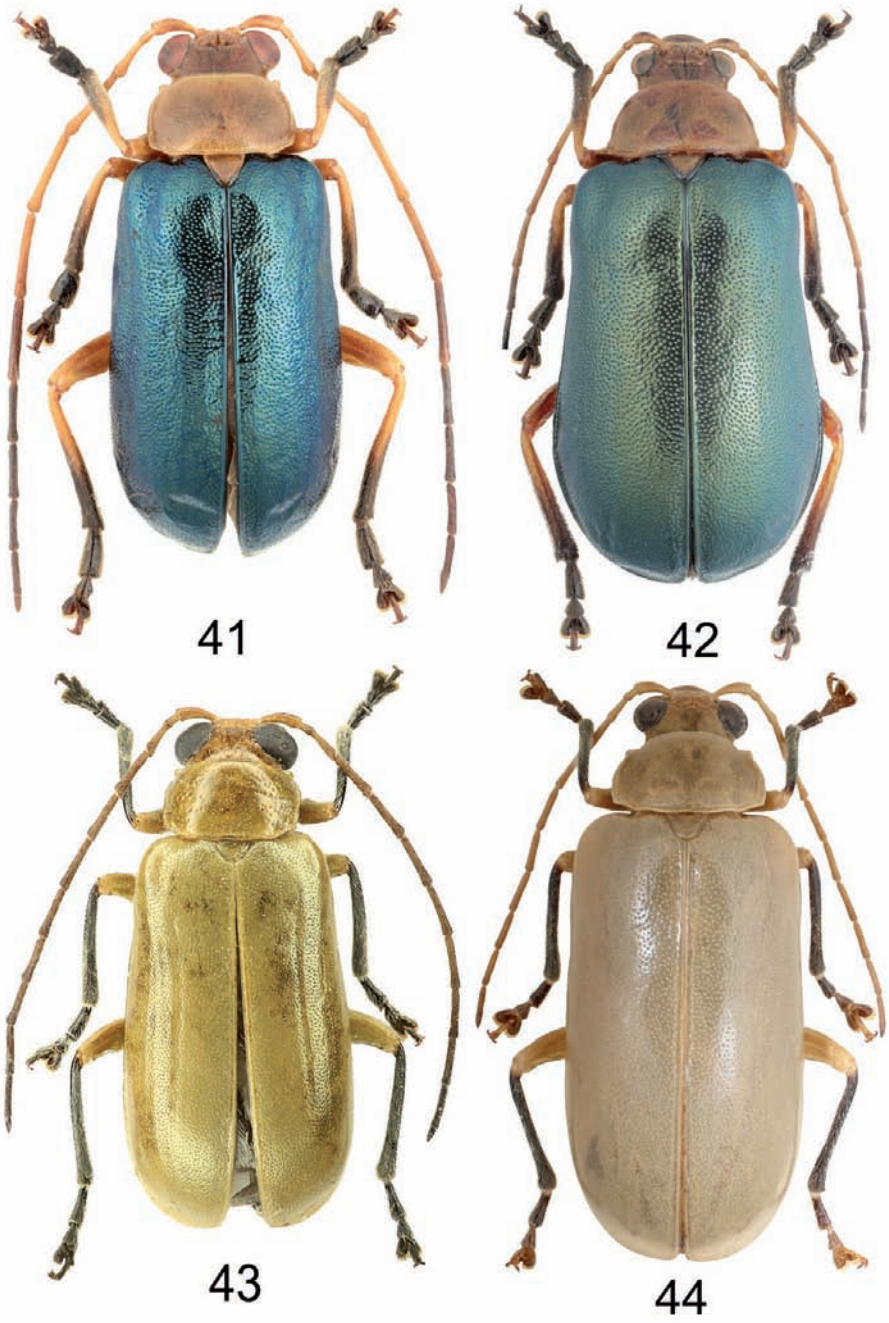
13-21. Male abdomen drawings, sword-like process in grey (13-15 – ventral view, 16-18 – lateral view, 19-21 – caudal view): 13, 16, 19 – *Luperogala clermonti*, 14, 17, 20 – *L. mirabilis*, 15, 18, 21 – *L. mohamedsaidi* sp. nov.



22-37. *Luperogala* details (22-25 – spermatheca, 26-29 – female last ventrite, 30-34 – claws, 35-37 – male protarsus): 22, 26, 30, 35 – *Luperogala clermonti*, 23, 27, 31 – *L. malayana*, 24, 28, 32, 36 – *L. mirabilis*, 25, 29, 33 (male), 34 (female), 37 – *L. mohamedsaidi* sp. nov. Scale bars: 1 mm for Figs. 26-29 and 35-37, 0.5 mm for Figs. 30-34, 0.25 mm for Figs. 22-25



38-40. Habitus: 38 – *Luperogala clermonti* (male, 11.7 mm), 39 – *L. clermonti* (female, 13.2 mm), 40 – *L. malayana* (female, 12.1 mm)



41-44. Habitus: 41 – *Luperogala mirabilis* (male, 10.4 mm), 42 – *L. mirabilis* (female, 13.5 mm), 43 – *L. mohamedsaidi* sp. nov. (male, paratype, 11.0 mm), 44 – *L. mohamedsaidi* sp. nov. (female, paratype, 13.4 mm)

45-52. Type specimens and their labels: 45-46 – holotype of *Pseudoliroetis clermonti* (female), 47-48 – holotype of *Luperogala paradoxa* (male), 49-50 – holotype of *Liroetis malayanus* (female), 51-52 – holotype of *Luperogala mirabilis* (male)

Genus	Vol. 25(3): 481-492	Wrocław, 30 IX 2014

Three *Cassida* species new to South Korea, with additional faunistic data and key to all Korean species (Coleoptera: Chrysomelidae: Cassidinae)

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Abstract. *Cassida ferruginea* Goeze and *C. mongolica* Boheman are reported for the first time in South Korea and occurrence of *C. japana* Baly is confirmed based on a critical examination of male genitalia. Key to all known species and additional material of Korean *Cassida* are provided.

Key words: entomology, new records, Chrysomelidae, Cassidinae, *Cassida ferruginea*, *Cassida japana*, *Cassida mongolica*, Korea.

INTRODUCTION

The genus *Cassida* Linnaeus, 1758 with 457 described species is the most speciose genus within the subfamily Cassidinae (Borowiec 1999, Borowiec & Świętojańska 2014). The genus is distributed throughout the Old World with two native species in North America (Spaeth 1927, Majka & LeSage 2008). Heyden (1887) reported *Cassida viridis* Linnaeus for the first time in Korea. Since then, Gressit & Kimoto (1963) provided the first comprehensive review of Korean *Cassida* and listed 13 species with a key to species. An et al. (1985) reported 18 species including 4 newly recorded species. Recently, Borowiec & Cho (2011) described a new species, *C. koreana*, which was the only endemic species to Korea. In total, 19 species have been recorded from Korea to date.

Here we report newly recorded species, *Cassida ferruginea* Goeze, 1777 and *C. mongolica* Boheman, 1854, from South Korea. *Cassida ferruginea* shows disjunct distribution in Western and Eastern Palearctic region while *C. mongolica* is widely

distributed in Northeast Asia. The occurrence of *C. japana* Baly, 1874 is confirmed based on recent materials and examination of male genitalia. *Cassida juglans* Gressitt, 1942 is excluded from the Korean fauna. Keys to 21 known species, photographs and additional material of Korean *Cassida* are provided. The specimens are deposited in the Department of Biodiversity and Evolutionary Taxonomy, University of Wrocław, Poland. Photographs were taken by a Nikon D5200 digital camera attached to a Nikon SMZ1500 microscope, and were edited by Helicon Focus 5.3.12 and Adobe Photoshop CS5 software.

RESULTS

Cassida ferruginea Goeze, 1777

(Figs. 5-6)

Material examined

1 ex., Buryeon Valley, Seo-myeon, Uljin-gun, Gyeongsangbuk Prov., South Korea, 10.V.1991, S.M. Jang.

Distribution

Europe (excluding Iberian Peninsula), Algeria, Turkey, Japan (Honshu, Kyushu). New to South Korea.

Remarks

Cassida ferruginea is similar to *C. panzeri* Weise in the colouration and triangular spot at elytral base, but can be distinguished by the obtusely angulate sides of pronotum, narrow and moderately declivous explanate margin of elytra and black femora on basal 2/3. This species had been regarded as a European species before *C. ferruginea*, previously misidentified as *C. panzeri*, was recorded from Japan by Suenaga (2013). The cause of this disjunct distribution still unknown.

Cassida japana Baly, 1874

(Figs. 9-10, 43-44)

Material examined

1 ex., Mt. Soemisan, Oncheon-dong, Dongnae-gu, Busan, South Korea, 3.VI.2004, H.W. Cho; 1 ex., Seodun-dong, Gwonseon-gu, Suwon-si, Gyeonggi Prov., South Korea, 26.V.2011, H.W. Cho.

Distribution

Laos, Vietnam, China (Jiangsu, Zhejiang, Anhui, Hubei, Sichuan, Fujian, Jiangxi, Guangdong, Guangxi), Taiwan, Japan. First certain record to South Korea.

Remarks

Cassida japana has long been confused with unspotted specimen of *C. piperata* since Doi (1927) reported this species under name of *C. japonica* for the first time in

Korea. The male genitalia, the only reliable diagnostic character, has not been studied in any specimens from Korea. In the study, we confirmed the occurrence of *C. japana* based on recent materials and study of male genitalia (Figs. 43-44).

Cassida mongolica Boheman, 1854

(Figs. 17-18)

Material examined

1 ex., Mt. Sangwolsan, Imgye-myeon, Jeongseon-gun, Gangwon Prov., South Korea, 17.VI.1997, H.C. Park.

Distribution

China (Hebei, Jiangsu, Shaanxi, Shandong), Mongolia, Russian Far East, Japan. New to South Korea.

Remarks

The black coloured specimen of *C. mongolica* is similar to *C. atrata* Fabricius in the black body with two yellowish brown triangular spots on the anterior margin of pronotum, but can be distinguished by the narrowly rounded pronotal sides and elevated relief of elytra. This species is widely distributed in Northeast Asia.

Cassida juglans Gressitt, 1942

Remarks

An et al. (1985) recorded *C. juglans* from South Korea based on two specimens and placed it in a key to Korean species. In our opinion the taxon was misinterpreted in this paper because original description of *C. juglans* is superficial and does not offer good diagnostic characters distinguishing *C. juglans* from *C. concha* and with great probability both taxa are conspecific. We unsuccessfully tried to find vouchers from the publication by An et al. (1985) and it is difficult to say which species the authors of this work examined. Until the revision of the type of *Cassida juglans* we recognize its presence in Korea as doubtful.

NEW FAUNISTIC DATA

***Cassida amurensis* (Kraatz, 1879)**. 1 ex., Corea sept. 1987, Pukde-chon [Bukdaecheon Stream, Tanchon-si, Hamgyongnam Prov., North Korea], Exped. ISEZ Cr.

***Cassida concha* Solsky, 1872.** 3 exx., Mt. Irwolsan, Irwol-myeon, Yeongyang-gun, Gyeongsangbuk Prov., South Korea, 12.VI.2011, H.W. Cho.

***Cassida fuscorufa* Motschulsky, 1866**. 1 ex., Mt. Gunyeosan, Bugi-myeon, Cheongwon-gun, Chungcheongbuk Prov., South Korea, 3.VIII.1997, J.W. Lee; 1 ex., Heungcheon-myeon, Yeoju-gun, Gyeonggi Prov., South Korea, 28.V.1999, Y.B. Lee; 1 ex., Songcheon-dong, Andong-si, Gyeongsangbuk Prov., South Korea, 5.V.2003, H.W.

Cho; 1 ex., same data as preceding one except 19.VI.2003, H.Y. Kwon; 1 ex., same data except 31.VI.2003; 1 ex., same data except 23.V.2006, J.E. Lee.

***Cassida koreana* Borowiec & Cho, 2011**. 1 ex., Naeji-ri, Yongmun-myeon, Yecheon-gun, Gyeongsangbuk Prov., South Korea, 11.V.2009, M.J. Lee; 1 ex., Songwol-ri, Hari-myeon, Yecheon-gun, Gyeongsangbuk Prov., South Korea, 11.V.2009, K.S. Sim; 1 ex., Mt. Baekunsan, Gwangyang-si, Jeollanam Prov., South Korea, 14.VI.2009, S.S. Kim; 1 ex., Dochon-ri, Sangni-myeon, Yecheon-gun, Gyeongsangbuk Prov., South Korea, 7.IX.2009, M.J. Lee.

***Cassida lineola* Creutzer, 1799.** 1 ex., Songcheon-dong, Andong-si, Gyeongsangbuk Prov., South Korea, 1.VI.2004, H.W. Cho; 1 ex., same data as preceding one except 2.VII.2004.

***Cassida mandli* Spaeth, 1921**. 1 ex., Dutaeyeon, Yanggu-gun, Gangwon Prov., South Korea, 30.V.1992, H.C. Park; 1 ex., Mt. Gwangdeoksan, Cheonan-si, Chungcheongnam Prov., South Korea, 16-18.VI.1994, H.S. Choi; 1 ex., Mt. Bangtaesan, Inje-gun, Gangwon Prov., South Korea, 25.VI.1996; 1 ex., Oknyeobong, Nonsan-si, Chungcheongnam Prov., South Korea, 23.V.1997, S.Y. Kim; 2 exx., Seodun-dong, Gwonseon-gu, Suwon-si, Gyeonggi Prov., South Korea, 20.VI.2000, S.J. Jang; 1 ex., Mt. Gyemyeongsan, Chungju-si, Chungcheongbuk Prov., South Korea, 17.VI.2003, K.D. Han & T.W. Kim; 1 ex., Mt. Jeombongsan, Girin-myeon, Inje-gun, Gangwon Prov., South Korea, 22.VI.2006, S.H. Kim.

***Cassida pallidicollis* Boheman, 1856**. 2 exx., Songcheon-dong, Andong-si, Gyeongsangbuk Prov., South Korea, 23.V.2004, H.W. Cho; 1 ex., same data as preceding one except 2.VII.2004; 1 ex., same data except 25.VII.2006, S.E. Noh.

***Cassida piperata* Hope, 1842**. 1 ex., Yeongdeok-gun, Gyeongsangbuk Prov., South Korea, 18.VI.1994, J.J. Park; 1 ex., Daemun-ri, Gunoe-myeon, Wando-gun, Jeollanam Prov., South Korea, 8.V.1998, I.S. Kim; 1 ex., Songcheon-dong, Andong-si, Gyeongsangbuk Prov., South Korea, 8.VI.2006, H.W. Cho; 1 ex., Dosan-myeon, Andong-si, Gyeongsangbuk Prov., South Korea, 18.VI.2006, H.W. Cho; 1 ex., Yeongjang-ri, Gwangtan-myeon, Paju-si, Gyeonggi Prov., South Korea, 30.V.2008, H.W. Cho.

***Cassida rubiginosa* Müller, 1776.** 1 ex., Mt. Daeamsan, Dong-myeon, Yanggu-gun, Gangwon Prov., South Korea, 7.VII.1995, J.I. Kim; 1 ex., same data as preceding one except 23.V.2003, T.W. Kim; 1 ex., same data except 7-8.VII.2003, J.K. Kim & T.W. Kim.

***Cassida sigillata* (Gorham, 1885).** 5 exx., Namcheon Valley, Danyang-gun, Chungcheongbuk Prov., South Korea, 7.VI.2008 H.W. Cho.

***Cassida velaris* Weise, 1896.** 1 ex., Nakdong River, Gangseo-gu, Busan, South Korea, 1.IV.2002, S.G. Kim.

***Cassida versicolor* (Boheman, 1855).** 1 ex., Mt. Naejangsan, Jeongeup-si, Jeollabuk Prov., South Korea, 26.V.1994, J.M. Park.

***Cassida viridis* Linnaeus, 1758.** 1 ex., Songnim-ri, Yeongok-myeon, Gangneung-si, Gangwon Prov., South Korea, 27.VI.1993, D.S. Ku; 1 ex., Mt. Palgongsan, Jangsu-gun, Jeollabuk Prov., South Korea, 24.V.2005, H.W. Cho.

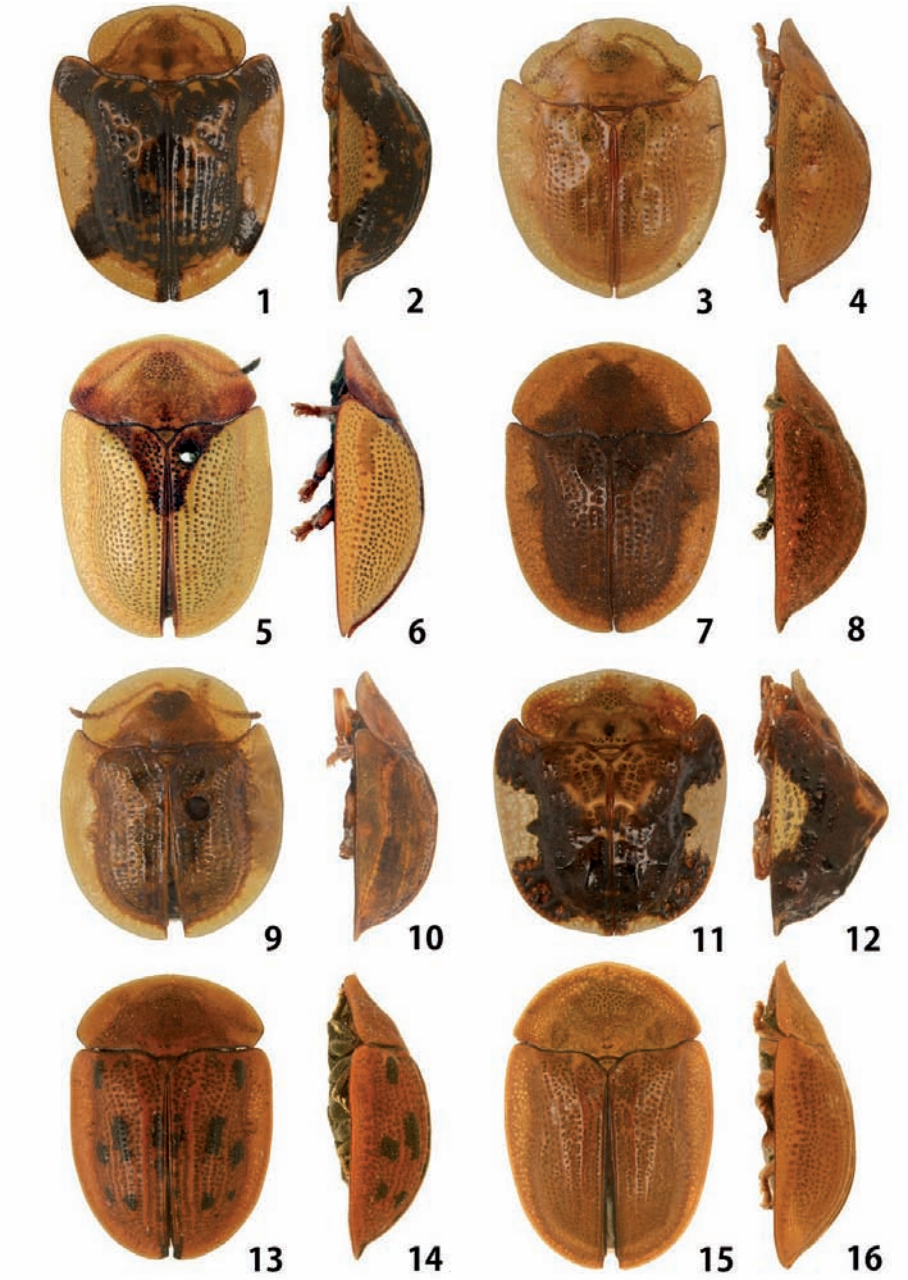
KEY TO SPECIES

1. Body pentagonal. Elytral disc with large postscutellar tubercle. Explanate margin of elytra with both humeral and posterolateral spots ..... 2.
–. Body oval or oblong or elongate. Elytral disc regularly convex or with more or less elevated postscutellar tubercle. Explanate margin of elytra with or without spots ..... 3.
2. Pronotum with small oval or v-shaped brown spot of distinct borders. Postscutellar area pale red (Figs. 11-12) ..... *koreana* Borowiec & Cho
–. Pronotum immaculate or only occasionally with small brown spot of diffused borders. Postscutellar area dark brown to black (Figs. 37-38) .... *vespertina* (Boheman)
3. Punctation of elytra at least partly regular ..... 4.
–. Punctation of elytra completely irregular (Figs. 39-40) ..... *viridis* Linnaeus
4. Claws simple ..... 5.
–. Claws appendiculate ..... 19.
5. Claws strongly divergent, not hidden by hairs of the last tarsal segment ..... 6.
–. Claws narrowly divergent, hidden by hairs of the last tarsal segment (Figs. 3-4) ..... *concha* Solsky
6. Body elongate. Explanate margin of elytra steeply declivous .....7.
–. Body oval or oblong or slightly elongate. Explanate margin of elytra moderately declivous ..... 9.
7. Femora black on basal half or more ..... 8.
–. Femora almost completely yellowish brown (Figs. 41-42) ..... *vittata* Villers
8. Punctation of pronotum shallow and sparse. Femora black except for apical half (Figs. 21-22) ..... *nobilis* Linnaeus
–. Punctation of pronotum coarse and dense. Femora black except for apical base (Figs. 33-34) .....*velaris* Weise
9. Punctation of elytra mostly regular, without any punctures between third and fourth rows ..... 10.
–. Punctation of elytra partly regular, with some extra punctures between third and fourth rows ..... 12.
10. Smaller, length 4.0-5.5 mm. Elytra with or without dark patterns and posterolateral spots. Outer margin of elytra not swollen ..... 11.
–. Larger, length 6.3-7.2 mm. Elytra with numerous spots, without posterolateral spots. Outer margin of elytra swollen in basal third (Figs. 19-20) .... *nebulosa* Linnaeus

11. Elytra without posterolateral spots (Figs. 9-10). Median lobe of aedeagus feebly curved in lateral view, apex oblong in dorsal view (Figs. 43-44) .... *japana* Baly
–. Elytra with or without posterolateral spots (Figs. 25-26). Median lobe of aedeagus distinctly curved in lateral view, apex more or less trapezoid in dorsal view (Figs. 45-46) ..... *piperata* Hope
12. Elytra without longitudinal stripes ..... 13.
–. Elytra with many longitudinal stripes (Figs. 13-14) ..... *lineola* Creutzer
13. Legs entirely black ..... 14.
–. Legs entirely or partly yellow to brown ..... 15.
14. Dorsum deep brownish red or rusty red, rarely yellowish brown. Pronotal sides angulate. Elytral disc with weak elevations. Dorsum with minute setae (Figs. 7-8) ..... *fuscorufa* Motschulsky
–. Dorsum largely black or rusty brown. Pronotal sides rounded. Elytral disc with distinct elevations. Dorsum with thick setae (Figs. 17-18) ..... *mongolica* Boheman
15. Pronotum without red basal band. Elytra generally without triangular spot at base ..... 16.
–. Pronotum with red basal band. Elytra always with triangular spot at base (Figs. 5-6) ..... *ferruginea* Goeze
16. Head black. Elytra without well marked H-shaped elevation .....17.
–. Head reddish brown. Elytra with well marked H-shaped elevation (Figs. 23-24) ..... *pallidicollis* Boheman
17. Femora entirely yellow to brown ..... 18.
–. Femora black on basal half (Figs. 27-28) ..... *rubiginosa* Müller
18. Elytral interstriae with minute setae (Figs. 15-16) ..... *mandli* Spaeth
–. Elytral interstriae without minute setae (Figs. 31-32) ..... *spaethi* Weise
19. Elytra without well marked X-shaped elevation ..... 20.
–. Elytra with well marked X-shaped elevation (Figs. 35-36) ..... *versicolor* (Boheman)
20. Explanate margin of elytra with both humeral and posterolateral spots (Figs. 1-2) ..... *amurensis* (Kraatz)
–. Explanate margin of elytra with only humeral spots (Figs. 29-30) ..... *sigillata* (Gorham)

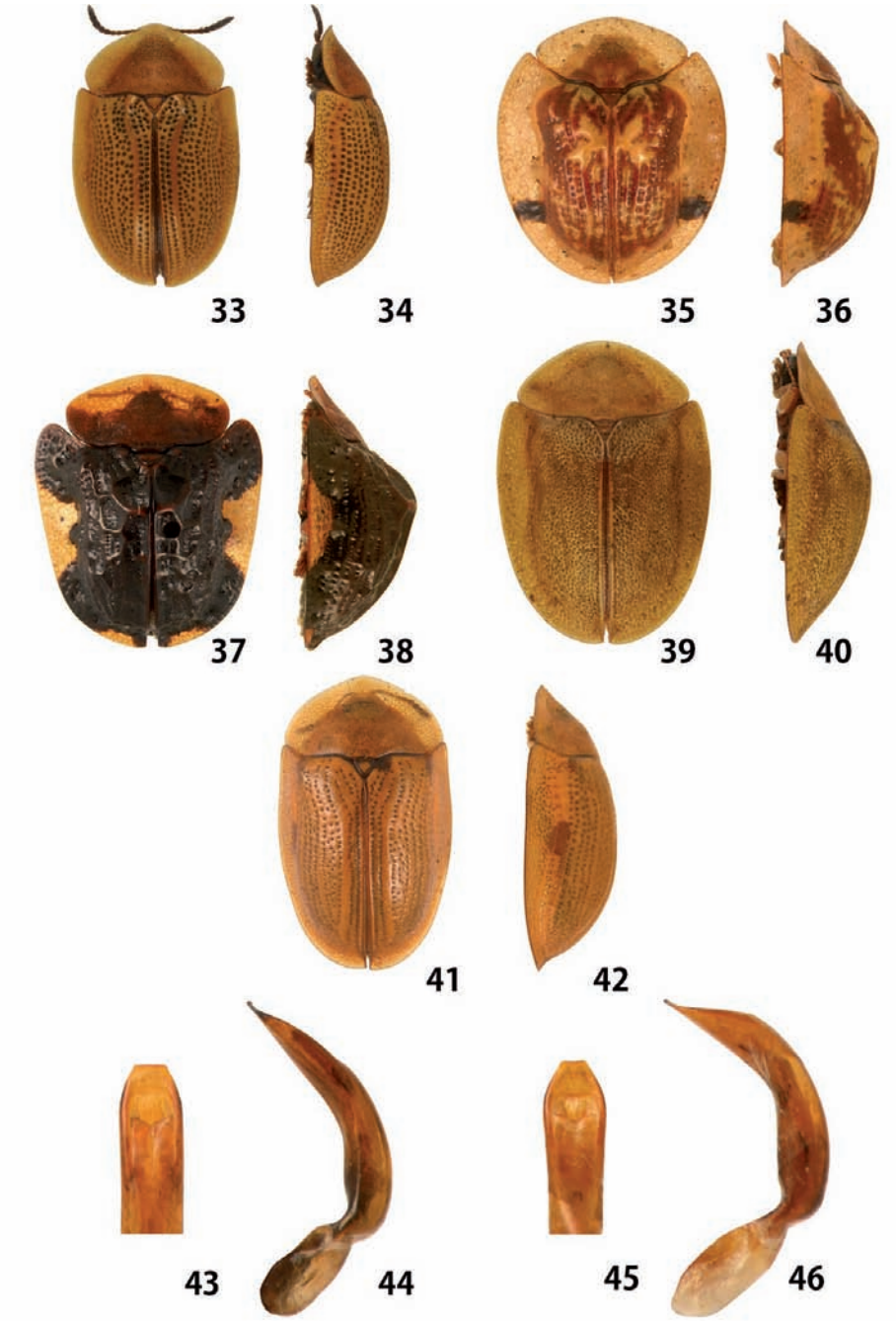
AUXILIARY KEY TO SPECIES

1. Explanate margin of elytra with distinct dark spots: humeral, posterolateral or both humeral and posterolateral (Figs. 1, 11, 25, 29, 35, 37) ..... 2.
–. Explanate margin of elytra without distinct dark spots: uniformly yellow (Figs. 3, 5, 15, 21), green (Figs. 27, 39), brown or black (Figs. 7, 17), or with indistinct mottled pattern (Fig. 23), or few dark spots in posterior length (Fig. 19) ..... 7.
2. Explanate margin of elytra with only humeral (Fig. 29) or posterolateral spots (Figs. 25, 35) ..... 3.



