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Taxonomy and ecology of Neotropical Cassidinae (Coleoptera: Chrysomelidae)

Ph.D. Thesis

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Annotation

This thesis investigates the systematics and biology of Neotropical Cassidinae and summarizes available knowledge of all tribes occurring in the Neotropics. This study uses a multidisciplinary framework to evaluate various issues in the taxonomy of this diverse group of beetles as a result of extensive field research.

Declaration [in Czech]

Prohlašuji, že svoji disertační práci jsem vypracoval samostatně pouze s použitím pramenů a literatury uvedených v seznamu citované literatury.

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to my parents Jiří and Vlasta,
my mate Katka and
our son Matyáš Martin

List of papers and author’s contributions

The thesis is based on the following papers (listed chronologically):

I. FLINTE V., WINDSOR D., **SEKERKA L.**, VALVERDE DE MACEDO M. & MONTEIRO R. F. (2010) Plagiometriona emarcida (Boheman, 1855) and Plagiometriona forcipata (Boheman, 1855) (Coleoptera: Chrysomelidae: Cassidinae), a single species differing in larval performance and adult phenotype. *Journal of Natural History*, **44**: 891–904. IF = 0.782.

Lukáš Sekerka examined relevant type material, identified taxa and was responsible for taxonomic implications.

II. **SEKERKA L.** & WINDSOR D. (2012) Two new species of *Plagiometriona* from Bolivia and Ecuador (Coleoptera: Chrysomelidae: Cassidinae: Cassidini). *Annales Zoologici*, **62**: 669–677. IF = 0.660.

Lukáš Sekerka wrote the paper, examined relevant material, and participated in field research.

III. **SEKERKA L.**, WINDSOR D. & STAINES C. L. (2013) A new species of Cephaloleia Chevrolat from Panamá with description of larva and first record of orchid-feeding in Cephaloleiini (Coleoptera: Chrysomelidae: Cassidinae). *Acta Entomologica Musei Nationalis Pragae*, **53**: 303–314. IF = 0.574.

Lukáš Sekerka wrote the paper, was responsible for introductory parts and description of adults, and participated in field research.

IV. **SEKERKA L.**, WINDSOR D. & DURY G. (2014) Cladispa Baly: revision, biology and reassignment of the genus to the tribe Spilophorini (Coleoptera: Chrysomelidae: Cassidinae). *Systematic Entomology*, **39**: 518–530. First online: DOI: 10.1111/syen.12070 (16 APR 2014). IF = 2.784.

Lukáš Sekerka wrote the paper, was responsible for introductory parts and description of adults, interpretation of results and participated in field research.

V. **SEKERKA L.** (2014) Review of Imatidiini genera (Coleoptera: Chrysomelidae: Cassidinae). *Acta Entomologica Musei Nationalis Pragae*, **54**: 257–314. IF = 0.659.

Lukáš Sekerka wrote the paper.

VI. SIMÕES M. V. P. & **SEKERKA L.** (2014) Redescription of Heteronychocassis acuticollis Spaeth, 1915 (Coleoptera: Chrysomelidae: Cassidinae). *Coleopterists Bulletin*, **68**: 407–410. IF = 0.495.

Lukáš Sekerka co-wrote the paper, studied type material and was responsible for discussion and conclusions.

VII. **SEKERKA L.** & BARCLAY M. L. V. (2014) Fabrician types of Cassidinae (Coleoptera: Chrysomelidae) deposited in the Natural History Museum, London. *Acta Entomologica Musei Nationalis Pragae*, **54**: 657–684. IF = 0.659.

Lukáš Sekerka wrote the paper, was responsible for most of the text and taxonomic implications.

VIII. **SEKERKA L.** & BOROWIEC L. (2015) Subgenera of Charidotella Weise with description of a new subgenus and species from Brazil (Coleoptera, Chrysomelidae, Cassidinae, Cassidini). *ZooKeys*, **506**: 61–74. IF = 0.933.

Lukáš Sekerka wrote the paper, was responsible for most of the text and taxonomic implications.

IX. SIMÕES M. V. P. & **SEKERKA L.** (2015) Review of the Neotropical leaf beetle subgenus Dorynota s. str. Chevrolat (Coleoptera: Chrysomelidae: Cassidinae: Dorynotini). *Coleopterists Bulletin*, **69**: 231–254. IF = 0.495.

Lukáš Sekerka co- wrote the paper and was responsible for species diagnoses, taxonomic remarks, key to species and description of one of the two new species.

Table of contents

Foreword

The presented thesis is based on author's long term research on Neotropical Cassidinae in various countries in Central and South America and study of extensive type material deposited in numerous institutions. It is composed of two parts: a review and series of scientific papers published in various impacted journals. The review summarizes known information on Neotropical Cassidinae and is based on published literature and numerous unpublished observations made by the author. For each of the 18 Neotropical tribes is given overview of its diversity, biology, larvae, diagnostic characters and additional comments. The presented information without cited source is new, unpublished and based on author's observations. Herein suggested taxonomic and nomenclatural acts have to be understood as unpublished and unavailable in sense of the Code of Zoological Nomenclature (4th edition, 1999).

Introduction

Introduction

Cassidinae is the second largest subfamily of leaf-beetles (Coleoptera: Chrysomelidae) containing up to date 6393 species, classified in 358 genera and 35 tribes (Sekerka, unpubl. data). Present day Cassidinae are identical to the group Cryptostoma, which included two separate families Hispinae and Cassidinae (e.g. Chapuis 1875). However, Weise (1910a) and Spaeth & Reitter (1926) early on suggested that, morphologically, the two groups are incompletely separated and overlapping, especially among tropical species. Recent phylogenetic research and studies on larvae and adults show that, if the group is to be considered monophyletic, both subfamilies have to be merged due to the number of transitional tribes (Chen 1940, 1964, 1973; Chen et al. 1986; Borowiec 1995; Staines 2002; Świętojańska 2009). Chen (1940) was the first who synonymized both groups and used the name Cassidinae as a valid. Some recent classifications (e.g. Crowson 1955, Lawrence & Britton 1991, Reid 1995) gave priority to Hispinae over Cassidinae, however, it is invalid act as according to the Principle of the first revising author (Article 24.2. of ICZN (1999)) the valid name is Cassidinae as the first revising author was Chen (1940). Borowiec & Świętojańska (2014) summarized the nomenclatorial history of the group name, morphology of adults and immature stages, diversity and biology.

The monophyly of Cassidinae is well supported based on recent molecular phylogenies (e.g. Goméz-Zurita et al. 2008, Bocák et al. 2013), however there are only relatively few morphological synapomorphies, which would be diagnostic for the group, some of them unambiguously results of inadequate sampling. Below is a chronological overview of principal characters used to separate Cassidinae from other chrysomelid lineages and overview of phylogenetic studies dealing with higher classification of chrysomelids.

Chapuis (1874, 1875) created the group Cryptostoma for Cassidinae and Hispinae and separated it from other chrysomelids by mouthparts directing downwards and not visible from above. This character was interpreted by subsequent authors as hypognathous or opistognathous head and used as one of the principal autapomorphies of the group (Jacoby 1908; Crowson 1955; Chen 1964, 1973, 1985; Chaboo 2007). There has been term confusion as some authors referred the head as hypognathous while others as opistognathous.

The situation was most likely rendered by studied sample of cassidines used in the analyses because the orientation of mouthparts is cassidines is quite diverse, however, I do not know of any example of truly opistognathous head in the group. The most common type of head in cassidines is hypognathous, however, in some groups prognathous head exists as well as intermediate forms between the two types. In my opinion the position of mouthparts is not a suitable character for higher classification of chrysomelids as it is strongly driven by trophic adaptations and cassidines are a good example of it. Many species of the tribe Imatidiini have head clearly prognathous with the oral cavity shifted to the front of the head and the mouthparts are in some cases projecting anteriad and visible from above while many other have fully hypognathous head. Based on my observations hypognathous mouthparts occur in species feeding either on open leaf surface or living in very tightly enclosed unopened leaves thus beetles have to scrape the surface of the leaf being tightly attached to it. Many species living in yet unopened leaves, which offer some space have mouthparts shifted towards front of the head and seems that the mouth position depends on how ‘spacious’ is the leaf. Fully prognathous mouthparts occur in species feeding along venation of unopened or yet opening leaves or in very tightly enclosed areas such as between leaf axil and stem. In some genera of Imatidiini several different states of the mouthparts position is present even within a single genus. For instance most species of *Pseudostilpnaspis* Borowiec, 2000 have sub-prognathous mouthparts not visible from above and they feed along venation of opened young leaves. In Panama there are two species feeding on leaves of *Cryosophila warszewiczi* (Arecaceae) but each with different strategy. One feeds on open leaf surface and has the latter form of mouthparts while the other feeds in pleats of opening leaf and has mouthparts distinctly more shifted forwards, somewhat projecting and thus partly visible from above. Such cases are not rare among Imatidiini and in my opinion these adaptations might allow coexistence of several species feeding on the same food source. All Cassidinae taxa with tendency to have more or less prognathous mouthparts also have reduced clypeus, often only linear. More or less prognathous head is also present in some other Cassidinae tribes such as Exothispini, Aproidini, Coelaenomenoderini, Promecothecini (Palaeotropical) and Hispoleptini (Neotropical). All these taxa are primarily associated with various monocotyledons, often Arecaceae.

CHEN (1940, 1964, 1973, 1985) used over time various characters to delimit Cassidinae but only a few persisted: opistognathous head, approximate antennal insertions, abdomen with eight visible tergites, tarsi with four visible tarsomeres, tarsomere IV indistinct and fused with V. Based on these characters Chen created a new system of chrysomelids and erected Cassidinae to family rank. Approximate antennal insertions also occur among other chrysomelid lineages such as Galerucinae and among Cassidinae there are many states of this character. For instance members of the tribe Arescini or Cryptonychini have antennal insertions widely separated by interantennal process of the head. Number of visible abdominal tergites was not adopted by subsequent authors nor discussed. Seems that all Cassidinae have eight visible tergites and the eight is forming the pygidium. On the contrary, tarsi with only four visible tarsomeres are considered as autapomorphy of the group (CHABOO 2007). According to LAWRENCE & ŚLIPIŃSKI (2014) only the subfamily Synetinae has also tarsi with four tarsomeres. This subfamily belongs to a different lineage of chrysomelids not being closely phylogenetically related, therefore pseudotetramerous leg can be considered as diagnostic autapomorphy of Cassidinae.

STORK (1980) and MANN & CROWSON (1981) reviewed the structure of tarsal ventral setae and reported bifid setae on tarsomere III in Bruchinae, Sagrinae, Donaciinae, Criocerinae, and on tarsomeres I–III in Cassidinae; remaining subfamilies have setae simple. CHEN (1985) considered the presence of bifid setae on three basal tarsomeres as autapomorphy of Cassidinae. REID (1995) used the presence/absence of bifid setae in his character matrix and found that some Bruchinae and Criocerinae also have bifid setae on all three basal tarsomeres. This character requires further research across Chrysomelidae as it was studied only in a very limited sample of taxa and in most groups is at the presentr assumed to be uniform based on observation of a few common species.

REID (1995, 2000) made a complex phylogenetic analysis of Chrysomelidae based on adult and larval morphological characters. He confirmed that Cassidinae and Hispinae form a single group, however, he was not able to resolve its position and suggested that it is probably sister group to Criocerinae. He did not report any apomorphic character for Hispinae (at that time used for the group).

CHABOO (2007) performed cladistic analysis of 209 morphological characters of adult specimens and immature stages for 98 taxa based on literature data and studied specimens. She resolved the Cassidinae as monophyletic group supported by eleven autapomorphies. It is important to mention that numerous taxa included in this study were misidentified, placed in the matrix twice, or the characters of immature stages were mixed with wrong adult, for more details see ŚWIĘTOJAŃSKA (2009). Below are listed characters resolved in the analysis as autapomorphies of Cassidinae with additional comments regarding their accuracy, real apomorphy and usefulness as a diagnostic character.

Character 5. Body of larva dorso-ventrally flattened. – Dorso-ventrally flattened larvae are present also in other chrysomelid lineages, mainly in those with mining larvae (e.g. Zeugophorinae and Galerucinae s. lato) and vice versa many Cassidinae have convex larvae (see ŚWIĘTOJAŃSKA 2009). The convexity of Cassidinae larvae is very variable and is most likely result of adaptation to environment. This character is present also in many Chrysomelinae species, among others also among Galerucinae considered in the paper as sister group of Cassidinae.

Character 24. Ventral side of body in adult specimens flattened with pleuron in same plane as sternum. – Such flattened ventral side of body is a common feature of many species of Chrysomelinae, Galerucinae or Alticinae. On the other hand some taxa sampled in the study (e.g. *Aproida balyi* Pascoe, 1863 or *Oncocephala* spp.) has clearly convex ventral side (considered as flattened in the matrix) on the other hand in *Cephalodonta* sp. (in fact *Xenochalepus*) it was wrongly scored as convex while it is flattened.

Characters 27 (hypognathous mouthparts), **73** (mouthparts on the same plane as genae), and **75** (mouthparts oriented ventrally). – The first and the last are basically duplication of the same character. As described above, many cassidines have prognathous head and projecting mouthparts. Moreover, some of these taxa were sampled in the matrix but wrongly scored (e.g. *Exothispa reimeri* Kolbe, 1897, *Aproida balyi*, *Demotispa* sp.); all three have prognathous head and the last has clearly projecting mouthparts forwards.

Character 69. Mouth fossa transverse and rectangle. – This character is a bit confusing as it was not defined in the study and is not mentioned besides the list of characters in the appendix. It probably refers to the shape of mouth cavity and is wrongly scored for many taxa as numerous hispines have oval or rounded mouth cavity.

Character 103. Prosternum at midline longer than mesosternum. – This character is also present among nearly all other chrysomelid lineages and almost certainly has no classification value.

Characters 177 and 178 refer to bifid/simple setation of tarsomeres I and II respectively. – As observed by REID (1995) presence of bifid setae on all three basal tarsomeres is not unique to Cassdinae and so far also has not been extensively studied whether it is present in all cassidines.

Character 180. Tarsomere IV indistinct, thus legs with four distinct tarsomeres. – This is the only character, which represent a diagnostic synapomorphy of Cassidinae.

Character 188. Abdomen flattened in lateral profile. – Flattened abdomen is present also in many Chrysomelinae species, among others also among Galerucinae considered in the paper as sister group of Cassidinae.

From abovementioned enumeration is evident that only one of the autapomorphies found by CHABOO (2007) is diagnostic for Cassidinae. And quite likely some other characters resulted in autapomorphies only due to inacurate sampling.

ŚWIĘTOJAŃSKA (2009) revised known data on morphology of immature stages of Cassidinae in old sense (excluding tribes traditionally listed in Hispinae). She summarized knowledge on first instar larvae that are the most informative for systematic studies as more advanced instars have often quite distinct morphology probably driven by adaptations to environment. Additionally, resemblance of advanced instars probably is a consequence of similar life histories (e.g. reduction of lateral scoli in species of Cassidini living in arid habitats). Because the data on first instars larvae are known only for five tribes individual morphological characters were summarized in the table and discussed without cladistic analysis.

Up to date there is only a single molecular phylogeny of Cassidinae (WINDSOR & HSIAO 1999) suggesting that the group is monophyletic. DUCKETT et al. (2004) analyzed 91 taxa of various chrysomelids (including 7 species of Cassidinae) using 18S rDNA (based on FARRELL's (1998) data set plus 43 newly added sequences) and combined with the morphological dataset used by REID (1995, 2000). Based on sequences Cassidinae were resolved as paraphyletic without Cryptocephalinae because *Imatidium* sp. grouped (as sister) with the latter and not Cassidinae. However, the bootstrap support for Cassidinae-Cryptocephalinae clade is only 35%. The latter clade was sister to Eumolpinae. In combined analysis Cassidinae were resolved as monophyletic and sister to Chrysomelinae+Galeucinae with low bootstrap value. FARRELL & SEQUEIRA (2004) analyzed the same data sets without species added by

DUCKETT et al. (2004) and obtained similar results for molecular data using parsimony analysis with exception of *Imatidium*, which was positioned inside Cryptocephalinae not sister to it. Bayesian analysis showed Cassidinae+Eumolpinae as sister to Cryptocephalinae including *Imatidium* sp., the latter situated on terminal branch inside. In the analysis of morphological data Cassidinae were monophyletic and sister to Criocerinae. Finally in the combined analysis of both data sets Cassidinae were monophyletic and sister to (Cryptocephalinae+Eumolpinae)+(Chrysomelinae+(Galerucinae+Alticinae)) and the whole group was sister to Criocerinae.

GOMÉZ-ZURITA et al. (2007, 2008) performed analysis on multiple gene sequences (nuclear 18S rRNA and 28S rRNA, and mitochondrial 16S rRNA) of 147 representatives of Chrysomelidae. Cassidinae (including Hispinae) were resolved in all trees as monophyletic with 100% bootstrap support value and placed sister to Cryptocephalinae in the 'eumolpine clade', however bootstrap of this and other major nodes within the clade is less than 50%. MARVARDI et al. (2009) modelled the tertiary structure of the 18S and 28S rRNA in phytophaga to obtain alignments. Their study included only 23 species of chrysomelids and most subfamilies were not resolved as monophyletic, however, Cassidinae in both trees showed bootstrap 98% and 100% respectively and they were sister to a clytrine species (Cryptocephalinae); the latter were, however, not resolved as monophyletic. BOCÁK et al. (2013) published a large scale molecular phylogeny of Coleoptera based on two nuclear (18S and 28S rRNA) and two mitochondrial (rrnL and COX1) genes. All included chrysomelid subfamilies were resolved as monophyletic with exception of Eumolpinae. Cassidinae were resolved as sister to all other eumolpid groups. REID (2014) reviewed classification of Chrysomeloidea based on published morphological and molecular analyses and again stated that neither traditional Cassidinae nor Hispinae were monophyletic, however, the relationship of Cassidinae to other subfamilies remain uncertain.

Tribal classification of Cassidinae

Species of Cassidinae are currently classified in 35 tribes. Most of the tribes are confined either to New or Old World with the exception of Cassidini, which includes taxa from both regions. Relationships among the new and old world tribes are unknown, however, there are similar life strategies and morphological affinities in both regions. So far it is not known whether these similarities are results of parallelism or mean phylogenetic affinity. Phylogenetic studies dealt either only with one of the former subfamilies or New or Old World and the subfamily still lacks a complex analysis based on combination of molecular and morphological data.

BOROWIEC (1995) analyzed tribes traditionally placed in Cassidinae (sensu Spaeth), suggested that traditional Cassidinae are polyphyletic and proposed the name *cassidoid Hispinae* for tribes of Spaeth's system with exception of Imatidiini. He also suggested that several tribes to be merged because of lack of apomorphies: Imatidiini with Cephaloleiini; Epistictini with Basiprionotini; Eugenysini with Stolaini (nowadays Mesomphaliini); Goniocheniini with Omocerini; Asterizini and Physonotini with Ischyrosonychini; Basiptini and Aspidimorphini with Cassidini. Some of these changes prevailed while other were not accepted in his catalogue (BOROWIEC 1999).

HSIAO & WINDSOR (1999) analyzed 12S mtDNA sequences of 48 species belonging to 18 tribes. Their results indicate that true Cassidinae (= the Cassida group in BOROWIEC (1995)) forms a monophyletic assemblage with remaining hispine-like tribes being basal to it, however, relations of cassidoid tribes remained unanswered. They supported synonymy of Imatidiini with Cephaloleiini and suggested also synonymy of Oediopalpini with Spilophorini. Hsiao & Windsor also found that average sequence divergence among cassidoid tribes is about 15% while the divergence among hispoid tribes was 37% between Uroplatini and Cephaloleiini and the latter constituting the least derived clade.

Contrary to these studies, CHABOO (2007), listed all previously synonymized tribes as valid because the suggestions of previous authors were not confirmed in her study. However, the study suffers from inadequate taxon sampling, misidentification of taxa and character scoring, and should be taken with caution. For instance Chalepini-Uroplatini are unambiguously forming a monophyletic lineage in the analysis but because they include also *Cephalodonta* sp. (Sceloenoplini) it was considered as polyphyletic. Nevertheless the taxon clearly belongs to Chalepini according to the figure. Such errors are so common in abovementioned paper that I find contra productive to further discuss classification problems generated by it under respective tribes. Therefore, for purpose of this review tribes are accepted after BOROWIEC & ŚWIĘTOJAŃSKA (2015) and STAINES (2002) and further discussed.

Následující pasáž o rozsahu 48 stran (pp. 8–55) obsahuje utajované skutečnosti a je obsažena pouze v archivovaném originále diplomové práce uloženém na Přírodovědecké fakultě JU.

Following passage of 48 pages (pp. 8–55) contains unpublished information and is available only in the archived original of the PhD. thesis deposited at the Faculty of Science JU.

immature stages. Hence our understanding of the group is limited by collecting of fresh material what unfortunately becomes more complicated than ever. Fresh material is also desirable for comparative purposes as many groups of taxa are represented by only a limited material in museums, which do not allow evaluation of intraspecific variability.

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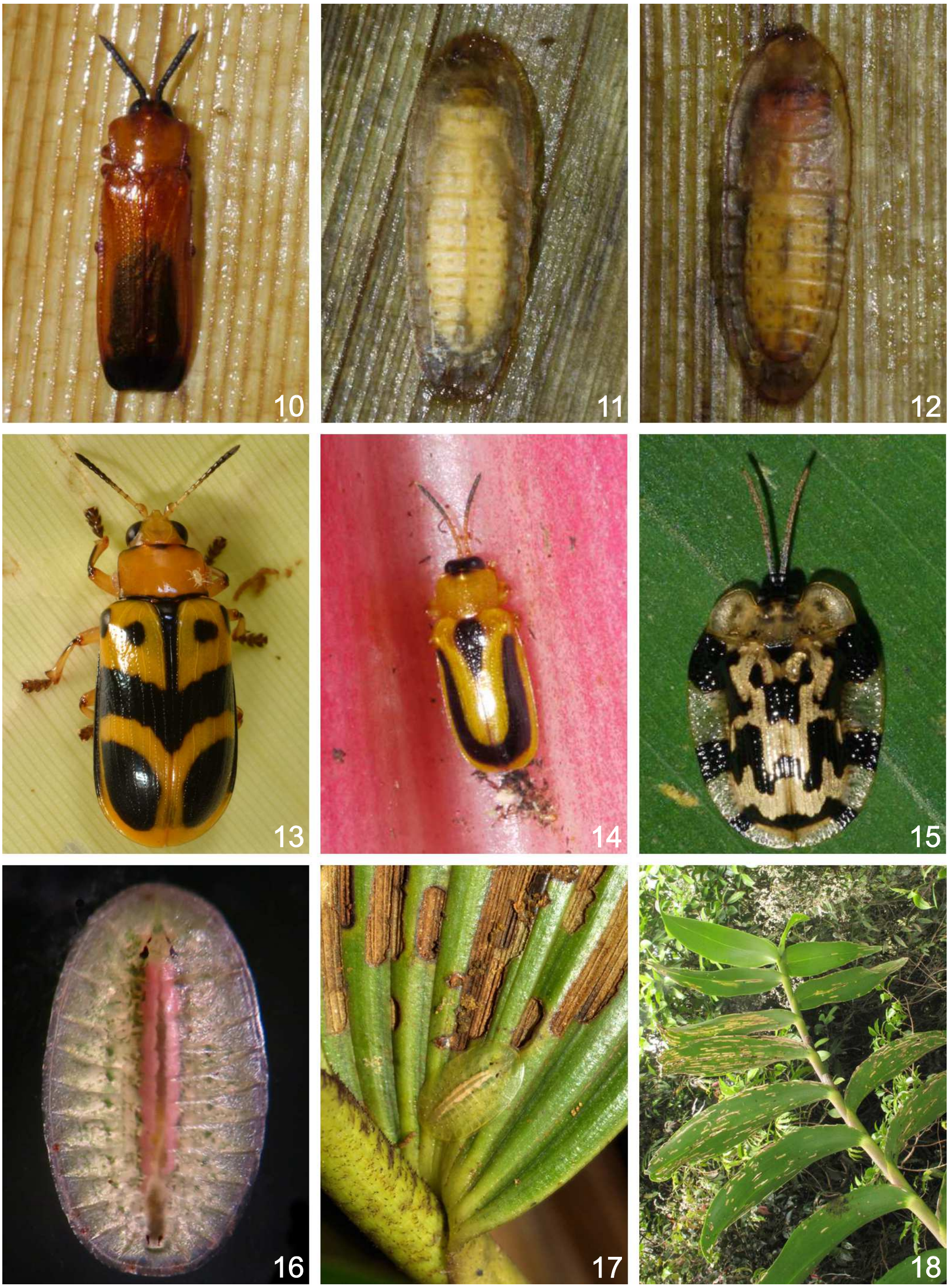
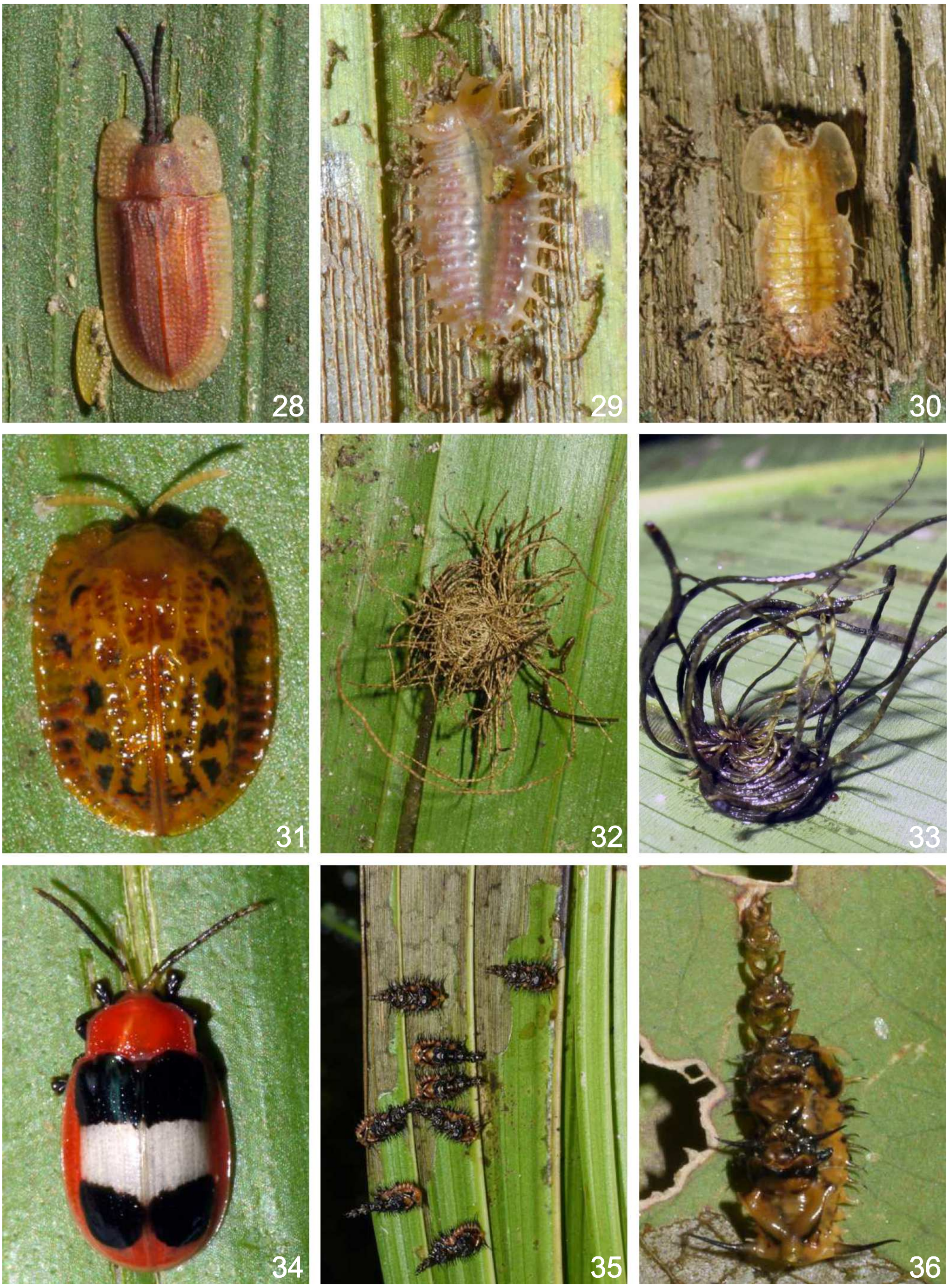
Figs 1–9. 1 – *Alurnus bicolor* Staines, 2013; 2 – *Coraliomela vicina* (Guérin-Méneville, 1840); 3 – *Mecistomela marginata* (Thunberg, 1821); 4 – *M. marginata*, mature larva; 5 – *C. vicina*, pupa; 6 – *C. vicina*, larval damage on *Astrocaryum aculeatum* G. Mey. (Arecaceae); 7 – *Platyauchenia* sp.; 8 – *Prosopodonta balyi* (Weise, 1905); 9 – *P. balyi* adult feeding damage on leaf of *Maxillaria* sp. (Orchideaceae).



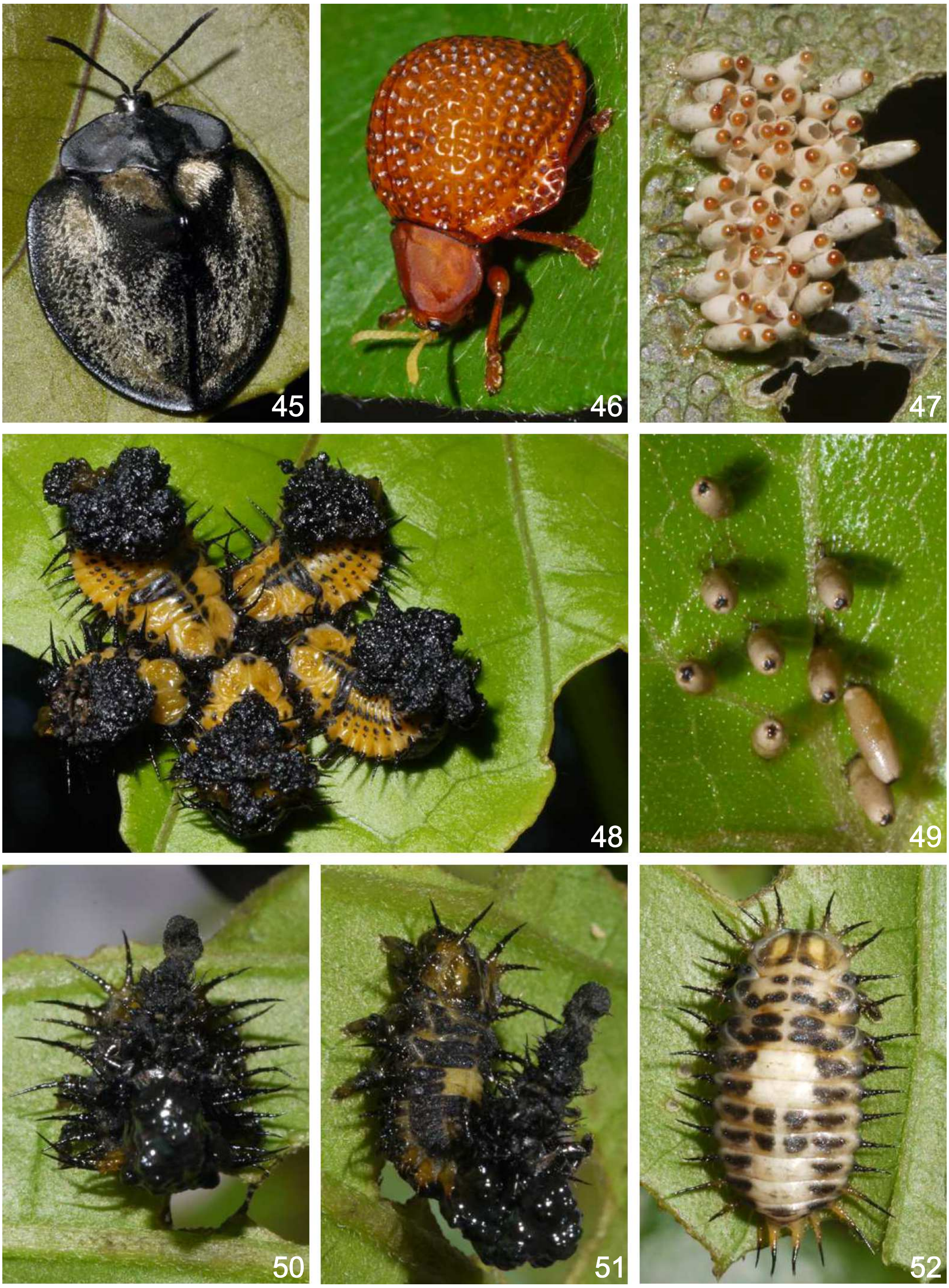
Figs 10–18. 10 –13 *Hybosispa* sp., 10 – adult, 11 – larva, 12 – pupa inside last larval skin; 13 – *Chelobais bicolor* Gray, 1832; 14 – *Cephaloleia picta* Baly, 1859; 15 – *Aslamidium* (s. str.) *bolivianum* Borowiec & Sassi, 2001; 16–17 – *Cephaloleia orchideivora* Sekerka, Windsor & Staines, 2013, larva; 18 – *C. orchideivora* feeding damage. Figs 16–18 are after SEKERKA et al. (2013). Fig. 13 by courtesy of D. Windsor.

Figs 19–27. 19 – *Pentispa* cf. *explanata* (Chapuis, 1877); 20 – *Clinocarispa* sp.; 21 – *Uroplata armata* Baly, 1886, multiple mines and adult feeding damage on leaf of unidentified Asteraceae; 22 – *Sceloenopla* sp.; 23 – *Sceloenopla godmani* Baly, 1885; 24 – *S godmani*, multiple mine; 25 – *Acentroptera* sp., larva removed from mine; 26 – *S. godmani* feeding damage on *Clusia* sp. (Clusiaceae); 27 – *Hispoleptis subfasciata* Pic, 1938. Fig. 27 by courtesy of D. Windsor.



Figs 28–36. 28 – *Delocrania cossyphoides* Guérin-Méneville, 1844; 29 – *D. panamensis* Champion, 1893, larva; 30 – *D. cossyphoides*, pupa and old feeding damage; 31–32 *Spaethiella* sp.; adult and larva (ex Arecaceae); 33 – *Spaethiella* sp. (ex Heliconiaceae); 34 – *Cladispa amboroensis* Sekerka & Windsor, 2014; *C. amboroensis*, group of 5th instar larvae and feeding damage; 36 – *Calyptocephala* sp., 5th instar larva. Figs 29, 33 by courtesy of D. Windsor.

Figs 37–44. 37 – *Omocerus* (s. str.) *masoni* (Spaeth, 1926); 38 – *Discomorpha* sp.; 39 – *Polychalca* (*Desmonota*) *salebrosa* (Boheman, 1855); 40–42; *Omocerus* (*Nebroma*) *humerosus* (Spaeth, 1913), 1st instar, 3rd instar and mature larva; 43 – *Discomorpha* sp. prepupa; 44 – *Eugenysa coscaroni* Viana, 1968.



Figs 45–52. 45 – *Stolas nudicollis* (Boheman, 1850); 46 – *Elytrogona bacca* Boheman, 1850; 47 – *S. lacordairei* (Boheman, 1850), egg-mass; 48 – *S. nudicollis*, group of mature larvae; 49 – *S. aenea* (Olivier, 1790), group of eggs; 50–52 *S. aenea*, mature larva in dorsal and lateral views, and prepupa.

Figs 53–59. 53–54 – *Omaspides* (s. str.) *trichroa* (Boheman, 1854), female guarding larvae and group of pupae; 55 – *Goniochenia* (*Baranosa*) *flavosparsa* (Boheman, 1856); 56 – *Herissa pantherina* (Blanchard, 1837); 57 – *Chlamydocassis* (s. str.) *perforata* (Boheman, 1850); 58 – *H. pantherina*, group of young larvae; 59 – *Ch. perforata*, mature larva hidden under faecal shield.

Figs 60–66. 60 – *Paranota spinosa* (Boheman, 1854); 61 – *Omoteina humeralis* (Olivier, 1808); 62–63 – *Dorynota* (*Akantaka*) *boliviana* Borowiec, 2005, mature larva covered with faecal shield and exposed; 64 – *Paratrikona* sp., larva; 65 – *Eremionycha bahiana* (Boheman, 1855); 66 – *D. boliviana*, adult feeding pattern on *Tabebuia* sp. (Bignoniaceae).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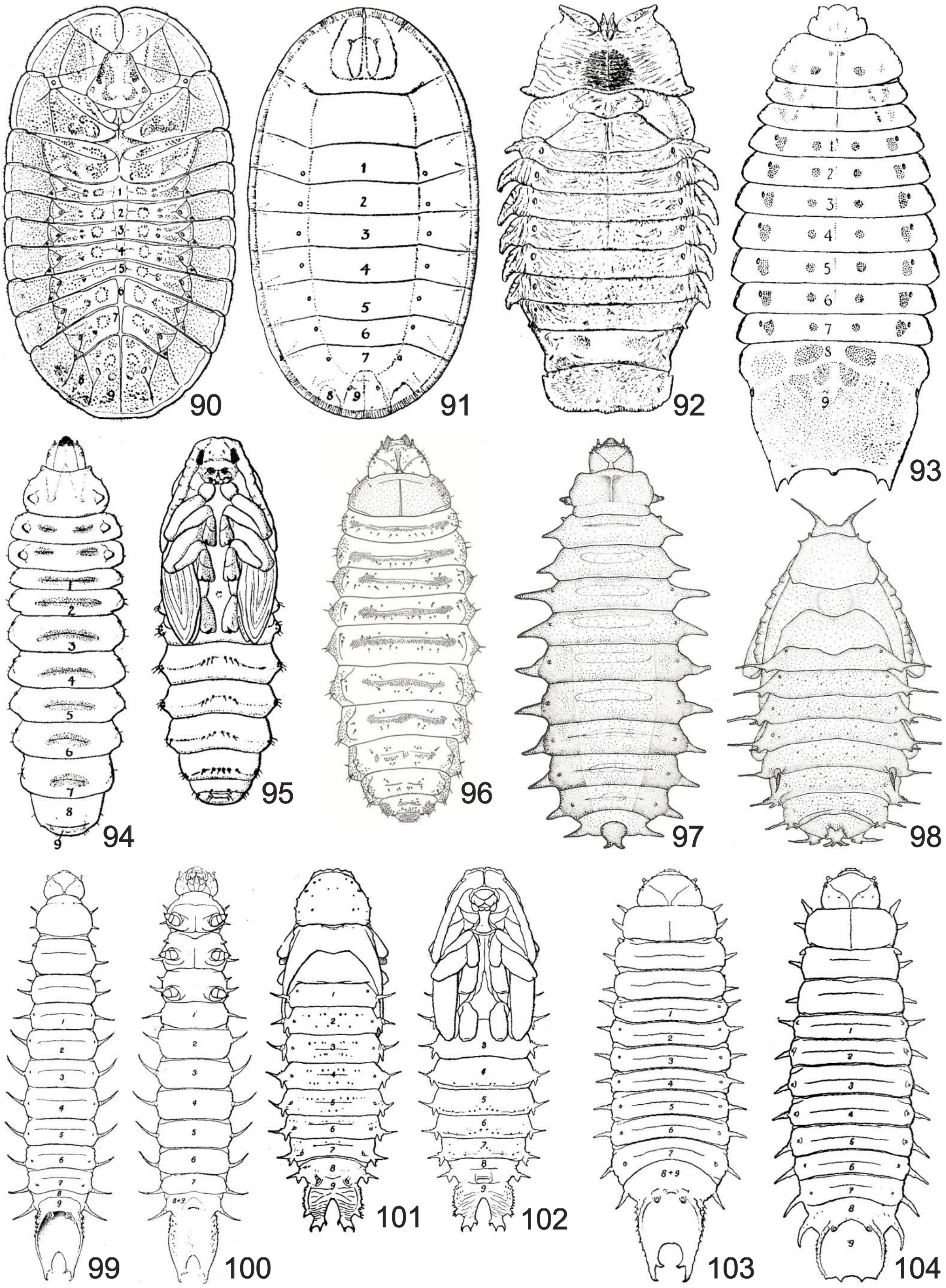
Figs 67–73. 67–69 – *Physonota helianthi* (Randall, 1838), freshly emerged, young fully sclerotized, and fully coloured adult; 70 – *Asteriza darlingtoni* Blake, 1939; 71 – *Orexita varians* (Guérin-Méneville, 1844), various colour morphs; 72 – *A. darlingtoni*, eggs; 73 – *P. alutacea* Boheman, 1854, group of larvae.

Figs 74–81. 74–76 – *Nuzonia* cf. *isthmica* (Champion, 1893), colour change from freshly emerged adult to fully sclerotized and metallic coloured specimen; 77–78 – *Coptocycla* (*Psalidonota*) *constellata* Boheman, 1855, adult and its host plant *Cordia alliodora* (Ruiz & Pav.) Oken (Boraginaceae); 79–80 – *Charidotis miniatula* Boheman, 1862, mature larva and its faecal shield; 81 – fresh (green) and old (brownish) feeding damage of *Charidotis chacoana* Spaeth, 1936.

Figs 82–89 Life history of *Rhoia* sp. 82 – egg-mass; 83 – group of 3rd instar larvae on fresh leaf of its host plant; 84 – freshly moulted 2nd instar larva; 85 – 5th instar larva; 86 – prepupa; 87 – pupa; 88 – adult male feeding as larva on older greenish leaves; 89 – adult female feeding as larva on young red leaves.



Figs 90–104. 90 – *Chelobasis perplexa* Baly, 1859, larva, dorsal aspect; 91 – *Cephaloleia mauliki* Uhmann, 1930, larva, dorsal aspect; 92–93 – *Platyauchenia latreillei* (Laporte de Castelnau, 1840), pupa and larva; 94–95 – *Craspedonispa saccharina* Maulik, 1930, larva and pupa, both in ventral aspect; 96 – *Physocoryna scabra* (Guérin-Méneville, 1844), larva, dorsal aspect; 97–98 – *Sceloenopla bidens* (Fabricius, 1792), larva and pupa, both in dorsal aspect; 99–102 – *Prosopodonta cordillera* Maulik 1931, larva and pupa in dorsal and ventral aspects; 103 – *P. quinquelineata* Weise, 1910, larva, dorsal aspect; 104 – *P. corallina* Weise, 1910, larva, dorsal aspect. Figs 90–91, 94–95 after Maulik (1932); 92–93, after Maulik (1933); 96 – after Casari & Texeira (2004); 97–98 after Costa et al. (1988); 99–104 after Maulik (1931).

Chapter I

FLINTE V., WINDSOR D., **SEKERKA L.**, VALVERDE DE MACEDO M. & MONTEIRO R. F. (2010) Plagiometriona emarcida (Boheman, 1855) and Plagiometriona forcipata (Boheman, 1855) (Coleoptera: Chrysomelidae: Cassidinae), a single species differing in larval performance and adult phenotype. *Journal of Natural History*, **44**: 891–904.

Abstract. Matings frequently observed between the tortoise beetles *Plagiometriona forcipata* (Boheman, 1855) and *Plagiometriona emarcida* (Boheman, 1855), in the State of Rio de Janeiro, Brazil, led us to compare the ecology, life history and genetics of these two morphologically distinct species. Host plant censuses revealed *P. emarcida* was about five times more abundant, while populations of both species responded in parallel to climate. Laboratory-reared immature *P. forcipata* took 2 days longer to complete development and showed higher mortality rates. No differences were detected in ovipositional behaviour, genitalia morphology or in sex ratio of offspring. The adult offspring of field-caught females of both species contained individuals with both species' elytral patterns. Finally, nearly identical cytochrome oxidase I sequences obtained from individuals of each species suggest that they are a single polymorphic species. Based on these observations and the examination of type material we propose the new synonymy: *Plagiometriona forcipata* = *P. emarcida*, syn. nov.

L. Sekerka participation: 20%

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Chapter II

SEKERKA L. & WINDSOR D. (2012) Two new species of *Plagiometriona* from Bolivia and Ecuador (Coleoptera: Chrysomelidae: Cassidinae: Cassidini). *Annales Zoologici*, **62**: 669–677.

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ANNALES ZOOLOGICI (Warszawa), 2012, 62(4): 669-677

TWO NEW SPECIES OF *PLAGIOMETRIONA* FROM BOLIVIA AND ECUADOR (COLEOPTERA: CHRYSOMELIDAE: CASSIDINAE: CASSIDINI)

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Abstract.— *Plagiometriona centromaculata* **sp. nov.** from Bolivia: Santa Cruz department and *P. hyalina* **sp. nov.** from Ecuador: Morona-Santiago and Sucumbíos provinces are described and figured. Both species are associated with *Solanum* species (Solanaceae).

⁂

Key words.— Entomology, taxonomy, new species, Coleoptera, Chrysomelidae, Cassidinae, Cassidini, *Plagiometriona*, Bolivia, Ecuador

INTRODUCTION

Plagiometriona Spaeth, 1899 is a large genus containing 84 species distributed from Mexico to northern Argentina with a single species in Cuba (Borowiec and Świętojańska 2012, Sekerka and Windsor unpublished data). Species are mostly found from mid to high elevations (500–4000 m) with the greatest number of species occurring in the Andes. Those species for which we know their biology are associated with one plant family, the Solanaceae (summarized in Borowiec and Świętojańska 2012). Host plants are presently known based on direct feeding observations only for 16 of 84 species and were mostly recorded recently (Windsor *et al.* 1992, Flinte *et al.* 2008, 2010). Additionally we have data for another 10 species which are also exclusively associated with Solanaceae (Windsor and Sekerka, unpublished data). There are a few published records of association with Convolvulaceae (Silva *et al.* 1968) and Boraginaceae (Zayas 1989), however, these records are based on single observations and most likely represent casual visits rather than feeding. The genus was never revised and its taxonomy is partly complicated as some species groups exhibit great variability in pattern (i.e. Flinte *et al.* 2010). However, Spaeth (1937) proposed a key to the species groups dividing the genus into two subgenera, *Parametriona* Spaeth, 1937 and *Plagiometriona,* on the basis of the shapes of the humeral angles and the pronotum. Later Borowiec (1999) synonymized the two subgenera. The shape and the degree to which the humeral angles protrude anteriorally along the pronotum is a sexually dimorphic character present in males of *Plagiometriona* s.str. (sensu Spaeth 1937) while females frequently have diverging humeral angles. Nevertheless, Spaeth's key is still valid as most characters are sexually constant and not difficult to observe. During field work in Bolivia and Ecuador we found two species representing new taxa. Both belong to the former subgenus, *Plagiometriona* s.str. (sensu Spaeth 1937) having humeral angles in males strongly protruding anterad along the sides of the pronotum and representing members of two groups of Spaeth's system with rather constant elytral pattern. Their descriptions are given below.

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MATERIAL AND METHODS

Figures 4–7 and 14 were taken using Leica S8Apo stereomicroscope with Nikon Coolpix 4500. Remaining macro photos (1–3 and 12–13) were taken by a Canon EOS 1Ds Mark III with Canon EF 100mm f/2.8L IS USM lens. All these figures were composed using Helicon software from stacks of 10–20 separate images.

Measurements were taken from photographs using UTHSCSA Image Tool 3.0; only specimens studied by the senior author in situ had been measured, however, these include the smallest and largest individuals in both cases.

All data from collection labels are verbatim; a double vertical bar '||' divides data on different labels and a single vertical bar '|' separates data in different rows. Additional comments and details of label are given in square brackets.

Descriptions are based on comparison with types of similar species and photos of most of them are available at Borowiec and Świętojańska (2012).

Plagiometriona centromaculata sp. nov.

Etymology. The name is derived from Latin 'centrum' = center and 'macula' = spot after elytral pattern with central black spot on elytral disc.

Diagnosis. The new species belongs to the *amplexa* group (= group 1 of *Plagiometriona* s.str. in Spaeth's (1937) system) characterized by humeral angles strongly protruding anterad in right angle along pronotum, inner margin of epipleuron not reaching to apex of elytra, the third antennomere two times longer than the second and distinctly longer than first, clypeus slightly longer than wide with mid furrow, and elytra regularly convex without postscutellar tubercle. The group includes nine species, however, only *Plagiometriona phoebe* (Boheman, 1855) has similar pattern – black elytral disc with yellow ring and black central spot. *Plagiometriona phoebe* is widely distributed through northern South America, mainly in Amazon basin and occasionally reaching Andean foothills in southeast Colombia and Ecuador while *P. centromaculata* is restricted to south Bolivian Andean foothills. *Plagiometriona phoebe* differs in having much bigger central spot on elytra which is elongate and extends basally almost to scutellum and laterally to third row of punctures thus the width of the yellow ring equals one elytral interval while *P. centromaculata* has a central circular spot small, extending laterally only to the second row of punctures thus the width of its yellow ring equals two puncture rows. *Plagiometriona phoebe* also differs in pronotum much broader, especially in males (width/length ratio above 2.1) with anterior margin weakly convex, not protruding anterad like in *P. centromaculata*. *Plagiometriona centromaculata* is also smaller, slimmer and with narrower explanate margin of elytra of 0.8 width of the disc (as wide as or slightly wider than the disc in *P. phoebe*), particularly obvious in males.

Description. Measurements (n = 5): length of body: 6.79–7.91 mm (mean: 7.18 mm), width of body: 6.10–6.79 mm (mean: 6.30 mm), length of pronotum: 2.30–2.57 mm (mean: 2.38 mm), width of pronotum: 4.32–4.71 mm (mean: 4.44 mm), length/width of body ratio: 1.11–1.16 (mean: 1.14), width/length of pronotum ratio: 1.83–1.89 (mean 1.86). Body almost circular, sexual dimorphism distinct. Males circular with stout, strongly protruding and rounded humeral angles and shallow emargination on pronotum near apex of humeral angles (Fig. 1). Females slightly elongate with obtusely angulate and moderately protruding humeral angles and without emargination on pronotum (Fig. 3).

Pronotum yellow with large basal spot covering almost whole disc. Scutellum black. Elytra yellow with black outer ring and central spot. Black ring extends from 4th to 9th rows of punctures laterally, to 8th row of punctures apically and basally to basal margin, around scutellum is deeply emarginated thus scutellum is not a part of it. Ultimate interval yellow. Central spot small, circular with semi-diameter the width of two sutural intervals. Underside uniformly yellow including legs and antennae, only apical antennomere black with yellowish tip. Living specimens pale yellow with black ring and spot and almost transparent explanate margins (Fig. 11).

Pronotum slightly rectangular, with humeral and basal corners broadly rounded, maximum width in anterior corners, and anterior margin regularly inflexed and moderately projecting foreward. Disc of pronotum moderately convex, smooth, shiny, impunctate and with shallow but distinct basal impression. Explanate margin broad, subhorizontal, more or less distinctly separated from disc by impressed line, and with honeycomb structure. Anterior margin moderately bent upwards and canaliculate. Whole surface of pronotum impunctate, polished, smooth, shiny and micro-reticulate.

Scutellum triangular, smooth, shiny, and micro-reticulate.

Base of elytra much wider than base of pronotum. Basal margin moderately sinuate and obtusely serrate. Humeral angles broadly rounded and strongly protruding anterad in right angle along pronotal sides and reaching almost to anterior corners of pronotum. Disc regularly convex without impression. Humeral calli normal, not protruding. Punctation regular, moderately dense, and moderately coarse. Punctures mostly regular in size, partly irregularly distributed in rows with interspaces varying from much narrower than puncture diameter to as wide as puncture diameter.

Figures 1–6. *Plagiometriona centromaculata* sp. nov.: (1) male dorsal; (2) male lateral; (3) female dorsal; (4) aedeagus dorsal and lateral; *P. phoebe* (Bhn.): (5) aedeagus dorsal and lateral; *P. hyalina* sp. nov.: (6) aedeagus dorsal and lateral.

Punctures gradually coarser laterally. Intervals narrow, 0.5–4.0 times wider than puncture diameter and gradually narrowing laterally. Scutellar row distinct, long, stretching from base of scutellum to the top of elytra. Submarginal row distinct in whole length, its punctures approximately twice coarser than those in remaining rows. Marginal row distinct in whole length, without distinct vacancy, its punctures as coarse as punctures on the disc and less coarse than punctures in submarginal row (Fig. 2). Explanate margin broad, subhorizontal, and with honeycomb structure. Whole surface of elytra smooth and shiny, disc polished, explanate margin micro-reticulate. Apex of elytral epipleura bare.

Eyes large, occupy almost whole sides of head, gena very short. Clypeal lines very fine, visible only as basal rudiments. Clypeus 1.2 times longer than wide, slightly convex, smooth, impunctate, and micro-reticulate with shallow medial furrow. Labrum transverse, broad, and moderately emarginate to $^1/_5$ length, not carinate. Antennae long, filiform, with six basal glabrous and five terminal dull segments. Length ratio of antennomeres: 100:57:66:66:69:62:76:79:81:80:133. Third antennomere 1.2 times longer than second and subequal in length to fourth. Ninth and tenth antennomeres subequal in length (Fig. 7).

Prosternal collar normal, slightly impressed on sides. Prosternal process moderately broad, moderately constricted around midlength, and strongly expanding apically. Intercoxal part with deep elongate sulcus, apex rhomboidal and slightly convex. Whole prosternal structure sparsely pubescent and micro-reticulate (Fig. 7).

Legs normal, not modified. Claws divergent, all appendiculate with moderate tooth and micro-pectinate.

Male genitalia. Aedeagus slim, broadly truncate on apex then gradually widening to its third length and then slowly narrowing towards base. Apex in lateral profile slightly bent dorsally, tubus regularly curved (Fig. 4). In comparison with *P. phoebe* the aedeagus is slightly stouter, apex twice broader and distinctly bent dorsally (Fig. 5).

Host plant. Solanaceae: *Solanum* sp. (Figs 8, 9).

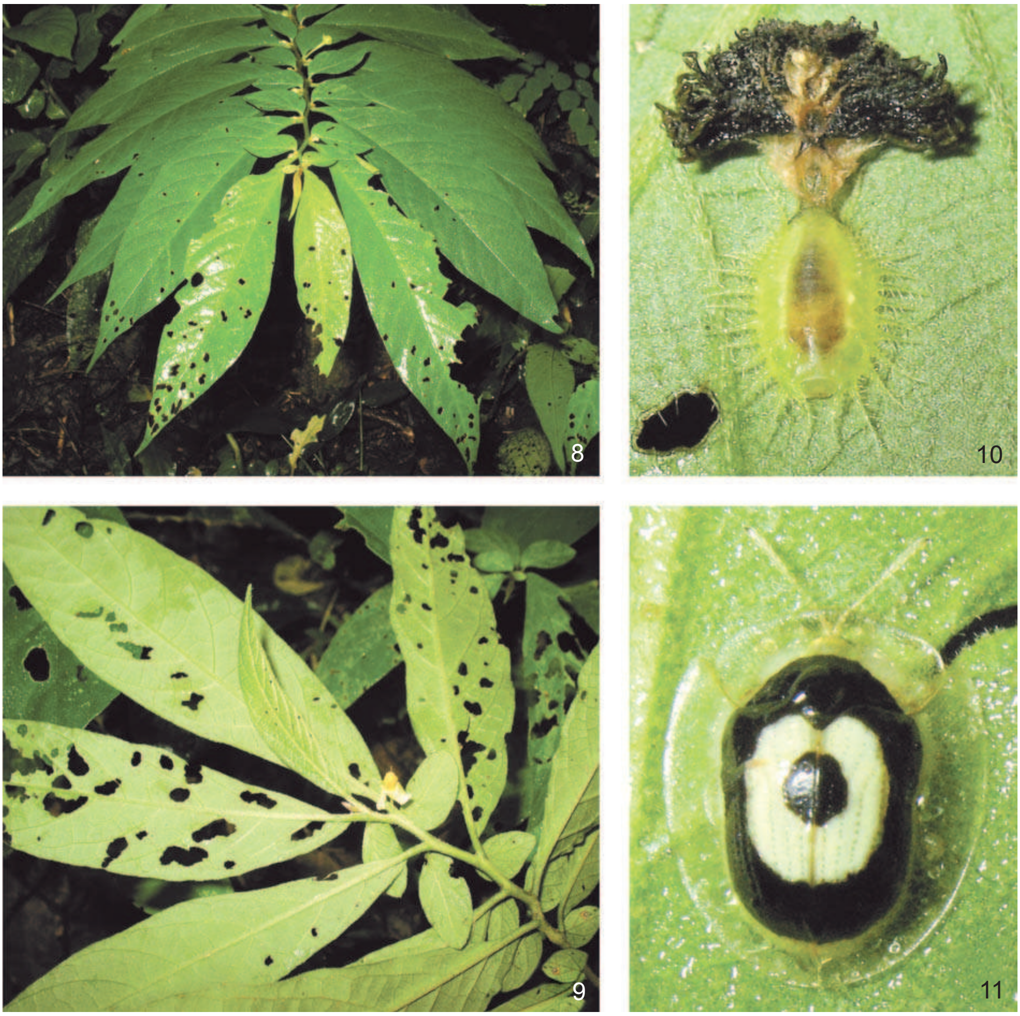
Distribution. Bolivia, Santa Cruz department, Ichilo province.

Material examined. Holotype, male, glued: 'BOLIVIA Santa Cruz dpt. | Florida prov. 9.–13.xii.2008 | Refugio los Volcanes | 18°06'S, 63°36'W, 1045 m | D. Windsor, S. Lingafelter & T. Henry lgt. [green, printed, cardboard label]' (deposited at the Natural History Museum, London, United Kingdom); 4 paratypes, glued and 2 in ethanol: same data as in holotype (preserved at the Department of Zoology, Faculty of Science, University of South Bohemia, Czech Republic and working collection of D. Windsor, Panamá City, República de Panamá); 2 paratypes, male and female, pinned: 'BOLIVIA: Prov. Florida | Dept. de Santa Cruz | Refugio los Volcanes | nr. Bermejo, 3,431 ft. [white, printed and cardboard label] | | S-18.10540°/W-63.59807° | Dec. 4/8, 2009 – A. J. Gilbert, | N. J. Smith & J. Aramayo | Bejarano [white, printed and cardboard label]'

Figure 7. *Plagiometriona centromaculata* sp. nov.: (7): head, antennae, prosternum, and fore legs.

(preserved at the Department of Zoology, Faculty of Science, University of South Bohemia, Czech Republic and in the collection of A. J. Gilbert, Sacramento, California, USA); three paratypes, male and two females, glued: 'BOLIVIA Santa Cruz dpt. | Florida prov. 10.–14.xii.2011 | Refugio los Volcanes | 18°06'S, 63°36'W, 1045 m | SOL: *Solanum* sp. | L. Sekerka lgt. [green, printed and cardboard label]' (preserved at the Department of Zoology, Faculty of Science, University of South Bohemia, Czech Republic and Museo de Historia Natural Noel Kempff Mercado, Santa Cruz de la Sierra, Bolivia). Three larvae (one 5th and the others 3rd instar) collected and conserved in pure ethanol on the same occasion as the holotype are deposited in working collection of D. Windsor, Panamá City, República de Panamá.

Biological notes. Present data indicate the species may be restricted to the foothills of the eastern Bolivian Cordillera at the so-called 'Elbow of the Andes' where the direction of the Cordillera abruptly changes. This area largely coincides with the Amboró National park, one of the most diverse parks in the World, and the



Figures 8–11. *Plagiometriona centromaculata* sp. nov.: (8, 9) host plant *Solanum* sp. (Solanaceae); (10) third instar larva; (11) living specimen on its host plant.

type locality of *P. centromaculata* is near its SE limit. The vegetation of Los Volcanes is lower Yungas forest that can be characterized as humid premontane cloud forest with steep slopes and cliffs, alluvial valleys and deep gorges. Yungas is generally the typical and most diverse habitat in Amboró NP. Specimens of *P. centromaculata* were found on young understorey *Solanum* plants growing along the edges of a small stream situated in deep ravine. Adults in repose under leaves of the host plant (Fig. 11) have nearly the same appearance as preserved specimens with marginal areas of pronotum and elytra highly transparent. Third instar larva has a semicircular, somewhat granular exuvial-fecal shield (Fig. 10) and was feeding on the same plant as adults. Pupa and egg are unknown.

Plagiometriona hyalina sp. nov.

Etymology. The name is derived from Latin 'hyalos'= glass after transparent explanate margin of elytra.

Diagnosis. The new species belongs to the *clarki* group (=group 4 of *Plagiometriona* s.str. in Spaeth's (1937) system) characterized by humeral angles strongly protruding anterad in right angle along pronotum, inner margin of epipleuron not reaching to apex of elytra, the third antennomere as long as or slightly longer than the second, and elytra with postscutellar tubercle. The group comprises four species: *P. clarki* (Boheman, 1862) from Bolivia, Ecuador, and Peru, *P. eggi* Spaeth, 1899 from Peru, *P. rubridorsis* Spaeth, 1912 from Ecuador, and *P. vespertilio* (Spaeth, 1902) from Peru. *Plagiometriona hyalina* differs in uniformly yellow dorsum while all above mentioned have black or brow pattern, spots, or disc uniformly black. Moreover, it has coarse and dense punctation of elytra with punctures nearly touching each other while remaining species of the *clarki* group has punctation of elytra fine and sparse with interspaces many times wider than the puncture diameter. *Plagiometriona hyalina* also has humeral angles broadly and regularly rounded while other species have slightly constricted lateral margin just behind apex thus looks slightly expanded and obtusely acuminate.

Description. Measurements (n = 3): length of body: 7.05–7.52 mm (mean: 7.33 mm), width of body: 6.92–7.31 mm (mean: 7.10 mm), length of pronotum: 2.19–2.26 mm (mean: 2.22 mm), width of pronotum: 4.14–4.28 mm (mean: 4.21 mm), length/width of body ratio: 1.02–1.05 (mean: 1.03), width/length of pronotum ratio: 1.89. Body stout, almost circular (Fig. 12). Discs of pronotum, elytra, and scutellum pale yellow. Explanate margins hyaline, semitransparent. Explanate margin of elytra with shortened and dark yellow humeral spot reaching to $^2/_3$ of width. Clypeus yellow, antennae yellow except blackish tip of last segment. Thorax black, abdomen yellow. Coxae infuscate black, remaining parts of legs yellow. Pronotum rectangular, with humeral and basal corners broadly rounded, maximum width in anterior corners, and anterior margin regularly inflexed and moderately projecting foreward.

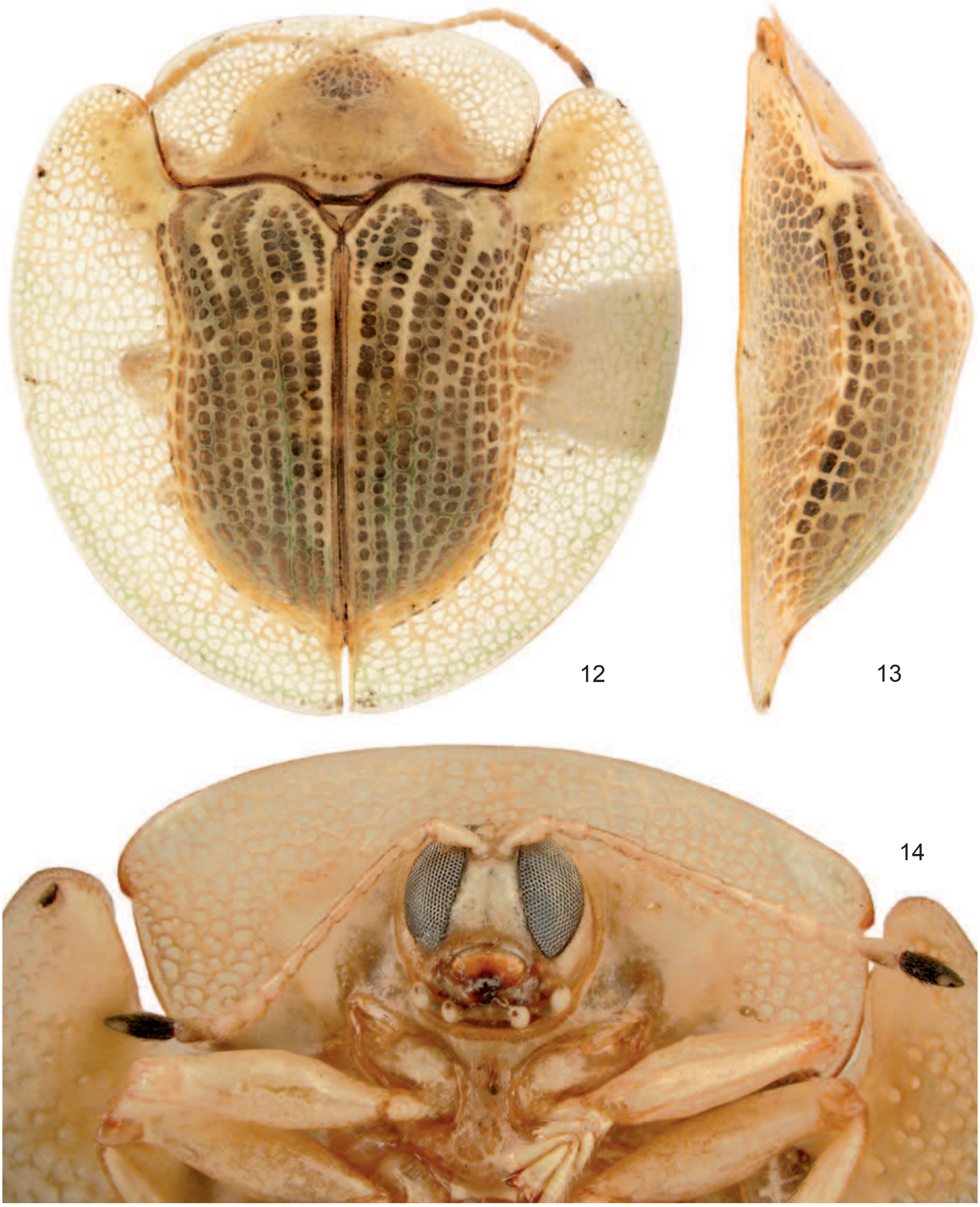
Disc of pronotum moderately convex, without any impression and impunctate, only base with moderate line of several punctures. Explanate margin broad, subhorizontal, more or less distinctly separated from disc by impressed line, and with honeycomb structure. Whole surface of pronotum impunctate, polished, smooth and shiny.

Scutellum triangular, smooth, shiny, and indistinctly micro-reticulate.

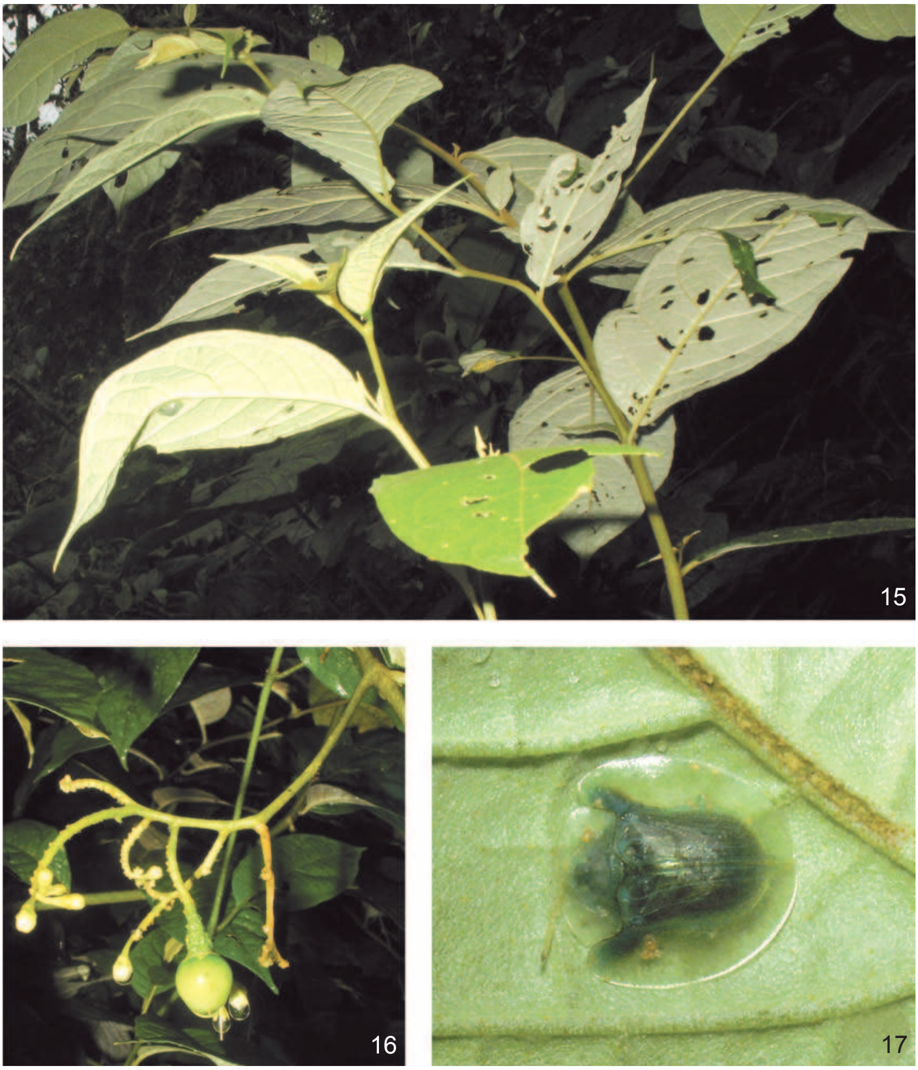
Base of elytra much wider than base of pronotum. Basal margin moderately sinuate and obtusely serrate. Humeral angles broadly rounded and strongly protruding anterad in right angle along pronotal sides and reaching almost to anterior corners of pronotum. Disc convex, with moderate postscutellar hump, and moderately deep scutellar impressions. Humeral calli normal, not protruding. Punctation regular, dense, and moderately coarse. Punctures mostly regular in size, regularly and densely distributed in rows with interspaces much narrower than puncture diameter. Punctures gradually coarser laterally. Intervals narrow, 0.5–1.0 times wider than puncture diameter and gradually widening apicolaterally. Scutellar row distinct, long stretching from base of scutellum to postscutellar hump. Submarginal row distinct in whole length, its punctures twice coarser than those in remaining rows. Marginal row distinct in whole length, without distinct vacancy, its punctures as coarse as punctures on the disc and less coarse than punctures in submarginal row. Ultimate interval narrow but still distinctly wider than others (Fig. 13). Explanate margin broad, subhorizontal, and with honeycomb structure. Whole surface of elytra smooth, shiny and polished. Apex of elytral epipleura bare.

