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Taxonomic and nomenclatorial revision within the Neotropical genera of the subtribe Odontocheilina W. Horn in a new sense – 14. *Pentacomia* (*Pentacomia*) *chrysammoides* sp.nov., a new species related to *P.* (*P.*) *chrysamma* (Coleoptera: Cicindelidae)

Jiří Moravec[1] Ronald L. Huber[2] & Charles Dheurle[3]

[1] *Sadová 336/21, 679 04 Adamov 1, Czech Republic; email: jirmor@quick.cz*

[2] *2521 Jones Place West, Bloomington, Minnesota 55431, U.S.A.; email: huber033@umn.edu*

[3] *5 place Jenson, F-52200 Langres; e-mail: charles.dheurle@wanadoo.fr*

Moravec J., Huber R. L. & Dheurle C. 2015: Taxonomic and nomenclatorial revision within the Neotropical genera of the subtribe Odontocheilina W. Horn in a new sense – 14. *Pentacomia* (*Pentacomia*) *chrysammoides* sp.nov., a new species related to *P.* (*P.*) *chrysamma*. (Coleoptera: Cicindelidae). *Acta Musei Moraviae, Scientiae biologicae* (Brno) **100(2):** 217–249. – *Pentacomia* (*Pentacomia*) *chrysammoides* sp.nov. is described as new to science from Bolivia. The new species is closely related to *P.* (*P.*) *chrysamma* Bates, 1872 (the type species of the genus *Pentacomia* Bates, 1872), originally described from Ecuador and commonly considered widespread in the Amazon Basin. After an examination of hundreds of specimens of a great number of populations, the occurrence of the genuine *P.* (*P.*) *chrysamma* with characters comparable with type specimens has been confirmed with certainty in Ecuador and partly in northern and interior Peru, while some populations in central and southern Peru (very rarely also in northern Bolivia) possess inconsistent internal characters. It has appeared that apart from a certain variability, *P.* (*P.*) *chrysamma* exhibits some dimorphism between separated and probably vicariant populations; presumably, their adaptation to different biotopes or under different environmental conditions may result in allopatric, parapatric and sympatric speciation of genetically distinct sister species. The new species described here, despite certain variability, differs from *P.* (*P.*) *chrysamma* in several, both external and internal, diagnostic characters.

Keywords. Coleoptera, Cicindelidae, Odontocheilina, *Pentacomia* taxonomy, nomenclature, new species, Neotropical region

Introduction

This paper is a continuation of the ongoing taxonomic revision of ten Neotropical genera of the subtribe Odontocheilina W. Horn, 1899 (originally spelled "Odontochilina") by the first author. The aim of this series of papers (see Moravec 2012a,b,c, 2013, 2014, 2015; Duran & Moravec 2013; Moravec & Duran 2013; Moravec & Brzoska 2013, 2014a,b,c, 2015; Moravec & Huber 2015) is to publish significant taxonomic and nomenclatorial changes or descriptions of new taxa that will be available before the completion of the final comprehensive publication. The subtribe Odontocheilina is in this series of papers defined exclusively for the Neotropical genera, separated from the subtribe Prothymina W. Horn, 1910 sensu Rivalier (1969, 1971), particularly because of a different chaetotaxy.

The genus *Pentacomi*a Bates, 1892, with type species (by original designation) *Pentacomia chrysamma* Bates, 1872, was last revised by Rivalier (1969). He subdivided

the genus into four subgenera but many of type specimens, namely of taxa described by Walther Horn were not examined by him and some of them even not included in his brief and incomplete revision. The infrageneric subdivision was followed by WIESNER (1992) and other recent authors.

The genus presently comprises approximately 37 taxa currently under review by the first author. Recently ERWIN & PEARSON (2008) addressed 42 taxa (including subspecies). However, the number was considerably changed during the recent revision: one new species was described from Panama (DURAN & MORAVEC 2013), one from Costa Rica (MORAVEC & BRZOSKA 2013), and one from Bolivia (MORAVEC & BRZOSKA 2014a); one species was re-combined back to the genus *Odontocheila* Laporte de Castelnau, 1844 by MORAVEC (2014), and lately the originally subgenus *Mesacanthina* Rivalier, 1967 was separated from *Pentacomia* by MORAVEC & HUBER (2015). It should be noted here that as a result of the present revision, the nominotypical subgenus *Pentacomia* is clearly delimited also from its other subgenera that due to their distinct internal and external diagnostic differences should be classified as separate genera. One of the differences in *Pentacomia* (s. str.) is the shape of the male protarsomeres which only indistinctly differ from those in females. This is in contrast to all other "subgenera" (and genera in the subtribe) where the first three protarsomeres in males are distinctly dilated, while in females are uniformly narrow. This character was already emphasized by HORN (1899) who treated all the species of *Pentacomia* (s. str.) as members of the genus *Pentacomia* which was at that time in his concept separated from other genus-group taxa recently considered subgenera of *Pentacomia*. Together with other differences, we consider the shape of the protarsomeres an important external diagnostic character for the separation of *Pentacomia* not only from *Mesacanthina*, but also from the "subgenera" *Mesochila* Rivalier, 1969 and *Poecilochila* Rivalier, 1969, which also deserve elevation to independent genera. *Beckerium* Horn, 1897 should also be reinstated to its original generic status.

Because of other new taxa and changes which have occurred during the revision, a new, more accurate infrageneric classification with keys to the taxonomic groups and species are being prepared for the concluding publication. Therefore a key to species cannot, at present, be compiled properly and is not included to this paper which is aimed to present two closely related species, one of them *Pentacomia* (*Pentacomia*) *chrysammoides* sp.nov. described here as new to science.

After examination of a great number of specimens of *P.*(*Pentacomia*) *chrysamma*, originally described by BATES (1872) from Ecuador and commonly considered widespread, it has appeared that apart from a certain variability, this species exhibits a considerable dimorphism between populations. Dispersed vicariant populations of *P.* (*P.*) *chrysamma* are either isolated by geological and phytogeographic barriers, or nearly sympatric, but their adaptation to different biotopes and environmental changes may result, under evolutionary forces, in allopatric, parapatric or sympatric speciation of genetically distinct sister species. The occurrence of the genuine *P.* (*P.*) *chrysamma* (comparable with type specimens) has been confirmed with certainty in Ecuador and

northern and interior Peru, while some populations in central and southern Peru towards Bolivia where *P*. (*P*.) *chrysammoides* sp.nov. occurs, exhibit somewhat inconsistent internal characters.

A comprehensive molecular study using new prospective methods and consistent sampling methods may probably better delimit morphologically closely related taxa, but molecular taxonomy could not be included to the present revision. This may be very difficult not only due to the fact that we must face the serious problem of obtaining molecular data from the very old genuine type specimens, but particularly because in order to obtain certainly reliable results, a great number of samples must be sequenced from sympatric and syntopic adults of a great number of populations dispersed throughout the vast occurrence of the closely related taxa. Such comprehensive molecular study, which has never been done and published, appears to be an almost superhuman task, especially due to the rapidly disappearing biotopes with the formerly common taxa.

Notwithstanding, adults of *P.* (*P*.) *chrysammoides* sp.nov. from the type locality in Bolivia, province of Santa Cruz, as well as from other Bolivian localities and one locality in Peru, despite some variability, differs from *P.* (*P*.) *chrysamma* in several external and internal diagnostic characters presented here.

Two other recently described species, *Pentacomia* (*P*.) *vallicola* Huber, 1999 and *P.* (*P*.) *nigrimarginata* Huber, 1999*,* although also closely related to *P.* (*P*.) *chrysamma*, may be distinguished from it and from the new species by a complex of different diagnostic characters emphasized by (Huber 1999) and confirmed by our recent examination (see relevant "Differential diagnosis" below). Nevertheless, some of the external characters of *P.* (*P*.) *vallicola* and *P.* (*P*.) *nigrimarginata*, as well as their aedeagi and internal sacs exhibit a close relationship of all these species, as well as their close relationship with *P.* (*P*.) *egregia* Chaudoir, 1835 and other species of *Pentacomia* s. str.

Material and Methods

Body length is measured without labrum and is the distance from the anterior margin of the clypeus to the elytral apex (including the sutural spine). The width of the pronotum includes the lateral margins of the proepisterna (as both the proepisternal margins and the notopleural sutures are visible from above). The width of the head is measured across the eyes, between their outer margins. The term "aedeagus" here refers to the median lobe of the organ (without parameres). All dimensions of aedeagi are measured (and primarily figured) in their left lateral position where the basal portion (with basal orifice) points to the right and the left lateral outline (with dorsoapical orifice) faces dorsally, provided that the ventral outline of the basomedian portion is settled in a vertical position, and the apex of the aedeagus is perfectly settled in its horizontal position. The treatment and mounting of the aedeagi, in order to observe the structure of the internal sac, followed the usual procedure as modified and in the terms that appear in Moravec (2002, 2010). The position of the aedeagus is also very important for establishing the real shape of the sclerites that make up the structure of the internal sac.

The colour photographs of the habitus and diagnostic characters, including aedeagi, were taken with a Nikon Coolpix 990 digital camera through an MBS-10 stereo microscope by the first author.

The morphological terminology largely follows the Torre-Bueno dictionary (NICHOLS 1989), those describing the surface macro-sculpture are partly after HARRIS (1979), but with many terms proposed by MORAVEC (2002, 2007, 2010).

Labels are cited in the following manner: lines on the same label are separated by a slash /, separate labels are indicated by a double-slash //; each specimen or series of specimens is separated by a full stop. The colour of the label and mode of writing appear in square brackets (in type specimens only, while in other specimens the citation is mostly restricted to locality labels). Words printed on labels in full capital letters are transcribed as normal letters (capitals are used in abbreviations only). It should be noted that the date on certain labels with the name of a museum collection denotes the year in which the specimen became part of the recent collection (e.g. MNHN, BMNH), and not necessarily the year in which it was collected.

The list (catalogue) under the species name in the descriptive part is selective. This means that it gives the original name combination, as well as the first publication of all subsequent taxonomic or nomenclatorial acts concerning the taxon, and of available names only.

The following abbreviations for type status are used in the descriptions and captions below the illustrations: HT = holotype; PT = paratype, AT = allotype; LT = lectotype, PLT = paralectotype.

Abbreviations for the collections:

ASUT . . . . . Arizona State University, Tempe, U.S.A.
BBFM . . . . . Collection Boris Bubeník, Frýdek Místek, Czech Republic
BMNH . . . . . Natural History Museum London, U.K.
CCJM . . . . . Collection Cicindelidae, Adamov, Czech Republic
CDCL . . . . . Collection Charles Dheurle, Langres, France
CJVB . . . . . Collection Jan Vybíral, Židlochovice (u Brna), Czech Republic
CMNH . . . . . Carnegie Museum of Natural History, Pittsburgh, U.S.A.
COSJ . . . . . Collection Ondřej Šafránek, Jiřetín pod Jedlovou, Czech Republic
CPVP . . . . . Collection Petr Votruba, Praha, Czech Republic
CSZU . . . . . Collection Sághy Zsolt, Vezsprém, Hungary
DBCN . . . . . Insect Collection of David W. Brzoska, Naples, Florida, U.S.A.
IRSNB . . . . . Institut Royal des Sciences Naturelles de Belgique, Brussels, Belgium
JWCW . . . . . Collection Jürgen Wiesner, Wolfsburg, Germany
KCBC . . . . . Collection Arnošt Kudrna, České Budějovice, Czech Republic
MFNB . . . . . Museum für Naturkunde der Humboldt-Universität, Berlin, Germany
MGKC . . . . . Michael G. Kippenhan Collection, Portland, Oregon, U.S.A.
MHCW . . . . . Collection Michio Hori, Wakayama, Japan
MNHN . . . . . Muséum national d'Histoire naturelle, Paris, France
MZMB . . . . . Entomology Department of the Moravian Museum, Brno, Czech Republic
NHMK . . . . . Natural History Museum, University of Kansas, Lawrence, Kansas U.S.A.
NHMW . . . . . Naturhistorisches Museum Wien, Vienna, Austria
NMPC . . . . . National Museum (Entomological Department), Prague, Czech Republic
RLHC . . . . . Collection Ronald L. Huber, Bloomington, Minnesota, U.S.A.
SDEI . . . . . Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany
USNM . . . . . Smithsonian Institution, Entomology, Washington DC, U.S.A.

Taxonomy

Pentacomia (*Pentacomia*) *chrysamma* Bates, 1872 (Figs 1–51)

Pentacomia chrysamma Bates, 1872: 266.
Odontochila chrysamma: Fleutiaux 1892: 125.
Pentacomia chrysamma: Horn 1899: 44; 1905: 16.
Cicindela chrysamma: Horn 1915: 401.
Cicindela (*Pentacomia*) *chrysamma*: Horn 1931: 30.
Phyllodroma (*Pentacomia*) *chrysamma*: Schilder 1953: 545.
Pentacomia (*Pentacomia*) *chrysamma*: Rivalier 1969: 230, 231, fig. 22, fig. 23.