1-2. *Cassida amurensis*; 3-4. *C. concha*; 5-6. *C. ferruginea*; 7-8. *C. fuscorufa*; 9-10. *C. japana*; 11-12. *C. koreana*; 13-14. *C. lineola*; 15-16. *Cassida mandli*

17-18. *Cassida mongolica*; 19-20. *C. nebulosa*; 21-22. *C. nobilis*; 23-24. *C. pallidicollis*; 25-26. *C. piperata*; 27-28. *C. rubiginosa*; 29-30. *C. sigillata*; 31-32. *C. spaethi*



33-34. *Cassida velaris*; 35-36. *C. versicolor*; 37-38. *C. vespertina*; 39-40. *C. viridis*; 41-42. *C. vittata*; 43-44. Aedeagus of *C. japana*: 43 – apex dorsal, 44 – aedeagus lateral; 45-46. Aedeagus of *C. piperata*: 45 – apex dorsal, 46 – aedeagus lateral

–. Explanate margin of elytra with both humeral and posterolateral spots (Figs. 1, 11, 37) ..... 5.
3. Explanate margin of elytra with broad humeral spot. Pronotal and elytral disc dark coloured, reddish-brown, brown or black (Figs. 29-30) ..... *sigillata* (Gorham)
–. Explanate margin of elytra with narrow posterolateral spot ..... 4.
4. Body regularly circular. Pronotal and elytral disc with reddish to brownish pattern on pale yellow background and yellow relief, with high, X-shaped postscutellar elevation (Figs. 35-36) ..... *versicolor* (Boheman)
–. Body oval. Pronotum unicolours, elytral disc with brownish pattern on yellowish-brown background, with low X-shaped postscutellar elevation. Typical form with posterolateral spots on explanate margin of elytra (Figs. 25-26) .... *piperata* Hope
5. Elytral disc with distinct hump in profile (Figs. 12, 38) and strong sculpture behind the hump (Figs. 11, 37) ..... 6.
–. Elytral disc regularly rounded in profile (Fig. 2) and indistinct sculpture behind the hump (Fig. 1) ..... *amurensis* (Kraatz)
6. Pronotal disc immaculate or only occasionally with small brown spot of diffused borders. Postscutellar area dark brown to black (Figs. 37-38) .... *vespertina* (Boheman)
–. Pronotal disc with small oval or v-shaped brown spot of distinct borders. Postscutellar area pale red (Figs. 11-12) ..... *koreana* Borowiec & Cho
7. Punctation of elytra at least partly regular, dorsal colour from uniformly yellow to black, or spotted. Claws simple or appendiculate ..... 8.
–. Punctation of elytra completely irregular, dorsum uniformly yellow or green (Figs. 39-40). Claws with small basal tooth ..... *viridis* Linnaeus
8. Both pronotum and elytra mostly or completely yellow, brown or with pattern but never black ..... 9.
–. Pronotum and elytra mostly black (Figs. 17-18) ..... *mongolica* Boheman
9. Legs entirely black ..... 10.
–. Legs entirely or partly yellow to brown ..... 11.
10. Pronotal sides angulate (Fig. 7). Elytral disc with weak elevations. Dorsum with minute setae ..... *fuscorufa* Motschulsky
–. Pronotal sides rounded (Fig. 17). Elytral disc with distinct elevations. Dorsum with thick setae. Pale form with mostly brown dorsum ..... *mongolica* Boheman
11. Elytra with well defined small black spots on yellow or reddish background (Figs. 13-14, 19-20) ..... 12.
–. Elytra uniformly yellow or brown, or with mottled pattern (Figs. 23, 25, 35), or basal spot (Fig. 5) but never with well defined small black spots on yellow or reddish ..... 13.
12. Pronotum with rounded sides, without basal corners. Explanate margin of elytra in posterior half usually with black spots (Fig. 19). Punctation of elytra completely regular. Sexual dimorphism indistinct ..... *nebulosa* Linnaeus
–. Pronotum widest close to base, with basal corners. Explanate margin of elytra in posterior half always without black spots (Fig. 13). Punctation of elytra at base

of elytra with additional punctures between rows. Sexual dimorphism distinct ..... *lineola* Creutzer

13. Claws simple. Elytra without well marked X-shaped elevation ..... 14.
–. Claws appendiculate. Elytra with well marked X-shaped elevation (Figs. 35-36) ..... *versicolor* (Boheman)
14. Body elongate, subcylindrical with narrow, steeply declivous explanate margin of elytra (Figs. 21, 33, 41) ..... 15.
–. Body oval to circular usually with broad, moderately declivous explanate margin of elytra (Figs. 3, 15, 23, 25, 27, 31) ..... 17.
15. Femora black on basal half or more ..... 16.
–. Femora almost completely yellowish brown (Figs. 41-42) ..... *vittata* Villers
16. Punctation of pronotum coarse and dense (Figs. 33-34) ..... *velaris* Weise
–. Punctation of pronotum shallow and sparse (Figs. 21-22) ..... *nobilis* Linnaeus
17. Claws strongly divergent, not hidden by hairs of the last tarsal segment. Body shape variable (Figs. 15, 23, 25, 27, 31) ..... 18.
–. Claws narrowly divergent, hidden by hairs of the last tarsal segment. Body almost hemispherical (Figs. 3-4) ..... *concha* Solsky
18. Punctation of elytra completely regular, without any punctures between third and fourth rows. Form without posterolateral spots on explanate margin of elytra (Figs. 9-10) ..... 19.
–. Punctation of elytra with some additional punctures between third and fourth rows ..... 20.
19. Median lobe of aedeagus feebly curved in lateral view, apex oblong in dorsal view (Figs. 43-44) ..... *japana* Baly
–. Median lobe of aedeagus distinctly curved in lateral view, apex more or less trapezoid in dorsal view (Figs. 45-46) ..... *piperata* Hope
20. Femora black on basal half ..... 21.
–. Femora entirely yellow to brown ..... 22.
21. Pronotum with red basal band, elytra with brown, triangular basal spot (Fig. 5) ..... *ferruginea* Goeze
–. Pronotum uniformly yellow, elytra unicolours, or with small brown spot at postscutellar point, occasionally with few brown basal spots in postscutellar impression (Fig. 27) ..... *rubiginosa* Müller
22. Elytral interstriae with minute setae. Base of elytra as wide as base of pronotum (Figs. 15-16) ..... *mandli* Spaeth
–. Elytral interstriae without minute setae. Base of elytra slightly wider than base of pronotum (Figs. 31-32) ..... *spaethi* Weise

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Description of fundatrix of *Anoecia vagans* (Koch, 1856) (Hemiptera: Aphididae)

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Abstract. The first description of fundatrix morph of *Anoecia vagans* (Hemiptera, Aphididae) is presented. Morphological traits distinguishing it from fundatrix of *A. corni* are presented.

Key words: entomology, taxonomy, aphids, Anoeciinae, stem-mother.

INTRODUCTION

Genus *Anoecia* Koch, 1857, nominative for the subfamily Anoeciinae Tullgren, 1909, is one of more taxonomically difficult among aphids. Its taxonomic position is uncertain, despite some molecular studies including representatives of this genus (Ortiz-Rivas & Martinez-Torres 2010). Also within the genus there are significant problems with proper species recognition, which concerns mainly alate females and fundatrices. Life cycles of many species are uncertain, with cases of sexually reproducing lines and constantly parthenogenetic combined with presence or absence of host alternation. Morphological features often overlap between species (Depa 2010). Most of them are described only on the basis of apterous viviparous females on secondary hosts, which in vast majority are representatives of the family Poaceae. Fundatrices of many species, feeding on *Cornus sp*., are either unknown or are regarded to be undistinguishable from fundatrix of *A. corni* (Heie 1980, Nieto-Nafría et al. 1998).

A. vagans (Koch, 1856) is a species widespread in Europe, host alternating between *Cornus sanguinea* and various Poaceae. A significant feature of this species is that its fundatrigeniae are exclusively alate, and unlike other European species, have no

sclerotic plate on their abdominal tergites (Fig. 1) (Zwölfer 1958, Heie 1980, Nieto-Nafría et al. 1998).

The aim of this study is to present first description of fundatrix of *A. vagans*, with reference to morphology of fundatrix of *A. corni*, as it is so far the only morphologically distinguished fundatrix of the genus *Anoecia*.

Collection data

14.05.2011, Cieszyn, N: 49°44'2.98" E: 18°37'50.90", inflorescence of *Cornus sanguinea*, 2 fundatrices, 1 alate fundatrigenia of *Anoecia vagans*, leg. and det. Ł Depa. The collection of alate fundatrigenia (Fig. 1) from the same colony allowed the correct determination of fundatrices.

For comparison with fundatrix of *A. corni*, the following specimens of *A. corni* were examined:

30.04.2009, Piekary Śląskie, N: 50°22'15.54" E: 18^{0}57'20.26", inflorescence of *Cornus sanguinea*, 4 fundatrices, leg. and det. Ł. Depa;

02.05.2009, Piekary Śląskie, N: 50°23'45.95" E: 18^{0}55'22.00", inflorescence of *Cornus sanguinea*, 5 fundatrices, leg. and det. Ł. Depa;

14.05.2009, Piekary Śląskie, N: 50°23'32.67" E: 18^{0}57'23.43", inflorescence of *Cornus sanguinea*, 4 fundatrices, leg. and det. Ł. Depa.

Microscopic slides are deposited in the collection of Zoology Department, University of Silesia.

1. Alate fundatrigenia of *A. vagans* in microscopic slide

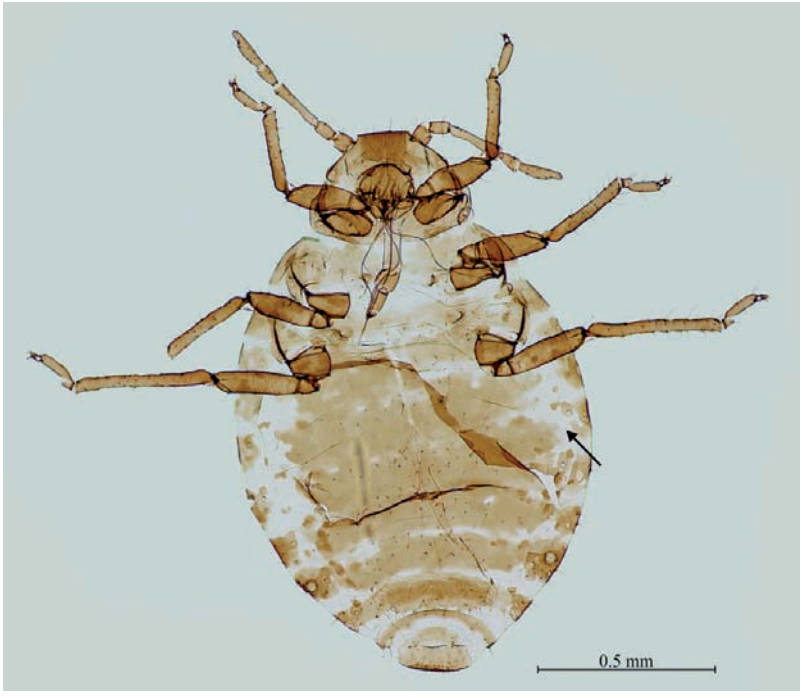
DESCRIPTION

Fundatrix (Fig. 2.)

Body blackish in live specimens, 1.50-1.58 mm long. Head capsule sclerotised, fused with prothorax. Frons straight, darker than rest of head, with 13-15 long, pointed hairs; median suture weak; triommatidium only. Antenna 5- segmented, 0.44-0.48 mm long, 0.29-0.30 of body length, with primary rhinaria only. Length of antennal segments: III 0.141-0.168, IV 0.06-0.07, V 0.126-0.128; ratio of processus terminalis to basal part of antennal segment V 0.36. Rostrum 0.29-0.30 mm long, 0.18-0.20 of body length; ultimate rostral segment 0.080-0.094 mm long, 0.70-0.78 of second segment of hind tarsus, with 2 accessory hairs.

Thorax sclerotised, with well developed and separated dorsal and marginal sclerites. Each segment with row of long, pointed hairs. Meso- and metathoracic furca poorly developed. Legs relatively short, as dark as frons, sparsely covered with pointed hairs. Hid tibiae 0.38-0.40 mm long, 2.50-2.71 of antennal segment III, second segment of hind tarsus 0.114-0.121 mm long.

Abdomen sclerotised, with spino-pleural sclerites - crossbars of tergite II-V fused to form discoidal sclerotic plate, however, in some places those crossbars are not entirely fused. Crossbar on tergite I is partly fused with discoidal plate and crossbars of tergites VI-VIII are separated. Marginal sclerites present on abdominal tergites I-VII, on tergites I-V are separated from discoidal plate. On tergites VI-VII there are single sclerotic bands developed from fused marginal and spino-pleural sclerites.



2. Fundatrix of *A. vagans* in microscopic slide (arrow indicates weak marginal sclerotisation)

Marginal tubercles present on marginal sclerites I-VII, however, may be missing from tergites V-VI, varying in size, usually the biggest are on I and VII tergite: 0.037-0.054 mm in diameter, and the smaller ones are on tergites III-VI: 0.0134-0.0201 mm in diameter.

Siphuncular pore on sclerotic plate, covered with fine, pointed hairs, 0.03-0.04 mm in diameter. Spiracles on small scleroits, fused with marginal sclerites.

Abdominal tergites I –VI with single rows of short, pointed or blunt hairs. Tergite VIII with 8 long, pointed hairs, 0.06-0.09 mm long. Subgenital plate rectangular, 0.09-0.011 long and 0.29-0.31 mm wide, covered with many long, pointed hairs. Cauda rounded, covered with many long, pointed hairs.

3. Fundatrix of *A. corni* in microscopic slide (arrow indicates dorsal sclerotic crossbars merged with large marginal plates)

Difference from fundatrix of *A. corni*

There is a set of conspicuous morphological features distinguishing fundatrices of *A. corni* and *A. vagans*. The following morphological traits may serve as a key for determination of fundatrices of both species:

1. Body size: *A. vagans* < 1.59 mm long, *A. corni* > 2.0 mm;
2. Sclerotisation: *A. vagans* – dorsum with sclerotic plates merged only partially, with weak marginal sclerotisation (Fig. 2), *A. corni* – dorsum heavily and uniformly sclerotised, with dorsal sclerotic plates merged with marginal plates (Fig. 3);
3. Accessory hairs on ultimate rostral segment: *A. vagans* – 2, rarely 3; *A. corni* – 4, rarely 3 or 5.

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Redescription of *Camponotus nitidescens* Forel, 1889, new status and notes on ants from Kefalonia, Greece (Hymenoptera: Formicidae)

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Abstract. *Camponotus kiesenwetteri* r. *nitidescens* Forel, 1889 described from Kefalonia island is removed from synonyms of *C. piceus* (Leach, 1825) and raised to the rank of species. List of 54 ant species collected in Kefalonia in 2014, with 24 species new to the island, and complete check-list of 76 ant species recorded hitherto from this island are given.

Key words: erntomology, taxonomy, zoogeography, Hymenoptera, Formicidae, Greece, Ionian Islands.

INTRODUCTION

Kefalonia (Greek: Κεφαλονιά or Κεφαλλονιά), formerly also known as Kefallinia or Kephallenia (Κεφαλληνία) is the largest island of the Ionian Archipelago. It is also a separate regional unit of the Ionian Islands region, and the only municipality of the regional unit. The capital of Kephalonia is Argostoli. The size of the island is about 781 km2 and the majority of the land is mountainous. The island's highest mountain is Mount Ainos, with an elevation of 1628 m; to the west-northwest are the Paliki mountains, with other high mountains including Roudi, Geraneia (Gerania) and Agia Dynati. The top of Mount Ainos is covered with fir forests and the dominant vegetation forms of the western slope of Roudi Mountain are deciduous oak forest of and numerous species of mediterranean shrubs. Both areas are protected as a national park. Logging is rare on the island; however its timber output is one of the highest in the Ionian islands. Forest fires were common during the 1990s and the early 2000s.

Ants of the island are poorly known. Most species recorded from Kefalonia were noted in end of XIXth and beginning of XXth century in various papers devoted to the fauna of the Mediterranean area, usually without precise locality data (Forel 1886, Emery 1901, 1914, Finzi 1930). The only paper with a significant number of species noted from Kefalonia was Collingwood's (1993) note published in the Proceedings of the International Congress on Zoogeography and Ecology of Greece and adjacent areas, which was held in Iraklion (Crete) in 1990. In his comparative studies of the ant fauna of five Greek islands he recorded generally 26 species from Kefalonia but noted that the small number of collected species was caused by late season when he collected on the island (September) and limited access due to raging fires.

A total of 56 ant species has been recorded from Kefalonia in the literature but the occurrence of seven taxa needs confirmation due to recent revisions and faunistic investigations on Mediterranean ants. The senior author collected in June 2014 in 19 localities spread over most of the island, recording 54 ant species, 24 previously not reported from Kefalonia (but 4 attributed to species complex only and 6 to numbered morphospecies). In this material we found a rare taxon originally described under name *Camponotus kiesenwetteri* r. *nitidescens* Forel, 1889 and later synonymized with *C. piceus* (Leach, 1825). In our opinion it represents a good species, very distinct from *C. piceus* and close to *C. boghossiani* Forel, 1911 known from Crete, Aegean Islands and western Turkey. Its redescription is given below. We also list all newly collected material and compile a check-list of all ant species recorded from Kefalonia.

MATERIALS AND METHODS

Abbreviations:

CI – clypeus index; CW/CL x 100;
CW – clypeus width; width of the posterior extension of the clypeus measured at the midpoint of the antennal sockets;
CL – clypeus length; maximum length of clypeus;
EL – eye length; measured along the maximum diameter of eye;
HI – head index: HW/HL x 100;
HL – head length; measured in straight line from mid-point of anterior clypeal margin to mid-point of occipital margin; in full face view;
HTI – hind tibia index ; HTL/HW x 100;
HTL – hind tibia length; maximum length of hind tibia;
HW – head width; measured below the eyes in full-face view;
MI – mesosoma index; ML/MH x 100;
ML – mesosoma length; measured as diagonal length from the anterior end of the neck shield to the posterior margin of the propodeal lobe;
MH – mesosoma width; measured from the upper level of the mesonotum to the lower margin of the mesopleuron;
SI1 – scapus index 1; SL/HL x 100;
SI2 – scapus index 2; SL/HW x 100;
SL – maximum straight-line length of scapus.

Explanation of measurements used in description:

HW: 1.217 ± 0.335 (0.813-1.626) = mean HW: average: 1.217 ± standard deviation: 0.335 (minimum value: 0.813 - maximum value: 1.626).

Localities:

(Symbols e.g. KE164 refer to locality number in the database of Greek ants available in AntWeb resources: www.antweb.org; locality numbers correspond to the numbers in the table, map with localities is on Fig. 9).

1 - KE164 - Hotel Panas n. Spartia, 23 m, 38,10398 N / 20,57470 E, 23 VI 2014 (garden and vicinity of a small hotel area);

2 - KE165 - n. Peratata, 211 m, 38,14058 N / 20,55038 E, 24 VI 2014 (pine forest on a rocky hill);

3 - KE166 - n. Troianata, 346 m, 38,16753 N / 20,55496 E, 24 VI 2014 (open oak woodland);

4 - KE167 - nr Razata, 159 m, 38,17166 N / 20,52268 E, 24 VI 2014 (open oak woodland on an archeological site with ancient stone walls);

5 - KE168 - Enos Mts. Loc. 1, 677 m, 38,19142 N / 20,59415 E, 25 VI 2014 (mountain pasture with clumps of low oaks);

6 - KE169 - Enos Mts. Loc. 2, 1336 m, 38,15273 N / 20,63930 E, 25 VI 2014 (fir forest);

7 - KE170 - Enos Mts. Loc. 3, 1571 m, 38,14105 N / 20,65708 E, 25 VI 2014 (fir forest);

8 - KE170A - Avithos Lake, 278 m, 38,17293 N / 20,71233 E, 25 VI 2014 (area near a small lake in a moist, shaded valley of a small creek);

9 - KE171 - Mt. Kalon Oros, 658 m, 38,34205 N / 20,56472 E, 26 VI 2014 (mountain pasture);

10 - KE172 - Andipata Erison, 67 m, 38,47108 N / 20,54327 E, 26 VI 2014 (dense oak forest);

11 - 173 - Psilithrias, 106 m, 38,45860 N / 20,56237 E, 26 VI 2014 (shady, dense, moist deciduous forest);

12 - KE174 - Vendourata, 202 m, 38,43202 N / 20,57021 E, 26 VI 2014 (open oak woodland);

13 - KE175 - Poros, 62 m, 38,14936 N / 20,77029 E, 27 VI 2014 (gorge in the limestone rocks);

14 - KE176 - rd. Poros-Skala, 13 m, 38,12813 N / 20,79509 E, 27 VI 2014 (shaded valley of a small creek);

15 - KE177 - Kateleios, 11 m; 38,07079 N / 20,75164 E, 27 VI 2014 (edge of a small river);

16 - KE178 - rd. Razata-Sami, 543 m, 38,20101 N / 20,60002 E, 28 VI 2014 (natural mountain deciduous forest);

17 - KE179 - n. Poulata, 102 m, 38,23170 N / 20,61041 E, 28 VI 2014 (open oak woodland);

18 - KE180 - Drongarati Cave, 56 m, 38,22711 N / 20,62839 E, 28 VI 2014 (entrance to a large cave);

19 - KE181 - rd. Sami-Razata, 553 m, 38,19937 N / 20,59685 E, 28 VI 2014 (open oak woodland).

RESULTS

Redscription of *Camponotus nitidescens* Forel

Camponotus nitidescens Forel, 1889 bona species, new status

Camponotus kiesenwetteri r. *nitidescens* Forel, 1889: 260; Radchenko 1997: 707 (as synonym of *Camponotus piceus*).
Camponotus kiesewetteri nitidescens For.: Emery 1914: 159; Finzi 1930: 310.
Camponotus (*Myrmentoma*) *kiesenwetteri* subsp. *nitidescens* Forel: Emery 1925: 121.