Eyes large, occupy almost whole sides of head, gena very short. Clypeal lines fine, visible only as basal rudiments. Clypeus 1.2 times longer than wide, slightly convex, smooth, impunctate, and micro-reticulate. Labrum transverse, broad, and moderately emarginate to $^1/_5$ length, not carinate. Antennae long, filiform, with six basal glabrous and five terminal dull segments. Length ratio of antennomeres: 100:60:57:67:66:62:69:75:73:79:119. Second antennomere 1.06 and fourth 1.17 times longer than third. Fourth and fifth antennomeres subequal in length (Fig. 14).

Prosternal collar normal, moderately impressed on sides. Prosternal process moderately broad, moderately constricted around midlength, and strongly expanding apically. Intercoxal part with deep elongate sulcus, apex rhomboidal and slightly convex. Whole prosternal



Figures 12–14. *Plagiometriona hyalina* sp. nov.: (12) male dorsal; (13) male lateral; (14): head, antennae, prosternum, and fore legs.



Figures 15–17. *Plagiometriona hyalina* sp. nov.: (15, 16) host plant *Solanum* (*Cyphomandra*) sp. (Solanaceae); (17) – living specimen on its host plant.

structure sparsely pubescent and partly striate (Fig. 14).

Legs normal, not modified. Claws divergent, all appendiculate with moderate basal tooth.

Male genitalia. Aedeagus slim, apex shallowly emarginate, gradually widening from apex to fifth of its length and then slowly narrowing towards base. Apex in lateral profile sinuate, tubus in apical third straight and then regularly curved towards base. Dorso-apical part in lateral view with hump (Fig. 6).

Host plant. Solanaceae: *Solanum* (*Cyphomandra*) sp. (Figs 15, 16).

Distribution. Ecuador: Morona-Santiago and Sucumbíos provinces.

Material examined. Holotype, male, glued: 'ECUADOR_Orellana[1] | San Rafael Cascadas, 1200 m |

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[1] The province is Sucumbíos not Orellana as the locality is situated on left bank of Río Quijos, a border between Sucumbíos and Orellana provinces.

0°6’15.41”S; 77°35’13.5”W, | 13–18 II 2008, D Windsor [white, printed and cardboard label] | | 7205 [white, printed and soft label]’ (preserved at the Department of Zoology, Faculty of Science, University of South Bohemia, Czech Republic); paratype, male, glued: ‘ECUADOR_Orellana | San Rafael Cascadas, 1300 m | 0°6’15.41”S; 77°35’13.5”W, | 20–25 VII 2008, D Windsor [white, printed and cardboard label] | | 7488 [white, printed and soft label]’ (in working collection of D. Windsor, Panamá City, República de Panamá); paratype, male, pinned: ‘ECUADOR: Morona-Santiago, |Macas [printed] 1,300 m. 19.ix. [handwritten] 19[printed]89[handwritten] | M. Cooper [white, printed and cardboard label] | | M. Cooper | BMNH{E} | 2004-275 [white, printed and cardboard label]’ (preserved at the Natural History Museum, London); paratype, male, pinned: ‘Ecuador, Morona- | Santiago, Cord de | Cutucu 6K.e.of Macas | 1,100 m | 2.iv. [handwritten]198 [printed]1[handwritten] | M. Cooper [white, printed and cardboard label] | | M. Cooper | BMNH{E} | 2004-275 [white, printed and cardboard label]’ (preserved at the Department of Zoology, Faculty of Science, University of South Bohemia, Czech Republic).

Biological notes. *Plagiometriona hyalina* is found in foothills of several lower Cordillera east of the main Cordillera Oriental range. The locality, San Rafael, is situated in the valley of the Río Qujios where the habitat can be characterized as lower montane cloud forest. The other locality, Cordillera del Cutucú, has the same habitat type and together with Volcán Reventador, Volcán Sumaco and Cordillera del Condor these ranges forms the eastern limit of the Ecuadorian Andes and to the east of them a descent into the Amazon basin. Living specimens have a smooth greenish-grey dorsal appearance in repose under leaves of the host plant (Fig. 17). Immature stages of this species were not observed.

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Chapter III

SEKERKA L., WINDSOR D. & STAINES C. L. (2013) A new species of Cephaloleia Chevrolat from Panamá with description of larva and first record of orchid-feeding in Cephaloleiini (Coleoptera: Chrysomelidae: Cassidinae). *Acta Entomologica Musei Nationalis Pragae*, **53**: 303–314.

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A new species of *Cephaloleia* from Panama with description of larva and first record of orchid-feeding in Cephaloleiini (Coleoptera: Chrysomelidae: Cassidinae)

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Abstract. *Cephaloleia orchideivora* sp. nov. is described and figured from Panama including larva, host plants and biology. This is the first *Cephaloleia* species known to be associated with Orchideaceae.

Keywords. Coleoptera, Chrysomelidae, entomology, taxonomy, new species, host plant, Orchideaceae, Panama, Neotropical Region

Introduction

The genus *Cephaloleia* Chevrolat, 1837 is one of the most speciose genera in Cassidinae having 201 described species (Staines 2011). *Cephaloleia* is a purely Neotropical genus distributed from Mexico to subtropical Argentina. Most species are associated with Zingiberales (mainly the families Heliconiaceae and Maranthaceae). Other plant families utilized include Arecaceae, Bromeliaceae, Costaceae, Poaceae and Zingiberaceae. The associations between *Cephaloleia* beetles and their host plants have been reviewed in several recent papers: Staines (2004), McKenna & Farrell (2005), Meskens et al. (2008, 2011), García-Robledo et al. (2010, 2013, in print). Countries with highest species richness include Brazil (72 species), Costa Rica (61 species), Panama (57 species) (Staines 2011), the latter two representing diversity hot spots for neotropical Zingibrerales (McKenna & Farrell 2006). Mesoamerican *Cephaloleia* species were revised by Staines (1996) and larvae of five species were described by MAULIK (1932)[1] and GARCÍA-ROBLEDO et al. (2010). During our studies of Panamanian Cassidinae we discovered a new *Cephaloleia* species which is a feeding associate of at least four species of Orchideaceae and thus represents a novel and undescribed feeding association for the genus as well as the entire subfamily. The description of the adult and larva, and aspects of the biology and ecology are given below.

Material and methods

Adults and larvae were collected from sampled plants and were studied using methods of standard comparative morphology. All given label data are in their original spelling; a vertical bar (|) separates data on different rows, a double vertical bar (||) separates different labels. Additional information about the label or explanatory notes are given in the square brackets.

Photos of adult specimens (Figs 1–3) were taken using Leica S8Apo steromicroscope with Leica 10447367 0.63× photo tube with Nikon Coolpix 4500 and Nikon MDC Lens as 15–20 separate images and then composed in Helicon Focus software. Figures 8–11 were taken using Wild MP5 stereomicroscope; 12–13 with Nikon Eclipse E600 compound microscope and with Nikon DS-Ri1; 14–16 and 19 with Zeiss EVO 40 Scanning Electron microscope; 17–18 with Olympus Fluoview FV 1000 confocal microscope.

Larvae used for description were cleared in KOH and slide mounted. Measurements were taken with an ocular micrometer mounted in a 10× Wild Stereoscope eyepiece and cross calibrated with either a Hope 6in steel precision scale (0.5 mm) or a Swift Objective micrometer (0.01 mm).

Studied specimens are deposited in the following collections:

BMNH	Museum of Natural History, London, United Kingdom;
DBET	Department of Biodiversity and Evolutionary Taxonomy, University of Wrocław, Poland;
DWCP	Donald Windsor voucher collection, Ciudad de Panamá, República de Panamá;
LSCL	Lukáš Sekerka collection, Liberec, Czech Republic;
NMPC	National Museum, Prague, Czech Republic;
STRI	Smithsonian Tropical Research Institute, Ciudad de Panamá, República de Panamá;
UPPC	University of Panama, Ciudad de Panamá, República de Panamá;
USNM	National Museum of Natural History, Smithsonian Institution, Washington, D.C., USA.

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[1] MAULIK (1932) described larvae of two species, *C. belti* Baly, 1885 and *C. mauliki* Uhmann, 1930, however the larva of the former belongs to a *Chelobasis* species as it has explanate margin above head divided into two flaps (GARCÍA-ROBLEDO et al. 2010). This character is typical for the tribe Arescini and we know of no Cephaloleiini larvae with such a division. For a proper description of *C. belti* larva see GARCÍA-ROBLEDO et al. (2010). The figure and description given by MAULIK (1932) thus belongs either to *Chelobasis perplexa* (Baly, 1858) or *Ch. bicolor* Gray, 1832. MAULIK (1933) described another onisciform larva from Costa Rica and attributed it just to *Cephaloleia*. According to the description it is definitely a Cephaloleiini larva but it would be difficult to place it even to genus as no biological information was given and larvae of relatively few Cephaloleiini species are well described.

Results

Cephaloleia orchideivora sp. nov.

Type material. Holotype, ♂, glued: ‘PANAMA: Chiriqui | LaFortuna; 1200m | 8°45’N; 82°15’W | 12 - V [handwritten] -199[printed]7[handwritten] | D.M. Windsor [white, printed and cardboard label]’ (USNM). Paratypes: **PANAMA: Chiriquí:** 2 paratypes, glued: with same label as holotype, one with following additional label ‘ex. Elleanthus | Orchidac. [white, handwritten and cardboard label]’ (DWCP); paratype, glued: ‘PANAMA: Chiriqui | LaFortuna; 1200m | 8°45’N; 82°15’W | 20 - I [handwritten] -199[printed]7[handwritten] | D.M. Windsor [white, printed and cardboard label]’ (DWCP); paratype, glued: ‘PANAMA: Chiriqui | La Fortuna, 9-1100m | Rio Hornito Trail | 8°45’N, 82°14’W | 15 - II [handwritten] -199[printed]8[handwritten] | D.M. Windsor [white, printed and cardboard label] || Orchid [white, handwritten and soft label]’ (DWCP); 2 paratypes, glued: ‘PANAMA, Chiriqui | Fortuna, Rio Hornito | Tr, N 8 47’, W 82 13’ | 1100m, 21-vii-2009 | D Windsor; L Sekerka [white, printed and cardboard label] || ex Elleanthus | Orchidac. [white, handwritten and soft label]’ (DWCP); paratype, in ethanol: ‘Epidendrum werkli | 21 VII 09 CRH [= Camino Río Hornito] [white, handwritten and cardboard label]’ (DWCP); paratype, glued: ‘PANAMA Chiriquí prov. | La Fortuna - Rio Hornito trail | 8°47’N, 82°13’W, 1100 m | cloud forest 21.vii.2009 | ORCH: Epidendrum sp. | L. Sekerka & D. Windsor lgt. [green, printed and cardboard label]’ (LSCL); 10 paratypes, glued and one in ethanol: ‘PANAMA: Chiriqui | La Fortuna, 9-1100m | Rio Hornito Trail | 8°45’N, 82°14’W | 12 - II [handwritten] -~~199~~[printed]2010[handwritten] | D.M. Windsor [white, printed and cardboard label]’ (DWCP, UPPC); 5 paratypes, glued: ‘PANAMA Chiriquí prov. | La Fortuna: Rio Hornito | 8°42.58’N, 82°13.48’W, 1180 m | montane forest | ORCH: Epidendrum wercklei | L. Sekerka lgt. 3.-4.x.2010 [green, printed and cardboard label]’ (BMNH, LSCL, NMPC); paratype, in ethanol: ‘PANAMA, CHIRIQ | Quijada, Fortuna | 1200 m., | Windsor-200[printed]1-AG-5 | ex. orchid [white, handwritten and cardboard label with black frame]’ (DWCP); 3 paratypes, glued: ‘PANAMA Chiriquí prov. | La Fortuna: Quijada del Diablo | 8°42.07’N, 82°13.36’W, 1200 m | montane forest | ORCH: Epidendrum wercklei | L. Sekerka lgt. 5.ix.2010 [green, printed and cardboard label]’ (LSCL); 3 paratypes, glued: ‘PANAMA Chiriquí prov. | La Fortuna: Quijada del Diablo | 8°42.07’N, 82°13.36’W, 1200 m | montane forest | ORCH: Epidendrum wercklei | L. Sekerka lgt. 8.ix.2010 [green, printed and cardboard label]’ (LSCL); paratype, glued: ‘PANAMA Chiriquí prov. | La Fortuna: Quijada del Diablo | 8°42.07’N, 82°13.36’W, 1200 m | montane forest | ORCH: Epidendrum wercklei | L. Sekerka lgt. 7.x.2010 [green, printed and cardboard label]’ (LSCL). **Bocas del Toro:** paratype, in ethanol: ‘PANAMA, Bocas d T | Palo Seco Tr. Km 63 | 8 48’ N; 82 13’W | 18 ix 2008 | D Windsor; L Sekerka [white, printed and cardboard label]’ (DWCP); paratype, in ethanol: ‘Panama | B.d.T. | 900 m | 3 II 2007 | D.W. | Cephaloleia | irregularis [white, handwritten and cardboard label]’ (DWCP). **Coclé:** paratype, glued: ‘Panamá: Coclé Prv. | 9-1000m, Caracoral | 8°37’N, 80°7’W; | 27 March 1993 | D.M. Windsor [white, printed and cardboard label]’ (LSCL); paratype, glued: ‘PANAMA: Cocle Prv. | La Mesa ab. El Valle | Cerro Caracoral | 15 Nov 92; el. 850 m | col. H. Stockwell [white, printed and cardboard label]’ (DWCP). **Panamá:** two paratypes, glued: ‘PANAMA Panamá prov. | PN Chagres: Cerro Jefe | 9°13.7’N, 79°23.0’W, 950 m | montane forest | ORCH: Epidendrum sp. | L. Sekerka lgt. 22.x.2010 [green, printed and cardboard label]’ (LSCL); paratype, glued: ‘Cerro Campana, 800 m | Panamá Prov., R. P. | 29 Apr. ’70 [handwritten] | H. P. Stockwell [white, printed and cardboard label] || ♀ [white, printed and cardboard label] (USNM).

Larval material. Larvae were collected from three different sites (Quijada del Diablo, El Vivero and Samudio Trail), all between 1100 and 1200 m elevation in the La Fortuna Reserve. One mature larva (21.vii.2009, DWCP) and two mature and four younger instars (5.ix.2010, LSCL and DBET) were collected from these sites and preserved in ethanol. One mature larva collected on Cerro Jefe (22.x.2010, DWCP) and one recently emerged, first instar larva from Quijada del Diablo (23.xii.2012, DWCP) were cleared in KOH and slide mounted.

Adult diagnosis. The new species is most similar to *Cephaloleia irregularis* Uhmann, 1930 described from a mountainous locality, Coronado (1400–1500 m), Limón province, Costa Rica. *Cephaloleia orchideivora* sp. nov. differs by the mostly regularly punctate elytra (irregularly in *C. irregularis*), the completely yellow and broad explanate margin of elytra (narrow and dark metallic brownish-green in *C. irregularis*), the anterior margin of pronotum emarginate (straight in *C. irregularis*), and the pronotum with triangular metallic spot (reverse V-shaped in *C. irregularis*).

Description of adult. Measurements (n = 16): length of body 5.48–6.89 mm (mean 6.20 mm), width of body 2.41–3.11 mm (mean 2.69 mm), length/width of body ratio 2.14–2.42 (mean 2.31), length of pronotum 1.06–1.37 mm (mean 1.23 mm), width of pronotum 1.55–2.08 mm (mean 1.82 mm), width/length of pronotum ratio 1.43–1.53 (mean 1.48). Body elongate-oval and subconvex (Figs 1, 3).

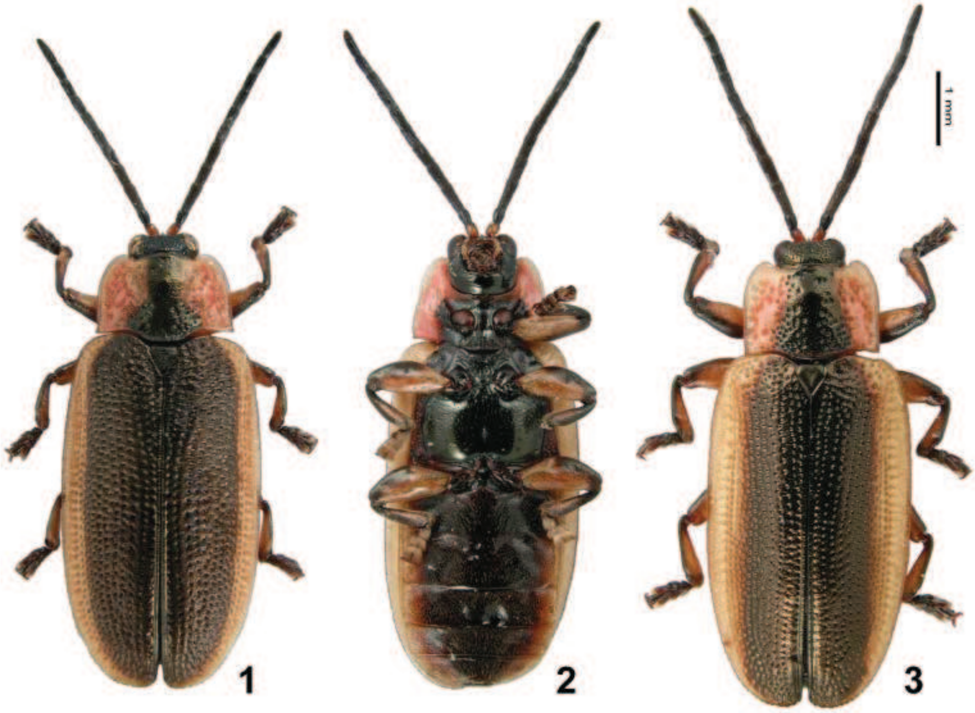
Head metallic olive-green sometimes with bluish or violet reflection. Mouthparts, antennal insertions and first antennomere rust-colored, remaining antennomeres black. Pronotum yellow (dry specimens) to pink (live and ethanol preserved specimens) with large triangular olive-green spot along midlength reaching to basal and apical margins. The spot is usually with more or less distinct lateral emargination. Scutellum and elytral disc olive-green, explanate margin yellow to penultimate interspace. Thorax mostly black with episterna brownish or yellowish. Abdomen brown-black variegated with distinct broad yellow outer margin. Coxa rust-colored, trochanters pitchy-brown, tibia and femur internally yellow and externally black, tarsi black.

Pronotum transverse, 1.5 times broader than long, anterior margin deeply emarginate behind head, emargination in the middle convex. Anterior angles of pronotum broadly rounded, lateral margins almost parallel-sided, slightly widened in the basal third in some specimens. Tubercle with sensila situated in corners of anterior emargination. Disc of pronotum coarsely and sparsely punctate with large shiny impunctate areas. Punctures deeply impressed, foveolate. Lateral margin only slightly explanate, distinctly separated from disc by deep impression and extreme outer margin swollen. Surface smooth and shiny, area with metallic spot distinctly micro-reticulate.

Scutellum subpentagonal, smooth, impunctate and micro-reticulate.

Elytra feebly convex, flat. Elytral base slightly sinuate, broader than base of pronotum. Humeral angles broadly rounded. Punctation coarse and sparse, mostly regular. Punctures deeply impressed and foveolate. Scutellar row very long, extending to basal fourth. Scutellar row and rows 1–5 and 8–10 regularly arranged in rows, 7 and 8 with numerous confused punctures on lateral slope. Between rows 7 and 8 there is an additional, more or less regular, row of punctures extending from about midlength of elytra to the apex. Interspaces between puncture rows narrow, 0.5–1.0 times as wide as puncture diameter. Intervals broad, 1–2 times wider than puncture diameter, second interval widest, about 4 times wider than puncture diameter. Surface of intervals and interspaces smooth, shiny and micro-reticulate. Punctation gradually coarser from suture to lateral rows. Row 10 twice as coarse as remaining lateral rows. Lateral margin of elytra distinctly explanate, as broad as 1/6 of elytron, slightly declivous. Its surface smooth, shiny and micro-reticulate, sometimes with 1–3 isolated punctures in basal fourth, otherwise impunctate. Extreme outer margin slightly swollen, distinctly serrate, particularly in apical fifth. Denticles obsolete, with short seta on tip. Apex of epipleura bare.

Vertex of head densely and coarsely punctate, punctures along the middle have tendency to form short striae. Frons impunctate but distinctly micro-reticulate. Clypeus very short, typical for *Cephaloleia*. Eyes normal, gena well visible. Antennae, long, filiform, moderately thick



Figs 1–3. *Cephaloleia orchideivora* sp. nov. 1 – dorsal aspect (Chiriquí population); 2 – ventral aspect; 3 – dorsal aspect (Cerro Jefe population).

and reaching beyond humerus. Pedicel and scapus cylindrical, smooth and shiny, only sparsely pubescent; remaining antennomeres elongate, densely setose and micro-reticulate. Third antennomere 2.3 times longer than second and 1.5 times than fourth. Terminal antennomere 1.6 times longer than 10th with rounded apex. Length ratio of antennomeres: 100 : 111 : 257 : 175 : 167 : 150 : 155 : 147 : 152 : 133 : 217. Prosternal process broad, between coxae smooth and shiny with deep sulcus along midlength, apex broadly explanate, micro-reticulate and with 7–9 sulci. Mesothorax smooth, micro-reticulate. Metathorax mostly smooth and shiny, its surface appears polished and with several punctures situated basolaterally, each puncture with moderately long golden seta. Metepisterna coarsely punctate. Abdomen finely and densely punctate and covered with adherent setae. Suture between abdominal sterna 1 and 2 complete. Last visible sternite slightly emarginate in male and deeply emarginate in female.

Legs short, robust, claws divergent and simple.

Variability of adults. Individuals from the Chiriquí population (Fig. 1) are relatively uniform with minor variability present only in the shape and size of the pronotal spot and elytral serration. Some specimens have denticles very obsolete (visible only under higher magnification) thus the margin appears nearly smooth. On the other hand some specimens, particularly those from central Panama, have distinctly serrate outer margin of elytra.

Specimens from central Panama (Fig. 3) (Cerro Campana, Cerro Caracoral and Cerro Jefe) also differ in slightly coarser punctation overall, pronotal spot always triangular and large, lateral sides of elytra yellow to 8th row, slightly narrower pronotum and second antennomere slightly shorter. However, we consider these characters as intraspecific variability. Particularly, punctation and surface of elytra is quite often finer in west Panamanian cassidine populations than in central and eastern.

Etymology. The specific epithet arises from the plant family Orchidaceae and Latin "*voro*" = feed.

Egg. The egg of *C. orcheidivora* sp. nov. is light yellow, membranous, flat, semitransparent, 2.5 mm in length and 1.5 mm in width (n = 5) bearing no maternal adornments (Figs 4, 8).

Larval diagnosis. The larva of *C. orchideivora* sp. nov. can be distinguished from the four species described by García-Robledo et al. (2010) by the following character combination: dorsum medially ridged2), lacking setae, prothorax with central and lateral areas shallowly rugose, prothorax carinate and venter shallowly rugose. One or two pairs of elongate, sclerotized plates, located medially on the prothorax (Fig. 12) distinguish *C. orchideivora* larvae from most if not all other *Cephaloleia* species. Degree of pigmentation in these structures is variable, darkening noticeably with age of first instar larva and reaching greatest density in the second instar. An additional pair of narrower, elongate sclerotized plates are present on the terminal tergite (fused abdominal segments 8 and 9) of most second-instar larvae. Larva of *C. mauliki* Uhmann, 1930 described by Maulik (1932) lacks these plates and differs in stemmata arranged in one line of four and one line of two (two lines of three in *C. orchideivora*, Fig. 13) and mandibles sharply tridentate (shallowly quadridentate in *C. orchideivora*, Figs 14–15).

Description of larva. ***Measurements.*** Upon emergence from the egg and before feeding first instar larva measured 2.3 by 1.3 mm (length by width) (n = 1); older first instar larvae 4.1 by 2.2 mm (n = 3), and second instar larvae 7.9 by 4.4 mm (n = 3). Body of greatest width at abdominal segment 3.

Color and size. Recently emerged first instar largely translucent and without pigmentation, while older first instar larvae have two dull, cream-colored, longitudinal stripes flanking a transparent region (gut) extending longitudinally along the midline. Margins are largely translucent, venter entirely transparent. Second instar differs from first by having one or two elongate, darkly-pigmented areas on the dorsal surface of the prothorax and one on the final abdominal segment. The body of both live and fresh ethanol preserved specimens have two conspicuous pink longitudinal stripes extending from mid-prothorax to abdominal segment 6, and groups of darker, greenish cells near spiracles, yellowing toward the margin. Body color in older specimens white bordered by transparent fringe, dorsum shallowly rugose, with an elevated medial ridge. Older ethanol preserved larvae turns to white or creamy color.

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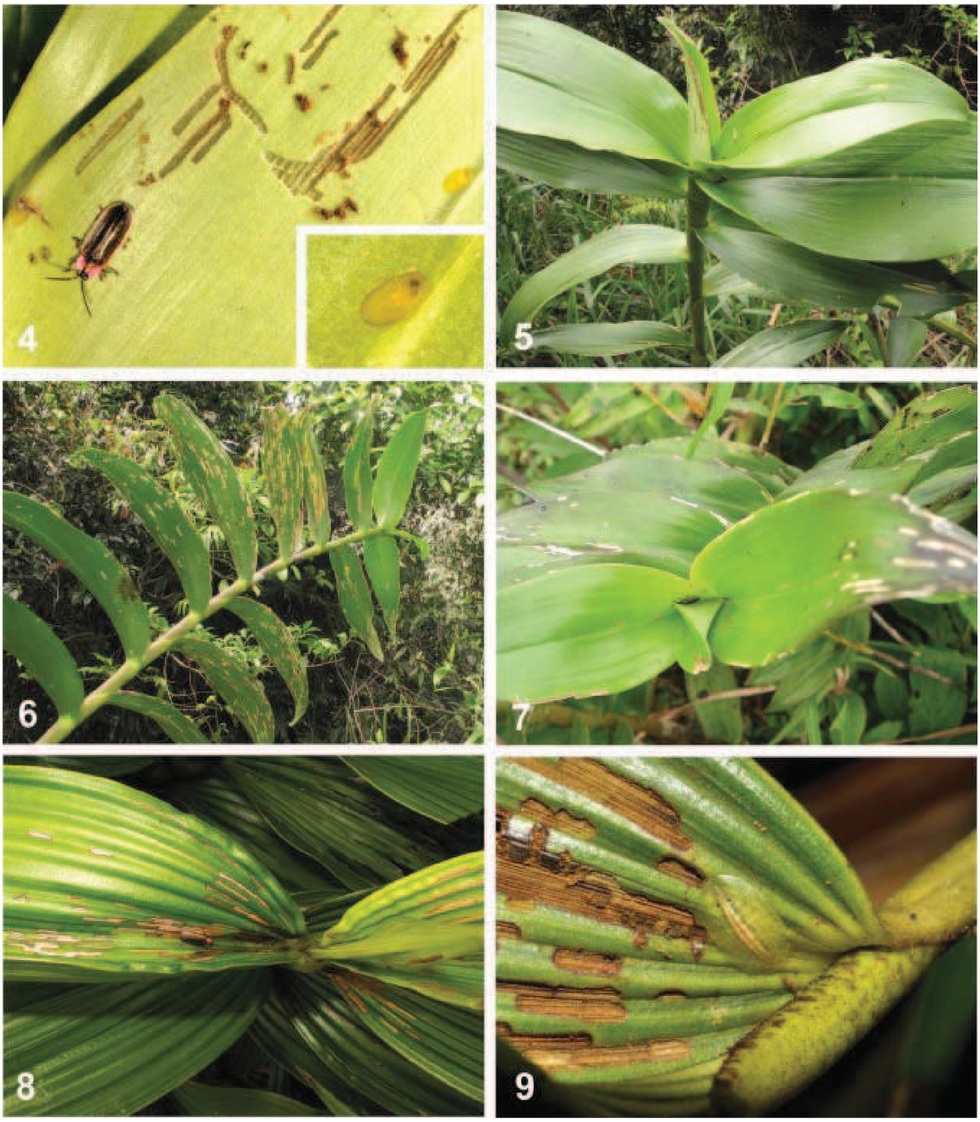
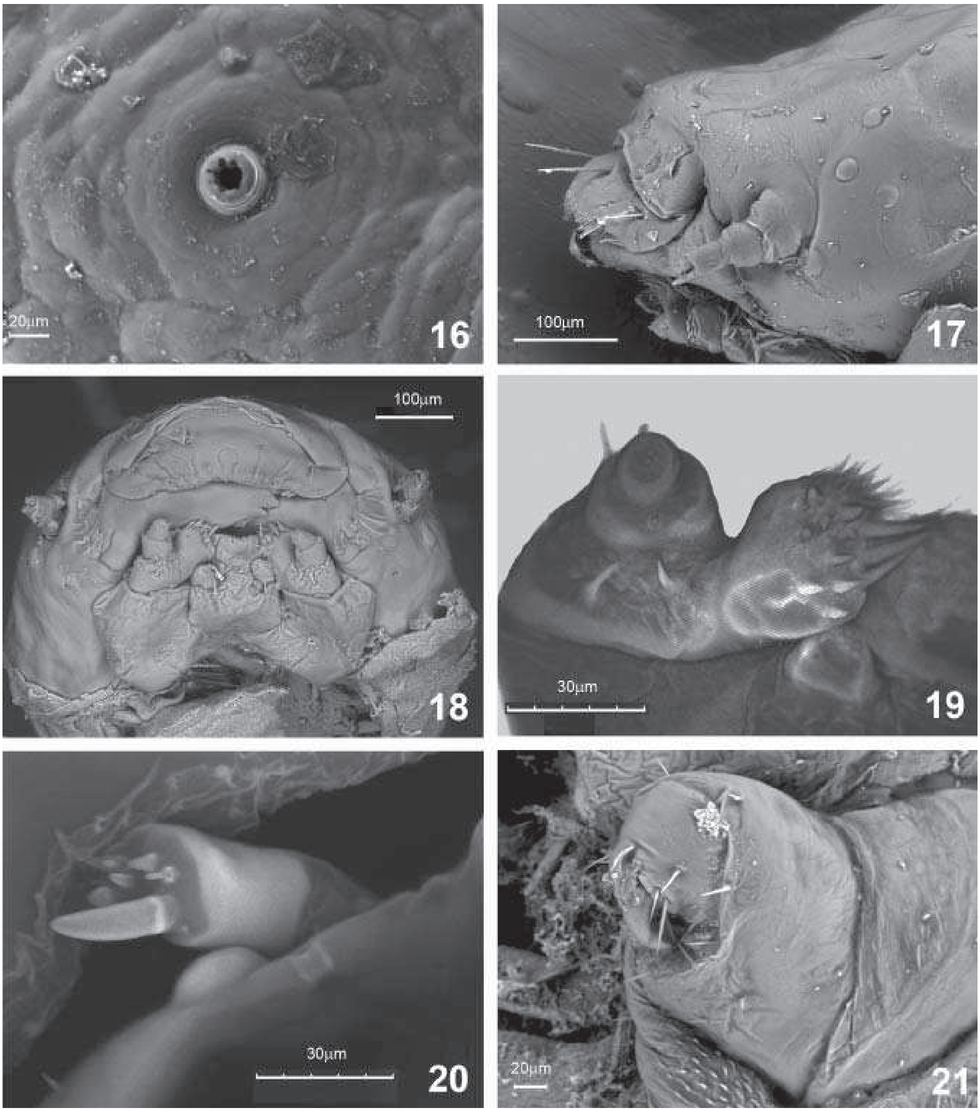
2) This character is, however, possibly an artifact caused by dehydration. We have observed many *Cephaloleia* larvae and they would have such dorsal ridge only in case of low humidity. It is also caused sometimes by quick dehydration in absolute alcohol.



Figs 4–9. Host plants of *Cephaloleia orchideivora* sp. nov. 4 – adult, feeding damage and egg on *Oerstedella exasperata* leaf held for several days in a plastic container; 5 – *O. exasperata* with damaged semi-closed terminal leaf hiding adult specimen; 6 – *O. exasperata* showing massive damage by the beetle; 7 – *O. exasperata* with adult in typical position in the axil between first and second leaves; 8 – *Elleanthus* cf. *robustus*, apical new growth with adult specimen; 9 – larva on near axil of youngest leaf of *Elleanthus* sp. on Cerro Jefe.

Figs 10–15. Egg and larva of *Cephaloleia orchideivora* sp. nov. 10 – egg containing nearly fully developed larva on *Oerstedella* leaf; 11 – freshly emerged first instar larva, live and prior to feeding; 12 – second instar larva fully grown; 13 – dissected head of first instar larva showing the location and conformation of the stemmata; 14 – mandible dissected, embedded in Hoyers medium and viewed through a compound microscope; a fourth tooth, deeper in the preparation and less focused appears between the second and third teeth; 15 – lateral view of the opposing mandible and its shallowly lobed teeth and concave mesal surface. All scale bars equal to 1 mm.

Dorsum. Basal prothorax elevated medially, sloping evenly toward anterior margin, surface shallowly rugose and medially bearing fields of sclerotized nonpigmented or pigmented cells, divided by diagonal anterior carina, sparsely placed microsetae; lateral margins rugose, terminating in a membranous fringe composed of chitinous rods of uniform breadth, surface populated by numerous minute spinules and a smaller number of longer setae (cf. MAULIK 1932, for a more detailed description of the fringe). Meso- and metathoracic segments elevated medially, shallowly rugose with sparse microsetae. Abdominal tergites 1–8 without carinae, shallowly rugose, bearing sparsely placed microsetae. Spiracles (Fig. 16) annular with crenulate peritreme, located equidistant between median and margin. Eighth abdominal spiracle located near margin between tergites 8–9. Separation of tergites 8 and 9 indistinct, margin rounded apically.



Figs 16–21. Larva of *Cephaloleia orchideivora* sp. nov. 16 – first abdominal spiracle; 17 – lateral view of head (second instar); 18 – ventral surface of same head, maxilla, maxillary palps, labium and labial palps, antenna and clypeus (lacking setal fringe); 19 – maxilla; 20 – apical segment of the antenna; 21 – leg.

Venter. Surface of expanded segments smooth to shallowly tuberculate. Prothoracic spiracle opening to ventral surface between legs 1 and 2. Head (Figs 17, 18) surface smooth with 5 large and one small stemmata on each side; clypeus with surface smooth, basally with 4 long-stout setae and apically with margin densely fringed with short robust setae unequal in length; maxillary palp (Fig. 19) with two palpomeres, basal palpomere with 2 isolated setae, apical palpomere with one lateral seta, terminating with 11 short sensillae; maxilla robust, clavate, with two stout setae at base of palpomere and apically fringed with setae unequal in length and stoutness; labium densely setose; labial palp with one palpomere, terminated by approximately eight short sensillae; antenna (Fig. 20) with three antennomeres, apical antennomere bearing one long, stout conical sensillum, seven short sensillae and one short seta. All thoracic and abdominal segments shorter than wide, surface smooth, concave and joined to adjacent segments by transverse sutures. Femur of leg (Fig. 21) wider and shorter than subconical tibiotarsus, the latter bearing one stout claw and 10 setae at apex.

Comments on larval morphology. The larva of *Cephaloleia orchideivora* (Figs 11, 12) conforms closely to the basic "onisciform" Cephaloleiini ground plan described first by MAULIK (1932) and later for four species by GARCÍA-ROBLEDO et al. (2010). The larva cuts a transverse slit in one end of the egg and exits without consuming any part of the chorion. Larval thoracic and abdominal segments are well defined, extended, laterally flattened and terminated by a continuous membranous fringe (laterally-fused setae) which appears to form a hermetic seal maintained between the larva, both active and resting, and its glabrous substrate. The prognathous head is strongly retracted and attached to the ventral surface of the prothorax and thereby is concealed from direct view at all times and from all angles. Three to four stemmata are visible in dorsal view through the cuticle of the prothorax of the first instar larva (Fig. 11). Due to increased thickness and pigmentation of the epidermis and more lateral presentation on the head, stemmata are usually not visible in dorsal view of the second instar larva (Fig. 12). However, by manipulating or dissecting the head from its ventral position, a cluster of 6 stemmata (one most ventral far smaller) is readily apparent on each side of the vertex (Fig. 13) just posterior to the base of the antenna in both first and second instar larvae. Mandibles (Figs 14, 15) are shallowly quadri-dentate with a widened concave mesal surface.

Host plants. Orchideaceae: *Elleanthus* cf. *robustus* (Rchb. f.) Rchb. f., *Elleanthus* sp., *Epidendrum werklei* Schltr., *Oerstedella exasperata* (Rchb. f.) Hágsater, *Oerstedella wallisii* (Rchb. f.) Hágsater.

Ecological observations. The species lives in montane cloud forests from 800 to 1200 m a.s.l. Most specimens were collected in the windy pass called 'Quijada del Diablo' where the Rio Hornito trail begins in the La Fortuna Reserve in Chiriquí Province, western Panama. The locality is characterized by sparse and shrubby forest with stands of terrestrial orchids including the three known host plants, *Elleanthus* cf. *robustus, Epidendrum werklei* and *Oerstedella exasperata*. Other terrestrial orchids present include *Epidendrum radicans* Lindl., *Oncidium* spp., and *Sobralia* spp., however, these were uniformly without feeding traces. The other localities where the new species was collected are Cerro Campana, Cerro Caracoral and Cerro Jefe, isolated mountains in central Panama where the vegetation is sparse, open and rather low. The label data from the specimen from Cerro Campana does not record any host plant or habitat.

Specimens from Cerro Jefe were feeding on a small *Epidendrum*-like epiphytic orchid growing about 4 m above ground level. While the plant was not flowering, it was clear from vegetative characters that it was distinct from either host plant species in Chiriquí. It had distinct warts on leaf sheaths and reddish scales on stem, characters found in the genus *Oerstedella* Rchb. f. The stem was similar to *O. wallisii* which grows abundantly on Cerro Jefe, however, we cannot assign it with certainty as our plant was without flowers. Nearby, on another occasion we found larvae on an epiphytic *Elleanthus* species.

Larval feeding damage is similar to that of the adult and is mostly present as narrow strips, often but not always paralleling leaf venation in smooth-leaved orchids (Figs 4–7) or as broader strips in species with pleated leaves (Figs 8, 9). Adult beetles are mostly hidden in the terminal leaf or between the terminal leaf and the base of last fully exposed leaf (Fig. 7). During the night adults also feed on the open leaf surface and sometimes the damage can be massive (Fig. 6). Adults lay eggs singly along the mid-vein of the terminal semi-closed leaf. The larva feeds on the top surface of the second or third newest leaves and shelters at the semi-closed leaf base (Fig. 9) in all host plant species. As the leaf expands and opens the larva moves to feed on the next newer leaf.

Distribution. Panama (Bocas del Toro, Chiriquí, Coclé and Panamá provinces).

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Chapter IV

SEKERKA L., WINDSOR D. & DURY G. (2014) Cladispa Baly: revision, biology and reassignment of the genus to the tribe Spilophorini (Coleoptera: Chrysomelidae: Cassidinae). *Systematic Entomology*, **39**: 518–530.

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Systematic Entomology

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Cladispa Baly: revision, biology and reassignment of the genus to the tribe Spilophorini (Coleoptera: Chrysomelidae: Cassidinae)

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Abstract. The genus, *Cladispa* Baly 1858, is transferred from the tribe Imatidiini (= Cephaloleiini Chapuis, 1875) to Spilophorini Chapuis, 1875 based on the review of type material, newly collected specimens and molecular phylogenetic analysis. The type species, *C. quadrimaculata* Baly, 1858, is redescribed, and two new species, *C. amboroensis* **sp.n.** from Bolivia (Santa Cruz Department) and *C. ecuadorica* **sp.n.** from Ecuador (Pastaza Province), are described and figured. The morphology of *C. amboroensis* **sp.n.** immature stages is broadly consistent with other Spilophorini. Field observations document that both *C. quadrimaculata* and *C. amboroensis* **sp.n.** are trophic specialists on Orchideaceae. Keys to *Cladispa* species and Spilophorini genera are provided. Trophic associations of other Cassidinae and Orchideaceae are discussed.

This published work has been registered in ZooBank, http://zoobank.org/urn:lsid:zoobank.org:pub:42A1ECF3-2030-4938-8F3D-FE7EC36F303A

Introduction

Baly (1858) proposed the genus *Cladispa* for a single species, *Cladispa quadrimaculata* Baly, 1858, from 'Demerara' (present-day Guyana). He placed his new genus between *Oediopalpa* Baly and *Octocladiscus* Thompson because of a similarly shaped labium and subserrate antennae. Chapuis (1875) noted that adult *Cladispa* possess antennae resembling those of *Cephaloleia* Chevrolat and palps resembling those of *Oediopalpa.* He placed both genera together with *Octocladiscus* in his group Callispites, whereas he created Cephaloléites for *Cephaloleia* and related genera. Weise (1910) proposed Amplipalpini (now included in Spilophorini) for *Oediopalpa* (= *Amplipalpa* Harold). Later, Weise (1911a,b) transferred *Cladispa* and *Octocladiscus* to Cephaloleiini (recently changed to Imatidiini due to name priority), a system followed for the next century, with *Cladispa* cited mainly only in catalogues (Uhmann, 1957; Seeno & Wilcox, 1982; Staines, 2014).

We examined the holotype of *C. quadrimaculata* and found that it has a long stiff seta in all four pronotal angles, strong evidence that the genus belongs within the tribe Spilophorini not Cephaloleiini, which has a seta only on the anterior angles. We also examined specimens of *Octocladiscus fasciatus* (Guérin-Méneville), finding setae only on the anterior angles, indicating that its placement is correct within the Imatidiini (= Cephaloleiini). We have recently collected a series of adult and associated immature specimens in Bolivia, here described as a new species, adults of which perfectly match the generic concept of *Cladispa* and larvae with characters typical for Spilophorini (exophagous, eruciform larvae with apical shield formed by old exuviae, contrasting clearly with the shieldless, onisciform larvae of Imatidiini). In addition to morphological and natural history information, we used Maximum Likelihood and Bayesian methods to analyse 1418 bp of DNA sequences from the nuclear ribosomal genes *18S* and *28S*, supporting the new placement of genus *Cladispa*.

The newly described species constitute only the second record of leaf beetles in the subfamily Cassidinae associated with the plant family Orchideaceae. The first record of orchid feeding

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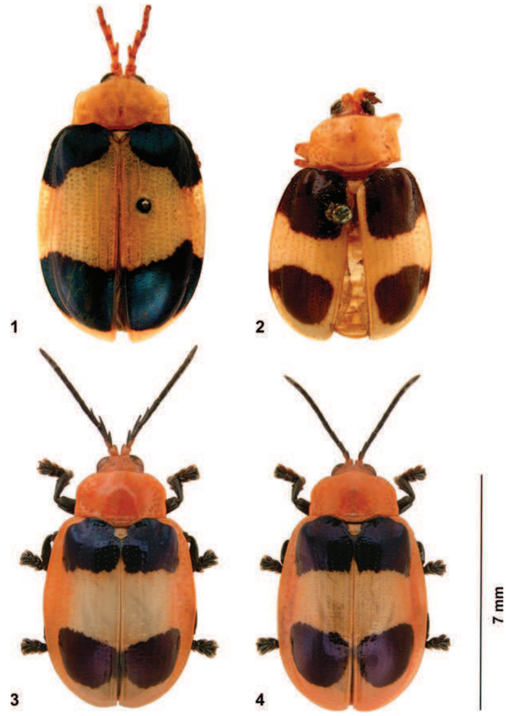


Figs. 1–4. Dorsal aspects of *Cladispa* species. 1, *C. ecuadorica* **sp.n.**, holotype, ♂; 2, *C. quadrimaculata* Baly, holotype, ♂; 3, *C. amboroensis* **sp.n.**, paratype, ♂; 4, *C. amboroensis* **sp.n.**, paratype, ♀.

involved *Cephaloleia orchideivora* Sekerka, Windsor & Staines, 2013, belonging to the tribe Imatidiini (Sekerka *et al.*, 2013), a feeding associate of at least three genera of Orchidaceae in Panamá.

Material and methods

Specimens were compared using standard methods of comparative morphology.

Photos of adult specimens (Figs 1–4) were taken using a Leica S8Apo stereomicroscope with Leica 10447367 0.63× photo tube attached to a Nikon Coolpix 4500 and Nikon MDC Lens as 15–20 separate images and then composed in Helicon Focus software. Images in Figs 5–11 were taken with a Canon G15 digital camera, Figs 12–17 with a Canon S100 digital camera hand held to the objective of a Wild MP5 stereomicroscope, and Figs 18–30 with a Zeiss EVO 40 Scanning Electron microscope.

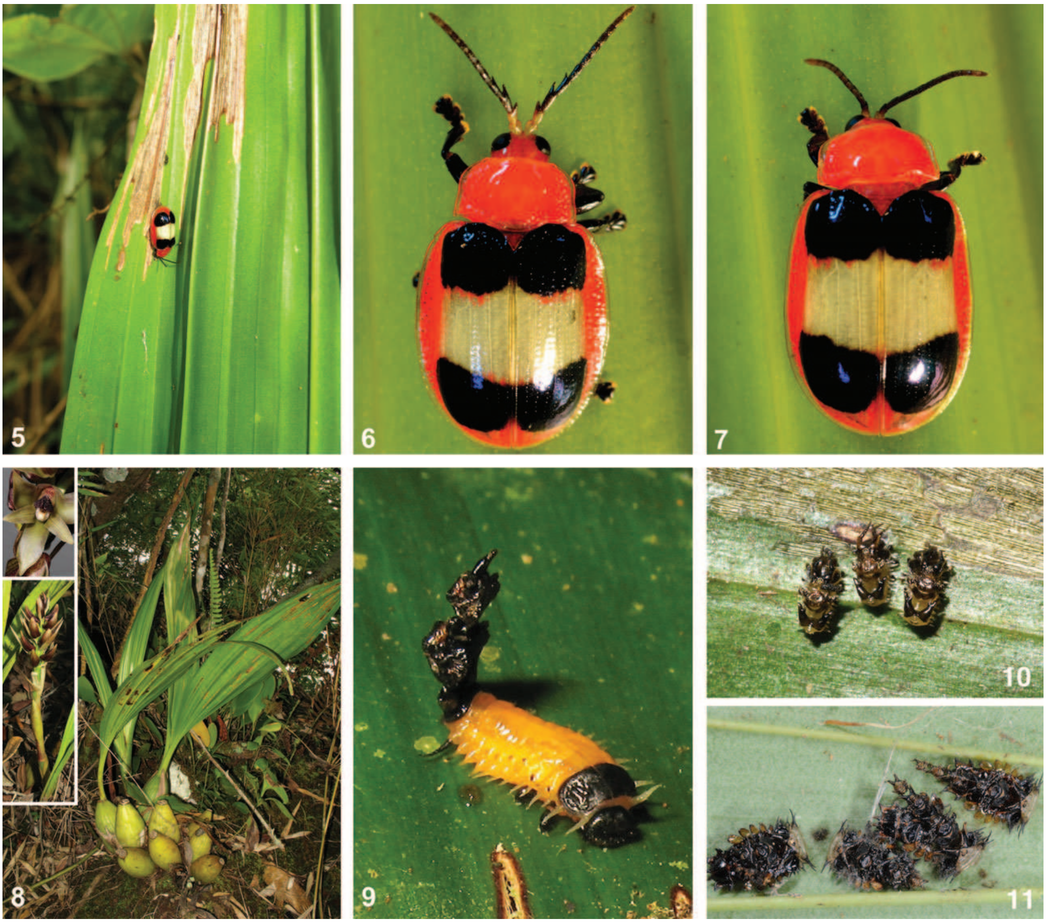
DNA was extracted from muscle tissue of whole insects maintained in absolute ethanol at −80°C and deposited in the collection of Donald Windsor (DWC). Duplicate specimens of dry pinned adults and photographs vouchering each of the 26 taxa included in the phylogenetic analysis (see Figure S1, Table S1) were also kept in DWC. Taxa were sampled primarily to test the traditional placement of *Cladispa* within Imatidiini (i.e. Weise, 1911a; Uhmann, 1957; Staines, 2002), versus an alternative arrangement in Spilophorini as suggested by the adult and larval morphological characters. We compared the sequences from *Cladispa amboroensis*, the only species in the genus from which we obtained DNA, to sequences from seven species of Cephaloleini and eight of Spilophorini. To test the more remote possibility that *Cladispa* is more closely related to hispine tribes other than Cephaloleiini or Spilophorini, we also included one representative of eight other common Neotropical hispine tribes and one important Paleotropical tribe (Hispini). As an outgroup basal to all Hispinae, we used *Platyphora megistomelina* Bechyně, 1954, a broad-shouldered leaf beetle, subfamily Chrysomelinae, as suggested by Gómez-Zurita *et al.* (2008).

All label data are given in their original spelling; a vertical bar (|) separates data on different rows, a double vertical bar (||) separates different labels. Additional information about the label and explanatory notes are given in the square brackets.

Examined specimens are housed in following collections: BMNH, Natural History Museum, London, UK; DBET, Department of Biodiversity and Evolutionary Taxonomy, University of Wrocław, Poland; DWC, working collection of Donald Windsor, Ciudad de Panamá, Panamá; LSC, collection of Lukáš Sekerka, Liberec, Czech Republic; MNKM, Museo de Historia Natural 'Noel Kempff Mercado', Santa Cruz de la Sierra, Bolivia; NMP, National Museum, Prague, Czech Republic; OKC, collection of Ondřej Konvička, Zlín, Czech Republic; USNM, National Museum of Natural History, Smithsonian Institution, Washington D.C., USA.

DNA extraction, sequencing and analysis

Genomic DNA was extracted from flight muscle ground in 180 μL of ATL tissue lysis buffer (Qiagen Inc., Valencia, CA, U.S.A.) and 20 μL proteinase K with a sterile pestle, vortexed for 10 s and incubated overnight at 55°C. Following incubation, we added 200 μL AL lysis buffer (Qiagen Inc.) and heated the sample to 70°C for 10 min, before adding 200 μL molecular grade ethanol to each sample. This mixture was then pipetted into a DNeasy mini spin column and centrifuged at 8000 rpm (~6000 *g*) for 1 min, discarding the flow-through and collection tubes. The DNeasy mini spin column was placed in a new 2-mL collection tube, and 500 μL wash buffer AW1 (Qiagen, Inc.) was added, the sample centrifuged for 1 min at 8000 rpm, subsequently discarding the flow-through and collection tubes. To a new collection tube, 500 μL wash buffer AW2 (Qiagen, Inc.) was added and the sample centrifuged for 3 min at 14 000 rpm (20 000 g); the collection tube was then discarded. The mini column was placed in a 1.5-mL tube and 200 μL AE elution buffer (Qiagen, Inc.) was added, the sample was incubated for 2.5 min at room temperature, and the sample centrifuged for 1 min at 8000 rpm (~6000 g). Extractions were held at −20°C between use, and at −80°C for long-term storage. Partial sequences from the *18S* and *28S* genes were obtained

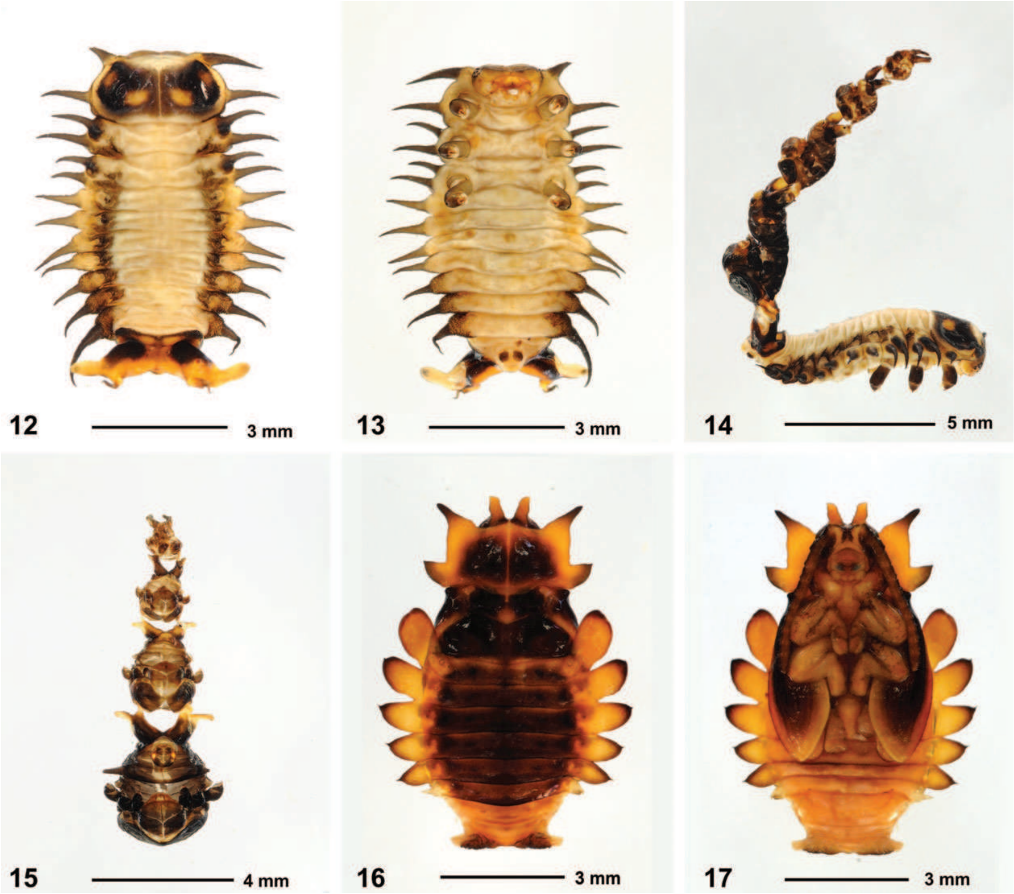


Figs. 5–11. *Cladispa amboroensis* **sp.n.**: appearance in nature. 5, Adult feeding; 6, live adult male; 7, live adult female; 8, the host plant, *Xylobium* sp., Orchidaceae; 9, fourth instar larva; 10, aggregation of three larvae; 11, aggregation of four pupae.

from the resulting genomic DNA using the primer sets given in Prado *et al.* (2012). The PCR cycling conditions were: 94 °C for 2 min, 10 cycles of 94°C for 30 s, 46°C for 30 min, 72°C for 45 min, then 24 cycles of 94°C for 30 s, 48°C for 30 min, 72°C for 45 min, and finally 72°C for 10 min and 10°C for 2 min.

Forward and reverse sequences were combined, reconciled and trimmed in Sequencher v5 (Gene Codes Corporation, Ann Arbor, MI, USA), leaving two segments of *18S*; fragment A of 502 bp and fragment B of 395 bp and one segment of *28S* of 521 bp. The two *18S* fragments were concatenated and treated as a single fragment in analyses (897 bp). Sequences were deposited in GenBank under accession numbers given in Table S1.

Sequences were aligned independently using 10 iterations of MUSCLE (Edgar, 2004). Evolutionary models of single-genes were selected with Modeltest 3.4 (Posada & Crandall, 1998) in Paup* v4.0b10 (Swofford, 2003) using the PaupUP graphical interface (Calendini & Martin, 2005) and Modeltest v3.7 (Posada, 2005). For the concatenated dataset, evolutionary models and partitioning strategy were selected using PartitionFinder v1.0.1 (Lanfear *et al.*, 2012). A single partition was suggested for the concatenated dataset, and both procedures suggested a TVM + I + G model, except for *18S*, for which Modeltest suggested GTR + I + G. This translated into a six-state model in MrBayes. Bayesian inference was done with 5 million generations in MrBayes v3.1.2 (Ronquist *et al.*, 2012). An appropriate burn-in of 10% was determined in MrBayes, and remaining trees were combined into single 50 percent majority rule trees. Maximum Likelihood analysis with 100 bootstrap pseudo-replications was performed on supercomputers of the Cyberinfrastructure for Phylogenetic Research (CIPRES) Science Gateway v3.3 (Miller *et al.*, 2010) using RAxML-HPC



Figs. 12–17. *Cladispa amboroensis* **sp.n.**: immature stages. 12, Dorsal; 13, ventral and; 14, lateral aspects of fifth instar larva; 15, dorsal aspect of exuvial annex from same larva; 16, dorsum and; 17, venter of pupa with larval annex removed.

(Stamatakis, 2006) to yield best-scoring trees. Both analyses were performed on single-gene datasets and on a concatenated dataset (1418 bp).

Results

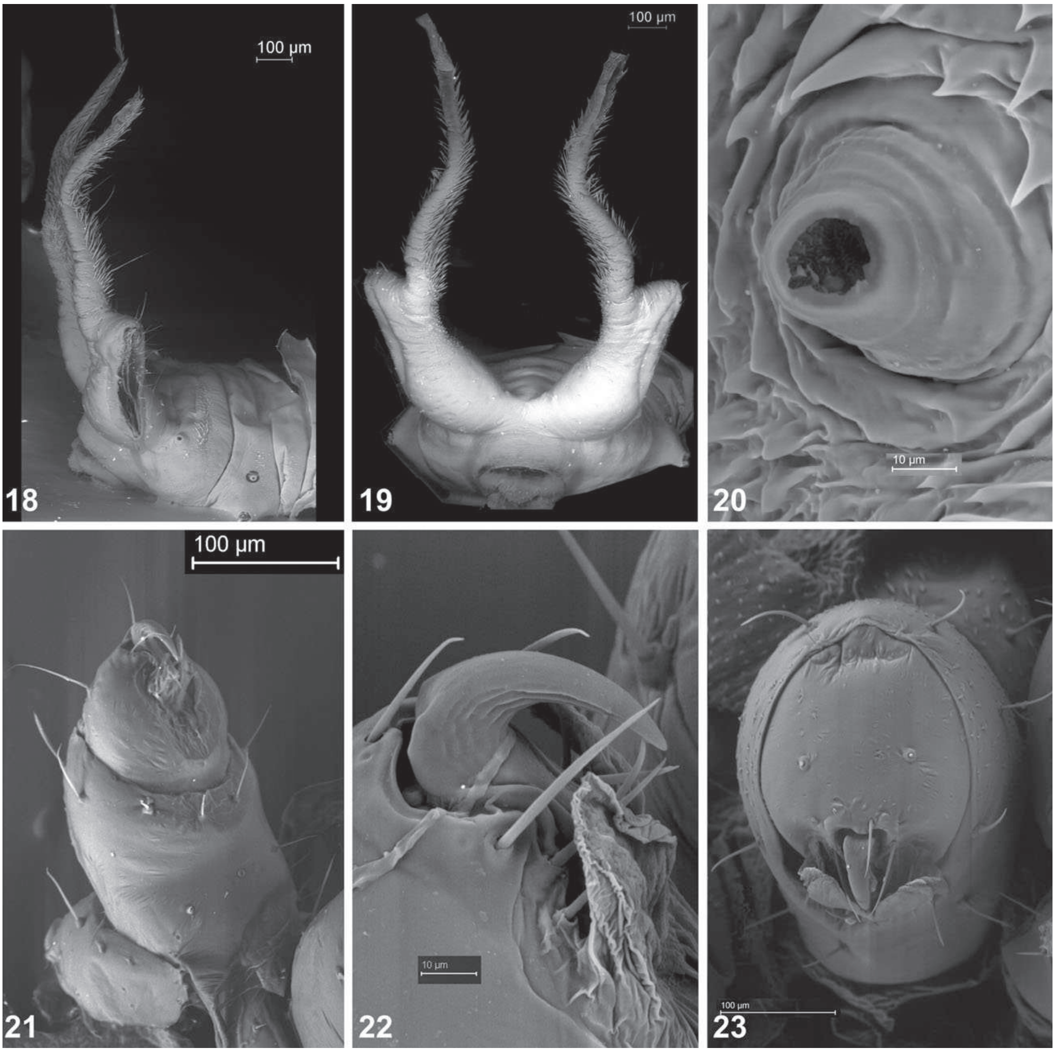
Cladispa Baly, 1858

Cladispa Baly, 1858: 22 (original description).

Type species. Cladispa quadrimaculata Baly, 1858 by monotypy.

Differential diagnosis. Cladispa is differentiated from other genera of Spilophorini by the form of antennae. Males have antennomeres II–IV pectinate, and females have filiform antennae. The only other genus with apparently pectinate antennae is *Spilophora* Boheman. However, males of *Spilophora* have pectinate antennomeres III–VI, and the projecting tooth of each is rather thin and short. *Spilophora* species also have an extremely long third antennomere, which is longer than IV and V combined, and more or less tubular antennae with tightly arranged antennomeres, whereas *Cladispa* has antennomeres III and IV subequal in length and antennae with the antennomeres loosely arranged and more or less constricted at their bases.

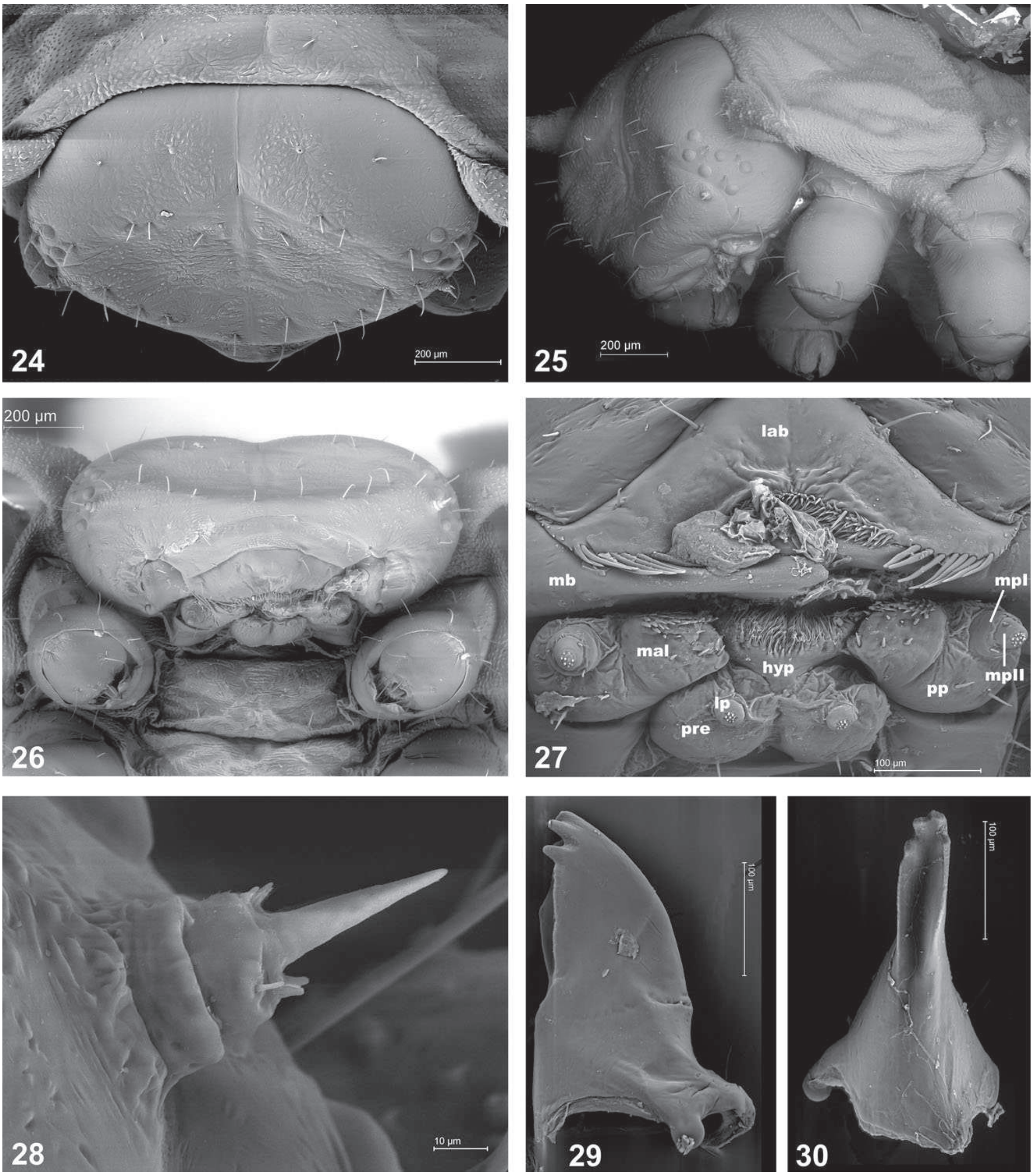
Description. Body broadly oval (Figs 1–4), pronotum subpentagonal, transverse, *c.* 1.6–1.8× wider than long, basal $^3/_4$ parallel-sided and apical fourth converging, anterior margin slightly convex.



Figs. 18–23. *Cladispa amboroensis* **sp.n.**: SEM images of first instar larva. 18, Lateral aspect of segments VII–IX; 19, ventral aspect of urogomphus, abdominal segment IX; 20, spiracle, segment VII; 21, right foreleg; 22, tarsal apex with tarsal claw, setae and deflated tarsungulus; 23, apical view of tarsus, claw and setae.

Vertex of head smooth, shiny, impunctate and with soft medial sulcus. Clypeus transverse, *c.* 2× wider than long, smooth and shiny with a few weakly impressed punctures. Labrum large, elliptical, along midlength with sharp carina. Antennae thin, antennomere I subglobose in both sexes. Remaining antennomeres in females filiform. Males with pectinate antennomeres II–IV, process on III longest and truncate, II and IV short and spiniform; V on ventral side slightly expanded. In both sexes antennomeres I–V sparsely pubescent, shiny and microreticulate, VI–VII intermediate, VIII–XI densely pubescent. Antennomere III twice as long as II and slightly shorter than IV. In males, pedicel and scape subequal in length; in females, scape 1.15× longer than pedicel. Remaining antennomeres proportionally similar in length in both sexes.

Pronotum with disc moderately convex, smooth and shiny, lateral margins with 10–30 coarse punctures. Outer margin not explanate but swollen and separated from disc by deep furrow. Disc with basal transverse impression. All four angles of pronotum with small tubercle possessing single long sensillum. Scutellum subpentagonal, smooth and shiny. Base of elytra as



Figs. 24–30. *Cladispa amboroensis* **sp.n.**: SEM images of head of first instar larva. 24, Dorsal; 25, lateral and; 26, ventral aspects; 27, mouthparts: hyp, hypopharynx; lab, labrum; lp, labial palp; mal, mala; mb, mandibula; mpI, fist maxillary palpomere; mpII, second maxillary palpomere; pp, palpiger; pre, prementum; 28, antenna; 29, lateral and; 30, mesal views of mandible.

wide as base of pronotum, straight. Humeral angles broadly rounded, not protruding. Humeral calli distinct, moderately convex, smooth, impunctate and shiny. Base of elytra with short, impressed and transverse row of coarse punctures. Each elytron with ten regular rows of punctures, scutellar row absent. Rows rather fine, not impressed. Punctures fine but distinctly impressed. Intervals broad, smooth and shiny. Outer rows coarser than inner. Marginal row distinct, interrupted below humeral callus, otherwise even. Explanate margin as broad as 1/5 of elytral width, moderately declivous and around midlength subhorizontal. Elytral surface, shiny and coarsely but sparsely punctate. Extreme outer margin moderately swollen, with one small but distinct denticle in posthumeral area, otherwise even, bare, not serrate. Apex conjointly rounded.