Type locality. Ecuador: "Macas district".

Type material. Lectotype ♂ (designated here) in BMNH, labelled: "Ecuador / Macas: [handwritten] // "Buckley" [handwritten] // "41855" [handwritten] // "♂" [handwritten] // "Pentacomia Bat. / chrysamma Bat." [handwritten] // "Fry Coll. / 1905-100" // "Lectotype / Pentacomia / chrysamma Bates, 1872 / design. Jiří Moravec 2012" [red, printed]. Paralectotypes. 1 ♂ in MNHN: "Macas / Ecuador" [handwritten] // "Ex Musćo / H.W. Bates / 1892" [printed] // "Muséum Paris / 1952 / Coll R. Oberthür" [greenish. printed] // "Pentacomia / chrysamma / Bates" [handwritten] // "1595 / Rivalier" [handwritten, referring to the aedeagus mounted by Rivalier]. 1 ♀ in MNHN with same first two labels and: "Chrysamma /Bates" [handwritten]. Booth paralectotypes labelled: "Revision Jiří Moravec 2014: / Paralectotype / Pentacomia / chrysamma Bates, 1872". [red, printed].
Other material examined. Historical data. 1 ♀ in MNHN: "Pérou / Staudinger". 1 ♂, 4 ♀♀ in SDEI: "Staudinger / Marcapata". 1 ♂, 1 ♀ in BMNH: "Peru/ S. America / ex Staudinger". 1 ♀ in SDEI: "Archidona / Ecuador". 1 ♂ in BMNH: "Ecuador" // "Pentacomia / chrysamma / Bt. t. Horn" // "F. bates Coll. / 1911-248". 1 ♀ in SDEI: "Equateur / Loja". 2 ♀♀ in MNHN: Pebas / Amazones". 1 ♀ in MNHN: "Iquitos / Amazones". 1 ♀ in MNHN: "Amazonas / Tarapoto". 1 ♂ in NHMW, 1 ♀ in SDEI, 1 ♀ in MFNB: "Peru / Rio Toro". Other data. 1 ♀ in BMNH: "Ecuador, Morona / Santiago, Cord de / Cutucu / 6km r of Macas / 1,100m, 18.vii.1984 / M. Cooper / BMNH (E)2004-275". 1 ♀ in BMNH: "Ecuador, Morona / Santiago, Rio Upano / 6 km east of Sucua / 750 m, 16.VII.1984 / M. Cooper". 1 ♂, 1 ♀ in DBCN: "Ecuador – Morona / Santiago Puyo Macas / Rd. 950 m 13.2 km SW / Pastaza (logging road) / D. Brzoska 26-IX-1995". 1 ♂ in DBCN, 2 ♂♂, 1 ♀ in CCJM: "Ecuador – Pastaza / Puyo Macas / Rd. 995 m / 53–59 km S – Puyo / (forest trail) / D. Brzoska 24-IX-1995". 1 ♂, 1 ♀ in DBCN: "Ecuador: Morona / Santiago, 5.2 km S Patuca / 02°46′6.8″S / 78°15′00″W / D. Brzoska 23-X-1997". 1 ♂ in DBCN, 3 ♂♂ in CCJM: "Ecuador Mor. Sant. / 2 km S Patuca, 800 m / D. Brzoska 17-IX-1996". 1 ♀ in DBCN: "Ecuador: Morona / Santiago 11 km NW / Sucus (S Macas) / (rocky stream) 1200 m / D. Brzoska 25-IX-1995". 1 ♂, 1 ♀ in CCJM (ex DBCN): "Ecuador – Pastaza / 25.6 km ENE – 10 de / Agosto (E – Puyo) 01°23′5.8″S / 77°42.7′W / D. Brzoska 23-X-1998". 02°46′6.8″S / 78°15′00″W / D. Brzoska 23-X-1997". 1 ♂ [green coloured] in CMNH: "Ecuador: Pastaza / 44 km S Puyo / 21.VI.1997 / W. E. Steiner". 1 ♂ in USNM: "Ecuador, Pastaza / Prov. Puyo (44 / km. S) 21.V.1997 / DL & SS Vincent". 1 ♀ in USNM: "Ecuad. Napo- / Pastaza / Pambay". 2 ♂♂ in JWCW: "Ecuador, Prov. Napo / Lago Agrio, VII.1976". 1 ♀ in JWCW: "Equateur / Lago Agrios / VII.1978, Ph. Genty leg.". 2 ♀♀ in CMNH: " Ecuador: Napo / 17 km SW Tena / 28.V.1997 / W. E. Steiner". 1 ♀ in BMNH: "Ecuador Napo / 10 km S.W. of Tena (Talag, 500 m) / 14.IV.1981 / M. Cooper". 1 ♀ in KCBC: "Ecuador Napo / Rio Hollin, 6.XII.2009 / Narupa – Loreto Rd. / 0°43′04″S, 77°38′19″W / L. Sekerka leg". 1 ♂ in CPVP: "Ecuador 14–19.I.2000 / Prov. Zamora Chinchipe / NP. Podocarpos / Zamora / lgt. Mráček". 1 ♂, 1 ♀ in CJVB: "Ecuador 16–19.XII.2000 / Prov. Zamora / NP. Podocarpos / Zamora / leg Mráček". 1 ♂, 1 ♀ in CCJM, 1 ♂ in CJVB: "Ecuador 1.–2.II.2000 / Provincia Napo / San Ramon / (Rio Napo) / lgt. Mráček". 1 ♂ in CCJM: "Ecuador – Zamora Chinchipe / Podocarpos NP. 1000 m / 17–19.I.200 /R. Veigler leg.". 1 ♂, 2 ♀♀ in CCJM: "Ecuador Tarapoa Reg. Amazon. / 14.I.1999 leg. Mráček". 1 ♂ in DBCN, 1 ♂ in CCJM: "Ecuador – Sucumbios / 24 km W & SW Dureno / 00°02.2′N; 76°49.5′W / D. Brzoska 16-IX-1998". 1 ♂ in CPVP: "Ecuador 4.–8.XII.2004 / Prov. Sucumbios, Shushufindi / (S 0°11′, W 76°38′/ 200–400 m Petr Baňař lgt.". 1 ♀ in CPVP: "Ecuador / Shushufindi 5.–7.XII.2004 / Prov. Sucumbios / lgt. Mráček". 1 ♀ in CCJM: "Ecuador Provincia Sucumbios / El Reventador / 3.II.2000 leg. Mráček". 2 ♂♂ in CDCL: " Equateur, Sucumbios / Shushufindi, VI.1996 / Coll. Dheurle". 1 ♀in CCJM: "Ecuador – Sucumbios / Pto. El Carmen Rd./ 30 km W Pto. El Carmen / 00°07.4′N, 76°04.9′W / D. Brzoska 17-X-1998". 1 ♂ in CJVB: "Ecuador Suc. / Shushufindi / 4.X.1997 / F. T. Hovore coll". 1 ♂ in DBCN:

"Ecuador: Napo Pr. / 21–25 km E Atahualpa / 1–6.X.1997 / F. T. Hovore coll". 1 ♂ in CCJM, 1 ♂, 1 ♀ in CJVB: "Ecuador Prov. Pastaza / 25–28.I.1999 leg. Mráček". 1 ♂ in CCJM: "Ecuador Provincia Napo / Baeza / 3–4.II.2000 leg. Mráček". 1 ♂ in CCJM: "Rio Napo / 23.I.1995 leg. Mráček". 1 ♂ in DBCN: "Ecuador – Sucumbios / Baeza-L. Agno Rd. 865 m / 10 km SW A-Lumbaque / (clay embankment) / D. Brzoska 19-IX-1995". 1 ♂ in DBCN, 1 ♂ in CCJM (ex DBCN): "Ecuador – Zamora / Chinchipe, 1260 m / Zamora – Romerillos Rd. / 7.7 km N Romerillos / D. Brzoska 19-III-1996". 1 ♂ in DBCN, 1 ♀ in CCJM: "Ecuador: Napo, 445 m / Loreto, Coca Rd. / 20 km W Coca / (forest trail) / D. Brzoska 20-IX-1995". 1 ♂ in DBCN: "Ecuador: Napo, 750 m / Loreto, Coca Rd. / 75 km E Tena Rd. / (red clay trail) / D. Brzoska 21-IX-1995". 1 ♂ in CMNH: "Ecuador: Napo / Limoncocha / 10.VI.1997 / W. E. Steiner". 1 ♂ in CCJM, 1 ♀ in COSJ: "Ecuador / 30.XI–3.XII.2004 / Prov. Napo, Loreto / (S 0°42′, W 77°19′) / 200–600 m Petr Bařař lgt.". 1 ♀ in CMNH: "Peru: Loreto Prov. / Explornapo Camp, ca / 100 mi. NE Iquitos / 30-VI – 2-VII-1990 / Sid. Dunkle". 2 ♀♀ in USNM: "Peru: dept Loreto, / Explornapo Camp on Rio / Sucusari, 2 km upstream / from Rio Napo (160 km NE / Iquitos, VI-24/VII-20 1990 / Menke & Awertschenko". 1 ♂ in CCJM (ex DBCN): "Peru: Loreto / Explornapo Camp / Aceer, Rio Sucusari / D. Brzoska 17-IV-1995". 15 ♂♂, 12 ♀♀ in DBCB, 3 ♂♂, 3 ♀♀in CCJM, 3 ♂♂, 4 ♀♀ in: CJVB: "Peru: Pasco, 1100 m / Oxapampa – Pozuzo / S. Pozuzo / 10°08.3′S;75°32.5′W / D. Brzoska 19-X-1999". 2 ♂♂, 2 ♀♀ in CMNH: "Peru: Cuzco / Quince Mil / 27.I.1997 / W. E. Steiner". 3 ♂♂, 1 ♀ in SDEI: "Pozuzo". 3 ♂♂, 2 ♀♀ in DBCN: "Peru: Huanuco, 800 m / Tingo Maria – Monzon Rd. / (S – Aqua Blanca) / 9°17.5′S;76°04.8′W / D. Brzoska 12-X-1999". 1 ♀ in CSZU: Peru: Villa Roca / S 10°52.184; W 750°16.563, 759 m / rain forest, from plants / leg. Sághy Zsolt". 1 ♀ in IRSNB: "Peru". 1 ♀ in IRSNB, 2 ♀♀ in NMPC: "Marcapata / Peru".1 ♀ in CMNH: "Peru: Loreto Napa[Napo?] R. / 3°14′S, 72°38′W / 10-I-1981" // "S.J. Rockey & R. / P. Withrow Coll.". 1 ♂ in USNM: "Peru: Madre de Dios / Manu/Pakitza / 13.X.1989 / T. L. Erwin". 2 ♂♂, 3 ♀♀ in DBCN, 1 ♂ in CCJM: "Peru – Madre de Dios / Manu Res. Zone – Pakitza B.S / Cana Brava Quebrada 320 m / 11°56.5′S; 17°16.7′W / D. Brzoska 15-X-2000". 2 ♂♂, 2 ♀♀ in DBCN: "Peru – Madre de Dios / Manu Res. Zone / Pakitza B.S 320 m / 11°56.7′S; 71°17.0′W / D. Brzoska 15-X-2000". 1 ♂, 1 ♀ in DBCN: "Peru – Madre de Dios / Manu Res. Zone 310 m / Cocha Pachita Trail / 12°01.0′S, 71°17.0′W / D. Brzoska 21-X-2000". 1 ♀ in DBCN: "Peru – Dept. Cusco / 15 km NE Cock of the / Rock Lodge / (NE Paucartambo), 1030 m / 13°01.6′S, 71°30.0′W / D. Brzoska 8-XI-2007". 1 ♀ in USNM: "Colombia: Caqueta / Morelia, Rio / Bodoquero 430 m / 19–20-I-69 / Duckworth & Dietz". 1 ♂ in BMNH: "Colombia: / Caqueta / Florencia 480 m / 31.X.–5.XI.1971 / M. Cooper / BM. 1972-255". 1 ♀ in CMNH: "Villavicencio, / Meta, Colombia".