Description

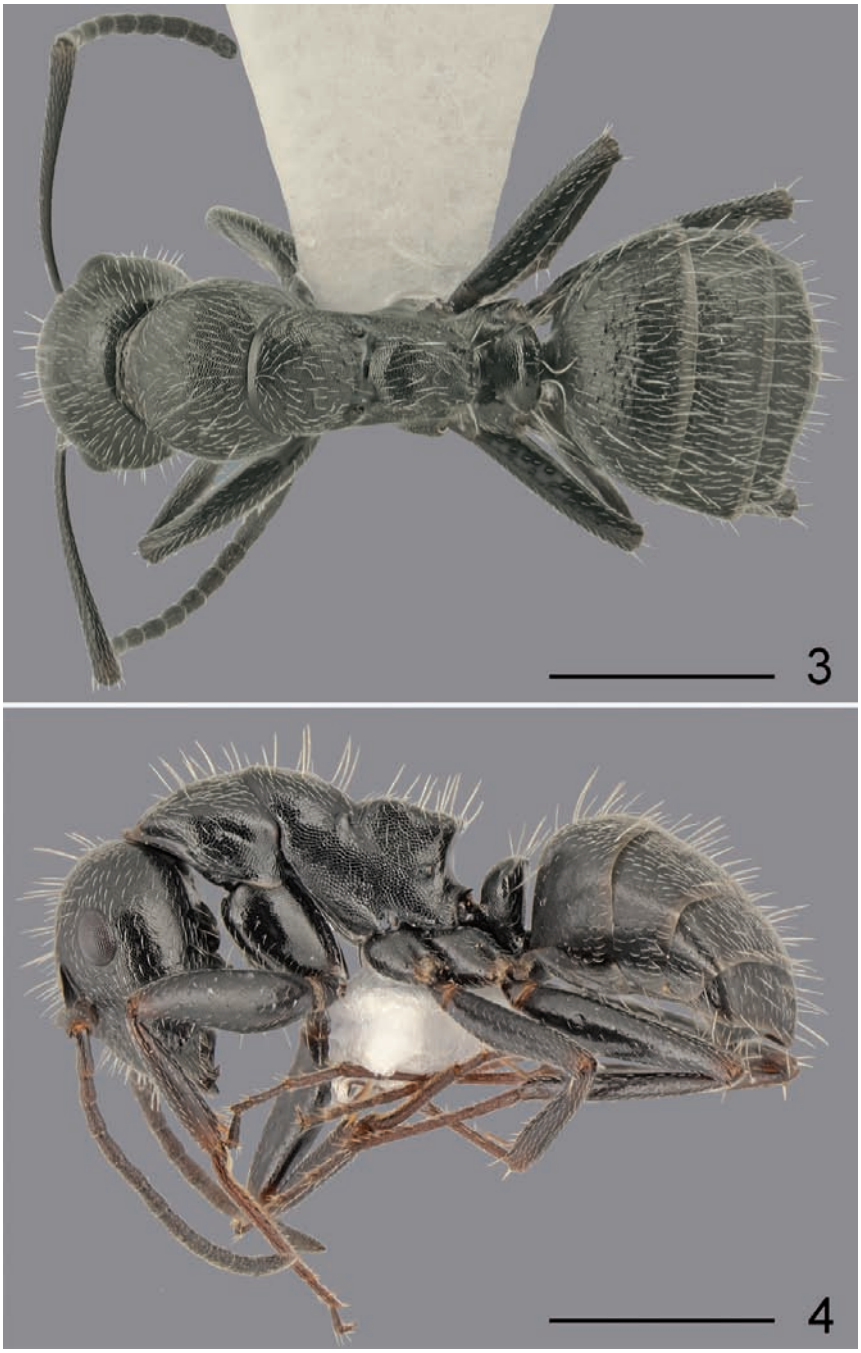
Measurements: Minor workers: HL: 1.1 ± 0.07 (1.008-1.193); HW: 0.908 ± 0.08 (0.813-1.019); CW: 0.469 ± 0.02 (0.447-0.492); CL: 0.28 ± 0.031 (0.235-0.313); SL: 1.149 ± 0.049 (1.089-1.213); EL: 0.277± 0.015 (0.263-0.296); ML: 1.472 ± 0.08 (1.373-1.549); MH: 0.989± 0.044 (0.934-1.041); HTL: 1.13 ± 0.131 (1.047-1.219); HI: 121.3 ± 2.7 (117.1– 124.0); SI1: 104.6 ± 5.0 (102.7-110.2); SI2: 127.0± 8.4 (114.3-135.2); CI: 170.9 ± 16.9 (142.8-194.9); MI: 148.7 ± 2.7 (146.5-153.8); TI: 123.5 ± 5.0 (118.3-128.8);

Major workers: HL: 1.569± 0.08 (1.478-1.652); HW: 1.525 ± 0.09 (1.413– 1.626); CW: 0.657± 0.04 (0.615– 0.715); CL: 0.531± 0.033 (0.492– 0.581); SL: 1.361 ± 0.064 (1.252– 1.421); EL: 0.344± 0.032 (0.293– 0.38); ML: 1.999± 0.1 (1.882– 2.132); MH: 1.361 ± 0.14 (1.263-1.605); HTL: 1.434 ± 0.09 (1.35-1.532); HI: 102.9 ± 1.2 (101.1-104.6); SI1: 86.8 ± 2.9 (84.1-92.1); SI2: 89.3 ± 3.6 (85.0-94.9); CI: 123.8 ± 4.4 (118.8-130.3); MI: 147.2± 8.4 (132.8-153.8); TI: 92.7 ± 3.8 (87.4-95.5).

Whole body black. Trochanters partly yellowish brown, in some specimens scapus, fore tibiae, and partly mid tibiae brown, tarsi in all specimens from brown to dark brown. (Figs. 1-4).

Distinctly polymorphic species, the largest major workers 1.5 times longer than the smallest minor workers. Head in major workers large, almost square in outline, the widest at eye height, softly narrowed anteriad and rounded posteriad (Fig. 5). Anterior margin of clypeus in the middle with triangular emargination. Eyes small, placed distinctly before mid length of head, small, 0.8 times as long as length of tempora and 0.4 times as long as length of genae. Scapes short, only slightly longer than width of head, at base 0.75 times as wide as in apex, gradually widened, straight, without preapical constriction. Funicle elongate and thin, 1.3 times as long as scape, first segment elongate, 2.3-2.4 times as long as wide on apex, 1.4 times as long as second segment, segments 3-6 equal in length and slightly longer than second segment, segments 7-11 slightly shorter than second segment. Surface of scape with fine microsculpture but

1, 2. *Camponotus nitidescens* Forel, minor worker: 1 – dorsal, 2 – lateral (scale bar 1 mm)



3, 4. *Camponotus nitidescens* Forel, major worker: 3 – dorsal, 4 – lateral (scale bar 1 mm)

5, 6. *Camponotus nitidescens* Forel, head: 5 – major worker, 6 – minor worker (scale bar 0.5 mm)

appears slightly shiny, covered with very short and sparse adherent setae and 6-9 short erect setae. Head in minor workers oval, the widest at eye height, softly narrowed anteriad and rounded posteriad (Fig. 6). Anterior margin of clypeus without emargination. Eyes proportionally larger than in major worker, placed distinctly before mid-length of head, small, approximately as long as length of tempora and 0.6 times as long as

7, 8. *Camponotus boghossiani* Forel, major worker (specimen from Samos): 1 – dorsal, 2 – lateral (scale bar 1 mm)

length of cheeks. Scapes short, slimmer than in major worker, 1.1-1.2 times longer than width of head, at base 0.77-0.79 times as wide as in apex, gradually widened, straight, without preapical constriction. Funicle in shape and ratio of segments similar as in major worker. Surface of scape with fine microsculpture appears less shiny than in major worker, covered with very short and sparse adherent setae and 0-3 short erect setae. Whole surface of head in both major and minor worker with numerous white, erect setae (Figs. 5, 6).

Promesonotum regularly, distinctly convex in profile or with distinct suture between pronotum and mesonotum, between promesonotum and propodeum deep cleft (Figs. 2, 4). Propodeum elongate, in major workers 1.3 in minor worker 1.5 times as long as wide, posterior margin truncate or very shallowly emarginate but posterior corners never forms tooth-like processes, upper surface of propodeum flat. Whole surface of pronotum, dorsal part of mesonotum and lateral parts of propodeum covered with sparse, adherent setae, dorsal part of whole mesosoma with numerous, long, white erect setae. Petiolar squama stout, with convex anterior and flat posterior surface, margin with row of long, white setae (Figs. 2, 4).

Mandibles short, dorsal surface with distinct microreticulation and several elongate setose punctures, dull, inner margin with one larger and 3-4 smaller teeth. Clypeus on whole surface microreticulate and sparse setose punctures, dull. Frontal carinae short, extending to the line connecting anterior margin of eyes, form regular arch, interantennal area flat with thin median line, microreticulate, with sparse setose punctures, dull. Area between eyes and top of head distinctly microreticulate, appears distinctly dull, microreticulation gradually diffused from dorsal to ventral part of head, gena, on underside of head tends to form linear sculpture, surface behind eyes and on ventral surface of head appears shiny. Mesosoma on dorsal surface with distinct microreticulation, cells of microsculpture with shallow impression, whole surface appears dull. On sides of mesosoma, especially on mesopleura microreticulation tends to form linear structures, cells of microireticulation with gradually shallower impression and surface from dorsum to basal parts change gradually from dull to more or less shiny. Petiole microreticulate but appears shiny. Gaster on dorsum with sparse, short adherent setae and numerous long erect setae, with distinct regular microsculpture, dull; on sides microsculpture ranges from dull to shiny, underside of gaster distinctly shiny.

Legs moderately long, hind femora 0.8 times as long as mesosoma, hind tibiae approximately as long as hind femora, hind tarsi 1.4 times as long as hind femora. Whole surface of femora and tibiae with short, sparse, adherent pubescence, posterior and ventral surface of fore femora, and ventral surface of mid and hind femora with numerous, long erect setae, surface of femora appears shiny, surface of tbiae slightly dull. Hind tibia with long apical spine and on inner surface with a row of 3-5 short spines.

Diagnosis

Deep cleft between mesonotum and propodeum and dull, strongly microreticulate dorsum places this species in the subgenus *Myrmentoma* in *Camponotus kiesenwetteri* group (Radchenko 1997). Only one other species of this group, *C. kiesenwetteri*,

occurs in Ionian Islands. It is well distinguished by emarginated posterior margin of the propodeum, with posterior angle forming broad tooth-like processes, while in *C. nitidescens* the posterior margin of propodeum is truncate or very shallowly emarginated. At first glance *C. nitidescens* is very similar to *C. boghossiani* known from Crete, Aegean Islands and western Turkey. Both species have similarly shaped propodeum but in *C. nitidescens* the cleft between mesonotum and propodeum is distinctly deeper and promesonotum is more convex than in *C. boghossiani* (Figs. 2, 4, 8). Microsculpture in *C. boghossiani* is more distinct and in dorsal and lateral views this species appears more dull than *C. nitidescens*. This clearly more matte sheen is caused by a different development of the cell of microsculpture, in *C. boghossiani* deeply impressed, while in *C. nitidescens* only shallowly impressed. On the sides of the mesosoma and gaster this microsculpture in *C. nitidescens* tends to be gradually shallower, cells lengthen and tend to lay in a linear pattern and the surface integument becomes gradually more shiny so that the lower part of the mesosoma and the underside of the gaster are entirely shiny, while in *C. boghossiani* the microsculpture is regular on the whole mesosomal surface and abdominal ventrites are only slightly less dull than tergites. The two other species of *C. kiesenwetteri* group occurring in eastern Greece are *Camponotus aegaeus* Emery and *C. libanicus* André and differs in the upper surface of mesosoma forming a regular arch, with distinct meso-propodeal suture but without a cleft between mesonotum and propodeum.

Biological notes

The nest of *Camponotus nitidescens* was on a cracked rock wall under a loose piece of rock. The rock was situated on the edge of a natural deciduous forest composed of low oaks and underbrush heavily overgrown with Mediterranean macchia. The wall with the nest was on north-western exposure. Syntopic ant species collected in this area (species collected on the same cracked rock are marked with bold) included ***Aphaenogaster balcanica* (Emery)**, ***Camponotus aethiops* (Latreille)**, ***Camponotus dalmaticus* (Nylander)**, *Camponotus honaziensis* Karaman & Aktaç, ***Plagiolepis pygmaea* (Latreille)**, ***Ponera testacea* Emery**, ***Stigmatomma denticulatum* Roger**, *Temnothorax bulgaricus* (Forel), *Temnothorax* cf. *interruptus*, *Temnothorax laconicus* Csősz, Seifert, Müller, Trindl, Schulz & Heinze, and *Tetramorium semilaeve* André.

Distribution

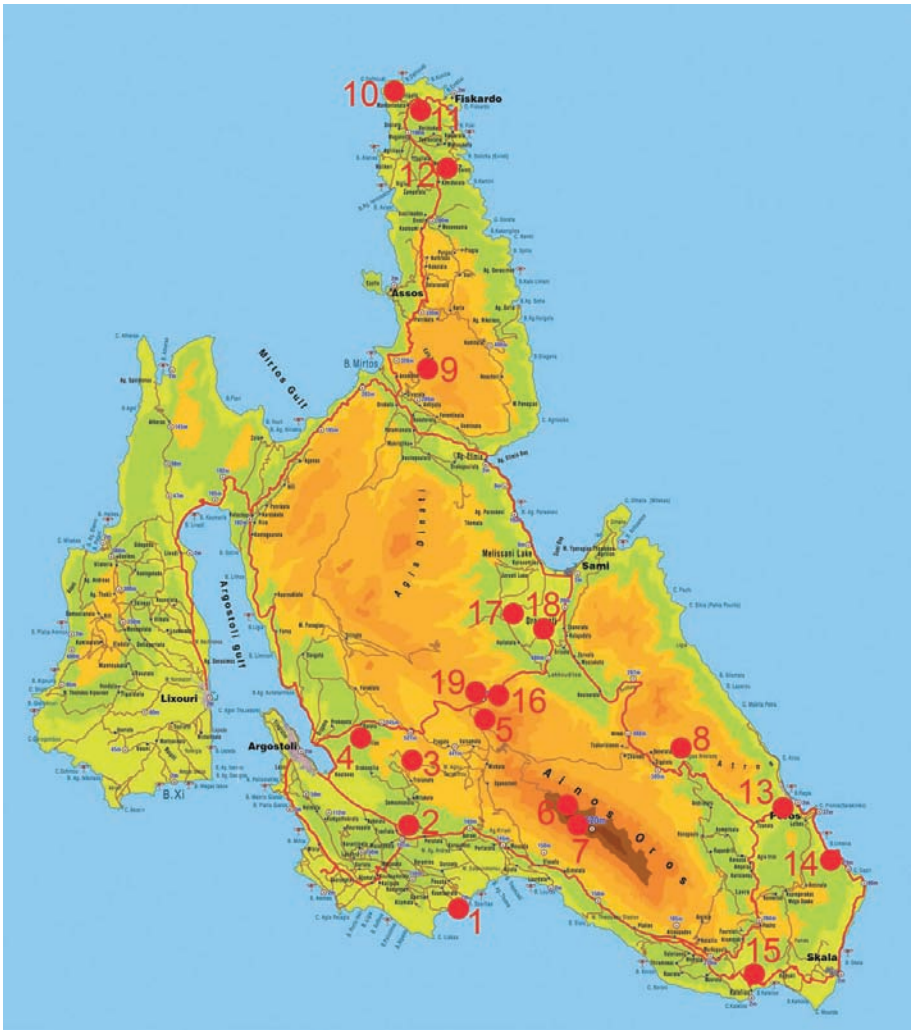
Camponotus nitidescens is known only from Kefalonia but its occurrence on other Ionian islands is possible, especially on Zakynthos which has some similar habitats. We have in collection a sample of very similar *Camponotus* species of *kiesenwewtteri*-group collected in SW Turkey with characters intermediate between typical *C. boghossiani* and *C. nitidescens*. In morphological features Turkish taxon is more similar to *C. boghossiani* with the same shape of mesosoma, shallow cleft between mesonotum and propodeum and distinctly areolate microsculpture of head and mesosoma but similar to *C. nitidescens* in shiny abdominal sternites. The taxonomic status of this Turkish form need further study.

ANTS COLLECTED IN KEFALONIA IN JUNE 2014

List of all species collected in Kefalonia is given in table 1.

CHECK-LIST OF ANTS OF KEPHALONIA
(*species need confirmation; **species new to Kefalonia)

Aphaenogaster balcanica (EMERY)**:** EMERY 1901: 57 (as *Stenamma* (*Aphaenogaster*) *testaceo-pilosum* var. *balcanica*); FINZI 1930: 310 (as *Aphaenogaster testaceopilosa ionia*); COLLINGWOOD 1993: 194 (as *Aphaenogaster ionia*); present paper;



9. Map of Kefalonia with marked localities

*****Aphaenogaster epirotes*** (EMERY): present paper;

Aphaenogaster muelleriana WOLF: EMERY 1914: 156 (as *Aphaenogaster ovaticeps muelleriana*); present paper;

****Aphaenogaster ovaticeps*** (EMERY): FINZI 1930: 310; COLLINGWOOD 1993: 194 [the status of Kefalonian populations of *muelleriana-ovaticeps* complex needs revision; our materials suggest that in Kefalonia occurs only *A. muelleriana* WOLF];

Aphaenogaster sangiorgii (EMERY): EMERY 1901: 57 (as *Stenamma* (*Aphaenogaster*) *sangiorgii*); FINZI 1930: 310;

****Aphaenogaster subterranea*** (LATREILLE): FOREL 1886: 168; FINZI 1930: 310; present paper [status of Kefalonian population is unclear; our material suggest that they represent at least local geographic form or even distinct species];

Aphaenogaster subterraneoides EMERY: EMERY 1914: 156 (as *Aphaenogaster pallida cypriotes*); FINZI 1930: 310 (as *Aphaenogaster pallida subterraneoides*);

Bothriomyrmex corsicus SANTSCHI: COLLINGWOOD 1993: 195 (as *Bothriomyrmex gibbus*);

Camponotus aethiops (LATREILLE): Forel 1886: 167 (as *Camponotus sylvaticus* st. *aethiops*); EMERY 1901: 57 (as *Camponotus maculatus aethiops* var. *concava*); EMERY 1914: 159 (as *Camponotus maculatus aethiops*); FINZI 1930: 310; COLLINGWOOD 1993: 195; present paper;

****Camponotus candiotes*** EMERY: COLLINGWOOD 1993: 195 [recent revision of European members of *C. lateralis* group (SEIFERT in prep.) suggests that *C. candiotes* does not occurs in the Ionian Archipelago and specimens determined previously under this names represent an undescribed species];

Camponotus dalmaticus (NYLANDER): FOREL 1886: 167 (*Camponotus lateralis* var. *dalmaticus*); EMERY 1914: 159 (*Camponotus lateralis* var. *dalmatica*); FINZI 1930: 310; COLLINGWOOD 1993: 195; present paper;

Camponotus gestroi EMERY: EMERY 1914: 159 (as *Camponotus gestroi creticus*); FINZI 1930: 310 (as *Camponotus gestroi creticus*); present paper;

*****Camponotus honaziensis*** KARAMAN & AKTAÇ: present paper;

Camponotus ionius EMERY: EMERY 1901: 57 (as *Camponotus maculatus samius* var. *ionia*); EMERY 1914: 159 (as *Camponotus maculatus samius* var. *ionia*); FINZI 1930: 310 (as *Camponotus samius ionia*); COLLINGWOOD 1993: 195; present paper;

Camponotus jaliensis DALLA TORRE: COLLINGWOOD 1993: 195;

Camponotus kiesenwetteri (ROGER): FOREL 1886: 167; EMERY 1901: 57; COLLINGWOOD 1993: 195; present paper;

Camponotus lateralis (OLIVIER): EMERY 1901: 57; FINZI 1930: 310; present paper;

Camponotus nitidescens FOREL: EMERY 1914: 159 (as *Camponotus kiesenwetteri nitidescens*); FINZI 1930: 310 (as *Camponotus kiesenwetteri nitidescens*); present paper;

****Camponotus oertzeni*** FOREL: COLLINGWOOD 1993: 195 [the status of this taxon is unclear; our recent materials suggests that all bicoloured specimens of the *C. aethiops* group collected in Kefalonia represent a mere colour form of *C. aethiops*];

Camponotus piceus (Leach): Emery 1914: 159 (as *Camponotus lateralis* var. *merula*); Finzi 1930: 310;

Camponotus truncatus (Spinola): Emery 1901: 57; Finzi 1930: 310; Collingwood 1993: 195;

Camponotus vagus (Scopoli): Emery 1901: 57; Finzi 1930: 310; present paper;

Cardiocondyla elegans Emery: Collingwood 1993: 194;

Cataglyphis nodus (Brullé): Forel 1910: 24 (19); Finzi 1930: 310 (as *Cataglyphis bicolor nodus*);

Chalepoxenus muellerianus (Finzi): Finzi 1930: 310; present paper;

Crematogaster schmidti (Mayr): Emery 1901: 57 (as *Crematogaster scutellaris* subsp. *Schmidti*); Emery 1914: 157 (as *Crematogaster scutellaris schmidti*); Finzi 1930: 310 (as *Crematogaster scutellaris schmidti*); Collingwood 1993: 194; present paper;

Crematogaster sordidula (Nylander): Emery 1901: 57 (*Crematogaster sordidula* var. *Flachi*); Emery 1914: 157 (*Crematogaster sordidula* var. *flachi*); Finzi 1930: 310 (*Crematogaster sordidula mayri*); Collingwood 1993: 194; present paper;

Formica fusca Linnaeus: Emery 1901: 57; Finzi 1930: 310; present paper;

****Lasius brunneus*** (Latreille): Emery 1901: 57; Finzi 1930: 310 [likely the species present in Kefalonia is *Lasius lasioides*, in the past often misidentified as *L. brunneus*];

Lasius flavus (Fabricius): Forel 1886: 167; Emery 1901: 57; Finzi 1930: 310; present paper;

Lasius illyricus Zimmermann: Emery 1901: 57; Finzi 1930: 310 (as *Lasius emarginatus*); present paper;

*****Lasius lasioides*** (Emery): present paper;

Lasius mixtus (Nylander): Emery 1901: 57; Finzi 1930: 310;

Lepisiota frauenfeldi (Mayr): Emery 1901: 57 (as *Acantholepis Frauenfeldi*); Emery 1914: 158 (as *Acantholepis frauenfeldi*); Finzi 1930: 310 (as *Acantholepis frauenfeldi*); Collingwood 1993: 195 (as *Acantholepis frauenfeldi*); present paper;

****Lepisiota karawaiewi*** (Kuznetsov-Ugamsky): Collingwood 1993: 195 (as *Acantholepis karawajewi*) [because Agosti & Collingwood (1987) misinterpreted several species of the genus *Lepisiota* in their key to the Balkan ants, occurrence of *L. karawaiewi* in Ionian Islands should be confirmed];

Lepisiota melas (Emery): Collingwood 1993: 195 (as *Acantholepis melas*); present paper;

Lepisiota nigra (Dalla Torre): Emery 1901: 57 (as *Acantholepis Frauenfeldi* var. *nigra*); Emery 1914: 158 (as *Acantholepis frauenfeldi nigra*); Finzi 1930: 310 (as *Acantholepis frauenfeldi nigra*);

*****Liometopum microcephalum*** (Panzer): present paper;

Messor orientalis (Emery): Forel 1910: 24 (19); Collingwood 1993: 194;

Messor* cf *structor (Latreille): Forel 1886: 168 (as *Aphaenogaster structor*); Emery 1914: 156 (as *Messor barbarus structor*); Finzi 1930: 310; present paper [nest samples collected in Kefalonia contained small gynes and represent an eastern morphospecies of the *M. structor* complex]

Messor wasmanni Krausse: Emery 1901: 57 (*Stenamma* (*Messor*) *barbarum meridionale*); Finzi 1930: 310 (as *Messor semirufus wasmanni*); Collingwood 1993: 194; present paper;

*****Monomorium monomorium*** Bolton: present paper;

*****Monomorium perplexum*** Radchenko: present paper;

Myrmecina graminicola (Latreille): Rigato 1999: 88; present paper;

*****Nylanderia jaegerskioeldi*** (Mayr): present paper;

Pheidole pallidula (Nylander): Emery 1901: 57; Finzi 1930: 310; Collingwood 1993: 194; present paper;

Plagiolepis pygmaea (Latreille): Finzi 1930: 310; Collingwood 1993: 195; present paper;

*****Ponera testacea*** Emery: present paper;

Proceratium melinum (Roger): Emery 1914: 156 (as *Sysphincta europaea*); Finzi 1930: 309 (as *Sysphincta europaea*); Baroni Urbani 1977: 91; Baroni Urbani & De Andrade 2003: 259;

*****Solenopsis* cf *fugax*** (Latreille): present paper;

Stenamma debile (Foerster): Rigato 2011: 8;

Stigmatomma denticulatum Roger: Emery 1914: 156; Finzi 1930: 309; Baroni Urbani 1978: 43; present paper;

Tapinoma erraticum (Latreille): Forel 1886: 167; Finzi 1930: 310; present paper;

Tapinoma festae Emery: Collingwood 1993: 195 (as *Tapinoma festai*);

Tapinoma nigerrimum (Nylander): Forel 1886: 167 (as *Tapinoma erraticum* var. *nigerrimum*); Finzi 1930: 310;

*****Temnothorax bulgaricus*** (Forel): present paper;

*****Temnothorax* cf. *clypeatus*** (Mayr): present paper;

*****Temnothorax exilis*** (Emery): present paper;

*****Temnothorax flavicornis*** (Emery): present paper;

*****Temnothorax* cf *interruptus*** (Schenck): present paper;

Temnothorax laconicus Csősz, Seifert, Müller, Trindl, Schulz & Heinze: Emery 1914: 157 (as *Leptothorax tuberum* ssp. *nylanderi*); Finzi 1930: 310 (as *Leptothorax nylanderi*); present paper;

Temnothorax rogeri Emery: Collingwood 1993: 194 (as *Leptothorax rogeri*); present paper;

*****Temnothorax sordidulus*** (Müller): present paper;

Temnothorax unifasciatus (Latreille): Forel 1886: 168 (as *Leptothorax tuberum* r. *unifasciatus*); Finzi 1930: 310 (as *Leptothorax unifasciatus*); Collingwood 1993: 194 (as *Leptothorax unifasciatus*);

*****Temnothorax* sp_ke01**: present paper [this is the species recorded by Bračko et al. (2014) from Montenegro as *Temnothorax* sp. 1];

*****Temnothorax* sp_ke02**: present paper;

*****Temnothorax* sp_ke03**: present paper;

*****Temnothorax* sp_ke04**: present paper;

*****Temnothorax* sp_ke05**: present paper;

*****Temnothorax* sp_ke06**: present paper;

Tetramorium* cf *caespitum (Linnaeus)**:** Collingwood 1993: 195; present paper;

*****Tetramorium diomedeum*** Emery: present paper;

***Tetramorium ferox* cf_ke01**: present paper [in our material we found a nest sample with very large workers characterized by extremely wide postpetiole but, unfortunately, without gynes; in our collection we have similar specimens from Crete, collected as a nest sample with a gyne of extremely broad postpetiole typical of the *T. ferox* group but workers of both Kefalonian and Cretean populations distinctly differs from all species of *T. ferox*-group revised by Csösz & Schulz (2010];

Tetramorium punicum (Smith)**:** Emery 1914: 158 (as *Tetramorium caespitum punicum*); Finzi 1930: 310 (as *Tetramorium caespitum punicum*);

Tetramorium semilaeve André**:** Emery 1914: 158 (as *Tetramorium caespitum semileve*); Finzi 1930: 310; present paper;

****Tetramorium splendens*** Ruzsky**:** Collingwood 1993: 195 [status of this taxon needs a revision; it is undetectable in any study on the genus *Tetramorium*].