Prosternal process broad, moderately expanded towards mouthparts. Apex broadly rounded and slightly expanded. Its surface shiny, and sparsely and coarsely punctate. Outer margins swollen and separated by deep furrow. Remaining parts of thorax smooth, shiny and micro-reticulate. Episterna and epimera with several fine punctures. Legs rather short, robust. Last tarsomere not projecting behind the sole of third tarsomere. Abdominal sterna I–II completely fused, III–V separate.

Sexual dimorphism distinct in shape of antennae. Females also posessing slightly narrower pronotum and somewhat less stout body.

Cladispa quadrimaculata **Baly, 1858**

(Fig. 2).

Cladispa quadrimaculata Baly, 1858: 23 (original description).

Type locality. ‘Demerara’.

Type material. Holotype (by monotypy), ♂, pinned: ‘Type | H.T. [white, printed and cardboard circular label with red frame] || Baly coll. [white, printed and cardboard] || Cladispa | quadrimaculata | Baly | Demerara [green, handwritten (by Baly) and cardboard label]’ (BMNH). Baly (1858) clearly stated he had only one specimen at disposal. The specimen was provided with an additional red, printed and cardboard label with black frame: ‘HOLOTYPUS | Cladispa | quadrimaculata | Baly, 1858 | Sekerka & Windsor des. 2013’. The holotype is damaged and was dissected. It is missing the left antenna from beyond the antennomere I, as well as the right antenna beyond the III. The mouthparts and genitalia were dissected (not by the authors). The aedeagus is inside the microvial pinned under the specimen. Mouthparts were not preserved except for the labrum.

Differential diagnosis. Cladispa quadrimaculata (Fig. 2) is readily characterized by the uniformly yellow ventrites and legs, except for the black tarsi, while the two congeners have meso- and metathorax partly to completely black and legs mostly infuscate to black. *Cladispa quadrimaculata* also has both bands on the elytra broken and the posterior spots rounded, whereas *C. amboroensis* **sp.n.** and *C. ecuadorica* **sp.n.** have at least one of these forming a complete band. Of all the three species, *C. quadrimaculata* is most coarsely punctate, particularly on the pronotum and in the basal row of punctures on the elytra. All punctures are very deep and pit-like, whereas the other two species have these less numerous and much shallower. Also, it has the external intervals with more confused punctures, but the explanate margin has fewer punctures and thus is smoother than in the congeners.

Description. Measurements ($n = 1$): length of body 7.11 mm, width of body 4.02 mm, length/width of body ratio 1.77, length of pronotum 1.56 mm, width of pronotum 2.56 mm, width/length of pronotum ratio 1.64.

Head, pronotum and scutellum yellow. Elytra yellow, each elytron with two large brown spots, one on base reaching from second interval to extreme outer lateral margin of elytra, the other on posteroapical part of the disc and extending laterally to explanate margin as narrow band (Fig. 2). Ventrites and legs yellow with exception of black tarsi. First antennomere yellow, II–III brown.

Pronotum 1.64× wider than long, subpentagonal, basal 3/4 parallel-sided and apical fourth converging, anterior margin slightly convex. Disc moderately convex, smooth and shiny, with *c.* 30 coarse punctures on each side and deep transverse basal impression possessing a row of coarse and foveolate punctures. Lateral margins swollen along whole length and separated from disc by deep furrow. Scutellum subpentagonal, smooth and shiny. Base of elytra as wide as base of pronotum, straight. Humeral angles broadly rounded, not protruding. Humeral calli distinct, moderately convex. Basal transverse row formed by 4–6 very coarse and deeply impressed punctures. Punctation of disc regularly arranged in rows. Punctures small with interspaces in rows *c.* 1–3× wider than puncture diameter. Intervals 5 and 7 with a few confused punctures. Explanate margin of each elytron with *c.* 10 coarse punctures.

Remaining characters as in the generic description.

Host plant. Orchideaceae: *Cyrtopodium andersonii* (according to Remillet, 1988).

Distribution. French Guiana (Remillet, 1988) and Guyana (Baly, 1858).

Remarks. Jolivet (1989) published the feeding record of larvae based on Remillet’s (1988) thesis (P. Jolivet, personal communication). For an unknown reason, the original source was not cited, and only the genus for both the host plant and the beetle was mentioned in Jolivet (1989). However, Remillet (1988) gave precise information: ‘This hispine was observed by Melle Veyret in April 1977 in the ORSTOM orchid collection in Cayenne on *Cyrtopodium andersonii* R. Br. Larvae feeding on leaves. [translated from French]’ Remillet also mentioned that the larvae remain attached to the leaf and that exuviae are stacked dorsally upon the caudal appendices, a habit typical for nearly all exophagous Cassidinae. Other works (i.e. Jolivet,

1989) mentioning host plant association of *Cladispa* were based on Remillet's thesis. The pale coloration of the holotype and nonmetallic spots suggest that the specimen was still teneral when captured. Other possibilities are that the specimen was bleached by killing substance or when genitalia were dissected.

Cladispa ecuadorica Sekerka & Windsor sp.n.

http://zoobank.org/urn:lsid:zoobank.org:act:8FAC448F-96C3-4E5A-8E3D-025ACBA9EFC1

(Fig. 1).

Type locality. Ecuador: Pastaza Province, Puyo. Puyo is the capital of Pastaza Province situated circa 01°04′00″S, 78°00′04″W at 950 m a.sl. The locality label does not provide any additional information about precise placement of the type locality.

Type material. HOLOTYPE: ♂, pinned: 'ECUADOR,Past. | Puyo | 16 May 1977 | P.J.Spangler& | D.R.Givens#48 [white, printed and cardboard label]' (USNM). The holotype is missing left the antenna from the antennomere VI and right antenna from IX. PARATYPE: ♂, pinned: same data (LSC). The paratype is missing the left antenna from the antennomere II and the right antenna from V. Both specimens were provided with an additional red, printed and cardboard label with black frame: 'HOLOTYPUS [or PARATYPUS respectively] | Cladispa | eduadorica sp. nov. | Sekerka & Windsor des. 2013'.

Differential diagnosis. Cladispa ecuadorica **sp.n.** (Fig. 1) can be easily distinguished by the narrow (*c.* 1/5 of length of elytra) and interrupted basal band on the elytra and the broad and complete posterior band, leaving only the extreme apex of the elytra and the disc yellow. The other two species have basal spots or bands occupying the basal third and apex of the elytra broadly yellow. *Cladispa ecuadorica* is intermediate regarding colour of the underside, as it has the thorax and legs partly infuscate (yellow in *C. quadrimaculata* and mostly black in *C. amboroensis* **sp.n.**). Punctation is similar to *C. amboroensis* but slightly weaker, particularly regarding the pronotal punctures and basal row on the elytra. This row is formed by only 3–4 punctures that do not differ from the others, whereas the two congeners have these distinctly coarser than the remaining. The basal impression on the pronotal disc is almost impunctate (shallowly but distinctly punctate in *C. amboroensis* **sp.n.** and coarsely punctate in *C. quadrimaculata*).

Description. Body measurements ($n = 2$): length 6.95–7.62 mm, width 4.17–4.70 mm, length/width of body ratio 1.62–1.67, length of pronotum 1.39–1.46 mm, width of pronotum 2.46–2.64 mm, width/length of pronotum ratio 1.77–1.81.

Head, pronotum and scutellum yellow. Elytra yellow, with basal and apical metallic blue band. Basal band interrupted by scutellum and sutural interval, otherwise reaching to extreme outer margin of elytra and prolonged on lateral slope and explanate margin. Apical band complete, covering approximately apical 1/4 of elytra, except narrow yellow apical margin (Fig. 1). Prothorax yellow. Meso- and metathorax mostly black, with only areas around trochanters yellow. Abdomen yellow. Coxae and trochanters yellow, femora, tibiae and tarsi irregularly infuscate, brownish-black, only fore femora in basal half yellow. Antennae rusty, first antennomere yellow.

Pronotum *c.* 1.8× wider than long, subpentagonal, basal ¾ parallel-sided and apical fourth converging, anterior margin slightly convex. Disc moderately convex, smooth and shiny, with *c.*15 coarse punctures on each side and deep transverse basal impression. Basal impression with only three punctures on each side. Punctures large but shallow, those in basal impression and towards centre of disc finer than those on sides. Lateral margins swollen and separated from disc by deep furrow, converging parts distinctly less swollen than parallel-sided ones. Scutellum subpentagonal, smooth and shiny. Base of elytra as wide as base of pronotum, straight. Humeral angles broadly rounded, not protruding. Humeral calli distinct, moderately convex. Basal transverse row formed by 3–4 moderate and shallowly impressed punctures that are similar to remaining punctures. Punctation of disc regularly arranged in rows. Intervals 5, 6 and 7 with a few irregularly distributed punctures. Explanate margin of each elytron with *c.* 20 coarse punctures.

Remaining characters as in the generic description.

Length ratio of antennomeres I–VIII (remaining missing): 100:75:138:100:73:88:91:87.

Etymology. Named after Ecuador.

Host plant. Unknown.

Distribution. Ecuador (Pastaza Province).

Remarks. The biology of this species is unknown; however, we predict that it feeds on orchids, as do the two other species in the genus.

Cladispa amboroensis Sekerka & Windsor sp.n.

http://zoobank.org/urn:lsid:zoobank.org:act:376A218E-9147-4DE7-9CDF-F08152551BA5

(Figs 3–30).

Type locality. Bolivia: Santa Cruz Department, Florida Province, Refugio los Volcanes, 18°06′S, 63°36′W, 1045 m a.s.l. The type locality is situated *c.* 5 km north of Bermejo, a small settlement at km 65, Road 7 connecting Santa Cruz de la Sierra and Cochabamba.

Type material. HOLOTYPE: ♂, glued: 'BOLIVIA Santa Cruz dpt. | Florida prov. 9–13.xii.2008 | Refugio los Volcanes | 18°06′S, 63°36′W, 1045 m | D. Windsor, S. Lingafelter | & T. Henry lgt. [green, printed and cardboard label]' (BMNH). PARATYPES: 6 ♂♂, 4 ♀♀, glued and 6 in alcohol: same data

(4 LSC, 6 DWC); 4 ♂♂, 4 ♀♀, glued and 4 in alcohol: 'BOLIVIA Santa Cruz dpt. | Florida prov. | Refugio los Volcanes | 18°06′S, 63°36′W, 1045 m | 29–31.v.2009 | D. Windsor & E. Gowin lgt. [green, printed and cardboard label]' (4 DWC, 1 BMNH, 1 DBET, 2 LSC); 15 ♂♂, 5 ♀♀, glued: 'BOLIVIA Santa Cruz dpt. | Florida prov. 1050–1150 m | Refugio los Volcanes | 18°06.3′S, 63°26.0′W | ORCH: Xylobium sp. | L. Sekerka lgt. 10–14.xii.2011 [white, printed and cardboard label]' (13 LSC, 1 DBET, 4 MNKM, 1 NMP, 1 USNM); 1 ♀, glued: 'Bolivia, depart. Santa Cruz | Refugio los Volcanes | Bermejo env. 1–4.5.2012 | 18°6′18″S, 63°35′55″W | lgt. O. Konvička [white, printed and cardboard label]' (OKC); 1 ♀, glued: 'BOLIVIA Santa Cruz dpt. | Florida prov. 1050–1150 m | Refugio los Volcanes | 18°06.3′S, 63°26.0′W| ORCH: Xylobium sp. | L. Sekerka lgt. 10–12.xi.2013 [white, printed and cardboard label]' (LSC); 1 ♂, glued: 'BOLIVIA Santa Cruz dpt. | Florida prov. 1050–1150 m | Refugio los Volcanes | 18°06.3′S, 63°26.0′W| ORCH: ? Oncidium sp. | L. Sekerka lgt. 10–12.xi.2013 [white, printed and cardboard label]' (LSC). All specimens were provided with an additional red, printed and cardboard label with black frame: 'HOLOTYPUS [or PARATYPUS respectively] | Cladispa | amboroensis sp. nov. | Sekerka & Windsor des. 2013'.

Larvae and pupae, collected on same occasions as adults, were preserved in pure ethanol and are deposited in DWC, DBET and LSC.

Differential diagnosis. Cladispa amboroensis **sp.n.** (Figs 3, 4) can be easily distinguished from its congeners (characters given in parentheses) by the uniformly yellow explanate margin of the elytra (elytral spots extending to explanate margin), the mostly black antennae (rusty to brownish), the mostly black legs, meso- and metathorax (yellow in *C. quadrimaculata* and only partly infuscate to black in *C. ecuadorica*), the complete basal metallic blue band on the elytra (interrupted by suture and at least one interval). Regarding punctation, *C. amboroensis* is intermediate between its congeners, but the punctation is generally similar to *C. ecuadorica*, with the basal row of punctures on the elytra more distinct and coarser than the remaining punctures. Punctures in the basal impression on the pronotal disc are more distinct than in *C. ecuadorica*. The explanate margins are similarly punctate to those in *C. ecuadorica*.

Description. Body measurements: males ($n = 14$): length of body 7.05–7.48 mm (mean 7.28 mm), width of body 4.26–4.47 mm (mean 4.35 mm), length/width of body ratio 1.66–1.73 (mean 1.67 mm), length of pronotum 1.43–1.62 mm (mean 1.55), width of pronotum 2.53–2.79 mm (mean 2.71), width/length of pronotum ratio 1.63–1.82 (mean 1.75). Females (n = 10): length of body 7.43–8.11 mm (mean 7.81 mm), width of body 4.43–4.79 mm (mean 4.65 mm), length/width of body ratio 1.65–1.70 (mean 1.68 mm), length of pronotum 1.54–1.64 (mean 1.60 mm), width of pronotum 2.65–2.89 mm (mean 2.79), width/length of pronotum ratio 1.69–1.81 (mean 1.74). Females (Fig. 3) slightly larger and stouter than males (Fig. 4).

Head, pronotum and scutellum yellow. Scutellum frequently with narrow metallic blue outer margin. Elytra yellow, with basal and apical metallic blue band. Basal band complete and broad occupying ⅓ of elytra, laterally reaching to marginal row of punctures, only scutellum yellow. Apical band complete or interrupted by suture and one interval, but always constricted in sutural area, sometimes suture only somewhat darkened, laterally reaching to marginal row of punctures and as wide as ⅙ length of elytra. Apical sixth of elytra yellow, as well as explanate margin. Living specimens bright red with metallic blue bands and with central portion of elytra nearly white (Figs 5–7). Prothorax yellow. Meso- and metathorax black. Abdomen yellow. Legs mostly uniformly black, with only part of coxae and basal ⅕ of femora yellow, trochanters black. Antennae black, antennomere I yellow, II and sometimes also III basally and externally yellow. Terminal 2–3 antennomeres slightly paler than the preceding.

Pronotum 1.7–1.8× wider than long, subpentagonal, basal ¾ more or less parallel-sided but always slightly concave, apical fourth converging, anterior margin convex. Disc moderately convex, smooth and shiny, with *c.* 12–18 coarse punctures on each side and deep transverse basal impression. Basal impression with a row of coarse punctures, laterally coarser than in middle. Pronotal punctures gradually shallower from sides towards centre. Lateral margins swollen and separated from disc by deep furrow. Scutellum subpentagonal, slightly but distinctly constricted in basal 1/3, smooth and shiny. Base of elytra as wide as base of pronotum, straight. Humeral angles broadly rounded, not protruding. Humeral calli distinct, moderately convex. Basal transverse row formed by 2–5 moderately coarse and impressed punctures that are distinctly coarser than remaining punctures. Punctation of disc regularly arranged in rows. Intervals 7 and 8 with a few irregularly distributed punctures. Explanate margin of each elytron with *c.* 20 coarse punctures.

Length ratio of antennomeres: 100:98:128:102:93:77:100:96:86:99:176 (males), 100:114:132:106:93:83:96:93:98:94:171 (females). In males III and IV subequal in length, in females IV slightly longer than III.

Remaining characters as in the generic description.

Etymology. The species is named after its type locality, Amboró National Park in the Santa Cruz Department of Bolivia.

Host plant. Orchideaceae: *Xylobium* sp. (Fig. 8).

Distribution. Bolivia (Santa Cruz Department, Florida Province).

Remarks. Present data indicate that the species may be restricted to the foothills of the eastern Bolivian Cordillera at the so-called 'Elbow of the Andes' where the direction of the Cordillera abruptly changes. This area largely coincides with Amboró National Park, one of the most diverse parks in the World, and the type locality of *C. amboroensis* is near its south-eastern limit. The vegetation of Refugio Los Volcanes (RLV) is lower Yungas forest that can be characterized as humid premontane cloud forest with steep slopes and cliffs, alluvial valleys and deep gorges. Yungas is generally the typical and most diverse habitat type in Amboró NP. Specimens of *C. amboroensis* were found on five consecutive visits to RLV, occurring on a single species of large orchid growing as a hemi-epiphyte on older forest trees or as a terrestrial plant (Fig. 8) in the understorey of open forests on sandstone hills and cliffs. The orchid was later identified to genus by R. Vásquez based on photographs of sterile mature plants and dry flowering stalks. Two species, *X. flavescens* Schltr. (*Xylobium*) and *X. varicosum* (Rchb.f.) Rolfe, occur on a list of orchid species for RLV (Vásquez *et al.*, 2001). In 2013 we found a single male specimen feeding on a second, as yet unidentified, orchid species. Eggs were laid in strip-like groups of 5–7 along one of the main leaf veins close to the base of the leaf. Freshly emerged larvae feed on the tip of the same leaf. Larvae and adult beetles were mostly found on the underside of middle-aged to old leaves. Feeding damage occurred in the form of narrow strips or broader patches, with feeding grooves running parallel to leaf venation (Fig. 5). Whereas larvae (Fig. 9) and pupae were occasionally found as single individuals, more commonly they occurred in small clusters of 3–6 individuals (Figs 10, 11), this being the first indication of gregarious larval habits in the Spilophorini.

Description of immature stages

Egg

Light ochraceous, membraneous, flat, semitransparent, 4.00–4.25 mm long and 1.5 mm wide ($n = 7$), bearing no maternal adornments. The description is based on older, already hatched eggs, as we never found fresh ones.

Larva

The larva (Figs 9, 12–15) agrees with the eruciform, exophagous larva described for other Spilophorini, including *Oediopalpa negligens* (Weise) by Bruch (1906), *Calyptocephala paralutea* Buzzi & Miyazaki by Buzzi & Miyazaki (1992), *C. gerstaeckeri* Boheman by Córdova-Ballona & Sánchez-Soto (2008), and their synthesis by Świętojańska (2009).

Body elongate, subparallel-sided, widest at abdominal segments I–III; bearing 13 pairs of sparsely setose, conical, lateral scoli, two pairs on each thoracic segment, and one pair on abdominal segments I–VII, but absent on heavily sclerotized segment VIII (Figs 12, 13). Ventral and dorsal surfaces of abdomen flavous in life (Fig. 9), the bases of scoli on segments V–VII and transverse band on dorsum of segment VIII densely covered by asperites. Thoracic and abdominal segments oval in cross-section, flattened, depth approximately one half of width. Prothorax dark brown, distinctly sculpted and plate-like, equal in length to meso- and metathoracic segments combined, bearing two widely spaced scoli on each side. Meso- and metathoracic segments and scoli proportionally similar. Segment IX (urogomphus) with base brown to black, thickened and sclerotized, with ventrally opening anus bordered anteriorly by two sclerotized plates (Fig. 13) covered by fine, equal-spaced setae. Segment IX with two horn-like processes, projecting dorsally (first instar – Figs 18, 19; fifth instar – Figs 12, 13), basal portions greatly thickened and bearing elongate, lateral sulcus sealed by membrane (Fig. 18), terminating apically in thinner and less sclerotized, lyriform extension (Fig. 19), densely covered in setae, which grabs and holds the interior surfaces of the thorax and abdomen of the previous moult, thereby forming a dorsal shield (Figs 14, 15).

Spiracles (Fig. 20) annular, raised, uniforous, with crenulate peritreme on dorsum of abdominal segments I–VIII. Mesothoracic spiracle opening ventrolaterally, partially hidden from laterotergite between fore and middle legs and ventral to thoracic scolus II (Fig. 26).

Legs (Figs 21–23, 25, 26) three-segmented; c-shaped coxa (Fig. 21) bearing three setae on both anterior and posterior surfaces; femur cylindrical with approx. ten stout setae arranged near and parallel to femorotibial joint; tibiotarsus with strong laterally grooved claw (Fig. 22), apex of tibia bearing two prominent setae (Fig. 23), base of claw with three setae, and junction of ventral tibia and pulvinus with 4–6 additional stout setae. Two-lobed fleshy pulvillus attached ventrally to tibiotarsus (Figs 21–23).

Head (Fig. 24) hypognathous, inclined, all but anterior margin covered by prothorax in dorsal view. Epicranial stem long, frontal arms straight, median endocarina extending anteriorly to clypeal suture. Stemmata (Fig. 25) equal-sized, loosely arranged near lower anterior margin of epicranial plate in two lines of three. Clypeus (Fig. 26) subrectangular, width 3–4× length, with three pairs of setae bordering frontoclypeal suture. Labrum (lab, Fig. 27) with two pairs of stout setae parallel and next to clypeolabral suture, lower margin emarginate, bordered by eight stout setae laterally and medially by dense array of finer setae. Antenna (Fig. 28) three-segmented, inserted in frontal plate anterior to lower stemmata, pedicel bearing six sensoria surrounding base of elongate, cone-shaped flagellum, these greater in length than scape and pedicel combined. Mandible (mb, Figs 27, 29) subtriangular, heavily sclerotized, quadridentate, mesal surface (Fig. 30) canaliculate. Maxilla (Fig. 27) consisting of palpifer (pp) bearing two stout setae, circular two-segmented maxillary palp with basal segment bearing two setae (mxI), apical segment with one seta plus a group of 12 short sensillae (mxII). Mala (mal) truncate apically, densely setose, proximally with seven stout setae. Labium densely setose, prementum (pre) attached basally to incompletely divided mentum, each section bearing a single stout seta and a globose single-segmented labial palp (lp) terminating apically with a cluster of nine sensillae. Hypopharynx (hyp) densely covered with numerous spines.

Pupa

Pupa of *C. amboroensis* **sp.n.** broadly resembling description of *Oediopalpa negligens* pupa by Bruch (1906) and summarized by Cox (1996), normally attached to host plant with larval exuvia attached apically. Body (Figs 16, 17) dorsoventrally flattened, widest at abdominal segment III, dorsal surface dark brown grading to flavous laterally, uniformly glabrous. Head bearing pair of conical processes projecting anteriad. Prothorax with two pairs of lateral scoli, meta- and mesothoracic scoli absent,

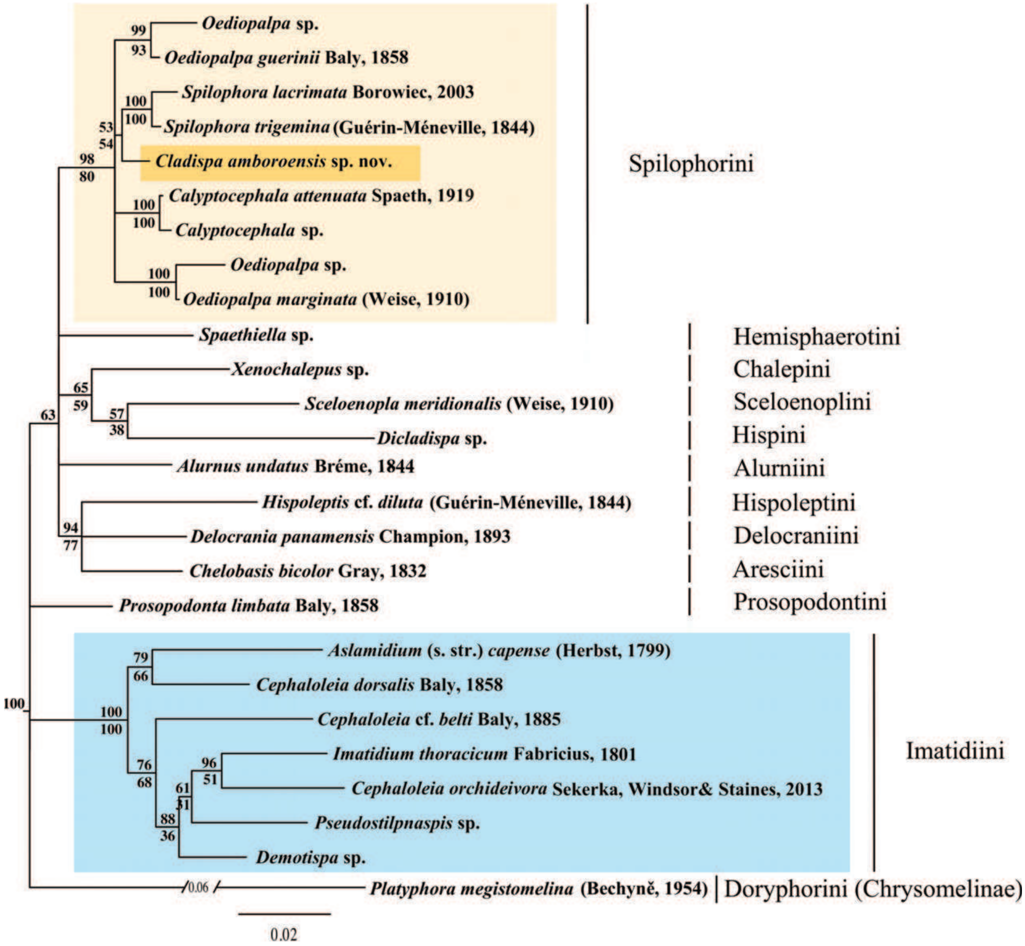


Fig. 31. Phylogenetic relationships among 25 hispine beetle taxa and one outgroup species inferred by Bayesian analysis of three concatenated nuclear ribosomal gene segments (1418 bp); two from *18S* and one from *28S*. Bayesian posterior probabilities are placed above the nodes whereas maximum likelihood (ML) bootstrap values are placed below. Two missing bootstrap values did not have corresponding values in the slightly better resolved ML tree.

abdominal segments I–VI each with one pair. Scoli on prothorax basally flattened and conical towards apex; abdominal scoli flattened with rounded terminals bearing short spines on segments II–VI. Abdominal segments VII–VIII less sclerotized, segments IX–X largely fused, surface wrinkled and expanded laterally into paired, widely separated urogomphi bearing thin vertical lyriform processes (rudimentary furca). Sternite VII laterally possessing pair of sclerotized, toothed processes which grab final larval molt permitting it and older molts to remain attached as a dorsal shield through pupation. Spiracles absent from thoracic segments, annular-uniforous on abdomen, diminishing in size on abdominal segments I through VI, with vestige remaining on VII.

Key to adults of *Cladispa* species

1. Spots on elytra extending to explanate margin; antennae yellow or rusty; legs yellow to infuscate 2
– Explanate margin of elytra uniformly pale; only two basal antennomeres rusty, remaining black; legs mostly black, only bases of femora yellow. Bolivia . . . . *C. amboroensis* **sp.n.**
2. Underside uniformly yellow; legs mostly yellow, with only tarsi black; spots on elytra more or less rounded, isolated, posterior spots smaller than basal spots, apex of elytra broadly yellow. Guianas Region. . . . . *C. quadrimaculata*
– Meso- and metathorax mostly black; femora and tibia infuscate, partly black; basal and apical spots forming transverse

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bands, basal band interrupted in scutellar area, posterior band complete, only extreme outer margin of elytra yellow. Ecuador. . . . . *C. ecuadorica* **sp.n.**

Key to genera of Spilophorini

1. Base of elytra much wider than base of pronotum. 2
– Base of pronotum as wide as or wider than base of elytra. 3
2. Body narrow, elongate, mostly parallel-sided, with narrow margin; lateroapical margin of elytra serrate; antennae in both sexes filiform. . . . . *Oediopalpa*
– Body stout, oval, with broadly explanate margin; lateroapical margin of elytra smooth; antennomeres II–IV serrate in males. . . . . *Cladispa*
3. Third antennomere short, three terminal antennomeres always longer than the third; antennae mostly short (except *C. nigricornis* (Germar)) and filiform in both sexes. . . . . *Calyptocephala*
– Third antennomere very long, three terminal antennomeres always shorter than the third; antennae long, in males antennomeres III–VI serrate. . . . . *Spilophora*

Discussion

Based upon a review of taxonomically useful characters of adult and immature stages and upon phylogenetic analysis, we reassign the genus *Cladispa* to the tribe Spilophorini, and remove it from the tribe Imatidiini. The three species in the genus – two of them described as new – are distributed entirely within South America, one from the Guianas Region, and two from the mid-Andean region. Whereas the feeding habits of *C. ecuadorica* **sp.n.** remain unknown, larvae and adults of the other two species feed exclusively on foliage of Orchidaceae; this is the first report of orchidivory within the Spilophorini and the second known in all Cassidinae (Sekerka *et al.*, 2013). Orchid-feeding is apparently not only limited to *Cladispa* species within Spilophorini, as two of the authors (DW and LS) have independently observed numerous adults of *Spilophora lacrimata* Borowiec feeding on as yet unidentified *Sobralia* sp. at San Rafael, Sucumbíos Province, Ecuador. Because larvae of this species were not observed, it remains unclear whether the association with Orchidaceae is as intimate as it appears to be for species of *Cladispa*. Finally, we report for the first time that *Cladispa amboroensis* **sp.n.** immatures remain aggregated while feeding and pupating, this being the first record of gregarious social behaviour within the Spilophorini.

Bayesian and Maximum Likelihood analyses of partial sequence data from the *18S* and *28S* nuclear ribosomal genes were used to test the monophyly of the hispine genus *Cladispa*, with the analyses including representatives of ten Neotropical tribes and one Paleotropical hispine beetle tribe (Hispini) (see Figure S1, Table S1). Traditionally, the little-known genus *Cladispa* has been placed in the tribe Imatidiini. Neither analysis of the two gene dataset recovers the orchid-feeding species *Cladispa amboroensis* within the well-supported clade containing seven species and five genera of tribe Imatidiini (Fig. 31). Furthermore, Bayesian analysis indicates, with a posterior probability of 98, that *Cladispa* is within the monophyletic clade containing eight species and three genera of Spilophorini, whereas Maximum Likelihood analysis indicates, with bootstrap support of 80, the same pattern of association. Although these reconstructions provide robust support for *Cladispa*'s affiliation with Spilophorini rather than Imatidiini, the assembled taxa and genetic data lack sufficient information to adequately resolve most other hispine tribal relationships. However, moderate levels of support (>50%) are present for a sister taxon arrangement between the genera, *Cladispa* and *Spilophora*. We report for the first time that one of the species (*S. lacrimata*) is also trophically associated with Orchidaceae (*Sobralia* sp.) in Ecuador, as are *Cladispa quadrimaculata* and *C. amboroensis*. Thus, a shared propensity to feed on Orchidaceae appears to underline a close historical relationship between these two genera.

Supporting Information

Additional Supporting Information may be found in the online version of this article under the DOI reference: 10.1111/syen.12070

Figure S1. Single gene trees (*18S*, *28S*) computed by Maximum Likelihood (ML) and Bayesian Inference (MB).

Table S1. Specimen voucher codes, names, tribes, country where collected, presence or absence of pronotal setae, cross-section of larva, position of head relative to thorax, ornamentation attached to the eight abdominal segment, larval feeding niche broadly defined, principal host plant family used by adults and larvae, and GenBank accession numbers for deposited DNA sequence data.

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Chapter V

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Review of Imatidiini genera (Coleoptera: Chrysomelidae: Cassidinae)

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Abstract. Genera of Imatidiini Hope, 1840 are revised and keyed. Colour images demonstrating general habitus of all genera are also given. The following genera are removed from synonymy and their status restored: *Caloclada* Guérin-Méneville, 1844, stat. restit., *Pseudimatidium* Aslam, 1966, stat. restit., and *Xenispa* Baly, 1858, stat. restit. *Xanthispa* Baly, 1858, stat. nov., is raised to full generic rank. *Caloclada fasciata* Guérin-Méneville, 1844 is designated as the type species of *Caloclada*. *Demotispa pulchella* Baly, 1858 is confirmed as the type species of *Demotispa* Baly, 1858 because it was fixed in the original publication. *Solenispa* Weise, 1905 is transferred to Hybosispini Weise, 1910 because it has no pronotal setae and carinate internal margin of eye. *Demotispa* and *Parimatidium* Spaeth, 1938 are reclassified because of misapplication of the type species. In addition, six genera are described as new: *Cyclantispa* gen. nov., *Katkispa* gen. nov., *Lechispa* gen. nov., *Parentispa* gen. nov., *Weiseispa* gen. nov., and *Windsorispa* gen. nov. Two species are removed from synonymy and their species status is restored: *Demotispa sanguinea* (Champion, 1894) stat. restit., and *Xenispa elegans* (Baly, 1875) stat. restit. Species status of *Xenispa pulchella* Baly, 1858, stat. restit., is restored and its replacement name *Demotispa magna* Weise, 1910 is suspended. The following new synonymies are proposed: *Caloclada* Guérin-Méneville, 1844 = *Octocladiscus* Thomson, 1856, syn. nov., and *Demotispa* Baly, 1858 = *Stilpnaspis* Weise, 1905, syn. nov. = *Rhodimatidium* Aslam, 1966, syn. nov.; *Demotispa pulchella* Baly, 1858 = *Stilpnaspis bicolorata* Borowiec, 2000, syn. nov.; *Pseudimatidium limbatum* (Baly, 1885) = *Homalispa limbifera* Baly, 1885, syn. nov.; *Pseudimatidium procerulum* (Boheman, 1862) = *Demotispa brunneofasciata* Borowiec, 2000, syn. nov.; *Weiseispa bimaculata* (Baly, 1858) = *Demotispa biplagiata* Pic, 1923, syn. nov. Based on new synonymies, changes in generic system, and study of type material, the following new combinations are proposed: *Cephaloleia basalis* (Weise, 1910) comb. nov., *C. bondari* (Monrós, 1945) comb. nov., *C. nigronotata* (Pic, 1936) comb. nov.; *Cyclantispa gracilis* (Baly, 1885) comb. nov., *C. subelongata* (Pic, 1936) comb. nov.; *Demotispa coccinata* (Boheman, 1862) comb. nov., *D. filicornis* (Borowiec, 2000) comb. nov., *D. fulva* (Boheman, 1850) comb. nov., *D. fuscocincta* (Spaeth, 1928) comb. nov., *D. impunctata* (Borowiec, 2000) comb. nov., *D. marginata* (Weise, 1905) comb.

nov., *D. marginata* (Weise, 1905) comb. nov., *D. monteverdensis* (Borowiec, 2000) comb. nov., *D. nevermanni* Uhmann, 1930 comb. nov., *D. panamensis* (Borowiec, 2000) comb. nov., *D. rubiginosa* (Boheman, 1862) comb. nov., *D. rubricata* (Guérin-Méneville, 1844) comb. nov., *D. sanguinea* (Champion, 1894) comb. nov., *D. scarlatina* (Spaeth, 1938) comb. nov., *D. tambitoensis* (Borowiec, 2000) comb. nov., *D. tricolor* (Spaeth, 1938) comb. nov.; *Katkispa elongata* (Pic, 1934) comb. nov.; *Lechispa parallela* (Pic, 1930) comb. nov., *P. rosariana* (Maulik, 1931) comb. nov.; *Parentispa formosa* (Staines, 1996) comb. nov., *P. gracilis* (Baly, 1878) comb. nov., *P. vagelineata* (Pic, 1926) comb. nov.; *Pseudimatidium bondari* (Spaeth, 1938) comb. nov., *P. discoideum* (Boheman, 1850) comb. nov., *P. florianoi* (Bondar, 1942) comb. nov., *P. gomescostai* (Bondar, 1943) comb. nov., *P. limbatum* (Baly, 1885) comb. nov., *P. limbatellum* (Boheman, 1862) comb. nov., *P. madoni* (Pic, 1936) comb. nov., *P. neivai* (Bondar, 1940) comb. nov., *P. pallidum* (Baly, 1885) comb. nov., *P. pici* (Staines, 2009) comb. nov., *P. procerulum* (Boheman, 1862) comb. nov., *P. rufum* (Pic, 1926) comb. nov.; *Pseudostilpnaspis curvipes* (Uhmann, 1951) comb. nov., *P. lata* (Baly, 1885) comb. nov.; *Stenispa minasensis* (Pic, 1931) comb. nov., *S. viridis* (Pic, 1931) comb. nov.; *Weiseispa angusticollis* (Weise, 1893) comb. nov., *W. bimaculata* (Baly, 1858) comb. nov., *W. cayenensis* (Pic, 1923) comb. nov., *W. membrata* (Uhmann, 1957) comb. nov., *W. peruana* (Weise, 1910) comb. nov.; *Xenispa atra* (Pic, 1926) comb. nov., *X. baeri* (Pic, 1926) comb. nov., *X. bahiana* (Spaeth, 1938) comb. nov., *X. bicolorata* (Uhmann, 1948) comb. nov., *X. boliviana* (Weise, 1910) comb. nov., *X. carinata* (Pic, 1934) comb. nov., *X. clermonti* (Pic, 1934) comb. nov., *X. collaris* (Waterhouse, 1881) comb. nov., *X. columbica* (Weise, 1910) comb. nov., *X. consobrina* (Weise, 1910) comb. nov., *X. costaricensis* (Uhmann, 1930) comb. nov., *X. cyanipennis* (Boheman, 1850) comb. nov., *X. elegans* (Baly, 1875) comb. nov., *X. exigua* (Uhmann, 1930) comb. nov., *X. fallaciosa* (Pic, 1923) comb. nov., *X. fulvimana* (Pic, 1923) comb. nov., *X. garleppi* (Uhmann, 1937) comb. nov., *X. germaini* (Weise, 1905) comb. nov., *X. grayella* (Baly, 1858) comb. nov., *X. jataiensis* (Pic, 1923) comb. nov., *X. ovatula* (Uhmann, 1948) comb. nov., *X. plaumanni* (Uhmann, 1937) comb. nov., *X. pygidialis* (Uhmann, 1940) comb. nov., *X. romani* (Weise, 1921) comb. nov., *X. scutellaris* (Pic, 1926) comb. nov., *X. sulcicollis* (Champion, 1920) comb. nov., *X. testaceicornis* (Pic, 1926) comb. nov., *X. tibialis* (Baly, 1858) comb. nov., *X. tricolor* (Weise, 1905) comb. nov., *X. uhmanni* (Pic, 1934) comb. nov., *X. zikani* (Spaeth, 1938) comb. nov.; *Windsorispa bicoloricornis* (Pic, 1926) comb. nov., *W. latifrons* (Weise, 1910) comb. nov., *W. submarginata* (Pic, 1934) comb. nov. The replacement name *Cephaloleia pici* nom. nov. is proposed for *Cephaloleia basalis* Pic, 1926 not Weise, 1910. Two species: *Demotispa sallei* Baly, 1858 and *Melanispa bicolor* Zayas, 1960 are considered as Imatidiini incertae sedis because they do not fit in any currently recognized genus. Lectotypes are designated for *Demotispa pulchella* Baly, 1858 and *Himatidium mauliki* Bondar, 1942 to stabilize the nomenclature in the group.

Key words. Coleoptera, Chrysomelidae, Cassidinae, Imatidiini, entomology, taxonomy, new genus, new synonymy, new combination, lectotype designation, Neotropical Region

Introduction

Imatidiini Hope, 1840 is a New World tribe of tortoise beetles (Coleoptera: Cassidinae) distributed from the United States to northern Argentina with about 400 described species. Most species are distributed in the Andes from Nicaragua to Bolivia and in various regions of Brazil. Within Brazil particularly species rich areas are the Atlantic forest (i.e. Bahia, Rio de Janeiro), the Amazon, and the central Brazilian plateau (Goiás, Minas Gerais). Brazil is currently the most species-rich country with 129 known species, which could be due to its enormous size. However, if the actual area of the country is considered, the most species-rich would be Costa Rica (78) and Panama (75) which had incredible diversity despite the smaller geographic scale. Other countries organized by number of species are as follows: Colombia (65), Ecuador (58), Peru (50), Bolivia (33), French Guyana (30), Mexico (28), Guatemala (26), Venezuela (23), Argentina (13), Nicaragua (10), Surinam and Paraguay (each 7), Guyana (4), Belize (3), Cuba, Honduras, Jamaica, Trinidad, and USA (each 2), Dominica, Dominican Republic, Guadeloupe and Uruguay (each 1) (UHMANN 1957a, 1964; STAINES 2014). Based on the aforementioned enumerations, it is evident that species numbers abruptly decreases in subtropical areas. Many countries in reality most likely have much more diverse fauna, but are insufficiently sampled such as Bolivia, Colombia, Ecuador, Peru, and Venezuela. Further sampling of these countries might prove that their species diversity is much higher, even comparable to Brazil, due to the presence of the Andes. This would be particularly true for Colombia and Ecuador as these two countries also contain a high diversity of potential Imatidiini host plants.

All Imatidiini, with a one exception, are associated with various monocots, particularly Zingiberales and Arecaceae. This may explain the high diversity of Imatidiini in Costa Rica and Panama as these two countries represent a diversity hot spot for Zingiberales, particularly Heliconiaceae and Marantaceae. In Brazil, the diversity of Heliconiaceae and Marantaceae is not as high thus Imatidiini frequently use other plant families such are Poaceae and Cyperaceae.

Imatidiini is currently composed of what was traditionally regarded as two independent tribes within two separate subfamilies (Cephaloleiini in Hispinae and Imatidiini in Cassidinae), a system established by CHAPUIS (1875) and followed by most authors until recently. However, even WEISE (1910b), pointed out that both tribes as well as both subfamilies have transitional taxa and are insufficiently separated. This proved to be true and both families were synonymized (i.e. CHEN 1940, 1964). MONRÓS & VIANA (1947) were the first to formally synonymize Cephaloleiini with Imatidiini, however, it was not fully respected by subsequent authors, thus BOROWIEC (1995) and STAINES (2002) resynonymized the tribes and used Cephaloleiini Chapuis, 1875 as the valid name for both. Recently, BOUCHARD et al. (2011) corrected the name to Imatidiini Hope, 1840, following the principle of priority as HOPE (1840) was first who published an available name for that group.

Imatidiini genera were reviewed not long ago (STAINES 2002), however, recent examination of extensive type material showed that some genera were misapplied and that there are some species not fitting in the currently recognized genera. This mainly applies to the traditionally problematic genus *Demotispa* Baly, 1858, used as a collective taxon with problems with its classification having been pointed out several times in the past (i.e. WEISE 1910b, UHMANN 1948, BOROWIEC 2000). STAINES (2009) first attempted to rearrange the *Demotispa* species, however, without reconsideration of the generic system and being based on invalid type species designation, his taxonomic changes proved to be erroneous. Below I provide a review of the Imatidiini genera with correction of *Demotispa* type species designation and appropriate new combinations. The history of *Demotispa* species and their past and present classification is summarized in Table 1.

Material and methods

All taxonomic changes were made upon study of respective type material. Several species were placed in their genera based on primary descriptions only, this fact is always mentioned and these are treated as tentative placements. Each genus is provided with diagnostic characters, range, and summary of biological information. Newly described genera and those with changed concept are catalogued to clearly summarize taxonomic acts proposed in this paper. However, the catalogue is presented in a shortened form that includes references to primary descriptions only, in taxa currently recognized as synonyms the source where the synonymy was proposed is given. For a complete catalogue see STAINES (2014). Each catalogue entry contains the primary reference, followed by the type locality in its original spelling as it appeared in the primary description, and the depository of the respective type specimen(s). Type specimens I have studied are denoted with an exclamation mark '!'. Included are also additional remarks and distribution. Distribution of individual species is given based on published information only and original sources are always cited. When known, I also include the respective topmost administrative divisions (i.e. states for Brazil and Venezuela; regions for Peru; departments for Bolivia and Colombia; districts for Belize; and provinces for remaining countries). Distribution of genera is based on that of species currently included in the respective genus (i.e. see UHMANN 1957a).

Genitalia were studied in most taxa, however, they proved to be very uniform and without classification value at the generic level, and thus are not described or discussed further. They might become potentially useful at the species-level, however, the differences are minor and closely related species have them nearly identical.

For species provided with lectotype designations, the original type material is also given and is cited in original spelling as the data appeared on the respective labels. Double vertical bar (||) separates data on different labels and a single vertical bar (|) separates rows within each label. Additional comments are placed in square brackets.

All genera are provided with a colour photograph of a typical representative to demonstrate external morphology. Photographs were taken using an Olympus SZX16 stereomicroscope with mounted Olympus DP73 digital camera. Each photograph was taken as 40–80 separate stacks and then composed in Helicon Focus software.

The key is based mainly on well visible dorsal characters as many Imatidiini specimens are usually glued on cards. The antennae of many genera are very fragile and many specimens in collections have them missing. This is particularly true for genera with very thin antennae like *Imatidium* Fabricius, 1801, *Demotispa* Baly, 1858 and *Calliaspis* Dejean, 1836. Therefore I attempt to use antennal characters as late as possible in the key. However, some genera can be easily separated by these antennal, as well as ventral characters, thus I give a paragraph depicting these distinctive characters after the key, which may help to separate some genera more easily.

Aslam (1966) published a review of *Imatidium*. The publication appeared in the volume 8 of 13th series of *The Annals and Magazine of Natural History* with the year listed as 1965, however, the publication was actually published as late as on 6 July 1966, as is printed on wrappers. Therefore publication year for the taxa described in that paper is changed here to 1966.

Acronyms of the collection depositories:

BMNH	Natural History Museum, London, United Kingdom (Max Barclay);
DBET	Department of Biodiversity and Evolutionary Taxonomy, Wrocław, Poland (Lech Borowiec);
SDEI	Senckenberg Deutsches Entomologisches Institut, Münchenberg, Germany (Stephan M. Blank);
MMUE	Manchester Museum, Manchester, United Kingdom (Dmitri Logunov);
MNHN	Muséum National d'Histoire Naturelle, Paris, France (Antoine Mantilleri);
MNRJ	Museu Nacional, Rio de Janeiro, Brazil (Miguel and Marcela Monné);
MTD	Museum für Tierkunde, Dresden, Germany (material not studied);
NHRM	Naturhistoriska Riksmuseet, Stockholm, Sweden (Bert Viklund);
USNM	National Museum of Natural History, Smithsonian Institution, Washington, D. C., USA (material not studied);
ZMHB	Museum für Naturkunde, Berlin, Germany (Johannes Frisch, Joachim Willers).

Additional abbreviations: HT – holotype; LT – lectotype; PT – paratype; ST – syntype(s); ! – respective type specimen(s) and collection was examined in this study.

Taxonomy

Imatidiini Hope, 1840

Imatidiidae Hope, 1840: 152
Himatidiini Chapuis, 1875: 361 (as Himatidiites, unjustified emendation; type genus: *Himatidium* Latreille, 1804)
Cephaloleiini Chapuis, 1875: 277 (as Céphaloléites)
Cephaloliini Weise, 1910b: 75 (unjustified emendation; type species: *Cephalolia* Gemminger & Harold, 1876)
Imatidiini Hincks, 1952: 332 (objective junior synonym of Imatidiini Hope, 1840)

Distinguishing characters. Imatidiini species can be easily distinguished from other New World tribes by the head being visible from above, elytra smooth and without striae, ribs, or strongly impressed punctures, the presence of setae in the anterior corners of the pronotum, and onisciform larvae. Smooth elytra are also present in Arescini Chapuis, 1875, Hybosispini Weise, 1910, Prosopodontini Weise, 1910, and Spilophorini Chapuis, 1875 which might in some respects appear similar to the Imatidiini. Spilophorini differs in the presence of setae in all four pronotal corners and exophagous larvae bearing an exuvial shield on the apical furca. Prosopodontini have a seta present in each posterior corner of the pronotum and larva with a widened abdominal plate. Arescini has similar onisciform larva but it has the margin above the head divided forming two flaps, while Imatidiini larvae have the anterior margin complete; Arescini adults differ by the head with interantennal projection and first antennomere (except of *Xenarescus monoceros* (Olivier, 1808)) with a projecting internal lobe, while Imatidiini do not have an interantennal projection, only a more or less distinct carina and the first antennomere is always without a lobe. Hybosispini are the most similar, but differ in the pronotum without setae in any corner and having the internal eye margin carinate.

Genera excluded from Imatidiini. SEKERKA et al. (2014) transferred the genus *Cladispa* Baly, 1858 to Spilophorini based on adult and larval morphology. Here I transfer the genus *Solenispa* Weise, 1905 to Hybosispini Weise, 1910 because it does not have any setae on the pronotum and has a carinate internal margin of the eye.

Biology. The tribe is associated with various monocots, mainly Zingiberales (Costaceae, Heliconiaceae, Marantaceae, and Zingiberaceae), Arecaceae, Poaceae, and Bromeliaceae. Several species are also associated with Cyperaceae, Cyclanthaceae, and Orchideaceae. Host plants were summarized by STAINES (2004, 2014). A single species, *Imatidium rufiventre* Boheman, 1850, was recorded from a dicot tree, *Inga marginata* Willd, belonging to the Fabaceae (GILBERT et al. 2001). Other published associations with dicots must be regarded as doubtful because they were not based on feeding damage by adults or larvae.

Imatidiini larvae are onisciform, rather uniform in shape, and pupate inside the last larval skin. Larvae of most species live hidden in young rolled or folded leaves. Immature stages were recently described in detail by GARCÍA-ROBLEDO et al. (2010) and SEKERKA et al. (2013).

History of the classification of the tribe. CHAPUIS (1875) was the first to establish a complex tribal classification of the Hispinae and Cassidinae, however he did not use Latin for the tribal names. He proposed the names Céphaloléites and Himatidiites, the latter based on *Himatidium* Latreille, 1804, an unjustified emendation of *Imatidium* Fabricius, 1801. WEISE (1910b) proposed the name Cephaloliini, based on *Cephalolia* Gemminger & Harold, 1876, an unjustified emendation of *Cephaloleia* Chevrolat, 1836, and did not mentioned Chapuis's paper. SPAETH (1929) was to Latinize Himatidiites as Himatidiitae and considered Chapuis as the author of the name. MONRÓS & VIANA (1947) synonymized both tribes, considering Cephaloliini as valid and accrediting Chapuis as author of both names. HINCKS (1952) emended Himatidiites Chapuis and Himatidiitae Spaeth to Imatidiini and considered the tribe as valid. UHMANN (1957a) emended Cephaloliini Weise to Cephaloleiini and considered himself as the author of the name. BOROWIEC (1995) and STAINES (2002) considered Imatidiini Chapuis a synonym of Cephaloleiini Chapuis and this system was followed until recently. BOUCHARD et al. (2011) considered both tribes as valid and changed the authorship of Imatidiini from Chapuis, 1875 to Hope, 1840 without any note. HOPE (1840) proposed the name Imatidiidae which has a Latin ending and being available from its original publication. Both tribes are beyond doubt synonymous, differing only in a single character – explanate margin of the elytra, however, this character appears to have evolved several times independently as it occurs in nearly all genera and is variable within each genus. Because of the synonymy, the valid name must be Imatidiini Hope, 1840 as it is the oldest available.

Groups based on mouthparts. Imatidiini genera can generally be divided into three groups on the basis of mouthparts. The first group has the mouthparts hypognathous, with all parts visible only from the underside, and the labrum facing ventrally (*Aslamidium* Borowiec, 1984, *Calloclada* Guérin-Méneville, 1844, *Parentispa* gen. nov., and *Weiseispa* gen. nov.; as in Fig. 33). The second group contains genera with prognathous mouthparts and the labrum facing anteriorly thus not visible from underside, but not projecting forward and not visible from above either (*Calliaspis* Dejean, 1836, *Cephaloleia* Chevrolat, 1836, *Demotispa* Baly, 1858, *Imatidium*

Fabricius, 1801, *Katkispa* gen. nov., *Melanispa* Baly, 1858, *Lechispa* gen. nov., *Parimatidium* Spaeth, 1938, *Pseudimatidium* Aslam, 1966, *Pseudostilpnaspis* Borowiec, 2000, *Spaethaspis* Hincks, 1952, *Stenispa* Baly, 1858, and *Xenispa* Baly, 1858; as in Figs 30–32, 34). Finally, the third group comprises genera with fully prognathous mouthparts, strongly projecting forward, thus the labrum is visible dorsally (*Cyclantispa* gen. nov., *Homalispa* Baly, 1858, and *Xanthispa* Baly, 1858; Figs 1–3, 29). However, some genera are transitional between the groups. For instance *Katkispa*, *Demotispa*, and *Pseudostilpnaspis* have the mouthparts slightly projecting forward, thus partly visible from above, but the labrum is still not visible from above (Figs 12, 17, 30). *Cephaloleia* species also display some variability in the position of the mouthparts. In most species it is diagonally oriented, thus subventral, but the labrum is always facing anteriorly. Some species, however, have mouthparts nearly fully directed anteriorly.

Key to Imatidiini genera

1 Mouthparts prognathous and strongly projecting forward (Fig. 29), thus easily visible from above. Labrum enlarged and visible from above. Habitus: Figs 1–3. 2

– Mouthparts prognathous or hypognathous not or slightly projecting forward (Figs 30–34), thus not visible or only palps partly visible. Labrum not visible from above. Habitus: Figs 4–25. 4

2 Antennae short, as long as pronotal base and with two basal glabrous antennomeres. Antennomere III ca 1.8 times longer than IV, I and II combined only slightly longer than III. Pronotum not emarginate above head, with anterior corners weakly marked and anterior margin protruding anteriad. 3

– Antennae long, about 1.5 times longer than pronotal base, and with one basal glabrous antennomere. Antennomere III ca. 1.2 times longer than IV, I and III combined distinctly much longer than III. Pronotum deeply emarginate above head with anterior corners angulate. Habitus: Fig. 1. .... ***Homalispa*** Baly, 1858

3 Anterior margin of labrum convex, maxillary palps short, as long as two basal antennomeres (Fig. 29). Interantennal space with obtuse, low and narrow carina, thus appearing impressed. Body nearly parallel-sided, pronotum pale and elytra metallic blue. Habitus: Fig. 2. .... ***Cyclantispa* gen. nov.**

– Anterior margin of labrum emarginate, maxillary palps as long as three basal antennomeres and very prominent. Interantennal space with large strongly elevated and broad carina. Body widened posteriorly, drop-shaped and uniformly red. Habitus: Fig. 3. .... ***Xanthispa*** Baly, 1858

4 Pronotum semicircular with distinctly rounded lateral sides. 5

– Pronotum subquadratic and parallel-sided or trapezoidal. 15

5 Head with sharp interantennal carina. 6

– Interantennal carina absent, head between antennae impressed or convex. 10

6 Pronotum without impression and with regularly convex and even surface. Body dorsally usually red to brown and without pattern. 7

– Pronotum with large latero-basal impression on each side, thus its surface uneven. Dorsum yellow with black pattern. Habitus: Fig. 5. .... ***Aslamidium* s. str.** Borowiec, 1984

7 Body elongate. Antennae 11 segmented. 8
– Body shortly oval or circular. Antennae 10 segmented. Habitus: Fig. 7. .... ***Calliaspis*** Dejean, 1836
8 Antennae filiform without pectinate or triangular antennomeres. 9
– Antennomeres IV–X pectinate in male and triangular in female. Habitus: Fig. 25. .... ***Caloclada*** Guérin-Méneville, 1844
9 Explanate margin of elytra broadly explanate, disc of elytra slightly convex. Body dorsally red or brown. Habitus: Fig. 18. .... ***Pseudimatidium*** Aslam, 1966
– Explanate margin of elytra narrow, body moderately convex. Body dorsally metallic blue. .... ***Cephaloleia*** Chevrolat, 1836 (partim)[1]
10 Interantennal area flat or convex and broader than first antennomere. 11
– Interantennal area with deep, pit-like fovea and narrower than first antennomere. 13
11 Pronotum broadly semicircular, 1.9–2.3 times wider than long. Body broadly oval, subcircular or elongate, but not widened posteriorly. Mouthparts more or less projecting, thus usually at least palps visible from above. 12
– Pronotum narrow, 1.5 times wider than long. Body widened from base posteriorly. Interantennal area flat. Mouthparts never visible from above. Habitus: Fig. 19. .... ***Windsorispa* gen. nov.**
12 Antennae long and filiform, first two antennomeres elongate. Body broadly oval with broad explanate margin. Habitus: Figs 14–15. .... ***Demotispa*** Baly, 1858
– Antennae short and thick, first two antennomeres globose. Body elongate, parallel-sided, explanate margin narrow. Habitus: Fig. 17. .... ***Pseudostilpnaspis*** Borowiec, 2000
13 Tarsal claws simple. 14
– Tarsal claws with large basal tooth. Habitus: Fig. 16. .... ***Parimatidium*** Spaeth, 1938
14 Lateroapical margins of elytra smooth. Antennae filiform and short, shorter than basal width of pronotum. Habitus: Fig. 4. .... ***Imatidium*** Fabricius, 1801
– Lateroapical margins of elytra serrate. Antennae moderately thick and long, as long as or slightly longer than basal width of pronotum. Habitus: Fig. 9. .... ***Xenispa*** Baly, 1858 (partim)[2]
15 Lateroapical margin of elytra smooth. 16
– Lateroapical margin of elytra finely to coarsely serrate. 21
16 Body stout with broadly explanate margin of elytra, widened around midlength. 17
– Body elongate with narrow explanate margin of elytra, mostly parallel-sided or widened posteriorly. 18
17 Anterior corners of pronotum narrow and obtuse. Head with sharp interantennal carina. Tarsal claws simple. Habitus: Fig. 13. .... ***Weiseispa* gen. nov.**
– Anterior corners of pronotum broad and rounded. Interantennal area convex, without carina. Tarsal claws with large basal tooth. Habitus: Fig. 8. .. ***Spaethaspis*** Hincks, 1952

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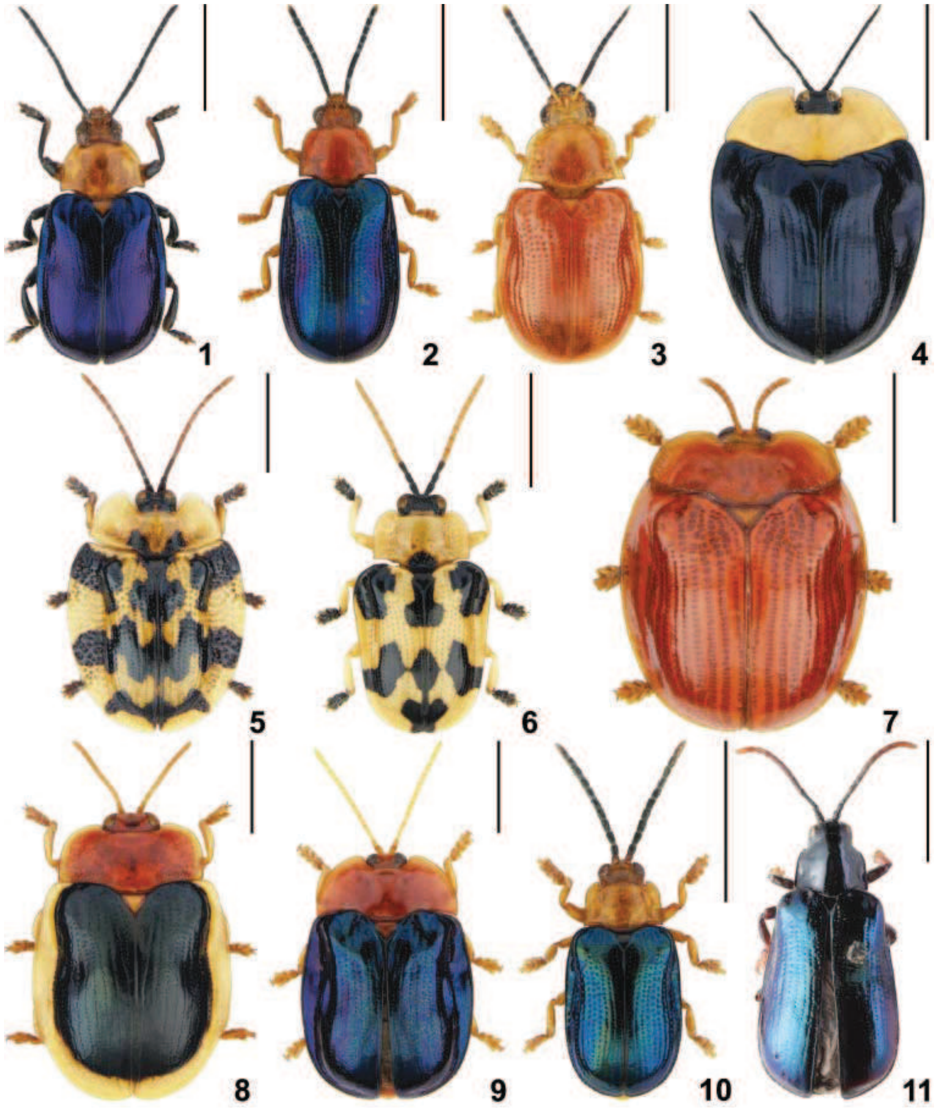
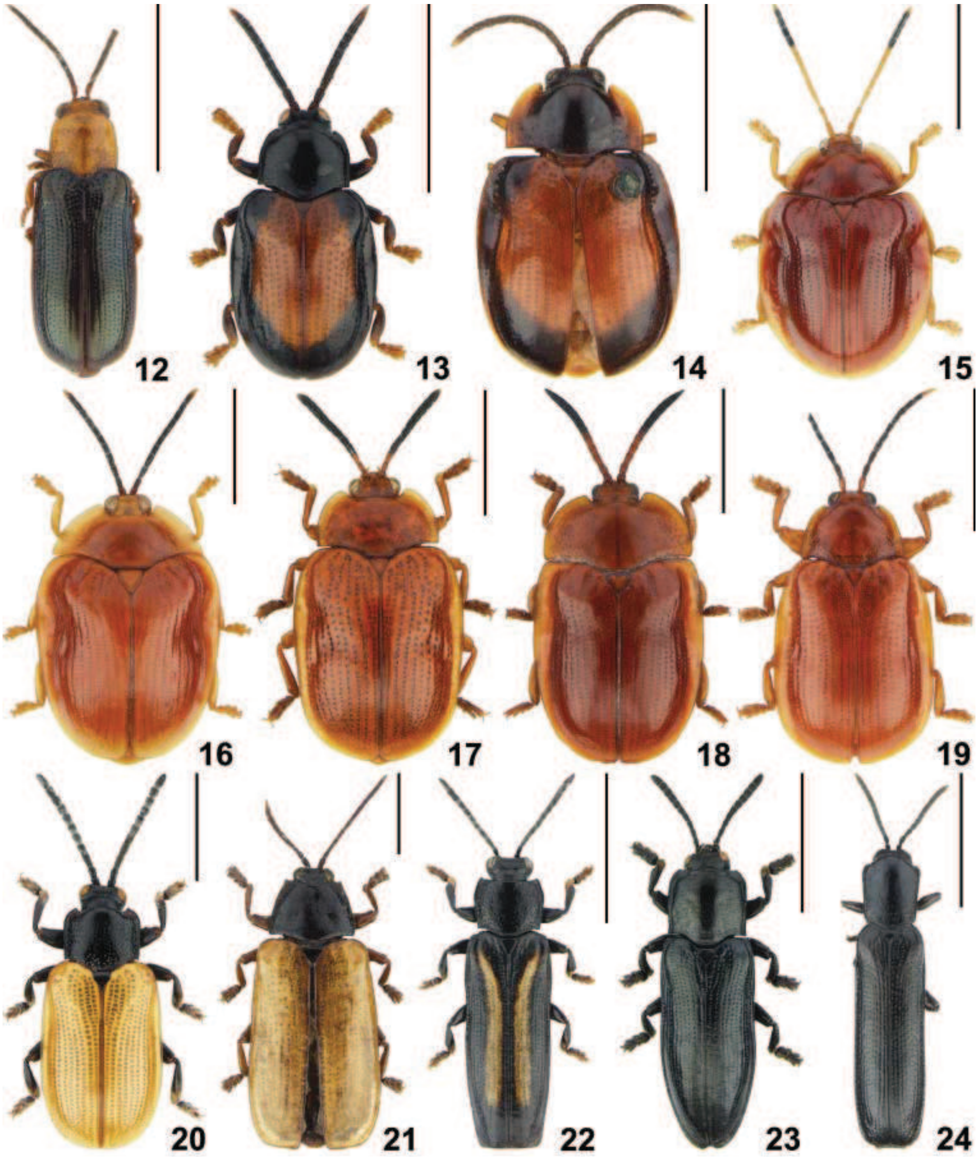
[1] Here belong two *Cephaloleia* species, *C. barroi* Uhmann, 1959, *C. sandersoni* Staines, 1996 and *Demotispa sallei* Baly, 1858. Quite likely these three species belong to a different genus. See more comments in the *Cephaloleia* chapter.

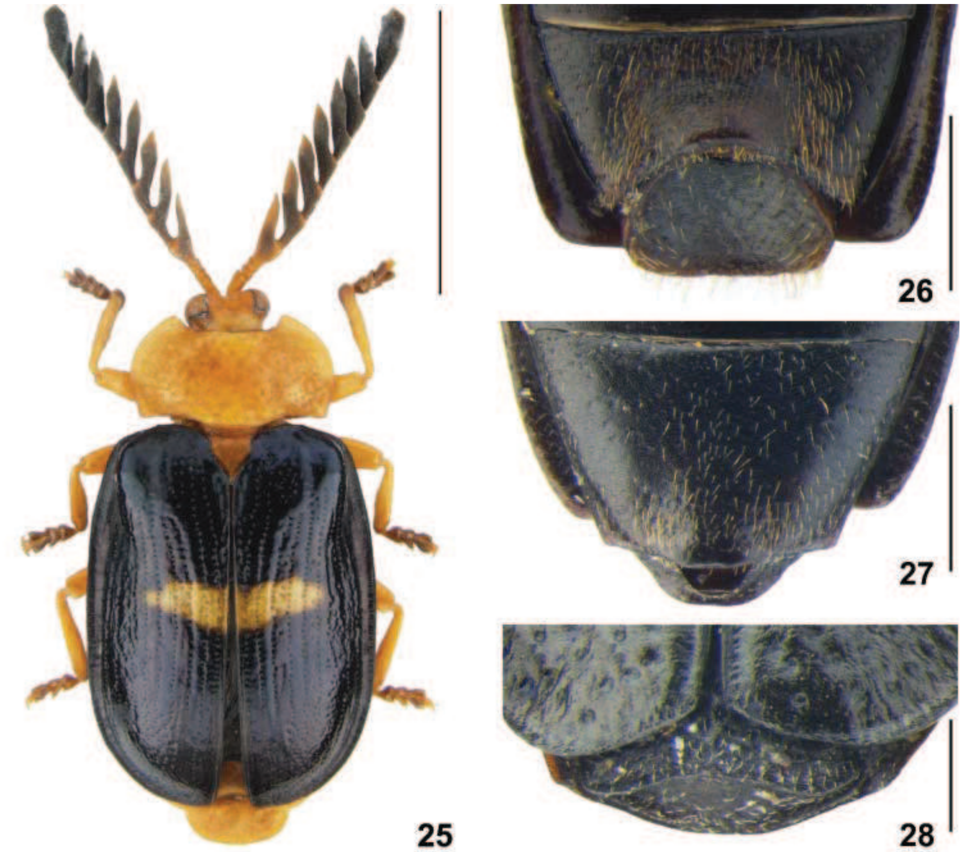
[2] Here belong eight (possibly ten) species with semicircular pronota.



Figs 1–11. Dorsal habitus. 1 – *Homalispa batesii* Baly, 1858, French Guyana: Mt. Kaw; 2 – *Cyclantispa gracilis* (Baly, 1885), Panama: La Fortuna; 3 –*Xanthispa cimicoides* (Guérin-Méneville, 1844), French Guyana: Le Larivot; 4 – *Imatidium thoracicum* Fabricius, 1801, Ecuador: Cascada San Rafael; 5 – *Aslamidium* (s. str.) *capense* (Herbst, 1799), French Guyana: Fourgassie; 6 – *Aslamidium* (*Neoaslamidium*) *pichinchaensis* Borowiec, 1998, Ecuador: Puerto Misahuallí; 7 – *Calliaspis sachaensis* Borowiec & Stojczew, 1998, Ecuador: Shushufindi; 8 – *Spaethaspis lloydi* Hincks, 1952, Ecuador: Río Puno. 9 – *Xenispa testaceicornis* (Pic, 1926), Bolivia: Refugio Los Volcanes; 10 – *Xenispa costaricensis* (Uhmann, 1930), Panama: La Fortuna; 11 – *Euxema insignis* Baly, 1858, syntype, Panama: Volcan de Barú. All scale bars = 2.5 mm.