Specimens cf. *P. chrysamma*: 3 ♀♀ in USNM: "Yahuarmayo" / 10.II.10 Peru". 1 ♂ in SDEI: "Chanchamayo / Rolle". 1 ♂ in MFNB, 1 ♂ in SDEI, 1 ♀ in NHMW: "Rio Oxabamba / La Merced Chanchamayo" // same det label. 1 ♀ [green-blue] in USNM: "Tingo Maria / Huanuco" // "Peru XII. 1937 / Woytkowski". 1 ♂ in JWCW: "Peru / Tingo Maria / Huanuco, XII.1989". 1 ♀ in USNM: ibid., except for: "VII.1937". 1 ♂, 1 ♀ in COSJ: "Peru – Huánuco / Puerto Inca env. / 20.XI.2001 / O. Šafránek lgt.". 2 ♂♂, 2 ♀♀ in BMNH: "Palcaga [illegible] / Peru". 2 ♂♂, 1 ♀ in BMNH: "Yungas / de La Paz / Boliv.: 1000". 1 ♀ [greenish] in MFNB: "Bolivia / Yungas de La Paz / Heyne". 2 ♂♂, 1 ♀ [greenish] in MFNB: "Bolivia / Yungas de La Paz". 1 ♂, 4 ♀♀ in CDCL: "Santipo Junin / Rio Tambo / Coll. Dheurle" // Mars 2010 / Patric Demez leg.". 1 ♂ in COSJ: "Patria: / Verosimiliter / Brazil / F. Cassola, 1994" [mislabelled?].

Redescription. Body (Figs 1–5) small to medium sized, 8.50–10.1 (LT 9.10) mm long, 2.50–3.30 (LT 2.90) mm wide, dorsal surface of head, pronotum and elytra mostly dark cupreous with bronze or reddish lustre, to dark cupreous with green or olivaceous lustre, rarely black-copper or bright green to green-blue.

Head (Figs 17–18) large with big eyes, but slightly or more distinctly narrower than body and notably wider than pronotum, 2.40–2.70 mm wide; all head portions glabrous.

Frons moderately to distinctly convex in middle when sloping towards clearly separated clypeus, very finely longitudinally parallel-striate, striae more distinct on lateral areas; posteromedian area passing to vertex over blunt frons-vertex fold finely transverse-wavy to vermicular rugulose; supraantennal plates irregularly triangular, smooth and shiny with green, golden or blue lustre, their blunt apices usually moderately raised, forming indistinct lateral edges.

Vertex almost flat, slightly convex on anteromedian area and with indistinct posteromedian impression; restricted anteromedian area irregularly finely vermicular-rugulose (the sculpture passing from the blunt frons-vertex fold) with some coarse rugae laterally; other area rather coarsely parallel-longitudinally or irregularly obliquely striate-rugose, striae on posterolateral areas diverging posteriad when passing on temples; large juxtaorbital areas longitudinally parallel-striate only on their posterior half, striae usually fragmented anteriorly; posteromedian and occipital area finely and irregularly vermicular-rugulose.

Genae shiny black copper with bright reddish-cupreous or bronze lustre, or metallic-green, rarely with blue lustre, almost smooth with only few very fine striae on postgenal area (passing from posterolateral areas of vertex).

Clypeus metallic dark or bright cupreous, usually with green lustre on anterior and lateral areas, finely irregularly wrinkled.

Labrum 4-setose, in both sexes comparatively long, but sexually dimorphic, ivory-yellow to ochre-yellow to pale testaceous, generally darker in female (in old specimens tarnished with darker spots); male labrum (Figs 19–21) 0.70–0.85 mm long, 1.00–1.20 mm wide, with blunt, right-angled to subacute basolateral teeth, then conically prolonged anteriad towards prominent but rounded anterolateral teeth which are variably in lower or slightly higher position than tridentate anterior lobe that consists of small, subacute to acute median tooth between much wider but rounded teeth; female labrum (Figs 22–23) of a similar shape of basolateral an lateral teeth as in male, but notably longer, length 1.05–1.10 mm, width 1.05–1.35 mm, its tridentate median lobe longer and with projecting median tooth.

Mandibles (Fig. 17) normally shaped with arcuate lateral margins, nearly symmetrical, each mandible with four teeth (and basal molar), the three inner teeth becoming gradually smaller towards the basal molar; coloration ivory to ochre on wide lateral areas, inner area and teeth variably mahogany-brown to black brown, often with bright reddish or green lustre, apices of teeth black-brown, in green coloured adults whole anterior part and teeth iridescent-green.

Palpi (Figs 17–18) normally shaped with elongate terminal palpomeres, both maxillary and labial palpi ivory-white to ochre-yellow including terminal palpomeres except for their metallic brown to black-blue apical third; penultimate (longest) palpomere of labial palpi elongate with almost parallel lateral margins, only slightly dilated towards apex which is 0.15–0.17 mm wide.

Antennae rather short, in male reaching elytral third, in female reaching or only slightly surpassing elytral quarter; scape metallic reddish-brown to black-brown with mahogany or greenish lustre (in old specimens faded to brownish), with one apical s and discal seta, rarely with two discal setae (the setae can be easily abraded); antennomeres 2–4 ochre-testaceous, to brownish-testaceous, often with reddish lustre, with sparse indistinct setae, antennomeres 5–6 often ochre-testaceous to brownish, other antennomeres gradually smoky-blackened.

Thorax. Pronotum (Figs 6–16) entirely glabrous, slightly longer than wide, length 1.80–2.00 mm, width 1.55–1.80 mm, sulci well pronounced; anterior lobe with anterior

margin distinctly prolonged forward and only slightly wider than the posterior lobe, but distinctly narrower than convex lateral margins of dorsally visible proepisterna, and mostly also than dorsally clearly visible notopleural sutures of disc; surface of anterior lobe irregularly and rather coarsely rugulose, rugae mostly vermicular to transverse wavy, on median area somewhat finer; disc mostly (also in LT) with distinctly convex lateral margins (including outer proepisternal margins) giving the disc a subglobose shape, notopleural sutures thin but clearly obvious in dorsal view, mostly (also in LT) of the same convex shape as the dorsally visible outer margins of the proepisterna but in dorsal view well distant from them, very rarely the proepisterna are narrower in middle (mutually subparallel); median line mostly indistinct; discal surface rather coarsely but densely rugulose, rugae irregularly vermicular or wavy and short, becoming more parallel and continuous when converging towards the median line and forming on anterior area an ornament of moderately arcuate converging rugae, almost of a rhomboidal appearance; sparser and irregularly transverse short rugae towards notopleural sutures; posterior lobe covered with prominent, 5–7 transverse rugae running parallel with posterior rim, these almost continuous rugae becoming irregularly interrupted on anteromedian area of the posterior lobe; proepisterna smooth and shiny, glabrous except for a few setae adjacent to ventral suture; mesepisterna smooth and glabrous, shiny metallic copper with golden-bronze, rarely green lustre; metepisterna of the same coloration, but with few, easily abraded short setae within deep impression at metepimeron; female mesepisternal coupling sulci indistinct as lacking a pit, in form of a longitudinal furrow which is only somewhat deeper than in male; ventral thoracic sterna concolorous with the lateral sterna; prosternum and mesosternum almost smooth and glabrous; metasternum distinctly punctate-setose, setae white, rather long, densest on lateral areas, sparser on anterior area and absent on smooth and shiny posteromedian area.

Elytra (Figs 24–32) elongate, length 5.00–6.10 mm, with rounded humeri, lateral margins at posterior half slightly dilated (more distinctly in female), anteapical angles arcuate, then obliquely running towards apices which are in male subacute to acute (including short but distinct sutural spine), in female rounded towards the sutural spine; microserrulation indistinct, irregular, partly or entirely absent; elytral dorsal surface markedly uneven due to several impressions: humeral impressions moderate, discal impression deep, thus clearly delimiting distinct basodiscal convexity; another distinctly raised discal convexity before the middle of the elytral disc, formed anteriorly by the deep discal impression and posteriorly by another deep impression in the middle of the elytral disc giving a raise of additional convexity in the area of white discal macula and delimited posteriorly by additional shallower impression; apical impression distinct; whole elytral surface rather distinctly punctate, punctures mostly isodiametric, rather deep with narrow but mostly flat intervals, larger on anterior elytral half and largest near humeri and within the impressions, mostly isolated, but largest punctures occasionally irregularly anastomosing; smaller, much denser and anastomosing punctures on juxtasutural-discal area; punctures on posterior elytral half become smaller, those on anteapical area shallower and dense, sometimes appearing somewhat longitudinally

prolonged; apical area possess very irregular sculpture (the appearance of the elytral sculpture changes depending on angle of illumination); elytral surface glabrous except for usual, a few and often very indistinct hairlike sensory setae scattered mostly on anterior area and at epipleura and few others scattered along the margin of the elytral apex; elytral coloration variable, usually dark copper to more vividly cupreous, often with greenish lustre, or partly or entirely dark olivaceous-green, rarely bright green or green-blue (in adults with uniformly green to green-blue coloured body); whitish elytral maculation usually consisting of three maculae, humeral lunule or macula is absent in both sexes as it is reduced to small, subhumeral rounded macula clearly isolated from outer elytral margin; lateral-median band is short and wide, mostly with short, mesad directed protrusion, but never connected with small, mostly rounded discal macula; anteapical macula is mostly wide and elongate, always markedly distant from elytral apex.

Legs. Procoxae and mesocoxae brownish-testaceous to tawny-brown, often with greenish or golden lustre anteriorly, densely whitish setose; metacoxae metallic black with cupreous, gold-bronze, or green-blue lustre, densely punctate-setose on whole lateral areas and sparser setae also on central area; trochanters smooth, brownish-testaceous to tawny-brownish; femora pale brownish testaceous or tawny brown to reddish testaceous except for limited metallic-black apical area, sometimes with faint metallic-green lustre, femoral surface densely covered with rows of mediocre-long and longer, erect and semierect whitish setae, their apices sometimes uncinate-bent; tibiae ochre-testaceous to brownish-testaceous with metallic blackened apices, protibiae usually with mahogany lustre, metatibiae usually darker; tibial surface covered with scattered, much stiffer, semierect, whitish setae; apical-ventral area of protibiae and mesotibiae covered with dense whitish to greyish setose pad; tarsi with tarsomeres usually testaceous with blackened apices, or dark brown to metallic black with bluish or greenish lustre, in both sexes comparatively wide and short, in female of a similar shape of dilated apices as in male, only slightly narrower; protarsomeres are the most unusually shaped within *Pentacomia* s. str. (see also "Remarks" below), which are in male dilated with subclavate to clavate apices (Figs 49–50), although only slightly more dilated than those in female (Fig. 51); lateral margins of protarsomeres rather sparsely covered with short and long, white and testaceous setae, while discal (dorsal) surface of the tarsomeres is smooth and almost glabrous with only few white setae; inner lateral margin of all tarsomeres in male with dense white and therefore barely visible pad of short setae; claws dark testaceous or metallic black, sometimes with green lustre.

Abdomen. Ventrites dark metallic black-blue, often with cupreous, gold-bronze or greenish lustre, apical pleurite usually brownish; surface of ventrites smooth and almost glabrous, but the usual hairlike sensory setae at posterior margins are rather dense and sometimes occurring also on the surface of the ventrites.

Aedeagus (Figs 33–39) 2.50–2.75 mm long, 0.40–0.45 mm wide, with rather straight basomedian-ventral margin; apical half dilated and with distinctly convex dorsal outline, conically attenuated and moderately ventrally directed towards narrow, rounded apex; internal sac (Figs 40–48) consisting of a conspicuous, cranked basal piece, ventral

spur with elongate thin spiny projection which is barely recognizable because its basal part is covered with strongly chitinized piece and a stiffening rib, characteristic central piece with arcuate-bent filiform projection, a central-ventral longitudinal, probably membranous piece of a variably diffusing outline, two conspicuous, elongate dorsal-upper spines, and a feebly sclerotized longitudinal ventral piece with rounded apex; the structure appearing rather variable, but it primarily depends on the position of the aedeagus which is very important for the observation of the sclerites (see the Variability below).

Variability. Apart from the variability in coloration mentioned in the redescription, the most variable is the shape of the pronotum: while in the type specimens and most adults from the type locality, as well as in those from Peruvian province of Loreto, the lateral margins of dorsally visible proepisterna and notopleural sutures are arcuate-convex, some other specimens, particularly from other areas of Peru, have the notopleural sutures (in dorsal view) subparallel. The variable appearance of the sclerites within the internal sac is usually caused by their different positioning within the internal sac and by the position of the internal sac within the aedeagus, as well as by the position of the aedeagus when observed: even a small differences in the position of the aedeagus when slightly turned in its lateral position, may distinctly change the appearance of the structure.

Differential diagnosis. *P.* (*Pentacomia*) *chrysamma* can be immediately distinguished from other species of the nominotypical subgenus by the characteristic pattern of the white elytral maculation. The maculation consist of three maculae: a small subhumeral macula which is distinctly isolated from outer elytral margin and never placed on humerus (humeral lunule is always absent); lateral-median macula in form of a short and wide band, mostly with short, mesad directed protrusion, but never connected with small, mostly rounded isolated discal macula; anteapical macula is mostly wide and indistinctly elongate, always markedly distant from elytral apex.