DISCUSSION

Ant fauna of Kefalonia is rich in species and represents 78.3% of all species known from the Ionian Islands (97 species). Thus, Ionian Islands archipelago is the third in the number of recorded species of the Greek archipelagos, and only slightly less diverse that the fauna of the Aegean Isles (104 species) and Dodecanese (102 species), and exceeds the number of species reported from Crete - the largest Greek island (87 species, but our unpublished material shows that the real number of species occurring on Crete is above 100) and the less numerous in species Cyclades (50 species). In comparison with the more northern Korfu, the second largest Ionian island, Kefalonia is characterized by a smaller number of species with northern type of distribution (e.g. no *Myrmica* species, only one *Formica*) and the more common species of Mediterranean type of distribution (Legakis 2011; Borowiec & Salata 2012, 2013; Borowiec 2014). This is due to a much smaller area of afforestation on Kefalonia with dominant, especially in mountainous areas, dry pastures with rare stands of small oak trees while on Corfu deciduous forests or olive plantations of natural character dominate (due to the religious tradition in historic times olive trees on Corfu have not been pruned and trees reach large sizes which provides under the crowns of trees fairly wet and shady habitats). The most interesting species collected recently are several taxa of *Temnothorax* attributed by us to numbered morphospecies only and species complexes. In our opinion at least some of them represent species new to science but their formal description requires a revision of several species groups within the genus.

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Table 1. Ants collected ants collected at Kefalonia in June 2014

Species	Locality																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Aphaenogaster balcanica		+	+	+	+				+		+	+	+	+	+	+			
Aphaenogaster epirotes														+					
Aphaenogaster muelleriana		+		+				+			+	+	+	+				+	
Aphaenogaster subterranea						+													
Camponotus aethiops		+	+	+	+		+		+	+	+	+	+	+		+			+
Camponotus dalmaticus		+	+		+			+			+		+	+		+			
Camponotus gestroi								+				+							
Camponotus honaziensis		+								+	+		+	+		+			
Camponotus ionius	+							+					+						
Camponotus kiesenwetteri	+			+						+			+	+					
Camponotus lateralis								+						+	+				
Camponotus nitidescens																+			
Camponotus vagus						+													
Chalepoxenus muellerianus														+			+		
Crematogaster schmidti		+		+				+		+	+	+	+	+	+				+
Crematogaster sordidula		+			+			+		+		+							+
Formica fusca						+	+												
Lasius flavus						+	+												
Lasius illyricus						+	+												
Lasius lasioides		+																	
Lepisiota frauenfeldi	+		+	+	+			+				+							

Table 1. Ants collected ants collected at Kefalonia in June 2014 (continuation)

Species	Locality																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Lepisiota melas				+						+									
Lepisiota nigra					+														
Liometopum microcephalum								+											
Messor cf. *structor*		+																	
Messor wasmanni	+				+			+	+				+						
Monomorium monomorium								+											
Monomorium perplexum												+							
Myrmecina graminicola								+											
Nylanderia jaegerskioeldi	+																		
Pheidole pallidula		+		+	+			+	+	+	+		+	+					+
Plagiolepis pygmaea		+			+			+				+	+	+	+	+			
Ponera testacea																+			
Solenopsis cf. *fugax*														+					
Stigmatomma denticulatum																+			+
Tapinoma madeirense								+											
Temnothorax bulgaricus			+					+					+	+	+	+		+	
Temnothorax cf. *clypeatus*		+												+					
Temnothorax exilis								+				+							
Temnothorax cf. *interruptus*			+		+						+			+		+			+
Temnothorax flavicornis																			+
Temnothorax laconicus				+				+			+	+	+	+		+	+	+	+

Table 1. Ants collected ants collected at Kefalonia in June 2014 (continuation)

Species	Locality																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Temnothorax rogeri			+	+					+	+	+	+	+	+			+		
Temnothorax sordidulus						+	+												
Temnothorax sp_ke01		+									+								
Temnothorax sp_ke02								+											
Temnothorax sp_ke03								+			+								
Temnothorax sp_ke04															+				
Temnothorax sp_ke05														+					
Temnothorax sp_ke06											+								
Tetramorium cf. *caespitum*						+	+												
Tetramorium diomedeum	+		+		+					+	+	+							
Tetramorium cf. *ferox*			+																
Tetramorium cf. *semilaeve*					+			+	+							+			

Genus	Vol. 25(3): 519-525	Wrocław, 30 IX 2014

Tetramorium exasperatum Emery, 1891 in Iberian Peninsula (Hymenoptera: Formicidae)

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Abstract. *Tetramorium exasperatum* Emery, 1891 described from Tunisia is recorded from Spain (S Andalusia) for the first time. *Tetramorium parvioculum* Guillem & Bensusan, 2009 described from Gibraltar and *Tetramorium exasperatum acutiseta* Santschi, 1921 described from Morocco are synonymized with *Tetramorium exasperatum* Emery, 1891.

Key words: entomology, taxonomy, faunistics, new synonyms, Hymenoptera, Formicidae, *Tetramorium*, Spain, North Africa.

INTRODUCTION

Tetramorium exasperatum Emery, 1891 was described from mountain region Khroumire in norhwestern Tunisia, near village Aïn Draham (now Ayn Darahim) close to Algerian border. Santschi (1921) described a new variety *Tetramorium exasperatum* var. *acutiseta* from two localities in coastal part of Morocco: Larache (El Araich) and Mogador Island (now Essaouira). Two years ago Santschi (1923 a) recorded it from Casablanca. In the same year Santschi (1923 b) described *Tetramorium zahrae* from Tanger in northern Morocco close to southern border of Spain and Gibraltar. Cagniant (1997) in his review of Moroccan species of *Tetramorium* synonymized *Tetramorium zahrae* Santschi, 1923 with *Tetramorium exasperatum* Emery, 1891 and noted that this species is wide distributed in Morocco from coastal regions to mountains up to 2600 m a.s.l. in Haut Atlas but does not mention the name *Tetramorium exasperatum* var. *acutiseta* Santschi, 1921. He recorded *Tetramorium exasperatum* also from Kabylie region and Aurès Mts. in northern Algeria which indicates that this species is widely distributed in the north-western Africa. Guillem & Bensusan (2009) described from

Gibraltar a new species *Tetramorium parvioculum* and noted that it is a member of the *simillimum*-group but with no close relatives within the group.

During an entomological trip to the southern Andalusia in Spain the senior author collected nest samples of a small *Tetramorium* species with characters of *Tetramorium parvioculum* Guillem & Bensusan, 2009 in two localities. After studying photographs of types of *Tetramorium exasperatum*, *Tetramorium exasperatum* var. *acutiseta*, *Tetramorium zahrae* and *Tetramorium parvioculum* available on AntWeb, we came to the conclusion that all represent the same taxon with the oldest name *Tetramorium exasperatum* Emery, 1891. Because the original description of *Tetramorium parvioculum* by Guillem & Bensusan (2009) is adequate, we do not give a full redescription but only supplement it by observations of variation in Spanish populations and present high quality photographs.

MATERIAL AND METHODS

Abbreviations

Terminology:

CI – cephalic index; HW/HL x 100;

EL – eye length; measured along the maximum diameter of the eye;

EI – ocular index: EL/HW x 100;

HL – head length; measured in a straight line from the mid-point of anterior clypeal margin to mid-point of occipital margin in full face view;

HW – head width; measured below the eyes in full-face view;

ML – mesosoma length; measured as diagonal length from the anterior end of the pronotal collar to the posterior margin of the propodeal lobe;

PW – pronotum width; maximum width of pronotum in dorsal view;

SI – scape index 1; SL/HW x 100;

SL – maximum straight-line length of scape;

Explanation of measurement section: HW: 0.465 ± 0.033 (0.474-0.489) mean HW: average: 0.465 ± standard deviation: 0.033 (minimum value: 0.474 - maximum value: 0.489).

Photos were prepared using a Nikon SMZ 1500 stereomicroscope and Helicon Focus software.

Material is preserved in senior author's collection (LBC), California Academy of Sciences (CAS), and Christophe Galkowski collection (CG).

RESULTS

Tetramorium exasperatum Emery, 1891

Tetramorium caespitum r. *exasperatum* Emery, 1891: 3 (syntype worker, AntWeb image examined, available from: http://www.antweb.org/specimenImages.do?name=casent0904829&project=allantwebants).

Tetramorium exasperatum Emery: Dalla Torre 1893: 133, Emery 1909: 705.

Tetramorium exasperatum var. *acutiseta* Santschi, 1921: 72, 1923 a: 334 (syntype worker, AntWeb image examined, available from: http://www.antweb.org/specimenImages.do?name=casent0915008&project=allantwebants), **new synonymy**.

Tetramorium zahrae Santschi, 1923 b: 135 (syntype worker, AntWeb image examined, available from: http://www.antweb.org/specimenImages.do?name=casent0915096&project=allantwebants); Cagniant 1997: 92 (as syn. of *exasperatum*).

Tetramorium parvioculum Guillem & Bensusan, 2009: 158 (paratype worker, AntWeb image examined, available from: http://www.antweb.org/specimenImages.do?name=casent0901053&project=allantwebants), **new synonymy**.

1, 2. *Tetramorium exasperatum* Emery, worker: 1 – dorsal, 2 – lateral (scale bar 0.5 mm)

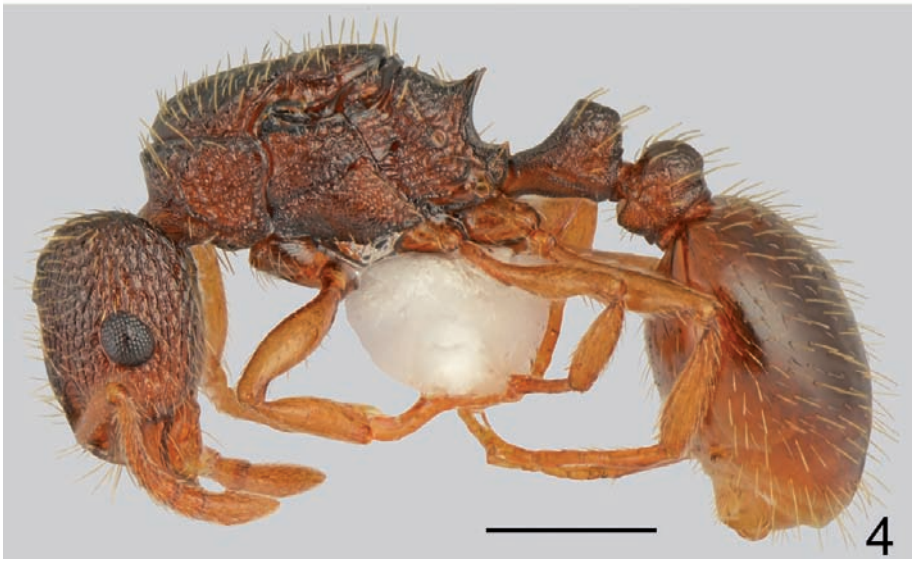
Material

SPAIN, Andalucia, Cádiz, El Tiradero (36.17109 N/ 5.58123 W), 222 m, 9 V 2014, 1 gyne and 23 workers, leg. L. Borowiec; SPAIN, Andalucia, Cádiz,El Bujeo loc. 2 (36,07034 N/ 5,55291 W), 334 m, 2 workers, leg. L. Borowiec (material preserved in LBC, CAS, CG). Species new to the fauna of Spain.

Additional morphological data

Measurements:

Workers: HL: 0.538 ± 0.01 (0.52-0.538); HW: 0.465 ± 0.033 (0.474-0.489); SL: 0.38 ± 0.009 (0.369-0.397); EL: 0.066 ± 0.007 (0.056-0.078); ML: 0.573 ± 0.038



3, 4. *Tetramorium exasperatum* Emery, gyne: 3 – dorsal, 4 – lateral (scale bar 0.5 mm)

5, 6. *Tetramorium exasperatum* Emery, head: 5 – worker, 6 – gyne (scale bar 0.5 mm)

(0.527-0.659); PW: 0.32 ± 0.008 (0.312-0335); CI: 86.4 ± 2.1 (82.3-89.4); SI: 81.9 ± 2.3 (77.9-84.8); EI: 14.3 ± 1.5 (12.5-16.3);

Gyne: HL: 0.648; HW: 0.581; SL: 0.446; EL: 0.145; ML: 0.911; PW: 0.536; CI: 89.6; SI: 76.8 ; EI: 24.95.

In comparison with measurements noted by Guillem & Bensusan (2009) our specimens appear slightly smaller but the analysis of the measurements table shows that Guillem & Bensusan (2009) had committed some measurement errors or swapped positions in the table e.g. TL (total length) correctly for gynes is greater than for workers but AL (alitrunk length) is given smaller for queens than for workers but should be larger. Indices measuring both Spanish and Gibraltar populations are similar and only CI (cephalic index) for specimens from Spain shows a slightly higher value (i.e. the head would be relatively broader) but a comparison of photographs of the head in the original description and our work no significant difference can be discerned.

Comparative notes

The genus *Tetramorium* Mayr is less speciose in the western part of the Mediterranean Basin than in eastern part of this area (Borowiec 2014). From Spain, eight named and three unnamed species belonging to the *T. caespitum* group have been recorded (http://www.hormigas.org/xEspecies/especies.htm). Three of them: *Tetramorium bicarinatum* (Nylander), *T. caldarium* (Roger) and *T. languinosum* Mayr are tramp species and belonging to the group of species (*T. simillimum* group sensu Bolton 1977, 1979, 1980) well distinguished from all native European taxa by very strong sculpture and head with frontal carinae extended backwards as longitudinal ridges almost to occipital margin. Guillem & Bensusan (2009) in description of *Tetramorium parvioculum* suggested that it is a member of the *simillimum*-group but with no close relatives within the group but this species is similar to the three tramp species listed above only by strong body sculpture and distinctly differs in head with "normal" short frontal carinae not extending to the occipital area. The other eight Spanish species differ in less sculptured body, especially by head in area above eyes without reticulate sculpture, at most with longitudinal ridges. All these species have gynes distinctly larger than *T. exasperatum* and less sculptured with pronotal dorsum at most with longitudinal striation but usually with more or less developed shiny areas.

Notes on habitat and syntopic ants

In both localities ants were found under big stone inside the bright cork oak forest. In El Tiradero as syntopic ant species collected were *Camponotus truncatus*, *Crematogaster scutellaris*, *Lasius grandis*, *Temnothorax* cf. *aveli*, *Temnothorax* cf. *exilis*, *Temnothorax luteus*, *Temnothorax* cf. *luteus*, and *Temnothorax* cf. *tristis*; in El Bujeo the syntopic ant species collected were *Crematogaster scutellaris*, *Hypoponera eduardi*, *Lasius grandis*, *Ponera testacea*, *Solenopsis* cf. *lusitanica*, *Temnothorax luteus*, and *Temnothorax* cf. *luteus*. Cagniant (1997) noted that in Morocco this species was collected in clearings and borders of forests, pastures and steppe. Guillem & Bensusan (2009) recorded it in woodland close to well known "The Mount" gardens and in rocky, high maquis.

ACKNOWLEDGEMENTS

Thanks to Jolanta ŚWIĘTOJAŃSKA (University of Wrocław , Poland) for her assistance during field trips of the senior author and Marek L. BOROWIEC (University of California, Davis, USA) for language verification and other comments. The junior author would like to thank the University of Wrocław for supporting grant no. 1161/M/KBTE/13.

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Genus	Vol. 25(3): 527-564	Wrocław, 30 IX 2014

Additional information on the distribution, anatomy, and systematics of living and fossil Chinese Plectopylidae (Gastropoda: Pulmonata)

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Abstract. This paper describes two new species, *Gudeodiscus marmoreus* Páll-Gergely n. sp. and *Sicradiscus vargabalinti* Páll-Gergely n. sp. from China. New conchological information indicates that *Plectopylis stenochila* var. *basilia* Gude, 1897 is the synonym of *Sinicola stenochila* (Möllendorff, 1885). We present the reproductive anatomy of *Gudeodiscus emigrans otanii* Páll-Gergely, 2013, *Gudeodiscus eroessi eroessi* Páll-Gergely & Hunyadi, 2013, *Gudeodiscus giardi giardi* (H. Fischer, 1898), *Gudeodiscus okuboi* Páll-Gergely & Hunyadi, 2013, *Gudeodiscus pulvinaris pulvinaris* (Gould, 1859), *Sicradiscus invius* (Heude, 1885), *Sicradiscus transitus* Páll-Gergely, 2013, *Sinicola asamiana* Páll-Gergely, 2013, *Sinicola murata* (Heude, 1885), and *Sinicola stenochila* (Möllendorff, 1885), with special focus on the morphology of the inner penial wall, and new locality information for several other Chinese Plectopylidae species. We moved the genus *Amphicoelina* Haas, 1933 from the family Plectopylidae to Camaenidae and synonymized the subgenera of Chinese Eocene *Plectopyloides* described by Li (1986) (*Henanspirus*, *Menyinspirus*, *Yenellus*) with the genus *Plectopyloides*.

Key words: malacology, taxonomy, *Sinicola*, *Sicradiscus*, *Gudeodiscus*, *Plectopylis*, anatomy, China.

INTRODUCTION

The family Plectopylidae is a group of approximately 120 flat-shelled land snail species having palatal and parietal plicae and lamellae about one quarter to half whorl behind the aperture. According to Schileyko (1999), Plectopylidae is a member of the superfamily Plectopyloidea together with the mainly Sri Lankan Corillidae. Bouchet and Rocroi (2005) classified Sculptariidae in this superfamily. Plectopylids differ from

corillids and other conchologically similar groups by presence of one or two vertical lamellae on the parietal wall.

Benson (1860) described the genus *Plectopylis* as a "helicid" group. He subdivided the genus (including only six Indian and Burmese species) into three "sections", without naming them. Gude (1899a) revised the whole genus *Plectopylis* and subdivided into seven "sections", namely *Endothyra* (replaced by *Endothyrella* by Zilch 1960), *Chersaecia*, *Endoplon*, *Plectopylis*, *Sinicola*, *Enteroplax* and *Sykesia* Gude, 1897. Recent papers classified the latter two genera in Strobilopsidae (Schileyko 1998, Solem 1968) and Endodontidae (see Gude 1914, Schileyko 2001) or Charopidae (see Schileyko 2010), respectively. Zilch (1960) included *Corilla* H. & A. Adams, 1858, *Sculptaria* L. Pfeiffer, 1856, *Plectopylis* (with the subgenera *Endothyrella*, *Chersaecia*, *Endoplon*, *Plectopylis* and *Sinicola*) and *Amphicoelina* F. Haas, 1933 within the family Corillidae. Schileyko (1999) elevated all plectopylid subgenera to separate genera, and classified the genera *Plectopylis*, *Endoplon*, *Sinicola*, *Endothyrella*, *Chersaecia*, and *Amphicoelina* into the Plectopylidae.

The family Plectopylidae is widely distributed from northeastern India to many parts of Southeast Asia and southern Japan (Gude 1899b, Páll-Gergely & Hunyadi 2013 and references therein). Most information on this family was described by G. K. Gude between 1896 and 1920 based on the material from India, Burma (Myanmar) and Vietnam. Most Chinese taxa were described at the end of the 19th and the beginning of the 20th Century (e.g. Möllendorff 1882, 1883, 1885a, 1885b, 1886, Heude 1882, 1885, 1889, Gredler 1881, 1887, Martens 1875, Ancey 1885, Gude 1897). The previous revision of Chinese Plectopylidae (Páll-Gergely & Hunyadi 2013) revealed 46 subspecies and species, including four questionable ones and 20 newly described species and subspecies. This paper presents further information on Chinese Plectopylidae.

MATERIALS AND METHODS

Ethanol-preserved specimens were dissected under Leica stereomicroscope, and photographs of the genital structures were taken with a camera attachment to provide basis for sketches presented here. To describe the reproductive system, we used the terms "distal" and "proximal" in relation to the atrium. Shells were directly observed without coating under a low vacuum SEM (Miniscope TM-1000, Hitachi). We followed the nomenclature of plicae and lamellae, genital organs and terminology of the shells size in the diagnosis by Páll-Gergely and Hunyadi (2013).

We list previously unpublished localities together with the name of the collector(s), the date of collection, the number and location of specimens under each taxon. The relevance of the new localities is explained in the Notes section under each species. Collection data of anatomically examined specimens is indicated in the Genital structure section before the description of the reproductive organs.

Geographic names are presented in pinyin without tone numbers. Only names of populated places (district=Xian, town region=Shi, community=Xiang and Zhen, Cun= village and autonomous regions=Zizhizhou) are written separately. Geographic names, such as mountain (shan), cave (dong) rock (yan) forest (lin) are not separated. The

appendix includes all mentioned localities and their respective provinces presented in simplified Chinese characters.

Abbreviations:
HNHM: Hungarian Natural History Museum (Budapest Hungary);
JUO: Collection Jamen Uiriamu Otani (Osaka, Japan);
MNHN: Muséum National d'Histoire Naturelle (Paris, France);
OK: Collection Kenji Ohara, Nishinomiya Shell Museum (Nishinomiya, Japan);
PGB: Collection Barna Páll-Gergely (Mosonmagyaróvár, Hungary).

RESULTS

As we taxonomically describe below, we found two new species and obtained new information on the genital anatomy, shell morphology and distribution of 15 known species. The genus *Amphicoelina* does not belong to Plectopylidae and should be moved to the Camaenidae. The Eocene subgenera described by Li (1986) are synonyms of the genus *Plectopyloides* Yen 1969.

Family Plectopylidae Möllendorff, 1898

Genus *Gudeodiscus* Páll-Gergely, 2013

2013 *Gudeodiscus* Páll-Gergely, In: Páll-Gergely & Hunyadi: Archiv für Molluskenkunde, 142 (1): 8.

Type species: *Plectopylis phlyaria* Mabille ,1887, by original designation.

Gudeodiscus emigrans otanii Páll-Gergely, 2013

New locality: Guangxi, Laibin Shi, Xingbin Qu, Qidong Xiang, cliffs above the Poliu Elementary School, 150 m, 24°0.512'N, 109°4.288'E, leg. Hunyadi, A. & Szekeres, M., 20.09.2013., HA/12, PGB/2.