Figs 12–24. Dorsal habitus. 18 – *Katkispa insignis* (Pic, 1934), syntype, Venezuela: Colonia Tovar; 13 – *Weiseispa angusticollis* (Weise, 1893), Ecuador: Río Palenque; 14 – *Demotispa pulchella* Baly, 1858, lectotype, Peru; 15 – *Demotispa rubiginosa* (Boheman, 1862), Panama: Chiriquí; 16 – *Parimatidium rubrum* (Boheman, 1850), French Guyana: St. Laurent du Maroni; 17 – *Pseudostilpnaspis lata* (Baly, 1885), Panama: Santa Clara; 18 – *Pseudimatidium elaeicola* Aslam, 1966, Colombia: Calima area; 19 – *Windsorispa latifrons* (Weise, 1910), Colombia: Santo Antonio; 20 – *Cephaloleia flavipennis* Baly, 1869, Ecuador: Río Hollín; 21 – *Melanispa* sp., Guadeloupe; 22 – *Parentispa formosa* (Staines, 1996), Panama: La Fortuna; 23 – *Stenispa attenuata* Baly, 1875, Panama: Gamboa; 24 – *Lechispa parallela* (Pic, 1930), syntype, Argentina: Rosas. All scale bars = 2.5 mm.



Figs 25–28. Dorsal habitus and pygidia. 25 – *Caloclada fasciata* Guérin-Méneville, 1844, French Guyana: Mt. Kaw; 26–27 *Parentispa formosa* male and female last ventrite and pygidium; 28 – *Lechispa parallela* (Pic, 1930), pygidium in posterior view. Scale bars: Fig. 25 = 5 mm, Figs 26–28 = 0.5 mm.

18 Body variously shaped but at most 2.7 times longer than wide. Pygidium visible or not but never with sharp and protruding horizontal carina. 19

– Body narrow, ca. 4.5 times longer than wide. Pygidium dorsally mostly visible, with sharp and strongly protruding horizontal carina (Fig. 28). Habitus: Fig. 24. .... ***Lechispa* gen. nov.**

19 Pronotum parallel-sided or widening anteriorly. Pygidium visible from above. Various regions, mainly continental South and Central America. 20

– Pronotum trapezoidal, strongly narrowed anteriorly. Pygidium not visible from above. Endemic to Guadeloupe. Habitus: Fig. 21. .... ***Melanispa*** Baly, 1858

20 Mouthparts prognathous, labrum facing anteriorly. Pygidium in both sexes of same size, never with parabolic cavity. Apex of elytra usually rounded, only one species with truncate apex. Habitus: Fig. 20. .... ***Cephaloleia*** Chevrolat, 1836 (most species)

Figs 29–34. Ventral aspects of head. 29 – *Cyclantispa gracilis* (Baly, 1885); 30 – *Katkispa insignis* (Pic, 1934); 31 – *Windsorispa latifrons* (Weise, 1910); 32 – *Weiseispa angusticollis* (Weise, 1893); 33 – *Parentispa formosa* (Staines, 1996); 34 – *Lechispa parallela* (Pic, 1930). Scale bars = 0.5 mm.

– Mouthparts hypognathous, labrum facing ventrally. Pygidium in males (Fig. 26) greatly enlarged, almost as long as wide and parabolic, in females (Fig. 27) slightly longer than wide and convex, with low and weakly indicated transverse carina. Habitus: Fig. 22. .... ***Parentispa* gen. nov.**

21 Pronotum even, without impressions. Body usually metallic blue or black, never with a pattern. All species with known associations feed on Poaceae. 22

– Pronotum uneven, with large latero-basal impression on each side. Body trapezoidal, yellow with variable black pattern. On Marantaceae. Habitus: Fig. 6. .... ***Aslamidium* subgen. *Neoaslamidium*** Borowiec, 1998

22 Body elongate oval, subparallel-sided or widened posteriorly. 23

– Body cuneiform, in apical third strongly tapered posteriorly. Habitus: Fig. 23. .... ***Stenispa*** Baly, 1858

22 Anterior corners of pronotum indistinct or weakly marked, anterior margin convex and distinctly reaching behind anterior corners. 24

– Pronotum with distinctly protruding anterior corners, thus area above head emarginate, anterior margin sometimes slightly convex, never reaching behind anterior corners. 25

24 Anterior margin strongly protruding anteriad, anterior corners small but distinct, lateral sides smooth. Body slightly widened posteriorly. Antennomere I only slightly shorter than second. Habitus: Fig. 11. .... ***Euxema*** Baly, 1885

– Pronotum without distinct anterior corners, only with small tubercle possessing setae, anterior margin regularly convex, lateral sides slightly serrate. Body parallel-sided. Antennomere I extremely short, second 3.6 times longer than first. Habitus: Fig. 12. .... ***Katkispa* gen. nov.**

25 Body dorsally finely punctate. Elytra uniformly metallic blue or black, pronotum uniformly yellow or dark. Habitus: Fig. 10. .... ***Xenispa*** Baly, 1858

– Body dorsally coarsely punctate. Elytra with pale explanate margins, pronotum pale with median metallic stripe. .... ***Cephaloleia*** Chevrolat, 1836 (partim)[1]

Characteristic morphological features instantly distinguishing some genera

Antennae 10-segmented: ***Calliaspis*** (Fig. 7).

Antennomeres IV–X pectinate or triangular: ***Caloclada*** (Fig. 25).

Mouthparts strongly projecting anteriad: ***Homalispa*** (long antennae, Fig. 1), ***Xanthispa*** (short antennae + emarginate labrum, Fig. 3), and ***Cyclantispa*** (short antennae + convex labrum, Fig. 2).

Pronotum with large latero-basal impressions: ***Aslamidium*** (pronotum semicircular – nominotypical subgenus, Fig. 5; pronotum parallel-sided – subgenus ***Neoaslamidium***, Fig. 6).

Pronotum trapezoidal and strongly narrowing anteriorly: ***Melanispa*** (Fig. 21).

Anterior margin of pronotum strongly protruding anterad: ***Euxema*** (Fig. 11).

Body thin, ca. 4.6 times longer than wide: ***Lechispa* gen. nov.** (Fig. 24).

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[1] Here belong *C. orchideivora* Sekerka, Windsor & Staines, 2013 and possibly also *C. irregularis* Uhmann, 1930.

Body cuneiform, strongly tapering posteriorly and with serrate lateroapical margins of elytra: ***Stenispa*** (Fig. 23).

Apical margin of elytra truncate: ***Melanispa*** (pronotum trapezoidal with smooth lateral sides narrowing apically, Fig. 21) and ***Parentispa*** (pronotum subparallel-sided with serrate sides widening apically, Fig. 22)

Tarsal claws with large basal tooth: ***Parimatidium*** (semicircular pronotum, Fig. 16) and ***Spaethaspis*** (transverse and parallel-sided pronotum, Fig. 8)

Pygidium nearly as long as wide and parabolic: ***Parentispa* gen. nov.** (Fig. 26).

Overview of Imatidiini genera

Aslamidium Borowiec, 1984

(Figs 5–6)

Imatidium sensu Aslam, 1966: 689 (based on erroneous type designation).

Aslamidium Borowiec, 1984: 412. Type species: *Cassida capense* Herbst, 1799 by original designation.

Neoaslamidium Borowiec, 1998: 371 (valid subgenus). Type species: *Himatidium formosum* Spaeth, 1907 by original designation.

Distinguishing characters. *Aslamidium* species can be readily distinguished by the presence of large latero-basal impressions on the pronotum in combination with hypognathous mouthparts and the presence of an interantennal carina. Other Imatidiini species have the surface of the pronotum even, without prominent impressions. The two subgenera can be distinguished by the shape of the pronotum, which is semicircular in *Aslamidium* s. str. (Fig. 5) and subquadratic in *Neoaslamidium* (Fig. 6).

Remarks. Fabricius (1801) proposed the genus *Imatidium* and included five species: *I. fasciatum* Fabricius, 1801, *I. lineola* Fabricius, 1801, *I. sanguineum* Fabricius, 1801, *I. thoracicum* Fabricius, 1801, and *I. trimaculatum* Fabricius, 1801. Latreille (1810) designated *I. thoracicum* Fabricius, 1801 as the type species. Subsequently, Duponchel & Chevrolat (1843) designated *I. fasciatum* as the type species and following authors mostly accepted this designation as valid (i.e. Chenu 1884, Spaeth 1938, Monrós & Viana 1947).

Aslam (1966) revised the generic concept of *Imatidium* and considered *Cassida capense* Herbst, 1799 (= *I. fasciatum*) as the type species, proposing a new genus, *Himatidiella* Aslam, 1966 for species related to *Imatidium thoracicum* Fabricius, 1801, with the latter designated as the type species. Most likely, Aslam overlooked Latreille's (1810) designation, despite it being considered as valid by Hincks (1952), and followed the concept of Duponchel & Chevrolat (1843) instead. However, Latreille's (1810) designation is the oldest available correct designation, thus remaining valid under the ICZN (1999), because of this Borowiec (1984) proposed a new genus *Aslamidium* for *Imatidium* sensu Aslam (1966).

Most recently, Borowiec (1998) divided *Aslamidium* into two subgenera on the basis of the body shape.

Number of species. *Aslamidium* – 7, *Neoaslamidium* – 8 (Borowiec 1998; Borowiec & Sassi 2001; Staines 2006a, 2013).

Key to species. Borowiec & Sassi (2001) and Staines (2006a, 2013) cover all known species.

Biology. Only four species have published host plant associations. These mainly include two plant families, Marantaceae (mainly *Calathea* spp.) and Heliconiaceae (*Heliconia* spp.), of the Zingiberales (i.e. Spaeth 1938, Meskins et al. 2008). According to our observations (Windsor & Sekerka, unpubl. data) most species prefers various *Calathea* species, particularly the subgenus *Neoaslamidium*, which seems to be exclusively associated with this plant genus. Two species of the nominotypical subgenus were recorded from both plant families and we observed two other species feeding exclusively on *Heliconia* species (Sekerka & Windsor, unpubl. data). The record of *Aslamidium* (*Neoaslamidium*) *strandi* (Uhmann, 1930) on Rubiaceae by Flowers & Janzen (1997) is probably based on an occasional sitting record, which was almost surely not its true host plant.

Larvae of most species feed on open leaf surfaces, mainly on the upper side of the leaf.

Distribution. Mexico to Bolivia and south Brazil.

Calliaspis Dejean, 1836

(Fig. 7)

Calliaspis Dejean, 1836: 367. Type species: *Cassida rubra* Olivier, 1808 by monotypy.

Cyanaspis Weise, 1904: 433; Spaeth (1905): 84 (synonymy). Type species: *Cyanaspis testaceicornis* Weise, 1904 by monotypy.

Distinguishing characters. The genus can be unambiguously distinguished by its ten-segmented antennae which is a unique character within the tribe. Unfortunately, pinned museum specimens frequently have broken antennae, but the genus is also characterized by its general habitus. All species have a short and very stout body, with broadly explanate margins and a semicircular pronotum (Fig. 7). It also possesses prognathous, but not projecting mouthparts, an interantennal carina, and smooth apico-lateral margins of the elytra.

Remarks. Dejean's (1836) proposed the genus and included five species, however, only one species, *Cassida rubra* Olivier, 1808, was a valid taxon, which became the type species by monotypy.

Weise (1904) described the genus *Cyanaspis* on the basis of ten-segmented antennae comparing it to *Himatidium* auct. thus he evidently did not know about the existence of *Calliaspis*. A year later *Cyanaspis* was synonymized with *Calliaspis* by Spaeth (1905).

Number of species. 20 (Borowiec 2003).

Key to species. Borowiec (2003) covers all the known species.

Biology. So far nothing was published on the biology of this genus as the association given by Burgess et al. (2003) for *C. rubra* is based on a misidentification[1]. Based on our field

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[1] Burgess et al. (2003) published an ecological paper on chrysomelid herbivory on *Aechmea nallyi* L. B. Smith (Bromeliaceae). Two voucher specimens were sent to C. L. Staines (USNM) who identified the species as *Calliaspis rubra* (Olivier, 1808) and that name was used in the paper. I have studied a single specimen preserved in USNM (Peru: Amazon Center for Education & Enviromental Research, 28.iii.1999, M. Lowman & D. Krabill lgt.) and found that it was misidentified and in fact belongs to *Spaethiella erhardti* (Boheman, 1862). However, it bears Staines identification label (from 2000) as the latter species. Therefore, feeding association with *A. nallyi* must be transferred to *S. erhardti*. The specimen was also published as *S. erhardti* and treated as a new country record for Peru by Chaboo (2002) but without plant association. Moreover, Burgess et al. (2003) mentioned also finding mines on leaves of *A. nallyi* and associated them also with *C. rubra*. Based on photographs published in the paper and description of the damage found on the plants, there is most likely a second cassidine species on *A. nallyi*, most probably some *Acenthroptera* Guérin-Méneville, 1844 species as this genus is known to have mining larvae in bromeliad leaves. The adult beetles may cause very extensive damage, however, they live mostly hidden among bases of leaves making them very difficult to find.

research, the genus seems to be associated with two plant families: Bromeliaceae and Poaceae (Windsor & Sekerka, unpubl. data).
Distribution. Colombia to Bolivia and SW Brazil.

Caloclada Guérin-Méneville, 1844, stat. restit.

(Fig. 25)

Cladophora Dejean, 1836: 366 (nomen nudum).

Caloclada Guérin-Méneville, 1844: 284. Type species: *Caloclada fasciata* Guérin-Méneville, 1844, designated here.

Octocladiscus Thomson, 1856: 480, **syn. nov.** Type species: *Octocladiscus flabellatus* Thomson, 1856 = *Caloclada fasciata* Guérin-Méneville, 1844, by monotypy.

Distinguishing characters. *Caloclada* is a very characteristic genus in the form of its antennae. The antennae show strong sexual dimorphism in the shape of antennomeres IV–X, being pectinate in males (Fig. 25) and triangular in females. Several *Cephaloleia* species also have sexually dimorphic antennae, however, these have only some of the five basal antennomeres (usually III–V) triangular in males and elongate in females.
Remarks. Guérin-Méneville (1844) proposed the name *Caloclada* as a replacement for *Cladophora* Dejean 1836, which was preoccupied. Moreover, Dejean's *Cladophora* is invalid because the original publication contained neither a description nor any valid species name associated with the genus. Guérin-Méneville (1844) clearly stated that he is giving the name *Caloclada* for *Cladophora* sensu Dejean and included two valid species, *Caloclada fasciata* Guérin-Méneville, 1844 and *C. flabellata* Guérin-Méneville, 1844, noting that both species are possibly forms of a single species. Thomson (1856) also pointed the homonymy of *Cladophora* Dejean and provided a new name, *Octocladiscus*, however, he did not mention *Caloclada*. Baly (1858) synonymized *Caloclada* with *Octocladiscus*, retaining the latter as the valid name and synonymizing all the included species under *O. fasciatus* (Guérin-Méneville, 1844). Subsequent authors (i.e. Uhmann 1957a, Staines 2002) omitted *Caloclada*, and considered *Cladophora* as being validated by Guérin-Méneville (1844) through his species, and thus considered it as synonym of *Octocladiscus* because of homonymy of *Cladophora*. However, Guérin-Méneville (1844) validly described *Caloclada*. As *Caloclada* has no senior homonym, it must be considered as valid and having priority over *Octocladiscus*. I was not able to find any type species designation for *Caloclada* thus I designate here *C. fasciata* as the type species.
Number of species. Monotypic (Uhmann 1957a).
Biology. So far, nothing is known about the biology of *Caloclada*.
Distribution. French Guyana.

Cephaloleia Chevrolat, 1836

(Fig. 20)

Cephaloleia Chevrolat, 1836 in Dejean (1836): 366. Type species: *Hispa nigricornis* Fabricius, 1792 designated by Staines (1992).

Cephalolia Gemminger & Harold, 1876: 3601 (unjustified emendation).

Uhmannispa Monrós & Viana, 1947: 172; Uhmann (1957a): 14 (synonymy). Type species: *Uhmannispa maculata* Monrós & Viana, 1947 by original designation.

Distinguishing characters. *Cephaloleia* is the largest genus of the tribe and it is a bit difficult to propose a combination of characters unique to the genus. Generally, *Cephaloleia* species are elongate and parallel-sided with narrow and smooth explanate margins of the elytra, subquadratic or anteriorly widening pronotum, rounded apex of the elytra and the pygidium usually being visible from above (Fig. 20). All species have mouthparts that are not visible from above but being directed forward or diagonally.

Remarks. The genus was proposed by Chevrolat in DEJEAN's (1836) second catalogue and included 31 species, however, only two, *Hispa nigricornis* Fabricius, 1792 and *H. metallica* Fabricius, 1801, were validly described. BALY (1858) designated *Cephaloleia gratiosa* Baly, 1858 as the type species and this designation was generally accepted (i.e. UHMANN 1957a). However, BALY's (1858) designation is invalid because the species was not originally included (article 69.1 of ICZN (1999)), thus STAINES (1992) designated *Hispa nigricornis* Fabricius, 1792, one of the two valid species originally included in the genus, as the type species.

The correct spelling used in the original publication is *Cephaloleia* Chevrolat in DEJEAN (1836). GEMMINGER & HAROLD (1876) considered BLANCHARD (1845) as the author of the genus and unjustly emended the name to *Cephalolia* Gemminger & Harold, 1876.

Having studied the type specimens of many *Cephaloleia* species, I found that some actually belong to different genera, while some described in *Demotispa* actually belong to *Cephaloleia*. *Cephaloleia barroi* Uhmann, 1959, *C. saundersi* Staines, 1996, and *Demotispa sallei* Baly, 1858 form a group of related species, most likely not congeneric with *Cephaloleia,* as they have a semicircular pronotum and convex body-shape, which in some respects is reminiscent of *Pseudostilpnaspis* species. However, having not examined their types I am leaving them in *Cephaloleia*. Some other *Cephaloleia* species like *C. cyanea* Staines, 1996, *C. facetus* Staines, 1996, and *C. gilvipes* Uhmann, 1930 might also belong to different genera.

BONDAR (1942) described *Himatidium mauliki* based on a long series of specimens. Subsequently it was transferred to *Cephaloleia* and a replacement name, *Cephaloleia bondari,* was proposed because of homonymy with *C. mauliki* Uhmann, 1930 (MONRÓS 1945). STAINES (2009) subsequently transferred the species to *Stilpnaspis*. I examined large part of the type series preserved in MNRJ and found it contains three different species, two belonging to *Cephaloleia* and one to *Pseudimatidium*. Therefore, a lectotype is designated for the *Cephaloleia* with bicolorous antennae as this character was mentioned in the original description (BONDAR 1942). The Lectotype, here designated, glued (top specimen on the pin): '2682 [white and handwritten label] || Cotipo [red and handwritten label] || Himatidium 2682 | mauliki Bond. [white and handwritten label] || 398 [white and handwritten label]' (MNRJ); 5 paralectotypes pinned on the same pin as lectotype (lower two belong to *C.* cf. *cognata* Baly, 1869, remaining three are the same as the lectotype): same data as lectotype (MNRJ); 6 paralectotypes glued in pairs on three cards and pinned on one pin (all belonging to *C.* cf. *cognata*): 'Cotipo [red and handwritten label] || Heliconia | E. E Santo [white and handwritten label] || 398 [white and handwritten label]' (MNRJ); 10 paralectotypes, glued in pairs on cards and pinned on one pin (all except left specimen on the second card (= *Pseudimatidium neivai* (Bondar, 1940)) agrees with the lectotype): 'Cotipo [red and handwritten label] || 398 [white and handwritten label]' (MNRJ); 9 paralectotypes, glued on five cards and pinned on one pin (left one on the first card, one on third card and the three on bottom card agrees with the lectotype, remaining belong to *C.* cf. *cognata*): 'Cotipo [red and handwritten label]' (MNRJ).

Species transferred to *Cephaloleia*. *Cephaloleia basalis* (Weise, 1910) comb. nov. (from *Demotispa*), *C. nigronotata* (Pic, 1936) comb. nov. (from *Demotispa*), and *C. bondari* (Monrós, 1945) comb. nov. (from *Stilpnaspis*). Because of the new transfer *Cephaloleia basalis* Pic, 1926 has become a secondary junior homonym of *C. basalis* (Weise, 1910), thus a new substitute name, *C. pici* nom. nov, is proposed for *C. basalis* Pic, 1926.

Species transferred from *Cephaloleia* to other genera. *Cephaloleia minasensis* Pic, 1931 and *C. viridis* Pic, 1931 to *Stenispa*; *Cephaloleia formosus* Staines, 1996, *C. gracilis* Baly, 1878, and *C. vagelineata* Pic, 1926 to *Parentispa* gen. nov.

Number of species. 201 (UHMANN 1957a, STAINES 1996, present paper).

Key to species. Costa Rica (UHMANN 1930), Central America including Caribbean (STAINES 1996); 31 species known from the whole Neotropics (UHMANN 1936).

Biology. *Cephaloleia* species are associated with various monocots and only 54 of them have known host plants. Of these, 39 are associated with Zingiberales (Heliconiaceae, Maranthaceae, Costaceae, Zingiberaceae). Other species live on Arecaceae (8 species), Poaceae (4 species), Cyperaceae, Orchideaceae, and Bromeliaceae (each with one associated species). Larvae as well as adults of most species live in young rolled-up leaves or in inflorescences when rolled leaves are not available or are too young (e.g., MESKINS et al. 2008, GARCÍA-ROBLEDO et al. 2010). Species associated with Arecaceae and Orchideaceae live in young not fully open leaves of their host plants and adults feed on 2–3 youngest leaves, usually only on the youngest, partly open leaf (SEKERKA et al. 2013).

Distribution. Mexico to northern Argentina.

Cyclantispa gen. nov.

(Figs 2, 29)

Type species. *Homalispa gracilis* Baly, 1885, here designated.

Other species included. *Homalispa subelongata* Pic, 1936.

Description. Body elongate oval, 2.0–2.2 times longer than wide. Length 4.5–6.0 mm. Body yellow to red with metallic blue elytra (Fig. 2).

Mouthparts prognathous, projecting forwards and visible from above (Figs 2, 29). Labrum enlarged, its apex rounded and covering mandibulae. Mandibula with three teeth. Maxillary palps as long as two basal antennomeres. Clypeus very short, triangular with low, narrow and obtuse carina projecting between antennal insertions, its lower margin densely pubescent. Antennal insertions deeply impressed. Antennae 11-segmented, strangulate, approximately as long as pronotal base, two basal antennomeres shiny, first globose, second subglobose. Length ratio of antennomeres: 100 : 131 : 277 : 167 : 163 : 132 : 157 : 139 : 171 : 165 : 279, first antennomere very short, second 1.3 times and third 2.8 times longer than first. Eyes large, outer margin with row of setose punctures. Vertex smooth, flat, and finely punctate. Head slightly longer than wide and moderately constricted behind eyes.

Pronotum circa 1.4 times wider than long, sub-rectangular, widest at base and slightly narrowing anteriorly. Anterior margin smooth, convex, moderately projecting forwards and with small tubercle possessing seta on each side at inner eye margin. Anterior corners rounded and not projecting forwards. Basal corners sharp forming almost right angle. Lateral margins weakly explanate, strongly swollen, and separated by impressed row of irregular punctures from disc with apical half slightly crenulate. Basal margin strongly projecting towards scutellum. Disc regularly convex, smooth, strongly shiny, and with several punctures baso-laterally.

Scutellum subpentagonal, smooth, and impunctate.

Elytra about 1.5 times longer than wide, elongate oval, slightly widened around midlength, weakly and regularly convex with ten rows of punctures plus scutellar row. Base of elytra smooth, distinctly wider than base of pronotum. Humeral angles rounded, not protruding. Humeral calli slightly convex, impunctate and micro-sculptured. Punctation completely regular. Punctures moderately large, foveolate. Intervals broad, circa 2–3 times wider than puncture diameter, with several additional setose micro-punctures. Otherwise intervals smooth and micro-sculptured. Punctures disposed regularly and densely in rows with interspaces narrower than puncture diameter. Marginal row distinct in whole length, regular. Explanate margin narrow, as wide as 0.15 elytron width, gradually narrowing towards apex, smooth, micro-sculptured and sparsely micro-punctate. Outer margin swollen, minutely serrate in whole length, serration gradually coarser towards apex of elytra. Each denticle possessing small seta on tip. Apex of elytra conjointly rounded. Epipleura flat, micro-sculptured and sparsely pubescent, gradually narrowing towards apex.

Prosternal process moderately broad with elliptical apex. Its surface smooth and micro-sculptured. Whole surface of meso-, metathorax and abdomen micro-sculptured and sparsely setose. Abdominal sterna I and II fused with slightly marked suture laterally.

Legs normal, all pairs equal. Tarsal claws broadly divergent, simple.

Sexual dimorphism indistinct.

Differential diagnosis. Prognathous and projecting mouthparts place the genus near *Homalispa* Baly, 1858 and *Xanthispa* Baly, 1858. The first differs in having long antennae, about 1.5 times longer than the base of the pronotum with one basal glabrous antennomere (as long as base the of the pronotum with two glabrous basal antennomeres in *Cyclantispa* gen. nov.) and the pronotum sub-trapezoidal with broadly explanate and canaliculate margins, anterior corners angulate and projecting forward (pronotum rectangular with narrow and non-canaliculate margins, anterior corners rounded and weakly marked in *Cyclantispa*). *Xanthispa* has similar antennae but differs in having much longer maxillary palps, a drop-shaped body and the interantennal space with a large and broad carina, while *Cyclantispa* has a subparallel-sided body, palps short, and the internatennal space with a very low carina causing the area to appear impressed.

Etymology. The genus is named after its association with Cyclanthaceae and the name is derived from that plant family name plus the generic name '*Hispa*' in reference to its relationships; gender is feminine.

Remarks and biology. I propose this genus for two species which are very different from all other known *Homalispa* species. Aside from the morphological characters given in the diagnosis, both genera also differ in host plant preference. *Homalispa* is associated with Poaceae and Arecaceae, while *Cyclantispa* is associated with Cyclanthaceae. *Cyclantispa gracilis* is a quite common species in Panama, particularly on *Cyclanthus bipartitus* Poit., living in the closed youngest leaves (Windsor & Sekerka, unpubl. data).

Number of species. 2.

Distribution. Bolivia and Panama.

Demotispa Baly, 1858

(Figs 14–15)

Demotispa Baly, 1858: 65. Type species: *Demotispa pulchella* Baly, 1858 by original designation.
Demothispa Gemminger & Harold, 1876: 3599 (unjustified emendation).
Stilpnaspis Weise, 1905b: 298, **syn. nov.** Type species: *Stilpnaspis marginata* Weise, 1905 by monotypy.
Rhodimatidium Aslam, 1966: 690, **syn. nov.** Type species: *Himatidium coccinatum* Boheman, 1862 by original designation.

Distinguishing characters. *Demotispa* species can be easily recognized by the prognathous and slightly projecting mouthparts, the semicircular pronotum, having the interantennal area broad, convex and without a carina, having a stout body with broadly explanated margins, and having filiform antennae (Figs 14–15). Some *Demotispa* might be misidentified as members of *Pseudostilpnaspis*, but the latter differs in having shorter, thicker antennae, with the first two antennomeres globose, and the body with narrow explanate margins. *Demotispa* has long, filiform antennae with first two antennomeres elongate, and the body with broadly explanate margins. Most of the *Demotispa* species have smooth lateroapical margins of the elytra, but a few have minute but distinct serrulation like *Windsorispa* gen. nov. but the latter differs in having a very narrow pronotum which is about 1.5 times wider than long while *Demotispa* has the pronotum at least two times wider than long. *Windsorispa* also has weakly convex elytra with a flat disc, while *Demotispa* is weakly to moderately convex. Moreover, *Windsorispa* has the mouthparts not visible from above.

Remarks. Baly (1858) clearly designated *D. pulchella* as the type species at the end of the genus description. Despite this fact Monrós & Viana (1947) designated *D. pallida* Baly, 1858 as the type species. Uhmann (1957a) considered *D. pulchella* as the type species thus was in accordance with the original description. However, Staines (1992) listed the species originally included in *Demotispa* and stated that 'There was no type species designation. [in Baly (1858)]'. He considered the designation by Monrós & Viana (1947) as valid because it was older than Uhmann's, despite the fact that Uhmann (1957a) did not provided any designation as all such new acts made in his catalogue had 'Uhmann, hoc loco' instead of a reference. Monrós & Viana (1947) designation is invalid as Baly himself designated the type species thus the type species is here corrected to *D. pulchella*.

This change renders quite a few taxonomic modifications because the whole generic concept has to be changed as the type species, *D. pulchella* (Fig. 14), is not congeneric with *D. pallida*. Moreover, *Demotispa* was always used as collective genus for species which did not fit to other Imatidiini genera.

Demotispa, sensu the type species, agrees with the first group of Spaeth's (1938) system of *Himatidium*. Aslam (1966) erected the genus *Rhodimatidium* for these species, unaware of the existence of *Stilpnaspis*, which has the same generic characters. Borowiec (2000) studied the type species of *Stilpnaspis* and synonymized *Rhodimatidium* with it. However, as *D. pulchella* agrees also with this generic concept, thus both genera are synonymized here with *Demotispa*.

Of all species previously included in *Demotispa* only the type, *D. pulchella*, and two other species remain in that genus, while others are here transferred to various other genera (see Table 1 summarizing the history of *Demotispa*-*Stilpnaspis*-*Himatidium* complex). On the other hand all species previously included in *Stilpnaspis* (see Borowiec 2000) are transferred here to *Demotispa*.

Table 1. Summary of placements of species included in genera *Demotispa* Baly, 1858, *Parimatidium* Spaeth, 1938, *Stilpnaspis* Weise, 1905. TP states for tentative placement based on primary description only.

Name	**Original combination**	**Uhmann (1957)**	**Borowiec (2000)**	**Staines (2009)**	**Present paper**
angusticollis Weise, 1893	*Demothispa*	*Demotispa*	n/a	*Stilpnaspis*	*Weiseispa*
argentina Monrós & Viana, 1947	*Demothispa*	*Demotispa*	n/a	*Stilpnaspis*	*Xenispa* [TP]
atra Pic, 1926	*Demothispa*	*Demotispa*	n/a	*Parimatidium*	*Xenispa* [TP]
baeri Pic, 1926	*Demothispa*	*Demotispa*	n/a	*Demotispa*	*Xenispa*
bahianum Spaeth, 1938	*Himatidium* (*Parimatidium*)	n/a	*Parimatidium*	*Parimatidium*	*Xenispa*
basalis Weise, 1910	*Demothispa*	*Demotispa*	n/a	*Demotispa*	*Cephaloleia*
bicolorata Uhmann, 1948	*Demotispa*	*Demotispa*	n/a	*Parimatidium*	*Xenispa*
bicolorata Borowiec, 2000	*Stilpnaspis*	n/a	*Stilpnaspis*	n/a	*Demotispa*
bicoloricornis Pic, 1926	*Demothispa*	*Demotispa*	n/a	*Parimatidium*	*Windsorispa* [TP]
bimaculata Baly, 1858	*Demotispa*	*Demotispa*	n/a	*Stilpnaspis*	*Weiseispa*
biplagiata Pic, 1923	*Demothispa*	*Demotispa*	n/a	*Demotispa*	*Weiseispa*
boliviana Weise, 1910	*Demothispa*	*Demotispa*	n/a	*Demotispa*	*Xenispa*
bondari Spaeth, 1938	*Himatidium*	*n/a*	*Demotispa*	*Demotispa*	*Pseudimatidium*
brunneofasciata Borowiec, 2000	*Demotispa*		*Demotispa*	*Demotispa*	*Pseudimatidium*
carinata Pic, 1934	*Demothispa*	*Demotispa*	n/a	*Demotispa*	*Xenispa*
cayenensis Pic, 1923	*Demothispa*	*Demotispa*	n/a	*Demotispa*	*Weiseispa*
clermonti Pic, 1934	*Demothispa*	*Demotispa*	n/a	*Parimatidium*	*Xenispa*
coccinatum Boheman, 1862	*Himatidium*	n/a	*Stilpnaspis*	n/a	*Demotispa*
columbica Weise, 1910	*Stilpnaspis*	n/a	*Pseudostilpnaspis*	n/a	*Pseudostilpnaspis*
columbica Weise, 1910	*Demothispa*	*Demotispa*	n/a	*Parimatidium*	*Xenispa*
consobrina Weise, 1910	*Demothispa*	*Demotispa*	n/a	*Demotispa*	*Xenispa*
costaricensis Uhmann, 1930	*Cephalolia*	*Demotispa*	n/a	*Parimatidium*	*Xenispa*
curvipes Uhmann, 1951	*Demotispa*	*Demotispa*	n/a	*Parimatidium*	*Pseudostilpnaspis*
cyanipenne Boheman, 1850	*Himatidium*	n/a	*Parimatidium*	*Parimatidium*	*Xenispa*
discoideum Boheman, 1850	*Himatidium*	n/a	*Demotispa*	*Demotispa*	*Pseudimatidium*
elaeicola Aslam, 1965	*Pseudimatidium*	n/a	*Demotispa*	*Demotispa*	*Pseudimatidium*
elegans Baly, 1875	*Demotispa*	n/a	*Parimatidium*	n/a	*Xenispa*
exigua Uhmann, 1930	*Cephalolia*	*Cephaloleia*	n/a	*Parimatidium*	*Xenispa*

(continued below)

Table 1. Continued.

Name	Original combination	Uhmann (1957)	Borowiec (2000)	Staines (2009)	Present paper
fallaciosa Pic, 1923	*Demothispa*	*Demotispa*	n/a	*Demotispa*	*Xenispa*
filicornis Borowiec, 2000	*Stilpnaspis*	n/a	*Stilpnaspis*	n/a	*Demotispa*
flavipennis Pic, 1923	*Demothispa*	*Demotispa*	n/a	*Demotispa*	*Demotispa* [TP]
florianoi Bondar, 1942	*Himatidium*	n/a	*Demotispa*	*Demotispa*	*Pseudimatidium*
fulvimana Pic, 1923	*Demothispa*	*Demotispa*	n/a	*Stilpnaspis*	*Xenispa*
fulvum Boheman, 1850	*Himatidium*	n/a	*Stilpnaspis*	n/a	*Demotispa*
fuscocinctum Spaeth, 1929	*Himatidium*	n/a	*Stilpnaspis*	n/a	*Demotispa*
garleppi Uhmann, 1937	*Demothispa*	*Demotispa*	n/a	*Parimatidium*	*Xenispa*
germaini Weise, 1905	*Demothispa*	*Demotispa*	n/a	*Demotispa*	*Xenispa*
gomescostai Bondar, 1943	*Himatidium*	n/a	*Demotispa*	*Demotispa*	*Pseudimatidium*
grayella Baly, 1858	*Demotispa*	*Demotispa*	n/a	*Parimatidium*	*Xenispa*
impunctata Borowiec, 2000	*Stilpnaspis*	n/a	*Stilpnaspis*	n/a	*Demotispa*
jataiensis Pic, 1923	*Demothispa*	*Demotispa*	n/a	*Parimatidium*	*Cephaloleia*
lata Baly, 1858	*Cephaloleia*	*Cephaloleia*	n/a	*Demotispa*	*Pseudostilpnaspis*
latifrons Weise, 1910	*Demothispa*	*Demotispa*	n/a	*Parimatidium*	*Windsorispa*
limbata Baly, 1885	*Demotispa*	*Demotispa*	n/a	*Demotispa*	*Pseudimatidium*
limbata Pic, 1928 = *pici* Staines 2009 (replacement name)	*Cephalolia*	*Cephaloleia*	n/a	*Demotispa*	*Pseudimatidium*
limbatella Boheman, 1862	*Himatidium*	*Demotispa*	n/a	*Demotispa*	*Pseudimatidium*
madoni Pic, 1936	*Demothispa*	*Demotispa*	n/a	*Demotispa*	*Pseudimatidium*
marginata Weise, 1905	*Stilpnaspis*	n/a	*Stilpnaspis*	n/a	*Demotispa*
marginicolle Boheman, 1850	*Himatidium*	n/a	*Parimatidium*	*Parimatidium*	*Parimatidium*
mauliki Bondar, 1941 = *bondari* Monrós, 1945 (replacement name)	*Himatidium*	*Cephaloleia*	n/a	*Stilpnaspis*	*Cephaloleia*
melancholica Weise, 1910	*Demothispa*	*Demotispa*	n/a	*Stilpnaspis*	*Weiseispa*
miniaceum Spaeth, 1923	*Himatidium*	n/a	*Stilpnaspis*	n/a	*Demotispa*
monteverdensis Borowiec, 2000	*Stilpnaspis*	n/a	*Stilpnaspis*	n/a	*Demotispa*
neivai Bondar, 1940	*Himatidium*	n/a	*Demotispa*	*Demotispa*	*Pseudimatidium*
nevermanni Uhmann, 1930	*Demothispa*	*Demotispa*	n/a	*Stilpnaspis*	*Demotispa* [TP]

(continued below)

Table 1. Continued.

Name	Original combination	Uhmann (1957)	Borowiec (2000)	Staines (2009)	Present paper
nigronotata Pic, 1936	*Demothispa*	*Demotispa*	n/a	*Demotispa*	*Cephaloleia*
ovatula Uhmann, 1948	*Demotispa*	*Demotispa*	n/a	*Parimatidium*	*Xenispa*
pallida Baly, 1858	*Demotispa*		*Demotispa*	*Demotispa*	*Pseudimatidium*
panamensis Borowiec, 2000	*Stilpnaspis*	n/a	*Stilpnaspis*	n/a	*Demotispa*
peruana Weise, 1910	*Demothispa*	*Demotispa*	n/a	*Stilpnaspis*	*Weiseispa*
plaumanni Uhmann, 1937	*Demothispa*	*Demotispa*	n/a	*Parimatidium*	*Xenispa*
pulchella Baly, 1858 = *magna* Weise, 1910 (replacement name)	*Xenispa*	*Demotispa*	n/a	*Parimatidium*	*Xenispa*
pulchella Baly, 1858	*Demotispa*	*Demotispa*	n/a	*Stilpnaspis*	*Demotispa*
pygidialis Uhmann, 1940	*Demotispa*	*Demotispa*	n/a	*Parimatidium*	*Xenispa*
romani Weise, 1921	*Demothispa*	*Demotispa*	n/a	*Parimatidium*	*Xenispa*
rubiginosum Boheman, 1862	*Himatidium*	n/a	*Stilpnaspis*	n/a	*Demotispa*
rubricatum Guérin-Méneville, 1844	*Imatidium*	n/a	*Stilpnaspis*	n/a	*Demotispa*
rubrum Boheman, 1850	*Himatidium*	n/a	*Parimatidium*	*Parimatidium*	*Parimatidium*
rufa Pic, 1926 = *pallida* Baly, 1858	*Demothispa*	*Demotispa*	*Demotispa*	*Demotispa*	*Pseudimatidium*
sallei Baly, 1858	*Demotispa*	*Demotispa*	n/a	*Demotispa*	incertae sedis
sanguineum Champion, 1893	*Himatidium*	n/a	*Stilpnaspis*	n/a	*Demotispa*
scarlatinum Spaeth, 1938	*Himatidium*	n/a	*Stilpnaspis*	n/a	*Demotispa*
scutelaris Pic, 1926	*Demothispa*	*Demotispa*	n/a	*Demotispa*	*Xenispa*
spaethi Bondar, 1940	*Himatidium*	n/a	n/a	n/a	*Oediopalpa*
strandi Uhmann, 1930	*Demothispa*	*Demotispa*	Transferred by Staines (2006a) to *Aslamidium*		
submarginata Pic, 1934	*Demothispa*	*Demotispa*	n/a	*Demotispa*	*Windsorispa*
testaceicornis Pic, 1926	*Demothispa*	*Demotispa*	n/a	n/a	*Xenispa*
tambitoensis Borowiec, 2000	*Stilpnaspis*	n/a	*Stilpnaspis*	n/a	*Demotispa*
tibialis Baly, 1858	*Demotispa*	*Demotispa*	n/a	*Parimatidium*	*Xenispa*
tricolor Weise, 1905	*Demothispa*	*Demotispa*	n/a	*Demotispa*	*Xenispa*
tricolor Spaeth, 1938	*Himatidium*	n/a	*Stilpnaspis*	n/a	*Demotispa*
uhmanni Pic, 1934	*Demothispa*	*Demotispa*	n/a	*Parimatidium*	*Xenispa*
zikani Spaeth, 1938	*Himatidium* (*Parimatidium*)	n/a	*Parimatidium*	*Parimatidium*	*Xenispa*

Species transferred from/to *Demotispa*. See Table 1.
Number of species. 18 (present paper).
Key to species. Spaeth (1938) covering eight presently valid species.
Biology. Biology of all species is unknown except for *D. panamensis* (Borowiec, 2000) which was observed feeding on two Arecaceae species (Meskins et al. 2008). Based on our observations, it seems that most species are associated with various palms, preferably understorey or subcanopy species (Windsor & Sekerka, unpubl. data).
Distribution. Costa Rica to Brazil.

Euxema Baly, 1885

(Fig. 11)

Euxema Baly, 1885: 3. Type species: *Euxema insignis* Baly, 1885 by monotypy.

Distinguishing characters. *Euxema* can be separated from other Imatidiini genera by the pronotum having the anterior margin convex and strongly projecting beyond, small and obtuse anterior corners (Fig. 11) and this character is so far unique for *Euxema*. The genus also possesses prognathous, but not projecting mouthparts, a parallel-sided pronotum, and the serrate lateroapical margins of the elytra. Externally it is most close to *Xenispa*, and perhaps some species included currently in the latter genus may actually belong to *Euxema*. However, this requires further study.
Remarks. Baly (1885) proposed this genus for a single species differing from all other Imatidiini in the anterior margin of the pronotum being strongly protruding anteriad. Pic (1934a), based on this character, placed his new species*, elongata*, in *Euxema*. However, it is not congeneric with *E. insignis*, and is here transferred to a new genus, *Katkispa* gen. nov. (see description on p. 282).
Number of species. Monotypic (present paper).
Biology. Nothing is known about the biology of this genus. According to Champion (Baly 1885), specimens were collected in high montane cloud forest (ca. 1830–2130 m a.s.l.). *Euxema insignis* resembles several species, here included in *Xenispa*, living in Panama in the similar habitats situated at lower altitude (ca. 1000–1400 m). All of them are associated with native bamboo of the genus *Chusquea* (Poaceae). Based on its body shape, *E. insignis* may also live on *Chusquea*, however, I was not able to rediscover it in Panama so far.
Distribution. Colombia: Magdalena (Staines 2007) and Panama: Chiriquí (Baly 1885).

Homalispa Baly, 1858

(Fig. 1)

Homalispa Baly, 1858: 33. Type species: *Homalispa batesii* Baly, 1858 by original designation.

Distinguishing characters. *Homalispa* can be easily distinguished from other genera by the prognathous and projecting mouthparts, and the long antennae which are about 1.5 times longer than the base of the pronotum (Fig. 1). The other two genera, *Cyclantispa* gen. nov. and *Xanthispa*, with strongly projecting mouthparts differ in having much shorter antennae, approximately as long as the pronotal base and the pronotum without an emargination above the head and with obtuse and non-projecting anterior corners, while *Homalispa* has the antennae at least 1.5 times longer than the pronotal base and the pronotum deeply emarginate above the head and with angulate and projecting anterior corners.

Remarks. Monrós & Viana (1947) designated *Homalispa marginata* Baly, 1858 as the type species, however, this designation is invalid as the type species was fixed in the original description (Baly 1858).

In the past, *Homalispa* was divided in two subgenera: the nominotypical subgenus and *Xanthispa* (i.e. Uhmann 1957a, Staines 2002). However, in my opinion, *Xanthispa* is a distinct genus and its status is restored here. In addition, two species previously classified as *Homalispa* are transferred to *Cyclantispa* gen. nov. (see description on page 274).

Homalispa signata Pic, 1926 is considered as a species of *incertae sedis* because the holotype deposited in MNHN was damaged by pests and is missing the head and part of the pronotum, thus its assignment to a genus is impossible. Pic (1926b) unfortunately did not mention anything about mouthparts. On the other hand the specimen has a quite broadly explanate and horizontal elytral margin like some small *Homalispa* species. However, until new material is available its position cannot be verified.

Species transferred to other genera. *Homalispa collaris* Waterhouse, 1881 and *H. sulcicollis* Champion, 1920 to *Xenispa*; *H. gracilis* Baly, 1885 and *H. subelongata* Pic, 1936 to *Cyclantispa* gen. nov.; and *H. limbifera* Baly, 1885 to *Pseudimatidium*.

Number of species. 22 (Uhmann 1957a, present paper).

Key to species. A key to species has yet to be provided.

Biology. So far, only two *Homalispa* species have published associations with host plants. *Homalispa deyrollei* Baly, 1858 was recorded from Poaceae (Bondar 1938) and *H. nevermanni* Uhmann, 1930 from Arecaceae (Meskins et al. 2008). Our field observations indicate that both associations are correct as we found a number of species on these two plant families (Windsor & Sekerka, unpunbl. data).

Distribution. Nicaragua to Bolivia and Brazil.

Imatidium Fabricius, 1801

(Fig. 4)

Imatidium Fabricius, 1801: 345. Type species: *Imatidium thoracicum* Fabricius, 1801 designated by Latreille (1810).

Himatidium Latreille, 1804: 131 (unjustified emendation).

Himatidiella Aslam, 1966: 690; Borowiec (1984): 412 (synonymy). Type species: *Imatidium thoracicum* Fabricius, 1801 by original designation; objective junior synonym.

Distinguishing characters. *Imatidium* species can be readily recognized by having a broadly explanate margin of the elytra and the pronotum, the latter semicircular and as wide as the base of the elytra (Fig. 4), smooth lateroapical margin of the elytra, interantennal area narrow with deep fovea and without a carina, and by the short and filiform antennae.

Remarks. Two type species were designated for *Imatidium*, by different authors, causing a misapplication of the genus, which was solved by Borowiec (1984); for more comments see remarks under *Aslamidium*.

Imatidium was in the past considered a broadly defined genus containing various groups defined by Spaeth (1938), who also proposed the subgenus *Parimatidium*. Subsequently, Aslam (1966) described Spaeth's groups as independent genera: 1st group – *Rhodimatidium* (= *Demotispa*), 2nd group – *Himatidiella* (= *Imatidium* sensu type species), 3rd group – *Imatidium* sensu Aslam (= *Aslamidium*), and 4th group = *Pseudimatidium*.

Number of species. 14 (Spaeth 1938, Borowiec 2000).
Key to species. Spaeth (1938) covered all presently included species.
Biology. Currently, only two species of *Imatidium* are associated with host plants: *I. rufiventre* Boheman, 1850 with Fabaceae (Gilbert et al. 2001) and *I. thoracicum* with Heliconiaceae and Marantaceae (Spaeth 1938, Meskins et al. 2008). Based on our field work, it seems that most species are associated with various *Heliconia* species rather than with *Calathea* (Marantaceae). The feeding record of *I. rufiventre* on *Inga* (Fabaceae) is a unique dicot association within Imatidiini, but is correct as we repeatedly collected larvae and adults on this host plant (Windsor & Sekerka, unpubl. data).
Distribution. Costa Rica to Bolivia and Brazil.

***Katkispa* gen. nov.**

(Figs 12, 30)

Type species. *Euxema elongata* Pic, 1934, here designated.
Description. Body elongate oval, parallel-sided, 2.5 times longer than wide. Length 4 mm. Body reddish brown with amber pronotum and metallic blue-grey elytra (Fig. 12).

Mouthparts prognathous, with labrum and maxillary palps slightly projecting forwards and slightly visible from above (Fig. 30). Labrum large, as broad as mouth cavity, slightly convex and semicircular, mostly covering mandibulae. Maxillary palps as long as two basal antennomeres. Labial palp half length of maxillary. Clypeus very short, transverse, without carina. Antennal area impressed without interantennal carina. Antennae 11-segmented, strangulate, twice longer than pronotal base, two basal antennomeres shiny, first globular, second transverse. Length ratio of antennomeres: 100 : 363 : 418 : 357 : 392 : 297 : 327 : 327 : 339 : 301 : 506, first antennomere extremely short, second 3.6 times and third 4.2 times longer than first. Eyes moderately large, gena well visible. Vertex sparsely but coarsely punctate. Head as wide as long and not constricted behind eyes but gradually narrowing.

Pronotum approximately as wide as long, subrectangular, subparallel-sided, widest in basal third, and narrower than base of elytra. Anterior margin smooth, convex and moderately projecting forwards and with small tubercle possessing seta on each side at inner eye margin. Anterior corners rounded, serrate and not projecting forwards. Basal corners sharp and projecting in small denticle. Lateral margins serrate, only slightly explanate, moderately swollen, and distinctly separated from disc. Basal margin strongly projecting towards scutellum. Disc regularly convex, micro-reticulate, sparsely but coarsely punctate, punctures gradually denser towards basal corners, shiny but not polished.

Scutellum long, subpentagonal, smooth, micro-reticulate, and impunctate.

Elytra about 1.8 times longer than wide, elongate, parallel-sided, weakly and regularly convex, disc flat, with ten rows of punctures plus scutellar row. Base of elytra smooth, sinuate, distinctly wider than base of pronotum. Humeral angles rounded and not protruding. Humeral calli slightly convex, impunctate and micro-reticulate. Punctation completely regular. Punctures moderately large, foveolate. Intervals broad, about 2–3 times wider than puncture diameter, smooth and micro-reticulate. Punctures disposed regularly and densely in rows with interspaces approximately as wide as puncture diameter. Marginal row distinct in whole length, regular. Elytral margin only slightly explanate, almost perpendicular. Its outer margin subhorizontal, swollen, and minutely serrate in whole length. Each denticle possessing small seta on tip. Apex of elytra conjointly rounded. Epipleura flat, micro-sculptured and sparsely pubescent, gradually narrowing towards apex.

Prosternal process moderately broad with truncate and not projecting apex. Its surface smooth and micro-sculptured. Whole surface of thorax and abdomen micro-sculptured and densely setose, abdomen also densely punctate. Abdominal sterna I and II fused with slightly marked suture laterally. Pygidium elliptical, coarsely punctate and its apical margin densely pubescent.

Legs normal, all pairs equal. Tarsal claws broadly divergent, simple.

Differential diagnosis. *Katkispa* gen. nov. is placed in a group of genera characterized by having prognathous and slightly projecting mouthparts, a subquadratic pronotum, and serrate lateroapical margins of the elytra. It also has the pronotum without protruding corners and an extremely short first antennomere like *Xanthispa* and *Cyclantispa* gen. nov., but the two latter differ in having strongly projecting mouthparts and a transverse pronotum, while *Katkispa* has the pronotum almost as wide as long. The other similar genera, with serrate lateroapical margins of the elytra and parallel-sided pronota, are *Xenispa* and *Euxema*. Both differ from *Katkispa* in having much longer antennae, a transverse pronotum, which is strongly expanded anteriorly in *Euxema* and deeply emarginate in *Xenispa*.

Etymology. This genus is dedicated to my girlfriend Katka Štajerová for her support and patience with my beetle studies, and the name is derived from her first name and generic name '*Hispa*'; gender is feminine.

Remarks. The genus is proposed for *Euxema elongata* which was assigned to the genus *Euxema* by Pic (1934a) on the basis of the convex and protruding anterior margin of the pronotum. However, the species has a very different shape of the pronotum and body from *E. insignis* (i.e. type species of *Euxema*) as well as from all other Imatidiini and thus requires a separate genus.

Biology. Nothing is known about biology of this species.

Number of species. Monotypic.

Distribution. Venezuela: Aragua (Pic 1934a).

Lechispa gen. nov.

(Figs 24, 28, 34)

Type species. *Stenispa parallela* Pic, 1930, here designated.

Other species transferred. *Stenispa rosariana* Maulik, 1933.

Description. Body filiform, elongate and parallel-sided, 4.5–4.7 times longer than wide. Length 5.8–6.2 mm. Body black (Fig. 24).

Mouthparts large, occupying almost whole head between eyes, hypognathous but labrum directed anteriorly (Fig. 34). Labrum, transverse, elliptical, and almost as wide as mouth cavity. Maxillary palps as long as two basal antennomeres. Labial palps as long as three basal segments of maxillary palps. Clypeus very short, present as narrow carina above labrum and projecting between antennal insertions. Antennal insertions deeply impressed. Interantennal carina reaching to frontal margin of vertex. Antennae, 11-segmented, strangulate, 1/5 longer than pronotal length, two basal antennomeres shiny, first globular, second transverse. Length ratio of antennomeres: 100 : 110 : 126 : 114 : 105 : 93 : 110 : 93 : 101 : 103 : 191, second antennomere 1.1 times and third 1.3 times longer than first. Eyes smaller, covering approximately half of lateral length of head thus gena well visible and sparsely punctate. Vertex micro-punctate and micro-reticulate with shallow basal sulcus. Head almost as long as wide, not constricted behind eyes.

Pronotum 1.3 times longer than wide, reversely trapezoidal, distinctly widened anteriad, and widest slightly behind anterior corners. Anterior margin smooth, convex and moderately projecting forwards and with small tubercle possessing seta situated next to anterior corners. Anterior corners rounded and slightly projecting due to explanate margin. Basal corners sharp and with small, projecting denticle due to weak basal constriction. Lateral margins smooth, not explanate but gradually swollen from base to anterior corners, and distinctly separated from disc. Basal margin convex, strongly projecting towards scutellum. Disc regularly convex, micro-reticulate, sparsely but distinctly punctate, punctures gradually coarser and denser towards lateral sides. Its surface appears rather dull due to micro-reticulation.

Scutellum short, subpentagonal, smooth, micro-reticulate, and impunctate.

Elytra about 3.3 times longer than wide, elongate, parallel-sided, weakly and regularly convex, disc flat, with ten rows of punctures plus scutellar row. Base smooth, bisinuate, constricted behind humeral calli and as wide as base of pronotum. Humeral angles rounded, not projecting. Humeral calli distinctly convex, impunctate and micro-reticulate. Punctation completely regular. Punctures moderately large, foveolate. Intervals ca. 1–2 times wider than puncture diameter, smooth and micro-reticulate. Punctures disposed regularly and densely in rows with interspaces ca. 1–2 times wider than puncture diameter. Punctures gradually slightly coarser from disc towards lateral slopes. Marginal row distinct in whole length, regular. Elytral margin not explanate only apical part slightly widened. Outer margin, swollen and smooth. Apex of elytra emarginate. Epipleura flat, micro-sculptured but shiny and very sparsely pubescent.

Prosternal process broad with truncate, apically widening and projecting apex. Its surface with several coarse punctures and micro-sculptured. Apex coarsely punctate and rugose. Whole surface of thorax densely setose. Abdomen micro-sculptured, punctate, and densely setose, setae gradually sparser towards middle. All abdominal sterna well separated. Pygidium strongly transverse with convex apex and strongly elevated and sharp transverse carina along midwidth, its surface rugose and sparsely pubescent (Fig. 28).

Legs normal, all pairs equal. Tarsal claws broadly divergent, simple.

Sexual dimorphism not evaluated because only the two type specimens (one of each species) were studied and dissections were not permitted.

Differential diagnosis. *Lechispa* gen. nov. can be easily recognized by the narrow and long body, which is at least 4.5 times longer than wide. Other genera with elongate bodies (*Stenispa* and some *Cephaloleia* species), are at most 2.7 times longer than wide. *Lechispa* also differs from both in having a transverse sharp carina on the pygidium, which is absent in all other Imatidiini. *Stenispa* also differs in the cuneiform body-shape (completely parallel-sided in *Lechispa*), the serrate lateroapical margins of the elytra (smooth in *Lechispa*), the pronotum being subquadratic and almost parallel-sided (widening anteriorly in *Lechispa*) with a straight apical margin (convex and protruding in *Lechispa*). Some *Cephaloleia* species, particularly those feeding on Poaceae and Cyperaceae, are somewhat similar but all have stouter bodies, not more than two times longer than wide, and with a parallel-sided pronotum.

Etymology. The genus is dedicated to Lech Borowiec, world leading specialist in Cassidinae, for his friendship, support and knowledge shared with me. The name is derived from his first name and generic name '*Hispa*'; gender is feminine.

Number of species. 2.

Key to species. Both species were keyed in the key to Argentinean *Stenispa* by Monrós & Viana (1947).

Biology. Both species were reported feeding on *Paspalum* species, Poaceae (Bosq 1943, Monrós & Viana 1947).

Distribution. Argentina (Buenos Aires, Chaco).

Melanispa Baly, 1858

(Fig. 21)

Melanispa Baly, 1858: 30. Type species: *Melanispa truncata* Baly, 1858 by monotypy.

Distinguishing characters. *Melanispa* can be easily distinguished from all other Imatidiini genera by the strongly trapezoidal and anteriorly narrowing pronotum with straight lateral sides (Fig. 21) and a tubercle with a seta situated in the anterior corners, while other genera have the pronotum semicircular, subquadratic, or widening anteriorly and the tubercle with the seta situated internally of the anterior corners. It also has strongly depressed elytra with truncate apices and the pygidium not visible from above. *Parentispa* gen. nov. and some *Cephaloleia* species also have truncate apices of the elytra but differ in the pygidium being visible from above and in the shape of the pronotum.

Remarks. Zayas (1960) described *M. bicolor* Zayas, 1960 from Cuba which remained enigmatic to all subsequent authors. Mike Ivie (Montana, USA) kindly provided me with photographs of the holotype, preserved in the private collection of the Zayas family in Cuba, which is currently inaccessible. The specimen is rather strange and does not remind me any of the described genera, however, the quality of the photo is not sufficient to make accurate observations thus examination of specimen would be necessary for correct placement of this taxon. It has a broadly trapezoidal and densely punctate pronotum, metallic blue-violet and convex elytra with rounded apices, and thus I am convinced that the species belong to a different genus. Therefore I consider *M. bicolor* as Imatidiini genus *incertae sedis*, until I have opportunity to study the type specimen or new material is available.

Number of species. Monotypic (Uhmann 1957a, present paper).

Biology. Nothing is known about the biology of *Melanispa*, however, based on its flattened body it might feed on palms.

Distribution. Guadeloupe.

***Parentispa* gen. nov.**

(Figs 22, 26–27, 33)

Type species. *Cephaloleia gracilis* Baly, 1878, here designated.
Other species transferred. *Cephaloleia formosus* [sic!] Staines, 1996, *C. vagelineata* Pic, 1926.
Description. Body elongate, subparallel-sided, slightly tapering apically, about 3.8 times longer than wide. Length 4.7–6.2 mm. Body black, each elytron with shortened yellow vitta along midlength of each elytron (Fig. 22).

Mouthparts large, occupying almost whole ventral surface of head, hypognathous with all parts facing ventrally (Fig. 33). Labrum small, semicircular, narrower than mouth cavity, micro-granulose. Maxillary palps as long as pedicel. Labial palps as long as 0.75 of first antennomere. Clypeus very narrow, present as narrow carina above labrum and projecting between antennal insertions. Antennal insertions deeply impressed. Interantennal carina reaching to frontal margin of vertex and then continuing as more or less visible sulcus to base of vertex. Antennae, 11-segmented, strangulate, twice longer than pronotal length, two basal antennomeres shiny and elongate. Length ratio of antennomeres: 100 : 45 : 58 : 62 : 43 : 49 : 46 : 47 : 51 : 41 : 83, first antennomere 2.2 times longer than second and 1.7 times longer than third. Eyes large, covering approximately 0.75 of lateral length of head, gena well visible, coarsely punctate and microreticulate. Whole vertex coarsely punctate and micro-reticulate. Head transverse and strongly constricted behind eyes.

Pronotum 1.4 times wider than long, subquadratic, basally parallel-sided and in anterior third slightly widening, and widest slightly behind anterior corners. Lateral margins serrate. Anterior margin smooth and almost straight, tubercle possessing seta small and situated at internal eye margin. Anterior corners angulate and moderately projecting. Basal corners sharp and slightly projecting. Lateral margins slightly but distinctly explanate and distinctly separated from disc, outer margin serrate, each denticle possessing small seta. Basal margin convex, moderately projecting towards scutellum. Disc weakly and regularly convex, micro-reticulate, sparsely but coarsely punctate, punctures gradually coarser and denser towards lateral sides, central area with several small micropunctures thus appears impunctate. Pronotal surface appears rather dull due to micro-reticulation.

Scutellum triangular, smooth, micro-reticulate, and impunctate.

Elytra about 2.6 times longer than wide, elongate, subparallel-sided and distinctly tapering in apical third, depressed, and with ten rows of punctures plus scutellar row. Base smooth, bisinuate, and slightly wider than base of pronotum. Humeral angles slightly projecting, subangulate. Humeral calli distinctly convex, impunctate and micro-reticulate. Punctation completely regular. Punctures moderately large, shallow. Intervals approximately as wide as puncture diameter, smooth and micro-reticulate. Punctures arranged regularly and densely in rows with interspaces much narrower than puncture diameter. Punctures gradually coarser from disc to lateral slopes. Marginal row distinct in whole length, regular. Elytral margin not explanate. Outer margin, swollen and irregular, minutely crenulate. Apex of elytra truncate with small projecting denticle at sutura. Surface of elytra smooth and semiopaque, apical third sparsely pubescent with very short and adherent setae. Epipleura narrow, flat, shiny and very sparsely pubescent.

Prosternal process broad with truncate, apically widening and projecting apex. Its surface micro-reticulate and shiny. Apex with several irregular sulci and thus appears subrugose. Whole surface of thorax and sparsely setose. Abdomen micro-reticulate, sparsely punctate and pubescent, setae gradually sparser towards middle. Ventrites I and II partly fused but with visible suture; remaining ventrites well separated.

Legs normal, all pairs equal. Tarsal claws broadly divergent, simple.

Sexual dimorphism distinct in formation of pygidium. Males have greatly enlarged pygidium forming ventral parabolic cavity (Fig. 26) while females have pygidium normal, regularly convex and only with apical margin visible from underside (Fig. 27).

Differential diagnosis. *Parentispa* gen. nov. at first glance is reminiscent of some *Cephaloleia* species but is very distinct in the formation of the mouthparts and the pygidium. It has hypognathous mouthparts with all parts facing down, while *Cephaloleia* species have the mouthparts prognathous with the labrum always facing anteriad. *Parentispa* also has truncate and slightly emarginate apices of the elytra and the pygidium in males strongly enlarged, subquadratic, and with a large parabolic concavity. *Cephaloleia* species have the pygidium transverse and elliptical without any concavity. The structure of the pygidium is unique to *Parentispa* within the whole tribe.

Etymology. The genus is dedicated to my parents, Vlasta and Jiří Sekerka for their constant support, without which I would not be able to conduct my beetle studies; the name is derived from Latin '*parentes*' = parents and generic name '*Hispa*'; gender is feminine.

Number of species. 3.

Biology. Two of the three species have published associations with various palms (Arecaceae), mainly the oil palm (*Elaeis guineensis* Jacq.) (Urueta Sandino 1972, Staines 1996).

Distribution. Belize, Brazil, Colombia, Panama.

Parimatidium Spaeth, 1938

(Fig. 16)

Parimatidium Spaeth, 1938: 307 (as subgenus of *Himatidium*); Aslam (1966): 691 (as genus). Type species: *Himatidium rubrum* Boheman, 1850 by original designation.

Distinguishing characters. Readily characterized by the tarsal claws with a large basal tooth, a rare character present only in *Parimatidium* and *Spaethaspis*, while all other Imatidiini have the claws simple. *Spaethaspis* differs in the transverse and subquadratic pronotum and the smooth lateroapical margins of the elytra, while *Parimatidium* has a semicircular pronotum and serrate lateroapical margins of the elytra (Fig. 16). Many *Demotispa* have similar body forms but differ in the simple tarsal claws.

Species transferred to other genera. Spaeth (1938) proposed *Parimatidium* as a subgenus of *Himatidium* and included in it five species having serrate apical margins of the elytra. Recently, Staines (2009) transferred numerous *Demotispa* species to *Parimatidium* on the basis of the serrate lateroapical margins of the elytra. However, both, Spaeth and Staines, overlooked that *Himatidium rubrum* Boheman, 1850, the type species, has tarsal claws with a large basal tooth, while other species included have the tarsal claws simple, thus not being congeneric with the type species. Therefore all species with simple tarsal claws (and also metallic elytra) are transferred here to *Xenispa*. *Himatidium spaethi* Bondar, 1940, also included in *Parimatidium*

(Staines 2009), is here transferred to *Oediopalpa* Baly, 1858 because it has each pronotal corner with a seta. As a result only two species remain in *Parimatidium*.
Number of species. 2 (present paper).
Biology. Nothing is known about the biology of *Parimatidium*.
Distribution. Brazil and French Guyana.

Pseudimatidium Aslam, 1966, stat. restit.

(Fig. 18)

Pseudimatidium Aslam, 1966: 691. Type species: *Demotispa pallida* Baly, 1858 by original designation.
Demotispa sensu Morós & Viana (1947), Borowiec (2000), Staines (2002, 2009).

Distinguishing characters. *Pseudimatidium* can be distinguished by the mouthparts not projecting but prognathous, semicircular pronotum, the presence of a sharp interantennal carina, the disc of the pronotum being regularly convex, body with a moderately broad explanate margin, and the pygidium being not visible from above (Fig. 18). Some *Cephaloleia* and *Pseudostilpnaspis* species are externally similar to *Pseudimatidium* because of the general shape of body with a narrow explanate margin. *Cephaloleia* differs in the subquadratic pronotum and having the pygidium mostly visible from above. *Pseudostilpnaspis* species differ in the convex body and the mouthparts slightly projecting forwards.
Remarks. Aslam (1966) proposed the genus *Pseudimatidium* for Spaeth's (1938) fourth group of *Himatidium* and designated *Demotispa pallida* Baly, 1858 as the type species. Borowiec (2000) considered *Pseudimatidium* as a junior objective synonym of *Demotispa* because both genera had the same type species. I restore here the validity of *Pseudimatidium* as the action of Borowiec (2000) was based on an invalid type species designation for *Demotispa* (for further comments see remarks under *Demotispa*).
Number of species. 12 (present paper).
Key to species. Spaeth (1938) covered three species.
Biology. *Pseudimatidium* species are associated with various palms and their biology has been much more studied than in other Imatidiini, being pests of economically important palms such as the coconut (*Cocos nucifera* L.) or African oil palm (*Elaeis guineensis* Jacq.) (i.e. Bondar 1940a, b, 1942, 1943; Bosq 1943; Monrós & Viana 1947; Aslam 1966).
Distribution. Mexico to northern Argentina.

Pseudostilpnaspis Borowiec, 2000

(Fig. 17)

Pseudostilpnaspis Borowiec, 2000: 162. Type species: *Stilpnaspis columbica* Weise, 1910 by original designation.

Distinguishing characters. *Pseudostilpnaspis* species can be recognized by the semicircular pronotum, interantennal area broad and convex, and without a carina, the regularly convex pronotum, and the thick antennae (Fig. 17). General body shape is reminiscent of *Demotispa*, *Windsorispa* gen. nov., and *Pseudimatidium*. The last one differs in having a sharp interantennal carina. *Windsorispa* differs in the narrow pronotum, depressed elytra, and serrate lateroapical margins of the elytra, while *Pseudostilpnaspis* has a broad pronotum and smooth elytral margins (with the exception of the tentatively included species *P. curvipes* (Uhmann, 1951)).

Demotispa differs in the long and filiform antennae with the basal two antennomeres elongate (moderately long, thick, and with two globular basal antennomeres in *Pseudostilpnaspis*) and the broadly oval body with broad explanate margins, while *Pseudostilpnaspis* has an elongate body with narrow explanate margins.

Species transferred to *Pseudostilpnaspis*. Staines (2009) transferred *Cephaloleia lata* Baly, 1885 to *Demotispa* without further comments. I have examined the type series of *C. lata* and found that it actually belongs to *Pseudostilpnaspis* because it has the two basal antennomeres globular, the interantennal area without a carina but convex, and the pronotum with slightly canaliculate explanate margins.

Number of species. 5 (present paper).

Key to species. A key to species has yet to be provided.

Biology. One species, *P. lata*, was recorded feeding on two *Chamaedorea* species (Arecaceae) (McKenna & Farrell 2005, Meskins et al. 2008). Although, both records are quite likely misidentified and belong to different *Pseudostilpnaspis* species, the association with palms is correct as we collected several species on Arecaceae, mainly *Chamaedorea* species (Windsor & Sekerka, unpubl. data).

Distribution. Belize to Colombia.

***Stenispa* Baly, 1858**

(Fig. 23)

Stenispa Baly, 1858: 13. Type species: *Hispa metallica* Fabricius, 1801 by original designation.