P. (*P.*) *chrysammoides* sp.nov. described below possesses a very similar pattern of white elytral maculation, but *P.* (*P.*) *chrysamma* immediately differs from the new species in having notably wider tarsomeres, namely the protarsi (Figs 49–51) are diagnostic: they are in male (Figs 49–50) wider with subclavate to clavate apices (although only slightly more dilated than those in female (Fig. 51) and with only sparse setae on their dorsal surface which is mostly smooth, only rarely with indistinct, thin longitudinal furrow. The shape of the pronotum is rather variable in both species, but the pronotal disc in *P.* (*P.*) *chrysamma* is generally wider, in the type and majority of other specimens from areas of the type locality (Figs 6–8) and some localities in Peruvian Loreto (Fig. 14) are notably subglobose. The posterior pronotal lobe is in *P. chrysamma* notably with more, 3–5, almost continuous transverse rugae, while in *P. chrysammoides* sp.nov. there are only 2–3 such rugae. Moreover, the elytral surface in *P.* (*P.*) *chrysamma* is more distinctly uneven, and the pronotal disc wider, mostly subglobose, and the antennal scape possess only apical seta or one or two discal setae. Despite a variability among populations, the aedeagus of *P.* (*P.*) *chrysamma* (Figs 33–39) is much straighter and with shorter, moderately ventrally directed apical part (in contrast to the distinctly bent, ventrally

directed and longer apical half of the aedeagus of *P.* (*P.*) *chrysammoides* sp. nov). The internal sac (Figs 40–48) in *P.* (*P.*) *chrysamma* also differs, particularly in absence of the large dorsal sclerite with mucronate basal apex usually protruding from the dorsoapical orifice (which is characteristic of *P.* (*P.*) *chrysammoides* sp.nov.).

P. (*P.*) *nigrimarginata* Huber, 1999 possesses somewhat similar white elytral maculation, but the subhumeral macula is much larger, close to the outer elytral margin, the anteapical macula is smaller, and elytral punctation consists of larger and deeper punctures. In contrast to always entirely glabrous dorsal surface of the pronotum in *P.* (*P.*) *chrysamma* and *P.* (*P.*) *chrysammoides* sp.nov., *P.* (*P.*) *nigrimarginata* is clearly differentiated in having several setae at the lateral margins of the dorsal surface of the pronotum. Moreover the structure of the internal sac of the aedeagus distinctly differs.

Biology and distribution. Apart from the type locality in the area of Macas lying in the province of Morona Santiago, southeastern Ecuador, the genuine *P.* (*P.*) *chrysamma* occurs also in other localities of Ecuador and Peru. Most of the specimens cited in "Other material examined" above, were previously recorded from Ecuador by Pearson, Buestán & Navarrete (1999). The female in SDEI labelled "Loja" comes from the area of the city in the large glacial Cuxibamba Valley which borders the Podocarpus National Park, a vast cloud-forest reserve. Specimens from the provinces of Zamora Chinchipe (CCJM, DBCN) come from the same national park.

The occurrence has been confirmed also in northern and interior Peru (it was addressed from Pakitza also by Pearson & Huber 1995). However, in Huánuco and southern areas of Peru, in Chanchamayo and in the locality "Yahuar-mayo" (lying in Carabaya Region of southeastern Peru on East slopes of Andes) as well as in one area of Madre de Dios, and particularly towards the Bolivian border, it is (although very rarely) sympatric with *P.* (*P.*) *chrysammoides* sp.nov. Some of these obviously vicariant Peruvian populations, as well as a few adults (several old specimens from northern Bolivian Yungas La Paz area, listed separately in the "Other material examined" above), possess somewhat intermediate shape of the aedeagi, although their external characters correspond mostly with *P.* (*P.*) *chrysamma* (see the discussion in the Introductory of this paper). It is also very interesting that such specimens are almost entirely very old. During the revision, *P.* (*P.*) *chrysamma* has not been confirmed from other parts of Bolivia. The records from Bolivia in literature, including Horn (1931), Mandl (1958), Wiesner (1992) and Erwin & Pearson (2008) belong at least partly (those from Santa Cruz, Sapecho) obviously to *P.* (*P.*) *chrysammoides* sp.nov. Likewise, those recorded recently by Pearson, Guerra & Brzoska (1999) from the Bolivian districts of Santa Cruz, Cochabamba, Beni, and partly La Paz (for instance Sapecho, Mapiri, Consata, San Buenaventura), proved to be *P.* (*P.*) *chrysammoides* sp.nov. (see under that species below). Only three specimens of *P.* (*P.*) *chrysamma* were found in collections and examined by us from Colombia. Erwin & Pearson (2008) listed *P.* (*P.*) *chrysamma* also from Brazil, but no verified specimen from the large country has been found in collections, although it occurs in Peruvian Amazonia and may spread to Brazilian parts of the Amazon Basin. The only specimen (bright green-blue coloured male) labelled: "Patria: / Verosimiliter / Brazil / F. Cassola, 1994", thus without an exact locality, came

probably from an insect dealer and was probably mislabelled. Notwithstanding, no evidence if the male was certainly collected in Brazil has been obtained.

Adults are diurnal, good fliers, inhabiting clay embankments and red clay trails in forests, small clay stream cuts, edges of disturbed forests, in altitudes 200–1300 m. They usually roost at night among vegetation and sometimes are attracted to lights.

Remarks. As obvious from BATES (1872), the original description of *Pentacomia chrysamma* was based on several syntypes of both sexes. Nevertheless, apart from the male lectotype (BMNH) bearing original labels by Bates (Fig. 4.), only one other male and female paralectotypes corresponding with the locality label data and originally from the historical collection of H. W. Bates have been found in MNHN, one of them, the female, became part of the MNHN collection in 1952 ex collection of Oberthür. The aedeagus of the lectotype was not examined in order to preserve the specimen that is not in a good state, but the shape of the apex of its aedeagus protruding from abdomen is in accordance with this species.

While HORN (1899, 1905) maintained *P.* (*P.*) *chrysamma* in the genus *Pentacomia*, he treated it later (HORN 1915) quite inadequately in the genus *Cicindela* Linné, 1758, later (HORN 1926) in *Cicindela* "Gruppe" *Pentacomia*, and finally (HORN 1931, 1938) in *Cicindela* subgen. *Pentacomia*. Likewise improperly, MANDL (1951) has it as *Cicindela*, and later (MANDL 1958) in *Cicindela* subgen. *Pentacomia* (it should be noted here that *Cicindela* is diagnostically very different, holarctic genus).

SCHILDER (1953) treated this species as *Phyllodroma* (*Pentacomia*) *chrysamma* as he considered *Pentacomia* a subgenus of the genus *Phyllodroma* Lacordaire, 1843. However, the genus *Phyllodroma*, with the type species (by original designation) *Phyllodroma cylindricollis* based on *Cicindela cylindricollis* Dejean, 1825 diagnostically differs from the genus *Pentacomia* and all other genera (see RIVALIER 1969 and MORAVEC 2012b).

***Pentacomia* (*Pentacomia*) *chrysammoides* sp.nov.** (Figs 52–111)

Type locality. Bolivia: Santa Cruz department, Mataracu Camp in the Amboro National Park, 75 km northwest of the city of Santa Cruz.

Type material. Holotype. ♂ in MNHN, labelled: "Bolivia – Santa Cruz depart. / 75 km NWW of city Sta. Cruz / Amboro n. p., Mataracu camp / 30.XI.2007, O. Šafránek leg." [printed]. Allotype. 1 ♀ in COSJ: ditto. Paratypes. 11 ♂♂, 9 ♀♀ in COSJ, 2 ♂♂, 1 ♀ in CCJM: ditto. 10 ♂♂, 10 ♀♀ in COSJ, 1 ♂, 1 ♀ in CCJM: "Bolivia: Santa Cruz depart. / Espejillos, 20 km SW from city / S.Cruz, 3.XII.2013, creek gorge / S17°54′59″;W63°25′40, 558 m / O. Šafránek et M. Amaya lgt." [printed]. 1 ♂ in BMNH: "Bolivia: Santa Cruz // Amboro National Park / Los Volcanes c 1000m / S 18°.06; W63°36′ / -20.xi-12.xii / 2004" [printed] // "MV Light Sheet / on stream beach / Barclay M.V.L. / & Mendel H. / BMNH(E)2004-280" [printed] // "Pentacomia (s. str.) chrysamma Bates / DEt. F. Cassola 2008" [printed]. 2 ♀♀ in CCJM: "Bolivia, XI.1998 / Santa Cruz / Buena Vista env. / leg. S. & P. Pokorný" [printed]. 1 ♀ in USNM: "Bolivia: Santa Cruz Prov. / 4–6 km SSE Buena Vista / Hotel Fauna y Flora 400–500 m / 17°37′S, 63°37′W / 1–10 Nov.2002, beating / Steven Lingafelter" [printed]. 1 ♂, 6 ♀♀ in JWCW, 2 ♀♀ in CCJM: "Bolivia, II.1978 / Sta Cruz Rio Estijo" [printed]. 1 ♀ in DBCN: "Bolivia – Santa Cruz / 12 km NW Yapacani / 1.3 km N Camino / Cochabamba 420m / D. Brzoska 26-XI-1996" [printed]. 1 ♂, 1 ♀ in NHMW: "Rio Espejo, 400 m / Ibańez Sta Cruz / Bolivia, II.1962" [handwritten] // "Coll. K. Mandl" [printed]. 1 ♀ in MFNB: "Bolivien / Prov. Sara, Dep. St. Cruz / de la Siera, 500 m, J. Steinbach, SV". 1 ♀ in BMNH: "Bolivia Cochabamba / Villa Tunari, 800 m / 17.X.1981 / M. Cooper".