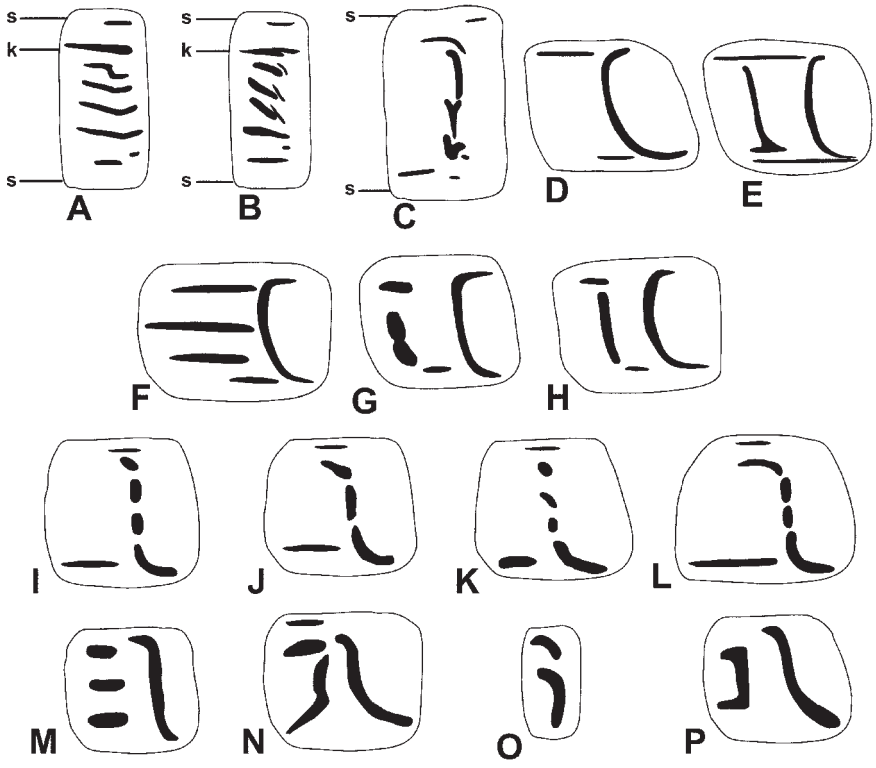
Characters of the genital structure (Fig. 6–7, Fig. 20A–B): Ethanol-preserved bodies are deposited in coll. PGB, respective shell in coll. JUO. Locality information: Guangxi, Yizhou Shi, Aishan Xiang, Xiannuyan, 172 m, 24°29.292'N, 108°34.057'E, leg. Nakahara, Y., Ohara, K., Okubo, K. & Otani, J. U., 13.11.2004. Three specimens were dissected. "Specimen1" had four parallel parietal plicae anterior to the single lamella, whereas both "Specimen2" and "Specimen3" had two vertical, "normal" lamellae. "Specimen1" and "Specimen2" had several embryos developing in uterus. "Specimen3" was entirely aphallic, having the proximal end of the vas deferens attached to the vagina near the genital opening. "Specimen3" had no embryos in its uterus, but had a spermatophore in its bursa copulatrix, which is the indication of a successful mating.

The right ommatophoral retractor crosses male and female genitalia. Penis of "Specimen1" was inflated, gradually tapering towards the end, "Specimen2" had a

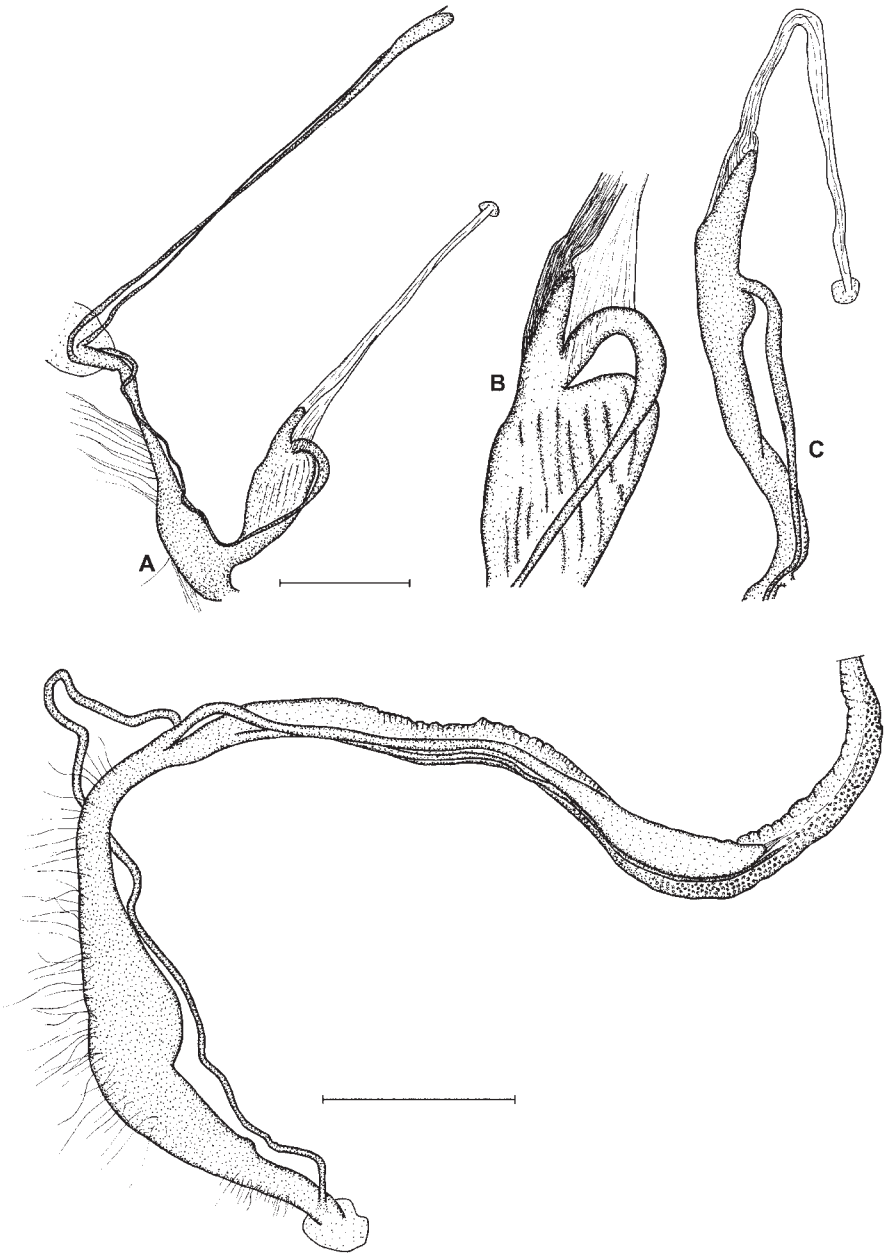
relatively slender penis with a thickening at its end; inner wall of "Specimen1" with parallel, longitudinal folds, of which some (2–4) are conspicuously thickened at the distal part of the penis (Fig. 20A); penial wall of "Specimen2" was more complex, with the

1-4. Shells of Chinese Plectopylidae: 1 – *Gudeodiscus marmoreus* n. sp. Guangxi, Hechi city, east of BaMa Xian, ex coll. Yang Hao, 2013, HNHM 97457 (holotype); 2 – *Sinicola vargabalinti* n. sp., Guangxi, LaiBin City, WuShan Xiang, ex coll. Yang Hao, 2013, HNHM 97455 (holotype); 3 – same data, HNHM 97456 (paratype); 4 – *Sinicola fimbriosa* (von Martens, 1875), Hunan, Huangcai Zhen, Ningxiang Xian, Qianfodong (Thousand Buddha Cave), 350–380 m, 28°12'53"N, 112°08'21"E, ex coll. Dengxin, 2011

parallel folds forming “hollows” between each other (Fig. 20B). Penial caecum short, about one third of the length of the penis; retractor muscle attaches to the end of penial caecum with several fibres, but some fibres attach at the base of the penial caecum on the distal end of the penis; vas deferens-epiphallus transition is not conspicuous and therefore boundary between the two organs is not well visible; epiphallus about as long or a bit longer than penial caecum. Vagina well-developed, its proximal part is inflated, its slimmer, distal part is slightly longer than the thicker proximal; vagina attached to diaphragm with several long, rather widely-spaced fibres; proximal part of vas deferens slender but distal end thickened; bursa copulatrix and additional organ next to the bursa copulatrix are both very slender (bursa slightly thickened) and extremely long.



5. Palatal (A–C, I–L) and parietal (D–H, M–P) plication of Chinese living and fossil Plectopylidae. Figs I–P after Li (1986). A and D: holotype of *Sinicola vargabalinti* n. sp. (same data as Fig. 3); B: paratype of *S. vargabalinti* n. sp. (same data as Fig. 2, HNHM 97456); C and E: holotype of *Gudeodiscus marmoreus* n. sp. (same data as Fig. 1, HNHM 97457); F–G: parietal plication of three different specimens of *Gudeodiscus emigrans otanii* Páll-Gergely, 2013, Guangxi, Yizhou Shi, Aishan Xiang, Xiannuyan, 172 m, 24°29.292’N, 108°34.057’E, leg. Nakahara, Y., Ohara, K., Okubo, K. & Otani, J. U., 13.11.2004; I and M: *Plectopyloides cretaceous* Yen, 1969; J, N: *Plectopyloides regularus* Li, 1984; K, O: *Plectopyloides guanzhuangensis* Li, 1986; L, P: *Plectopyloides multispiralus* Li, 1986. Abbreviations: k: keel, s: suture



6. Genital anatomy of *Gudeodiscus emigrans otanii* PÁLL-GERGELY, 2013. Locality: Guangxi, Yizhou Shi, Aishan Xiang, Xiannuyan, 172 m, 24°29.292'N, 108°34.057'E, leg. Nakahara, Y., Ohara, K., Okubo, K. & Otani, J. U., 13.11.2004. Fig. 6A–B: "Specimen1", Fig6C: "Specimen2". Scale represents 5 mm, and refers to Fig. 6A only; 7. Genital anatomy of an aphallic *Gudeodiscus emigrans otanii* PÁLL-GERGELY, 2013 specimen ("Specimen3"). Locality: same as in Fig. 6. Scale represents 5 mm

Remarks: In the original description (see Páll-Gergely & Hunyadi 2013) we mentioned that this species exhibits interesting variation in parietal plicae. Some specimens have four relatively long horizontal plicae anterior to the single vertical lamella (similar to those of the Vietnamese *G. emigrans quadrilamellatus* Páll-Gergely, 2013), whereas others have two vertical lamellae, the anterior being sometimes somewhat S-shaped. These two radically different forms were even found to occur within the same population (Guangxi, Yizhou Shi, Shibie Xiang, Qingtan, 225 m, 24°23.719'N, 108°42.137'E, leg. Nakahara, Y., Ohara, K., Okubo, K. & Otani, J. U., 13.11.2004.). Other shell characters, such as the shell sculpture, aperture shape and palatal plicae of these specimens were, however, identical. Therefore they would not represent two different species. In another population, which is situated approximately 17 km from the previous one (Guangxi, Yizhou Shi, Aishan Xiang, Xiannuyan, 172 m, 24°29.292'N, 108°34.057'E, leg. Nakahara, Y., Ohara, K., Okubo, K. & Otani, J. U., 13.11.2004.) we only found specimens having two vertical lamellae (Páll-Gergely & Hunyadi 2013). After the revision (Páll-Gergely & Hunyadi 2013) we examined seven additional specimens, which made the total number of observed shells from this population nine. Among the nine shells, two had four parallel plicae (Fig. 5F) and six other shells exhibited two lamellae, with horizontal plicae above and below the anterior lamella (Fig. 5H). In the ninth shell, anterior to the curved lamella, two oval plicae were connected to each other and located between the other horizontally short plicae (Fig. 5G). The plicae structure of Fig. 5G may be interpreted as the intermediate phenotype between those of Fig 5F and H.

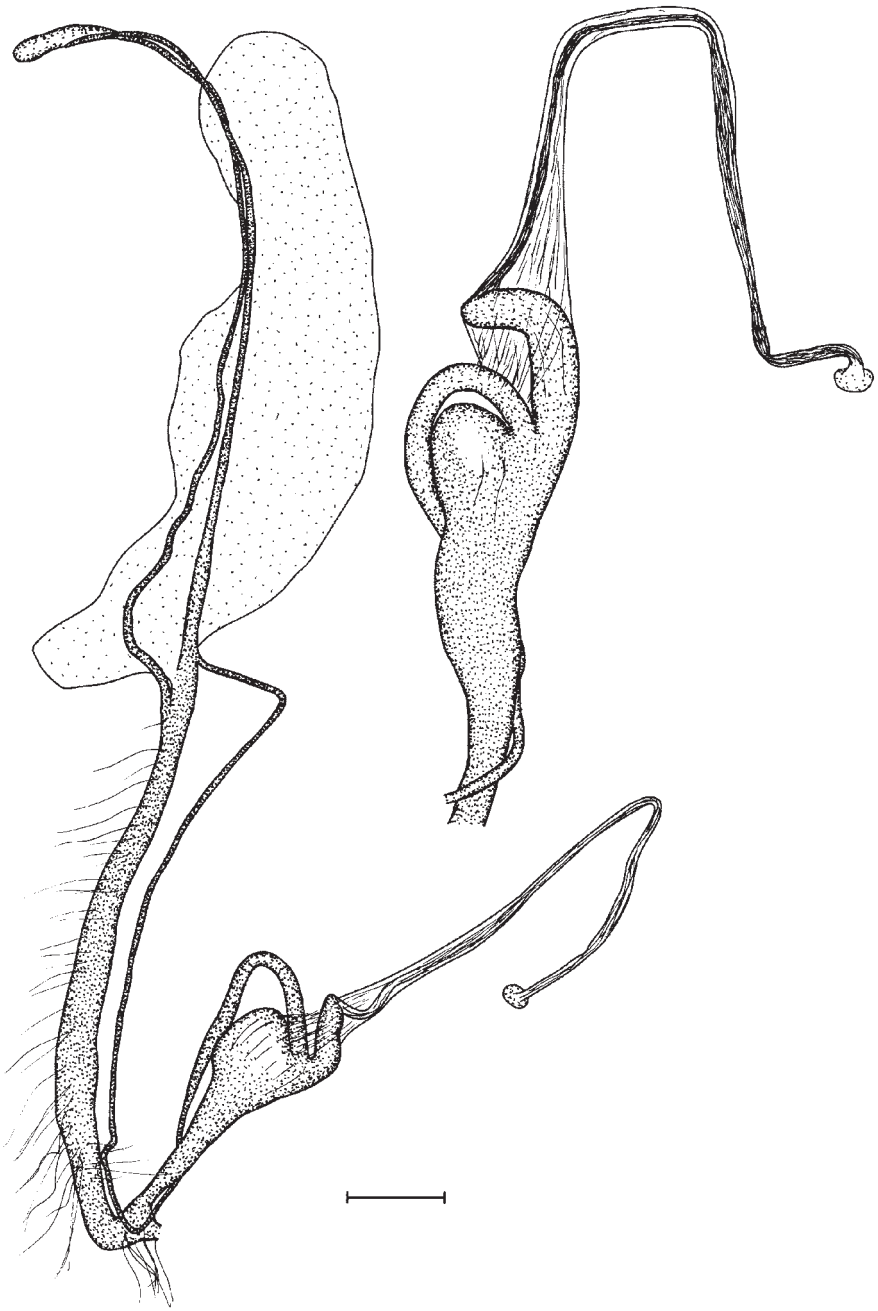
The anatomical differences between the two different forms (i.e. shell with four parallel, horizontal plicae and the shell with two lamellae) represent intraspecific variability only (see under description of the genitalia).

The new locality is situated about 45 km southwest from the nearest known location (Liuzhou Shi). The shells collected at this locality are unusually large (D=29–29.2 mm, n=2) and have only a single upper horizontal parietal plica anterior to the lamella (3 shells opened).

Gudeodiscus eroessi eroessi Páll-Gergely & Hunyadi, 2013

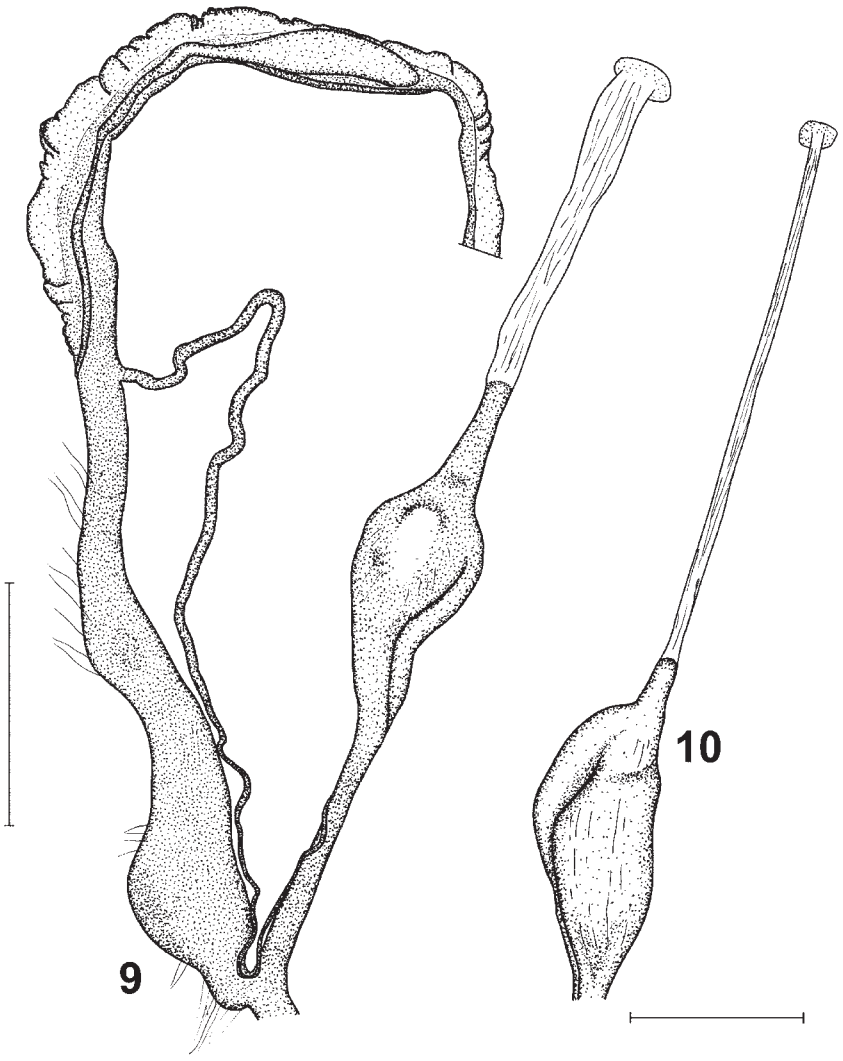
Characters of the genital structure (Fig. 8, Fig. 20F): Two specimens were anatomically examined. Both specimens had several embryos developing in the uterus. Ethanol-preserved body is deposited in coll. PGB, respective shell in coll. JUO. Locality information: Guangxi, Guigang Shi, Guzhang Xiang, beyond Chuanshan village, 153 m, 23°20.848'N, 109°19.256'E, leg. Nakahara, Y., Ohara, K., Okubo, K. & Otani, J. U., 09.11.2004.

The right ommatophoral retractor crosses the male and female genitalia. Penis rather long, its distal portion inflated; inner wall of the proximal part smooth or with weak longitudinal folds all along the whole penis; inner wall of the distal penis part with several, slit-like pockets standing in a transversal row. The pockets did not contain calcareous crystals. Penial caecum well-developed, curved, internally with approximately 16 folds which may be wavy forming slit-like pockets for calcareous crystals,



8. Genital anatomy of *Gudeodiscus eroessi eroessi* Páll-Gergely & Hunyadi, 2013 ("Specimen1": whole genitalia, "Specimen2": only penis). Locality: Guangxi, Guigang Shi, Guzhang Xiang, beyond Chuanshan village, 153 m, 23°20.848'N, 109°19.256'E, leg. Nakahara, Y., Ohara, K., Okubo, K. & Otani, J. U., 09.11.2004. Scale represents 2 mm

which were absent in the examined *G. eroessi eroessi* specimens, but were visible in *G. pulvinaris pulvinaris* specimens (see below). Epiphallus shorter than the penis, but its exact length is unknown due to the obscure boundary between the epiphallus and the vas deferens. Retractor muscle attaches at the lateral side of the tip of the penial caecum. Several additional muscle fibres attach to the distal end of the penis. Vagina



9-10. Genital anatomy of *Gudeodiscus* species: 9 – *G. giardi giardi* (H. Fischer, 1898). Locality: Guangxi, Longzhou Xian, Wude Xiang, Qunhe Cun, Banxintun, 308 m, 22°35.46563'N, 106°46.29486'E, leg. Ohara, K., Okubo, K. & Otani, J. U., 11.01.2006. Scale represents 5 mm; 10 – Penis of *G. multispira* (Möllendorff, 1883). Locality: Guangxi, Qingshan, Qingshan Zhen, Lipu Xian, 252 m, 24°26.189'N, E110°20.008'E, leg. Nakahara, Y., Ohara, K., Okubo, K. & Otani, J. U., 12.11.2004. Scale represents 2 mm

slightly longer than the penis and epiphallus together; with weak vaginal bulb; several weak muscle fibres attach the vagina to the diaphragm. Bursa copulatrix and additional organ next to it extremely long; bursa slightly thickened.

Gudeodiscus giardi giardi (H. Fischer, 1898)

New localities: Guangxi, Longzhou Xian, Nonggang Protected Area, near ranger station, 205 m, 22°28.48990'N, 106°57.43325'E, leg. Ohara, K., Okubo, K. & Otani, J. U., 12.01.2006., OK/2; Guangxi, Longzhou Xian, near Nonggang, 202 m, 22°29.31403'N, 106°57.31251'E, leg. Ohara, K., Okubo, K. & Otani, J. U., 12.01.2006., OK/4; Guangxi, Longzhou Xian, Nonggang Protected Area, inner side of ranger station, 173 m, 22°28.13390'N, 106°57.63413'E, leg. Ohara, K., Okubo, K. & Otani, J. U., 12.01.2006., OK/6.

Characters of the genital structure (Fig. 9, Fig. 20D): One specimen was anatomically examined, which had no embryos in its uterus. Ethanol-preserved body is deposited in coll. PGB, respective shell in coll. JUO. Locality information: Guangxi, Longzhou Xian, Wude Xiang, Qunhe Cun, Banxintun, 308 m, 22°35.46563'N, 106°46.29486'E, leg. Ohara, K., Okubo, K. & Otani, J. U., 11.01.2006.

The right ommatophoral retractor crosses the male and female genitalia. Penis very long, club-shaped with long, slender, proximal portion and thickened distal "head"; penial caecum moderately long, slightly shorter than the epiphallus; epiphallus slender, approximately as long as the thickened distal part of the penis. Penis internally with longitudinal folds, in some parts with hardly visible reticulated sculpture; the inner wall of the distal end of the penis had several longitudinal slit-like "pockets", which contained flat, thin, calcareous crystals (one crystal per pocket). Distal end of the penis and the proximal part of penial caecum had reticulated sculpture. The inner wall of penial caecum was tuberculated, the tubercles were paired, probably forming pockets for calcareous crystals, as it was visible in *G. pulvinaris pulvinaris* (see below). Epiphallus internally with longitudinal folds. Vas deferens very long, curly; thickened near its insertion to spermoviductus. Vagina very long, approximately as long as the penis and penial caecum together, it has well-developed vaginal bulb at its proximal part. Bursa copulatrix and additional organ next to it are very long and slender; the bursa with a thickened distal end.

Remarks: *G. giardi giardi* is known from the Vietnamese Cao Bằng Province and western Guangxi (Páll-Gergely & Hunyadi 2013). The localities reported here are situated within the boundaries of the known distribution.

Gudeodiscus marmoreus Páll-Gergely n. sp.

Fig. 1, 5C, 5E.

Diagnosis: A very large, flat species with a low, long fold in the aperture which is free from the callus. Dorsal surface with coarse radial ribs and very fine spiral lines. On the parietal wall there are two lamellae with horizontal plicae above and below the anterior lamella.

Description of the holotype: Shell brownish with lighter mosaic colouration dorsally and a yellowish band around the umbilicus, which is visible in all whorls inside the infundibular umbilicus; shell flat with a slightly elevated apex; 7.5 whorls are separated by rather shallow suture; protoconch very finely, regularly ribbed; dorsal surface of teleoconch with extremely fine, microscopic spiral lines and coarse, irregular radial growth lines; shell surface almost smooth around the umbilicus; within the umbilicus spiral lines not visible, only the radial growth lines; peristome brown, thickened and reflexed, with slightly S-shaped, low callus and a white, low entering fold free from it.

The armature is situated very deep, about half whorl behind the aperture; parietal wall with two lamellae; anterior one rather straight and short, above slightly elongated anteriorly, below both anteriorly and posteriorly; posterior lamella long and very much curved; two horizontal plicae are above and below the first lamella, the lower one starts from the lower end of the posterior lamella and stops and the middle of the anterior lamella; the upper plica is about as long as lower, starts just anterior to the posterior lamella, and it exceeds the anterior lamella. Palatal wall with six plicae; first long and slim, close to the suture and situated posterior of the other plicae; second bent posteriorly; third and fourth almost vertical, slightly depressed Z-shaped; fifth short and V-shaped, probably consists of two plicae; the sixth one is situated anterior of the other plicae, slim; there are two additional small, denticle-like plicae posterior to the fifth and sixth plicae.

Measurements (in mm, holotype): D=26.7, H=9.6.

Differential diagnosis: The coloration (mosaic structure dorsally, light band around the umbilicus) and the sculpture (extremely fine spiral lines and rough radial growth ridges) of the new species is unique among *Gudeodiscus*. Moreover, most large, flat species reported from China ("*Chersaecia*" *andersoni* (Blanford, 1869), *G. concavus* Páll-Gergely, 2013, *G. eroessi* Páll-Gergely, 2013, *Gudeodiscus goliath* Páll-Gergely & Hunyadi, 2013, *G. okuboi* Páll-Gergely & Hunyadi, 2013, *G. pulvinaris* (Gould, 1859)) have only one parietal lamella. Some taxa however, have two parietal lamellae (*G. emigrans otanii* Páll-Gergely, 2013, *G. giardi*, *G. phlyarius*, *G. yanghaoi* Páll-Gergely & Hunyadi, 2013). These differ from the new species in the following shell characters; *G. emigrans otanii* has Y-shaped palatal plicae, sometimes four parallel plicae instead of an anterior lamella in front of the lamella and has fine ribbing on the whole shell. *G. giardi* and its subspecies have a more elevated spire, domed shell shape and their anterior lamella is connected to the lower plica. *G. phlyarius* usually has the more elevated spire, stronger apertural fold, thicker peristome and finely ribbed sculpture than the new species. *G. yanghaoi*, which is probably the closest relative to *G. marmoreus* n. sp., has the more elevated spire, a long entering fold connected to the callus, all middle palatal plicae are united and being visible as one plate through the semitransparent shell, which has the finely ribbed dorsal surface.