Diagnosis. *Stenispa* species can be easily recognized by the narrow, parallel-sided, and cuneiform body, with serrate lateroapical margins of the elytra. Some *Cephaloleia* species, particularly those associated with various Poaceae, have more or less similar body-forms but differ in having smooth lateroapical margins of the elytra and the pygidium visible from above. *Lechispa* gen. nov. differs in the much more elongate body, smooth lateroapical margins of the elytra, and the pygidium visible from above and possessing a prominent transverse carina.

Species transferred to *Stenispa*. *Stenispa minasensis* (Pic, 1931) comb. nov. and *S. viridis* (Pic, 1931), both from *Cephaloleia*.

Remarks. *Cephaloleia minasensis* Pic, 1931 and *C. viridis* Pic, 1931 are transferred to *Stenispa* because of the cuneiform body and the serrate lateroapical margins of the elytra. On the other hand, *Stenispa parallela* Pic, 1930 and *S. rosarina* Maulik, 1933 are transferred to *Lechispa* gen. nov. because they have smooth lateroapical margins of the elytra, the body-form being strongly elongate and parallel-sided, and the pronotum widening anteriorly.

Number of species. 21 (Uhmann 1957a, present paper).

Key to species. Monrós & Viana (1947) covered three Argentinean species, Staines (2006b) covered two USA species.

Biology. The genus was reported from two plant families Cyperaceae (i.e. Monrós & Viana 1947) and Poaceae (i.e. Ford & Cavey 1985). We have repeatedly collected other species on these two plant families (Windsor & Sekerka, unpubl. data).

Distribution. United States to northern Argentina.

Weiseispa gen. nov.

(Figs 13, 32)

Type species. *Demotispa bimaculata* Baly, 1858, here designated.
Other species transferred. *Demotispa angusticollis* Weise, 1893, *D. cayenensis* Pic, 1923, *D. melancholica* Weise, 1910, and *D. peruana* Weise, 1910.
Description. Body broadly oval, 1.5–1.8 times longer than wide (Fig. 13). Length 3.5–4.0 mm. Ventral parts amber-yellow to yellowish-brown, legs partly pitchy. Pronotum and head black. Elytra uniformly pitchy to black or with large central red macula. Apical margin sometimes pale coloured.

Mouthparts large, occupying almost whole ventral surface of head, hypognathous with all parts facing ventrally (Fig. 32). Labrum small, semicircular, narrower than mouth cavity, micro-granulose. Maxillary palps as long as scapus. Labial palps as long as pedicel. Clypeus shortly triangular, present as narrow carina above labrum and projecting between antennal insertions. Antennal insertions deeply impressed. Interantennal carina sharp, reaching to frontal margin of vertex and then gradually disappearing towards base of vertex. Vertex micro-reticulate and eventually sparsely micro-punctate. Antennae 11-segmented, first two antennomeres strangulate, remaining tubular, twice longer than pronotal length, two basal antennomeres shiny and elongate. Length ratio of antennomeres: 100 : 89 : 81 : 63 : 70 : 52 : 65 : 59 : 57 : 65 : 105, second antennomere 1.1 times longer than third and first 1.1 times longer than second. Eyes large, covering approximately 0.75 of lateral length of head, gena well visible, micro-reticulate and sparsely pubescent. Head approximately as long as wide, not constricted.

Pronotum approximately 1.4 times wider than longer, subquadratic, subparallel-sided but distinctly narrowing anteriad, widest at base. Lateral margins serrate. Anterior margin smooth and weakly convex, tubercles possessing small seta situated internally next to anterior corner. Anterior corners angulate and moderately projecting. Basal corners angulate, not projecting. Lateral margins not explanate, distinctly separated from disc, gradually swollen from apex to base, and smooth. Basal margin convex, moderately projecting towards scutellum. Disc regularly convex, shiny, micro-punctate, sparsely but distinctly punctate, punctures gradually coarser and denser towards base. Anterior and central parts sparsely punctate to almost impunctate.

Scutellum subpentagonal, smooth, shiny, micro-punctate.

Elytra 1.2–1.4 times longer than wide, broadly oval, regularly convex, widest in basal third, apically weakly tapering, and with ten rows of punctures plus scutellar row. Base smooth, bisinuate, and distinctly wider than base of pronotum. Humeral angles broadly rounded, not projecting. Humeral calli distinctly convex, only micro-punctate. Punctation completely regular, fine. Punctures small, shallow. Intervals 1.0–2.5 times wider than puncture diameter, smooth. Punctures arranged regularly in rows with interspaces approximately as wide as puncture diameter. Punctures finer on dark coloured parts of elytra than of pale coloured. Marginal row distinct in whole length, regular. Elytral margin moderately explanate, broadest behind humeri and then narrowing apically. Its surface smooth and micro-reticulate. Outer edge slightly swollen, smooth, more or less distinctly minutely crenulate in widest part of explanate margin. Apex of elytra conjointly rounded. Surface of elytra smooth and shiny. Epipleura moderately broad, flat, micro-reticulate shiny and sparsely pubescent.

Prosternal process broad with truncate, apically widening and projecting apex. Its surface shiny, apex and intercoxal part rugose and irregularly coarsely punctate. Meso- and metathorax densely pubescent, shagreened, metathorax laterally punctate. Abdomen micro-reticulate and densely pubescent. Ventrites I and II fused, suture visible but gradually weaker towards middle; remaining ventrites well separated.

Legs normal, all pairs equal. Tarsal claws broadly divergent, simple.

Sexual dimorphism indistinct, females slightly stouter and bigger.

Differential diagnosis. *Weiseispa* gen. nov. species can be easily recognized by the general body shape, as they have a subquadratic pronotum and the elytra broadly oval with broadly explanate and smooth margins. The only other genus with similar characters is *Spaethaspis* but it differs in being of larger size of 7–8 mm (3–4 mm in *Weiseispa*) and having the tarsal claws with a large basal tooth (simple in *Weiseispa*). Some *Demotispa* species might be misidentified with *Weiseispa* because of the elytral shape, particularly *D. pulchella*, because of the similar colour pattern, but it differs in having a semicircular pronotum with broad explanate margins. *Weiseispa* is also one of the few Imatidiini genera with hypognathous mouthparts with all parts, including labrum, facing ventrally.

Etymology. This genus is dedicated to German leaf beetle specialist Julius Weise (1844–1925), who had a particular interest in Hispinae. The name is derived from his surname and generic name '*Hispa*'; gender is feminine.

Remarks. All species included in *Weiseispa* gen. nov. were originally described in *Demotispa*. Staines (2009) transferred all of them to *Stilpnaspis*, probably because of the elytral shape. *Weiseispa* species have very different morphology from *Stilpnaspis* (= *Demotispa*) as well as biology, as they are associated with *Heliconia* species, while *Demotispa* is associated only with Arecaceae.

Based on the species distribution, the genus seems to be restricted to the eastern foothills of the Andes. The type species, *D. bimaculata*, was described from Mexico, however, the specimen must have been mislabelled as the same population lives only in Colombia and no new specimens exist from Mexico.

Number of species. 5.

Key to species. Uhmann (1937b) covered four species in a key to *Demotispa*.

Biology. So far nothing has been published on the biology of these species. The genus is associated with various *Heliconia* species and the adults as well as larvae feed on open leaf surfaces (Windsor & Sekerka, unpubl. data).

Distribution. Colombia to Bolivia.

***Windsorispa* gen. nov.**

(Figs 19, 31)

Type species. *Demotispa latifrons* Weise, 1910, here designated.

Other species transferred. *Demotispa bicoloricornis* Pic, 1926 and *D. submarginata* Pic, 1934.

Description. Body broadly oval, moderately widening apically, about 1.7 times longer than wide. Length 5.2–5.4 mm. Body uniformly red (Fig. 19).

Mouthparts moderately large, occupying apical third of head, prognathous (Fig. 31). Labrum small, semicircular, narrower than mouth cavity, micro-reticulate. Maxillary palps as long as scapus. Labial palps nearly as long as pedicel and scapus combined. Clypeus very narrow, present as thin carina above labrum not projecting between antennal insertions. Antennal insertions deeply impressed. Interantennal area flat on the same level as vertex. Vertex micro-reticulate and impunctate. Antennae 11-segmented, strangulate, twice longer than pronotal length, two basal antennomeres shiny, pedicel elongate and scapus subglobose. Length ratio of antennomeres: 100 : 107 : 93 : 82 : 86 : 70 : 71 : 72 : 72 : 66 : 135, second antennomere 1.06 times longer than first and 1.14 times longer than third. Eyes normal, covering lateral anterior third of head, gena well visible, smooth and shiny. Head approximately as long as wide, not constricted.

Pronotum 1.5 times wider than long, semicircular, but strongly converging anteriad. Lateral margins smooth. Anterior margin smooth and weakly convex, tubercles possessing small seta situated internally next to anterior corner. Anterior corners subangulate small, but distinctly projecting. Basal corners obtuse and slightly projecting posteriorly. Lateral margins moderately explanate, distinctly separated from disc, gradually narrowing from base to apex, smooth, and slightly canaliculate. Basal margin convex, moderately projecting towards scutellum. Disc regularly convex, shiny, micro-reticulate and micro-punctate, laterobasally sparsely but coarsely punctate, punctures gradually coarser and denser towards base. Anterior and central parts impunctate.

Scutellum subpentagonal, smooth, shiny, micro-reticulate.

Elytra about 1.2 times longer than wide, broadly oval and widening apically, regularly convex, widest in apical 0.25, and with ten rows of punctures plus scutellar row. Base smooth, bisinuate, and slightly narrower than pronotum. Humeral angles broadly rounded, only indistinctly projecting. Humeral calli distinctly convex, smooth and shiny. Punctation completely regular, moderate. Punctures small, shallow. Intervals 1–2 times wider than puncture diameter, smooth. Punctures arranged regularly in rows with interspaces 0.5–1.0 times as wide as puncture diameter. Marginal row distinct in whole length, regular. Elytral margin moderately explanate, broadest around midlength and then moderately tapering apically. Its surface smooth, shiny, and micro-reticulate. Outer margin, slightly swollen, distinctly serrate, each denticle possessing small seta. Apex of elytra conjointly rounded, smooth. Surface of elytra smooth and shiny. Epipleura moderately broad, flat, micro-reticulate shiny and sparsely pubescent.

Prosternal process broad with convex, widening and projecting apex. Its surface shiny, apex and intercoxal part irregularly rugose and micro-reticulate. Mesothorax moderately sculptured. Metathorax smooth and shiny, laterally finely shagreened. Abdomen micro-reticulate, sparsely punctate and densely pubescent. Ventrites I and II fused, suture visible but gradually weaker towards middle; remaining ventrites well separated.

Legs normal, all pairs equal. Tarsal claws broadly divergent, simple.

Sexual dimorphism indistinct, females slightly stouter and bigger.

Differential diagnosis. The genus is characterized by prognathous mouthparts, but not projecting, thus not visible from above, having a semicircular pronotum and the head without an interantennal carina. The genera most similar are *Demotispa* and *Pseudostilpnaspis* which differ in having a broad, at least two times wider than long, pronotum, the mouthparts slightly projecting anteriad, and the convex interantennal area.

Etymology. This genus is dedicated to my friend, and specialist in Cassidinae, Don Windsor (Panamá), who introduced me to the fascinating biology of Neotropical Cassidinae and has always been great a fellow on our expeditions. The name is derived from his surname and generic name '*Hispa*'; gender is feminine.

Remarks. I include three species in *Windsorispa*, however, placement of *W. bicoloricornis* is tentative as I did not examine its type, thus the transfer is based only on the short description and comparative note by Pic (1926a).

Number of species. 3.

Key to species. A key to species has yet to be provided.

Biology. Weise (1910b) stated that *W. latifrons* was abundantly collected on 'Stechpalmen' = genus *Ilex* (Aquifoliaceae). This record was never interpreted after Weise till now.

Distribution. Colombia, French Guyana, and Venezuela.

Xanthispa Baly, 1858, stat. nov.

(Fig. 3)

Xanthispa Baly, 1858: 31. Type species: *Cephaloleia cimicoides* Guérin-Méneville, 1844 by monotypy.

Distinguishing characters. *Xanthispa* can be easily distinguished from other genera by the prognathous and projecting mouthparts. *Homalispa* differs in the long antennae and the pronotum being deeply emarginate above the head with large and sharp anterior corners. *Cyclantispa* gen. nov. similarly has short antennae and weakly pointed anterior corners of the pronotum, but differs in the elongate body-form, metallic blue elytra, convex labrum, and the interantennal area impressed with an obtuse, low, and narrow carina, while *Xantispa* has a wedge-shaped and uniformly red body (Fig. 3), emarginate labrum, and the interantennal area with a broad and convex carina.

Remarks. *Xanthispa* has been considered a subgenus of *Homalispa* (Uhmann 1957a, Staines 2002). Staines (2002) stated that the only differences are in the proportions of antennomere III and the structure of the lateroapical margins of the elytra. Nevertheless, he is not particularly clear which character belongs to which genus, as in the key he stated that *Homalispa* s. str. has the antennomere III the longest, and serrate margins of the elytra, while in the redescription these characters are given for *Xanthispa*. Actually, neither formulation is correct as all *Homalispa* as well as *Xanthispa* have serrate lateroapical margins and the third antennomere the longest. *Xanthispa* has serrate elytral margins similar to smaller *Homalispa* species without metallic colours, while metallic-coloured species have strong serration. I have seen the types of most the species described in *Homalispa*, as well as extensive material of *Xanthispa*, and in my opinion both should be treated as independent genera.

Xanthispa differs from *Homalispa* (its characters given in brackets) in having a sub-trapezoidal pronotum with rounded, almost not protruding anterior corners, and lateral sides less explanate and only weakly bent upwards (pronotum sub-circular to sub-trapezoidal, with angulate and protruding anterior corners, and lateral margins broadly explanate and canaliculate); antennae short, as long as the base of the pronotum (antennae about 1.5 times

longer than the pronotum); apex of the labrum emarginate (apex of labrum convex); maxillary palps prominent, as long as the first three antennomeres combined (maxillary palps shorter, as long as two basal antennomeres); and interantennal space with a strongly elevated carina (interantennal space deeply impressed). Because of the above-mentioned differences I have decided to elevate the rank of *Xanthispa* to genus.
Number of species. Monotypic (Uhmann 1957a).
Biology. The genus is associated with Arecaceae (Windsor & Sekerka, unpubl. data).
Distribution. French Guyana.

Xenispa Baly, 1858, stat. restit.

(Figs 9–10)

Xenispa Baly, 1858: 63. Type species: *Xenispa pulchella* Baly, 1858 by monotypy.

Distinguishing characters. *Xenispa* is characterized by having a subquadratic (Fig. 10) or semicircular (Fig. 9) pronotum with an emarginate apical margin above the head, prognathous but not projecting mouthparts, and the serrate lateroapical margins of elytra. *Euxema* and *Katkispa* gen. nov. are the only similar genera, but both differ in the apical margin of the pronotum being convex, not emarginate.
Remarks. Baly (1858) proposed the genus for a single species, *X. pulchella*. Weise (1910b) synonymized *Xenispa* with *Demotispa* and proposed a replacement name, *D. magna*, for *Xenispa pulchella* Baly, 1858, not *Demotispa pulchella* Baly, 1858 but never examined the type. This was followed until Staines (2009) transferred *D. magna* to *Parimatidium* Spaeth, 1938, however did not proposed synonymy of *Xenispa* with *Parimatidium* nor mentioned existence of that genus, although *Xenispa* had a priority because of being the older name. Staines (2009) also transferred all *Demotispa* species with serrate lateroapical margins of elytra to *Parimatidium*, however, not a single one of these species is actually congeneric with *Parimatidium rubrum*, the type species, as it has tarsal claws with basal tooth while all transferred species have simple tarsal claws. Hence, I restore the status of *Xenispa* which has serrate lateroapical margins of the elytra, simple tarsal claws, and metallic elytra. Some species transferred here to *Xenispa* have to be considered as tentative placements, as I did not examine their types (see Table 1).

Xensipa species can be divided into two groups on the basis of pronotal shape, thus is placed doubly in the key. About eight species have semicircular pronota (Fig. 9) while the rest, including the type species, have subquadratic and parallel-sided pronota (Fig. 10). Species with subquadratic pronota can be further split in to two groups, one with broadly explanate margins of the pronotum and the other with narrow margins of the pronotum. However, other morphological features as well as their biology are similar, thus I retain all the species in the same genus.
Species transferred to *Xenispa*. See Table 1.
Number of species. 33 (present paper).
Biology. So far, only three species have published host plant associations, two with bambusoid Poaceae (Uhmann 1959, Meskins et al. 2008) and one with Arecaceae (Bondar 1940b). Based on our field observations it seems that most species are associated with various bambusoid Poaceae, mainly *Chusquea* and *Guadua* species (Windsor & Sekerka, unpubl. data).
Key to species. Uhmann (1937b) covered eight species in a key to *Demotispa*.
Distribution. Costa Rica to southern Brazil.

Catalogue of species included in Imatidiini genera described in this paper or previously placed in the *Demotispa*-*Stilpnaspis* complex

Cyclantispa gen. nov.

Cyclantispa gracilis (Baly, 1885) comb. nov.

Homalispa gracilis Baly, 1885: 8 (type locality: ‘Panama, Bugaba’; HT! in BMNH!).

Distribution. Costa Rica (Staines 1996) and Panama (Baly 1885).

Cyclantispa subelongata (Pic, 1936) comb. nov.

Homalispa subelongata Pic, 1936: 13 (type locality: ‘Bolivia’; ST! in MNHN!).

Distribution. Bolivia (Pic 1936).

Demotispa Baly, 1858

Demotispa coccinata (Boheman, 1862) comb. nov.

Himatidium coccinatum Boheman, 1862: 33 (type locality: ‘Ega prope fluvium Amazonum’; ST! in BMNH!).

Distribution. Brazil: Amazonas (Boheman 1862) and Peru: San Martín (Spaeth 1942).

Demotispa flavipennis (Pic, 1923) comb. nov.

Demothispa flavipennis Pic, 1923: 8 (type locality: ‘Bolivie’; HT! in MNHN!).

Remarks. Although I have examined holotype of this species, I am not fully convinced it belongs to *Demotispa*, as it has quite a convex body, narrow pronotum and the mouthparts seem somewhat protruding anteriad. Further study of the specimen, including full examination of the verntral parts (specimen is currently glued to a card), will be necessary to clarify its classification.

Distribution. Bolivia: Cochabamba (Descarpentries & Villiers 1959).

Demotispa filicornis (Borowiec, 2000) comb. nov.

Stilpnaspis filicornis Borowiec, 2000: 152 (type locality: ‘Ecuador, Santa Inez’; HT! in DBET!).

Distribution. Ecuador: Pichincha (Borowiec 2000).

Demotispa fulva (Boheman, 1850) comb. nov.

Himatidium fulvum Boheman, 1850: 79 (type locality: ‘Columbia’; ST! in NHRM!).
Calliaspis nigricornis Kirsch, 1865: 95 (type locality: ‘Bogotà’; ST in MTD); Spaeth (1919): 23 (synonymy).

Distribution. Colombia (Boheman 1850, Kirsch 1865).

Demotispa fuscocincta (Spaeth, 1928) comb. nov.

Himatidium fuscocinctum Spaeth, 1928: 32 (type locality: ‘Rio Magdalena in Columbien’; ST! in BMNH!, MMUE!).

Distribution. Colombia (Spaeth 1928).

Demotispa impunctata (Borowiec, 2000) comb. nov.

Stilpnaspis impunctata Borowiec, 2000: 153 (type locality: 'Costa Rica, Monteverde Res'; HT! in DBET!).

Distribution. Costa Rica: Puntarenas (Borowiec 2000).

Demotispa marginata (Weise, 1905) comb. nov.

Stilpnaspis marginata Weise, 1905b: 298 (type locality: 'Songo: Bolivia'; HT! in ZMHB!).

Distribution. Bolivia: La Paz (Weise 1905).

Demotispa miniacea (Spaeth, 1923) comb. nov.

Himatidium miniaceum Spaeth, 1923: 171 (type locality: specimens without locality labels; ST! in MMUE!).

Remarks. This species was previously considered to be described in 1922. The description was published in the fourth issue of the 1922 volume of *Norsk Entomologisk Tidsskrif* which appeared on 24th June 1923, thus the year of publication is here changed to 1923.
Distribution. Neotropics (Spaeth 1923).

Demotispa monteverdensis (Borowiec, 2000) comb. nov.

Stilpnaspis monteverdensis Borowiec, 2000: 155 (type locality: 'Costa Rica: Puntarenas, Monteverde'; PT! in DBET!).

Distribution. Costa Rica: Puntarenas (Borowiec 2000).

Demotispa nevermanni (Uhmann, 1930) comb. nov.

Demothispa nevermanni Uhmann, 1930: 214 (type locality: 'Hamburg-Farm, Reventazon, Ebene Limon, Costa Rica' after introduction chapter; ST in SDEI, USNM).

Remarks. This species was transfered to *Stilpnaspis* by Staines (2009). I did not examine its type, but based on the original description, I think it is congeneric with *Demotispa*.
Distibution. Costa Rica: Limón (Uhmann 1930).

Demotispa panamensis (Borowiec, 2000) comb. nov.

Stilpnaspis panamensis Borowiec, 2000: 157 (type locality: 'PANAMA: Panama Prov., Cerro Campana'; HT! in DBET!).

Distribution. Panama: Panamá (Borowiec 2000).

Demotispa pulchella Baly, 1858

Demotispa pulchella Baly, 1858: 67 (type locality: 'Amazons; Peru'; LT! in BMNH!).
Stilpnaspis bicolorata Borowiec, 2000: 151, **syn. nov.** (type locality: 'PERU, Loreto, Iquitos, Barillal'; HT! in DBET!, PT! in DBET!, ZMHB!)

Type material examined. *D. pulchella***:** Lectotype (present designation), pinned: 'Type | H.T. [w, p, cb, circular label with red frame] || Baly Coll. [w, p, cb] || Demotispa | pulchella | Baly | Amazons, Peru [green, hw, cb, Baly's hw]' (BMNH).

Remarks. Baly (1858) did not state how many specimens he had at his disposal, but he must have had at least two, as he mentioned the typical form with large red spot covering nearly whole elytra (coll. Baly) and the variety with completely black elytra (coll. Saunders). I have found one specimen of the typical form (ex coll. Baly), designated here as the lectotype (Fig. 14) to conserve its identity and avoid further misapplications if additional specimen(s) is discovered. This is particularly important as it is the type species of the genus. I was not able to find the specimen representing the variety, which should also be located in BMNH, as the William Saunder's collection came to the museum via Alexander Fry. However, it is quite unlikely that both specimens belong to a single species, as I have not so far observed such variability in any *Demotispa* species, having seen extensive material of all species. Borowiec (2000) described *Stilpnaspis bicolorata* from Peru, which perfectly agrees with the lectotype of *D. pulchella*, thus it is synonymized here. Staines (2009) transferred *D. pulchella* to *Stilpnaspis* not knowing that it was actually the type species of *Demotispa*.

Distribution. Brazil: Amazonas (Baly 1858), Peru: Huánuco, Loreto (Baly 1858; Borowiec 2000, 2009).

Demotispa rubiginosa (Boheman, 1862) comb. nov.

Himatidium rubiginosum Boheman, 1862: 32 (type locality: 'Bolivia'; ST! in ZMHB!).

Demotispa gebieni Uhmann, 1930: 136 (type locality: 'Costa Rica'; HT in USNM), Uhmann (1937b): 204 (synonymy).

Remarks. Types of *H. rubiginosum* were labelled as originating from Bolivia, but in fact they came from Veragua in Panamá (Spaeth 1917). Borowiec (1996) provided new faunistic records for *D. sanguinea* (Champion, 1894), however, these specimens actually belong to *D. rubiginosa*.

Distribution. Costa Rica: Puntarenas (Uhmann 1930, Borowiec 1996) and Panama: Chiriquí (Spaeth 1917).

Demotispa rubricata (Guérin-Méneville, 1844) comb. nov.

Imatidium rubricatum Guérin-Méneville, 1844: 285 (type locality: 'Cayenne'; ST! in MMUE!).

Himatidium latum Spaeth, 1923: 170 (type locality: 'Cayenne'; HT! in MMUE!); Spaeth (1938): 308 (synonymy).

Distribution. French Guyana (Guérin-Méneville 1844, Spaeth 1923).

Demotispa sanguinea (Champion, 1894) stat. restit. & comb. nov.

Himatidium sanguineum Champion, 1894: 233 (type locality: 'Costa Rica, Volcan de Irazu'; HT! in BMNH!).

Remarks. This species was synonymized with *D. rubiginosa* by Spaeth (1917), however, the synonymy was made upon primary description only. I have studied the holotype of *D. sanguinea* and found that the species is very different, having an oval body with broadly explanated margins (circular with narrow margins in *D. rubiginosa*) thus it is removed from synonymy of the latter, and its species status is restored here. Borowiec (1996) provided new

faunistic records for *D. sanguinea* (Champion, 1894), however, these specimens actually belong to *D. rubiginosa*.
Distribution. Costa Rica: Cartago (Champion 1894).

Demotispa scarlatina (Spaeth, 1938) comb. nov.

Himatidium scarlatinum Spaeth, 1938: 309, 315 (type locality: 'Ecuador: Cachabé'; HT! in BMNH!, PT! in MMUE!).

Distribution. Ecuador: Esmeraldas (Spaeth 1938).

Demotispa tambitoensis (Borowiec, 2000) comb. nov.

Stilpnaspis tambitoensis Borowiec, 2000: 160 (type locality: 'Colombia, distr. Cauca, Nat. Re. Tambito near El Tambo'; HT! in DBET!).

Distribution. Colombia: Cauca (Borowiec 2000).

Demotispa tricolor (Spaeth, 1938) comb. nov.

Himatidium tricolor Spaeth, 1938: 309, 315 (type locality: 'Costa Rica: Turrialba'; HT!, PT! in MMUE!).

Distribution. Costa Rica: Cartago (Spaeth, 1938), Panama: Panamá (Staines 2007).

Katkispa gen. nov.

Katkispa elongata (Pic, 1934) comb. nov.

Euxema elongata Pic, 1934a: 154 (type locality: 'Colonie Tovar'; ST! in MNHN!).

Distribution. Venezuela: Aragua (Pic 1934a).

Lechispa gen. nov.

Lechispa parallela (Pic, 1930) comb. nov.

Stenispa parallela Pic, 1930: 45 (type locality: 'Rosas, F. C. S. Prov. Buenos Aires'; ST! in MNHN!).

Distribution. Argentina: Buenos Aires and Chaco (Pic 1930, Monrós & Viana 1947).

Lechispa rosariana (Maulik, 1933) comb. nov.

Stenispa rosariana Maulik, 1933: 608 (type locality: 'Argenita: Rosario'; HT! in BMNH!).

Distribution. Argentina: Buenos Aires and Chaco (Maulik 1933, Monrós & Viana 1947).

Parentispa gen. nov.

Parentispa formosa (Staines, 1996) comb. nov.

Cephaloleia formosus [sic!] Staines, 1996: 34 (type locality: 'Porto Bello, Pan[ama]'; HT, PT in USNM).

Distribution. Belize: Belize, Colombia: Antioquia, and Panama: Colón (Staines 1996).

Parentispa gracilis (Baly, 1878) comb. nov.

Cephaloleia gracilis Baly, 1878: 41 (type locality: 'Amazons'; ST! in BMNH!).

Remarks. Described generally from the 'Amazons', collected during the travels of H. W. Bates to South America, thus the specimen could originate either from Brazil or Peru.
Distribution. Brazil or Peru (Baly 1878).

Parentispa vagelineata (Pic, 1926) comb. nov.

Cephalolia vagelineata Pic, 1926b: 10 (type locality: 'Brésil'; HT! in MNHN!).

Remarks. The record published by Urueta Sandino (1972) most likely belongs to *P. formosa*, as *P. vagelineata* does not occur in Colombia. The record from Peru (Couturier & Kahn 1992) might actually belong to *P. gracilis*, but this needs further verification.
Distribution. Brazil: Goiás (Descarpentries & Villiers 1959) and Peru: San Martín (Couturier & Kahn 1992).

Parimatidium Spaeth, 1938

Parimatidium marginicolle (Boheman, 1850)

Himatidium marginicolle Boheman, 1850: 80 (type locality: 'Brasilia'; HT! in ZMHB!).

Distribution. Brazil (Boheman 1850).

Parimatidium rubrum (Boheman, 1850)

Himatidium rubrum Boheman, 1850: 78 (type locality: 'Brasilia'; ST! in ZMHB!).

Distribution. Brazil: Pará, São Paulo (Boheman 1850, 1862; Spaeth 1938), French Guayana (Spaeth 1914, Borowiec 2009), and Surinam (Borowiec 1996).

Pseudimatidium Aslam, 1966

Pseudimatidium bondari (Spaeth, 1938) comb. nov.

Himatidium bondari Spaeth, 1938: 313, 316 (type locality: 'Bahia'; HT! in MMUE!, PT! in BMNH!).

Distribution. Brazil: Bahia (Spaeth 1938).

Pseudimatidium discoideum (Boheman, 1850) comb. nov.

Himatidium discoideum Boheman, 1850: 77 (type locality: 'Bahia'; type unknown).
Calliaspis rufula Boheman, 1850: 87 (type locality: 'Cayenna'; ST in ?MNHN); Spaeth (1922): 172 (synonymy).
Calliaspis punctata Wagener, 1881: 25 (type locality: 'Bahia'; HT in MM); Spaeth (1922): 172 (synonymy).

Distribution. Brazil: Bahia (Boheman 1850, Wagener 1881), Rio Grande do Sul (Borowiec 1996) and French Guyana (Boheman 1850).

Pseudimatidium elaeicola **Aslam, 1966**

Pseudimatidium elaeicola Aslam, 1966: 692 (type locality: 'Columbia, Calima area'; HT!, PT! in BMNH!).

Distribution. Colombia: Cauca (Aslam 1966) and Ecuador: Napo (Borowiec 1996).

Pseudimatidium florianoi **(Bondar, 1942) comb. nov.**

Himatidium florianoi Bondar, 1942: 38 (type locality: 'Bahía: Bomfim, Feira de S. Ana'; ST! in MNRJ!).

Distribution. Brazil: Bahia (Bondar 1942).

Pseudimatidium gomescostai **(Bondar, 1943) comb. nov.**

Himatidium gomes-costai Bondar, 1943: 385 (type locality: 'Taquari, Rio Grande do Sul'; ST! in MNRJ!).

Distribution. Argentina: Misiones (Monrós & Viana 1947) and Brazil: Rio Grande do Sul (Bondar 1943).

Pseudimatidium limbatum **(Baly, 1885) comb. nov.**

Demotispa limbata Baly, 1885: 27 (type locality: 'Guatemala, Cubilguitz in Vera Paz'; ST! in BMNH!).
Homalispa limbifera Baly, 1885: 7, **syn. nov.** (type locality: 'Guatemala, Cubilguitz, San Juan in Vera Paz'; ST! in BMNH!).

Remarks. Baly (1885) described *H. limbifera* and *D. limbata* from the same locality without any additional note. It is quite unusual because *H. limbifera* does not have prognathous and projecting mouthparts, like the other *Homalispa* species, and Baly was mostly quite careful about details, particularly in hispines. I have examined types of both species and found that they are conspecific, *H. limbifera* representing just a teneral specimen of *D. limbata*. Therefore I synonymize them here and retain the name *D. limbata* as the valid one because its type specimen is fully sclerotized and perfectly preserved (following the First Reviser Principle, Article 24.2.1 of the Code (ICZN 1999)).
Distribution. Guatemala: Alta Vera Paz (Baly 1885).

Pseudimatidium limbatellum **(Boheman, 1862) comb. nov.**

Himatidium limbatellum Boheman, 1862: 29 (type locality: 'Mexico'; ST! in BMNH!).

Distribution. Mexico (Boheman 1862).

Pseudimatidium madoni **(Pic, 1936) comb. nov.**

Demothispa madoni Pic, 1936: 12 (type locality: 'Cayenne'; HT! in MNHN!).

Distribution. French Guyana (Pic 1936).

Pseudimatidium neivai **(Bondar, 1940) comb. nov.**

Himatidium neivai Bondar, 1940a: 205 (type locality: 'Bahia, Agua Preta'; ST! in MNRJ!).

Remarks. The species is reported from numerous countries (Genty et al. 1978), however, quite likely records from countries other than Brazil belong to different *Pseudimatidium* species.

Distribution. Brazil: Bahia (Bondar 1940) and Colombia, Ecuador, Panama, Peru, Surinam and Venezuela (Genty et al. 1978).

Pseudimatidium pallidum (Baly, 1885) comb. nov.

Demotispa pallida Baly, 1858: 65 (type locality: 'Bogota; Columbia'; HT! in BMNH!).
Demothispa rufa Pic, 1926a: 14 (type locality: 'Guyane Fr.'; HT! in MNHN!); Spaeth (1938): 313 (synonymy).

Distribution. Brazil: Pará (Weise 1910b), Colombia (Baly 1858), French Guyana (Weise 1910b, Pic 1926a).

Pseudimatidium pici (Staines, 2009) comb. nov.

Cephalolia limbata Pic, 1928: 4 (type locality: 'R. Argentine'; ST! in MNHN!).
Demotispa pici Staines, 2009: 2 (new substitute name for *D. limbata* Pic, 1928 not Baly, 1885).

Distribution. Argentina: Buenos Aires, Entre Ríos, Misiones (Monrós & Viana 1947) and Uruguay (Monrós & Viana 1947).

Pseudimatidium procerulum (Boheman, 1862) comb. nov.

Calyptocephala procerula Boheman, 1862: 45 (type locality: 'Peruvia'; HT! in BMNH!).
Demotispa brunneofasciata Borowiec, 2000: 170, **syn. nov.** (type locality: 'Peru: Dept. Loreto, 1.5 km N Teniente Lopez'; HT in SEM).

Remarks. *Calyptocephala procerula* has remained unknown to nearly all authors since its description. I have examined its holotype in BMNH and found it is not a member of the Spilophorini, but of the Imatidiini, as it has a seta only in anterior corners of pronotum. The holotype is conspecific with the recently described *Demotispa brunneofasciata*, which is here synonymized.
Distribution. Peru (Boheman 1862): Loreto (Borowiec 2000).

Pseudostilpnaspis Borowiec, 2000

Pseudostilpnaspis belizensis Borowiec, 2008

Pseudostilpnaspis belizensis Borowiec, 2008: 90 (type locality: 'Belize, Cayo, Ciquibul Forest Res., Las Cuevas Field Station'; HT! in BMNH!).

Distribution. Belize: Cayo (Borowiec 2008).

Pseudostilpnaspis columbica (Weise, 1910)

Stilpnaspis columbica Weise, 1910a: 43 (type locality: 'Columbia: Cordill. occ., Vitacoberge'; HT! in ZMHB!).

Distribution. Colombia: Cauca (Weise 1910a).

Pseudostilpnaspis curvipes (Uhmann, 1951) comb. nov.

Demotispa curvipes Uhmann, 1951: 66 (type locality: 'Venezuela: Rancho Grande, Aragua'; HT! in BMNH!).

Remarks. This species was recently transferred to *Parimatidium* on the basis of the serrate lateroapical margins of the elytra (Staines 2009), however, it has simple tarsal claws, thus it

is not congeneric with *Parimatidium*. I place it tentatively in *Pseudostilpnaspis* because of the convex body with narrow explanate margins, however, the species may prove to belong to a different genus.
Distribution. Venezuela: Aragua (Uhmann 1951).

Pseudostilpnaspis costaricana Borowiec, 2000

Pseudostilpnaspis costaricana Borowiec, 2000: 166 (type locality: 'Costa Rica, La Sulza de Turrialba'; HT! in DBET!).

Distribution. Costa Rica: Cartago (Borowiec 2000).

Pseudostilpnaspis lata (Baly, 1885) comb. nov.

Cephaloleia lata Baly, 1885: 13 (type locality: 'Panama, Bugaba, Volcan de Chiriqui 4000 to 6000 feet'; ST! in BMNH!).

Remarks. The species was also recorded from Costa Rica, Mexico, and Nicaragua (Staines 1996, 2007). However, I do not include these records in the distribution of *P. lata* because they are very likely based on misidentifications. *Pseudostilpnaspis lata* seems to be restricted in Panama to a relatively small area in western Chiriquí, and all other populations I have examined belong to different species (Sekerka & Windsor, unpubl. data). Moreover, the record from Mexico was based on specimens labelled only 'Mexico', thus must be considered as doubtful until more accurately labeled material is found.
Distribution. Panama: Chiriquí (Baly 1885).

Pseudostilpnaspis muzoensis Borowiec, 2000

Pseudostilpnaspis muzoensis Borowiec, 2000: 167 (type locality: 'Nouv. Grenade, Muzo'; HT! in DBET!).

Distribution. Colombia: Boyacá and Panama: Panamá (Borowiec 2000).

Weiseispa gen. nov.

Weiseispa angusticollis (Weise, 1893) comb. nov.

Demothispa angusticollis Weise, 1893: 16 (type locality: 'Ecuador'; HT! in ZMHB!).

Distribution. Ecuador (Weise 1893).

Weiseispa bimaculata (Baly, 1858) comb. nov.

Demotispa bimaculata Baly, 1858: 68 (type locality: 'Mexico'; ST! in BMNH!).
Demothispa biplagiata Pic, 1923: 8 (type locality: 'Bogota'; HT! in MNHN!), **syn. nov.**

Remarks. Most likely, the type locality of *D. bimaculata* is erroneous, as I have never seen a specimen of *Weiseispa* collected north of Panama. Moreover, there are no more specimens from Mexico besides the type. I have examined types of both, *D. bimaculata* and *D. biplagiata*, and in my opinion both belong to the same species.
Distribution. Colombia: Cundinamarca (Pic 1923) and ? Mexico (Baly 1858).

Weiseispa cayenensis (Pic, 1923) comb. nov.

Demothispa cayenensis Pic, 1923: 8 (type locality: 'Cayenne'; HT! in MNHN!).

Distribution. French Guyana (Pic 1923).

Weiseispa melancholica (Weise, 1910) comb. nov.

Demothispa peruana var. *melancholica* Weise**,** 1910b: 79 (type locality: 'Peru: Pachitea'; ST! in ZMHB!); Uhmann (1937b): 199 (raised to species).

Distribution. Peru: Huánuco (Weise 1910b).

Weiseispa peruana (Weise, 1910) comb. nov.

Demothispa peruana Weise, 1910b: 78 (type locality: 'Peru: Pachitea'; ST! in ZMHB!).

Demothispa peruana chr. *membrata* Uhmann, 1957b: 3 (type locality: 'Yungas de Arepucho, Sihuencas'; ST in ZSM), unavailable infrasubspecific name (chromation).

Remarks. Staines (2009) raised the rank of *D. membrata* to species, however, he did not provided any description. The name was proposed as an infrasubspecific entity, thus is not valid according to ICZN (1999) and therefore Staines' act is invalid.
Distribution. Peru: Huánuco (Weise 1910b).

Windsorispa gen. nov.

Windsorispa bicoloricornis (Pic, 1926) comb. nov.

Demothispa bicoloricornis Pic, 1926a: 14 (type locality: 'Guyane Fr.'; HT in MNHN).

Remarks. This species is placed in *Windsorispa* based on the primary description and comparative note by Pic (1926a), however, I had no oportunity to study its type, so the transfer is rather tentative and requires confirmation in the future.
Distribution. French Guyana (Pic 1926a).

Windsorispa latifrons (Weise, 1910) comb. nov.

Demotispa latifrons Weise, 1910b: 78 (type locality: 'Columbien, Cordill. occ., St. Antonio, Alto de las cruces, Rio Vitaco'; ST! in NHRM!, ZMHB!).

Distribution. Colombia: Cundinamarca (Weise 1910b).

Windsorispa submarginata (Pic, 1934) comb. nov.

Demothispa submarginata Pic, 1934c: 8 (type locality: 'Vénézuela'; HT! in MNHN!).

Distribution. Venezuela (Pic 1934c).

Xenispa Baly, 1858, stat. restit.

Xenispa argentina (Monrós & Viana, 1947) comb. nov.

Demothispa argentina Monrós & Viana, 1947: 158 (type locality: 'Argentina: Formosa, dt° Capital: Isla de Oro'; HT, PT in USNM).

Remarks. Monrós & Viana (1947) compared the species with *D. latifrons* and *D. bicoloricornis*, both placed here in *Windsorispa* gen. nov., but the depicted beetle has a completely different shape of the pronotum and body. Judging from the description and the given figure, it seems most similar to some *Xenispa* species, however, this transfer has to be understood as tentative until it is verified by examination of the type specimens.
Distribution. Argentina: Formosa and Paraguay: Itapúa (Monrós & Viana 1947).

Xenispa atra **(Pic, 1926) comb. nov.**

Demothispa atra Pic, 1926a: 13 (type locality: 'Vénézuela'; HT in MNHN).

Remarks. This species is placed in *Xenispa* based on the primary description only and according to Pic (1926a), it is most similar to *X. jataiensis*. However, I did not examine the type and thus the placement is tentative.
Distribution. Venezuela (Descarpentries & Villiers 1959).

Xenispa baeri **(Pic, 1926) comb. nov.**

Demothispa baeri Pic, 1926b: 9 (type locality: 'Pérou'; HT! in MNHN!).

Distribution. Peru: Huallaga (Pic 1926b).

Xenispa bahiana **(Spaeth, 1938) comb. nov.**

Himatidium (*Parimatidium*) *bahianum* Spaeth, 1938: 307, 314 (type locality: 'Bahia'; HT! in MM, PT! in BMNH!).

Distribution. Brazil: Bahia (Spaeth 1938).

Xenispa bicolorata **(Uhmann, 1948) comb. nov.**

Demotispa bicolorata Uhmann, 1948: 214 (type locality: 'Brasilien: Sta. Catharina, Nova Teutonia'; HT in SDEI).

Remarks. This species is placed in *Xenispa* based on the primary description only, however, Uhmann (1948) compared it to species which clearly belong to *Xenispa*.
Distribution. Brazil: Santa Catarina (Uhmann 1948).

Xenispa boliviana **(Weise, 1910) comb. nov.**

Demothispa boliviana Weise, 1910b: 80 (type locality: 'Bolivia: Cochabamba'; ST! in ZMHB!).

Distribution. Bolivia: Cochabamba (Weise 1910b).

Xenispa carinata **(Pic, 1934) comb. nov.**

Demothispa carinata Pic, 1934a: 154 (type locality: 'Venézuela: Colonie Tovar'; ST! in MNHN!).

Distribution. Venezuela: Aragua (Pic 1934a).

Xenispa clermonti (Pic, 1934) comb. nov.

Demothispa clermonti Pic, 1934b: 2 (type locality: 'Brésil: Hansa'; HT! in MNHN!).

Distribution. Brazil: Santa Catarina (Pic 1934b).

Xenispa collaris (Waterhouse, 1881) comb. nov.

Homalispa collaris Waterhouse, 1881: 264 (type locality: 'Ecuador, Sarayacu' after introduction; ST! in BMNH!).

Remarks. Waterhouse (1881) described this species in *Homalispa* and subsequent authors accepted his opinion (i.e. Uhmann 1957a), however, the specimen does not have protruding mouthparts like other *Homalispa* species. Therefore, it is transfered here to *Xenispa* based on general shape and the serrate apicolateral margins of the elytra.
Distribution. Ecuador: Pastaza (Waterhouse 1881).

Xenispa columbica (Weise, 1910) comb. nov.

Demothispa columbica Weise, 1910b: 80 (type locality: 'Columbien, Cordill. occ., St. Antonio, Alto de las cruces'; ST! in ZMHB!).

Distribution. Colombia: Tolima (Weise 1910b).

Xenispa consobrina (Weise, 1910) comb. nov.

Demothispa consobrina Weise, 1910b: 80 (type locality: 'Columbien, Cordill. occ., Alto de las cruces'; ST! in ZMHB!).

Distribution. Colombia: Tolima (Weise 1910b).

Xenispa costaricensis (Uhmann, 1930) comb. nov.

Cephalolia costaricensis Uhmann, 1930: 229 (type locality: 'Hamburg-Farm, Reventazon, Ebene Limon, Costa Rica' after introduction; ST in SDEI, USNM).

Distribution. Costa Rica: Cartago, Heredia, Limón (Uhmann 1930, Staines 1996) and Panama: Bocas del Toro (Staines 1996).

Xenispa cyanipennis (Boheman, 1850) comb. nov.

Himatidium cyanipenne Boheman, 1850: 72 (type locality: 'Brasilia'; ST! in ZMHB!).

Distribution. Bolivia (Spaeth 1914), Brazil (Boheman 1850), Peru (Spaeth 1938, 1942).

Xenispa elegans (Baly, 1875) stat. restit. & comb. nov.

Demotispa elegans Baly, 1875: 75 (type locality: 'Ecuador'; ST in BMNH).

Remarks. This species was synonymized with *X. cyanipennis* by Spaeth (1938), however, the latter has uniformly yellow antennae and much coarser punctation of the elytra. I was not able to locate the type specimen(s) in BMNH, however, I have seen several specimens

collected recently in Ecuador, and they perfectly agree with the primary description, having bicolorous antennae, coarser punctation and being somewhat narrower. Therefore I restore species status of *X. elegans* and Ecuador is removed from the range of *X. cyanipennis*.
Distribution. Ecuador (Baly 1875).

Xenispa exigua (Uhmann, 1930) comb. nov.

Cephalolia exigua Uhmann, 1930: 230 (type locality: 'Hamburg-Farm, Reventazon, Ebene Limon, Costa Rica' after introduction; HT in USNM).

Distribution. Costa Rica: Heredia, Limón (Uhmann 1930, Staines 1996), and Panama: Panamá (Staines 1996).

Xenispa fallaciosa (Pic, 1923) comb. nov.

Demothispa fallaciosa Pic, 1923: 8 (type locality: 'Pérou'; HT! in MNHN!).

Distribution. Peru: Huallaga (Descarpentries & Villiers 1959).

Xenispa fulvimana (Pic, 1923) comb. nov.

Demothispa fulvimana Pic, 1923: 8 (type locality: 'Brésil'; HT! in MNHN!).

Distribution. Brazil: Goiás (Descarpentries & Villiers 1959).

Xenispa garleppi (Uhmann, 1937) comb. nov.

Demothispa garleppi Uhmann, 1937b: 200 (type locality: 'Peru, Dep. Cuzko, Bergland Cajon'; HT! in ZMHB!).

Distribution. Bolvia: La Paz (Uhmann 1948) and Peru: Cuzco (Uhmann 1937b).

Xenispa germaini (Weise, 1905) comb. nov.

Demothispa germaini Weise, 1905a: 54 (type locality: 'Bolivia: Cochabamba'; ST! in ZMHB!).

Distribution. Bolivia: Cochabamba (Weise 1905a).

Xenispa grayella (Baly, 1858) comb. nov.

Demotispa grayella Baly, 1858: 66 (type locality: 'Petropolis, Brazil'; ST! in BMNH!).

Distribution. Brazil: Paraná, Rio de Janeiro, São Paulo (Baly 1858, Staines 2014).

Xenispa jataiensis (Pic, 1923) comb. nov.

Demothispa jataiensis Pic, 1923: 8 (type locality: 'Brésil'; ST! in MNHN!).

Remarks. This species perhaps belongs to *Cephaloleia*.
Distribution. Brazil: Goiás (Descarpentries & Villiers 1959).

Xenispa ovatula (Uhmann, 1948) comb. nov.

Demotispa ovatula Uhmann, 1948: 214 (type locality: 'Brasilien: E. do Rio, Itatiaya'; HT in SDEI).

Remarks. This species is placed to *Xenispa* based on primary description only.
Distribution. Brazil: Rio de Janeiro (Uhmann 1948).

Xenispa plaumanni (Uhmann, 1937) comb. nov.

Demothispa plaumanni Uhmann, 1937a: 153 (type locality: 'Brasilien: S. Catharina, Nova Teutonia'; HT, PT in SDEI, NHRM!).

Distribution. Brazil: Rio Grande do Sul, Santa Catarina, São Paulo and Paraguay (Uhmann 1948).

Xenispa pulchella Baly, 1858 stat. restit.

Xenispa pulchella Baly, 1858: 64 (type locality: 'Columbia'; HT! in BMNH!).
Demothispa magna Weise, 1910b: 77 (replacement name for *Xenispa pulchella* Baly, 1858 not *Demotispa pulchella* Baly, 1858).

Remarks. Weise (1910b) synonymized *Xenispa* with *Demotispa* and proposed a replacement name, *D. magna*, for *X. pulchella* Baly, 1858, not *D. pulchella* Baly, 1858. Here *Xenispa* is removed from synonymy of *Demotispa* thus the replacement name is no longer necessary. Since Weise (1910b) the species has only been cited in catalogues (i.e. Uhmann 1957a). Therefore, I restore the name *X. pulchella* according to article 59.3 (ICZN 1999).
Distribution. Colombia (Baly 1858)

Xenispa pygidialis (Uhmann, 1940) comb. nov.

Demotispa pygidialis Uhmann, 1940: 114 (type locality: 'Brasilien: S. Catharina, Nova Teutonia'; HT, PT in SDEI, PT! in ZMHB!).

Distribution. Brazil: Rio Grande do Sul and São Paulo (Uhmann 1940).

Xenispa romani (Weise, 1921) comb. nov.

Demothispa romani Weise, 1921: 174 (type locality: 'Rio Purus'; HT! in NHRM!).

Distribution. Brazil: Amazonas (Weise 1921).

Xenispa scutellaris (Pic, 1926) comb. nov.

Demothispa scutellaris Pic, 1926b: 9 (type locality: 'Brésil'; HT! in MNHN!).

Distribution. Brazil: Goiás (Descarpentries & Villiers 1959).

Xenispa sulcicollis (Champion, 1920) comb. nov.

Homalispa sulcicollis Champion, 1920: 222 (type locality: 'Costa Rica, Alajuela and Juan Viñas near Rio Reventazon'; ST! in BMNH!).

Remarks. Champion (1920) placed this species in *Homalispa* particularly because of the serrate lateroapical margins of the elytra and the metallic colour. However, the syntypes in BMNH do not have the mouthparts projecting forwards. The species seems to be most similar to *X. costaricensis* and *X. exigua*, and quite likely one of them represents its synonym. However, this require further comparison of type specimens.
Distribution. Costa Rica: Alajuela and Limón (Champion 1920).

Xenispa testaceicornis (Pic, 1926) comb. nov.

Demothispa testaceicornis Pic, 1926a: 14 (type locality: 'Pérou'; HT! in MNHN!).

Distribution. Peru: Cuzco (Descarpentries & Villiers 1959).

Xenispa tibialis (Baly, 1858) comb. nov.

Demotispa tibialis Baly, 1858: 66 (type locality: 'Amazons'; HT in BMNH not found).

Remarks. The transfer is made upon the primary description, as I was unable to find the holotype, which should be located in the BMNH. The species was listed only in catalogues without any new specimens having been reported, and therefore, it is questionable whether it was collected in Brazil or Peru.
Distribution. Brazil or Peru (Baly 1858).

Xenispa tricolor (Weise, 1905) comb. nov.

Demothispa tricolor Weise, 1905a: 54 (type locality: 'Bolivia: Cochabamba'; ST! in MNHN!).

Distribution. Bolivia: Cochabamba (Weise 1905a).

Xenispa uhmanni (Pic, 1934) comb. nov.

Demothispa uhmanni Pic, 1934b: 2 (type locality: 'Colombie: S. Antonio'; HT in SDEI).

Distribution. Colombia: Tolima (Pic 1934b).

Xenispa zikani (Spaeth, 1938) comb. nov.

Himatidium (*Parimatidium*) *zikani* Spaeth, 1938: 307, 313 (type locality: 'Minas Geraes'; HT! in MMUE!).

Distribution. Brazil: Minas Gerais (Spaeth 1938).

Imatidiini, genus *incertae sedis*

bicolor Zayas, 1960

Melanispa bicolor Zayas, 1960: 131 (type locality: 'Cuba, Pico de Potrerillos, Las Villas'; HT in coll. Zayas, Cuba).

Remarks. The species is not congeneric with *Melanispa*, nor does it fit into any other described genus. However, I had no oportunity to examine its type to make any final conclusions, thus it is considered as an unclassified to genus. See additional comments under *Melanispa*.

sallei Baly, 1858

Demotispa Salléi Baly, 1858: 167 (type locality: 'St. Domingo'; HT in BMNH).

Remarks. The species seems to be most similar to *Cephaloleia barroi* Uhmann, 1959 and *C. saundersi* Staines, 1996. In my opinon, these three species are not congeneric with *Cephaloleia* as they have broadly semicircular pronota with projecting anterior corners of the pronotum and convex body. However, I did not examine the respective types, thus leave *D. sallei* as unclassified to genus, for the time being.

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Chapter VI

SIMÕES M. V. P. & **SEKERKA L.** (2014) Redescription of Heteronychocassis acuticollis Spaeth, 1915 (Coleoptera: Chrysomelidae: Cassidinae). *Coleopterists Bulletin*, **68**: 407–410.

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SCIENTIFIC NOTE

REDESCRIPTION OF *HETERONYCHOCASSIS ACUTICOLLIS* SPAETH, 1915 (COLEOPTERA: CHRYSOMELIDAE: CASSIDINAE)

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Spaeth (1915) described the genus *Heteronychocassis* for a single species, *Heteronychocassis acuticollis* Spaeth, 1915. In his view, the genus is the closest relative of *Eremionycha* Spaeth, 1911 and that both belong to the group Batonotites (= Dorynotini Monrós and Viana 1949).

The genus has never been redescribed, only mentioned in catalogs (*e.g.*, Borowiec 1999; Borowiec and Moragues 2005; Borowiec and Świętojańska 2014) and is only known from its type specimen. The exception is Monrós and Viana (1949), who made a key for the genera of Dorynotini and placed *Heteronychocassis* in it, based on the primary description. In this note, the species *H. acuticollis* is redescribed.

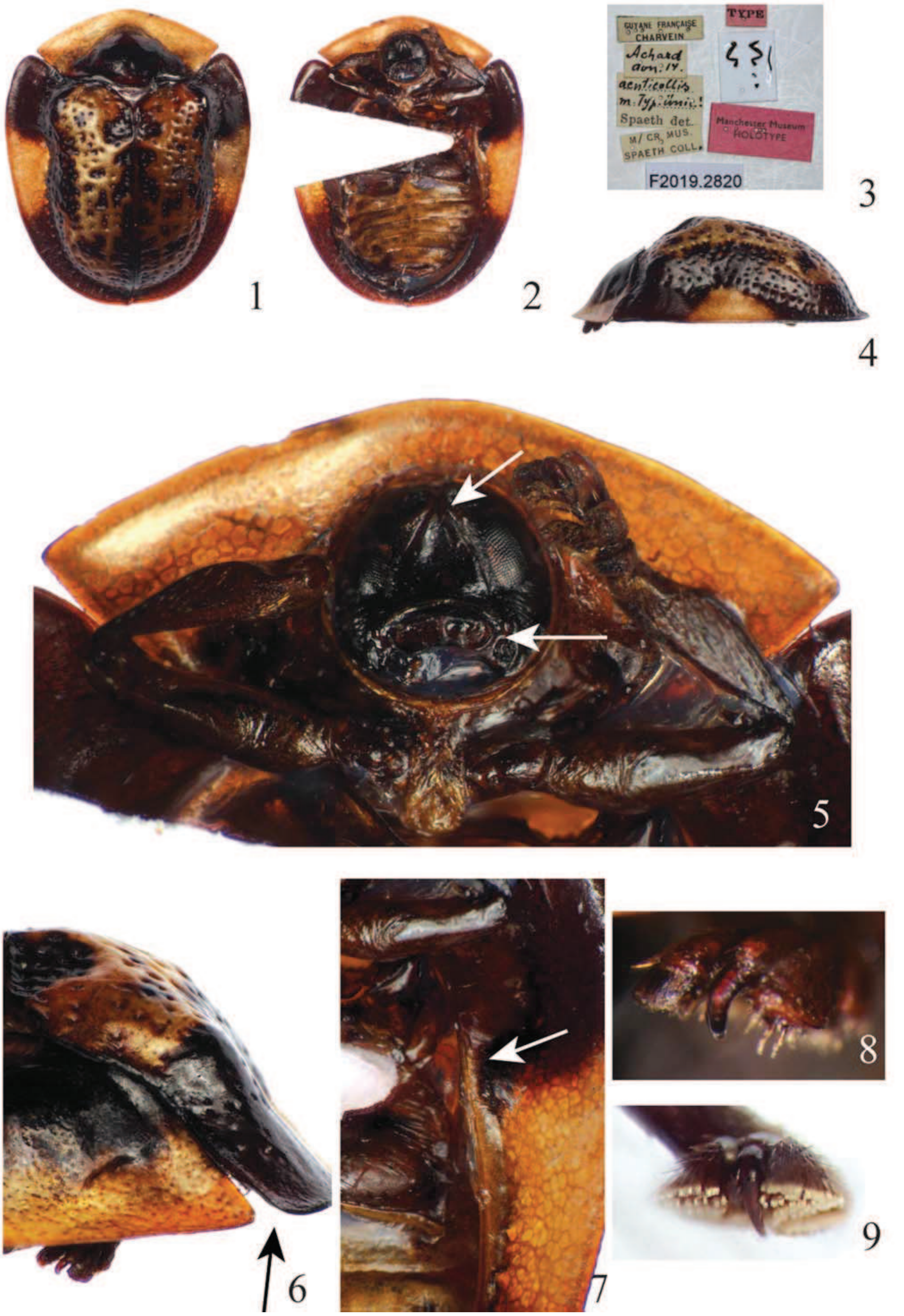
Heteronychocassis Spaeth, 1915

Heteronycocassis Spaeth, 1915: 285 (type species: *Heteronychocassis acuticollis* Spaeth, 1915 by monotypy); Blackwelder 1946: 747 (catalog); Monrós and Viana 1949: 425 (key to Dorynotini genera); Hincks 1952: 334 (overview of Cassidinae tribes and genera); Seeno and Wilcox 1982: 174 (catalog); Borowiec 1999: 166 (catalog); Borowiec and Moragues 2005: 263 (catalog).

Heteronychocassis acuticollis Spaeth, 1915
(Figs. 1–9)

Heteronychocassis acuticollis Spaeth, 1915: 286 (original description); Blackwelder 1946: 747 (catalog); Monrós and Viana 1949: 426 (catalog); Borowiec 1999: 166 (catalog); Borowiec and Moragues 2005: 263 (catalog).

Redescription. Measurements: Total length 8.7 mm; greatest elytral width 7.7 mm; pronotal length 2.0 mm; greatest pronotal width 5.5 mm. Body (Figs. 1–2, 4) subtriangular, around 1.2X longer than wide. Integument glabrous, except for extremely short setae and sparse setae on pronotum and ventral side. Ground color brown with anterior margin of pronotum, midregion of elytral margin, and elytral disc brownish yellow and antennomeres V–XI dark brown and I–IV light brown. Antenna with scape, pedicel, antennomeres II–III glabrous with sparse, long setae, IV–XI with long, dense setae. Length ratio of antennal segments 100:40:60:84:68:76:85:68:68:84:132, with XI tapered towards apex. Interocular distance 1.3X wider than widest width of eye. Coronal suture deep. Eyes (Fig. 5) subrounded, around 2.05X longer than wider. Frontoclypeus (Fig. 5) as wide as long, open and elevated at the apex, depressed medially with short, complete epistomal suture and incomplete midsuture; labrum (Fig. 5) medially elevated, with sinuous anterior margin. Pronotum (Fig. 1) trapezoidal, 2X wider than long, with sharp sides; anterior margin continuous, covering the head completely in dorsal view; lateral margins sharp; basal margin bisinuate and posterior angle truncate; disc convex, with shallow depression close to posterior angle, and finally punctate. Prosternum glabrous and smooth, with narrow elevation; process (Fig. 5) 1.5X longer than wide, apex depressed and rounded. Mesosternum glabrous; mesosternal process deeply notched; mesepimeron with exposed portion closing mesocoxal cavity. Scutellum seemingly triangular. Elytra continuous with pronotum, slightly longer than wide, with the widest region at the



Figs. 1–9. *Heteronychocassis acuticollis*, holotype. **1)** Dorsal habitus; **2)** Ventral habitus; **3)** Labels; **4)** Lateral habitus; **5)** Prosternum, ventral view, arrows indicate frontoclypeus and labrum; **6)** Anterior margin of elytron, frontal view, arrow indicates smooth, rounded humerus; **7)** Elytron, ventral view, arrow indicates epipleuron; **8)** Protarsal claw; **9)** Mesotarsal claw.

anterior third; basal margin smooth; anterolateral angle rounded and projected anteriorly. Humeri smooth and round (Fig. 6), moderately protruding. Disc regularly convex, with 2 shallow principal impressions at anterior third close to suture; in dorsal view, coarse punctation in discontinuous rows, with fine, disordered punctation in the intervals, denser close to suture and principal impressions; in lateral view, humeri followed by deep and straight notch and row of coarse punctures. Explanate elytral margins moderately broad, in the widest part half the width of disc, smooth and shiny. Epipleura (Fig. 7) continuous, with 2 deep cavities, 1 short anterior to deep notch following the humeri, and another after, not reaching apex. Metasternum smooth, with midregion elevated. Sternites length ratio 100:66:60:60:66. Legs sparsely and finely setose at tibial apex; trochanters triangular, with sparse and short setae; femur slightly wider and grooved at anterior half, with sparse, long setae; tibia longer than femur, wider towards the apex, densely setose. Tarsomeres with long, dense setae; I with subparallel lateral margins, II–III bilobed, with long, sparse setae. Proclaws (Fig. 8) with single large, basal tooth, meso- and metaclaws (Fig. 9) asymmetrical, with inner claw half the length of outer.

Geographic Distribution. French Guiana (Spaeth 1915).

Material Examined. Holotype (Figs. 1–9) (by monotypy), glued: 'Guyane Française | Charvein [white, printed and cardboard label] || Type [pink, printed and cardboard label] || Archard | don. 14 || acuticollis | m. Typ. unic! | Spaeth det. [white, printed and cardboard label] || Manchester Museum | Holotype [pink, printed and cardboard label]'.

Type Locality. Charvein (circa 5°34.5′ N, 53°53.7′ W, 10–30 m elevation.) is a former French prison named Camp Charvein situated in Mana commune, arrondissement of Saint-Laurent-du-Maroni in French Guiana.

Discussion and Conclusions. Chapuis (1875) erected the group Batonotites, composed of a single genus *Batonota* Hope, 1840, that later would be split into several genera (Spaeth 1923). He defined Batonotites as having the metepisternum distinctly separated from the metepimeron by a stria and possessing simple tarsal claws basally approximated and thus barely divergent. The supplemental characters used by Chapuis included: convex body; pronotum inserted in the notch at the anterior margin of elytra; prosternum slightly projecting anteriorly; elytra with a spinose projection; and metepisternum distinct.

Maulik (1916) divided *Batonota* into three genera based on the general shape and form of the dorsal spine: *Batonota* (species with trapezoidal scutellum, long dorsal spine, and lateral sides of the elytra concave), *Akantaka* Maulik, 1916 (species with trapezoidal scutellum, short dorsal spine, and lateral sides of the elytra straight), and *Trikona* Maulik, 1916 (species with triangular scutellum and very deeply punctate elytra).

Spaeth (1923) summarized the characters which separate *Batonota* (*sensu lato*), made note of the structure of tarsal claws as unique within all Cassidinae (*sensu* Spaeth), and revised the genera close to *Batonota*. As a result, he downgraded *Akantaka* to a subgenus of *Batonota* and additionally described a new genus, *Paratrikona* Spaeth, 1923, for species included formerly in *Trikona* (later recognized as a junior objective synonym of *Omoteina* Chevrolat, 1836), with the exception of *Trikona humeralis* (Olivier, 1808), and provided a key to the genera.

Later, Monrós and Viana (1949) proposed a new substitute name, Dorynotini, for Batonotites because the latter was based on a junior synonym, and they included seven genera: *Akantaka* (now considered as a subgenus of *Dorynota* Chevrolat, 1836), *Dorynota* (senior objective synonym of *Batonota*), *Eremionycha*, *Heteronychocassis*, *Omoteina*, *Paranota* Monrós and Viana, 1949, and *Paratrikona*. Since that time, the name Dorynotini has had prevailing usage and was conserved by all subsequent authors (*e.g.*, Hincks 1952; Borowiec 1999). Monrós and Viana (1949) characterized Dorynotini as having the following combination of characteristics: head covered by pronotum; pronotum inserted in a notch at the anterior margin of elytra; epipleura projecting; elytra with tubercle or spine projecting close to elytral suture; and tarsal claws parallel or slightly divergent, sometimes with one of them reduced or absent.

Monrós and Viana (1949) also provided a key to the genera of the tribe. In the key, the genus *Heteronychocassis* was characterized by the following combination of morphological features: subtriangular body, with the widest body width close to humeri; antennae with four basal antennomeres glabrous and seven pubescent apical antennomeres; head not visible from above; elytra without spinose projection; and each tarsus with a pair of non-divergent, asymmetrical claws. However, this does not correspond with the morphology of the type specimen of *H. acuticollis*, which exhibits protarsal claws with a single large, basal tooth, while the meso- and metatarsal claws are paired, asymmetrical, with inner claw half the length of the outer. Almost certainly Monrós and Viana did not examine the actual type specimen, because the Spaeth collection was at that time inaccessible. So they placed *Heteronychocassis* in the key based on the original description, which does not describe the protarsal claw as single. Hincks (1952) retained the genus within Dorynotini and used the structure of the tarsal claws as the main character to separate the tribe.

So far, *Heteronychocassis* is still known only from the holotype specimen, which was unfortunately heavily damaged during a loan (Lech Borowiec and Dmitri Logunov, personal communication). One of us (LS) salvaged the specimen in 2008 and glued all parts together to get an idea about the general shape and prevent future loss of fallen parts. Some legs and antennae were glued to a separate card pinned under specimen. Fortunately, the crucial morphological features for identification were preserved. The structure of the tarsal claws is typical for Dorynotini, with the meso- and metatarsi having two proximate claws, with the inner claw being shorter. The basally proximate asymmetrical tarsal claws are unique features within Cassidinae *sensu stricto* (otherwise, present only in several genera of Old World hispines) and thus most likely represents a synapomorphy for Dorynotini. Within Dorynotini, *Heteronychocassis* is unique, as it is the only genus which lacks a postscutellar tubercle or spiniform projection.

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Chapter VII

SEKERKA L. & BARCLAY M. L. V. (2014) Fabrician types of Cassidinae (Coleoptera: Chrysomelidae) deposited in the Natural History Museum, London. *Acta Entomologica Musei Nationalis Pragae*, **54**: 657–684.

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Fabrician types of Cassidinae (Coleoptera: Chrysomelidae) deposited in the Natural History Museum, London

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Abstract. All Fabrician types of Cassidinae found at the Natural History Museum, London were revised. The following new taxonomic changes were made: species status of *Basiprionota bipuncticollis* (Boheman, 1856) stat. restit., *Chelymorpha multipunctata* (Olivier, 1790) stat. restit., *Eugenysa decussata* (Fabricius, 1775) stat. restit., and *Aspidimorpha* (*Aspidimorpha*) *calligera* Boheman, 1854, stat. restit., are restored. The identities of *Cassida cincta* Fabricius, 1781, stat. nov., *Cassida dorsata* Fabricius, 1787, stat. nov., and *Cassida octopunctata* Fabricius, 1787, stat. nov., are corrected based on examination of type material. The following new synonymies are proposed: *Aspidimorpha isparetta* Boheman, 1854 = *Cassida cincta* Fabricius, 1781, syn. nov., *Aspidimorpha calligera* = *A. dorsata* sensu auctt., *Basiprionota bipuncticollis* = *B. privigna* (Boheman, 1862) syn. nov. = *B. octopunctata* sensu auctt., *Basiprionota octopunctata* (Fabricius, 1787) = *B. privigna* sensu auctt., *Cassida dorsata* Fabricius, 1787 = *Aspidomorpha fuscopunctata* Boheman, 1854, syn. nov. = *A. rubrodorsata* Boheman, 1854 ,syn. nov., *Cassida decussata* Fabricius, 1775 = *C. venosa* Fabricius, 1798, syn. nov., *Cassida marginella* Fabricius, 1775 = *Charidotis punctatostriata* Boheman, 1855, syn. nov. = *Charidotis herbida* Boheman, 1855, syn. nov., *Coccinella cassidea* Fabricius, 1775 = *Cassida cribraria* Fabricius, 1775, syn. nov. The species generally referred to as *Aspidimorpha cincta* (sensu auctt.) is left without a name, and is described here as *Aspidimorpha* (*Aspidimorpha*) *innominata* Sekerka sp. nov. A neotype is designated for *Coccinella cassidea* Fabricius, 1775 as the original type specimen is presumed lost. Lectotypes are designated for *Cassida cincta* Fabricius, 1781, *C. cribraria* Fabricius, 1775, *C. dorsata* Fabricius, 1787, *C. marginella* Fabricius, 1775 and *C. miliaris* Fabricius, 1775 to avoid further misinterpretations and to stabilize the current usage of the names. No type material of *Cassida sinuata* Fabricius, 1792 could be traced. Colour photographs of type specimens are provided.