1 ♀ in JWCW: "Bolivia, 400m / Cochabamba / Chapare, I.75" [printed]. 1 ♂ in JWCW: "Bolivia, XII.85 / Cochabamba / Chapare, Villa Tunari" [printed]. 1 ♂ in COSJ: "Bolivia– Cochabamba / Villa Tunari env. / 4–5.XII.2001 O. Šafránek lgt." [printed]. 7 ♂♂, 5 ♀♀ in DBCN, 2 ♂♂, 2 ♀♀ in CCJM, 3 ♂♂, 1 ♀ in ASUT: "Bolivia – Cochabamba / 1 km S – Río Chimore – / 320 m / D. Brzoska 26-XI-1995" [printed]. 1 ♂ in RLHC with same locality data and: "Pentacomia (s. str.) / n. sp. nr. chrysamma / det. R. Huber 1996" [handwritten]. 1 ♂ in ASUT: "Bolivia – Cochabamba / 17km NW Villa Tunari / Pt. Patino Rd, 300m / D. Brzoska 27-XI-1995" [printed] // "Pentacomia (s. str.) / n. sp. nr. chrysamma / det. R. Huber 1996" [handwritten]. 10 ♂♂, 10 ♀♀ in DBCN, 5 ♂♂, 3 ♀♀ in ASUT, 2 ♂♂, 2 ♀♀ in CCJM, 2 ♂♂, 3 ♀♀ in CJVB, 1 ♂, 1 ♀ in MHCW, 1 ♂, 2 ♀♀ in BBFM, 1 ♀ in MHCW, 1 ♂, in SDEI, 1 ♀ in MNHN, 1 ♂, 1 ♀ in RLHC: "Bolivia – Cochabamba / 37 km NW –Villa Tunari / Pt. Patino Rd, 280m / D. Brzoska 27-XI-1995" [printed]. 1 ♀ in DBCN: "Bolivia – La Paz / 4 km SE Ixiamas / 29-XI-1994 / Brzoska/Guerra" [printed]. 5 ♂♂, 3 ♀♀ in DBCN, 2 ♂♂ in CCJM, 1 ♂ in CJVB: "Bolivia – La Paz 500 m / 6.5 km W – Sapecho / 15°33′96″S, 67°23′24″W / D. Brzoska 22-XI-1996" [printed]. 1 ♀ in MFNB (ex DBCN), 1 ♂ in MZMB (ex DBCN), 2 ♀♀ in DBCN, 1 ♂, 1♀ in CCJM, 1 ♂ in CJVB: "Bolivia – La Paz / 25 km W – Sapecho 580 m / 15°28′66″S, 67°12′75″W / D. Brzoska 22-XI-1996" [printed]. 1 ♀ in DBCN: "Bolivia – La Paz / 2 km E – Sapecho / 600 m / D. Brzoska 22-XI-1996" [printed]. 1 ♂, 1 ♀ in DBCN: "Bolivia – La Paz / 2 km N – Tucupi / (S – Sapecho) 580 m / 15°43′38″S, 67°03′78″W / D. Brzoska 26-XI-1996" [printed]. 1 ♂ in DBCN: "Bolivia – La Paz / 70 km NW San Buenaventura / 27.XI.1994 / Brzoska / Guerra" [printed]. 1 ♂ in DBCN: "Bolivia – La Paz / Rio Alto Beni / Puente Sapecho / 2.XII.1994 / Brzoska / Guerra" [printed]. 1 ♂ in CCJM (ex DBCN): "Bolivia – Beni / Rio Yucumo / 15°14′57″S, 67°04′89″W / D. Brzoska 25-XI-1996" [printed]. 1 ♀ in DBCN, 1 ♂ in CJVB: "Bolivia – La Paz / 32 km NW – Guanay 780 m / 15°27′09″S, 68°09′91″W / D. Brzoska 18-XI-1996". 1 ♂, 4 ♀♀ in DBCN, 2 ♂♂ in CCJM, 1 ♂ in CJVB: "Bolivia – La Paz / 49 km NW – Guanay 800 m / 15°26′91″S, 68°05′86″W / D. Brzoska 18-XI-1996" [printed]. 2 ♂♂ in DBCN, 1 ♂ in NMPC, 1 ♂ in CCJM, 1 ♂ in MHCW: "Bolivia – La Paz / 20 km SE Mapiri / 15°21′67″S, 68°10′84″W / D. Brzoska 17-XI-1996" [printed]. 1 ♂, 1 ♀ in DBCN, 1 ♀ in MHCW: "Bolivia – La Paz / 6.5 km SE Mapiri 1125 m / 15°20′64″S, 68°13′50″W / D. Brzoska 17-XI-1996" [printed]. 1 ♀ in DBCN: "Bolivia – La Paz / 15 km SE – Mapiri 985 m / 15°22′05″S, 68°12′72″W / D. Brzoska 17-XI-1996" [printed]. 1 ♀ in DBCN: "Bolivia – La Paz / 24 km SE – Mapiri 550m / 15°22′33″S, 68°10′14″W / D. Brzoska 17-XI-1996" [printed]. 1 ♀ in IRSNB, 1 ♂ in NMPC: "Mapiri / Bolivia". 1 ♀ in BMNH: "Mapiri / Bolivia" // "Pentacomia / v. boliviensis" [handwritten] // "H. E. Hinton / Collection / BM 1577-560" [printed]. 1 ♂, 2 ♀♀ in DBCN, 1 ♂, 2 ♀♀ in CCJM: "Bolivia – La Paz / 5–7 km E – Consata 1140m / 15°19′64″S, 68°30′54″W / D. Brzoska 16-XI-1996" [printed]. 2 ♂♂, 1 ♀ in CDCL: "Bolivie, 250m / Rio Mero / Alto Madidi / Coll. Dheurle" [printed] // "24–28.XI.2002 / P. Bleuzen leg." [printed]. 1 ♂ in CDCL: " Bolivien, 450m / Piste Yucumo – / Rurremboque / PK 75" // "23–30.XI.2002 / P. Bleuzen leg. / Coll. Dheurle" [printed]. 2 ♂♂, 1 ♀ in DBCN, 1 ♂ in CCJM: "Peru – Madre de Dios / Rio Alto Madre de Dios / Pantiacolla Lodge, / 410–700 m.a.s.l., 12°39.4′S, 71°13.9′W / D. Brzoska 26-X-2000" [printed]. All type specimens labelled: // Holotype (Allotype or Paratype respectively) / "Pentacomia (s. str.) / chrysammoides sp.nov. / det. J. Moravec, R. Huber / & C. Dheurle 2015" [red, printed].

N o t e . Some of the paratypes from the DBCN collection will later be distributed to the collection CCJM and several other private and institutional collections.

Other material examined. 1 ♂, 1 ♀ in NHMW, 1 ♂ in SDEI: "Bolivia / N. Schunse" / 22.I.03.1910" // "1910 / 8" // "Coll. W. Horn / DEI Eberswalde". 1 ♀ in SDEI: ditto, except for: "2.III.1910". 1 ♂ in MNHN: " Bolivia / Prov. Chapare / 6.IV.49".

Description. Body (Figs 54–57) of a variable size, often independent of sex, or females larger than males, 8.30–11.30 (HT 9.20, AT 9.30) mm long, 2.50–3.50 (HT 2.70, AT 2.80) mm wide, dorsal surface of head, pronotum and elytra mostly bright cupreous with bronze or reddish lustre (also in HT, AT and adults from type locality), to dark cupreous with green or olivaceous lustre, rarely olivaceous-green, exceptionally dark green with bright green lustre.

Head (Figs 69–70) large with markedly big eyes, only slightly narrower than body and notably wider than pronotum, 2.40–3.20 mm wide; all head portions glabrous.

Frons moderately to distinctly convex in middle when sloping towards clearly separated clypeus, very finely longitudinally parallel-striate; posteromedian area passing

to vertex over blunt frons-vertex fold rather coarsely very irregularly asperate- to vermicular rugulose; supraantennal plates irregularly triangular, smooth and shiny reddish-cupreous with green or golden lustre, their blunt apices usually moderately raised, forming very indistinct lateral edges.

Vertex almost flat in middle, very irregularly rather coarsely but densely vermicular-rugulose (coarser than in *P.* (*P.*) *chrysamma*), rugae on median area more parallel-longitudinal, striae on posterolateral areas diverging posteriad when passing on temples irregularly fragmented; large juxtaorbital areas longitudinally parallel-striate, but striae with asperate surface and often fragmented anteriorly; posteromedian and occipital area finely and irregularly vermicular-rugulose to almost granulate-rugulose.

Genae bright reddish-cupreous with bronze or green lustre, almost smooth and shiny with only few very fine wrinkles on postgenal area.

Clypeus bright or dark cupreous, usually with green lustre on anterior and lateral areas, rarely dark green, finely irregularly wrinkled.

Labrum 4-setose, generally shaped as in *P.* (*P.*) *chrysamma*, sexually dimorphic, ivory-yellow to ochre-yellow to pale testaceous, generally darker in female; male labrum (Figs 71–74) 0.70–0.85 mm long, 1.10–1.30 mm wide; female labrum (Fig. 75) notably longer, length 1.00–1.20 mm, width 1.15–1.45 mm, its tridentate median lobe longer and with projecting median tooth.

Mandibles (Figs 69–70) normally shaped (as in *P.* (*P.*) *chrysamma*) nearly symmetrical, each mandible with four teeth (and basal molar), the three inner teeth becoming gradually smaller towards the basal molar; coloration as in *P. chrysamma* or paler, ivory to ochre on wide lateral areas, inner area and teeth usually mahogany with bright reddish or green lustre, apices of teeth black-brown.

Palpi (Figs 69–70) normally shaped with elongate terminal palpomeres, much paler than in *P.* (*P.*) *chrysamma*, both maxillary and labial palpi ivory-white to ochre-yellow including terminal palpomeres except for their usually pale brown darkened apical area; penultimate (longest) palpomere of labial palpi elongate with almost parallel lateral margins, only slightly dilated towards apex which is 0.16–0.18 mm wide.

Antennae paler and longer than in *P.* (*P.*) *chrysamma*, in male reaching or slightly surpassing elytral half, in female somewhat shorter; scape usually mahogany-testaceous with reddish lustre with one apical and usually 2–5 discal setae, rarely (Fig. 76) up to with 7 discal setae, exceptionally the discal setae can be absent (apart from that the setae can be easily abraded); antennomeres 2–4 ochre-yellow to ochre-testaceous. usually with mahogany to reddish lustre, with sparse indistinct setae, antennomere 5 smoky-blackened, 6–11 smoky black.

Thorax. Pronotum (Figs 58–68) entirely glabrous, always longer than wide, length 1.65–2.15 mm, width 1.40–1.80 mm, sulci well pronounced; anterior lobe with anterior margin distinctly prolonged forward and only slightly wider than posterior lobe, but usually slightly narrower than lateral margins of proepisterna; surface of the anterior lobe coarsely rugulose, rugae mostly irregularly vermicular, rarely transverse wavy; disc generally narrower than in *P.* (*P.*) *chrysamma*, notopleural sutures clearly visible in dorsal view, mutually subparallel as mostly narrower than the dorsally visible proepisternal

margins, but sometimes the disc and the proepisternal margins are so narrow that the notopleural sutures and the lateral margins are in the same line and the disc is narrower than the anterior lobe (Fig. 68); median line mostly indistinct as partly merging with the surface sculpture; discal surface coarsely rugulose, rugae irregularly vermicular or zigzag-wavy or short mostly on the whole discal surface, only very rarely becoming subparallel and indistinctly continuous when converging towards the median line; sparser and irregularly transverse short rugae towards notopleural sutures; posterior lobe with irregular vermicular rugae on anteromedian area, but in middle with prominent, 2–3 transverse, mostly continuous rugae (notably sparser than in *P.* (*P.*) *chrysamma*) running parallel with posterior rim, proepisterna smooth and shiny metallic cupreous, rarely (in greenish adults) metallic green, glabrous except for a few setae adjacent to ventral suture; mesepisterna smooth and glabrous usually darker; metepisterna of the same coloration as the proepisterna, with a deep impression at metepimeron, glabrous or with only very indistinct, 1–2 microsetae; female mesepisternal coupling sulci indistinct as lacking a pit, in form of a longitudinal furrow which is only somewhat deeper than in male; ventral thoracic sterna metallic deep green with chatoyant, reddish rarely green lustre on lateral areas; prosternum and mesosternum almost smooth and glabrous; metasternum smooth and glabrous on posteromedian area, while lateral areas are densely punctate-setose, and sparser setae are also on anterior area; setae white, rather long.

Elytra (Figs 77–86) elongate, length 5.10–6.50 mm, with rounded humeri, in female humeri sometimes subquadrate, lateral margins in male almost parallel, in female slightly dilated in middle, anteapical angles arcuate, then obliquely running towards apices which are in male subacute to acute (including short but distinct sutural spine), in female rounded towards the sutural spine, rarely of the same acute shape as in male (in the only female from Rio Alto Madre de Dios); microserrulation indistinct, irregular, partly or entirely absent; elytral dorsal surface uneven due to several moderate impressions (which are notably shallower than in *P.* (*P.*) *chrysamma*), humeral impressions indistinct, discal impression rather deep, thus clearly delimiting moderate to rather distinct basodiscal convexity; another, moderate impression in the middle of the elytral disc (above the discal white macula) forming rather distinctly raised discal convexity before the middle of the elytral disc; apical impression distinct; whole elytral surface rather finely punctate (punctation of a similar pattern as in *P.* (*P.*) *chrysamma*, but generally finer and more regular), punctures mostly isodiametric with narrow but mostly flat intervals, larger on anterior elytral half and usually largest near humeri and within the impressions, mostly isolated, but largest punctures occasionally irregularly anastomosing; smaller, much denser and anastomosing punctures on juxtasutural-discal area; punctures on posterior elytral half become much smaller, very dense and shallow and often with merging intervals (the appearance of the elytral sculpture changes depending on angle of illumination); elytral surface glabrous except for usual, a few and often very indistinct hairlike sensory setae scattered mostly on anterior area and at epipleura and few , short setae scattered along the margin of the elytral apex; elytral coloration rather variable, usually (also in HT and adults from the type locality) light iridescent cupreous, often with greenish lustre, or partly or entirely dark olivaceous-green, rarely bright green (but never

bright green-blue as in some adults of *P.* (*P.*) *chrysamma*); whitish elytral maculation usually consisting of three maculae, humeral lunule is absent in both sexes, being reduced into small, subhumeral-sublateral spot; lateral-median band is short and wide, mostly with postero-mesad directed protrusion and mostly isolated from small, mostly rounded discal macula, but rarely also connected with it by a thin, exceptionally wide stripe (Figs 81, 83); anteapical macula is mostly narrower and more elongate than that in *P.* (*P.*) *chrysamma*, but always markedly distant from elytral apex; very often the white maculae are very small and indistinct (as also in HT, Fig. 54),

Legs basically coloured as in *P.* (*P.*) *chrysamma*, but generally somewhat paler; procoxae and mesocoxae brownish-testaceous to tawny-brown, sometimes with feeble greenish or golden lustre, densely whitish setose; metacoxae metallic green with cupreous, or gold-bronze lustre, densely punctate-setose on whole lateral areas and sparser setae also on central area; trochanters smooth, brownish-testaceous to tawny-brownish; femora pale brownish testaceous or tawny brown to reddish testaceous except for limited metallic-black apical area, usually with mahogany lustre, femoral surface densely covered with rows of mediocre-long and longer, erect and semierect whitish setae (generally denser than in *P.* (*P.*) *chrysamma*); tibiae ochre-testaceous to brownish-testaceous with metallic blackened apices, protibiae usually with mahogany lustre; tibial surface covered with scattered, much stiffer, semierect, whitish setae; apical-ventral area of protibiae and mesotibiae covered with dense whitish to greyish setose pad; tarsi with tarsomeres mahogany-testaceous with blackened apices, but often also metallic coloured with violaceous or greenish lustre; protarsi (Figs 52–53) in both sexes very narrow (notably narrower than those in *P.* (*P.*) *chrysamma*, in some males (also in HT) only slightly wider than protarsi in females, because the first four protarsomeres in male are only indistinctly dilated and only at their apices; dorsal surface of the protarsomeres mostly possess more or less distinct longitudinal furrow; lateral margins of tarsomeres, but also their dorsal surface rather densely covered with short and long, white and testaceous setae (the setosity is denser than in *P.* (*P.*) *chrysamma*), setae arising from marginal pits which give the lateral margins of the tarsomeres a "notched" shape; inner lateral margin of all tarsomeres in male with dense white and therefore barely visible pad of short setae; claws dark testaceous or metallic black, sometimes with green lustre.