Etymology: The new species is named after its marbled dorsal shell surface (*marmoreus* = marbled in Latin).

Material: China, Guangxi, Hechi city, east of BaMa Xian, ex coll. Yang Hao, 2013, HNHM 97457 (holotype).

Gudeodiscus multispira (Möllendorff, 1883)

New localities: Guangxi, Yangshuo Xian, Fuli Zhen, Xinzhai Cun, 118 m, 24°45.816'N, 110°34.131'E, leg. Ohara, K., Okubo, K. & Otani, J. U., OK/1; Guangxi, Sanjiang Xiang, Jiahui Xiang, Luohanduyan, 238 m, 25°01.120'N, 110°53.961'E, leg. Ohara, K., Okubo, K. & Otani, J. U., OK/5; Guangxi, Sanjiang Xiang, Pingan Xiang, Chuanyan, 153 m, 24°55.120'N, 110°48.979'E, leg. Ohara, K., Okubo, K. & Otani, J. U., OK/1; Guangxi, Pingyue Xian, Ertang Zhen, north of Chaotianyan, 182 m, 24°37.577'N, 110°45.710'E, leg. Ohara, K., Okubo, K. & Otani, J. U., OK/2; Guangxi, Pingle Xian, Ertang Zhen, in front of Chaotianyan, 168 m, 24°37.500'N, 110°45.474'E, leg. Ohara, K., Okubo, K. & Otani, J. U., OK/4; Guangxi, Zhongshan Xian, Wanggao Zhen, Bishuiyan, 170 m, 24°35.992'N, 111°25.447'E, leg. Ohara, K., Okubo, K. & Otani, J. U., OK/1; Guangxi, Yangshuo Xian, Puyi Xiang, Muqiao, 125 m, 24°43.590'N, 110°32.355'E, leg. Ohara, K., Okubo, K. & Otani, J. U., OK/1; Guangxi, Yangshuo Xian, Yangshuo Zhen, Mushan, 126 m, 24°46.342'N, 110°31.301'E, leg. Ohara, K., Okubo, K. & Otani, J. U., JUO/3; Guangxi, Guilin Shi, Gongcheng Xian, Pingan Xiang, Jiaojintang, 750 m, 24°45.454'N, 110°53.530'E, leg. Ohara, K., Okubo, K. & Otani, J. U., OK/2, PGB/1.

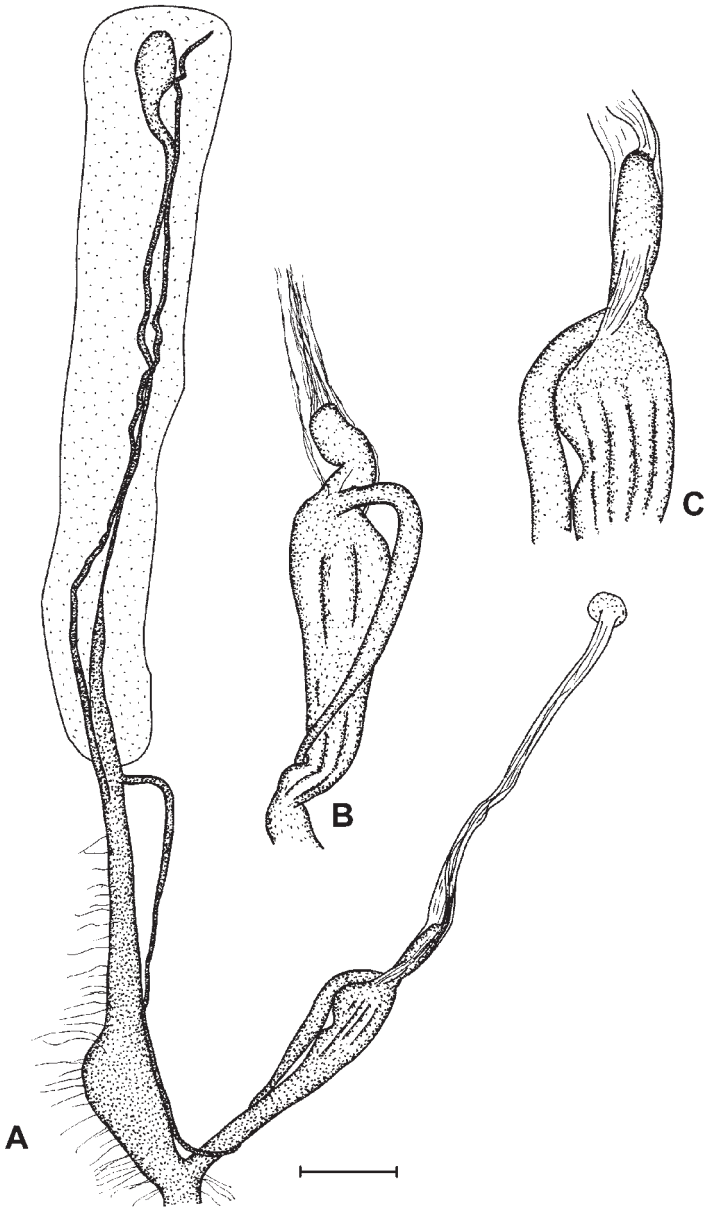
Characters of the genital structure (Fig. 10, Fig. 20E): The anatomy of *G. multispira* specimens collected in the southern part of Lipu (190 m a.s.l., 24°28.909'N, 110°24.024'E) was described by the Páll-Gergely & Hunyadi (2013). We dissected two specimens from a nearby locality (Guangxi, Qingshan, Qingshan Zhen, Lipu Xian, 252 m, 24°26.189'N, E110°20.008'E, leg. Nakahara, Y., Ohara, K., Okubo, K. & Otani, J. U., 12.11.2004.). The only notable difference is the much shorter penial caecum in the newly examined specimen in relation to the others published in the Chinese revision (Páll-Gergely & Hunyadi 2013).

Remarks: *G. multispira* is known from two nearby occurring localities in southern Hunan province, and from several localities from north-eastern Guangxi. The new localities published here extend the known distribution further in Guangxi. The locality near Bishuiyan is situated about 95 km east from the nearest known location.

Gudeodiscus okuboi Páll-Gergely & Hunyadi, 2013

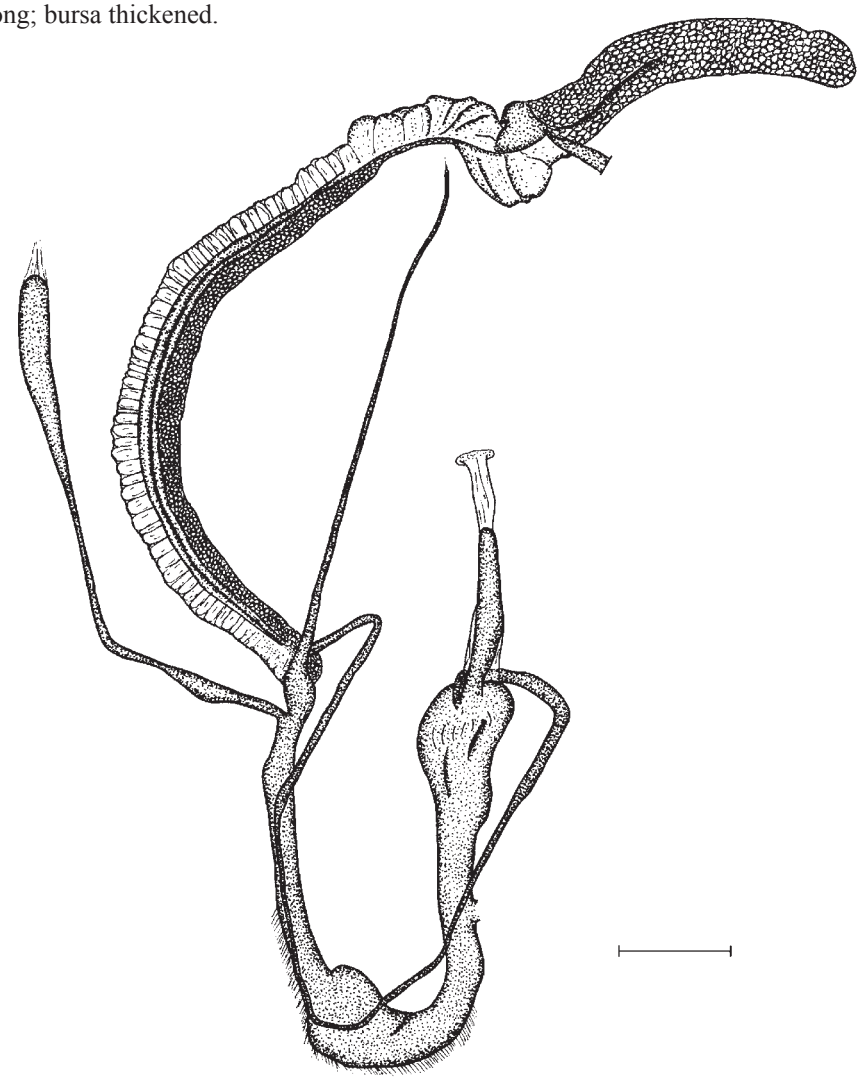
Characters of the genital structure (Fig. 11, Fig. 20C): Two specimens were anatomically examined. "Specimen1" had several embryos developing in its uterus, "Specimen2" was not gravid. Ethanol-preserved bodies are deposited in coll. PGB, respective shell in coll. JUO. Locality information: Guangxi, Guigang Shi, Guzhang Xiang, road to Wushan Xiang, 131 m, 23°21.178'N, 109°17.432'E, leg. Nakahara, Y., Ohara, K., Okubo, K. & Otani, J. U., 09.11.2004.

The right ommatophoral retractor crosses the male and female genitalia. Penis rather long, gradually tapers to the end; internally with weak longitudinal folds all along the whole penis and pockets on the wall of the thickened, distal part; the pockets did not contain calcareous crystals; a portion of the penis wall more conspicuously thickened



11. Genital anatomy of *Gudeodiscus okuboi* Páll-Gergely & Hunyadi, 2013. Locality: Guangxi, Guigang Shi, Guzhang Xiang, road to Wushan Xiang, 131 m, 23°21.178'N, 109°17.432'E, leg. Nakahara, Y., Ohara, K., Okubo, K. & Otani, J. U., 09.11.2004. Fig. 11A and C: "Specimen1", Fig. 11B: "Specimen2". Scale represents 2 mm, and refers to Fig. 11A only

than other parts of penis; penial caecum relatively short and thick, internally with two well-visible folds; epiphallus shorter than the penis, but its length is unknown due to obscured boundary between the epiphallus and the vas deferens; retractor muscle attaches at the end of penial caecum, and several additional muscle fibres attach to the distal end of the penis. A muscle fibre is visible between the middle section of the penial caecum and the distal end of the penis. Vagina slightly longer than penis and epiphallus together, with well-developed vaginal bulb; several weak muscle fibres attach vagina to diaphragm. Bursa copulatrix and additional organ next to it are extremely long; bursa thickened.



12. Genital anatomy of *Gudeodiscus pulvinaris pulvinaris* (Gould, 1859). Locality: Hong Kong Peak. Scale represents 5 mm

Gudeodiscus pulvinaris pulvinaris (Gould, 1859)

Characters of the genital structure (Fig. 12, Fig. 21H): Two specimens collected at the Hong Kong Peak by Miu Yeung in June 2013, were anatomically examined. Specimens are deposited in the PGB collection. The genital anatomy of *G. pulvinaris pulvinaris* does not differ notably from that of *G. pulvinaris robustus* Páll-Gergely & Hunyadi, 2013. This confirms their close relationship and supports their subspecific status.

The dissected *G. pulvinaris robustus* specimen (see Páll-Gergely & Hunyadi 2013) had developing embryos in its uterus, and had no calcareous crystals or granules within the penis lumen, whereas the *G. pulvinaris pulvinaris* specimens examined this time were not gravid and had several translucent claws within the "pockets" on the wall of the distal part of the penis. Additionally, the *G. pulvinaris pulvinaris* specimens had similar, but smaller calcareous claws between the folds inside the penial caecum.

Genus *Sicradiscus* Páll-Gergely, 2013

2013 *Sicradiscus* Páll-Gergely, In: Páll-Gergely & Hunyadi: Archiv für Molluskenkunde, 142 (1): 50.

Type species: *Plectopylis schistoptychia* Möllendorff, 1886.

Sicradiscus invius (Heude, 1885)

Characters of the genital structure (Fig. 13, Fig. 21A): Two specimens were anatomically examined. Ethanol-preserved bodies are deposited in coll. PGB, respective shells in coll. JUO. Locality information: Sichuan, Dujiangyan Shi, Taian Zhen, Sanlong Shuijingrongdong, 1087 m, 30°55.039'N, 103°29.662'E, leg. Hosoda, T., Ohara, K., Okubo, K., Otani, J. U., 17.09.2013.

The right ommatophoral retractor crosses the male and female genitalia. Penis short, blunt, consists of a longer proximal and a shorter distal portions; it is the widest at the distal end of the proximal part; inner wall with rather parallel folds which form "pockets" in the distal part of the penis; penial caecum missing, epiphallus is a little longer than the distal part of the penis; extremely long retractor muscle attaches to the point of penis-epiphallus transition; Vagina longer than penis, with well-developed vaginal bulb and many short fibres which connect it to diaphragm; vas deferens slender, but thickened at the end; additional organ next to bursa copulatrix slender, long; bursa copulatrix slightly shorter and tapers towards the end.

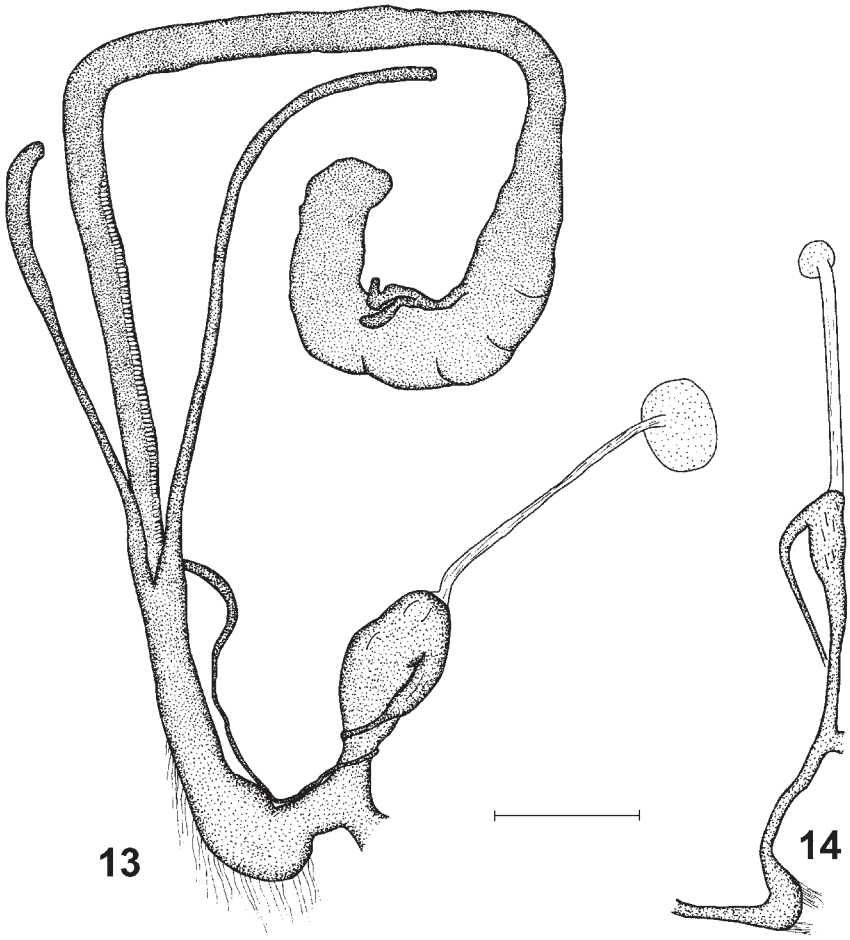
Sicradiscus schistoptychia (Möllendorff, 1886)

Characters of the genital structure: The outer morphology of the genital structure was described in our revision of species from China (Páll-Gergely & Hunyadi 2013). Re-examining the same samples revealed that the inner wall of the posterior half of the penis contained approximately 12 simple parallel folds with tiny calcareous crystals

between them. We found no signs of characteristic "pockets" (see under *Gudeodiscus* species, *Sic. invius* and *Sic. transitus*). The proximal, extremely slender half of the penis had smooth internal wall.

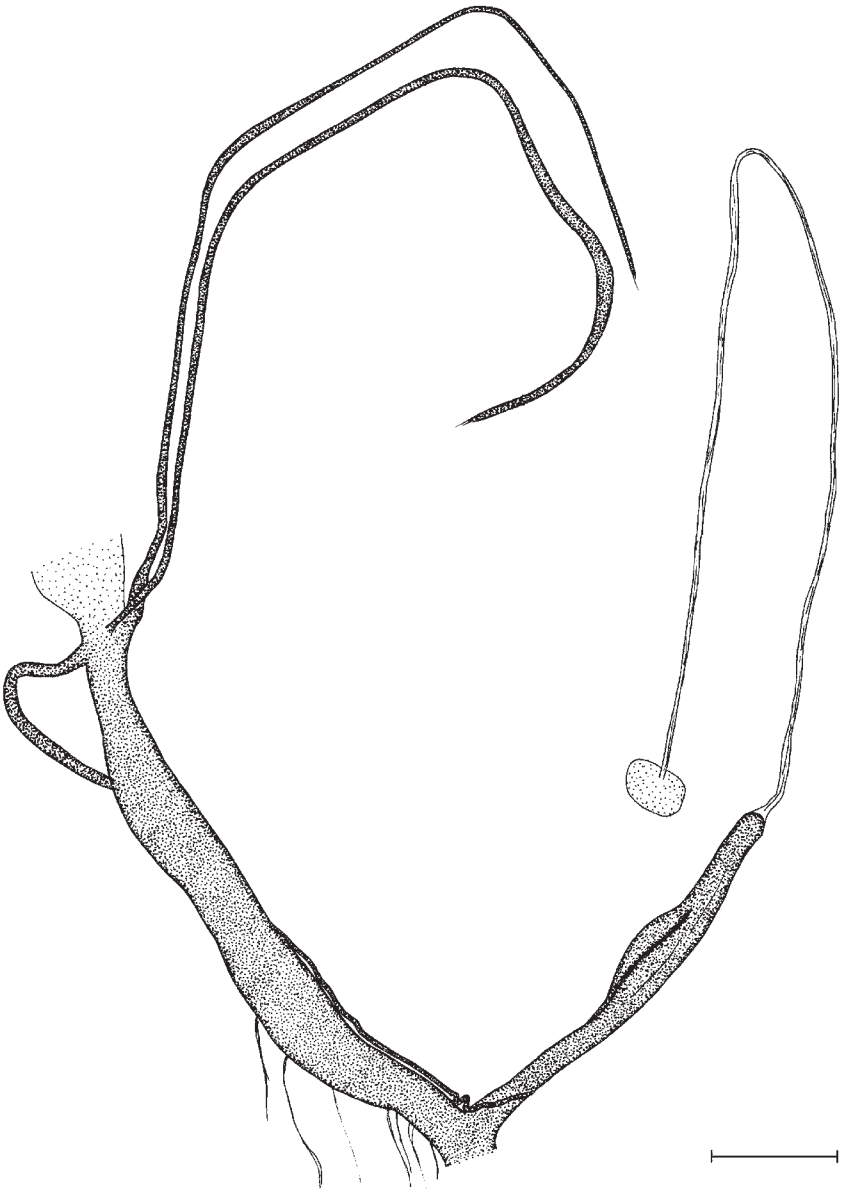
Sicradiscus transitus Páll-Gergely, 2013

Characters of the genital structure (Fig. 14, Fig. 21B): Two subadult specimens (without "finished" peristome) were anatomically examined (stored in coll. PGB). The locality data are the following: Guangxi, Hechi Shi, Tiane Xian, Qimu Xiang, near Lahaoyan, 650 m, 24°51.359'N, 107°11.407'E, leg. Hunyadi, A. & Szekeres, M., 12.09.2013.



13-14: Genital anatomy of *Sicradiscus* species: 13 – *S. invius* (Heude, 1885). Locality: Sichuan, Dujiangyan Shi, Taian Zhen, Sanlongshuijingrongdong, 1087 m, 30°55.039'N, 103°29.662'E; 14 – *S. transitus* Páll-Gergely, 2013. Locality: Guangxi, Hechi Shi, Tiane Xian, Qimu Xiang, near Lahaoyan, 650 m, 24°51.359'N, 107°11.407'E. Scales represent 1 mm

The right ommatophoral retractor crosses male and female genitalia. Shell and genital organs were immature. Penis rather long, consists of slim proximal and thick distal portions which are approximately the same in length; the width of the penis changes gradually between the two portions; distal end of penis with very small penial



15. Genital anatomy of *Sinicola asamiana* Páll-Gergely, 2013. Locality: Sichuan, Dujiangyan Shi, Qingchengshan Zhen, Jinbianyan, 860 m, 30°53.762'N, 103°33.101'E. Scale represents 1 mm

caecum-like part; long retractor muscle attaches the caecum; epiphallus about as long as the distal, thickened part of the penis; inner wall of the penis with approximately 10 parallel folds which are becoming more pronounced towards the distal end of the penis, where the folds are more elevated and form "pockets". Very tiny calcareous crystals were found between these "pockets". Vagina also long, with well-developed vaginal bulb; with several short fibres attaching it to diaphragm.

Genus *Sinicola* Gude, 1899

1899a *Sinicola* Gude, Science Gossip, 6: 148.

Type species: *Helix fimbriosa* von Martens, 1875.

Sinicola asamiana Páll-Gergely, 2013

New localities: Sichuan, Dujiangyan Shi, Taian Zhen, Sanlongshuijingrongdong, 1087 m, 30°55.039'N, 103°29.662'E, leg. Hosoda, T., Ohara, K., Okubo, K., Otani, J. U., JUO/1; Sichuan, Dujiangyan Shi, Qingchengshan Zhen, Jinbianyan, 860 m, 30°53.762'N, 103°33.101'E, leg. Hosoda, T., Ohara, K., Okubo, K., Otani, J. U., 16.09.2013.

Characters of the genital structure (Fig. 15, Fig. 21C): One specimen was dissected. Ethanol-preserved body is deposited in coll. PGB, respective shell in coll. JUO. Locality information: Sichuan, Dujiangyan Shi, Qingchengshan Zhen, Jinbianyan, 860 m, 30°53.762'N, 103°33.101'E, leg. Hosoda, T., Ohara, K., Okubo, K., Otani, J. U., 16.09.2013.

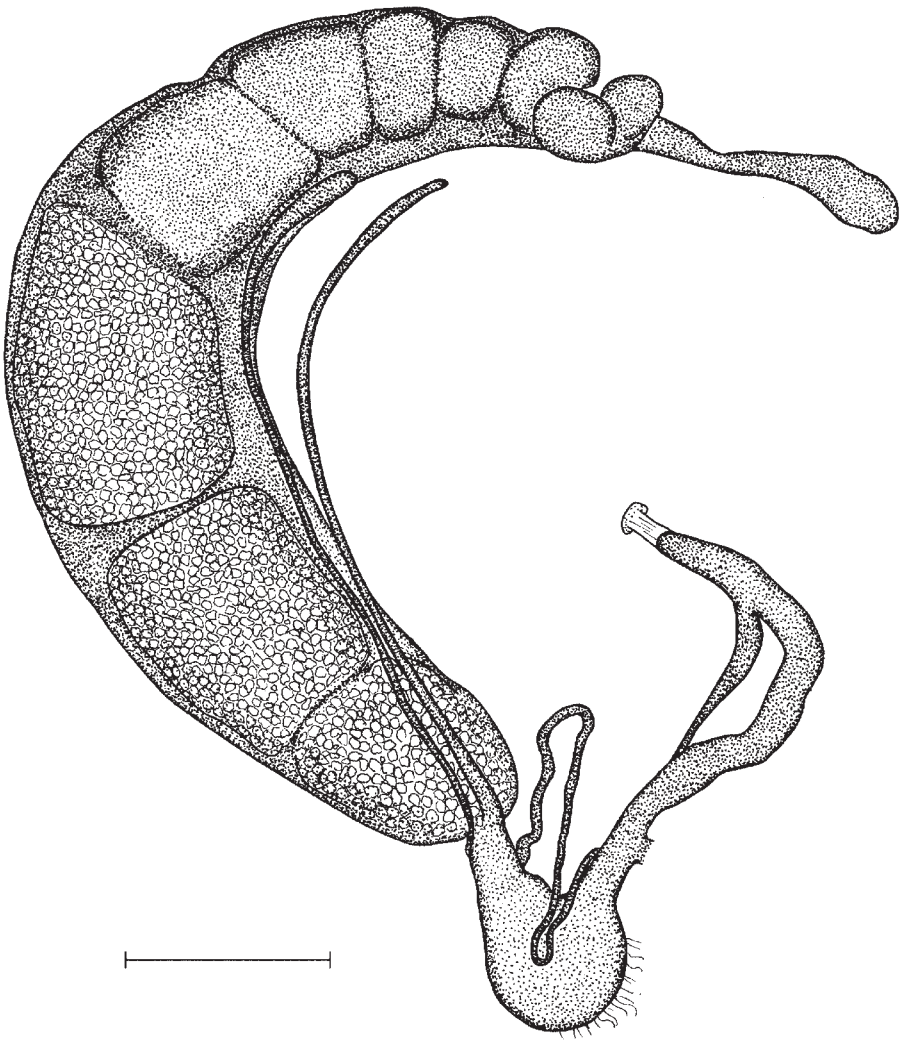
The right ommatophoral retractor crosses male and female genitalia. Penis very long, rather flat, equally wide to the end, internally with approximately 10 parallel, longitudinal folds; penial caecum as wide as penis; penis about five times as long as the penial caecum; epiphallus as long as the caecum but much thinner, spindle-shaped; retractor muscle attaches the distal end of the penial caecum, and is extremely slender and almost four times as long as penis. Vagina flat, almost twice as long as penis and much thicker than penis; no vaginal bulb present; vagina attached to diaphragm with a few long and widely-spaced fibres; proximal part of vas deferens slender but distal end thickened; bursa copulatrix and additional organ next to the bursa copulatrix are both very slender and extremely long.