Key words. Chrysomelidae, Johan Christian Fabricius, Joseph Banks, taxonomy, new synonymy, new species, new status, lectotype designation, neotype designation

Introduction

Danish zoologist Johan Christian Fabricius (1745–1808) was one of the most prolific early entomologists, and named nearly 10,000 species, mostly insects. His original collection was divided between the Zoological Museum, University of Kiel, Germany (JFUK) and the Zoological Museum, University of Copenhagen, Denmark (ZMUC) because he had worked as a professor in both universities (Tuxen 1967). Often, even within the type series of various species, some specimens belong to JFUK, while others to ZMUC. In the 1960s ZMUC received the JFUK part of the Fabricius collection on permanent loan. Both parts (JFUK and ZMUC) of the collection were catalogued by ZMUC employee Ella Zimsen (Zimsen 1964). They are housed separately in ZMUC and well curated by the ZMUC staff. Specimens are organized in new drawers and a convenient unit tray system, except one original box that has been maintained in its original state for display (A. Solodovnikov, pers. comm.).

Fabricius was a regular visitor to London, where he studied the collection of the British Museum as well as that of Sir Joseph Banks (1743–1820). Banks was the President of the Royal Society and an eminent English naturalist and botanist, who had participated in Captain Cook's first Endeavour voyage (1768–1771). His collection, rich in Fabrician types, was originally left to the Linnean Society, but presented to the British Museum in 1863, and along with the other natural history material, transferred to the Natural History Museum, London (BMNH) in the 1880s, where it remains, described by Zimsen (1964) as 'well preserved and easily accessible'. The Coleoptera collection consists of 15 drawers, and is housed separately from the main collections.

Fabricius described 15 Cassidinae from collections in London, 14 in the genus *Cassida* Linnaeus, 1758 and one in *Coccinella* Linnaeus, 1758. Of these, 12 were from 'Mus. Dom. Banks' (collection of Master Banks) and three, including *Coccinella cassidea* Fabricius, 1775, in 'Mus. Britann.' (collection of the British Museum). Most of these specimens have never been examined by specialists working on Cassidinae. In many cases specimens standing under the same name in ZMUC and JFUK have been consulted instead, and present concepts have largely been based on these. However, in many cases specimens in Fabricius's own collections of species that he had described from other collections, are not in accordance with original descriptions, are often pinned on different pins, and were apparently acquired by him subsequently to description and should not be regarded as type material. Fabricius's concepts were broad, and specimens he may have regarded as conspecific, especially some years after the description, may not have been. We found discrepancies between BMNH and JFUK specimens of several species described from Banks's collection.

The first author had the opportunity to examine the ZMUC collections (including JFUK material) and to study all Fabrician types housed there. He also had the opportunity to study the Cassidinae collections of the BMNH including the Fabrician types in the Banks collection. As a result, we present below a list of Fabrician types of Cassidinae located in BMNH with necessary taxonomic changes and comments. All the taxonomic changes made are aimed to best serve the interests of nomenclatural stability, though, some major changes were required to keep the use of names in accordance with their type material.

Material and methods

All specimens were studied using methods of standard comparative morphology and compared to additional type material whenever necessary. Original descriptions are cited as they appeared in the first edition of the respective work, except Gothic long letter ‘s’ has been changed to normal letter ‘s’ and letter ‘v’ was replaced with letter ‘u’ where necessary. Status given by Zimsen (1964) is also reproduced verbatim, with individual characters and comments discussed under ‘Remarks’. Current status follows Borowiec’s (1999) catalogue or is adjusted according to new observations.

Type localities are cited as they appeared in the original descriptions. Label data for all specimens are verbatim as they appeared on the labels. Individual labels are separated by a double vertical bar (‘||’) while data on different rows by a single vertical bar (‘|’). Additional comments and explanatory notes are given in the square brackets and following abbreviations are used for characteristics of the label: b – blue, bf – black frame, cb – cardboard paper, g – green, hw – handwritten, r – red, s – soft, w – white.

All type specimens are housed in the BMNH if not stated otherwise. Collection codens used in the paper:

BMNH	Natural History Museum, London, UK (formerly British Museum of Natural History);
DBET	Department of Biodiversity and Evolutionary Taxonomy, University of Wroclaw, Poland (Lech Borowiec);
IRSN	Institut Royal des Sciences Naturelles de Belgique, Bruxelles, Belgium (Pol Limbourg);
JFUK	J. C. Fabricius collection, University of Kiel, Germany (currently in ZMUC);
LSPC	Lukáš Sekerka collection, Prague, Czech Republic;
MHNG	Muséum d’Histoire Naturelle, Genéve, Switzerland (Ivan Löbl);
MRAC	Musée Royal de l’Afrique Centrale, Tervuren, Belgium (Eliane De Coninck);
NHMB	Naturhistorisches Museum, Basel, Switzerland (Eva Sprecher);
NHRS	Naturhistoriska Riksmuseet, Stockholm, Sweden (Johannes Bergsten);
NMPC	National Museum, Prague, Czech Republic (Jiří Hájek);
ZMUC	Zoological Museum, University of Copenhagen, Denmark (Alexey Solodovnikov).

List of species described by Fabricius (in alphabetical order)

Cassida bidens Fabricius, 1781

(Figs 1–3)

Cassida bidens Fabricius, 1781: 112.

Type locality. ‘Brasilia’.
Type material examined. Syntype: pinned, ‘Cassida bidens | Fabr. Spec. 112. n. 32 [w, hw, s, bf]’ (BMNH).
Status in Zimsen (1964). P. 91; No. 1345. ‘London, 1 specimen’.
Original description. ‘C. atra, elytris antice porrectis, spina suturali erecta.

Habitat in Brasilia. Mus. Dom. Banks.

Magna. Thoracis clypeus rotundatus, subemarginatus dorso carinato niger maculis duabus ferrugineis obsoletis. Elytra reticulata, atra, immaculata, basi ultra caput porrecta, carinata, spinaque in medio suturae elongata, acuta, atra nitida. Corpus atrum femoribus anticis intus pallidis.’ (Fabricius 1781).

Current status. *Dorynota* (*Dorynota*) *bidens* (Fabricius, 1781).
Remarks. The species was described from Banks’s collection and Zimsen (1964) reported only a single specimen in BMNH, probably the only specimen Fabricius had for description.

Dorynota bidens has been correctly identified since its description. There is only one similar species, *D. nigra* (Boheman, 1856), which differs in its uniformly black dorsum with a dark green metallic sheen and a shorter dorsal spine, while *D. bidens* has dorsum black without metallic sheen and with a small reddish spot on the lateral slope of each elytron, and a long dorsal spine.

Cassida cincta Fabricius, 1781

(Figs 4–6)

Cassida cincta Fabricius, 1781: 109 (junior primary homonym of *Cassida cincta* DeGeer, 1774).

Type locality. 'Africa aequinoctiali' [= equatorial Africa].

Type material examined. Lectotype (here designated): ♀, pinned, 'Cassida cincta | Fabr. Spec. 109. n. 9. [w, hw, s, bf]' (BMNH). The specimen is provided with an additional label: 'LECTOTYPUS | Cassida | cincta | Fabricius, 1781 | L. Sekerka & | M.V.L. Barclay des. 2014 [r, p, cb]'.

Status in Zimsen (1964). P. 89; No. 1295. 'London, 1 specimen (Kiel 1 specimen)'.

Original description. 'C. thorace elytrisque obscuris, margine flavescente, elytris ante marginem macula albo hyalina. Habitat in Africa aequinoctiali. Mus. Dom. Banks.

Statura omnino C. interruptae. Thorax rotundatus, integer obscurus margine flavescente. Elytra obscura margine flavo et ante marginem macula magna albo hyalina.

Variat rarius macula magna marginis ad basin et ante apicem.' (Fabricius 1781).

Current status. New senior synonym of *Aspidimorpha isparetta* Boheman, 1854.

Remarks. Boheman (1854) transferred this species to *Aspidimorpha* Hope, 1840 and placed *C. quadriremis* Gyllenhal, 1808 as its synonym. Borowiec (1999) used *A. quadriremis* as the valid name on the grounds that *Cassida cincta* Fabricius, 1781 was a junior homonym of *C. cincta* De Geer, 1775, and thus *C. quadriremis* was the next available synonym. However, this synonymy was based on a specimen of *A. quadriremis* housed in the NHRS which is not actually a type specimen. Sekerka (2008) found that the true type of *A. quadriremis* is located in the Uppsala Museum where Gyllenhal's collection is housed and that the specimen was conspecific with *A. tecta* Boheman, 1854. However because of the homonymy, Sekerka (2008) proposed a new substitute name *A. fabricii* Sekerka, 2008 for *C. cincta* Fabricius not De Geer, 1775 and synonymized *A. tecta* with *A. quadriremis*.

Fabricius (1781) apparently based this species on more than one specimen, as he mentioned that the typical form was uniformly yellow with just the explanate margin of elytra with a hyaline spot, and mentioned a rare variety with large basal and postero-lateral spots on the explanate margin of elytra.

Zimsen (1964) mentioned one specimen in BMNH and one in JFUK (the latter placed in parentheses, suggesting it was possibly not mentioned in the original description). Both specimens have basal and postero-lateral spots on the explanate margin of elytra but each belongs to a different species. The JFUK specimen is in accordance with the widely applied concept of *A. cincta* (= *A. fabricii*), but does not agree with the original description of *A. cincta* as it does not have a large hyaline spot in the middle of the explanate margin of each elytron (this character is completely absent in this taxon). The BMNH specimen agrees with the original description as it has the hyaline spot. However, it is conspecific with *A. isparetta* Boheman, 1854. The latter is a widespread and very abundant species in Africa, displaying great variability in dorsal pattern (see Borowiec 1997), however, nearly all specimens have more or less distinct hyaline spot on the explanate margin of elytra. The identification of some populations is complicated, but fortunately the BMNH specimen is a female possessing densely pubescent apex of the elytral epipleura, another typical character for *A. isparetta* which is present only in females.

We concur with Zimsen (1964) that Fabricius did not use the JFUK specimen in the description of *C. cincta* as it is very different from the BMNH one (pattern, convexity of elytra, body size, and general shape) and does not agree with the original description. Most likely Fabricius obtained the specimen later and included it under this species, however, it is also questionable whether this particular specimen was included in original Fabrician collection under *C. cincta,* because the collection was largely disorganized (Zimsen 1964). We were unable to trace any other specimen(s) which might belong to the original type series of *C. cincta,* so the BMNH specimen is the only one known to survive. The genus *Aspidimorpha* is rather complicated regarding its taxonomy and species identification, therefore we designate the BMNH specimen as the lectotype to avoid any further misapplications.

As we stated above, true *C. cincta* is conspecific with *A. isparetta*, so the two species need to be synonymized. However, because *C. cincta* Fabricius is a junior homonym of *C. cincta* De Geer, 1775, the name *A. isparetta* is the oldest available name for this species (see ICZN 1999: Article 60.2), and the recently proposed replacement name for *C. cincta* Fabricius, *A. fabricii* Sekerka, becomes its junior synonym. Due to the new synonymy, the species presently referred to as *A. fabricii/A. cincta* is without a name, and thus is here described as new species, *Aspidimorpha innominata* Sekerka sp. nov. (see p. 678).

Cassida cribraria Fabricius, 1775

(Figs 7–9)

Cassida cribraria Fabricius, 1775: 90.

Type locality. 'America'.

Type material examined. Lectotype (hereby designated): ♀ (specimen with large spots on elytra), pinned, 'Cassida cribraria | Fab. Entom. p. [printed] 90. n. 9. [w, hw, s, bf]' (BMNH). Paralectotype: ♀ (specimen with small spots), without label and pinned next to the lectotype (BMNH). Both specimens are provided with an additional label: 'LECTOTYPUS [or PARALECTOTYPUS, respectively] | Cassida | cribraria | Fabricius, 1775 | L. Sekerka & | M.V.L. Barclay des. 2014 [r, p, cb]'.

Status in Zimsen (1964). P. 90; No. 1315. 'London, 2 specimens (Kiel 1 specimen)'.

Original description. 'C. rufescens, thorace punctis quatuor, elytris numerioris, nigris, clypeo emarginato. Habitat in America. Mus. Dom. Banks.

Statura nostratum, at paulo major. Antennae apice nigrae. Clypeus emarginatus, rufescens, punctis quatuor dorsalibus nigris. Elytra laevia, gibba, rufescentia, punctis numerosis sparsis. Corpus nigrum.' (Fabricius 1775).

Current status. New junior objective synonym of *Chelymorpha cassidea* (Fabricius, 1775).

Remarks. Fabricius (1775) proposed the species based on specimen(s) with four black spots on the pronotum and red elytra with black spots and black ventrites. Boheman (1854) transferred the species to *Chelymorpha* Chevrolat, 1836 and used the name for South American specimens having the pronotum with two small spots and the elytra with numerous small black specks. Zimsen (1964) reported three specimens, two in the BMNH and one in JFUK (the latter placed in parentheses). The JFUK specimen is in accordance with Boheman's (1854) concept of *C. cribraria*, but, it does not agree with the original description.

Chelymorpha cribraria as defined and used since Boheman (1854) is a very variable species, but the first author has never examined a specimen having four spots on pronotum in combination with numerous small black spots on the elytra, although Boheman (1854) mentioned such a colour form as 'var. A'. Some populations have four irregular spots on the pronotum but these have a more or less black disc of the elytra. Moreover, *C. cribraria* sensu Boheman always has at least a slightly reddish or rust-coloured underside, like the JFUK specimen, but unlike the original description (Fabricius 1775) which mentions a black underside. Therefore we do not consider the JFUK specimen as part of the type series.

The two BMNH specimens agree with the original description having black body, red dorsum, and the pronotum with four black spots. What Fabricius meant by '[elytra] punctis numerosis sparsis' is questionable, since both specimens have each elytron with six spots and one common postscutellar spot. One specimen has these spots large and the other smaller, but still, the spots are at least sparsely distributed. In such cases Fabricius usually (though not always) gave a precise number of spots. Other characters are fully in accordance with the original description, and indeed 13 spots may be considered 'numerous', so we consider both specimens to be syntypes. Both specimens are conspecific with *Chelymorpha cassidea* (Fabricius, 1775) described in the same work as *C. cribraria* but in the genus *Coccinella* Linnaeus, 1758. We retain the name *C. cassidea* as valid with *C. cribraria* as its junior synonym following the First Reviser Principle, Article 24.2.1 of the Code (ICZN 1999), because *C. cassidea* has been correctly applied and refers to a common North American species (see further comments under *Coccinella cassidea*).

As we stated above, *C. cassidea* is a very variable species having several more or less distinct local races in the USA and the two Banks specimens of *C. cribraria* belong to different populations. Therefore we designate as the lectotype the specimen with larger elytral spots which represents the most common North American population, also characterized by fine punctation of the elytra. The other specimen has, except for smaller spots, distinctly coarser punctation thus certainly came from a different locality.

Due to the new synonymy, the taxon identified until now as *Chelymorpha cribraria* loses its name, and thus following the Code (ICZN 1999), the oldest available synonym *Chelymorpha multipunctata* (Olivier, 1790) becomes the valid name. This species was also designated as the type species of the genus *Chelymorpha* by Duponchel & Chevrolat (1843).

Cassida decussata Fabricius, 1775

(Figs 19–21)

Cassida decussata Fabricius, 1775: 93.
Cassida venosa Fabricius, 1798: 84, **syn. nov.**

Type locality. *Cassida decussata*: 'Jamaica'; *C. venosa*: 'Cajennae'.
Type material examined. *Cassida decussata*: Syntype: ♂, pinned, '? [hw] Type [w, p, round label with red frame] || venosa Fabr. [b, hw by C. H. Boheman] || Cassida. | decussata [hw] | Fab. [hw] | Type? C.J.G. [hw] [w, p, cb, hw by C. J. Gahan]' (BMNH). *Cassida venosa*: Syntype: pinned, 'venosa [grey and hw by Fabricius pinned separately from the specimen]' (JFUK).
Status in Zimsen (1964). P. 237; No. 4100 (no material listed).
Original description. 'C. nigro coerulescens, elytris flavo maculatis: maculis dorsalibus reticulatis, lateralibus distinctis. Habitat in Jamaica. Mus. Brit.

Magna. Thoracis clypeus emarginatus, coerulescens, macula utrinque magna flava. Elytra dorso reticulata, margine maculis sex vel septem distinctis flavis.' (Fabricius 1775).

Current status. *Eugenysa decussata* (Fabricius, 1775) stat. restit.
Remarks. Fabricius (1775) described this species from BMNH material only. Zimsen (1964) did not locate any material of this species, but stated that it was considered a synonym of *Eugenysa grossa* (Linnaeus, 1758), a synonymy established by Schönherr (1808). Searching in the BMNH collection we found a single specimen which agrees with the original description, having pronotum with two reddish spots and explanate margin of the elytra with seven more or less defined red transverse spots. However, the specimen is conspecific with *E. venosa* (Fabricius, 1798) not *E. grossa* as suggested by Schönherr (1808). The specimen was also studied by C. H. Boheman as it has his original handwritten identification label stating '*E. venosa*'. However, Boheman apparently did not recognize the specimen as the Fabrician type. Charles Joseph Gahan, former BMNH Keeper of Entomology, labelled the specimen as a potential type around the turn of the 19th century. There is no other specimen in the BMNH collection which agrees with the original description. Particularly characteristic is the pronotum with large red spots, a rare feature in this species. Therefore we agree with Gahan and consider the specimen as syntype because Fabricius did not state how many specimens he used for description. However, quite likely this was the only specimen he had.

Eugenysa grossa always has a red pronotum (at most with two indistinct black specks) thus it is evident even from the original description that *C. decussata* could not be the same as *E. grossa*.

The syntype has a weakly convex elytra (gibbous in *E. grossa*) and the explanate margin of the elytra finely punctate (coarsely punctate in *E. grossa*). Because *C. decussata* is older name we restore its species status and place *E. venosa* as its junior synonym (the type in ZMUC has been seen).

The type locality of *E. decussata* is assumed to be erroneous as no species of *Eugenysa* is known from Antilles. The species is so far known only from French Guyana and Suriname.

Cassida deusta Fabricius, 1775

(Figs 13–14)

Cassida deusta Fabricius, 1775: 89.

Type locality. 'nova Hollandia' [= Australia].
Type material examined. Syntypes (2 specimens): pinned, one with following label, the other without label: 'Cassida deusta | Fab. Entom. p. [printed] 89. n. 8. [w, hw, s, bf]' (BMNH): 1 specimen: pinned, 'deusta [grey and hw by Fabricius pinned separately from the specimen]' (JFUK).
Status in Zimsen (1964). P. 90; No. 1313. 'London, 2 specimens (Kiel 1 specimen)'.
Original description. 'C. rufescens, thorace punctis duobus, elytris numerosis cyaneo nigris, clypeo integro. Habitat in nova Hollandia. Dom. Banks.

Statura nostratum. Antennae apice nigrae. Clypeus rotundatus, integer, rufus, punctis duobus nigris in medio, elytra rufa, punctis circiter novem lateralibus majoribus nigro cyaneis. Margo subtus fasciis tribus. Corpus flavescens.' (Fabricius 1775).

Current status. *Aspidimorpha* (*Aspidimorpha*) *deusta* (Fabricius, 1775).
Remarks. *Cassida deusta* was described from the Banks collection and Zimsen (1964) reported two specimens in BMNH and one in JFUK. This is the only case when the JFUK specimen agrees morphologically with those in BMNH and is also pinned on the same kind of pin: therefore all three can probably be regarded as syntypes. The taxon is clearly distinct morphologically from other *Aspidimorpha* species and the name has been correctly applied since its description thus there is no need for a lectotype designation.

Cassida dorsata Fabricius, 1787

(Figs 16–18)

Cassida dorsata Fabricius, 1787: 64.
Aspidimorpha fuscopunctata Boheman, 1854: 298, **syn. nov.**
Aspidimorpha rubrodorsata Boheman, 1854: 310, **syn. nov.**

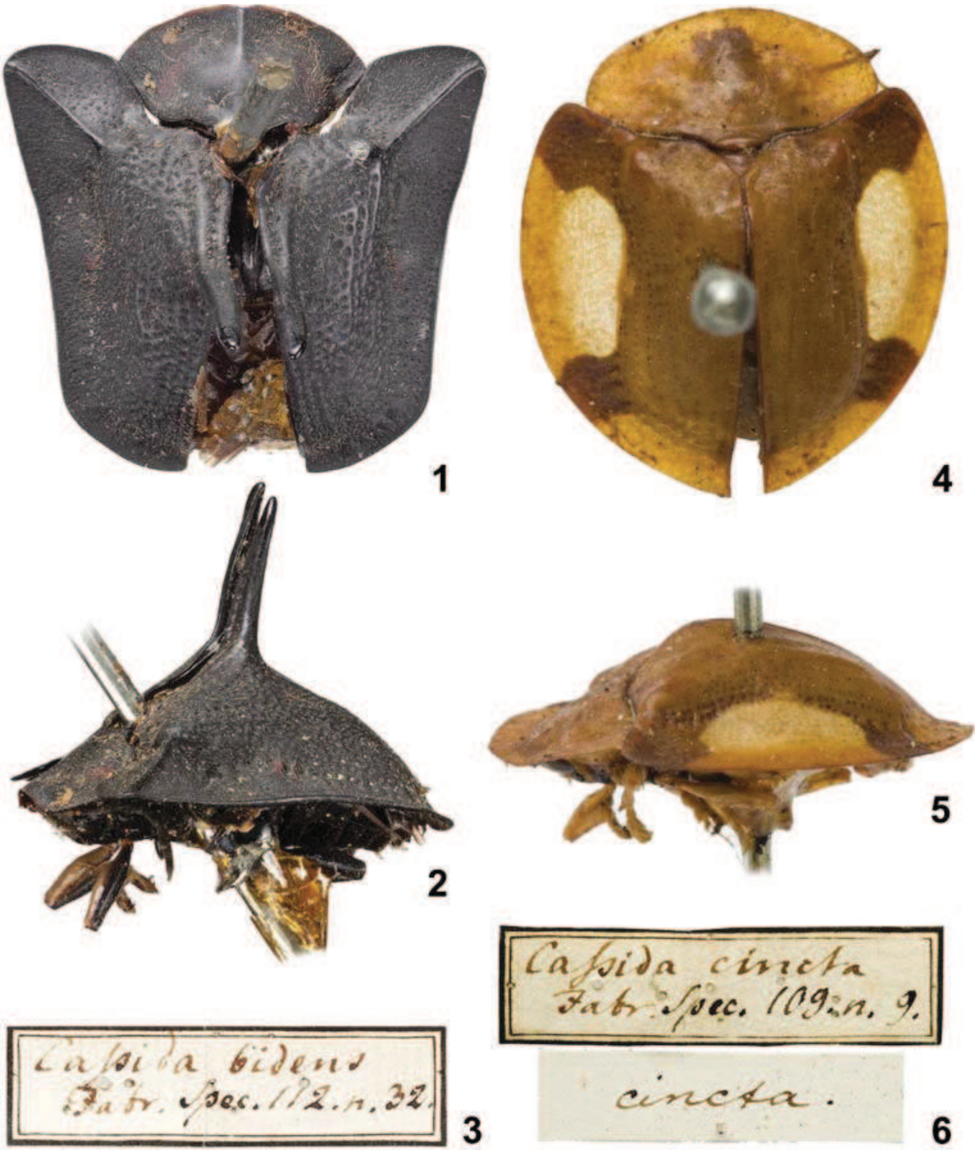
Type locality. *Cassida dorsata*: 'Siam'; *A. fuscopunctata*: 'Java'; *A. rubrodorsata*: 'Java'.
Type material examined. *Cassida dorsata*: Lectotype (here designated): pinned, 'Cassida dorsata | Fab. Mant Ins. 33. [w, hw, s, bf]'. The specimen is provided with an additional label: 'LECTOTYPUS | Cassida | dorsata | Fabricius, 1787 | L. Sekerka & | M.V.L. Barclay des. 2014 [r, p, cb]' (BMNH). *Aspidimorpha fuscopunctata*: Lectotype (designated by Borowiec 1999): pinned, 'Java. [w, p, s] || Mellb. [w, p, s] || Type. [w, p, s] || LECTOTYPE | des. L. Borowiec [r, p, cb] || NHRS-JLKB | 000020954 [w, p, cb]' (NHRS). *Aspidimorpha rubrodorsata*: Holotype: pinned, 'Java. [w, p, s] || Westerm [w, p, s] || Type. [w, p, s] || NHRS-JLKB | 000020956 [w, p, cb]' (NHRS).
Status in Zimsen (1964). P. 91; No. 1339. 'London, 1 specimen'.
Original description. 'C. thorace elytrisque obscuris, elytris spina suturali margineque albi ante: basi obscuro. Habitat in Siam. Mus. Dom. Banks.

Statua omnino C. iamaicensis at duplo minor. Thoracis clypeus rotundatus, obscurus, nitens. Elytra antice ad suturam spinosa, fusca margine late albicante basi obscura. Corpus flavescens.'

Current status. *Aspidimorpha* (*Aspidimorpha*) *dorsata* (Fabricius, 1787).
Remarks. This species was described from the Banks collection and Zimsen (1964) mentioned only one specimen. *Cassida dorsata* was transferred by Boheman (1854) to *Aspidimorpha* Hope, 1840 and since that time has been used for a common SE Asian species characterized by the elytra having only humeral spots, a sharp, high conical tubercle and elytra often with a dark pattern. However, Boheman most likely never studied the actual type specimen as his concept of *A. dorsata* is different from the type.

Cassida dorsata sensu Fabricius is conspecific with *A. fuscopunctata* Boheman, 1854 as well as its synonym *A. rubrodorsata* Boheman, 1854, and both are here synonymized with it. Due to the new synonymy we restore specific status of *Aspidimorpha calligera* Boheman, 1854, stat. restit., which had been considered as a junior synonym of *A. dorsata*. Type specimens of all three discussed species have been examined and lectotype is designated for *C. dorsata* to avoid further misaplication of this taxon. All references (see Borowiec 1999, Borowiec & Świętojańska 2014) to *A. dorsata* since Boheman (1854) therefore refer to *A. calligera*.

Both species are widely distributed in SE Asia and some specimens are rather difficult to identify without series of properly identified specimens. Generally, *A. dorsata* is smaller (8–10 mm) and has body subcircular in outline while *A. calligera* is larger (9.3–12.6 mm) and has somewhat subtriangular body. *Aspidimorpha calligera* is a rather continental species which is not abundant in Indonesia (Java and Sumatra); all populations have distinct humeral spots on the explanate margin of elytra and frequently the disc of elytra with some dark markings. *Aspidimorpha dorsata* is abundantly distributed in both continental and insular Asia; insular populations usually do not have humeral spot on the explanate margin of the elytra and frequently have the disc of the elytra with dark markings, while continental populations usually have the humeral spot on the explanate margin of elyta (like the type) and the disc almost uniformly yellow. For detailed redescriptions, comparative notes, and key see Świętojańska (2001).



Caſsida bidens
Fabr. Spec. 112. n. 32.

Caſsida cincta
Fabr. Spec. 109. n. 9.

cincta.

Figs 1–6. 1–3 – *Cassida bidens* Fabricius, 1781, syntype; 4–6 – *C. cincta* Fabricius, 1781, lectotype. (1, 4 – habitus dorsal; 2, 5 – habitus lateral; 3, 6 – labels).

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Caſsida Cribraria
Fab. Entom. p. 90. n. 9.

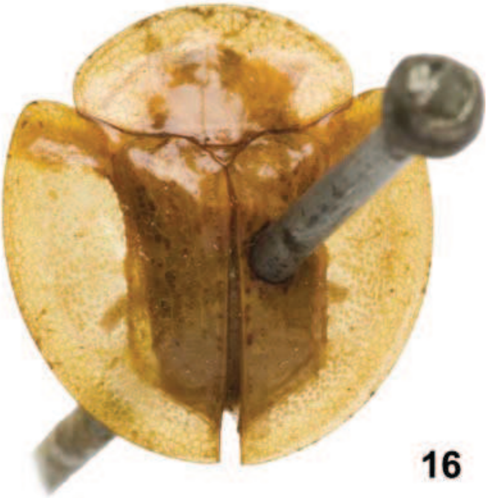
9

Caſsida Interrupta
Fab. Entom. p. 89. n. 7.

12

Figs 7–12. 7–9 – *Cassida cribraria* Fabricius, 1775, lectotype, and *Coccinella cassidea* Fabricius, 1775, neotype; 10–12 – *Cassida interrupta* Fabricius, 1775, syntype. (7, 10 – habitus dorsal; 8, 11 – habitus lateral; 9, 12 – labels).

13



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17

Caſsida Deuſta.
Fab. Entom. p. 89. n. 8.

15

Caſsida dorſata e ſiam
Fabr. Mant. Ins. n. 33.

18

Figs 13–18. 13–15 – *Cassida deusta* Fabricius, 1775, syntype; 16–18 – *Cassida dorsata* Fabricius, 1787, lectotype. (13, 16 – habitus dorsal; 14, 17 – habitus lateral; 15, 18 – labels).

19

22

20

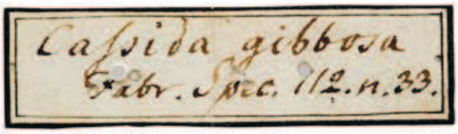
23

?Type

Cassida.
decussata
Type? Fab.
c.99.

venoſa Fabr.

21



Caſsida gibboſa
Fabr. Spec. 112. n. 33.

24

Figs 19–24. 19–21 – *Cassida decussata* Fabricius, 1775, syntype; 22–24 – *Cassida gibbosa* Fabricius, 1781, syntype. (19, 22 – habitus dorsal; 20, 23– habitus lateral; 21, 24 – labels).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28


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29


Caſ: marginella
Fab. Entom. p. 89. n. 6

27


Caſsida miliaris.
Fab. Entom. p. 91. n. 15.

30

Figs 25–30. 25–27 – *Cassida marginella* Fabricius, 1775, lectotype; 28–30 – *Cassida miliaris* Fabricius, 1775, lectotype. (25, 28 – habitus dorsal; 26, 29 – habitus lateral; 27, 30 – labels).

Caſsida 8_punctata
e Siam
Fabr. Mant. Ins. n. 8

Caſsida 6_pustulata
Fabr. Spec. 114. n. 46

6-pustulata.

Figs 31–36. 31–33 – *Cassida octopunctata* Fabricius, 1787, syntype; 34–36 – *Cassida sexpustulata* Fabricius, 1781, syntype. (31, 34 – habitus dorsal; 32, 35 – habitus lateral; 33, 36 – labels).

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Caſsida truncata
Fabr. ſpec. 112 n. 34.

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Figs 37–43. 37–39 – *Cassida truncata* Fabricius, 1781, syntype; 40–43 – *Aspidimorpha* (*Aspidimorpha*) *innominata* sp. nov.: 40–41 – holotype (Dakar, NMPC); 42 – paratype (Senegal, NMPC); 43 – paratype (Dakar, NMPC). (37, 40, 42–43 – habitus dorsal; 38, 41 – habitus lateral; 39 – label).

Cassida gibbosa Fabricius, 1781

(Figs 22–24)

Cassida gibbosa Fabricius, 1781: 112.

Type locality. 'Brasilia'.
Type material examined. Syntype: pinned, 'Cassida gibbosa | Fabr. Spec. 112. n. 33. [w, hw, s, bf]' (BMNH).
Status in Zimsen (1964). P. 91; No. 1346. 'London, 1 specimen'.
Original description. 'C. atra, thorace maculis duabus villoso aureis, elytris virescenti reticulatis, spina suturali obtusa. Habitat in Brasilia. Mus. Dom. Banks.

Corpus magnum, atrum. Thoracis clypeus rotundatus, emarginatus maculis duabus magnis villoso aureis. Elytra atra viridi villoso reticulata margine nigro. Sutura in medio elevata in spinam obtusam. Pedes nigri plantis fuscis.' (Fabricius 1781).

Current status. *Mesomphalia gibbosa* (Fabricius, 1781).
Remarks. *Cassida gibbosa* was described from the Banks collection only and Zimsen (1964) reported just a single specimen in the BMNH, which was quite likely the only one Fabricius used for the description. Hope (1840) placed it in *Mesomphalia* Hope, 1840 and since that time the name has been correctly applied and the present identification is in accordance with the type.

Cassida interrupta Fabricius, 1775

(Figs 10–12)

Cassida interrupta Fabricius, 1775: 89.

Type locality. 'nova Hollandia' [= Australia].
Type material. Syntype: pinned, 'Cassida Interrupta | Fab.Entom.p. [printed] 89. n. 7. [w, hw, s, bf]' (BMNH).
Status in Zimsen (1964). P. 90; No. 1309. 'London, 1 specimen'.
Original description. 'C. flavescens, thorace immaculato, elytris ante marginem punctisque nigris. Habitat in nova Hollandia. Mus. Dom. Banks.

Statura omnino praecedentis [*C. marginella*]. Antennae flavae, apice nigrae. Thoracis clypeus rotundatus, flavus, integer. Elytra flavescentia, linea lata atra in medio interrupta, quae ante marginem a basi ad angulum ani excurrit. Margo ipse late flavescens fasciis duabus atris, altera ad basin, altera versus apicem. In disco obscuriore puncta aliquot nigra sparsa. Corpus subtus flavescens.' (Fabricius 1775).

Current status. *Aspidimorpha* (*Aspidimorpha*) *interrupta* (Fabricius, 1775).
Remarks. This name has been correctly applied since its description and the present identification is in accordance with the type. A detailed redescription of *A. interrupta* was published by Borowiec (1992). Zimsen (1964) reported just a single specimen in the BMNH, which was quite likely the only one Fabricius used for the description.

Cassida marginella Fabricius, 1775

(Figs 25–27)

Cassida marginella Fabricius, 1775: 89.
Charidotis punctatostriata Boheman, 1855: 49, **syn. nov.**
Charidotis herbida Boheman, 1855: 51, **syn. nov.**

Type locality. *Cassida marginella*: 'Brasilia'; *Charidotis herbida*: 'Saltogrande Brasiliae'; *Charidotis punctatostriata*: 'Bolivia'.
Type material. *Cassida marginella*: Lectotype (here designated): pinned, 'Cass: Marginella | Fab.Entom.p. [p] 89. n. 6. [w, hw, bf]' (BMNH). Paralectotypes: 1 spec., pinned (teneral specimen), without label but pinned in the same

series as previous specimen (BMNH). Both specimens are provided with an additional label: 'LECTOTYPUS [or PARALECTOTYPUS, respectively] | Cassida | marginella | Fabricius, 1775 | L. Sekerka & | M.V.L. Barclay des. 2014 [r, p, cb]'. *Charidotis herbida*: Lectotype (designated by Borowiec 1999): pinned, 'Brasil [w, p, s] || Bhn. [w, p, s] || Type. [w, p, s] || NHRS-JLKB | 000021821 [w, p, cb]' (NHRS). *Charidotis punctatostriata*: Lectotype (designated by Borowiec 1999): pinned, 'Boliv [w, p, s] || Guéril [w, p, s] || Type. [w, p, s] || NHRS-JLKB | 000021820 [w, p, cb]' (NHRS).

Status in Zimsen (1964). P. 89; No. 1293. 'London, 1 specimen. (Kiel 1 specimen)'.

Original description. 'C. viridis, thoracis elytrorumque marginibus flavis. Habitat in Brasilia. Mus. Dom. Banks.

Statura omnino C. nebulosae. Clypeus rotundatus, integer, viridis, margine flavo. Elytra punctata, viridia, margine flavo. Aliam vidimus simillimam, totam pallescentem, vix distinctam.' (Fabricius 1775).

Current status. *Charidotis marginella* (Fabricius, 1775).

Remarks. The species was described from the Banks collection and Zimsen (1964) mentioned one specimen in BMNH and one in JFUK. Based on the description, Fabricius must have had at least two specimens, as he mentioned one green specimen with a yellow margin and the other uniformly pale-yellow. The Banks Collection includes two specimens, on identical pins, and not one as listed by Zimsen (1964); one is apparently the green individual and the other the pale-yellow one mentioned by Fabricius, which is a teneral specimen. Both agree with the original description, as does the JFUK specimen, and there is an argument to include the latter as a syntype (on the assumption that Fabricius retained one).

Charidotis marginella forms together with two allies a natural group of three species defined by uniformly yellow-green dorsum (golden when alive) and latero-posterior slope of elytra irregularly punctate. Boheman (1855) described the two species included in this group and separated them by pronotum finely punctate and elytra more convex with distinct postscutellar hump (*C. marginella* and *C. flavicans* Boheman, 1855) and *C. punctatostriata* Boheman, 1855 with pronotum distinctly punctate and elytra weakly convex. Spaeth (1936) also mentioned that the first two species have pronotum more rounded on sides. All three specimens have weakly convex elytra without a distinct hump and rather narrowly rounded lateral sides of pronotum but they differ in the punctation of pronotum. The two BMNH specimens have densely punctate lateral sides of pronotum and are conspecific with typical *C. punctatostriata* specimens while the JFUK specimen has them weakly and finely punctate and is intermediate to *C. marginella* sensu Boheman (1855). The punctation of pronotum and convexity of elytra are evidently variable characters as we have studied long series of *C. punctatostriata* / *marginella* specimens collected in one locality and there are specimens with weakly convex elytra in combination with finely punctate pronotum while others show densely punctate pronotum and subgibbous elytra with distinct dorsal hump like in *C. marginella* sensu Boheman (1855). Boheman (1855) also mentioned that the species differs in broader or narrower body respectively, however, this seems to be at least partly affected by gender of specimens and this feature appears also to be different population to population. It is desirable to conduct more field studies to resolve status of these nominal taxa, however, we here synonymize *C. punctatostriata* and *C. herbida* Boheman, 1855 (previously synonym of the latter) with *C. marginella* because the two BMNH specimens agree with the types of *C. punctatostriata* and were certainly those used by Fabricius. As mentioned above the JFUK specimen is slightly different and most likely Fabricius obtained it after the description of *C. marginella*. Therefore we designate the fully sclerotized BMNH specimen as the lectotype and exclude the JFUK specimen from the type series.

Cassida miliaris Fabricius, 1775

(Figs 28–30)

Cassida miliaris Fabricius, 1775: 91.

Type locality. ‘insula St. Helenae’.
Type material examined. Lectotype (here designated): pinned, ‘Cassida Miliaris | Fab.Entom.p. [p] 91. n. 15. [w, hw, bf]’ (BMNH). The specimen is provided with an additional label: ‘LECTOTYPUS | Cassida | miliaris | Fabricius, 1775 | L. Sekerka & | M.V.L. Barclay des. 2014 [r, p, cb]’.
Status in Zimsen (1964). P. 91; No. 1333. ‘London, 1 specimen. (Kiel 3 specimens)’.
Original description. ‘C. flava, thorace immaculato, elytris nigro punctatis: margine bifasciato. Habitat in insula St. Helenae. Mus. Dom. Banks.

Statura C. marginatae. Antennae flavae, apice nigrae. Thoracis clypeus rotundatus, integer, immaculatus. Elytra laevia, flava, punctis circiter decem nigris sparsis. Margo uti in reliquis dilatatus fasciis duabus, altera ad basin, altera versus apicem nigris. Sutura apice nigra. Subtus nigra, margine flavescente. Pedes flavi.’ (Fabricius 1775).

Current status. *Aspidimorpha* (*Aspidimorpha*) *miliaris* (Fabricius, 1775).
Remarks. Zimsen (1964) reported one BMNH and three JFUK specimens. It is unlikely that the three JFUK specimens were retained by Fabricius from the original Banks series as they do not agree well enough with the original description. Fabricius (1775) used for description specimen(s) with approximately ten black spots on each elytron. The BMNH specimen has the left elytron with eleven spots and right with ten while the JFUK specimens have larger and less numerous spots on the elytra. Therefore only the BMNH specimen is considered to be a syntype and is here fixed by lectotype designation to avoid any further confusions with JFUK specimens. The species has nearly always been identified and the name applied correctly.

Cassida octopunctata Fabricius, 1787

(Figs 31–33)

Cassida octopunctata Fabricius, 1787: 63.
= *Basiprionota privigna* (Boheman, 1862) (misidentification): Spaeth (1925: 393), Spaeth (1926c: 117), Borowiec (2009: 447).

Type locality. *Cassida octopunctata*: ‘Siam’ [= Thailand].
Type material examined. *Cassida octopunctata:* Syntype: ♀, pinned, ‘Cassida 8-punctata | e Siam | Fabr. Mant. Ins. n. 8 [w, hw, s, bf]’ (BMNH).

Prioptera bipuncticollis: Holotype: ♀, pinned, ‘Type [w, p, s, circle label with red frame] || Java. | Horsfield. | 60–15. [w, p, cb] || Java | E.I.C. [w, hw, s] || 725 [w, hw, s] || 60•15 | E.I.C. [w, p, s] || Basiprionota | bipuncticollis | Bhn. n. sp. [b, hw, s, Boheman‘s hw] || Prioptera | bipuncticollis | Type Bhn [w, hw by Gahan, cb]’ (BMNH).

Prioptera privigna: Syntype: ♀, pinned, ‘Type [w, p, s, circle label with red frame] || Java [hw] | Baly Coll. | 1905—54. [w, p, cb] || Prioptera | Privigna | Boh | Java [w, hw by Baly, cb] || Coll | Horsfield | Type [hw by Baly on underside of previous label]’ (BMNH).
Status in Zimsen (1964). P. 90; No. 1310. ‘London, 1 specimen’.
Original description. ‘C. rufescens thorace punctis duobus, elytris quatuor cyaneo nigris. Habitat in Siam Mus. Dom. Banks.

Statura et magnitudo C. deustae. Antennae rufescentes apice nigrae. Thorax rufescens punctis duobus paruis nigris. Elytra punctata, rufescentia punctis quatuor maioribus cyaneo nigris 2. 2. Corpus rufescens.’ (Fabricius 1787).

Current status. *Basiprionota octopunctata* (Fabricius, 1787).
Remarks. There is only a single specimen in the Banks collection, as reported by Zimsen (1964), and quite likely it is the only one Fabricius used for the description. Boheman (1850)

transferred the species to *Prioptera* Hope, 1840 (now a synonym of *Basiprionota* Chevrolat, 1836) and placed it in the group of species with the convex basal part of the explanate pronotal margin connected to the disc. This concept was also followed by Spaeth (1925) in his revision of *Prioptera*. However, the type specimen has the pronotal disc completely separated from the explanate margin by a sulcus, and is conspecific with *B. privigna* Boheman, 1862 sensu Spaeth (1925). We have examined the type of *B. privigna*, also housed in BMNH, and found that it is conspecific with *B. bipuncticollis* (Boheman, 1856), which was until now considered as synonym of *B. octopunctata*.

As *B. octopunctata* and *B. bipuncticollis* are two distinct species, the latter is removed from synonymy and its specific status is restored. *Basiprionota privigna* was until now considered as a valid species (i.e. Borowiec & Świętojańska 2014) but it seems that Spaeth never examined its type as it falls according to his key (Spaeth 1925) under *B. octopunctata* (Fabricius, 1787). Most likely Spaeth followed Boheman's (1850) concept of the latter species as there is a specimen in the BMNH collection identified as *B. octopunctata* by Boheman but actually matching with *B. bipuncticollis* and *B. privigna*. Boheman (1850, 1856) most likely did not examine the Fabrician type of *B. octopunctata,* as he stated that it had the explanate margin of the pronotum posteriorly convex, while the type specimen of *B. octopunctata* has it flat and completely separated from the disc.

The syntype of *B. privigna* was collected in Java by Horsfield, like the holotype of *B. bipuncticollis* (both also preserved in BMNH) and the latter differs only in the presence of two black spots on the disc of pronotum. The following new synonymy is proposed: *B. bipuncticollis* (Boheman, 1856) = *B. privigna* (Boheman, 1862) syn. nov. On the other hand, *B. privigna* sensu auctt. is conspecific with the true *B. octopunctata*. Therefore all published records of *B. octopunctata* since Boheman (1850) refer to *B. bipuncticollis*.

Currently, true *B. octopunctata* is known with certainty only from Sumatra and Singapore. It is listed for Thailand because of the type, but that may be incorrectly labelled, since no other specimen is known from Thailand. The record from Java most likely refers to the type locality of *B. privigna,* as we were unable to assess any further records from this island.

Cassida sexpustulata Fabricius, 1781

(Figs 34–36)

Cassida 6 pustulata Fabricius, 1781: 114.

Type locality. 'Brasilia'.

Type material examined. Syntype: pinned, 'Cassida 6 pustulata | Fab.Entom.p. [printed]114. n. 46. [w, hw, s, bf]' (BMNH).

Status in Zimsen (1964). P. 92; No. 1363. 'London, 2 specimens'.

Original description. 'C. cyanea, elytris maculis tribus rubris. Habitat in Brasilia. Mus. Dom. Banks.

Media. Thoracis clypeiis transversus, cyaneus, immaculatus, antice subemarginatus. Elytra medio gibba, cyanea maculis tribus rubris, prima baseos, secunda in margine et tertia versus marginem.' (Fabricius 1781).

Current status. *Cyrtonota sexpustulata* (Fabricius, 1781).

Remarks. Zimsen (1964) reported two specimens in BMNH, but apparently in error since there is only one (the opposite error occurred for *C. marginella*). This name has been correctly applied since its description and the present identification is in accordance with the type.

Cassida sinuata Fabricius, 1792

Cassida sinuata Fabricius, 1792: 298.

Type locality. 'Asia'.
Type material examined. Presumably lost, not found in the BMNH collection.
Status in Zimsen (1964). P. 90; No. 1323 (no material listed).
Original description. 'C. flavescens ferruginea thorace postice sinuato, coleoptris punctis undecim nigris. Habitat in Asia Mus. Britann.

Media. Antennae, caput, thorax aut flava, aut ferruginea, immaculata. Thoracis margo posticus sinuatus. Elytra punctis quinque, primo baseos, secundo, ad suturam, tertio in medio, quatro & quinto pari, & communi versus apicem.' (Fabricius 1792).

Current status. Junior synonym and primary junior homonym of *Basiprionota sinuata* (Olivier, 1790).
Remarks. So far, we have been unable to find any specimen in the collection which might represent potential type of *C. sinuata*. Judging from the description we are not sure whether the species was correctly synonymized with *B. sinuata* (Olivier, 1790) because the latter has differently positioned spots on elytra and with one spot on marginalia which was not mentioned by Fabricius. *Basiprionota sinuata* is a very variable species but it never has a spot on the suture, as in Fabricius's description.

Zimsen (1964) did not report any material for this species. However, it is possible that the species belongs to a quite different genus and any surviving type specimen(s) are standing unnoticed under a different species name. We processed in detail most of the BMNH Cassidinae, with the exception of the old world Cassidini and Aspidimorphini. There is a chance that the type could still be hidden among this material, but it is certainly not present in the main collection of *Basiprionota*.

Cassida truncata Fabricius, 1781

(Figs 37–39)

Cassida truncata Fabricius, 1781: 112.

Type locality. Not given.
Type material examined. Syntype: pinned, 'Cassida truncata | Fabr. Spec. 112. n. 34. [w, hw, bf]' (BMNH).
Status in Zimsen (1964). P. 91; No. 1347. 'London, 1 specimen'
Original description. 'C. rufa, elytris subreticulatis nigro maculatis dorso gibbis. Habitat ..... Mus. Dom. Banks.

Magna. Antennae nigrae. Thorax rufus maculis duabus dorsalibus nigris. Elytra basi truncata, gibba, rufa, subreticulata, nigro maculata, Margo rufus maculis simplicibus limboque ipso tenuissime nigro. Corpus nigrum.' (Fabricius 1781).

Current status. *Dorynota* (*Akantaka*) *truncata* (Fabricius, 1781).
Remarks. Zimsen (1964) reported just a single specimen (BMNH), which is quite likely to be the only one Fabricius used for the description. This name has been correctly applied since its description, and the present identification is in accordance with the type.

Coccinella cassidea Fabricius, 1775

(Figs 7–9)

Coccinella cassidea Fabricius, 1775: 82.
Cassida cribraria Fabricius, 1775: 90, **syn. nov.**

Type locality. Original type locality of *C. cassidea*: 'Marylandia'. Due to the designation of neotype a new type locality is established: 'America', after the type locality of *C. cribraria* mentioned by Fabricius (1775: 90).

Type material examined. Original type material lost. NEOTYPE (present designation): ♀ (specimen with large spots on the elytra), pinned, 'Cassida cribraria | Fab. Entom. p. [p] 90. n. 9. [w, hw, s, bf] || LECTOTYPUS | Cassida | cribraria | Fabricius, 1775 | L. Sekerka & | M.V.L. Barclay des. 2014 [r, p, cb]' (BMNH). The specimen is provided with an additional label: 'NEOTYPE | Coccinella | cassidea | Fabricius, 1775 | L. Sekerka des. 2013 [r, p, cb]'.
Status in ZIMSEN (1964). P. 85; No. 1221 (no material listed).
Original description. 'C. oblonga rubra: coleoptris punctis duodecim, thorace quatuor nigris. Habitat in Marylandia. Mus. Brit.

Thorax ruber, punctis quatuor nigris, antice emarginatus, margine incrassato, postice tridentatus. Elytra punctis sex, antico minutissimo.' (FABRICIUS 1775).

Current status. *Chelymorpha cassidea* (Fabricius, 1775).
Description of neotype. Body elongate oval, 12 mm long (Fig. 7).

Pronotum red with four black spots. Scutellum brownish-black. Elytra red, each elytron with seven spots organized in three rows: first containing a single postscutellar spot forming a common spot; second row running along approximately internal third width of elytra and containing three spots, one at base, one at the level of postscutellar spot and one slightly behind; third row running along outer third of elytral width and containing three spots, one at humerus, one situated between 2nd and 3rd spot of the second row and one on apicolateral slope. Two internal spots, 2nd and 3rd of the second row, distinctly larger than other (Figs 7–8). Head yellow with black mouthparts, five basal antennomeres yellow with upper side infuscate, remaining antennomeres black. Thorax including legs black, only episterna of mesothorax slighly paler. Abdomen black, three apical ventrites with a small yellow spot on each side.

Disc of pronotum sparsely but distinctly micro-reticulate and dull. Anterior margin moderately emarginate, swollen. Lateral margins swollen. Basal corners of pronotum strongly projecting posteriorly, thus pronotum distinctly broader than base of elytra.

Scutellum smooth and shiny.

Elytra regularly convex, smooth, without any ribs or elevated structures. Punctation dense, completely irregular. Punctures rather small but distinct, not particularly impressed. Interspaces two to four times wider than puncture diameter. Surface of elytra glabrous.

Clypeus approximately twice as wide as long, coarsely punctate. Prosternal collar moderately projecting towards mouthparts. Prosternal process moderately broad and slightly expanding apically. Tarsal claws divergent with large basal tooth.

Differential diagnosis. *Chelymorpha cassidea* belongs to a group of species characterized by a red dorsum with distinct black spots, elongate oval body, and weakly convex and finely to moderately punctate elytra. The group contains only three species: *C. cassidea* (Fabricius, 1775), *C. phytophagica* Crotch, 1873 and *C. rugicollis* Champion, 1893. *Chelymorpha cassidea* differs in bare elytra while *C. phytophagica* and *C. rugicollis* have pubescent elytra. The latter also has much coarser punctuation, more numerous spots on the elytra, and the postscutellar spot distinctly elongate. Mesoamerican species of the *C. comata* Boheman, 1854 group are similarly coloured, but this group differs in densely pubescent and gibbous elytra with coarse punctation, with the exception of *C. comata*.

Remarks. FABRICIUS (1775) stated that the species was described only from BMNH material. ZIMSEN (1964) was not able to trace any surviving type specimens of this species, and we have also failed to find any potential type, and thus consider it as lost. Therefore we have designated a neotype.

CROTCH (1873) transferred *Coccinella cassidea* to *Chelymorpha* Chevrolat, 1836 and considered *C. cribraria* as its synonym, but without any additional comments. As the type is lost we can judge only from the original description, and all characters listed apply to the species presently referred to as *C. cassidea* except Fabricius mentioned each elytron having six spots while the species has usually thirteen spots on elytra (six on each elytron plus one common postscutellar spot). The size of elytral spots is very variable in this species so it could be that Fabricius had some rare colour morph which was missing one of the elytral spots, and counted the postscutellar spot as two, making twelve in total. Regarding elytral punctures Fabricius also stated that the basal punctures are smaller, which is in accordance with most specimens that we have seen. Particularly important characters mentioned by Fabricius are those of the pronotum. He stated that it has thickened anterior and tridentate posterior margin. This is very characteristic of *Chelymorpha* species, which all have the hind angles of the pronotum projecting backwards, making the basal margin appear tridentate: no such pronotal shape is present in North American Coccinellidae. Fabricius also mentioned the oblong body which would be unusual for most coccinellids of this region. Moreover, Fabricius did not mentioned such characters in other *Coccinella* species described or treated in the same book (Fabricius 1775), and he must have considered them to be diagnostic for *C. cassidea*. Therefore we think that the transfer proposed by Crotch (1873) was correct.

Chelymorpha cassidea is a widespread and very common North American species having several distinct local races, some of which might in the future be revealed as distict species. Moreover, *C. cassidea* is synonymous with *C. cribraria* Fabricius, 1775, which had been used until now for a different species since Boheman (1854). As the two names are published in the same work, we use the First Reviser Principle (ICZN 1999: Article 24.2.1) to select *C. cassidea* as the valid name for the taxon because it has been correctly applied, and this avoids changing the generally used name of a common species. In order to avoid any further misapplications of *C. cassidea* and *C. cribraria*, we have designated the lectotype of *C. cribraria* as the neotype of *C. cassidea*, making the names objective synonyms. Original descriptions of both species agree with the specimen in question.

Description of a new species

Aspidimorpha innominata Sekerka sp. nov.

(Figs 40–44)

Aspidimorpha cincta (Fabricius, 1781) (misidentification): Boheman (1854: 251), Spaeth (1914: 73), Borowiec (1997: 230).

Type locality. Senegal, Dakar.

Type material. Holotype: pinned, ‘Environs | de Dakar | Chissadon 1911 [w, hw, cb] || cincta F. [hw] | Spaeth det. [w, p, cb] || COLL.ACHARD | MUS.PRAGENSE [w, p, cb, bf]’ (NMPC). Paratypes: **BENIN: Zou Department:** 1 spec., glued: ‘Coll. R. I. Sc. N. B. | Le Moult vendit [blue, p, cb] || Zagnanado, Dahomey [w, hw, s, glued on previous label]’ (IRSN); 3 spec., pinned: ‘Coll. R. I. Sc. N. B. | Dahomey | Zagnanado [hw] | Le Moult vendit [blue, p, cb]’ (IRSN). **BURKINA FASO: Centre Region:** 2 spec., glued: ‘COLL. MUS. TERVUREN | Haute-Volta : Ouaga- | dougou (leg. P.C. Fer- | nandez) X-70 [w, p, cb]’ (DBET). **CAMEROON: North Region:** 1 spec., pinned: ‘Kamerun int | Garua [= Garoua] | 19.-24.VII.09. | Riggenbach S.G. [b, p, cb] || Zool. Mus. | Berlin [w, p, cb] || ASPIDOMORPHA | 5-FASCIATA | DET.L.BOROWIEC [w, p]’ (DBET). **CENTRAL AFRICAN REPUBLIC:** 11 spec., glued: ‘Oubangui-Chari | Belg Congo | Coll Škulina [w, p, cb]’ (NMPC, 2 LSPC). **Nana-Grébizi Prefecture:** 14 spec., 11 glued and 3 pinned: ‘Coll. R. I. Sc. N. B. | Rép. Centrafricaine | (Congo Français) | Fort Crampel [nowadays Kaga-Bandoro] | ex coll. Le

Moult [b, p, cb]’ (7 IRSN, 6 DBET, 1 LSPC). **CHAD: N’Djamena Region:** 7 spec., pinned: ‘Fort Lamy | 30.IX.55 [w, p, cb] || Exped.Mus.G.Frey | Tchad A.E.F. | Bechyne 1955 [w, p, cb]’ (NHMB, 1 LSPC); 12 spec., pinned: ‘Fort Lamy | 1.X.55 [w, p, cb] || Exped.Mus.G.Frey | Tchad A.E.F. | Bechyne 1955 [w, p, cb]’ (NHMB, 3 LSPC). **DEMOCRATIC REPUBLIC OF THE CONGO: Orientale Province:** 1 spec., glued: ‘Coll. R. I. Sc. N. B. | Congo belge Mahagi | Abok, 5-iii-1929 | A.Collart [b, p, cb, three last rows on w, p, cb label glued to the previous]’ (DBET). **ERITREA: Northern Red Sea Region**: 1 spec., glued: ‘Ghinda | Erithrea [w, p, cb] || cincta [w, hw, cb] || NHRS-JLKB | 000022818 [w, p, cb]’ (NHRS). **THE GAMBIA: Banjul Area:** 1 spec., glued: ‘The Gambia | BANJUL | T-E Leiler [w, p, cb] || 8.1. | 1968 [hw on underside of previous label] || NHRS-JLKB | 000022824 [w, p, cb] || Aspidimorpha | quadriremis Sch. | det. L. Borowiec [w, p]’ (NHRS); 1 spec., pinned: ‘THE GAMBIA | Kotu Stream | 7[hw].11.1981 | B. Gustafsson [w, p, cb] || NHRS-JLKB | 000022826 [w, p, cb] || Aspidimorpha | quadriremis Sch. | det. L. Borowiec [w, p]’ (NHRS). **Brikama Area:** 2 spec., glued: ‘Gambia. | Bakau [hw] | Jan. 06 [hw] | G.C.Dudgeon. | 1906–73. [w, p, cb]’ (BMNH); 1 spec., glued: ‘The Gambia | BAKAU | T-E.Leiler [w, hw] || 1.I. | 1968 [hw on underside of preceding label] || Riksmuseum | Stockholm [g, p]’ (DBET); 1 spec., glued: ‘The Gambia | BAKAU | T-E Leiler [w, p] || 7.1. | 1968 [hw on underside of previous label] || NHRS-JLKB | 000022823 [w, p, cb] || Aspidimorpha | quadriremis Sch. | det. L. Borowiec [w, p]’ (NHRS); 1 spec., glued: ‘Gambia. Kombo S.Mary | Bakau | 25[hw]-11-1976 G. Wängsjö [w, p, cb] || 1326 [hw on underside of previous label] || NHRS-JLKB | 000022827 [w, p, cb] || Aspidimorpha | quadriremis Sch. | det. L. Borowiec [w, p]’ (NHRS); 1 spec., glued: ‘GAMBIA Kombo North | Bijilo Forest Park | 26-11-1976 G. Wängsjö [w, p, cb] || 1327 [hw on underside of preceding label] || NHRS-JLKB | 000022825 [w, p, cb] || Aspidimorpha | quadriremis Sch. | det. L. Borowiec [w, p]’ (NHRS). **Janjanbureh Area:** 1 spec., pinned: ‘Gambia | Mc Carthy Isl. | G. Svenson [w, p, cb] || NHRS-JLKB | 000022819 [w, p, cb] || Aspidimorpha | quadriremis Sch. | det. L. Borowiec [w, p]’ (NHRS); 1 spec., pinned: ‘Gambia | Mc Carthy Isl. | G. Svenson [w, p, cb] || NHRS-JLKB | 000022820 [w, p, cb] || Aspidimorpha | quadriremis Sch. | det. L. Borowiec [w, p]’ (NHRS); 1 spec., pinned: ‘Gambia | Mc Carthy Isl. | G. Svenson [w, p, cb] || NHRS-JLKB | 000022821 [w, p, cb] || Aspidimorpha | quadriremis Sch. | det. L. Borowiec [w, p]’ (NHRS). **Kerevan Area:** 1 spec., glued: ‘The Gambia | M BOLLET | T-E Leiler [w, p, cb] || 8.1. | 1968 [hw on underside of previous label] || NHRS-JLKB | 000022822 [w, p, cb] || Aspidimorpha | quadriremis Sch. | det. L. Borowiec [w, p]’ (NHRS). **GHANA:** 1 spec., pinned: ‘Togo,Hinterland | Weg nach Salaga | Döring S. [b, p, cb] || Zool. Mus. | Berlin [w, p, cb]’ (DBET). **GUINEA:** 1 spec., glued: ‘Rep. de Guinée | Kandan 2-62 | Dr. Krýsa lgt [w, hw, cb]’ (NMPC). **Kindia Region:** 1 spec., glued: ‘Kindia 27 | Guinea franc. | Baum lgt. [w, p, cb]’ (NMPC). **GUINEA-BISSAU:** 1 spec., pinned: ‘Bocan; | Guin.Port. [w, hw by Clark, cb] || 213 [blue, hw, cb] || 67·56 [w, p]’ (BMNH). **MALI: Sikasso Region:** 1 spec., glued: ‘MALI Sikasso | 4 [hw] X 1994 | Longorola [hw] | J.M. MALDES [b, p, cb] || sur patate | douce [= on sweet potato] [b, hw, cb] || Aspidimorpha | quadriremis Sch. | det. L. Borowiec [w, p, cb, bf]’ (DBET). **NIGERIA:** 2 spec., glued: ‘Nigeria | II-1998 | leg. Balletto [w, p, cb]’ (MDC). **Bauchi State:** 2 spec., pinned: ‘N.NIGERIA. | Azare. | 1925 | Dr.Ll. Lloyd. [w, p, cb] || Pres. by | Imp.Inst.Ent. | Brit.Mus. | 1933-64. [w, p, cb]’ (BMNH, LSPC); 1 spec., pinned: ‘N.NIGERIA. | Azare. | 1925 | Dr.Ll.Lloyd. [w, p, cb] || Pres. by | Imp.Inst.Ent. | Brit.Mus. | 1926–213. [w, p, cb]’ (BMNH). **Enugu State:** 7 spec., pinned: ‘Enugu | 31.X.55 [w, p, cb] || Exped.Mus.G.Frey | Nigeria-Kamerun | Bechyne 1955.56 [w, p, cb]’ (NHMB). **Federal Capital Territory:** 1 spec., glued: ‘NIGERIA Fed. Capital | Abuja 10.x.2009 | 9°12’49”N, 7°25’55”E | Kremitovský lgt. [w, p, cb]’ (LSPC). **Kaduna State:** 1 spec., pinned: ‘NIGERIA: | Samaru. | 18–25.v.1970. | P.H.Ward. | B.M.1970–604. [w, p, cb]’ (BMNH). **Kano State:** 1 spec., glued: ‘W.E.S.Merrett. | B.M. 1967-270. [w, p, cb] || KANO [hw] | ~~Lagos~~ Dist. [w, p, cb] | N [hw] ~~S~~.Nigeria | NOV [hw] 19[p]51[hw] | W.E.S.Merrett [w, p, cb]’ (BMNH); 1 spec., glued: ‘W.E.S.Merrett. | B.M. 1967-270. [w, p, cb] || Kano Dist. [w, p, cb] | N.Nigeria | JUNE [hw] 195[p]3[hw] | W.E.S.Merrett. [w, p, cb]’ (BMNH); 2 spec., pinned: ‘Kano | 4.X.55 [w, p, cb] || Exped.Mus.G.Frey | Nigeria-Kamerun | Bechyne 1955.56 [w, p, cb]’ (NHMB); 1 spec., pinned: ‘Kano | 5.X.55 [w, p, cb] || Exped.Mus.G.Frey | Nigeria-Kamerun | Bechyne 1955.56 [w, p, cb]’ (NHMB). **Niger State:** 1 spec., pinned: ‘NIGERIA | Minna | G. Wilson. | (Proc.R.Ent.Soc. | 1934. p.7. [w, hw]’ (BMNH); 1 spec., pinned: ‘Zungeru, | N. Nigeria, | Dr. Williams. | 1910-289. [w, hw, cb]’ (BMNH); 1 spec., glued: ‘N.Nigeria, | Zungeru. | 2.11.10. [hw] | Dr.W.Morrison. | 1911–423. [w, p, cb]’ (BMNH). **SENEGAL:** 1 spec., pinned: ‘Seneg [w, p, cb] || Chevr [w, p, cb] || NHRS-SRAH | 000000041 [w, p, cb]’ (NHRS); 1 spec., pinned: ‘Seneg [w, p, cb] || Chevr [w, p, cb] || NHRS-JLKB | 000022811 [w, p, cb]’ (NHRS); 1 spec., pinned: ‘Seneg [w, p, cb] || Mhm. [w, p, cb] || NHRS-JLKB | 000022812 [w, p, cb]’ (NHRS); 1 spec., pinned: ‘Seneg [w, p, cb] || NHRS-JLKB | 000022813 [w, p, cb]’ (NHRS); 1 spec., pinned: ‘Seneg [w, p, cb] || M. Berl [w, p, cb] || NHRS-JLKB | 000022814 [w, p, cb]’ (NHRS); 1 spec., glued: ‘Aspidimorph | 5 fasciata | Senegal [w, hw, cb] || COLL.ACHARD | MUS.PRAGENSE [w, p, cb, bf]’ (NMPC); 1 spec., glued: ‘Aspidimorph | 5 fasciata | Senegal [w, hw, cb] || COLL.ACHARD | MUS.PRAGENSE [w, p, cb, bf]' (NMPC); 1 spec., glued: 'E. Coll. | Chev^{t}. [w, p, cb] || Aspidimorph | cincta B | Senegal [w, hw, cb] || COLL.ACHARD | MUS.PRAGENSE [w, p, cb, bf]' (NMPC); 1 spec., pinned: 'Senegal [w, hw, cb] || COLL.ACHARD | MUS.PRAGENSE [w, p, cb, bf]' (NMPC); 4 spec., pinned: 'Senegal [w, p, cb] || COLL.ACHARD | MUS.PRAGENSE [w, p, cb, bf]' (NMPC); 1 spec., pinned: 'Senegal [w, hw, cb] || COLL.ACHARD | MUS.PRAGENSE [w, p, cb, bf] || Aspidomorpha | cincta F. [hw] | Spaeth det. [w, p, cb]' (NMPC); 2 spec., pinned: 'Sénégal [green, hw, cb, bf] || cincta F. [hw] | Spaeth det. [w, p, cb] || COLL.ACHARD | MUS.PRAGENSE [w, p, cb, bf]' (NMPC, LSPC); 1 spec., pinned: 'West-Afrika | Senegal [hw] [w, p, cb, bf] || Aspidomorpha | cincta F. [Spaeth's hw] | Spaeth det. [w, p] || Zool. Mus. | Berlin [w, p, cb]' (DBET); 1 spec., pinned: 'MUSÉE DU CONGO | Sénégal | Don Burgeon [w, p, cb] || R. DÉT. | M [hw] | 1258 [w, p, cb] || Aspidomorpha | cincta [hw by Spaeth] | Spaeth det. [w, p, cb]' (MRAC); 2 spec., one glued other pinned: 'MUSÉE DU CONGO | Sénégal | Don Burgeon [w, p, cb] || R. DÉT. | M [hw] | 1258 [w, p, cb]' (MRAC); 1 spec., pinned: 'MUSÉE DU CONGO | Sénégal: | Coll. Clavareau [w, p, cb] || Sénégal [w. hw, s] || Aspid. [hw by Spaeth] | cincta [hw by Spaeth] | det. Spaeth [w, p, cb] || Determination | Dr. F. Spaeth [w, hw, cb] || Aspidomorpha | Cincta | Fab. [w, hw, cb]' (MRAC); 1 spec., pinned: 'Coll. R. I. Sc. N. B. [blue, p, cb] || Sénégal [w, hw, cb, glued on the previous label]' (IRSN); 1 spec., pinned: 'Coll. R. I. Sc. N. B. | Sénégal | ex coll. F. Chapuis [blue, p, cb] || Senegal [w, hw, cb, glued on previous label] || det. [p] Chapuis [hw] [w, p, cb] || Aspidimorpha | cincta [w, hw, s, glued on previous label]' (IRSN); 3 spec., pinned: 'Coll. R. I. Sc. N. B. | Sénégal | ex coll. F. Chapuis [blue, p, cb] || D^{r}.Chapuis det. | ASPIDOMORPHA | cincta [hw] [w, p, cb]' (IRSN); 1 spec., pinned: 'Coll. R. I. Sc. N. B. | Sénégal | ex coll. Bonneuil [blue, p, cb]' (IRSN); 1 spec., pinned: 'Coll. R. I. Sc. N. B. | Sénégal | Le Moult vendit [blue, p, cb] || Aspidimorpha [hw] | cincta F. [hw] | det. L. Borowiec [w, p, cb]' (IRSN); 1 spec., pinned: 'Coll. R. I. Sc. N. B. | Sénégal | Le Moult vendit [blue, p, cb] || Aspidomorpha | cincta | Linn | Sénégal [w, hw, s]' (IRSN); 1 spec., glued: 'ex dress | hem [w, hw, cb] || W. Africa | Senegal | NOV. 1975 | B.M. 1976-30 [w, hw, cb] || exhibited on | television programme | 'Blue Peter' [w, hw, cb]' (BMNH). **Dakar Region:** 1 spec., pinned: 'Dakar | 12.09 [w, hw, cb] || COLL.ACHARD | MUS.PRAGENSE [w, p, cb, bf]' (NMPC); 2 spec., pinned: 'Exped. Mus.G.Frey | Franz.Guinea 1951 | W.Afr.leg.Bechyne [w, p, cb] || Dakar | 4.6.51 [w, p, cb]' (NHMB); 1 spec., pinned: 'IFAN [p] 1.XI. [hw] 19[p]63[hw] | DAKAR [hw] | FANN [hw] | R. ROY [w, p, cb]' (DBET); 1 spec., glued: 'IFAN [p] 5.XI. [hw] 19[p]64[hw] | DAKAR [hw] | FANN [hw] | J. N. [hw] ROY [w, p, cb]' (DBET); 1 spec., glued: 'DAKAR | Fin X.1964 | J. N. Roy [w, hw, cb]' (DBET). **Diourbel Region:** 2 spec., pinned: 'SENEGAL | Bambey | 19.-23. XII.1939 [hw] | J. Risbec [w, p, cb] || Pres. by | Imp. Ins. Ent. | B.M. 1942-102. [w, p, cb]' (BMNH, LSPC); 14 spec., pinned: 'SENEGAL | Bambey | - XII. 2. 1. 1940 [hw] | J. Risbec [w, p, cb] || Pres. by | Imp. Ins. Ent. | B.M. 1942-102. [w, p, cb]' (BMNH, 3 LSPC); 2 spec., pinned: 'SENEGAL | Bambey | II.1940 [hw] | J. Risbec | No. 9152- [w, p, cb] || Pres. by | Imp. Ins. Ent. | B.M. 1942-102. [w, p, cb]' (BMNH); 2 spec., pinned: 'SENEGAL | Bambey | IV.1940 [hw] | J. Risbec | No. [p] 9197 [hw] [w, p, cb] || Pres. by | Com. Ins. Ent. | B.M. 1948-529. [w, p, cb] || Aspidomorpha [hw] | cincta [hw] | Boh. [hw] | Det. G.E.Bryant [w, p, cb]' (BMNH); 4 spec., pinned: 'SENEGAL | Bambey | IV.1940 [hw] | J. Risbec | No. [p] 9197 [hw] [w, p, cb] || Pres. by | Com. Ins. Ent. | B.M. 1948-529. [w, p, cb]' (BMNH); 12 spec., pinned: 'SENEGAL | Bambey | IV.1940 [hw] | J. Risbec | No. [p] 9194 [hw] [w, p, cb] || Pres. by | Com. Ins. Ent. | B.M. 1948-525. [w, p, cb]' (BMNH, 2 LSPC); 1 spec., pinned: 'SENEGAL | Bambey | IV.1940 [hw] | J. Risbec | No. [p] 9194 [hw] [w, p, cb] || Pres. by | Com. Ins. Ent. | B.M. 1948-525. [w, p, cb] || Aspidomorpha [hw] | cincta [hw] | Boh. [hw] | Det. G.E.Bryant [w, p, cb]' (BMNH); 1 spec., pinned: 'SENEGAL | Bambey | 1945 | J. Risbec [w, p, cb] || Pres. by | Com. Ins. Ent. | B.M. 1948-525. [w, p, cb]' (BMNH); 1 spec., pinned: 'SENEGAL | Bambey | 1945 | J. Risbec. [w, hw, cb] || Pres. by | Com. Ins. Ent. | B.M. 1948-525. [w, p, cb]' (BMNH); 1 spec., pinned: 'SENEGAL | Bambey | 1945 | J. Risbec [w, p, cb] || Pres. by | Com. Ins. Ent. | B.M.1948-143 [w, p, cb]' (BMNH); 1 spec., pinned: 'COLL. MUS. CONGO | Senegal: M'Bambey | I/11 [hw vertically on side] 7-III[hw]-1939 | M. Risbec [w, p, cb] || R. DÉT. | Z. [hw] | 4727 [w, p, cb] || cincta [hw by Spaeth] | Spaeth det. [w, p, cb] | Im | oranger [blue, hw, cb, bf]' (MRAC); 2 spec., pinned: 'COLL. MUS. CONGO | Senegal: M'Bambey | 22-IV[hw]-1939 | M. Risbec [w, p, cb] || R. DÉT. | Z. [hw] | 4727 [w, p, cb] || cincta [hw by Spaeth] | Spaeth det. [w, p, cb]' (MRAC); 1 spec., pinned: 'COLL. MUS. CONGO | Senegal: M'Bambey | 11-20-VII[hw]-1939 | M. Risbec [w, p, cb] || R. DÉT. | Z. [hw] | 4727 [w, p, cb] || Aspidomorpha | cincta F. [hw by Spaeth] | Spaeth det. [w, p, cb]' (MRAC); 2 spec., pinned: 'COLL. MUS. CONGO | Senegal: M'Bambey | 22-VII[hw]-1939 | M. Risbec [w, p, cb] || R. DÉT. | Z. [hw] | 4727 [w, p, cb] || Asp. [hw by Spaeth] | cincta [hw by Spaeth] | Spaeth det. [w, p, cb]' (MRAC); 2 spec., glued: 'COLL. MUS. CONGO | Senegal: M'Bambey | 28-X-6-XI[hw]-19[p]39[hw] | M. Risbec [w, p, cb] || R. DÉT. | Z. [hw] | 4727 [w, p, cb] || Aspid. [hw by Spaeth] | cincta [hw by Spaeth] | Spaeth det. [w, p, cb]' (MRAC); 3 spec., two pinned, one glued: 'COLL. MUS. CONGO | Senegal:

M‘Bambey | 22-27-I[hw]-194[p]0[hw] | M. Risbec [w, p, cb] || R. DÉT. | Z. [hw] | 4727 [w, p, cb]’ (MRAC); 2 spec., pinned: ‘COLL. MUS. CONGO | Senegal: M‘Bambey | 25-III-9-IV[hw]-194[p]0[hw] | M. Risbec [w, p, cb] || R. DÉT. | Z. [hw] | 4727 [w, p, cb]’ (MRAC); 1 spec., glued: ‘COLL. MUS. CONGO | Senegal: M‘Bambey | 25-III-9-IV[hw]-194[p]0[hw] | M. Risbec [w, p, cb] || R. DÉT. | Z. [hw] | 4727 [w, p, cb] || cincta [hw by Spaeth] | Spaeth det. [w, p, cb]’ (MRAC); 1 spec., pinned: ‘COLL. MUS. CONGO | Senegal: M‘Bambey | 9-15-IV[hw]-194[p]0[hw] | M. Risbec [w, p, cb] || R. DÉT. | G [hw] | 4514 [w, p, cb] || Aspid. [hw by Spaeth] | cincta [hw by Spaeth] | Spaeth det. [w, p, cb]’ (MRAC). **Saint-Louis Region:** 7 spec., pinned: ‘SENEGAL | Guede [hw] | ii.1946 [hw] | J. Risbec. [w, p, cb] || Pres. by | Com. Ins. Ent. | B.M.1948-143 [w, p, cb]’ (BMNH, 1 LSPC). **Unknown Region:** 1 spec., pinned: ‘Coll. R. I. Sc. N. B. | Senegal: riv. Bao | 10-VII-1938 | Le Moult vendit [blue, p, cb] || Aspidimorpha [hw] | cincta F. [hw] | det. L. Borowiec [w, p, cb]’ (IRSN). **SIERRA LEONE:** 1 spec., pinned: ‘MUSÉE DU CONGO | Sierra Leone [hw] | D. Ent. Nat. Mus. | Ex coll Kraatz [w, p, cb] || S^{ra} Leone [w, p, cb, bf] || Coll. Kraatz | Spaeth det. [w, p, cb] || R. DÉT. | F [hw] | 1336 [w, p, cb] || A. cincta F. [pink, hw, s]’ (MRAC). **SUDAN: Darfur Province:** 1 spec., pinned: ‘W.DARFUR: | S.Jebel Murra, | Kallikitting. | 4,450 ft. 7[hw].vi.1932. | M.Steele. [w, p, cb] || 82. [w, hw] || Aspidomorpha | cincta F. [hw by F. Spaeth] | Spaeth det. [w, p, cb] || Pres.by | Imp.Inst.Ent. | B.M.1936-505. [w, p, cb]’ (BMNH). **TOGO: Maritime Region:** 10 spec., pinned: ‘Togo | Lome [w, p, cb]’ (NHMB, 2 LSPC). **UNKNOWN LOCALITIES:** 1 spec., pinned: ‘Niger | Benne [b, J. Weise’s hw, cb] || Nigr. Benn. [w, hw, cb] || Zool. Mus. | Berlin [w, p, cb] || ASPIDOMORPHA | 5-FASCIATA | DET.L.BOROWIEC [w, p]’ (DBET); 1 spec., pinned: ‘Rafirqu [w, hw] || Späth | 1899 [w, hw, cb] || Aspidomorpha | cincta F. [p, hw] || COLL.NICKERL | MUS.PRAGENSE [w, p, cb, bf]’ (NMPC); 1 spec., pinned: ‘E. Coll. | Chev.^{t} [w, p] || Catein | Cazavr [blue, hw, circle label] || cincta | F. Bhn | col AK [w, hw by Chevrolat] || 67·56 [w, p]’ (BMNH). **WITHOUT LOCALITY DATA:** 1 spec., pinned: ‘67·56 [w, p]’ (BMNH); 1 spec., pinned: ‘E. Coll. | Laferté [w, p] || 67·56 [w, p]’ (BMNH); 1 spec., pinned: ‘E. Coll. | Chev.^{t} [w, p] || 67·56 [w, p]’ (BMNH); 1 spec., pinned: ‘E. Coll. | Chev.^{t} [w, p] || Asp. | cincta | var. Bhn. | [illegible] [w, hw by Chevrolat, cb] || 67·56 [w, p]’ (BMNH); 1 spec., pinned: ‘E. Coll. | Chev.^{t} [w, p] || Aspidomorpha | cincta F | Bhn Brasilia [w, hw by Chevrolat] || 67·56 [w, p]’ (BMNH); 1 spec., pinned: ‘E. Coll. | Chev.^{t} [w, p] || Aspidom. | cincta | F Bhn. | Bayres [w, hw by Chevrolat, cb] || 67·56 [w, p]’ (BMNH); 1 spec., pinned: ‘D. [three or four illegible letters due to pinholes] ot [blue, hw, cb] || E. Coll. | Chev.^{t} [w, p] || 67·56 [w, p] || Aspid. | cincta F. Bhn [w, hw by Chevrolat]’ (BMNH); 1 spec., pinned: ‘3636. [w, p, cb]’ (BMNH); 1 spec., pinned: ‘3636.d [w, p, cb]’ (BMNH); 1 spec., pinned: ‘3636. [w, p, cb] || cincta Fabr. [blue, hw by Boheman] || Aspidomorpha. | = cincta Boh. [hw] | nec Fab. [hw] [w, p, cb]’ (BMNH); 1 spec., pinned: ‘Aspidom. | cincta. [w, hw, cb] || 57 [yellow, p] || 67·56 [w, p] || Aspidomorpha. | cincta. [hw] | sec.Boheman. [w, p, cb]’ (BMNH); 1 spec., pinned: ‘Nevinson Coll. | 1918-14 [w, p, cb] || cincta [w, hw, cb]’ (BMNH); 1 spec., glued: ‘THANH MOI | TONKIN | H. PERROT [w, p, cb; erroneous locality]’ (MHNG); 1 spec., pinned: ‘NHRS-JLKB | 000022816 [w, p, cb]’ (NHRS); 1 spec., pinned: ‘NHRS-JLKB | 000022817 [w, p, cb]’ (NHRS).

Description. A detailed description and bibliography of this species was provided by Borowiec (1997: 230) under the name *Aspidimorpha cincta* Fabricius. We use the oportunity to establish this species with a reference to its detailed description accompanied with drawings according to the Article 13.1.2 of the ICZN (1999).

Differential diagnosis. *Aspidimorpha* (*Aspidimorpha*) *innominata* sp. nov. belongs to the *A. quinquefasciata* species group characterized by more or less parallel-sided body, base of the elytra only slightly wider than base of the pronotum, explanate margin of the elytra with both basal and postero-lateral spots, elytral disc depressed to weakly and regularly convex, punctation of elytra regular, moderately dense and not impressed. The group currently contains nine species and was referred to as the *A. cincta* group in Borowiec’s (1997) revision: *A. astraea* Spaeth, 1917, *A. ertli* Spaeth, 1906, *A. gruevi* Borowiec, 1985, *A. innominata* sp. nov., *A. katangana* Spaeth, 1932, *A. nigropunctata* (Klug, 1835), *A. quinquefasciata* (Fabricius, 1801), *A. sternalis* Weise, 1896, and *A. wahlbergi* Boheman, 1854. *Aspidimorpha nigropunctata* differs in its large size (9.9−12.0 mm) and disc of elytra and pronotum with black spots while *A. innominata* is small with size below 10.0 mm and dorsum never with black spots. *Aspidimorpha wahlbergi* differs in very small size (6.8−7.3 mm) and is separated geographically, occurring in south and southeast Africa while *A. innominata* is larger, always above 7.5 mm and is distributed through western to central Africa. *Aspidimorpha astraea*, *A. ertli*, *A. katangana*, and *A. sternalis* differ in larger size (mostly above 9.0 mm) and are separated geographically occurring from Angola and northern Namibia through the south of the Democratic Republic of the Congo and Zambia to Tanzania and Mozambique while *A. innominata* has size 7.8−9.7 mm but most specimens are below 9.0 mm, and is distributed through western Africa. *Aspidimorpha gruevi* has comparable size but differs in oval body (parallel-sided in *A. innominata*) and is restricted to northwestern Africa from Ethiopia to the Arabian Peninsula. The most similar species is *A. quinquefasciata* which is also sympatric with the new species, however, it can be separated by stouter body (length/width ratio 1.14−1.27) and by distinctly rounded sides of elytra while *A. innominata* has parallel-sided body and is slimmer (length/width ratio 1.30−1.39). *Aspidimorpha innominata* is also mostly smaller, particularly specimens from western Africa (Senegal, The Gambia, Guinea), however, specimens are gradually larger towards central Africa and separation of the two species requires longer series. *Aspidimorpha quinquefasciata* is more variable regarding dorsal pattern, often having black forms while *A. innominata* has more constant elytral pattern formed by red patches (Figs 40–43); of all examined specimens, only one had black maculation like *A. quinquefasciata,* and one had nearly the whole elytral disc black.

Etymology. The specific epithet is the Latin adjective *innominatus* (*-a*, *-um*) = nameless because the species was for long time recognized in collections, but until now was not correctly named.

Distribution. Benin, Burkina Faso, Cameroon, Chad, Central African Republic, Democratic Republic of Congo, Erithrea, The Gambia, Ghana, Guinea, Guinea-Bissau, Mali, Nigeria, Senegal, Sierra Leone, Sudan, Togo.

Summary of proposed taxonomic changes

Aspidimorpha (*Aspidimorpha*) *calligera* Boheman, 1854 **stat. restit.** = *A. dorsata* sensu Boheman (1854) not Fabricius

Aspidimorpha (*Aspidimorpha*) *dorsata* (Fabricius, 1781) **stat. nov.** = *A.* (*A.*) *fuscopunctata* Boheman, 1854: 298, **syn. nov.** = *A.* (*A.*) *rubrodorsata* Boheman, 1854, **syn. nov.**

Aspidimorpha (*Aspidimorpha*) *isparetta* Boheman, 1854 = *Cassida cincta* Fabricius, 1781 not DeGeer, 1775 = *A.* (*A.*) *fabricii* Sekerka, 2008, **syn. nov.**

Aspidimorpha (*Aspidimorpha*) *innominata* Sekerka **sp. nov.** = *A.* (*A.*) *cincta* sensu Boheman (1854)

Basiprionota bipuncticollis (Boheman, 1856) **stat. restit.** = *B. privigna* (Boheman, 1862) **syn. nov.** = *B. octopunctata* sensu Boheman (1850) not Fabricius

Basiprionota octopunctata (Fabricius, 1787) **stat. nov.** = *B. privigna* sensu Spaeth (1925) not Boheman

Charidotis marginella (Fabricius, 1775) = *C. punctatostriata* Boheman, 1855, **syn. nov.** = *C. herbida* Boheman, 1855, **syn. nov.**

Chelymorpha cassidea (Fabricius, 1775) = *C. cribraria* (Fabricius, 1775) **syn. nov.**

Chelymorpha multipunctata (Olivier, 1790) **stat. restit.** = *Ch. cribraria* sensu auctt.

Eugenysa decussata (Fabricius, 1775) **stat. restit.** = *E. venosa* (Fabricius, 1798) **syn. nov.**

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Chapter VIII

SEKERKA L. & BOROWIEC L. (2015) Subgenera of Charidotella Weise with description of a new subgenus and species from Brazil (Coleoptera, Chrysomelidae, Cassidinae, Cassidini). *ZooKeys*, **506**: 61–74.

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Subgenera of *Charidotella* Weise with description of a new subgenus and species from Brazil (Coleoptera, Chrysomelidae, Cassidinae, Cassidini)

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Abstract

A new subgenus and species, *Charidotella* (*Chapadacassis* **subgen. n.**) *paradoxa* **sp. n.** is described and figured from the Chapada plateau in Mato Grosso, Brazil. Subgenera of *Charidotella* Weise, 1896 are listed, supplemented with basic data, diagnostic table, and a key is proposed. Based on a study of respective type material following new combinations are proposed: *Charidotella* (*Philaspis*) *stulta* (Boheman, 1855), **comb. n.**, *Charidotella* (*Xenocassis*) *amoenula* (Boheman, 1855), **comb. n.**, *Ch.* (*X.*) *cyclographa* (Boheman, 1855), **comb. n.**, *Ch.* (*X.*) *discoidalis* (Boheman, 1855), **comb. n.**, *Ch.* (*X.*) *incerta* (Boheman, 1855), **comb. n.**, *Ch.* (*X.*) *purpurea* (Linnaeus, 1758), **comb. n.**, *Ch.* (*X.*) *myops* (Boheman, 1855), **comb. n.** (all previously placed in the nominotypical subgenus), and *Plagiometriona cingulata* (Boheman, 1862), **comb. n.** (from *Charidotella* (*Xenocassis*)).

Keywords

Entomology, taxonomy, new subgenus, new species, new combination, Neotropical Region, Brazil

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Introduction

New World Cassidini comprises currently 726 species in 46 genera. Brazil is the country with richest fauna represented by 402 species, 252 of them so far known only from Brazil (Borowiec and Świętojańska 2015). Most likely the number of endemic taxa will be much lower as many species occur also in neighbouring countries. Particularly Bolivia and Venezuela are quite poorly explored regarding Cassidinae fauna and our recent research indicates that many species so far known only from Brazil are present in these countries too (Windsor and Sekerka, unpubl. data).

Dry regions of Southern America are poorly collected and many species are known only from small areas while their range is in fact large. This is particularly true for western Bolivia and central-west Brazil (Windsor and Sekerka, unpubl. data). The Chapada plateau in Mato Grosso is perhaps one of the most interesting areas in this part of Southern America and probably hides numerous undescribed taxa. Several cassidines were described recently by Świętojańska and Borowiec (1995, 1996, 1999) and Borowiec (2004). In the material studied recently we found a new species belonging to an undescribed peculiar subgenus of *Charidotella* Weise, 1896 characterized by completely irregular punctation of the elytra, a very rare morphological feature in New World Cassidini.

Weise (1896) proposed *Charidotella* for a single species, *Ch. zona* (Fabricius, 1801), while he also created *Metriona* Weise, 1896 where he placed most species currently classified in *Charidotella*. Spaeth (1914) downgraded *Charidotella* to subgenus of *Metriona* and designated *M. elatior* (Klug, 1829) as the type species of the latter. He also included six more species in *Charidotella*, all having pattern on the ventral side of the elytral disc. Spaeth (1942) raised *Charidotella* to genus rank and listed eleven species in it. Meantime, Spaeth described several genera (*Philaspis* Spaeth, 1913, *Xenocassis* Spaeth, 1936 and *Metrionaspis* Spaeth, 1942) for species previously classified in *Coptocycla* Chevrolat, 1836 or *Metriona*. Subsequently Hincks (1952) placed them as subgenera of *Charidotella* and validated one more subgenus *Charerocassis* Spaeth in Hincks, 1952 following Spaeth's unpublished manuscript for Wytsman's Genera Insectorum. Borowiec (1989) placed *Metrionaspis* as subgenus of *Charidotella*, proposed a key to the subgenera and the first catalogue of the genus. Most recently, Windsor et al. (1992) considered *Xenocassis* as a separate genus, however, this change was not accepted and *Xenocassis* remained as subgenus of *Charidotella* (e.g. Borowiec 1999).

Currently *Charidotella* comprises 100 species divided in five subgenera (Borowiec and Świętojańska 2015). Identification of subgenera was established mainly on the basis of structure of tarsal claws (simple vs. appendiculate) by Spaeth (1936) and followed by Borowiec (1989). General body shape, convexity of the elytra, and punctation provide good characters too, however, in many cases they are hard to describe to be clearly and easily understood. The structure of tarsal claws proved as yet not fully understood and at least some species have intraspecific variability in presence or absence of the basal tooth on respective claw (e.g. Riley 1982, 1986). Besides the key we provide also a diagnostic table (Table 1) to help to recognize subgenera of *Charidotella*.

Table 1. Summarizing most important morphological differences among subgenera of *Charidotella* Weise, 1896. Numbers in parentheses indicate number of species possessing particular character when variable within one subgenus.

subgenus **character**	***Chapadacassis* subgen. n.**	***Philaspis* Spaeth, 1913**	***Metrionaspis* Spaeth, 1942**	***Chaerocassis* Spaeth in Hincks, 1952**	***Xenocassis* Spaeth, 1936**	***Charidotella* s. str. Weise, 1896**
body shape	oval and parallelsided	oval and parallelsided	subtriangular to subcircular	subcircular (3) or oval (3)	circular	variable, mostl subcircular to subtriangular
convexity of elytra	irregular and subgibose	regular and weak	irregular with postscutellar hump	regular and weak	regular and moderate	from regular and low to tuberculate
punctation of elytra	irregular	regular	regular	regular	regular	regular
explanate margin of elytra	densely punctate	sparsely punctate (4) or impunctate (6)	sparsely punctate in humeral area	impunctate (4) or punctate in humeral area (2)	impunctate	impunctate
pattern on underside of elytra	absent	present (6) or absent (4)	absent	absent	absent	present (at least in 32 species) or absent
pattern on disc of elytra	absent	absent	disc uniformly red	disc uniformly red or yellow	usually with ring, rarely yellow	usually yellow
spots on explanate margin of elytra	absent	absent	present	present (5) or absent (1)	absent	absent (61) or present (7)
sides of pronotum	rounded	subangulate	rounded	rounded	rounded	rounded (66) or subangulate (1)
size of eye	large, occupying almost whole side	large, occupying almost whole side	large, occupying almost whole side	large, occupying almost whole side	moderately large occupying 2/3 of side, gena well visible	large, occupying almost whole side, gena sometimes visible but very narrow
antennae	5 basal slim shiny antennomeres + 6 dull and broad	6 basal slim shiny antennomeres + 5 dull and broad	5 basal slim shiny antennomeres + 6 dull and broad	6 basal slim shiny antennomeres + 5 dull and broad	6 basal slim shiny antennomeres + 5 dull and broad	6 basal slim shiny antennomeres + 5 dull and broad
antennomeres II–IV	II and III subequal, IV approx. 1/4 longer than either II and III	II distinctly shorter than III, III and IV subequal	II and III subequal, IV as long as II and III combined	III longer than II and IV longer than III	variable	variable
proclaws	both with small basal tooth	both with large basal tooth	both with large basal tooth	both with large basal tooth	both with small to large basal tooth	both with moderate to large basal tooth

subgenus / **character**	***Chapadacassis* subgen. n.**	***Philaspis* Spaeth, 1913**	***Metrionaspis* Spaeth, 1942**	***Chaerocassis* Spaeth in Hincks, 1952**	***Xenocassis* Spaeth, 1936**	***Charidotella* s. str. Weise, 1896**
mesoclaws	outer simple, inner with small tooth	outer simple (♂) or with small tooth (♀), inner with large tooth	both simple (♀) or outer with large basal tooth (♂)	♂: both or only inner simple; ♀: all with large tooth or one simple	inner with small to large basal tooth, outer simple or both simple	outer simple (♂) or both with small to large tooth (♀)
metaclaws	both with small basal tooth	both with large basal tooth	inner simple, outer with large basal tooth	♂: inner simple; ♀: both with large tooth or one simple	inner with small to large basal tooth, outer simple or both simple or both with large tooth	both with moderate to large basal tooth

The genus *Charidotella* can be characterized by at least some tarsal claws with a basal tooth, venter of the pronotum without antennal grooves, the clypeus flat or impressed and without distinct grooves, and a broad prosternal process with the apex not strongly expanded laterally. *Charidotella* species are mostly associated with the plant family Convolvulaceae, mainly with the diverse genus *Ipomoea*, however at least one species is associated with Asteraceae (Windsor and Sekerka, unpubl. data).

Label data from the type specimens are cited as they appeared on the labels. Individual labels are separated by a double vertical bar "||" and rows within the label by a single vertical bar "|".

Overview of subgenera of *Charidotella*

***Charidotella* (s. str.) Weise, 1896**

Figs 8–9

Charidotella Weise, 1896: 13.

Type species. *Cassida zona* Fabricius, 1801 by monotypy.

Number of species. 67 (Borowiec and Świętojańska 2015, present paper).

Key to species. Borowiec (2007) proposed a key covering 23 species with pattern on the ventral part of the elytral disc.

Range. Canada to Argentina.

Distinguishing characters. Species of the nominotypical subgenus can be separated by all tarsal claws with a basal tooth of variable size, or in males the outer claw of mesotarsi is with small tooth or simple. They also have subcircular to subtriangular body and are more convex in comparison to most other subgenera except *Metrionaspis* and *Chapadacassis* subgen. n. Otherwise the nominotypical subgenus is polymorphic displaying greater variability and some species externally reminds other subgenera. Most species are yellow with or without pattern on the ventral side of the elytral disc which can be variable. After revising most species of *Charidotella* there is no species in the nominotypical subgenus with dark annulus on the upper side of the elytra and all such coloured species are here transferred to *Xenocassis*.

***Chaerocassis* Spaeth in Hincks, 1952**

Figs 10–11

Charidotella subgen. *Chaerocassis* Spaeth in Hincks, 1952: 350.

Type species. *Coptocycla marculenta* Boheman, 1855 by original designation.

Number of species. 6 (Borowiec and Świętojańska 2015).

Key to species. Not yet proposed.

Range. USA to Panama.

Distinguishing characters. *Chaerocassis* species have subcircular or oval body outline, regularly convex elytra, the base of the elytra distinctly wider than the pronotum and humeral angles moderately projecting anterad. Four species have explanate margin of the elytra with basal and posterolateral spots. One species has outer margin of the elytra black and the type species is uniformly yellow. Males have the outer claw of meso- and metatarsi, or both claws of meso- and the outer claw of metatarsi simple. Females have all claws appendiculate or one of the meso- and metatarsi simple. They are externally close to the nominotypical subgenus but can be easily separated by one of the metaclaws simple and elytra always without pattern on uderside.

***Metrionaspis* Spaeth, 1942**

Figs 16–17

Metrionaspis Spaeth, 1942: 39; Borowiec 1989: 204 (as subgenus of *Charidotella*).

Type species. *Aspidomorpha rubicunda* Guérin-Méneville, 1844 by monotypy.

Number of species. 2 (Borowiec and Świętojańska 2015).

Key to species. Not yet proposed.

Range. *Charidotella rubicunda* is widely distributed through South America from Colombia to Argentina while *Ch. santaremi* Borowiec, 1995 is so far known only from the state of Pará in Brazil.

Distinguishing characters. The two *Metrionaspis* species have a broadly oval to subtriangular body outline, base of the elytra distinctly wider than pronotum with humeral angles projecting anterad, explanate margin of the elytra with humeral and posterolateral spots, and the elytra with a postscutellar tubercle. Externally both species are very similar to two *Charidotella* s. str. species, *Ch. tuberculata* (Fabricius, 1775) and *Ch. ventricosa* (Boheman, 1855), but they can be separated by an impunctate explanate margin of the elytra and claws of the metatarsi in both sexes with a basal tooth. While *Metrionaspis* species have humeral area of the explanate margin punctate and the inner claw of the metatarsi simple in both sexes.

***Philaspis* Spaeth, 1913**

Figs 14–15

Philaspis Spaeth, 1913: 142; Hincks 1952: 342 (as subgenus of *Charidotella*).

Type species. *Odontionycha seriatopunctata* Spaeth, 1901 designated by Hincks (1952).

Number of species. 10 (Borowiec 2004, present paper).

Key to species. Spaeth (1936) covered eight species, Borowiec (2004) covered nine species.

Range. One species in Mexico and Costa Rica, remaining in the southern part of South America.

Distinguishing characters. *Philaspis* species are at first glance easily distinguished by the parallel-sided elytra in combination with subangulate sides of the pronotum. All species are uniformly yellow or have a small black spot in the middle of each elytron.

Remarks. *Charidotella stulta* (Boheman, 1855) was previously classified in the nominotypical subgenus. We recently examined its holotype, preserved in Museum für Naturkunde, Berlin, and found that it belongs to the subgenus *Philaspis* near *Ch.* (*P.*) *inculta* (Boheman, 1855).

Xenocassis Spaeth, 1936

Figs 12–13

Xenocassis Spaeth, 1936: 260; Hincks 1952: 342 (as subgenus of *Charidotella*).

Type species. *Coptocycla amoena* Boheman, 1855 by original designation.

Number of species. 15 (present paper).

Key to species. Not yet proposed.

Range. Mexico to Peru with most species in the Central America.

Distinguishing characters. *Xenocassis* species can be easily separated from other subgenera by the small eyes covering only 2/3 of lateral sides of the head thus gena is well visible while all other subgenera have large eyes. In addition *Xenocassis* has nearly regularly circular body outline, weakly convex elytra with coarser punctation on lateral slope, and dorsum with ring pattern on the upper side. In extreme cases the ring can form a large discal spot or can be completely vanished thus whole dorsum is uniformly yellow.

Remarks. So far *Xenocassis* was separated from other genera on the basis of the tarsal claws and general body shape. Windsor et al. (1992) were the first who noticed that all species have also small eyes in comparison to other *Chardotella* species. As a result they raised *Xenocassis* to genus in the provided key but unfortunately made no additional comments and their change was not accepted later (e.g. Borowiec 1999). We agree with them that the small size of the eye is diagnostic for *Xenocassis* and found that five species currently classified in the nominotypical subgenus should be transferred to *Xenocassis* based on this character. In addition we found that *Xenocassis* species are very variable regarding the size and presence of tarsal appendages. The genus was based by Spaeth (1936) on the outer claws of the metatarsi simple in both sexes, however, examination of extensive material revealed that even the type species, *C. amoena*, could have the outer claws of the metatarsi with a large basal tooth. Similar situation was found in two other species we had extensive material to study – *Ch.* (*X.*) *ambita* (Champion, 1894) and *Ch.* (*X.*) *puella* (Boheman, 1855). In both the basal teeth showed variable size even within one population. While the size of the eye is constant. Some species of other subgenera have slightly smaller eyes than others thus they have gena visible but always very narrow while species of *Xenocassis* have gena covering approximately basal third of lateral side of the head.

We consider *Xenocassis* as subgenus of *Charidotella* as the size of the eye is found variable also in some other new world Cassidini genera, e.g. *Charidotis* Boheman, 1855 and *Plagiometriona* Spaeth, 1899.

Last catalogue, Borowiec (1999) listed 10 species in the subgenus *Xenocassis*. We have recently examined types of all species and found that one was wrongly assigned to *Xenocassis*. *Coptocycla cingulata* Boheman, 1862 (type seen in the Natural History Museum, London) was unknown to most authors and have been tentatively placed in *Charidotella* based on the original description (Boheman 1862) and notes published by Champion (1894) in the Cassidinae volume of the Biologia Centrali Americana (Borowiec 1989). It posses all characters of the genus *Plagiometriona* and is here transferred to it as *Plagiometriona cingulata* (Boheman, 1862), comb. n.

During examination of species placed in the nominotypical subgenus we found four which had small eyes and are here transferred to *Xenocassis*: *Ch.* (*X.*) *discoidalis* (Boheman, 1855), comb. n., *Ch.* (*X.*) *incerta* (Boheman, 1855), comb. n., *Ch.* (*X.*) *purpurea* (Linnaeus, 1758), comb. n., and *Ch.* (*X.*) *myops* (Boheman, 1855), comb. n. Types of all, with exception of *Ch. purpurea*, were examined and are preserved in the Naturhistoriska Riksmuseet, Stockholm, Sweden. In addition Boheman (1855) described two more species in the same groups as abovementioned ones and we have strong feeling that they belong to *Xenocassis* too: *Ch.* (*X.*) *amoenula* (Boheman, 1855), comb. n. and *Ch.* (*X.*) *cyclographa* (Boheman, 1855), comb. n. Unfortunately, we were not able to locate their type specimens thus the transfer is tentative, based on primary descriptions according to which the species should have the circular body shape, the annulus on upper side of the elytra, and coarser punctation on the lateral slope of elytral disc like other *Xenocassis* species.

***Chapadacassis* subgen. n.**

http://zoobank.org/2BC3A84F-44A2-48C0-A888-14EB4101B789

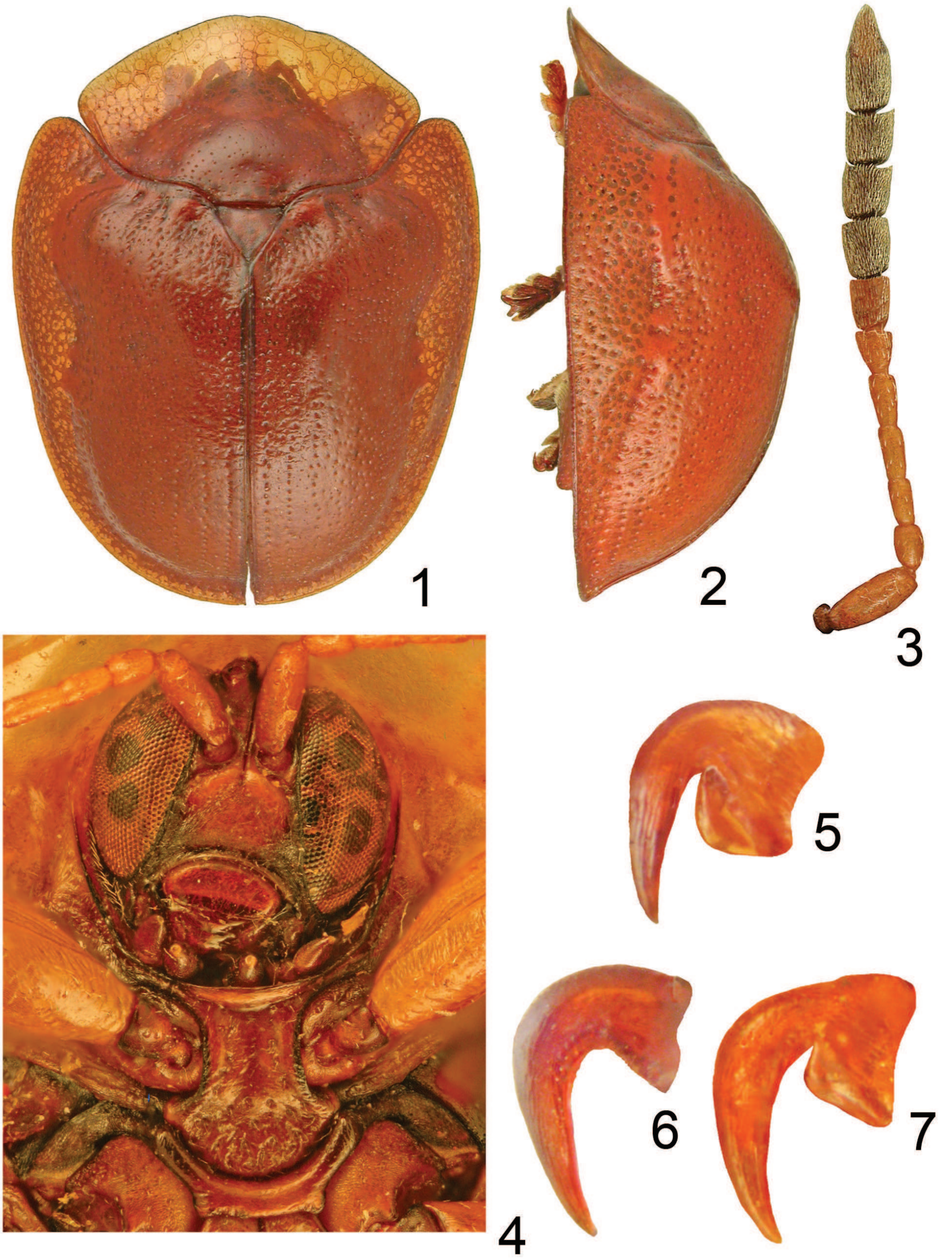
Figs 1–7

Type species. *Charidotella* (*Chapadacassis*) *paradoxa* sp. n. here designated.

Etymology. The genus name is a combination of its type locality, the Chapada plateau and the genus name *Cassida*, gender feminine.

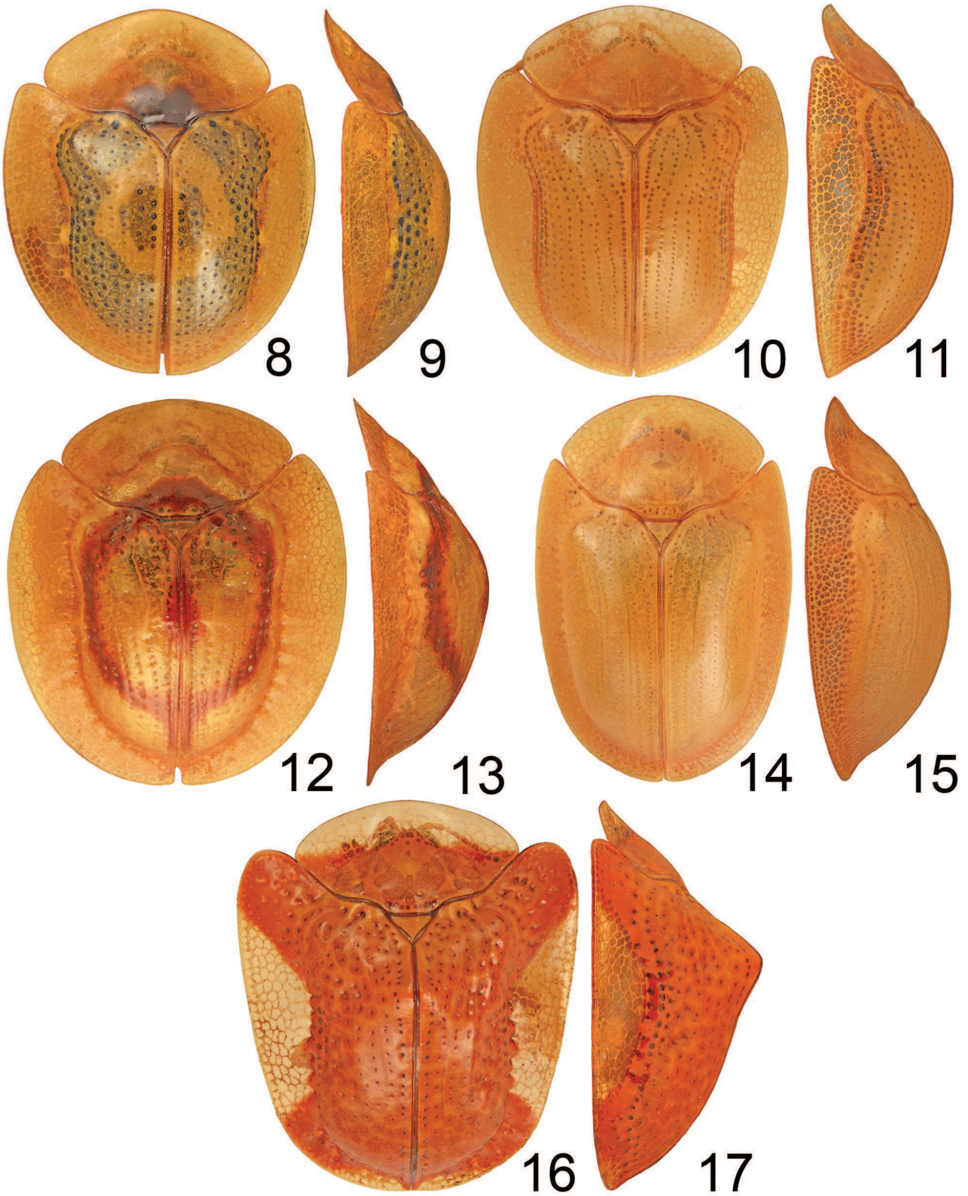
Diagnosis. *Chapadacassis* subgen. n. is well characterized by completely irregular punctation of the elytra, only apical two thirds of sutural row appear more or less regular, while all other *Charidotella* species have mostly regular punctation of the elytra. Mostly or completely irregular punctation of the elytra is generally a rare feature in Neotropical Cassidini present only in a few taxa (e.g. *Metriona elatior* (Klug, 1829) or *Scaeocassis turbulenta* (Boheman, 1862)).

Externally, *Chapadacassis* subgen. n. is reminiscent of *Philaspis* because of the body shape, but *Philaspis* species have moderately and regularly convex elytra without any impressions while *Chapadacassis* subgen. n. has strongly convex elytra with moderate scutellar impressions thus elytral profile is distinctly broken (Fig. 2). *Chapadacassis* subgen. n. also differs in having lateral sides of pronotum rounded (angulate in *Philaspis*), tarsal



Figures 1–7. *Charidotella* (*Chapadacassis*) *paradoxa* sp. n. **1** body dorsal **2** body lateral **3** antenna **4** head and prosternum **5** outer claw of protarsus **6** inner claw of mesotarsus **7** inner claw of metatarsus.

claws with small tooth (large in *Philaspis*), antennae with five basal shiny and slim antennomeres (six in *Philaspis*), and antennomeres II and III subequal in length and IV longer than either (III and IV subequal in length and II distinctly shorter than either one).



Figures 8–17. Type species for subgenera of *Charidotella*. **8–9** *Charidotella* (s. str.) *zona* (Fabricius, 1801) **10–11** *Charidotella* (*Chaerocassis*) *marculenta* (Boheman, 1855) **12–13** *Charidotella* (*Xenocassis*) *amoena* (Boheman, 1855) **14–15** *Charidotella* (*Philaspis*) *seriatopunctata* (Spaeth, 1901) **16–17** *Charidotella* (*Metrionaspis*) *rubicunda* (Guérin-Méneville, 1844).

Description. Body 7.6 mm long and 5.9 mm wide, broadly oval and strongly convex (Figs 1–2). Pronotum subpentagonal, 1.9 times wider than long, widest slightly before midlength with obtuse lateral sides. Disc indistinctly separated from explanate margin, whole surface of pronotum sparsely and coarsely punctate. Scutellum triangular, smooth, dull, micro-reticulate. Elytral base distinctly wider than base of pronotum, humeral angles strongly protruding anterad and rounded. Disc strongly convex, moderately impresed on each side of scutellum, thus lateral profile broken (Fig. 2). Punctation of elytra overall coarse, mostly irregular only first two rows more or less regular in apical half. Marginal row distinct, interrupted by large callosity around midlength, its punctures approximately twice coarser than those on disc. Explanate margin broad, almost as broad as half width of disc, strongly declivous, sparsely and coarsely punctate. Extreme outer margin swollen.

Eyes large, gena not visible. Clypeus transverse, impunctate and shiny, anterior margin micro-rugose and slightly elevated (Fig. 4). Antennae slim, antennomeres I–V slim, glabrous and shiny, antennomere V intermediate, VI–XI broad and densely pubescent (Fig. 3). Labrum oval, not emarginate. Mandible with three large teeth. Prosternal collar slightly expanded towards mouth. Prosternal process broad with moderately expanded apex. Metepisterna coarsely punctate and dull. Mesepimera and mesepisterna micro-reticulate and dull. Metaventrite smooth, shiny and sparsely punctate. Abdominal ventrites I–IV smooth and shiny, V shiny and sparsely punctate, each puncture with long seta. Legs normal, slim, tarsal claws divergent. Both pro- and metaclaws appendiculate with small tooth. Outer mesoclaw claw simple (Fig. 6), inner with small tooth.

***Charidotella* (*Chapadacassis*) *paradoxa* sp. n.**

http://zoobank.org/2F581A64-5A62-4D6C-BDBA-0570F65417EA

Type locality. The type locality most likely refers to Chapada dos Guimarães (approximately 15°10'–15°30'S, 55°40'–56°00'W), Mato Grosso, Brazil.

Type material. Holotype, pinned: “BRAZIL, Mato Grosso | Chapada Plateau | XI 1965 | native collector [white, printed and cardboard label]” (preserved at Department of Biodiversity and Evolutionary Taxonomy, Wrocław, Poland). Paratype, pinned: same data as holotype (preserved in collection of L. Sekerka, Prague, Czech Republic). Both specimens are provided with an additional red, printed and cardboard label: “HOLOTYPUS [or PARATYPUS respectively] | Charidotella | Chapadacassis sgen. n. | paradoxa sp. n. | L. Sekerka & | L. Borowiec des. 2014”.

Description. Body 7.6 × 5.9 mm, broadly oval and strongly convex (Figs 1–2).

Dorsum uniformly reddish-yellow. Margins of thoracic segments, trochanters, head, central parts of abdominal ventrites, and tarsi infuscate. Remaining ventral parts yellow. Five terminal antennomeres black, remaining yellow.

Pronotum subpentagonal, 1.9 times wider than long, widest slightly before midlength with obtuse lateral sides. Disc indistinctly separated from explanate margin, strongly convex, without impressions, sparsely and coarsely punctate, punctures laterobasally gradually coarser. Interspaces smooth and shiny, 1–4 times wider than puncture diameter. Explanate margin broad, lateral sides coarsely and sparsely punctate, transparent, smooth, and shiny, and with honeycomb structure. Anterior margin regularly convex.

Scutellum triangular, smooth, dull, micro-reticulate.

Elytra widest in basal third, then slowly tapering posteriorly. Elytral base distinctly broader than base of pronotum, humeral angles strongly protruding anterad and rounded. Disc strongly convex, with moderate impression on each side of scutellum, thus profile broken in lateral view (Fig. 2). Punctation of elytra overall coarse, mostly irregular only first two rows more or less regular in apical half. Punctures gradually coarser from top of disc to lateral sides. Interspaces 1–5 times wider than puncture diameter, finely micro-reticulate and appear shiny. Marginal row distinct, interrupted by large callosity around midlength, its punctures approximately twice coarser than those on disc (Fig. 2). Explanate margin broad, almost as broad as half width of disc, strongly declivous, sparsely and coarsely punctate, punctures gradually denser towards base and apex. Interspaces 1–5 times wider than puncture diameter, micro-reticulate and appear dull. Extreme outer margin swollen.

Clypeus 1.3 times broader than long, impunctate and shiny, anterior margin micro-rugose and slightly elevated. Antennae slim, length ratio of antennomeres: 100:46:49 :59:54:45:57:57:55:56:115. Antennomere III slightly longer than II, VII–X subequal in length and approximately as long as wide (Fig. 3). Labrum oval, its lower margin smooth, not emarginate. Prosternal collar slightly expanded towards mouth. Prosternal process broad with moderately expanded apex, its surface microreticulate, sparsely and coarsely punctate, each puncture with single long seta (Fig. 4).

Legs normal, slim, tarsal claws divergent. Both fore claws appendiculate (Fig. 5). Inner mid claw simple (Fig. 6), outer with small tooth. Inner hind claw with large tooth (Fig. 7), outer with small.

Diagnosis. At first glance *Ch.* (*C.*) *paradoxa* sp. n. reminds some species of the subgenus *Philaspis*. Particularly recently described, *Ch.* (*P.*) *marginepunctata* Borowiec, 2004 (also from Chapada in Mato Grosso) because of quite similar body shape and coarsely punctate explanate margin of elytra and pronotum. The latter distinctly differs in regularly punctate and less convex elytra without postscutellar impressions, subhorizontal explanate margin of the elytra, and the presence of a small black spot on each elytron.

Etymology. The species epithet from Latin "*paradoxus*" = peculiar or curious for its unusual combination of morphological characters for Neotropical Cassidini.

Distribution. Brazil (Mato Grosso).

Key to subgenera of *Charidotella* Weise, 1896

1 Eyes large covering whole sides of the head, gena very narrow or invisible **2**
– Eyes moderately sized, covering 2/3 of lateral sides of the head, gena well visible, covering the basal third .... ***Xenocassis* Spaeth, 1936**
2 Punctation of elytra regular.. **3**
– Punctation of elytra completely irregular .... ***Chapadacassis* subgen. n.**

3 Body outline subcircular to subtriangular. Pronotal sides usually broadly rounded **4**
– Body outline oval, parallel-sided. Pronotal sides sub-angulate .... ***Philaspis* Spaeth, 1913**
4 At least in male one of the metaclaws simple **5**
– All claws in both sexes with basal tooth or in male external claw of mesotarsi simple .... ***Charidotella* s. str.**
5 Elytra regularly convex or slightly impressed around scutellum. Antennae with six shiny basal antennomeres and five dull and broad apical .... ***Chaerocassis* Spaeth in Hincks, 1952**
– Elytra with a large postscutellar gibbosity, thus lateral profile appears angulate. Antennae with five shiny basal antennomeres and six dull and broad apical .... ***Metrionaspis* Spaeth, 1942**

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Chapter IX

SIMÕES M. V. P. & **SEKERKA L.** (2015) Review of the Neotropical leaf beetle subgenus Dorynota s. str. Chevrolat (Coleoptera: Chrysomelidae: Cassidinae: Dorynotini). *Coleopterists Bulletin*, 69: 231–254.

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REVIEW OF THE NEOTROPICAL LEAF BEETLE SUBGENUS *DORYNOTA S. STR.* CHEVROLAT (COLEOPTERA: CHRYSOMELIDAE: CASSIDINAE: DORYNOTINI)

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ABSTRACT

A review of *Dorynota* Chevrolat *s. str.* is presented in which 18 species are included in the subgenus. Three new species are described: *Dorynota* (*s. str.*) *monneorum* Simões and Sekerka, **new species** and *Dorynota* (*s. str.*) *borowieci* Simões and Sekerka, **new species** from Brazil, and *Dorynota* (*s. str.*) *wappesi* Sekerka and Simões, **new species** from Bolivia. Two new synonyms are proposed: *Dorynota* (s. str.) *aculeata* (Boheman, 1854) = *Dorynota* (*s. str.*) *pubescens* (Blake, 1939), **new synonymy**, and *Dorynota* (*s. str.*) *cornigera* Boheman, 1854 = *Dorynota* (*s. str.*) *bellicosa* Boheman, 1854, **new synonymy.** *Dorynota* (*s. str.*) *pugnax* Boheman, 1854, **restored status**, is resurrected from synonymy with *Dorynota* (*s. str.*) *nodosa* (Boheman, 1854). Thirty-five new country and region records are reported for 10 species. A key to species and color photographs of all species are provided.

Key Words: taxonomy, tortoise beetles, new species, new synonyms, new records, key to species, Neotropics

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Chevrolat (in Dejean 1836) proposed the genus *Dorynota* for 12 Neotropical cassidines with a postscutellar spine. Of these, only three were previously described in the genus *Cassida* L., 1758: *D. bidens* (F., 1781), *D. pugionata* (Germar, 1824), and *D. truncata* (F., 1781), with the remaining names representing *nomina nuda*. Hope (1840) described the genus *Batonota* and designated *Cassida bidens* F, 1781 as its genotype. However, Duponchel and Chevrolat (1842) designated *C. bidens* as the genotype of *Dorynota*, thus *Batonota* became a junior objective synonym of *Dorynota*. Nevertheless, most of the genera proposed in Dejean's catalogues were not used at that time; consequently, subsequent authors (*i.e.*, Boheman 1854; Chapuis 1875; Spaeth 1914) gave priority to *Batonota*. The validity of Dejean's names was clarified by Barber and Bridwell (1940), and since then, *Dorynota* has been considered the valid generic name for this taxon.

Maulik (1916) erected the genus *Akantaka* for species of *Batonota* (= *Dorynota* Chevrolat, 1836) with a short postscutellar spine, thus appearing rather gibbous than spinose and with broadly explanate elytra with straight or convex lateral sides. Spaeth (1923) lowered *Akantaka* to a subgenus of *Batonota* and provided a key to related genera and species groups. Monrós and Viana (1949) considered *Akantaka* a valid genus and designated *Batonota viridisignata* Boheman, 1854 as its type species. Hincks (1952) again lowered *Akantaka* to a subgenus of *Dorynota*, which remains accepted (Borowiec 1999).

Dorynota is distributed from Mexico to northern Argentina, with its highest diversity in tropical areas of South America. The genus currently includes 16 species in the nominate subgenus and 24 in the subgenus *Akantaka*. Host plants are known for only nine species, with most all being associated with the diverse genus *Tabebuia* Gomes ex A. P. de Candolle (Bignoniaceae). A few associations have also been recorded from *Tecoma* Juss. (Monrós and Viana 1949), which has its history of generic delimitations intricately interwoven with that of *Tabebuia* (Gentry 1969). Based on our recent extensive fieldwork, at least 21 *Dorynota* species are associated with *Tabebuia* and its related genera (D. Windsor and L. Sekerka, personal observation).

Recently, we had the opportunity to examine extensive material of *Dorynota* and found several new species and numerous new country and province records. The present paper deals with the nominate subgenus, which has never been reviewed with the exception of a key to species provided by Wagener (1881) and the review of the Argentine species by Monrós and Viana (1949).

MATERIAL AND METHODS

All identifications were made by comparison to respective type specimens. Distributions are given by countries and their major administrative divisions. The information generally follows a summary by Borowiec and Świętojańska (2014). However, we verified all original sources of the distributional information for the species here discussed and replaced localities with their respective provinces or departments to provide consistent data. For species with very few records, we cite also the original source(s). For brevity and to reduce duplication, we include only new unpublished faunistic records in the "Additional Material Examined" section, although significantly more material was examined.

Label data for studied type specimens are cited verbatim: a vertical bar (|) separates data on different rows and a double vertical bar (||) separates different labels. Additional information about the label or explanatory notes are given in square brackets. The following abbreviations are used to describe the labels as necessary: b – blue; bb – black frame; cb – cardboard; g – green; gl – glued; hw – handwritten; p – printed; r – red; sl – soft label; tr – triangle; w – white.

Distribution maps were made based on locality information from specimen labels and literature records. They are provided for every species except for *Dorynota rufomarginata* (Wagener, 1881) and *Dorynota nodosa* (Boheman, 1854) for which no detailed locality data are known.

Institutional abbreviations cited in the text follow Evenhuis (2014): American Museum of Natural History, New York, USA (**AMNH**); Coleção de Entomolgia de Pe. Jesus S. Moure do Departamento de Zoologia, Universidade Federal do Paraná, Paraná, Brazil (**DZUP**); Collection of Lukáš Sekerka, Prague, Czech Republic (**LSC**); Department of Biodiversity and Evolutionary Taxonomy, University of Wrocław, Poland (**DBET**); Finnish Museum of Natural History, Helsinki, Finland (**MZH**); Instituto Nacional de Biodiversidad, Costa Rica (**INBIO**); Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil (**MZUSP**); Museu Nacional, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil (**MNRJ**); Museum fur Naturkunde de Humboldt Universität, Berlin, Germany (**ZMHB**); Muséum National d'Histoire Naturelle, Paris, France (**MNHN**); National Museum of Natural History, Smithsonian Institution, Washington, District of Columbia, USA (**USNM**); Natural History Museum, London, UK (**BMNH**); Swedish Museum of Natural History, Stockholm, Sweden (**SMNH**); Texas A&M University, Texas, USA (**TAMU**); Manchester Museum, Manchester, UK (**MMUE**); Zoological Museum, University of Copenhagen, København, Denmark (**ZMUC**).

Terminology for the structures follows those commonly used in Chrysomelidae and/or Coleoptera, and female terminalia are described as in Rodriguez (1994), Chaboo (2007), and Borowiec and Opalińska (2007).

References cited for each species are limited only to primary descriptions and additional works which include taxonomic changes. For a complete list of references, see Borowiec (1999) and Borowiec and Świętojańska (2014).

RESULTS

Dorynota (*Dorynota*) *aculeata* (Boheman, 1854)

(Figs. 1–2, 44)

Batonota aculeata Boheman, 1854: 170 (type locality: 'Insula St. Domingo' [= Hispaniola]).

Batanota pubescens Blake, 1939: 234 (type locality: 'Constanza, Dom. [inican] Rep. [ublic]'). **New synonymy.**

Type Material. *Batonota aculeata*, lectotype (designated by Borowiec 1999), pinned: 'Domingo. [w, p] || Mhn. [w, p, cb] || Type. [w, p, cb] || LECTOTYPE | des. L. Borowiec [r, p, cb]' (SMNH); Paralectotype, pinned: 'Domin | go. [w, p, s] || Mhm. [w, p, cb] || NHRS-JLKB | 000020989 [w, p, cb] || PARALECTOTYPE | des. L. Borowiec [r, p, cb]' (SMNH). *Batonota pubescens*, holotype, pinned: 'Constanza | Aug. '38, Dom.Rep. | 3–4000ft | Darlington [w, p, cb] || MCZ | Type No 23634 [r, cb, hw] || M.C.Z. | Type | 23634 [r, p, cb] || Batonota | pubescens | type Blake [cb, hw]' (MCZ).

Additional Material Examined (13). Without additional locality data: (1 specimen, DBET; 1 specimen, MZH); **DOMINICAN REPUBLIC:** St. Domingo[1] (2 specimens, MMUE; 3 specimens, MZH), 1985, A. Salle (4 specimens, MNHN); **HAITI:** without additional locality data: (1 specimen, DBET); **Port-au-Prince:** East Pétionville, 24.V.1973 (1 specimen, DBET).

Diagnosis. *Dorynota aculeata* is a very distinctive species, as it is among the two species of the

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[1] We included these specimens under Dominican Republic, however, they were not necessarily collected in the capital Santo Domingo. In the past, the island of Hispaniola was referred to as 'Insula Santo Domingo', not only the capital, as it is today.

Figs. 1–8. *Dorynota* (*s. str.*) species. **1)** *D. aculeata,* paralectotype, dorsal view; **2)** *D. aculeata,* paralectotype, lateral view and labels; **3)** *D. aurita* from Mexico (Durango), dorsal view; **4)** *D. aurita*, lateral view; **5)** *D. bidens* from Brazil (Minas Gerais), dorsal view; **6)** *D. bidens*, lateral view; **7)** *D. borowieci*, holotype, dorsal view; **8)** *D. borowieci*, lateral view.

subgenus possessing a triangular scutellum, the second one being *Dorynota ohausi* (Spaeth, 1916). It has coarse punctation with finely punctate elytral intervals as in *Dorynota hastifera* (Spaeth, 1923), *D. parallela* Blanchard, 1846, and *D. pugionata*. However, these differ by possessing wider intervals among the punctation and the intervals not or only weakly costate, while *D. aculeata* presents narrow and costate intervals.

Remarks. Boheman (1854) described *B. aculeata* based on an unknown number of specimens. However, he must have had at least two, as he listed a length span. Blake (1939) described *D. pubescens* based on 16 specimens collected in Constanza, Dominican Republic and compared it to *D. aculeata* described from Hispaniola. She probably had not examined the type specimens of *D. aculeata,* and her comparative notes were based on the original description. Blake (1939) used the dorsal color, presence or absence of elytral pubescence, and form of the elytral sculpture as the primary distinguishing characters between the species. As its name suggests, pubescence of the elytra is particularly distinct, and this was probably the main reason why she described *D. pubescens*, as Boheman's (1854) description does not mention this feature.

We examined the type series of both nominal taxa as well as 13 additional specimens and found them to be conspecific. We observed great variability in body color, pubescence, distribution, and elytral ridging in the examined series of both taxa. The dorsal color ranges from yellowish brown to dark red, with punctures always darker than the background dorsal color. The pro-, meso-, metasterna and abdomen are always darker than the distal portion of the legs, ranging from blackish red with legs yellow distally to blackish brown with legs yellowish brown distally. The pubescence varies with the conservation of the specimen, being more conspicuous and distinct in well-preserved material than in older specimens. Both types of *D. aculeata* possess short but clearly seen elytral pubescence. We have also observed that freshly eclosed specimens of many *Dorynota* species have more conspicuous pubescence than older ones. The sculpture of the elytra is similar in both taxa, with the punctation becoming more irregular on the second half of the disc.

Based on the examined material, we consider the assigned characteristics by Blake (1939) to differentiate the two taxa as constituting intraspecific variation. Thus, we synonymize *D. pubescens* with *D. aculeata*.

Distribution. Dominican Republic (La Vega, Santo Domingo) and Haiti (Port-au-Prince) (Borowiec and Świętojańska 2014) (Fig. 44).

Dorynota (*Dorynota*) *aurita* (Boheman, 1862)

(Figs. 3–4, 44)

Batonota aurita Boheman, 1862: 237 (type locality: 'Costa Rica').

Type Material Examined. Holotype, pinned: '14264 [w, p, sl] || aurita | N. | Costa | Rica. Wagn. [g, hw, cb] || HOLOTYPE | des. L. Borowiec [r, p, cb] || HOLOTYPUS | Batonota | aurita | Boheman, 1854 | des. L. Borowiec [r, p, cb, bb]' (ZMHB).

Additional Material Examined (10). COSTA RICA: Guanacaste: Santa Rosa National Park, D. H. Janzen lgt. (2 specimens, TAMU); **MEXICO: Chiapas:** Aguacera, 16 Km, W. Ocozocautla, 6.VI.1987, D.B. Thomas lgt. (1 specimen, TAMU); La Sepultura, 26.VI.1988, DB & AM Thomas lgt. (1 specimen, TAMU); **Durango:** Ventanas, Godman-Salvin Coll., Biol. Centr-Amer. (8 specimens, BMNH); **Guerrero:** Acapulco, Godman-Salvin Coll., Biol. Centr-Amer. (1 specimen, TAMU); 18.2 miles, 3,000 ft, 5.VII.1987 Kovarik, Schaffner lgt. (1 specimen, TAMU); Ixtapa, 17–20. VII.1985, J. E. Wappes lgt. (1 specimen, TAMU); **Oaxaca:** 4 Km, E. Ventosa 50m, 12. VII. 1992 C. Bellamy lgt. (2 specimens, TAMU); **PANAMA: Los Santos:** Laboratorio Los Achotines, 3 km, 23. VI. 1996, Gillogly & Schaffner lgt. (8 specimens: 2 LSC, 6 TAMU).

Diagnosis. *Dorynota aurita* is readily characterized by the presence of a long spine, impunctate elytral intervals, yellow dorsum, and U-shaped elytra. Most similar externally is *D. ohausi* from Ecuador, which differs in absence of the humeral carina, while *D. aurita* has a large and high humeral carina. Other similar species, such *D. rileyi*, *D. wappesi* or *D. monneorum*, differ in having a subtriangular (*D. rileyi* and *D. wappesi*) or shield-shaped body (*D. monneorum*) and maculate explanate margin of elytra (*D. rileyi* and *D. monneorum*). For summary of the distinguishing characters of these three spcies, see Table 1.

Remarks. The Panamanian specimens fully match the holotype. Based on the distribution data, the species is probably restricted to seasonally dry Pacific forests, which, unfortunately, have been mostly destroyed in Panama.

Distribution. Costa Rica, Mexico (Durango, Guerrero, Jalisco, Puebla), and Nicaragua (Chontales) (Borowiec and Świętojańska 2014). **New country record** for Panama (Los Santos) and a **new province record** for Costa Rica (Guanacaste) (Fig. 44).

Dorynota (*Dorynota*) *bidens* (F., 1781)

(Figs. 5–6, 44)

Cassida bidens Fabricius, 1781: 112 (type locality: 'Brasilia').

Table 1. Diagnostic characters distinguishing *Dorynota aurita*, *Dorynota rileyi*, *Dorynota wappesi*, and *Dorynota monneorum*.

Diagnostic character	*D. aurita*	*D. rileyi*	*D. wappesi*	*D. monneorum*
Body shape	U-shaped	elongate-triangular	elongate-triangular	escutcheon-shaped
Anterior margin of pronotum	sinuate	truncate	truncate	sinuate
Outline between pronotum and elytra	discontinuous	discontinuous	discontinuous	continuous
Anterior margin of humeral angles	truncate horizontally	truncate horizontally	oblique	sinuate
Humeral carina	strongly elevated	low	low	absent
Outer humeral angle	rounded, on same level as inner	subacuminate, on same level as inner	rounded, situated lower than inner	subacuminate, situated lower than inner
Explanate margin of elytra	immaculate	maculate	immaculate	maculate
Lateral margin of elytra	sinuate behind humeral angles, followed by straight, parallel outline	sinuate behind humeral angles, followed by straight, oblique outline	sinuate behind humeral angles, followed by straight, oblique outline	bisinuate
Apex of prosternal process	subrounded	subrounded	acuminate	acuminate

Type Material Examined. Syntype (? holotype), pinned: ‘Cassida bidens | Fabr. Spec. 112. n. 32 [w, hw, cb, bb]’ (BMNH).

Additional Material Examined (32). BRAZIL: Bahia: without additional locality data (1 specimen, ZMUC); ‘Cachimbo’, 1890 Ch. Pujol lgt. (12 specimens, MNHN; 3 specimens, LSC); Conceição de Almeida (Interceção B. Rios e Rio Jaguaripe), 21.VII.1979, J. Becker lgt. (1 specimen, MNRJ); Itamaraju, 26.X.1985, J. Becker lgt. (1 specimen, MNRJ); Porto Villa Victoria, 1890, Ch. Pujol lgt. (1 specimen, MNHN); **Espírito Santo:** without additional locality data (3 specimens, DBET; 1 specimen, LSC; 2 specimens, MMUE, 1 specimen ZMUC); Linhares (1 specimen, MNRJ); **Pernambuco:** without additional locality data, L. L. Castro lgt. (1 specimen, MNRJ); **São Paulo:** Rio Piracicaba, II.1885, P. Germain lgt. (1 specimen, MNHN); **FRENCH GUIANA: Cayenne:** Cayenne (3 specimens, DBET).

Diagnosis. *Dorynota bidens* is one of two species in the subgenus with a black dorsum. The other species, *D. nigra*, differs in that the elytra are uniformly black with a dark green metallic tint and the shorter dorsal spine, while *D. bidens* has a dull black body with a small dark red spot around the midlength of the lateral slope of each elytron. Externally, *D. bidens* resembles *D. monoceros* and differs except for the color in having finer and sparser punctation of the elytra, particularly in the apical half, and the presence of relatively dense and long pubescence around the red elytral spot, at the base of the elytra, and on the pronotum.

Remarks. Fabricius (1781) did not state how many specimens he examined, mentioning only that *D. bidens* was described from the Joseph Banks collection, currently deposited at the BMNH. There is just a single specimen in the Banks collection, and quite likely it is the sole specimen used for the description (for more details, see Sekerka and Barclay 2014).

The record from Paraguay was made by Spaeth (1914) in the *Coleopterorum Catalogus* without specification of specimens or locality. We were not able to find any specimen from Paraguay and consider this record to be dubious. Based on the distribution data known to us, *D. bidens* seems to be a species occurring rather along the eastern coast of South America in regions influenced by the Atlantic ocean than in the interior dry areas.

Distribution. Brazil (Minas Gerais, Rio de Janeiro), Paraguay, and Trinidad and Tobago (Borowiec and Świętojańska 2014). **New country record** for French Guiana and four **new state record**s in Brazil (Bahia, Espírito Santo, Pernambuco and São Paulo) (Fig. 44).

Dorynota (*Dorynota*) *borowieci* Simões and Sekerka, new species

(Figs. 7–8, 44)

Type Locality. Brazil, Ceará State, Serra do Baturité.