Abdomen. Ventrites dark metallic green, their lateral areas often reddish-cupreous, apical pleurite usually brownish; surface of ventrites smooth and almost glabrous, but the usual hairlike sensory setae at posterior margins are rather dense.

Aedeagus (Figs 87–96) 2.60–3.00 mm long, 0.45–0.60 mm wide, with rather narrow, conical basomedian-portion; apical half dilated, then notably bent and directed ventrally, apical part elongate, conically attenuated towards rounded apex (much longer and much distinctly bent than in *P.* (*P.*) *chrysamma*); internal sac (Figs 96a, 97–111) distinguished from that in *P.* (*P.*) *chrysamma* as consisting of basal pieces of indefinite shape, ventral spur with elongate thin spiny projection which is barely recognizable because its basal part is covered with strongly chitinized piece and a stiffening rib, characteristic large dorsal piece with acute apex and mucronate to acute base bent dorsally and usually projecting from the dorsoapical orifice (the shape of its apex

optically depends on the position of the sclerite within the internal sac – compare fig. 110 to fig. 111 marked by the arrows), usually covered with satellite spike with acute apex (this spike is sometimes moved upwards giving the structure seemingly different pattern); a central-ventral longitudinal (probably membranous) piece of a variable outline and which may appear voluminous or diffusing; the structure appearing rather variable (see Variability below).

Variability. The variability in coloration, as well as the shape of the pronotum has been mentioned in the redescription; some adults from Bolivian Rio Chimore (Figs 64–65) and the only female from Peruvian Rio Alto Madre de Dios (Fig. 68) have the narrowest pronotal disc. Some adults from Villa Tunari and Rio Chimore (Figs 57, 80–81) have the white elytral median-discal band partly or entirely continuous, the most distinctly and widest in one male (Fig. 82) from Villa Tunari. Adults from the Alto Madidi National Park (La Paz Department) possesses slightly wider protarsi, but still much narrower and longer than in adults of *P.* (*P.*) *chrysamma*. The different appearance of the sclerites within the internal sac is usually caused by the position of the aedeagus which is very important for the observation of the sclerites. The shape of the sclerites also depends on their positioning within the internal sac, as well as on the position of the internal sac within the aedeagus, because even small differences in the positioning may change the appearance of the structure (compare Fig. 110 to 111).

It should also be noted here that the aedeagi cleared in order to show their internal sacs, become usually widened and straightened by the clearing procedure.

Differential diagnosis. *P.* (*P.*) *chrysammoides* sp.nov. shares the pattern of white elytral maculation with the closely related *P.* (*P.*) *chrysamma*, but it can be immediately distinguished from it by the notably narrower and longer protarsi which are in some males (also in HT) only slightly wider than the protarsi in females; dorsal surface of the elongate protarsomeres mostly possess more or less distinct longitudinal furrow and also the setae on their surface are much denser. Despite the emphasized variability in both species, the pronotal disc in *P.* (*P.*) *chrysammoides* sp.nov. is never so subglobose as in the type specimens of *P.* (*P.*) *chrysamma* (and almost all other specimens from its type locality). The posterior pronotal lobe in the new species bears only 2–3 transverse (almost continuous) rugae, while there are 3–5 such rugae in *P.* (*P.*) *chrysamma*. Moreover, the elytral surface in the new species is generally less uneven, and the antennal scape has (apart of the apical seta) 2–5, rarely 7 setae on the discal surface of the scape (Fig. 76). Some adults from Villa Tunari and Río Chimore have the white elytral median-discal macula connected with the short lateral band by a discal band, either in form of thin stripe, or (in one specimen examined) the bend is wide. Such specimens may be confused with *Pentacomia* (*Pentacomia*) *cupriventris* (Reiche, 1842) which inhabits Panama and Costa Rica and is immediately distinguished by notably wide and complete white elytral maculation, namely the wide humeral and apical lunules and much coarser elytral punctation. *P.* (*P.*) *vallicola* which always posses the continuous median-discal band, can also be immediately distinguished by its elongate humeral and anteapical-apical lunules, as well as by the setae on anterior and lateral areas of the dorsal surface of its pronotum. *P.* (*P.*) *nigrimarginata* Huber, 1999 which possesses a similar white elytral maculation as

in *P.* (*P.*) *chrysamma* and *P.* (*P.*) *chrysammoides* sp.nov. is also clearly distinguished by the presence of the setae on lateral areas of the dorsal surface of the pronotum (for other differences see the "Differential diagnosis" under *P.* (*P.*) *chrysamma*).

Biology and distribution. *P.* (*P.*) *chrysammoides* sp.nov. occurs in most areas of Bolivia, very rarely in southern Peru. Apart from the type locality, the Amboro National Park 75 km northwest of the city of Santa Cruz, it occurs also in other areas of the large department, including Buena Vista areas. Many specimens come from the district of Cochabamba, namely from Villa Tunari and Río Chimore, others from the district of Beni. It occurs also in the northern Bolivian district of La Paz, caught there in the Alto Madidi National Park, also in Guanay, Río Yucumo, Consata and other localities (listed in "Type material" above). Most specimens from Sud Yungas of the district of La Paz come from Sapecho areas, others from Río Alto Beni. However some old specimens (MNHN, SDEI, BMNH) from "Yungas de La Paz" are *P.* (*P.*) *chrysamma* (or comparable to it, having similar external characters, but differing slightly in shape of the aedeagi). Only two adults come from the area of the Peruvian river of Alto Madre de Dios, while specimens from other areas of Madre de Dios proved to be *P. chrysamma*. This species was commonly in literature, including most recently by Erwin & Pearson (2008) recorded under the name *P.* (*P.*) *chrysamma*. Also specimens listed by Guerra et al. (1997), Ledezma (2000), and Pearson, Guerra & Brzoska (1999) from the Bolivian districts of Santa Cruz, Cochabamba, Beni, and partly La Paz (for instance Sapecho, Mapiri, Consata, San Buenaventura), proved to be in fact *P.* (*P.*) *chrysammoides* sp.nov. (most of the specimens listed by the cited authors were examined by us).

The adults of this new species, as in most of the other *Pentacomia* species, were mostly caught along rivers on moist, shaded clayey banks (D. Brzoska, pers. com.) mostly in altitude from 200 – 800 m, but also 1140 m (adults from Consata). Adults from the type locality were caught when flying on wet clayey mud of a track through a primary forest of the Amboro National park, while adults from Los Espejillos (one of the entrances to the Amboro National Park) were caught in a long creek gorge on clayey sediments and sandy places of a partly dry rivulet bed (O. Šafránek pers. com.). The gorge, situated in the Andean hilly area is inhabited by several other tiger beetles, such as *Pentacomia* (*Pentacomia*) *vallicola* Huber, 1999, *Pentacomia* (*Poecilochila*) *lacordairei* (Gory, 1833) and *Mesacanthina argentina* (Lynch Arribálzaga, 1878. *P.* (*P.*) *chrysammoides* sp.nov. is sympatric with *P.* (*P.*) *vallicola* also in other localities of the department of Santa Cruz, for instance in the province of Sara.

Etymology. Derived from the species name *chrysamma* (probably derived from Latin adjective *chryseus,* referring to golden coloration), and ancient Greek suffix *–oídes* (likeness, similar to) referring to the similarity of the new species with *P.* (*P.*) *chrysamma*.

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References

Bates H. W. 1872: Notes on Cicindelidae and Carabidae, and descriptions of new species (No. 14). *Entomologist's Monthly Magzine* **8:** 263–266.

Duran D. P. & Moravec J. 2013: A new species of the genus Pentacomia from Panama (Coleoptera: Cicindelidae). *Acta Entomologica Musei Nationalis Pragae* **53:** 49–57.

Erwin T. L. & Pearson D. L. 2008: *A treatise on the Western Hemisphere Caraboidea (Coleoptera). Their classification, distributions, and ways of the life. Volume II. Carabidae – Nebriformes 2 – Cicindelitae*. Pensoft Series Faunistica 84, Pensoft Publishers, Sofia, 366 pp + 33 pl.

Fleutiaux E. 1892: *Catalogue systematique des Cicindelidae*. Liege, 186 pp.

Guerra J. F., Brzoska, D. W. & Pearson, D. L. 1997: Preliminary list of the tiger beetle species of Bolivia (Coleoptera: Cicindelidae). *Cicindela* **29(1–2):** 25–32.

Harris R. A. 1979: A glossary of surface sculpturing. In: Andrews G. (ed.): Department of Food and Agriculture Division of Plant Industry, Sacramento. Occasional papers of Laboratory Services / Entomology **28:** 1–31.

Horn W. 1899: Ueber das System der Cicindeliden. *Deutsche Entomologische Zeitschrift* **1:** 33–51.

Horn, W. 1905: Systematischer Index der Cicindeliden. *Deutsche Entomologische Zeitschrift*, Beiheft: 1–56.

Horn W. 1915: *Coleoptera Adephaga*, Fam. *Carabidae*, Subfam. *Cicindelinae*. In: Wytsman, P., *Genera Insectorum* **82:** 209–487, plates 16–23.

Horn W. 1926: Carabidae, Cicindelinae. In: Junk W. & Schenkling S. (eds.): *Coleopterorum Catalogus*. Junk, Berlin, 345 pp.

Horn W. 1931: Die Cicindelidenfauna von Bolivien. *Revista de Entomologia* **1(1):** 19–30.

Horn W. 1938: 2000 Zeichnungen von Cicindelinae. *Entomologische Beihefte aus Berlin-Dahlem* **5:** 1–71, 90 Tafeln.

Huber R. L. 1999: Eight new tiger beetle species from Bolivia in the genera Odontocheila, Pentacomia and Pometon (Coleoptera: Cicindelidae). *Cicindela* **31(1–2):** 1–44.

Ledezma J. 2000: *Guia de Camptode los escarabajostigre (Coleoptera, Cicindelidae) de Bolivia*. Universidad Autónomo Gabriel René Moreno, Santa Cruz, Bolivia.

Mandl K. 1951: Cicindelidae (Col.). Jena. *Beiträge zur Fauna Perus* **1:** 211–221. (Nachdruck).

Mandl, K. 1958: Beiträge zur Kenntnis der Insektenfauna Boliviens 5, Coleoptera 4, Cicindelidae. *Opuscula Zoologica* **11:** 1–12.

Moravec J. 2002: *Tiger beetles of Madagascar 2. A monograph of the genus Physodeutera* (*Coleoptera: Cicindelidae*). Nakladatelství Kabourek, Zlín, 290 pp.

Moravec J. 2007: *Tiger beetles of Madagascar 1. A monograph of the genus Pogonostoma (Coleoptera: Cicindelidae)*. Nakladatelství Kabourek, Zlín, 499 pp.

Moravec J. 2010: *Tiger beetles of the Madagascan Region (Madagascar, Seychelles, Comoros, Mascarenes, and other islands. Taxonomic revision of the 17 genera occurring in the region (Coleopterea: Cicindelidae)*. Biosférická rezervace Dolní Morava, o.p.s., Lednice na Moravě, Czech Republic, 429 pp.

Moravec J. 2012a: Taxonomic and nomenclatorial revision within the Neotropical genera of the subtribe Odontochilina in a new sense – 1. Some changes in taxonomy and nomenclature within the genus *Odontocheila* (Coleoptera: Cicindelidae). *Acta Musei Moraviae, Scientiae Biologicae* **97(2):** 13–33.