Remarks: The species were reported from three localities west of Qingchengshan Zhen, Sichuan (see Páll-Gergely & Hunyadi 2013). The present new localities are in the vicinity (2-3 km) of these localities. For notes on the anatomy see under *S. murata*.

Sinicola emoriens (Gredler, 1881)

New locality: Guangxi, Yangshuo Xian, Yangshuo Zhen, Mushan, 126 m, 24°46.342'N, 110°31.301'E, leg. Ohara, K., Okubo, K. & Otani, J. U., OK/17, PGB/2.

Remarks: The genital structure of the species was described in a previous paper (PÁLL-GERGELY & HUNYADI 2013). An additional specimen from the same locality was anatomically examined (collection data: Hunan, Yongzhou Shi, Lingling Qu, Dengjiachong, rocky wall, 125 m, 26°13.808'N, 111°35.907'E, leg. Hunyadi, A., 8.11.2010, specimens in coll. PGB). This specimen had 10 embryos developing inside the semi-stransparent capsule in the uterus (see Fig. 16). Calcareous granules were present in the capsule layers of only the three largest embryos, which were situated most closely to the genital opening. However, the other seven embryos had no granules. This may indicate that those embryos with granules belong to a single litter.



16. Genital anatomy of *Sinicola emoriens* (GREDLER, 1881). Locality: Hunan, Yongzhou Shi, Lingling Qu, Dengjiachong, rocky wall, 125 m, 26°13.808'N, 111°35.907'E. Scale represents 2 mm

The dissected specimens had approximately 14 elevated, more or less parallel folds on the inner wall of penis (Fig. 21F).

The new collection site reported here represents the southernmost locality of the species, which extends its distribution range by approximately 20 km.

Sinicola fimbriosa (von Martens, 1875)

(Fig. 4)

New locality: Guangxi, Sanjiang Xiang, Limu Zhen, Yankou Cun, 210 m, 25°10.509'N, 110°56.366'E, leg. Ohara, K., Okubo, K. & Otani, J. U., OK/1.

Remarks: The species is widely distributed in Hunan Province. Additionally, it has been reported from a single locality in northern Guangxi (Páll-Gergely & Hunyadi 2013). The present new locality is about 50 km east from the previous one.

Sinicola murata (Heude, 1885)

New localities: Sichuan, Dujiangyan Shi, Taian Zhen, Qingchenghoushan, Shenxiandong, 835 m, 30°54.61750'N, 103°30.97445'E, leg. Nakahara, Y., Ohara, K., Okubo, K. & Otani, J. U., 09.07.2007., JUO/2; Sichuan, Dujiangyan Shi, Taian Zhen, Qingchenghoushan, above lower station of Jinli cable station, 979 m, 30°55.62540'N, 103°29.08667'E, leg. Nakahara, Y., Ohara, K., Okubo, K. & Otani, J. U., 08.07.2007., JUO/1; Sichuan, Qionglai Shi, Tiantaishan Zhen, Tiantaishan Dengyuean, 1071 m, 30°16.78396'N, 103°07.22660'E, leg. Nakahara, Y., Ohara, K., Okubo, K. & Otani, J. U., 12.07.2007., JUO/2; Sichuan, Dujiangyan Shi, Qingchengshan Zhen, Jinbianyan, 860 m, 30°53.762'N, 103°33.101'E, leg. Hosoda, T., Ohara, K., Okubo, K., Otani, J. U., 16.09.2013.

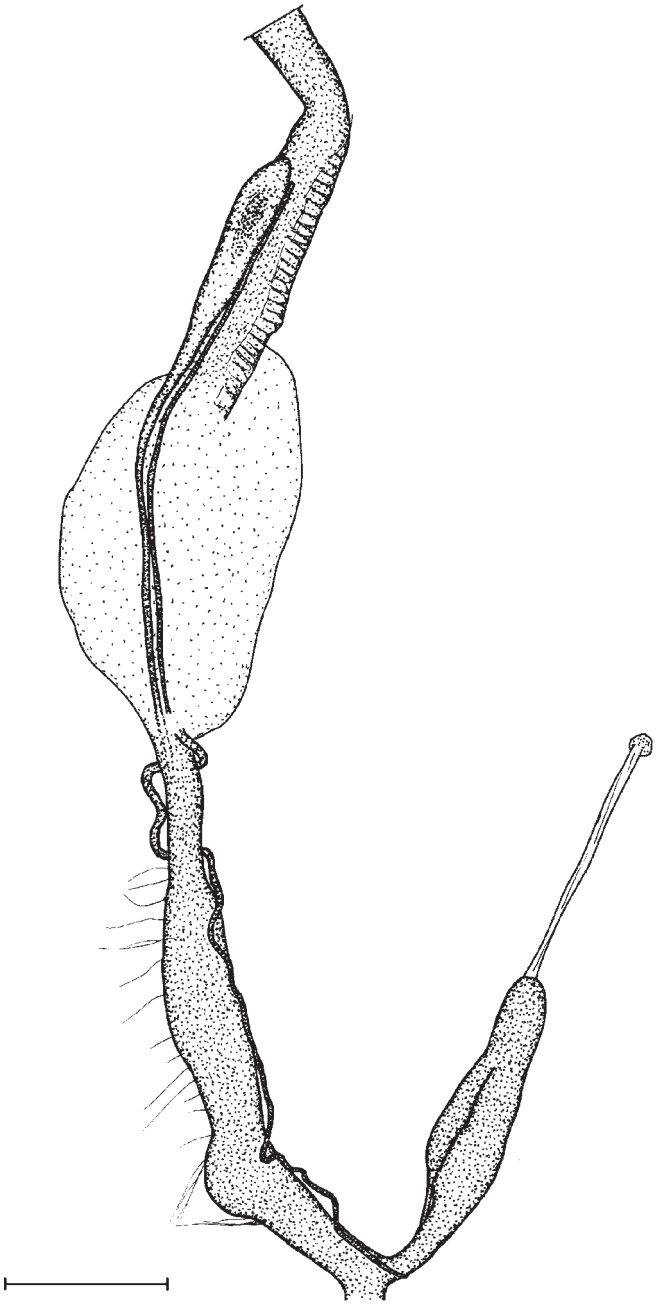
Characters of the genital structure (Fig. 17, Fig. 21E): Two specimens were anatomically examined from two different localities: Sichuan, Dujiangyan Shi, Qingchengshan Zhen, Jinbianyan, 860 m, 30°53.762'N, 103°33.101'E, leg. Hosoda, T., Ohara, K., Okubo, K., Otani, J. U., 16.09.2013.; Sichuan, Dujiangyan Shi, Taian Zhen, Sanlongshuijing-rongdong, 1090 m, 30°55.039'N, 103°29.662'E, leg. Hosoda, T., Ohara, K., Okubo, K., Otani, J. U., 17.09.2013. Ethanol-preserved bodies are deposited in coll. PGB, respective shells in coll. JUO.

The right ommatophoral retractor crosses male and female genitalia. Penis very long, rather spindle-shaped; inner wall of the distal portion is with 10–12 parallel folds; two of these folds become thickened proximally and connect at their proximal ends; penial caecum very short, pointed; epiphallus slender, cylindrical, about half as long as penis; retractor muscle about twice as long as the penis, very slender. Vagina flat, slightly longer than penis; equally wide to its proximal part, its distal end a bit more slender; proximal part of vagina attached to diaphragm with few slender fibres; vas deferens long, slender, and very slightly thickened at the end; bursa copulatrix and additional organ next to it are extremely long and very slender; only the bursa is slightly thickened. The uterus of the figured specimen from Jinbianyan contained six embryos, and the one from Sanlongshuijingrongdong had two embryos.

Remarks: This species has been reported from middle Sichuan (PÁLL-GERGELY & HUNYADI 2013). The present localities are less than 5 km from the nearest locality.

Sinicola murata differs from *S. stenochila* only in shell size, relative size of the aperture, and shell colour (PÁLL-GERGELY & HUNYADI 2013). Anatomical features of *S. murata*, however, are more similar to those of *S. asamiana*, which also inhabits Sichuan. Both species have the extremely long penial retractor muscle, short penial caecum and several long, widely-spaced muscle fibres along the vagina. *S. stenochila* differs from these species by having extremely long and terminally pigmented penial caecum of which the short and divided retractor muscle is attached, and vaginal muscle fibres which are restricted to the vaginal bulb.

17. Genital anatomy of *Sinicola murata* (HEUDE, 1885). Locality information: Sichuan, Dujiangyan Shi, Qingchengshan Zhen, Jinbianyan, 860 m, 30°53.762'N, 103°33.101'E. Scale represents 1 mm



18. Genital anatomy of *Sinicola reserata azona* (Gredler, 1887). Locality: Guizhou, Tongren Shi, Wanshanchen dirt road, Xianrendong, 863 m, 27°31.785'N, 109°13.008'E, leg. Ohara, K., Okubo, K. & Otani, J. U., 10.5.2010. Scale represents 2 mm

Sinicola reserata azona (Gredler, 1887)

Characters of the genital structure (Fig. 18, Fig. 20G, Fig. 21D, 21G): One specimen was dissected. Ethanol-preserved body is deposited in coll. PGB, respective shell in coll. JUO. Locality information: Guizhou, Tongren Shi, Wanshanchen dirt road, Xianrendong, 863 m, 27°31.785'N, 109°13.008'E, leg. Ohara, K., Okubo, K. & Otani, J. U., 10.5.2010.

The right ommatophoral retractor crosses male and female genitalia. Penis relatively long, spindle-shaped, slightly thickened at its middle part; internally with several longitudinal folds which form small "pockets" with neighbouring ones, in the whole distal portion of penis (Fig. 21D); penial caecum short, thickened; epiphallus slender, about half the length of penis; vas deferens slender, but becomes thicker near its insertion to spermoviductus; retractor muscle slender and moderately long, attaching to the end of penial caecum. Vagina flat, with a weakly developed "vaginal bulb"; vagina attaches to diaphragm with a few rather long fibres; diverticulum and bursa copulatrix are long and slender, with bursa slightly thickened. The anatomized specimen had a flat spermatophore with two round "packages", resembling two peas in a pod (Fig. 20G). A single, well-developed embryo was found in the uterus (Fig. 21G).

Sinicola stenochila (Möllendorff, 1885)

1885b *Plectopylis stenochila* Möllendorff, Nachrichtsblatt der Deutschen Malakozoologischen Gesellschaft, 11–12: 165 ["cum praec." = "Badung provinciae sinensis Hubei"].

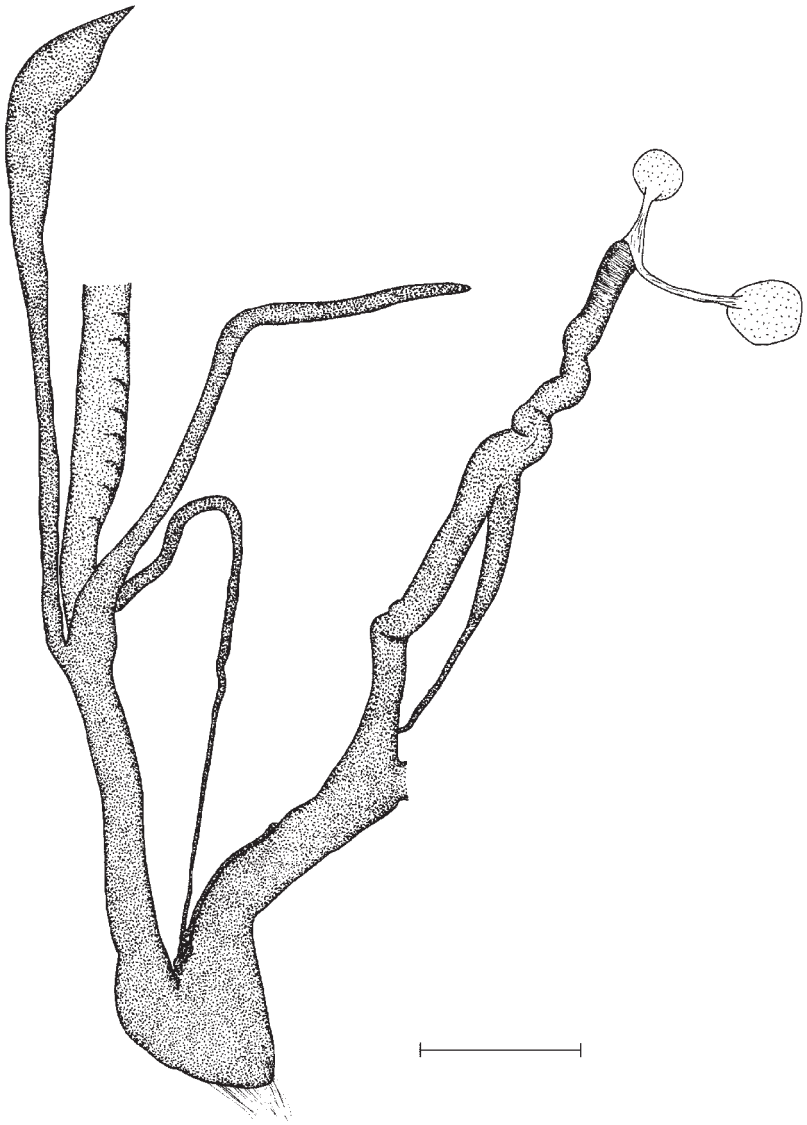
1897 *Plectopylis stenochila* var. *basilia* Gude, Science Gossip, 38 (4): 36, figs. 49a–c ["Badung, Province Hoo-Pé, China"].

New localities: Hubei, Badong Xian, Yanduhe Zhen, Shiyang Cun, 374 m, 31°11.98743'N, 110°21.46432'E, leg. Ohara, K., Okubo, K. & Otani, J. U., 10.05.2007., OK/4; Chongqing, Chongqing Shi, Wushan Xian, Jianping Xiang, near toll station, 710 m, 31°03.05724'N, 109°55.51583'E, leg. Ohara, K., Okubo, K. & Otani, J. U., 09.05.2007., OK/11 (one of them with smooth base); Chongqing, Chongqing Shi, Wushan Xiàn, Luoping Zhen, near toll station in Liziping, 1097 m, 31°11.55433'N, 110°04.46165'E, leg. Ohara, K., Okubo, K. & Otani, J. U., 10.05.2007., OK/16 (one of them with smooth base).

Characters of the genital structure (Fig. 19): Two specimens were anatomically examined. Collection information: Hubei, Enshi Tujiazu Miaozu Zizhizhou, Badong Xian, Badong E, Bashan Senlin Gongyuan, 300 m W from the entrance, 220 m, 31°01.684'N, 110°25.094'E, leg. Hunyadi, A., 3.11.2010. Ethanol-preserved specimens are deposited in coll. PGB.

The right ommatophoral retractor crosses male and female genitalia. Penis very long, cylindrical, equally wide throughout its length; distal half of penis internally with pockets which contained tiny calcareous granules; penial caecum very long, almost as long as penis, but slightly more slender than penis; distal end of penial caecum finely pigmented with transversal lines; two short, independent retractor muscles (or

a single, basally divided one?) attaches to distal end of caecum; epiphallus shorter and slimmer than caecum. Vagina about twice as long as penis, with well-developed vaginal bulb in the middle; vagina attached to diaphragm with several dense fibres on vaginal bulb; vas deferens long, slender, but thickened at the end; bursa copulatrix and additional organ next to the bursa are moderately long, the bursa is more thickened than the additional organ.



19. Genital anatomy of *Sinicola stenochila* (Möllendorff, 1885). Locality: Hubei, Enshi Tujiazu Miaozu Zizhizhou, Badong Xian, Badong E, Bashan Senlin Gongyuan, 300 m W from the entrance, 220 m, 31°01.684'N, 110°25.094'E. Scale represents 1 mm

Remarks: YEN (1939) treated *Sinicola stenochila* var. *basilia* (GUDE, 1897) as a synonym of *Sinicola stenochila stenochila* (MÖLLENDORFF, 1885) based on some *S. stenochila stenochila* specimens that bear as sharp a keel as *basilia*. PÁLL-GERGELY & HUNYADI (2013) distinguished these two forms based on the sculpture in the ventral shell surface (smooth in *basilia* and ribbed in *stenochila*), although specimens from Changyang showed intermediate shell characters between "typical" *stenochila* and *basilia*. New information revealed that smooth and ribbed specimens occur in the same new localities, which suggests that they represent variation within populations. Therefore, we conclude that *S. basilia* is a synonym of *S. stenochila* as proposed by YEN (1939). For anatomical notes, see under *S. murata*. The present new localities are 30–40 km from the nearest known sites.

Sinicola vargabalinti PÁLL-GERGELY n. sp.

Fig. 2–3, 5A–B, 5D, 22 E–F.

Diagnosis: A middle-sized, uniformly coloured *Sinicola* species with thickened apertural lip and a weaker callus. Parietal wall with a single lamella and two horizontal plicae anteriorly, one above and one below.

Description: Shell yellowish corneous or reddish brown; lenticular with domed apical part, keel situated slightly above the middle line of shell in apertural view; apex slightly elevated from the dorsal surface; the 6.25–7 (n=5) regularly growing whorls separated by shallow suture; finely and regularly ribbed protoconch consists of about two and a half whorls; dorsal side of teleoconch sculpture above the keel dominated by irregular radial ribs with some spiral lines between them; ventral side under the keel smooth; dorsal and ventral surfaces change discontinuously in morphology across the keel; the keel with flat deciduous periostracal folds; these are sometimes visible on the preceding whorls on the dorsal surface of shell; peristome whitish, thickened and reflexed, callus relatively weak but always present, slightly S-shaped and both ends of callus are separated from peristome by shallow canals;

Two specimens were opened. On parietal wall there is a curved lamella and two long horizontal plicae anteriorly without denticles in between; first palatal plica short and situated close to suture; the last one also straight or curved downwards with an additional denticle above its posterior end; the remaining five plicae are more or less horizontal and parallel, but they are usually depressed V-shaped, with the longer arm of the "V" pointing in anterior direction. One specimen had "doubled" palatal plicae (Fig. 5B).

Measurements: (in mm, n=5): D= 16–19.5, H= 6.6–8.5.

Differential diagnosis: In size the most similar species is *Sinicola fimbriosa*, which has a more flattened shell with shouldered body whorl. The keel of *S. vargabalinti* is lower in position in apertural view than *S. fimbriosa* and slightly above the middle line of the shell. Moreover, *S. fimbriosa* has a light band around the umbilicus, stronger reticulated surface on the dorsal side of the teleoconch, and six more regular and straight palatal plicae, whereas seven slightly V-shaped palatal plicae are present in the new species. *S. fimbriosa* lacks the callus, but *S. vargabalinti* has the weak callus.

Material: China, Guangxi, Laibin Shi, Wushan Xiang, ex coll. Yang Hao, 2013, HNHM 97455 (holotype), HNHM 97456 (paratype), PGB/3.

Etymology: *S. vargabalinti* is named after Bálint VARGA, a friend of the first author, to celebrate a 25 year-old friendship.

Genus *Plectopyloides* YEN, 1969

1969 *Plectopyloides* YEN, — Sitzungsberichte der Österreichisch Akademie der Wissenschaften (Abt.I), 177: 56.

1986 *Plectopyloides* (*Plectopyloides*), LI, — Professional Papers of Stratigraphy and Palaeontology, 14: 242.

1986 *Plectopyloides* (*Henanspirus*) LI, — Professional Papers of Stratigraphy and Palaeontology, 14: 246. **new synonym**

1986 *Plectopyloides* (*Menyinspirus*) LI, — Professional Papers of Stratigraphy and Palaeontology, 14: 244. **new synonym**

1986 *Plectopyloides* (*Yenellus*) LI, — Professional Papers of Stratigraphy and Palaeontology, 14: 245. **new synonym**

Remarks: LI (1986) revised the system of *Plectopyloides* YEN 1969 (type species: *Plectopyloides cretaceous* YEN 1969) after LI (1984, 1985) and YEN (1969) described plectopyloids. According to YEN (1969) the age of these fossils is late Cretaceous, but LI (1986) argued based on other fossils (gastropods, ostropods and mammals) that they belong to Eocene. Based on differences in umbilicus, palatal and parietal plicae and lamellae, LI (1986) erected three subgenera within the genus *Plectopyloides*, namely *Yenellus* (with the species *guanzhuangensis*), *Menyinspirus* (with the species *multispiralus*) and *Henanspirus* (with the species *altus*, *applanatus* and *regularus*; type species: *Plectopyloides regularus*). LI (1986) did not mention *Plectopyloides shantungensis* YEN, 1969. The palatal plicae and umbilicus differ only slightly among species of this genus. In contrast, the parietal plicae and lamellae differ from one another considerably. According to LI (1986), *Plectopyloides* has one vertical lamella and three parallel horizontal plicae anterior to the lamella (Fig. 5M), and *Yenellus* a single parietal lamella (Fig. 5O), whereas *Henanspirus* and *Menyinspirus* have two vertical lamellae (Figs 5 N, P). In addition, *Henanspirus* has a horizontal straight plica above the first lamella, but *Menyinspirus* lacks this plica. Our revision of living Chinese Plectopylidae (PÁLL-GERGELY & HUNYADI 2013) revealed huge diversity in palatal as well as parietal plication within the same genera, between subspecies or sometimes even within specimens from the same localities. All of these types in variable parietal lamellation occur within the genus *Gudeodiscus*. The parietal plicae and lamellae of *G. ursula* PÁLL-GERGELY & HUNYADI, 2013 are similar to those of the genus *Plectopyloides* (*Plectopyloides*). The "*Yenellus*-type" plication (presence of a single lamella) occurs in several species of the genus *Gudeodiscus*. Moreover, the "*Plectopyloides*-type" specimens as well as the "*Henanspirus*-type" specimens are found together with *Gudeodiscus emigrans otanii* in the same localities (see PÁLL-GERGELY & HUNYADI 2013, and this study). Accordingly, these differences, although are seemingly large, do not support taxonomical separation into multiple subgenera or in other higher ranks than species. The subgenera described by LI (1986) (*Menyinspirus*, *Yenellus* and *Henanspirus*) are

synonyms of *Plectopyloides*. The taxonomic position of "*Plectopylis*" *antiquus* Yu & Pan, 1982 is questionable because the inner lamellae of fossils could not be observed, and thus should be placed in the genus *Plectopyloides*.

In the original description, Li (1986) used two different spellings for each of two species; *multispiralus* and "*multispiralul*" for one species and *guanzhuangensis* and "*guanzhangensis*" for the other species. We propose to use the names spelled as *multispiralus* and *guanzhuangensis*.

Plectopyloides and *Gudeodiscus* are more similar to each other than others, in the rounded body whorl and morphology of plicae and lamellae. *Plectopyloides* differs from *Gudeodiscus* in the conspicuously narrow umbilicus and arrangement of palatal plicae. According to the drawings of Li (1986) (see Fig. 5I–L), the lower, straight and long palatal plica is situated anteriorly of the penultimate and curved plica. This is never the case in *Gudeodiscus*, which has the short, usually curved plica usually under the penultimate plica. In some cases, such as in *Gudeodiscus marmoreus* n. sp., the lower plica is positioned anteriorly to the other plicae, but much lower in position, unlike in *Plectopyloides*. *Plectopyloides* is so far only fossil genus that can be assigned to family Plectopylidae without doubts, based on the vertical parietal lamellae which distinguishes plectopylids from all other conchologically similar groups. The other genera that have been mentioned as probably related to Plectopylidae/Corillidae, such as the Middle European *Proterocorilla* Hrubesch, 1965 and *Pseudostrobilus* Oppenheim, 1892 (see also Tausch 1886) or the Indian "*Anchistoma*" species (see Stoliczka 1868 and Nevill 1881), are all much older (Cretaceous) and have no vertical lamellae. The systematics of these fossils require a comprehensive revision. They may probably be assigned to the superfamily Plectopyloidea but not to the family Plectopylidae.

Family Camaenidae Pilsbry, 1895

Remarks: Molecular phylogenetic studies (Wade et al. 2006, 2007) showed that former Camaenidae (without dart apparatus) and Bradybaenidae (with dart apparatus) are mutually polyphyletic within a monophyletic clade. Therefore Bradybaenidae is a junior synonym of Camaenidae.