Type Material. Holotype, pinned: ‘Serra do Baturité | (Ceará) | Gounelle 1.1895 [w, p, cb] || Museum Paris | Coll. E. Gounelle 1915 [g, p, cb]’

(MNHN). Three paratypes, pinned: same data as holotype, deposited: 2 in LSC, 1 in MNHN. All specimens provided an additional label: 'HOLOTYPE [or PARATYPE respectively] | Dorynota | borowieci sp. nov. | M. Simões & L. Sekerka des. 2014 [r, p, cb]'.

Diagnosis. *Dorynota borowieci* belongs to the species group characterized by the uniformly brownish red body, except humerus black dorsally, and subtriangular or U-shaped habitus, with the anterior third of the lateral margins of the elytra abruptly wider than the posterior two-thirds. This new species is quite similar in appearance to four species, *D. monoceros*, *D. pugnax*, *D. nigra*, and *D. bidens*, by the U-shaped body, but it can be easily separated mainly by its conspicuous, uniform, brownish red dorsal color, except for the black humerus, whereas *D. nigra* and *D. bidens* are entirely dark-colored dorsally. In general appearance including color and structure of elytral disc, *D. borowieci* is most similar to *D. monoceros* and *D. pugnax*. The main diagnostic characters to distinguish *D. monoceros*, *D. pugnax*, and *D. borowieci* are summarized on Table 2.

Description. Measurements ($n = 4$): Body length 12.5–14.0 mm, body width 11.5–12.5 mm, body length/width ratio 1.1, pronotal length 3.0–3.5 mm, pronotal width 6.5–7.1 mm, pronotal width/length ratio 2.0. Body subtriangular, U-shaped, with anterior 1/3 of the elytral lateral margins abruptly wider than the posterior 2/3. Integument opaque; glabrous, except for short, yellow, sparse setae on pronotum, abdominal sternites and legs. Ground color brownish red, except for antennomeres VI–XI, mouthparts, basal margin of elytra, and humerus black. Antennae with scape and pedicel glabrous, antennomeres III–V with short, sparse setae and VI–XI densely setose with ventromarginal groove. Length ratio of antennal segments 100:37:33:50:67:108:108:83:100:100:133, with XI tapered towards apex. Pronotum approximately 2X wider than long, elliptical, with maximum width in the middle, disc finely and densely punctate; anterior margin sinuous; lateral margins rounded; posterior angles W-shaped. Prosternum with collar projecting laterally, not covering mouthparts; process flat, with concave lateral margins, and acuminate apex expanded laterally. Scutellum rhomboidal, impunctate, smooth, shiny. Elytra with poorly marked crenulate basal margin, lateral and sutural margins flat. Humeral angles strongly expanded anteriorly, reaching to midlength of pronotum laterally, with anterior margin truncate and oblique corner angle. Disc with coarse, large, shallow punctures arranged in rows on the anterior 1/3 and disordered on apical 2/3; intervals distinct, approximately as wide as puncture diameter, smooth, impunctate; explanate margin converging posterad, finely and densely punctate, and distinctly bordered from disc by marginal row of punctures, the latter extending from humeral callus to apex of elytra. Dorsal spine acute, as long as body height, in lateral view tilted posteriorly, with base 2X wider than apex.

Distribution. Brazil (Ceará) (Fig. 44).

Etymology. The species is dedicated to Dr. Lech Borowiec (DBET, Wrocław, Poland), a leading specialist in the Cassidinae.

Dorynota (*Dorynota*) *cornigera* (Boheman, 1854)
(Figs. 9–10, 44)

Batonota cornigera Boheman, 1854: 162 (type locality: 'Brasilia').
Batonota bellicosa Boheman, 1854: 159 (type locality: 'Brasilia'). **New synonymy.**

Type Material. *Batonota cornigera*, lectotype (designated by Borowiec 1999), pinned: 'Brasil. [w, p, cb] || Mhn. [w, p, cb] || Type. [w, p, cb] || LECTOTYPE | des. L. Borowiec [r, p, cb]' (SMNH). *Batonota bellicosa*, holotype, pinned: '14262 [w, p, sl] || bellicosa | Boh.* | Brasil. Sello. [g, hw, cb, bb] || HOLOTYPE | des. L. Borowiec [r, p, cb] || HOLOTYPUS | Batonota | bellicosa | Boheman, 1854 | des. L. Borowiec [r, p, cb, bb]' (ZMHB).

Additional Material Examined (37). ARGENTINA: Misiones: XI.1941, A. Maller lgt. (1 specimen, MNRJ); **BRAZIL:** without additional locality data (2 specimens, DBET; 3 specimens, MMUE); XII.1964 (2 specimens, MNRJ);

Table 2. Diagnostic characters distinguishing *Dorynota monoceros*, *Dorynota pugnax*, and *Dorynota borowieci*.

Diagnostic character	*D. monoceros*	*D. pugnax*	*D. borowieci*
Dorsal spine	high, 2.60X longer than base	low, 1.60X longer than base	low, 1.25X longer than base
Humeral carina	elevated, sharp	not elevated, obtuse	elevated, sharp
Prosternal collar followed by depression	present	present	absent
Prosternal process	depressed medially	depressed medially	flat

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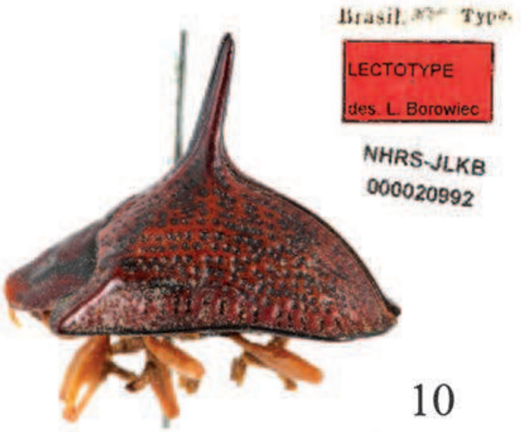

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Figs. 9–14. *Dorynota* (*s. str.*) species. **9)** *D. cornigera*, lectotype, dorsal view; **10)** *D. cornigera*, lateral view and labels; **11)** *D. hastifera*, holotype, dorsal view; **12)** *D. hastifera*, lateral view and labels; **13)** *D. monoceros* from Brazil (Bahia), dorsal view; **14)** *D. monoceros*, lateral view.

Goiás: Jatahy (1 specimen, MMUE); **Mato Grosso:** without additional locality data (1 spec., LSC; 1 specimen, ZMHB); **Minas Gerais:** Pedra Azul, XII.1970, F.M. Oliveira lgt. (1 specimen, MNRJ); Poços de Caldas, Morro de Ferro Poços de Caldas (Morro de Ferro), I.XI.1970, J. Becker lgt. (1 specimen, MNRJ); **Rio de Janeiro:** without additional locality data (1 specimen, DBET); Corcovado, I.1962, Alvarenga & Seabra lgt. (1 specimen, MNRJ); **Rio Grande do Sul:** without additional locality data (1 specimen, MMUE); Porto Lucena, (1 specimen, MMUE); **São Paulo:** without further locality data (1 specimen, DBET, 1 specimen, ZMUC); Rosana (Porto Primavera), 11.XII.1998, A. Brescov lgt. (1 specimen, MZUSP); **Santa Catarina:** Curupá (Hansa), XI.1939 (2 specimens, MNRJ); Joinville (2 specimen, MMUE); Pinhal, XII.1953, A. Maller lgt. (1 specimen, MNRJ); Rio Vermelho, XII.1948, Dirings lgt. (2 specimens, MZUSP); I.1949, A. Maller lgt. (2 specimens, AMNH); Rio Vermelho, III.1952 (1 specimen, MNRJ); XII.1955, A. Maller lgt. (1 specimen, MNRJ); Rio Negrinho, XI.1925, A. Maller lgt. (1 male, 1 female, MNRJ); **PARAGUAY:** without additional locality data (2 specimens, DBET); **Cordillera:** San Bernardino, W. Elsenlohr V. [endor] (1 specimen, DBET), P. Sladhorn lgt. (1 specimen, LSC).

Diagnosis. *Dorynota cornigera* is a very variable species with regards to coloration, but can be easily distinguished by the presence of conspicuous acute humeral angles. *Dorynota hastifera* and some specimens of *D. pugionata* possess the humeral angles shaped as such, but they also have punctate elytral intervals, while in *D. cornigera* they are impunctate.

Remarks. Boheman (1854) described *D. cornigera* and *D. bellicosa* from an unknown number of specimens. However, length and variation of *D. cornigera* were provided, and he cited ‘A Dom. Com. Mannerheim et e Mus. Imp. Wienn. ad describendum communicata’, therefore he must have had at least two specimens. Borowiec (1999) studied Boheman’s material that is deposited at the SMNH and found a single specimen of this species, which he designated as the lectotype. Other specimens, if found, shall be designated as paralectotypes.

Dorynota bellicosa was also described from an unknown number of specimens. However, as Boheman gave a single length measurement and stated ‘Dom. Sellow. Mus. Reg. Berol.’, we assume he must have had a single specimen, as in many other species described by him. The ZMHB holds a single specimen of this species, and only one specimen is mentioned in the historical collection`s catalog. Therefore, it is considered as the holotype.

Boheman (1854) compared *D. cornigera* and *D. bellicosa* to *D. pugionata*, based on general body appearance and the presence of a long dorsal spine. From reading the primary descriptions, the main characters used to separate *D. cornigera* and *D. bellicosa* were size and body coloration, with *D. bellicosa* presenting being a darker form with partly black ventrites and *D. cornigera* a pale form with yellowish ventrites. We examined types of both nominal taxa, as well as 37 additional specimens, and concluded that both taxa are conspecific. *Dorynota bellicosa* represents an extreme form, differing from *D. cornigera* by the dark yellowish brown elytra and somewhat sparser and slightly smaller elytral punctation. The examined series of specimens display great variability in dorsal as well as ventral color. The dorsum is always with a variegated pattern ranging from yellow to brown or evenly black with lateral slopes and margin darker than the central part of the disc. Coloration of the pronotum is also variable, and the black pattern can be completely reduced in extreme forms. Punctation of the elytra is also variable, as noticed by Monrós and Viana (1949), and is dependent on the size of the specimen. Small specimens with a smaller elytral surface have more condensed punctation, while large specimens with a larger surface have sparser punctation.

As both taxa were described in the same publication, we chose to retain the name *D. cornigera* as valid for this taxon, since it has been applied correctly and *D. bellicosa* was unknown to subsequent cassidine workers (following the First Reviser Principle, Article 24.2.1. of the Code (ICZN 1999)).

Distribution. Argentina (Entre Ríos, Salta, Chaco), Brazil (Distrito Federal, Goiás, Minas Gerais, Santa Catarina, São Paulo), Paraguay (Asunción) (Borowiec and Świętojańska 2014). Three **new state records** in Brazil (Mato Grosso, Rio de Janeiro, Rio Grande do Sul) and **new province records** in Argentina (Misiones) and Paraguay (Cordillera) (Fig. 44).

Dorynota (*Dorynota*) *hastifera* (Spaeth, 1923)

(Figs. 11–12, 44)

Batonota hastifera Spaeth, 1923: 71 (type locality: ‘Bahia’).

Type Material Examined. Holotype, pinned: ‘Bahia [hw by Spaeth] | Brasil [w, p, cb] || ex coll. | v d. Poll [w, p, cb] || hastifera [hw] | Typus [hw] | Spaeth det. [w, p, cb] || TYPUS [pink, p, cb] || M/ CR MUS. | SPAETH COLL. [w, p, cb] || Manchester Museum | SYNTYPE [b, p, cb]’ (MMUE).

Diagnosis. See diagnosis under *D. pugionata*.

Remarks. Spaeth (1923) described *D. hastifera* from two specimens, one from Bahia and the other from Colombia. As the second specimen is conspecific with the holotype but does not have more precise locality data and as no species of this group occur in Colombia, we consider this record as dubious and quite likely the specimen was mislabeled.

Distribution. Brazil (Bahia) and Colombia [?] (Spaeth 1923) (Fig. 44).

Dorynota (*Dorynota*) *monneorum* Simões and Sekerka, new species

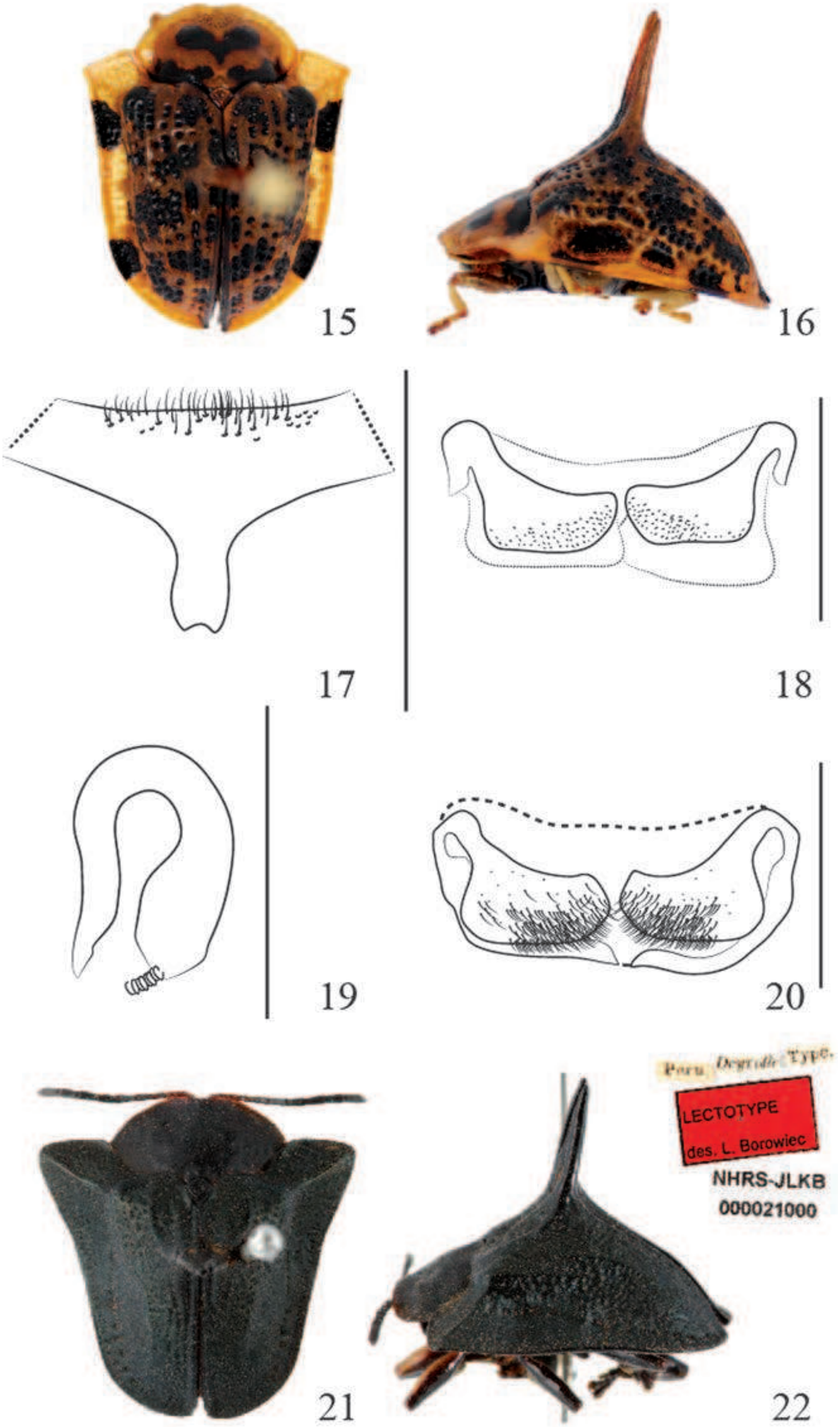
(Figs. 15–20, 45)

Type Locality. Costa Rica, Puntarenas Province, Osa Peninsula, Carara Biological Reserve, Estacíon Quebrada Bonita, approximately 09°46′ N, 84°36′ W 50 m elevation.

Type Material. Holotype, pinned: 'Est. Queb. Bonita, 50m, Res. Biol. | Carara, Prov. Punt., COSTA | RICA, Abr 1993, R. Guzmán. | L-N-194500, 469850 [w, p, cb] || Costa Rica INBIO | CR1001 | 370598 [w, p, cb]'. Four paratypes, two females and two of undetermined sex pinned: female, with dissected genitalia in vial, with label data: 'female [w, hw, cb] || Rancho Quemado, 200m, | Península de Osa, Prov, | Puntarenas, Costa Rica | D. Brenes, Abr 1992 | L-S 292500, 511000 [w, p, cb] || Costa Rica INBIO | CR1000 | 495202 [w, p, cb] || Dorynota | A. Mora D`93 [w, bb, hw, cb]'; female, dissected with abdomen and three apical antennomeres from right antenna mounted on white triangle, with label data: 'female [w, hw, cb] || Rancho Quemado, Penín- | sula de Osa, 200m. Prov, | Punt., COSTA RICA, | F. Quesada, Nov 1991, | L-S 292500, 511000 [w, p, cb] || Costa Rica INBIO | CR1000 | 45202 [w, p, cb]'; unsexed specimen: 'Rancho Quemado, 200m, | Península de Osa, Prov. Punt., | COSTA RICA, Jul 1991. F. | Quesada. L-S-292500, 511000 [w, p, cb] || Costa Rica INBIO | CR1001 | 407485 [w, p, cb] || Dorynota | sp. | det. Chaboo 2000 [w, bb, hw, cb]'; unsexed specimen: 'glued leg [w, p, cb] || Brasil AM, Benjamin | Constant VIII. | 1979 A.C. Domingos leg. [w, hw, cb]'. Holotype and two paratypes deposited in INBIO, one in LSC and one in MNRJ. All specimens provided with additional label: 'HOLOTYPE [or PARATYPE respectively] | Dorynota | monneorum sp. nov. | M.V.P. Simões & L. Sekerka des. 2014 [r, p, cb]'.

Diagnosis. *Dorynota monneorum* belongs to a species group that is characterized by impunctate elytral intervals and pronotum at most finely punctate but can be distinguished by its shield-shaped body with bisinuate lateral margins of the elytra, a feature so far unique for this taxon. It also can be easily separated from other species by the regularly convex surface of the humeral angles, which is without the carina present in all remaining *Dorynota s. str.* except *D. ohausi*. The latter can be easily separated by the uniformly yellowish or reddish brown dorsum, while *D. monneorum* has the pronotum and elytra with an extensive black pattern and the explanate margins of elytra with two transverse maculae. In general appearance, including color and structure of the elytral disc, *D. monneorum* is most similar to *D. rileyi* and *D. monoceros*, the only two other *Dorynota s. str.* species with maculae on the explanate margin of the elytra. However, *D. monoceros* has spots on the underside of the explanate margin, while *D. monneorum* and *D. riley* have them on the upper surface. The diagnostic characters to distinguish *D. rileyi* and *D. monneorum* are summarized in Table 1.

Description. Measurements (n = 5): Body length 9.1–11.5 mm, body width 8.1–9.2 mm, body length/width ratio 1.2, pronotal length 2.9–3.3 mm, pronotal width 4.9–5.7 mm, pronotal width/length ratio 1.7. Body slightly longer than wide, shield-shaped, with anterior half wider and sinuate, and posterior half chalice-like, converging posteriad. Integument opaque except for transparent anterior margin of pronotum and explanate margin of elytra; glabrous except for short setae on pronotum and ventral side. Ground color of dorsum yellow; pronotum with black pattern on disc (Fig. 15) and with narrow lateral spots on margins; elytra with extensive black pattern (Fig. 15), explanate margin with narrow posthumeral and wide posterolateral transverse spots; distal 5 antennomeres brownish yellow, remainder yellow; ventral surface brownish black except anterior 2/3 of prosternum, anterior half of metasternum, legs, and sternites I–V yellow. Antennae with 5 basal antennomeres glabrous and distal antennomeres with short setae; scape almost 3X longer than pedicel, tapered towards apex. Length ratio of antennomeres: 100:33:27:47:60:67:67:53:67:63:100. Pronotum about 1.8X wider than long, elliptical, with maximum width medially, disc finely and sparsely punctate; anterior margin sinuous; lateral margins rounded; posterior angles truncate. Prosternum with prosternal collar projecting anteriorly, not covering mouthparts; process flat, with acuminate, elongate apex. Scutellum rhomboidal, impunctate, smooth, shiny. Elytra with basal margin crenulate, lateral and sutural margins elevated. Humeral angles expanded anteriorly reaching to midlength of pronotum, anterior margin obliquely truncate, with outer margin of humeral corner slightly projecting laterally, followed by sinuous lateral margin. Disc with coarse punctures arranged in discontinuous rows;



Figs. 15–22. *Dorynota* (*s. str.*) species. *D. monneorum*: **15)** Holotype, dorsal view; **16)** Lateral view; **17)** Sternite VIII; **18)** Tergite X; **19)** Spermatheca; **20)** Sternite IX. *D. nigra*, lectotype: **21)** Dorsal view; **22)** Lateral view and labels.

intervals distinct, approximately as wide as puncture diameter, smooth and slightly forming carinae: 2 posthumeral (on 1st and 2nd intervals), one reaching ½ and other ¼ of disc, and 2 dorsal (on 3rd and 4th intervals), stretching from basal ¼ of disc to apical ¾; explanate margin converging posterad, with fine, sparse punctures, distinctly bordered from disc by marginal row of punctures, extending from humeral callus to apex of elytra, interrupted by 2 transverse ridges around midlength; surface of humeral angle regularly convex without carina. Dorsal spine acute, almost 1.5X longer than body height; in posterior view, base 2.5X wider than apex. Female terminalia as in Figs. 17–20. Sternite VIII (Fig. 17) somewhat sclerotized with median setae at apical margin, shortening laterally; lateral arms membranous, fused to sternite IX, forming transverse membranous sacs; apodemes as long as width of apical region. Sternite IX (Fig. 20) subdivided into 2 plates with long, erect setae at apical margin. Tergite X (Fig. 18) with 2 regions next to sclerotized apical margin, densely setose, with a mixture of short and erect setae on the edge. Spermatheca (Fig. 19) strongly sclerotized and curved, with apex parallel to base, abruptly tapered, 2X wider than at middle. Duct of spermathecal gland strongly coiled and long, ca. 6X longer than spermatheca.

Distribution. Brazil (Amazonas) and Costa Rica (Puntarenas) (Fig. 45).

Etymology. The species is named after Dr. Miguel Monné and Dra. Marcela Monné, Museu Nacional/Universidade Federal do Rio de Janeiro.

Dorynota (*Dorynota*) *monoceros* (Germar, 1824)
(Figs. 13–14, 45)

Cassida monoceros Germar, 1824: 536 (type locality: 'Brasilia').

Batonota gladiator Boheman, 1856: 94 (type locality: 'Guayra'); Spaeth 1914: 66 (synonym).

Type Material Examined. *Cassida monoceros*: lectotype (designated by Borowiec (1999)), pinned: '14255 [w, p, s] || LECTOTYPE | des. L. Borowiec [r, p, cb] || monoceros | Boh.* | Caffid. Monoceros | Germ. | S. Paul. Sello [g, hw, cb, bb] || PARALECTOTYPUS | Cassida | monoceros | Germar, 1824 | des. L. Borowiec [r, p, cb, bb]' (ZMHB); two paralectotypes, pinned: 'PARALECTOTYPE | des. L. Borowiec [r, p, cb] || PARALECTOTYPUS | Cassida | monoceros | Germar, 1824 | des. L. Borowiec [r, p, cb, bb]' (ZMHB). *Batonota gladiator*: syntype, pinned: 'Guayra [w, hw, s] || Deyrolle [w, p, s] || Gladiator Bhn. [w, Boheman hw, s] || NHRS-JLKB | 000020993 [w, p, cb]' (SMNH); syntype, pinned: 'Type | Guayra [w, Baly's hw, cb] || Type [w, p, s, circle label with red frame] || Guayra. [hw] | ex Deyrolle [hw] | Baly Coll. | 1905—54. [w, p, cb] || Batonota | gladiator, Bhn | ?Type [w, C. J. Gahan's hw, cb]' (BMNH).

Additional material examined (30). BRAZIL: Bahia: without additional locality data, G. Bondar lgt. (2 specimens, MMUE; 1 spec., MNRJ); **Espírito Santo:** Linhares (Reserva Biologica Sooretama), XII.1964, F. M. Oliveira lgt. (1 specimen, MNRJ); **Mato Grosso:** Rosário-Oeste, II.1972, (1 specimen, MZUSP), X.1973, Dirings lgt. (2 specimen, MZUSP), II.1974 (1 specimen, MZUSP); **Minas Gerais:** Lagoa Santa, Reinhardt lgt. (4 specimens, ZMUC); Matozinho, 3–4 trimestre 1885, E. Gounelle lgt. (1 specimen, MNHN); **Pará:** Santarém (Santarenzinho, Rio Tapajós), II.1964, Dirings lgt. (7 specimens, MZUSP); **São Paulo:** without additional locality data (1 specimen, DBET); Bananal (Serra da Bocaína), I.1937, D. Mendes lgt. (1 specimen, MNRJ); Peruíbe, 20.XII.1936 (1 specimen, MNRJ); **COLOMBIA:** 'Kolombian', (1 specimen, MMUE); **PARAGUAY: Central:** San Antonio (Rio Paraguay), 8.X.1936 (1 specimen, DBET); **Itapuá:** Vega, XII.1954, Dirings lgt. (3 specimens, MZUSP); **URUGUAY: Paysandú:** 'Paysandu' (1 specimen, LSC); **VENEZUELA: Distrito Federal:** Caracas (1 specimen, MMUE).

Diagnosis. *Dorynota monoceros* is characterized by the elytra with a long dorsal spine, the impunctate elytral intervals, humeri strongly expanded laterally with low but distinct carina, and pale colored dorsum. A similar combination of characters is also found in *D. pugnax*, which differs by having a short elytral spine (1.0–1.5X longer than width of its base), while *D. monoceros* has a long spine (at least 2.0X longer than width of its base). *Dorynota borowieci* is the most similar species, but it differs in having a uniformly yellow, explanate elytral margin and less impressed and somewhat sparser punctation on the elytra, whereas *D. monoceros* has the explanate elytral margin laterobasally black and a black spot posteriorly on the underside, and the punctation is very dense and strongly impressed, particularly on the lateroapical slope of the elytra.

Remarks. Among other records, we found a single specimen from Colombia in the MMUE collection, that unfortunately does not have precise locality data and could be easily mislabeled. Therefore, we do not consider it as a new country record until more accurately labeled specimens become available.

Boheman (1856) described *B. gladiator*, which was later synonymized with *D. monoceros* by Spaeth (1914). *Batonota gladiator* differs from the types of *D. monoceros* in that it has slightly less coarse and sparser elytral punctation, there is a black macula present on the apical slope of the elytra, and the venter is rust-colored.

Monrós and Viana (1949) were the first to list Bolivia in the species' distribution. However, they did not mention any particular specimen in their examined material. We do not know why they did so. Since we were unable to find any published record of either taxon from Bolivia, we consider this record as dubious. On the other hand, the species might occur in Bolivia as it is found in neighboring countries. However, at the moment there is no reliable faunistic record of *D. monoceros* from Bolivia, thus we exclude that country from the species' range.

Also problematic is the interpretation of the type locality of *B. gladiator*, since Guayra can refer to different places. Boheman (1856) provided just a brief description and mentioned that he obtained the material from Deyrolle. Boheman (1862), in the supplement to his monograph, included a description of *B. gladiator* again and mentioned 'Guayra. Dom. Deyrolle. Venezuela Dom. Baly.', which might suggest that the type locality he referred to was the city La Guaira in the Venezuelan state of Vargas. On the other hand, there are no accurately labeled specimens of *Dorynota* from Venezuela, thus it could optionally refer to Guairá department of Paraguay, which is within the species' distribution. The third option is two Brazilian municipalities named Guaíra. One is situated in the state of Paraná and the other in São Paulo. It is known that Baly purchased many syntypes of species described by Boheman (1856, 1862) from Deyrolle, thus the BMNH specimen of *B. gladiator* is considered a syntype. We do not consider the specimen from Venezuela in Baly's collection as a syntype because it was not mentioned in 1856. Both syntypes from Guaira have a long spine and are morphologically similar to specimens from the southern part of the species' range, thus the type locality probably refers to Paraguay rather than Venezuela. Generally, it is questionable whether the species is truly present in Venezuela, as only old and poorly labeled specimens with data 'Caracas' or 'Venezuela' are available. Baly's specimen from Venezuela has a short dorsal spine and less expanded and broadly rounded humeral angles and probably belongs to *D. pugnax*. On the other hand, we present above a specimen of true *D. monoceros* from Venezuela, which, however, could be mislabeled, therefore occurrence in Venezuela is considered doubtful.

Distribution. Argentina (Corrientes, Misiones), Brazil (Rio de Janeiro, Santa Catarina), Paraguay (Asunción, Caazapá, Concepción, Guairá, Paraguarí) Venezuela [?] (Borowiec and Świętojańska 2014). **New country record** for Uruguay (Paysandú), six **new state records** for Brazil (Bahia, Espírito Santo, Mato Grosso, Minas Gerais, Pará, São Paulo), and two new department records for Paraguay (Central, Itapuá) (Fig. 45).

***Dorynota* (*Dorynota*) *nigra* (Boheman, 1856)**
(Figs. 21–22, 45)

Batonota nigra Boheman, 1856: 93 (type locality: 'Peruvia').

Type Material Examined. Lectotype (designated by Borowiec 1999), pinned: 'Peru [w, p, cb] || Deyrolle [w, p, cb] || Type. [w, p, cb] || Lectotype | des. L. Borowiec [r, p, cb]' (SMNH). Paralectotype, pinned: 'Peru [g, hw, cb] || Type | C: Deyrolle [w, J. S. Baly's hw, cb] || Type [w, p, s, circle label with red frame] || Peru. [hw] | ex Deyrolle [hw] | Baly Coll. | 1905—54. [w, p, cb] || Batonota | nigra, Bhn | Type ! [w, C. J. Gahan's hw, cb]' (BMNH).

Additional Material Examined (1). COLOMBIA: Arauca: Tame, 21.–29.VI.1976, M. Cooper lgt. (1 specimen, BMNH).

Diagnosis. *Dorynota nigra* is a well-characterized species, the only one of the nominate subgenus with elytra with a metallic tint. The similarly dark colored *D. bidens* differs in that the elytra are dull black without a metallic tint and the dorsal spine is longer.

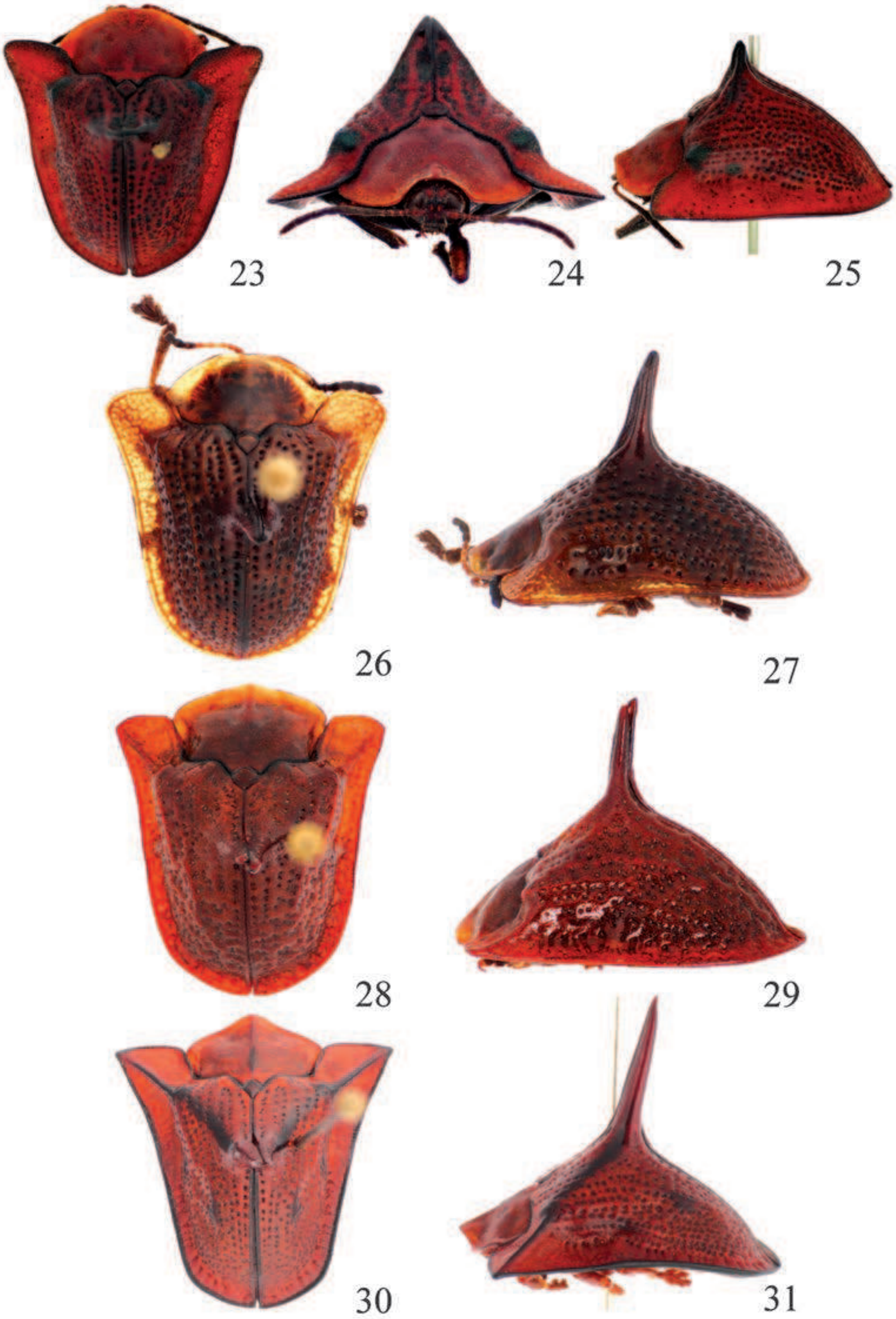
Remarks. Boheman (1856) did not state how many specimens he examined. However, we can assume he had at least two, as he provided two localities in his description and also described var. a. Borowiec (1999) examined the specimen in SMNH and designated it as a lectotype. We recently examined another specimen from the Baly collection (ex. Deyrolle material) deposited in the BMNH, which thus becomes a paralectotype according to the Code (ICZN 1999). The typical form was described from Peru, while the variants are from Caracas. The types were almost certainly mislabeled and only the locality for the variants is correct, as we do not know of any other specimens of this species from Peru, and the species seems to be restricted to the northern coast of South America.

Distribution. Trinidad and Venezuela (Aragua, Distrito Federal) (Borowiec and Świętojańska 2014). **New country record** for Colombia (Fig. 45).

***Dorynota* (*Dorynota*) *nodosa* (Boheman, 1854)**
(Figs. 23–25)

Batonota nodosa Boheman, 1854: 160 (type locality: 'Columbia').

Type Material Examined. Syntype, pinned: '292 | [illegible] [g, sl, hw on underside of a circle label] || MUSÉUM PARIS | Colombie ?



Figs. 23–31. *Dorynota* (*s. str.*) species. **23)** *D. nodosa* from Colombia, dorsal view; **24)** *D. nodosa*, frontal view; **25)** *D. nodosa*, lateral view; **26)** *D. ohausi* from Ecuador (Zamora-Chinchipe), dorsal view; **27)** *D. ohausi*, lateral view; **28)** *D. parallela* from Brazil (Goiás), dorsal view; **29)** *D. parallela*, lateral view; **30)** *D. pugionata* from Brazil (Rio de Janeiro), dorsal view; **31)** *D. pugionata*, lateral view.

[hw] [g, p, cb]' (MNHN); syntype, pinned: 'MUSEUM PARIS | COLOMBIE | C. PARZUDAKI 1840 [g, p, cb] || 2899 | 40 [g, sl, hw on underside of a circle label]' (MNHN).

Diagnosis. *Dorynota nodosa* and *D. rufomarginata* are the only two species of the nominate subgenus that have a very short spine reminiscent of *Akantaka* species, which is triangular in frontal view and not projecting above the base. All *Akantaka* species can be easily separated by the following combination of characters: the lateral sides of the elytra straight, not concave behind the humeral angles; and dorsal spine in lateral view with apex not markedly narrower than base, followed by gradual and continuous slope. Both species are externally quite similar, but *D. nodosa* has the elytra with a thin, black outer margin with the lateral margins more concave, while *D. rufomarginata* has a uniformly pale elytral margin and lateral margins less concave and subparallel.

Remarks. *Dorynota nodosa* has been misidentified in the past with some populations of *Dorynota* (*Akantaka*) *insidiosa* (Boheman, 1854) from Central America because no author examined the type specimen deposited in the MNHN. *Dorynota nodosa* has a short spine and distinctly concave lateral elytral margins, which certainly place it in nominate subgenus. All Mesoamerican specimens we have seen so far have straight or slightly convex lateral elytral margins and an even shorter spine, thus they belong to a yet probably undescribed species of *Akantaka*. Spaeth (1923) synonymized *D. pugnax* with *D. nodosa*, and since then the species was considered a synonym. We have examined type of *D. pugnax* and found that it is quite different from *D. nodosa* and rather similar to *D. monoceros*. Therefore, it is removed from synonymy with *D. nodosa* (see remarks under *D. pugnax*). Published records of *D. nodosa* (*i.e.*, Champion 1893; Chaboo 2002) quite likely belong to other species, therefore we retain only Colombia in the distribution of *D. nodosa*.

Distribution. Colombia (Boheman 1854).

Dorynota (*Dorynota*) *ohausi* (Spaeth, 1916)
(Figs. 26–27, 45)

Batonota Ohausi Spaeth, 1916: 284 (type locality: 'Ecuador').

Type Material Examined. Syntype, pinned: 'Ecuador | Buckley [w, hw, cb, circular label] || Ohausi [hw] | m. Typus [hw] | Spaeth det. [w, p, cb, Spaeth's hw] || coll. Baly [w, p, cb] || TYPE [r, p, cb] || M/CR MUS | SPAETH COLL. [w, p, cb] || Manchester Museum | SYNTYPE [b, p, cb]' (MMUE).

Additional Material Examined (4). ECUADOR: Loja: without additional locality data, A. Gaujon lgt. (1 specimen, LSC; 3 specimens, MNHN).

Diagnosis. *Dorynota ohausi* can be easily separated from other species by the regularly convex humeral angles which lack a carina. The only other species with this character is *D. monneorum*, but it differs from *D. ohausi* in the escutcheon body shape and black-patterned dorsum, while *D. ohausi* is uniformly yellow with a subtriangular body.

Remarks. So far, this species has been considered as being described in 1915. However, the description was published in the second issue of 1915 volume of the Stettiner Entomologische Zeitung which was released on 31 March 1916. Therefore, the year of publication must change to 1916.

Distribution. Ecuador (Zamora-Chinchipe) (Borowiec 2002). **New province record** for Ecuador (Loja) (Fig. 45).

Dorynota (*Dorynota*) *parallela* Blanchard, 1846
(Figs. 28–29, 46)

Dorynota parallela Blanchard, 1846: 212 (type locality: 'Guarayos (Bolivia)').

Type Material Examined. Paralectotype (designated by Borowiec 1999), pinned: 'MUSEUM PARIS | BOLIVIE | (CHIQUITOS) | D`Orbigny 1834 [w, p, cb, bb] || 7316 | 34 [circle label] || PARALECTOTYPE | des. L. Borowiec [r, p, cb, bb]' (MNHN).

Additional Material Examined (54). ARGENTINA: Misiones: without additional locality data, V.1955, Dirings lgt. (1 female, MZUSP); **BRAZIL: Bahia:** without additional locality data, G. Bondar lgt. (13 spec. MNRJ, 3 specimens, USNM); **Pará:** Santarém (Santarenzinho, Rio Tapajós), II.1964, Dirings lgt. (26 specimens, MZUSP); **São Paulo:** without additional locality data (1 specimen, DZUP); Vale do Anhangabaú, XI.1924, R. Spitz lgt. (2 specimens, MNRJ); Rio Claro, 13.XI.1980, Alejo Mesa lgt. (1 specimen, MZUSP); **Santa Catarina:** Corupá, XI.1944, J. Guerín lgt. (1 specimen, USNM); **BOLIVIA: Beni:** Reyes, 1–20.XII.1956, L. Peña lgt. (1 specimen, MNRJ); **Santa Cruz:** Chiquitos, Santiago, 730m, XI.2008, W. D. Edmonds & T. Vidaurre (4 specimens, TAMU).

Diagnosis. *Dorynota parallela* can be easily distinguished from other species as having densely punctate intervals of the elytra and rounded humeral angles. *Dorynota pugionata* and *D. hastifera* have acute humeral angles and more sparsely and more finely punctate intervals. *Dorynota aculeata* differs in that it has very finely and sparsely punctate intervals and humeral angles that are not expanded laterally.

Remarks. The species was considered until now as being described in 1837. However, d'Orbigny's voyage was published in many separate issues, and the volume containing a greater part of the beetles (including the subfamily Cassidinae) was published as late as 1846 (Sherborn and Woodward 1901), thus the year of publication must be revised to reflect this.

Boheman (1854) redescribed the species, with further details of body color and elytral and pronotal shape and punctuation, and transferred it to the genus *Batonota* Hope, 1840. Monrós and Viana (1949) revised the Argentine species of Dorynotini and transferred *Batonota parallela* (Blanchard) to a newly formed genus, *Paranota* Monrós and Viana, 1949. Recently, Simões (2014) revised the genus *Paranota* and transferred *P. parallela* back to *Dorynota* (*s. str.*) on the basis of the structure of the anterior margin of the pronotum, scutellum, tarsal claws, and male terminalia.

Spaeth (1914) recorded the species from Ecuador, and Borowiec (1996) reported it from French Guiana. However, both records must be considered as erroneous. The first one was published by Spaeth (1914) in the *Coleopterorum Catalogus* where he cited Ecuador as part the species' distribution and since then it was followed. It is questionable whether Spaeth had seen some specimen(s) from Ecuador (there are none in his collection), or perhaps the record is the result of an error. Borowiec (1998) considered the record an error as well. Borowiec (1996) recorded the species as new to French Guiana, based on old specimens from Bas Maroni. However, these specimens were most likely mislabeled, as pointed out later by Borowiec and Moragues (2005).

Distribution. Brazil (Goiás, Mato Grosso, Minas Gerais, Rio de Janeiro); Bolivia (Santa Cruz); Peru (Vilcanota); Paraguay (Asunción, Concepción) (Borowiec and Świętojańska 2014). **New country record** for Argentina (Misiones), four **new state records** for Brazil (Pará, Bahia, São Paulo, Santa Catarina), and **new department record** for Bolivia (Beni) (Fig. 46).

Dorynota (*Dorynota*) *pugionata* (Germar, 1824)

(Figs. 30–31, 46)

Cassida pugionata Germar, 1824: 537 (type locality: 'Brasilia').

Batonota Ballista Boheman, 1854: 157 (type locality: 'Brasilia'); Spaeth, 1914: 66 (synonym).

Type Material Examined. Lectotype (designated by Borowiec 1999), pinned: '14261 [w, p, s] ‖ LECTOTYPE | des. L. Borowiec [r, p, cb] ‖ pugionata / Boh.* / S. Joao d. R. Sello. [g, hw, cb, bb]' (ZMHB); five paralectotypes without labels but according to the register coming from the same series as the lectotype, pinned (ZMHB). All specimens were provided with an additional label: 'LECTOTYPUS [or PARALECTOTYPUS] | Cassida | pugionata | Germar, 1824 | L. Borowiec des. [r, p, cb, bb]'. *Batonota ballista*: lectotype (designated by Borowiec (1999)), pinned: 'Brasil. [w, p, cb] ‖ M. Berl [w, p, cb] ‖ Type. [w, p, cb] ‖ Ballista Bhn. [w, hw, s, Boheman's hw] ‖ LECTOTYPE | des. L. Borowiec [r, p, cb] ‖ NHRS-SRAH | 000000105 [w, p, cb]' (SMNH).

Additional Material Examined (5). BRAZIL: Pará: Cachimbo, 1890, Ch. Pujol lgt. (1 specimen, MNHN); **BOLIVIA: Santa Cruz:** Chiquitos, 1834, d'Orbigny lgt. (2 specimens, MNHN); **PARAGUAY: Asunción:** without additional locality data (1 specimen, ZMHB); **Paraguarí:** 'Paraguari' (1 specimen, MMUE).

Diagnosis. *Dorynota pugionata* is characterized by the following combination of characters: elytral intervals punctate; humeral angles acuminate; and elytra smooth, without ribs. *Dorynota aculeata* and *D. parallela* differ in their rounded humeral angles and the elytra with at least partly elevated intervals. The most similar species is *D. hastifera*, which differs by its less coarsely punctate intervals, a much narrower explanate margin of the elytra, and a dorsum which is mostly pale, with only the humeral carina being black.

Remarks. Boheman (1854) described *B. ballista* from an unknown number of specimens. However, he mentioned a length span and two depositories: 'Mus. Reg. Holm. A Dom. Germar ad conferendum etiam misa'. Borowiec (1999) designated the lectotype from a specimen Boheman obtained from Germar and a paralectotype from a second specimen, originally from Stål. In our opinion, the second specimen is not part of the type series, since Boheman did not mention Stål among depositories nor was Stål mentioned as a collector/depository in any of the species described in the *Monographia Cassididarum*. The specimen was most likely collected by J. W. Stål in southern Brazil and was certainly received after publishing the description. Therefore, we remove the specimen from the type series.

The MMUE specimen from Paraguay is quite likely the one published by Spaeth (1923) as a first record for this country, but without specified locality data.

Distribution. Argentina (Misiones), Brazil (Bahia, Espírito Santo, Goiás, Mato Grosso, Minas Gerais, Paraná, Rio Grande do Sul, Rio de Janeiro, São Paulo, Santa Catarina); Paraguay (Concepción, Presidente Hayes) (Borowiec and Świętojańska 2014). **New country record** for Bolivia, **new state record** in Brazil (Pará), and two **new province records** in Paraguay (Asunción, Paraguarí) (Fig. 46).

***Dorynota* (*Dorynota*) *pugnax* (Boheman, 1854), restored status**

(Figs. 32–33, 46)

Batonota pugnax Boheman, 1854: 161 (type locality: 'Columbia').

Type Material Examined. Holotype, pinned: 'E. Coll. | Chevt. [w, p, cb] || Type [w, p, s circle label with red frame] || 44 [g, p, s] || Batonota | pugionata | Bhn | Columbia [w, s hw by Chevrolat] || 67·56 [w, p, sl]' (BMNH).

Additional Material Examined (4). COLOMBIA: 'Columbia', (1 specimen, LSC); **PANAMA: Chiriquí:** 'Chiriqui' (1 specimen, DBET; 1 specimen, MMUE); **VENEZUELA:** 'Venezuela', (1 specimen, BMNH ex coll. J. S. Baly and published by Boheman (1862) as *D. gladiator*).

Diagnosis. See diagnosis under *D. monoceros* and Table 2.

Remarks. Boheman (1854) did not state the precise number of specimens. However, he mentioned 'Mus. Dom. Chevrolat' as the depository and gave single length and width measurements. In such cases, Boheman always had a single specimen, and because there is only a single specimen in the Chevrolat collection, we consider it the holotype.

The species was synonymized with *D. nodosa* by Spaeth (1923) based on the primary description. However, examination of the type revealed that this species is actually morphologically close to *D. monoceros* and not to *D. nodosa*. The latter distinctly differs in that it has a very short dorsal spine, which is barely longer than the width of its base, and the elytra are strongly emarginate and more protruding behind the humeral angles. Therefore, we restore *D. pugnax* to species status. It can be separated from *D. monoceros* by its shorter elytral spine, less dense and finer punctation on the elytra, and the elytra with mostly distinct intervals, while *D. monoceros* has very coarse and dense elytral punctation with very narrow intervals and punctures nearly touching each other.

The species is also probably found in Venezuela as the specimen reported by Boheman (1862) under *D. gladiator* and cited here most likely belongs to *D. pugnax*.

Distribution. Colombia (Boheman 1854), Venezuela [?] (Boheman 1862). **New country record** for Panama (Fig. 46).

***Dorynota* (*Dorynota*) *rileyi* Borowiec, 1994**

(Figs. 34–35, 46)

Dorynota rileyi Borowiec, 1994: 161 (type locality: 'Parag.[uay] Central: Asuncion').

Type Material Examined. Paratype, pinned: 'PARAG: CENTRAL | Asuncion, Jardin | Botanico: II-6-| 83: E.G.Riley [w, p, cb] || PARATYPTE | des. L. Borowiec [r, p, cb] || Dorynota | rileyi n. sp. | L. Borowiec, 1994 [w, p, cb, bb]' (DBET).

Additional Material Examined (1). BOLIVIA: Santa Cruz: Potrerillo del Guenda, 17°40.3′S, 63°27.4′W, 22.IX–12.XII.2005, B. K. Dozier lgt. (1 specimen, LSC).

Diagnosis. This is a well-characterized species and one of three species with a maculate explanate elytral margin. *Dorynota monoceros* has spots on the underside of the explanate margin, while the other two species have them on the upper surface. *Dorynota monneorum* differs in the escutcheon body shape and absence of a humeral carina. Externally, *D. rileyi* is also similar to *D. wappesi*, which differs in having the explanate elytral margin uniformly yellow. For further comparison of character states, see the diagnosis for *D. wappesi* and Table 1.

Distribution. Paraguay (Asunción) (Borowiec 1994). **New country record** for Bolivia (Fig. 46).

***Dorynota* (*Dorynota*) *rufomarginata* (Wagener, 1881)**

(Figs. 36–38)

Batonota rufomarginata Wagener, 1881: 41 (type locality: 'Brasilia').

Type Material Examined. Holotype, pinned: 'Brasil [w, hw, cb] || rufomargin. [hw] | coll. Wagener | Typus ! [hw] [w, p, cb] || TYPUS [pink, p, cb] || M/ CR MUS. | SPAETH COLL. [w, p, cb] || Manchester Museum | SYNTYPE [b, p, cb] || F2019.2722 [w, p, cb]' (MMUE).

Diagnosis. See diagnosis under *D. nodosa*.

Remarks. This species is very close to *D. nodosa* and perhaps representative of just a local form. Unfortunately, both species are known only from the types, thus it is very difficult to evaluate them. Until we have an opportunity to study more material, we will leave *D. rufomarginata* as a valid species close to *D. nodosa*. It is also uncertain whether the specimen was actually collected in Brazil or was mislabeled.

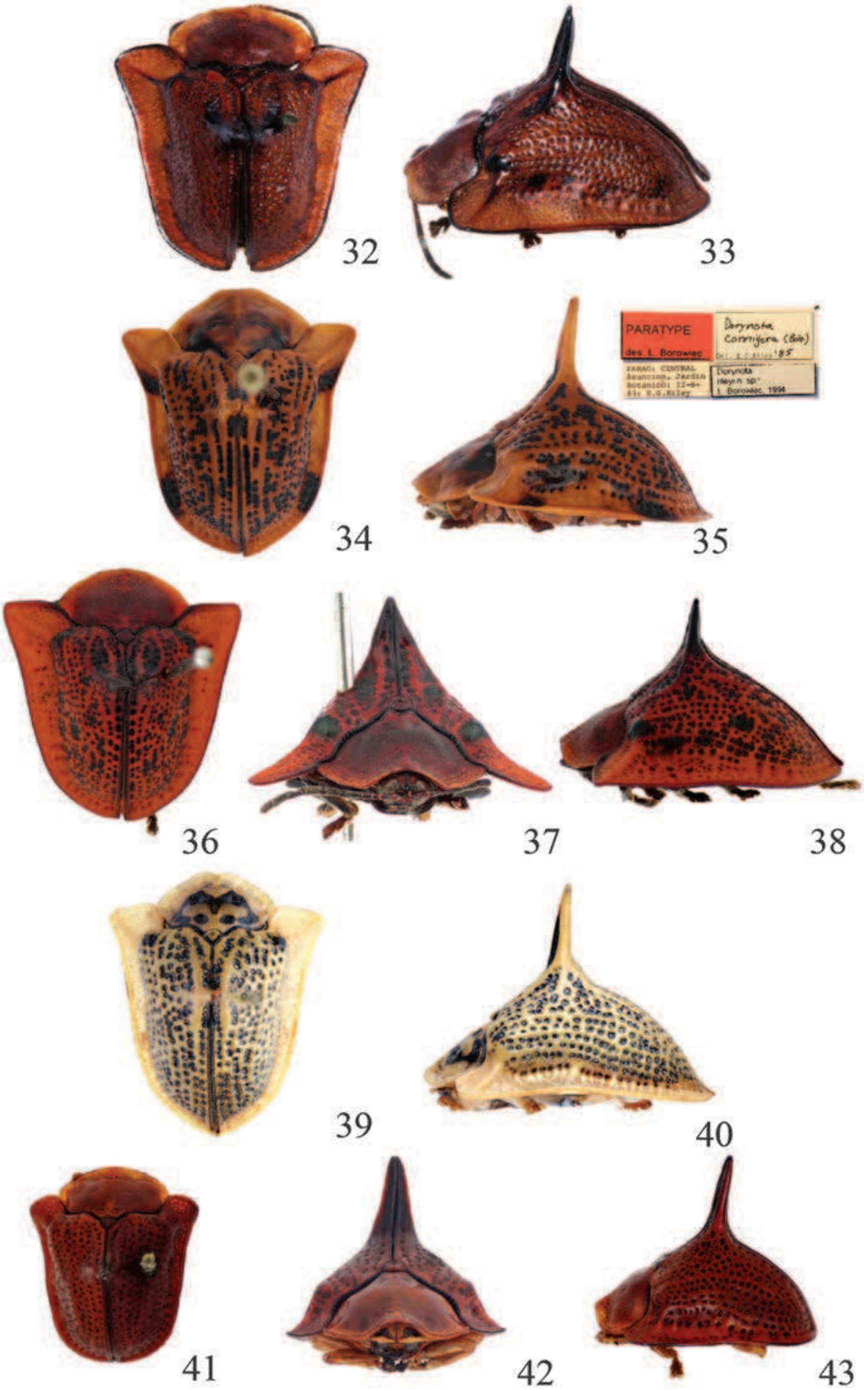
Distribution. Brazil (Wagener 1881).

***Dorynota* (*Dorynota*) *wappesi* Sekerka and Simões, new species**

(Figs. 39–40, 46)

Type Locality. Bolivia, Santa Cruz Department, Florida Province, road to Amboró National Park above Achira, 18°07.43′ S, 63°47.98′ W, 1940 m.

Type Material. Holotype: 'BOLIVIA Santa Cruz dpt. | Florida pr. 1940 m | Rd. to Amboro



Figs. 32–43. *Dorynota* (*s. str.*) species. **32)** *D. pugnax*, holotype, dorsal view; **33)** *D. pugnax*, lateral view; **34)** *D. rileyi*, paratype, dorsal view; **35)** *D. rileyi*, lateral view and labels; **36)** *D. rufomarginata*, holotype, dorsal view; **37)** *D. rufomarginata*, frontal view; **38)** *D. rufomarginata*, lateral view; **39)** *D. wappesi*, holotype, dorsal view; **40)** *D. wappesi*, lateral view; **41)** *D. yucatana*, syntype, dorsal view; **42)** *D. yucatana*, frontal view; **43)** *D. yucatana*, lateral view.

Fig. 44. Geographic distribution of five *Dorynota* (*s. str.*) species.

above Achira | 14–15.x.2006 (cut/burn area) | 18°07.43′S, 63°47.98′W | Wappes, Nearns & Eya lgt. [w, p, cb]' (LSC). Specimen provided with additional label: 'HOLOTYPUS | Dorynota (s. str.) | wappesi sp. nov. | L. Sekerka & | M. Simões des. 2014 [r, p, cb]'.

Diagnosis. *Dorynota wappesi* belongs to a group of species characterized by impunctate elytral intervals, a pronotum which is at most finely punctate, a long postscutellar elytral spine, humeral angles with a costa and moderately expanded laterally, and a rather narrow explanate elytral margin. The group is comprised of *D. aurita* and *D. rileyi*. *Dorynota aurita* differs in that it has a U-shaped body and a strongly elevated humeral carina, while *D. wappesi* has an elongate-triangular body and a low humeral carina. *Dorynota rileyi* has a similar body shape and form of the humeri, but differs in that the explanate elytral margin is maculate, the antennae are uniformly yellow with only the terminal antennomeres slightly infuscate, the prosternal process is much more widened apically, and the scutellum is regularly rhomboidal, while *D. wappesi* has an immaculate explanate

Fig. 45. Geographic distribution of five *Dorynota* (*s. str.*) species.

elytral margin, seven distal antennomeres infuscated, the prosternal process weakly widened apically, and the scutellum subrhomboidal with a convex anterior margin. For the main diagnostic characters to distinguish *D. wappesi* from other related species, see Table 1.

Description. Measurements ($n = 1$): Body length 11.5 mm, body width 7.5 mm, body length/width ratio 1.5, pronotal length 2.5 mm, pronotal width 5.3 mm, pronotal width/length ratio: 2.2. Body elongate-triangular, regularly converging from base to apex. Integument shiny, disc of elytra and pronotum opaque with transparent explanate margins; pronotum and elytral disc with short, sparse, yellow setae, denser ventrally. Ground color of dorsum yellow; pronotum with M-shaped spot on disc (Fig. 37) and basal margin black; elytral punctures with black fovea, suture and humeral calli black, explanate margin uniformly yellow, only apex somewhat darkened ventrally (Fig. 38); 3 basal antennomeres yellow, remainder infuscate brownish black; ventral side yellow with basal margin of abdomen, posterior half of metathorax, and areas around coxae black.

Fig. 46. Geographic distribution of seven *Dorynota* (*s. str.*) species.

Antennae with 5 basal antennomeres glabrous, 6 distal antennomeres densely setose; scape ca. 3X longer than pedicel, tapered towards apex. Length ratio of antennomeres: 100:33:27:47: 60:67:67:53:67:63:100. Pronotum semicircular, with maximum width approximately in the middle, disc finely and sparsely punctate, except anterior half with coarse punctures; anterior margin strongly emarginate but this could be an artifact due to inadequate emergence from the pupa as seen in other *Dorynota* species; lateral margins rounded and convex; posterior angles truncate. Explanate pronotal margin moderately broad, smooth, shiny, sparsely punctate, transparent and with honey-comb structure. Prosternum with prosternal collar projecting anteriorly, not covering mouthparts; process flat, weakly constricted and with short, rhomboidal apex, surface smooth, shiny, and sparsely pubescent with long setae. Scutellum subrhomboidal, impunctate, smooth and shiny, with convex anterior margin. Elytra strongly convex and projecting in sharp postscutellar spine. Dorsal spine 3.5 mm long, 2X longer than its base and 1.4X longer than height of elytra. Base of elytra much wider than base of pronotum, strongly emarginated due to projecting humeral angles; basal margin serrate in emargination, denticles obtuse and swollen. Humeral angles strongly projecting anterad and reaching midlength of pronotum, with oblique carina extending from humeral callus to outer corner, truncate anterior margin, obtuse corners, outer corners slightly expanded laterally and situated slightly posteriorly to inner ones. Disc coarsely and partly irregularly punctate, sutural and 5 lateral intervals regular; intervals distinct, mostly narrower than puncture diameter, only 2nd interval slightly wider than puncture diameter, smooth, shiny, impunctate, and sparsely pubesent with extremely short and barely visible adherent setae. Punctures deeply impressed, foveolate, fovea micro-reticulate thus semiopaque. Due to strongly impressed punctures, intervals appear to form low ribs, particularly 1st behind dorsal spine and 4th and 6th nearly their entire length. Marginal row of punctures distinct in entire length, interrupted twice around midlength, its punctures with smaller diameter than those on disc but more deeply impressed. Ultimate interval slightly wider than remaining lateral ones. Explanate elytral margin converging posterad, smooth, finely and sparsely punctate, micro-reticulate but shiny, its outer margin swollen thus appearing slightly canaliculate.

Distribution. Bolivia (Santa Cruz) (Fig. 46).

Etymology. The species is named in honor of the collector of the holotype, Jim Wappes (San Antonio, Texas), friend and a specialist in Bolivian Cerambycidae.

Dorynota (*Dorynota*) *yucatana* (Champion, 1893)
(Figs. 41–43, 46)

Batonota yucatana Champion, 1893: 162 (type locality: 'Mexico, Temax in North Yucatan').

Type Material Examined. Syntype, pinned: 'Temax, | N. Yucatan | Gaumer. [w, p, cb] || Batonota | yucatana, | Champ. [w, hw, cb, G. C. Champion's hw] || Sp. figured. [w, p, cb] || Godman-Salvin | Coll., Biol. | Centr.-Amer. [w, p, cb]' (BMNH); six syntypes, pinned: 'Temax, | N. Yucatan | Gaumer. [w, p, cb] || Batonota | yucatana, | Ch. [w, hw, cb, Champion's hw] || Godman-Salvin | Coll., Biol. | Centr.-Amer. [w, p, cb]' (BMNH); three syntypes, pinned: 'Temax, | N. Yucatan | Gaumer. [w, p, cb] || Godman-Salvin | Coll., Biol. | Centr.-Amer. [w, p, cb]' (BMNH); syntype, pinned: 'Temax, | N. Yucatan. | Gaumer. [w, p, s] || Batonota | yucatana, | Champ [w, Champion hw, cb] || NHRS-JLKB | 000022144 [w, p, cb]' (SMNH).

Additional Material Examined (1). BELIZE: Cayo: without additional locality data, B. Davis lgt. (1 specimen, BMNH).

Diagnosis. *Dorynota yucatana* can be readily characterized by its very small body, which is less than 8 mm long, while all other species are at least 11 mm long. Additionally, the pronotum is transverse, much broader than wide and broadly rounded, with laterally projecting humeral angles with high carinae. Champion (1893) mentioned that the punctures of the elytral intervals are visible only under strong lens. We have studied most of the type series, and the intervals are micro-reticulate without distinct punctation.

Remarks. The Belizean specimen mentioned above is the only specimen known to us besides those of the type series. It originally came from the collection of G. C. Champion, however, Champion most likely received it after the completion of the Cassidinae volume in *Biologia Centrali-Americana*, as it was not included there (Champion 1893). It bears an original identification label from Champion, which reads 'Batonota sp.'. In our opinion, the specimen belongs to *D. yucatana* because it is similar in size, shape, and form of the humeri. It differs only in its slightly coarser punctation and darker color. This variation is quite normal for Mesoamerican Cassidinae, as in southern populations there is a gradient towards a more sculptured and darker form.

Distribution. Mexico (Yucatán) (Champion 1893). **New country record** for Belize (Fig. 46).

KEY TO THE SPECIES OF *DORYNOTA S. STR.*

1\. Lateral margins of elytra concave behind humeral angles; dorsal spine in lateral view with at least apical half 2X narrower than basal half, followed by steep, abrupt slope (***Dorynota s. str.***) 2

1′. Lateral margins of elytra straight or convex about midlength; dorsal spine in lateral view with apex not markedly narrower than base, followed by gradual, continuous slope........ .... ***Akantaka*** **Maulik, 1916**

2\. Dorsal spine in frontal view broadly triangular and not projecting from its base with straight lateral margins (Figs. 24, 37) 3

2′. Dorsal spine in frontal view elongate and projecting from its base with sinuous lateral margins at the base (Fig. 42)..................... 4

3\. Body with dark red outline and lateral margins subparallel; elytral disc in lateral view with low elevation under humeral angle and

2 clusters of punctation, medially and close to apical 1/3, markedly darker than rest of disc (Figs. 36–38)....................................
...........***D. rufomarginata*** **(Wagener, 1881)**

3′. Body with black outline and lateral margins slightly sinuous in anterior half; elytral disc with low elevation under humeral angle, with punctation distributed uniformly (Figs. 23–25).....................................
.......................***D. nodosa*** **(Boheman, 1854)**

4. Pronotum densely and coarsely punctate; elytral intervals punctate............................5

4′. Pronotum smooth, impunctate, or with several sparsely arranged punctures; elytral intervals impunctate...................................8

5. Scutellum rhomboidal; dorsum at most with sparse, very short pubescence; South America 6

5′. Scutellum triangular; dorsum usually with long, dense pubescence (Figs. 1–2); endemic to Hispaniola ....
.....................***D. aculeata*** **(Boheman, 1854)**

6. Body appearing strongly triangular, with strongly explanate humeral angles and subacuminate apex of elytra; elytral surface smooth, intervals not elevated; dorsum with black pattern...7

6′. Body nearly oval with weakly explanate humeral angles and rounder elytral apex; elytra appear rugose due to more or less elevated intervals; dorsum reddish brown without black spots (Figs. 28–29).............
....................***D. parallela*** **Blanchard, 1846**

7. Explanate margin of elytra broad; outer margin of elytral suture, oblique ridge from spine to humerus, latero-apical spot, scutellum, and midline of pronotum black; elytral intervals densely and coarsely punctate (Figs. 30–31)...
....................***D. pugionata*** **(Germar, 1824)**

7′. Explanate margin of elytra narrow; black color limited to humeral angles; elytral intervals moderately punctate (Figs. 11–12)
.......................***D. hastifera*** **(Spaeth, 1923)**

8. Dorsum black, with or without metallic tint 9

8′. Dorsum yellow to reddish or brown, but never with metallic tint............................10

9. Dorsum opaque black, sides of pronotum and lateral slope about midlength with more or less visible reddish spot; dorsum densely pubescent with long setae; dorsal spine long, approximately 1.2X shorter than body height (Figs. 5–6)....................***D. bidens*** **(F., 1781)**

9′. Dorsum uniformly black, usually with dark green metallic luster; dorsum covered with short setae, but at first glance appears bare; dorsal spine short, approximately 2X shorter than body height (Figs. 21–22)...................
........................***D. nigra*** **(Boheman, 1856)**

10. Humeral angles without carina................11

10′. Humeral angles with sharp carina...........12

11. Body subtriangular, with rounded apex; dorsum uniformly yellow (Figs. 26–27); endemic to Ecuador....................................
.........................***D. ohausi*** **(Spaeth, 1916)**

11′. Body escutcheon-shaped, with acuminate apex; dorsum with extensive black pattern (Figs. 15–16); Costa Rica (Puntarenas) and Brazil (Amazonas).......................................
.......***D. monneorum*** **Simões and Sekerka, new species**

12. Body large, at least 11 mm long; humeral angles straight, truncate; South American species, but one in Mesoamerica............13

12′. Body small, length <8mm; humeral angles rounded and directed backwards (Figs 41–43); endemic to Yucatán Peninsula in Mexico and Belize........***D. yucatana*** **(Champion, 1893)**

13. Humeral angles broad, moderately protruding laterally (Figs. 3, 34, 39)...................14

13′. Humeral angles very broad, strongly protruding laterally (Figs. 7, 9, 13, 32)........16

14. Dorsum yellow with black pattern; humeral carina low; outer humeral angle obtuse; apex of elytra subangulate; explanate elytral margin moderately broad; Bolivia and Paraguay 15

14′. Dorsum amber-yellow with indistinct yellowish to brownish pattern; humeral carina strongly elevated; outer humeral angle rounded; apex of elytra rounded; explanate elytral margin very narrow (Figs. 3–4); Mesoamerica
..........................***D. aurita*** **(Boheman, 1862)**

15. Explanate elytral margin with transverse black spots; antennae uniformly yellow, only terminal antennomere slightly infuscate; scutellum rhomboidal (Figs. 34–35); lowland species; Bolivia and Paraguay......................
.............................***D. rileyi*** **Borowiec, 1994**

15′. Explanate elytral margin uniformly yellow; antennomeres IV–XI infuscate; scutellum subrhomboidal, with convex anterior margin (Figs. 39–40); montane species; Bolivia.......
................***D. wappesi*** **Sekerka and Simões, new species**

16. Humeral angles rounded; lateral margin of elytra broadly explanate; punctation of

elytra coarse and dense with intervals narrower than puncture diameter; elytra yellowish red to reddish brown, but color always uniform; pronotum same color as elytra and always immaculate.................................... 17

16′. Humeral angles sharply triangular; explanate margin of elytra narrow; punctation of elytra coarse but sparsely arranged with intervals 1–2X wider than puncture diameter; elytra variegated yellowish brown; pronotum usually with black maculation (Figs. 9–10)........ ....***D. cornigera*** **(Boheman, 1854)**

17. Outer margin of elytra black, at least on humeri 18

17′. Explanate margin of elytra uniformly yellow (Figs. 7–8) ....***D. borowieci*** **Simões and Sekerka, new species**

18. Dorsal spine long, at least 2.0X longer than width of its base; punctation of elytra very dense with narrow intervals with punctures nearly touching each other (Figs. 13–14)......... ....***D. monoceros*** **(Germar, 1824)**

18′. Dorsal spine short, approximately 1.0–1.5X longer than width of its base; punctation moderate with distinct intervals at least as wide as puncture diameter (Figs. 32–33) .... ***D. pugnax*** **(Boheman, 1854)**

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