Moravec J. 2012b: Taxonomic and nomenclatorial revision within the Neotropical genera of the subtribe Odontochilina W. Horn in a new sense – 2. Brzoskaicheila gen. nov., a new genus for Cicindela hispidula Bates, 1872, and Brzoskaicheila crassisculpta sp.nov. (Coleoptera: Cicindelidae). *Acta Musei Moraviae, Scientiae Biologicae* **97(2):** 35–48.

Moravec J. 2012c: Taxonomic and nomenclatorial revision within the Neotropical genera of the subtribe Odontochilina W. Horn in a new sense – 3. Pentacomia (Mesacanthina) punctum (Klug) and P. (M.) ronhuberi sp.nov. (Coleoptera: Cicindelidae). *Acta Musei Moraviae, Scientiae Biologicae* **97(2):** 49–63.

Moravec J. 2013: Taxonomic and nomenclatorial revision within the Neotropical genera of a subtribe Odontochilina W. Horn in a new sense – 4. A new species and a new synonymy within the genus *Odontocheila*. (Coleoptera: Cicindelidae). *Acta Musei Moraviae, Scientiae Biologicae* **98(1):** 53–73.

Moravec J. 2014: Taxonomic and nomenclatorial revision within the Neotropical genera of the subtribe Odontocheilina W. Horn in a new sense – 9. *Odontocheila pentacomioides* W. Horn, 1900 comb. restit.; *O. cyanella pseudomargineguttata* W. Horn, 1930 syn. nov., a junior synonym of *O. spinipennis* Chaudoir, 1843. *Acta Musei Moraviae, Scientiae biologicae* (Brno) **99(1):** 47–64.

Moravec J. 2015: Taxonomic and nomenclatorial revision within the Neotropical genera of the subtribe Odontochilina W. Horn in a new sense – 11.The genus *Cenothyla* Rivalier, 1969 (Coleoptera: Cicindelidae). *Studies and Reports Taxonomical Series* **11(1):** 77– 122.

Moravec J. & Brzoska D. 2013: Taxonomic and nomenclatorial revision within the Neotropical genera of the subtribe Odontochilina W. Horn in a new sense – 5. A new species of the genus *Pentacomia* from Costa Rica. *Acta Musei Moraviae, Scientiae Biologicae* **98(1):** 75–84.

Moravec J. & Brzoska D. 2014a: Taxonomic and nomenclatorial revision within the Neotropical genera of the subtribe Odontocheilina W. Horn in a new sense – 7. *Pentacomia* (*Pentacomia*) *davidpearsoni* sp.nov., a new species from Bolivia related to *P.* (*P.*) *speculifera* (Brullé) (Coleoptera: Cicindelidae). *Acta Musei Moraviae, Scientiae biologicae* (Brno) **99(1):** 15–33.

Moravec J. & Brzoska D. 2014b: Taxonomic and nomenclatorial revision within the Neotropical genera of the subtribe Odontocheilina W. Horn in a new sense – 8. Redescription and lectotype designation of *Pentacomia* (*Pentacomia*) *lanei* (W. Horn), with a new record from Paraguay. *Acta Musei Moraviae, Scientiae biologicae* (Brno) **99(1):** 35–46.

Moravec J. & Brzoska D. 2014c: Taxonomic and nomenclatorial revision within the Neotropical genera of the subtribe Odontocheilina W. Horn in a new sense – 10. *Odontocheila castelnaui* species-group (Coleoptera: Cicindelidae). *Studies and Reports Taxonomical Series* **10(2):** 495–526.

Moravec J. & Brzoska D. 2015: Taxonomic and nomenclatorial revision within the Neotropical genera of the subtribe Odontocheilina W. Horn in a new sense – 12. *Odontocheila angelsolisi* spec. nov., *O. mirekskrabali* sp.nov. and related species of a newly proposed *Odontocheila cajennensis* species-group (Coleoptera: Cicindelidae). *Acta Musei Moraviae, Scientiae biologicae* (Brno) **100(1):** 23–66.

Moravec J. & Duran D. P. 2013: Taxonomic and nomenclatorial revision within the Neotropical genera of the subtribe Odontochilina W. Horn in a new sense. 6. *Odontocheila fraternum* sp.nov., a new species sister to *O. gilli* (Coleoptera: Cicindelidae). *Acta Entomologica Musei Nationalis Pragae* **53:** 585–599.

Moravec J. & Huber R. 2015: Taxonomic and nomenclatorial revision within the Neotropical genera of the subtribe Odontocheilina W. Horn in a new sense . 13. The genus *Mesacanthina* Rivalier, stat.nov., separated from the genus *Pentacomia* Bates (Coleoptera: Cicindelidae), *Acta Musei Moraviae, Scientiae biologicae* (Brno) **100(1):** 67–114.

Nichols S. W. 1989: *The Torre-Bueno glossary of entomology, revised edition of Torre Bueno (Rollin J.) 1937: A glossary of entomology including Tulloch G. S. 1962*: Supplement A. The New York Entomological Society, American Museum of Natural History, New York, 840 pp.

Pearson D. L., Buestán J. & Navarrete R. 1999: The Tiger beetles of Ecuador: their Identification, Distribution and Natural History (*Coleoptera*: *Cicindelidae*). *Contributions on Entomology, International* **3(2):** 185–315.

Pearson D. L., Guerra J. F. & Brzoska D. W. 1999: The Tiger beetles of Bolivia: their Identification, Distribution and Natural History (Coleoptera: Cicindelidae). *Contributions on Entomology, International* **3(4):** 379–524.

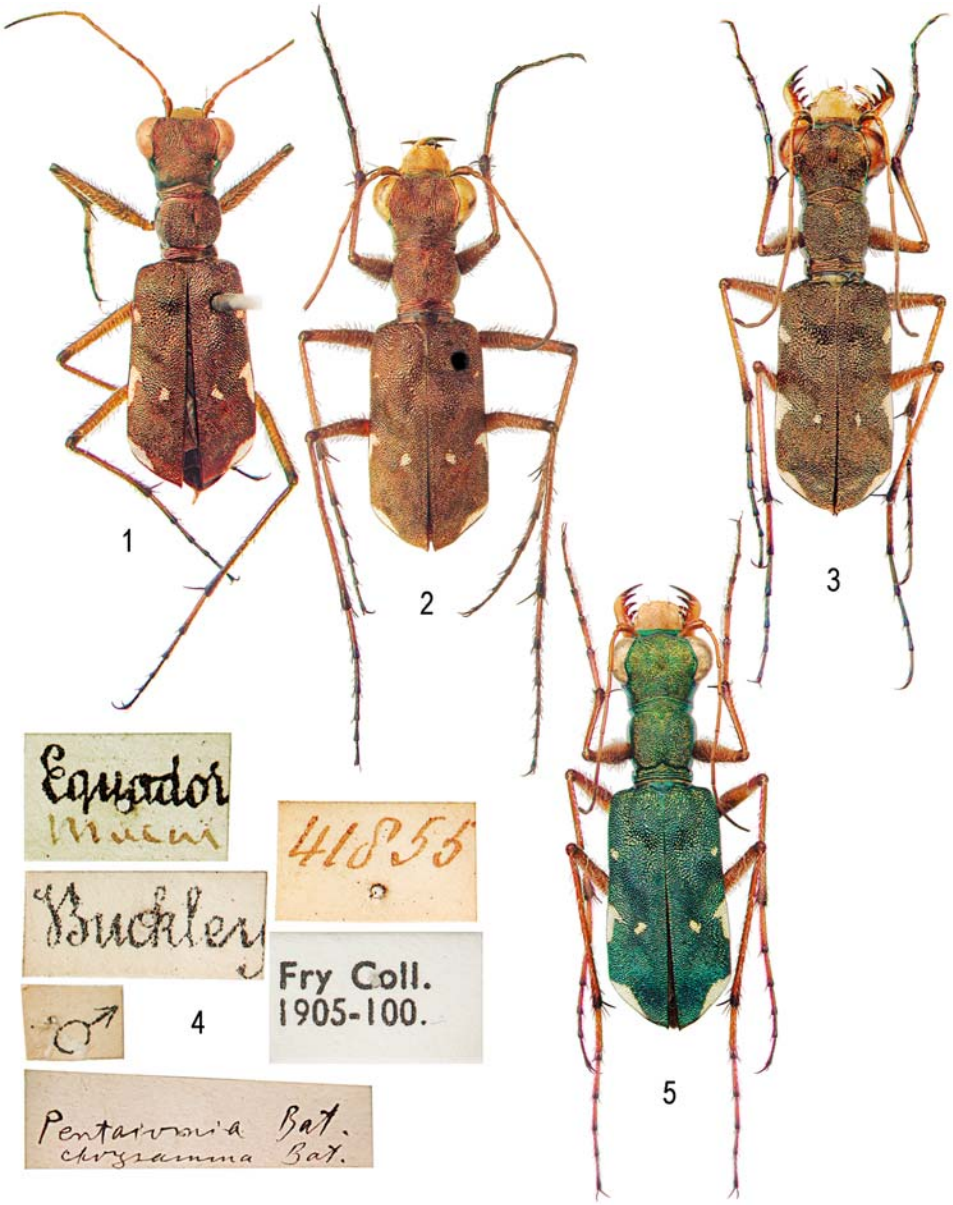
Pearson D. L. & Huber R. L. 1995: The tiger beetles of Pakitza, Madre de Dios, Peru: identification, natural history and a comparison to the Peruvian fauna (Coleoptera: Cicindelidae). *Cicindela* **27(1/2):** 1–28.

Rivalier E. 1969: Démembrement du genre Odontochila (Col. Cicindelidae) et Révision des principales espèces. *Annales de la Société Entomologique de France (N. S.)* **5:** 195–237.

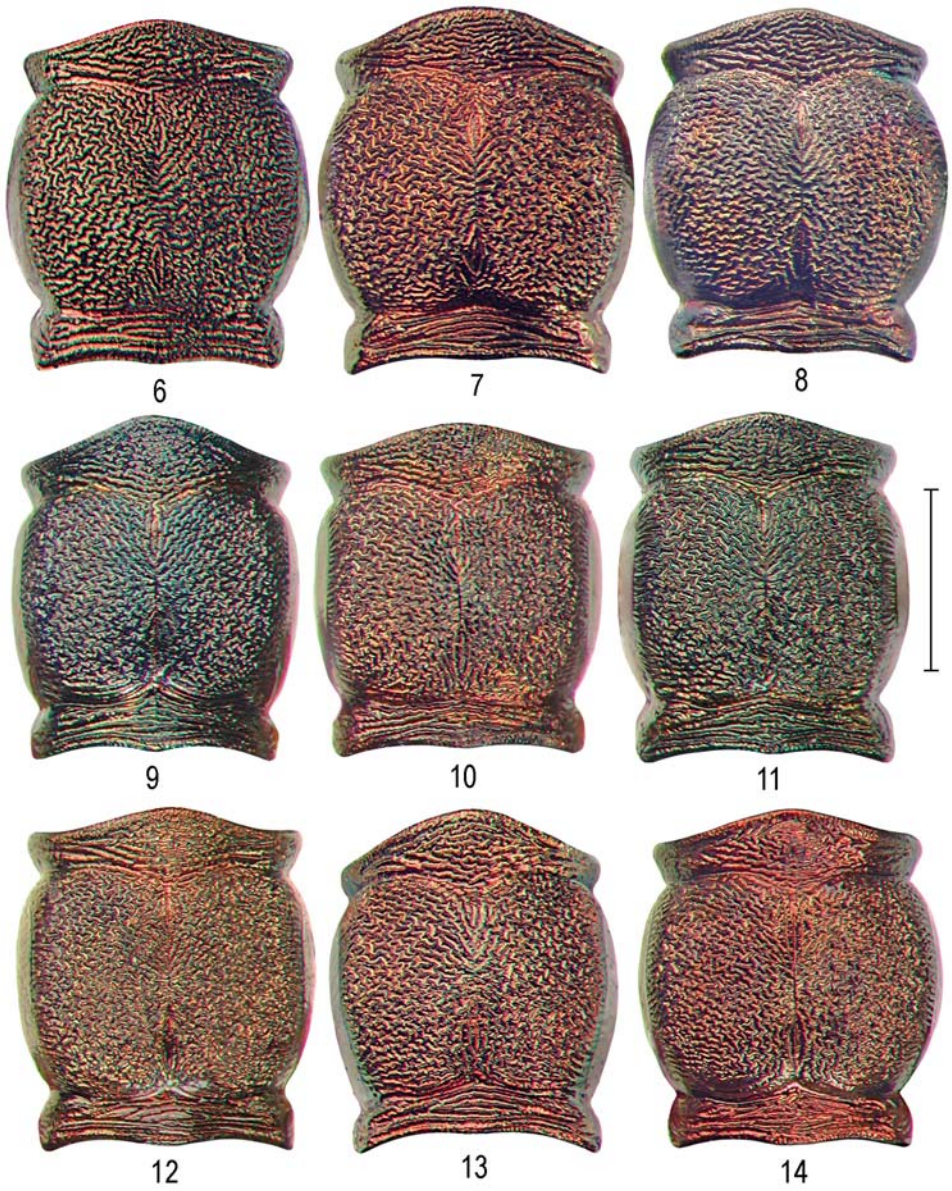
Rivalier E. 1971: Remarques sur la tribu des Cicindelini (Col. Cicindelidae) et sa subdivision en sous-tribus. *Nouvelle Revue d'Entomologie* **1:** 135–143.