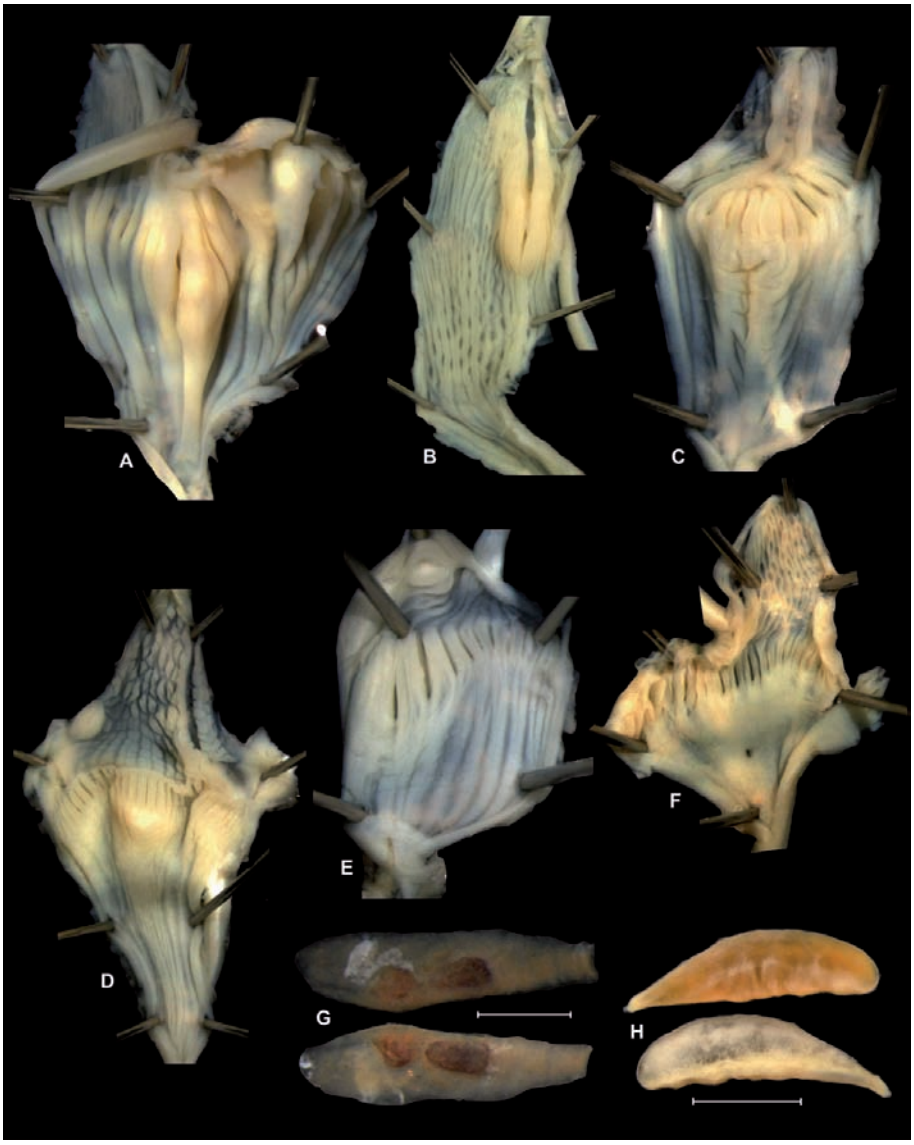
Genus *Amphicoelina* Haas, 1933

1933 *Amphicoelina* Haas, Archiv für Molluskenkunde, 65 (4/5): 231.

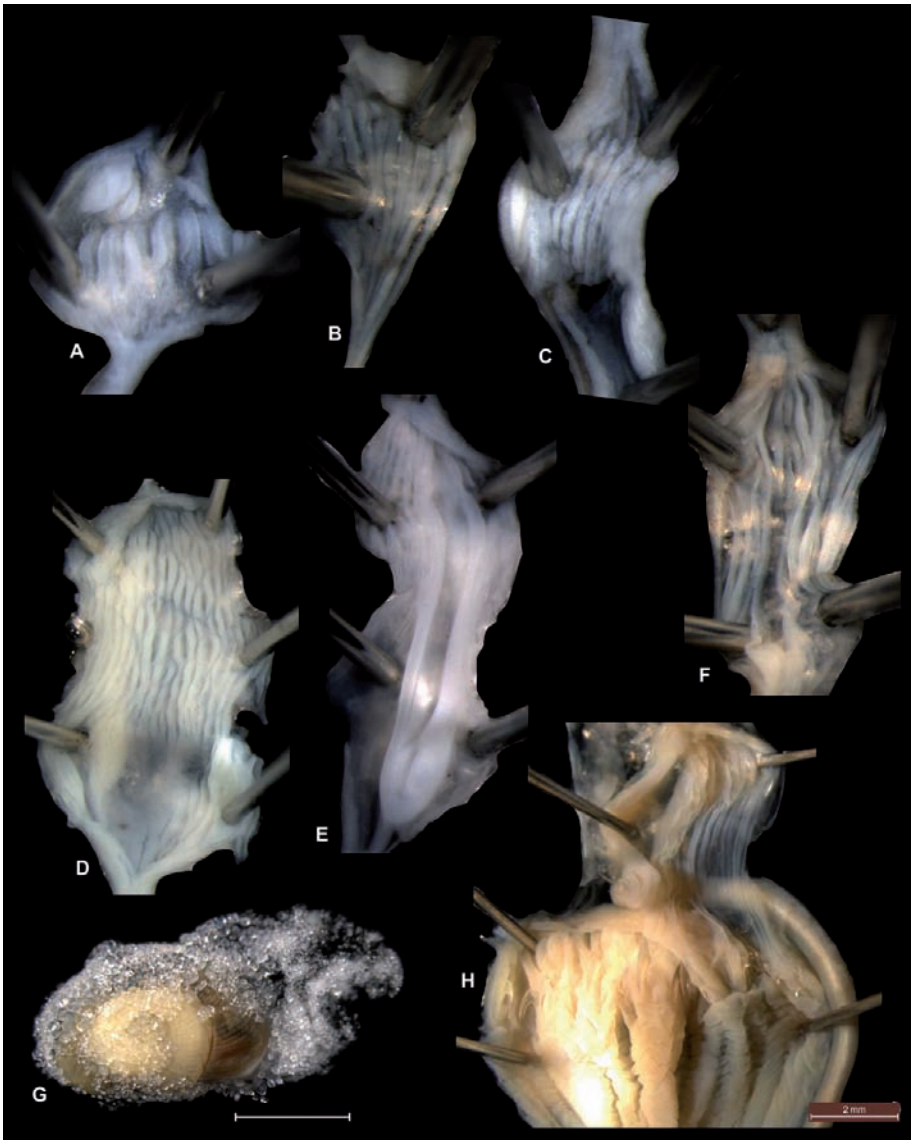
Type species: *Helix biconcava* Heude, 1882.

Content: *biconcava* (Heude, 1882), *diplomphala* (Möllendorff, 1886), *omphalospira* (Möllendorff, 1897) and *subobvoluta* (Ancey, 1882).

Remarks: Haas (1933) erected the genus *Amphicoelina* for four Chinese *Drepanostoma*-like (*Drepanostoma* Porro, 1836, family Helicodontidae) species, and chose *Helix biconcava* Heude, 1882 as the type species. He proposed that the genus is closely related to *Chloritis* (now family Camaenidae, see Schileyko 2003). To our knowledge,

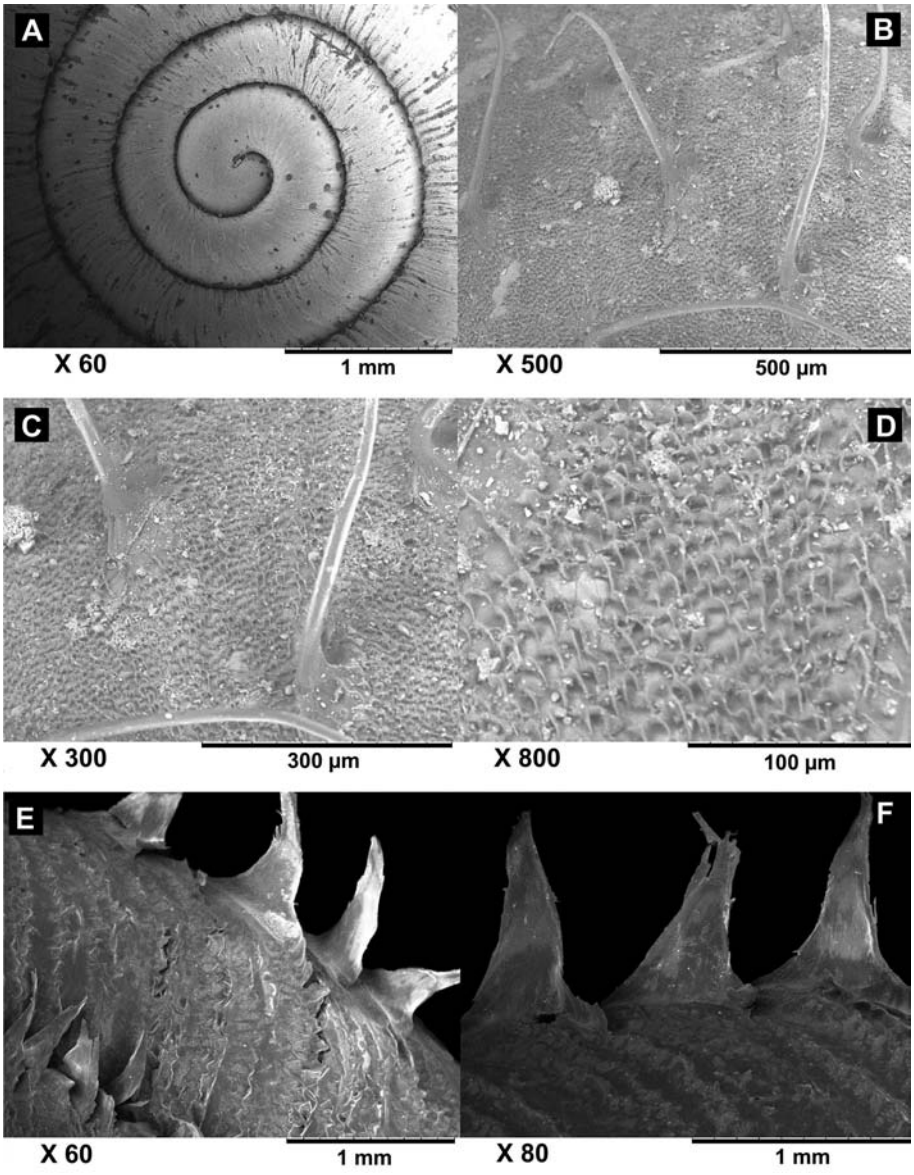


20A-F: inner wall of the penis and penial caecum of Chinese *Gudeodiscus* species. 20G-H: both sides of spermatophore of Chinese Plectopylidae species. For geographic localities see previous figure captions. A: *G. emigrans otanii* Páll-Gergely, 2013, "Specimen1"; B: *G. emigrans otanii* Páll-Gergely, 2013, "Specimen2"; C: *G. okuboi* Páll-Gergely & Hunyadi 2013 ("Specimen1"); D: *G. giardi giardi* (H. Fischer, 1898); E: *G. multispira* (Möllendorff, 1883); F: *G. eroessi eroessi* Páll-Gergely & Hunyadi, 2013 ("Specimen1"); G: *Sinicola reserata azona* (Gredler, 1887); H: *G. emigrans otanii* Páll-Gergely, 2013 ("Specimen3")



21A-F, H: inner wall of the penis and penial caecum of Chinese *Gudeodiscus*, *Sicradiscus* and *Sinicola* species. Fig. 21G: embryo in the embryo sac. A: *Sic. invius* (Heude, 1885); B: *Sic. transitus* Páll-Gergely, 2013; C: *Sin. asamiana* Páll-Gergely, 2013; D: *Sin. reserata azona* (Gredler, 1887), E: *Sin. murata* (Heude, 1885) (same specimen as in Fig. 18); F: *Sin. emoriens* (Gredler, 1881); G: *Sin. reserata azona*; H: *Gudeodiscus pulvinaris pulvinaris* (Gould, 1859)

the first author who classified *Amphicoelina* within the Corillidae was Yen (1939). Zilch (1960) followed this idea, and classified *Plectopylis*, *Corilla* and *Amphicoelina* within Corillidae. Schileyko (1999) mentioned that there is a thin parietal lamella inside the body whorl and classified the genus together with Gude's sections into the Plectopylidae. Our examination, however, did not confirm the presence of a vertical



22. SEM images of the shell of *Amphicoelina* sp. China, Chensi merid., Mont Tsin-Ling (?), leg. l'Abbé David, MNHN 2012-27024, (A–D) and *Sinicola vargabalinti* n. sp. (E–F; paratype, same data as Fig. 2)

plate beyond the aperture (or any inner lamellae or teeth). In the SMF collection we examined the *Amphicoelina* shells, and found three shells with broken apertural part (i.e. the last half/quarter whorl was missing): paralectotype of *A. diplomphala*, Patung, Hupei: China, coll. Möllendorff, SMF 7018; paralectotype of *A. omphalospira*, Patung, Hupei: China, coll. Möllendorff, SMF 7016A; one corroded specimen labelled as *A. subobvoluta*, Njŭ-tsoŭ-shan, Ta-Yeh, Hupei, China, Krejci-Graf, S 1937, SMF 24755. The internal lamellae would have been visible in these shells if they were present, but we found no signs of folds. Moreover, one *Amphicoelina* specimen (China, Chensi merid., Mont Tsin-Ling (?), leg. l'Abbé David, MNHN 2012-27024) has a small hole of the last whorl which allowed us to observe the parietal wall. We again found no signs of plicae. To our knowledge, no illustrations of lamellae of *Amphicoelina* have ever been published.

The shell sculpture of *Amphicoelina* consists of extremely small (about 10–20 μm) scale-like structure as well as long, slender and cylindrical hairs (Fig. 22). These slender periostracal hairs are not in spiral or radial arrangement. This sculpture clearly differs from that of Plectopylidae, which usually have the reticulated surface. Some plectopylid species (*Chersaecia dextrorsa*, several *Sinicola* and *Endothyrella* species) also possess long periostracal folds, but these are arranged in well-visible spiral lines on the body whorl. At present, our information on *Amphicoelina* is limited, without anatomy of soft bodies. However, the absence of internal lamellae and the camaenid-like sculpture on shell surface suggest that *Amphicoelina* belongs to the Camaenidae as proposed by Haas (1933).

Distribution: Southern China (Hunan and Hubei).

REMARKS ON THE ANATOMY

Out of approximately 120 plectopylid species, genital anatomy is only known in the following species: *Plectopylis bensoni* (Gude, 1914 under the name *achatina*) and *P. cyclaspis* (both in Stoliczka 1871); *Chersaecia simplex* (Solem 1966, in the original description); *Endothyrella pinacis* (Godwin-Austen 1889–1914, Schileyko 1999); *Sicradiscus hirasei* (Pilsbry, 1904) (Azuma & Azuma 1984), *Sic. ishizakii* (Kuroda, 1941), (Chang & Ookubo 1999), *Sic. schistoptychia* (in Páll-Gergely & Hunyadi 2013), *Sic. transitus* and *Sic. invius* (this study), *Sinicola fimbriosa*, *Sin. emoriens* (in Páll-Gergely & Hunyadi 2013), *Sin. asamiana*, *Sin. murata*, *Sin. reserata azona*, *Sin. stenochila* (this study), *Gudeodiscus pulvinaris robustus*, *G. multispira*, *G. phlyarius* (in Páll-Gergely & Hunyadi 2013), *G. emoriens otanii*, *G. eroessi eroessi*, *G. giardi giardi*, *G. okuboi*, *G. pulvinaris pulvinaris* (this study). Stoliczka (1871) mentioned that he also "examined the animal" of *Plectopylis macromphalus* (W. Blanford, 1870) (now genus *Endothyrella*), but described only the anatomy of *Plectopylis achatina* and *P. cyclaspis*.

The genital organs of Plectopylidae are rather simple and do not show significant diversity. Most species share simple penis and epiphallus with or without penial caecum, having the retractor muscle attached to the penis-epiphallus transition or on the penial caecum. The female genitalia are also simple, usually with a (1) "vaginal bulb",

which is a thickening at the middle of the vagina where the organ is folded ("turns back") in the animal when it is withdrawn into the shell; (2) muscle fibres which fix the vagina to the diaphragm, and (3) a long bursa copulatrix with usually an additional and similarly shaped organ running in parallel with the bursa copulatrix. The genitalia of *Chersaecia simplex* differ from all the other known plectopylids by lack of an epiphallus and unique formation of vas deferens. According to SOLEM (1966), the vas deferens "becomes an integral part of the fibres surrounding the penis, ascends penis laterally to its head, entering through small penis papilla". Additionally, *Ch. simplex* lacks the additional organ next to the bursa copulatrix.

There are two characters which show dimorphism across plectopylid species (all except for *Ch. simplex*). Namely, the presence or absence of the penial caecum and the additional organ next to the bursa copulatrix. The penial caecum is absent in *S. invius*, *S. ishizakii* (see CHANG & OOKUBO 1999) and in both *Plectopylis* species (STOLICZKA 1871). It is probably also absent or vestigial in *S. hirasei* as well, but the drawing and the description of AZUMA and AZUMA (1984) is not clear in this respect. On the other hand it is present in all known *Sinicola* species (*asamiana*, *emoriens*, *fimbriosa*, *murata*, *stenochila*), in *Sicradiscus schistoptychia* and it is vestigial in *S. transitus*. All known Chinese *Gudeodiscus* species has penial caecum (PÁLL-GERGELY & HUNYADI 2013 and this study).

The organ next to the bursa copulatrix was described by STOLICZKA (1871) as "a shorter, more muscular gland which appears to represent the arrow or amatorial gland" and by PILSBRY (1894) as "An organ of unknown homology, either a dart sack, a diverticulum of the spermatheca or an appendicula". The identity of this organ is unknown. It is extremely slender and it is difficult to dissect out especially in case of gravid animals, because it is attached to the very thin wall of the oviduct. Probably for this reason, this organ is absent in figures in the literature (see PÁLL-GERGELY & HUNYADI 2013). This makes the evaluation of taxonomic importance of this trait difficult. These results suggest that the presence or absence of penial caecum and additional organ parallel next to the bursa copulatrix within the family Plectopylidae may have only limited values of taxonomy. The variation of other characters such as the morphology of the inner plicae and lamellae of the shell and the surface of the inner wall of reproductive organs could be more informative for the taxonomy of this group.

We see two types in terms of the morphology of the penis-epiphallus-retractor muscle complex in the genus *Gudeodiscus*. In one type, the epiphallus is slender, cylindrical, and addition to the retractor muscle, which attaches on the penial caecum, several muscle fibres attach to the penis itself (*emigrans*, *eroessi*, *okuboi*, *pulvinaris*). In the other type the epiphallus has a somewhat thickened proximal part, and has no additional muscle fibres attached to the penis. In this second type only the single retractor muscle is visible which attaches at the end of the penial caecum (*giardi*, *multispira*, *phlyarius*). Even if these two groups seem to be clearly distinct, we cannot state that they form monophyletic units, because the shell morphology of *G. multispira* and *G. eroessi*, as well as *G. phlyarius* and *G. emigrans* are very similar. More information is needed to see if the genus *Gudeodiscus* is separable on the basis of the penial morphology.

The morphology of the inner penial wall might be useful to reveal the taxonomic relationship between the genera *Gudeodiscus*, *Sicradiscus* and *Sinicola*. All known *Sinicola* species (*asamiana*, *emoriens*, *fimbriosa*, *murata*, *reserata azona*, *stenochila*) have parallel folds on the inner wall of penis, sometimes with tiny, flat or rounded calcareous granules between these folds, or within the slit-like pockets which are formed by neighbouring folds. Even if "pockets" are formed by the folds, they cover the whole inner wall of the distal portion of the penis. In contrast, in the genus *Gudeodiscus* the pockets are arranged in one or two transversal rows. In the genus *Gudeodiscus* these pockets are occasionally filled with hook- or claw-like calcareous crystals. The presence of these crystals seems to be associated with the mating season (or absence of embryos within the uterus). *Sicradiscus invius* and *Sic. transitus* also had "pockets" on the inner wall, similar to those of the genus *Gudeodiscus*. In contrast, *Sicradiscus schistoptychia* had simple parallel folds, similar to those of *Sinicola* species. *S. schistoptychia* is very similar to *Sic. transitus* in terms of shell morphology. Thus, the anatomical similarity to the former to *Sinicola* and the latter to *Gudeodiscus* species is surprizing. Since the anatomy of the majority of *Gudeodiscus* and *Sicradiscus* species is unknown, we find the available information insufficient to draw a conclusion regarding the value of this character and the relationship between *Sicradiscus* and *Gudeodiscus*.

Acknowledgements

We are very grateful to Kanji Okubo, Kenji Ohara, Jamen Uiriamu Otani, András Hunyadi, Yang Hao and Miu Yeung for providing shell and ethanol-preserved material, to Ronald Janssen who opened access to the collection of the SMF and to Virginie Héros and Philippe Bouchet (MNHN) for their help in loaning museum material. We are indebted to The Biodiversity Heritage Library for the literature made available to us (www.biodiversitylibrary.org).

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APPENDIX

All mentioned Chinese localities and their respective provinces presented in simplified Chinese characters.

Pinyin	**Chinese characters**	**Province**
Aishan Xiang	矮山乡	Guangxi
Badong Xian	巴东县	Hubei
Bama Xian	巴马县	Guangxi
Banxintun	板新屯	Guangxi
Bishuiyan	碧水岩	Guangxi
Chaotianyan	朝天岩	Guangxi
Chongqing	重慶	Chongqing
Chongqing Shi	重慶市	Chongqing
Chuanshan	川山	Guangxi
Chuanyan	穿岩	Guangxi
Cili Xian	慈利县	Hunan
Daxin Xian	大新县	Guangxi
Dujiangyan Shi	都江堰市	Sichuan
Ertang Zhen	二塘镇	Guangxi
Fuli Zhen	福利镇	Guangxi
Gongcheng Xian	恭城县	Guangxi
Guangxi	广西	Guangxi
Guigang Shi	贵港市	Guangxi
Guilin Shi	桂林市	Guangxi
Guizhou	貴州省	Guizhou
Guzhang Xiang	古樟乡	Guangxi
Hechi Shi	河池市	Guangxi
Huangcai Zhen	黄材鎮	Hunan
Hubei	湖北	Hubei
Hunan	湖南	Hunan
Jiahui Xiang	嘉会乡	Guangxi
Jianping Xiang	建平乡	Chongqing
Jiaojintang	蛟津塘	Guangxi
Jinbianyan	金鞭岩	Sichuan
Jinli	金骊	Sichuan

Lahaoyan	拉号岩	Guangxi
Laibin Shi	来宾市	Guangxi
Limu Zhen	栗木镇	Guangxi
Lipu Xian	荔浦县	Guangxi
Liuzhou Shi	柳州市	Guangxi
Liziping	梨子坪	Chongqing
Longzhou Xian	龙州县	Guangxi
Luohanduyan	罗汉肚岩	Guangxi
Luoping Zhen	骡坪镇	Chongqing
Muqiao	木桥	Guangxi
Mushan	木山	Guangxi
Ningxiang Xian	寧乡县	Hunan
Nonggang	弄岗	Guangxi
Pingan Xiang	平安乡	Guangxi
Pingyue Xian	平乐县	Guangxi
Poliu Elementary School	坡六小学	Guangxi
Puyi Xiang	普益乡	Guangxi
Qianfodong	千仏洞	Hunan
Qidong Xiang	七洞乡	Guangxi
Qimu Xiang	豈暮乡	Guangxi
Qingchenghoushan	青城后山	Sichuan
Qingshan	青山	Guangxi
Qingshan Zhen	青山镇	Guangxi
Qionglai Shi	邛崃市	Sichuan
Qunhe Cun	群合村	Guangxi
Sanguansitujiazu Xiang	三官寺土家族乡	Hunan
Sanjiang Xiang	三江乡	Guangxi
Sanlongshuijingrongdong	三龙水晶溶洞	Sichuan
Shenxiandong	神仙洞	Sichuan
Shiyang Cun	石羊村	Hubei
Shuanghedong	双合洞	Hunan
Sichuan	四川	Sichuan
Taian Zhen	泰安鎮	Sichuan
Tiane Xian	天峨县	Guangxi

Tiantaishan Dengyuean	天台山等乐安	Sichuan
Tiantaishan Zhen	天台山	Sichuan
Tianzishan	天子山	Hunan
Tongren Shi	銅仁市	Guizhou
Wanggao Zhen	望高镇	Guangxi
Wanshanchen	万山特区	Guizhou
Wude Xiang	武德乡	Guangxi
Wulingyuanqu	武陵源区	Hunan
Wushan Xian	巫山县	Chongqing
Wushan Xiang	五山乡	Guangxi
Xiannuyan	仙女岩	Guangxi
Xianrendong	仙人洞	Guizhou
Xingbin Qu	兴宾区	Guangxi
Xinhe	新合	Guangxi
Xinzhai Cun	新寨村	Guangxi
Yanduhe Zhen	沿渡 河镇	Hubei
Yangshuo Xian	阳朔县	Guangxi
Yangshuo Zhen	阳朔镇	Guangxi
Yankou Cun	岩口村	Guangxi
Yizhou Shi	宜州市	Guangxi
Zhangjiajie Shi	张家界市	Hunan
Zhangjiajieda Xiagu	張家界大峡谷	Hunan
Zhongshan Xian	钟山县	Guangxi

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