Schilder F. A. 1953: Studien zur Evolution von Cicindela. *Wissenschaftliche Zeitschrift der Martin-Luther-Universität Halle-Wittenberg* **3:** 539–576.

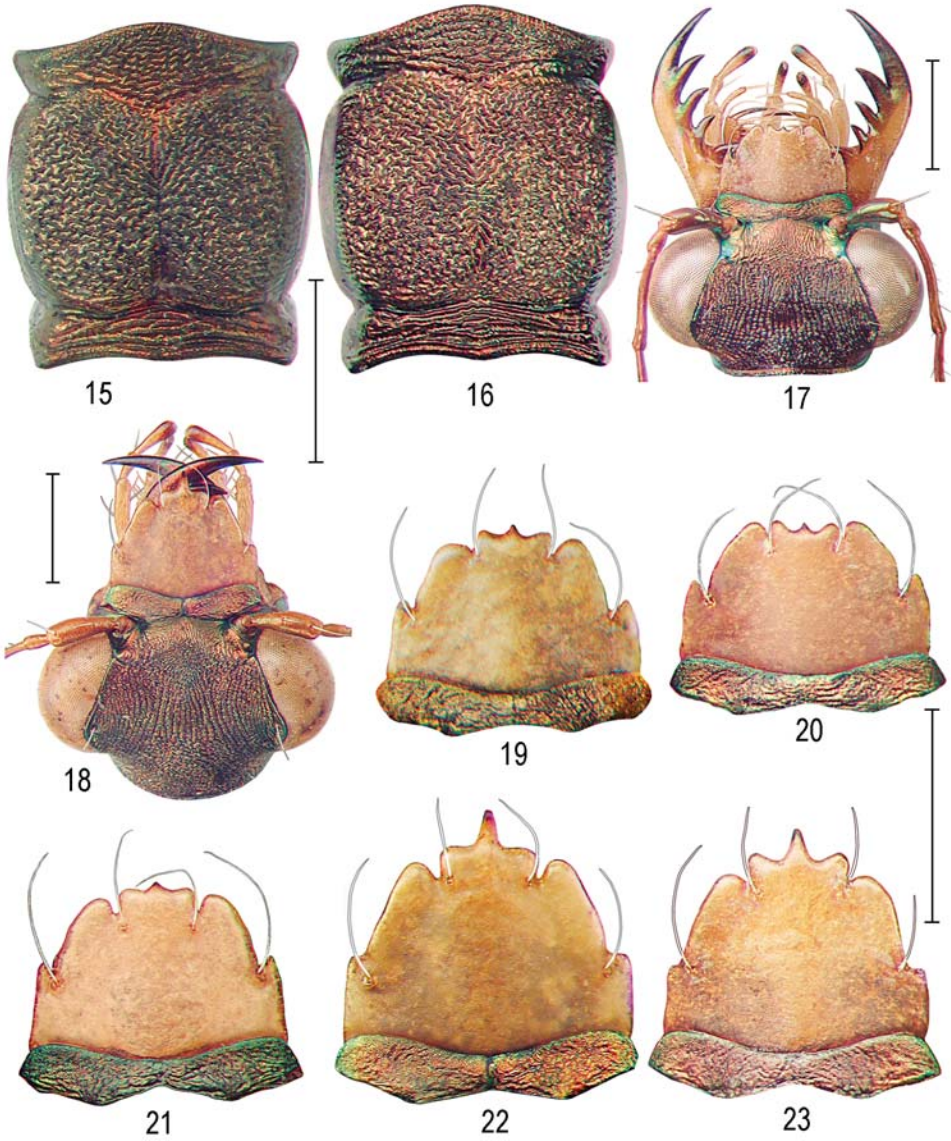
Wiesner J. 1992: *Verzeichnis der Sandlaufkäfer der Welt. Checklist of the tiger beetles of the world (Coleoptera, Cicindelidae)*. Keltern, Verlag Erna Bauer, 364 pp.



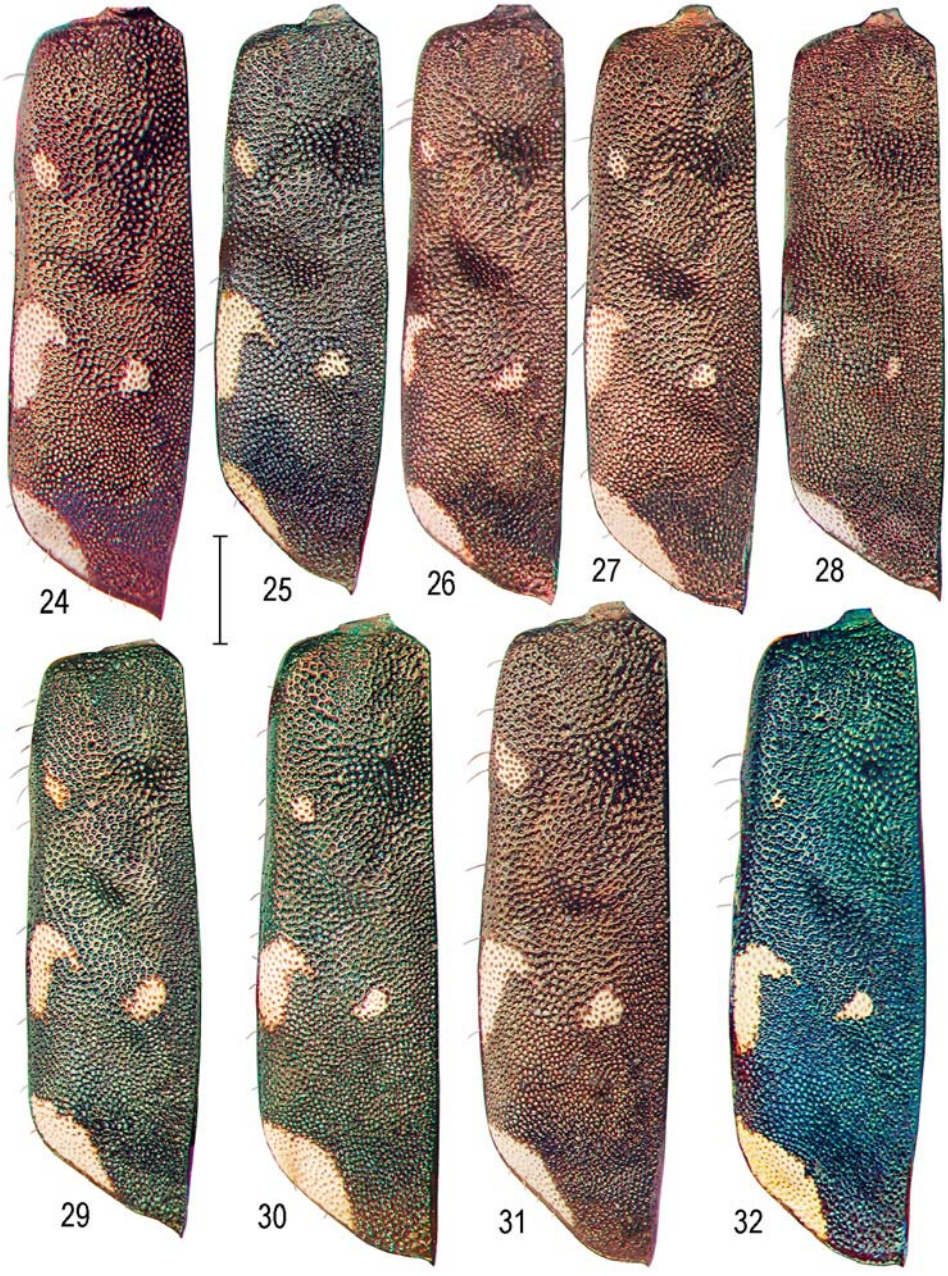
Figs 1–5. *Pentacomia* (*P.*) *chrysamma*. 1 – ♂, 9.1 mm, Ecuador, Macas, LT (BMNH); 2 – ♂, 9.3 mm, Macas, PLT (MNHN); 3 – ♂, 8.3 mm, Ecuador, Sucumbios (CDCL); 4 – labels of LT; 5 – ♂ 9.7 mm, Peru, Madre de Dios, Cana Brava (DBCN).



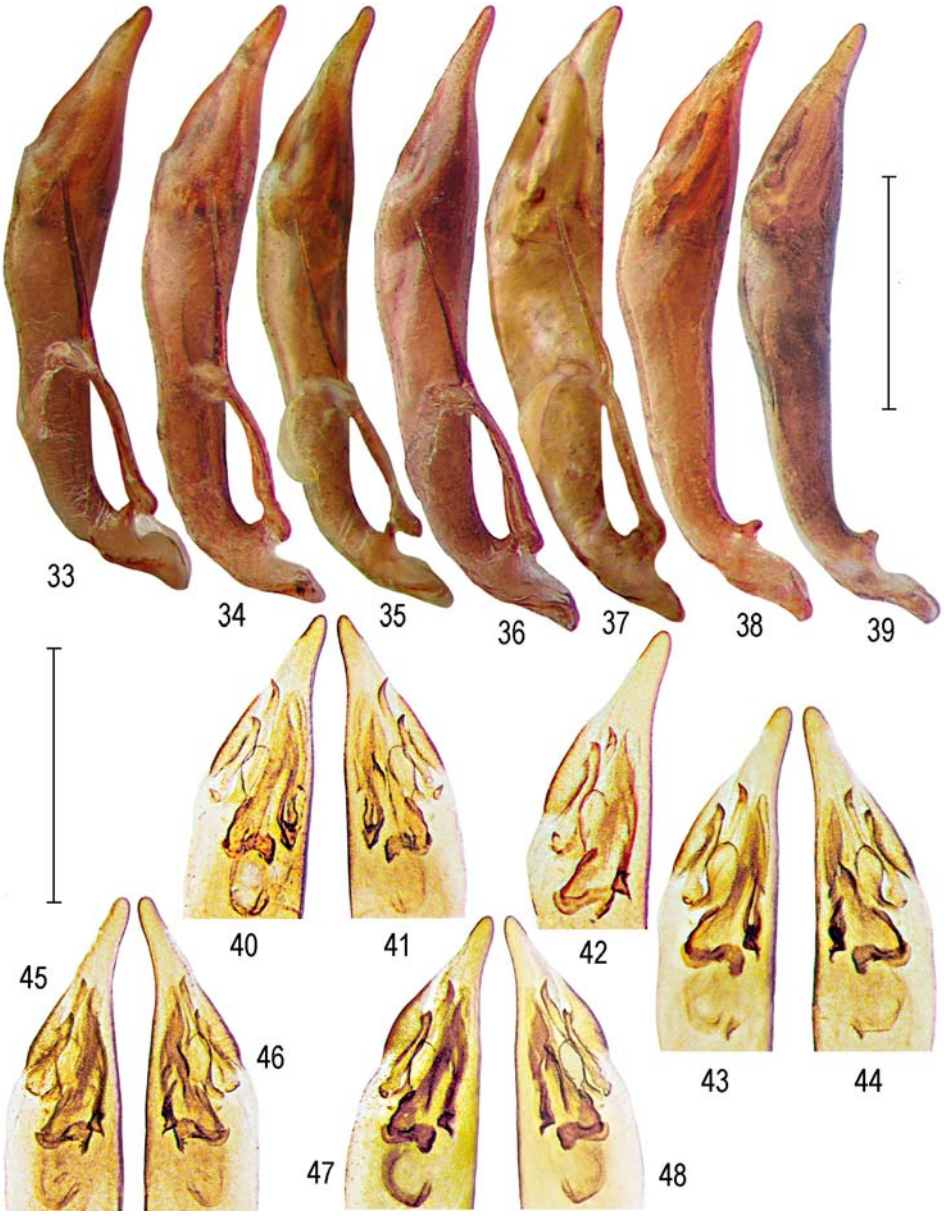
Figs 6–14. *Pentacomia* (*P.*) *chrysamma*, male pronotum: 6 – Ecuador, Macas, LT (BMNH); 7 – Macas, PLT (MNHN); 8–10 – Puyo – Macas (DBCN); 11–12 – Ecuador, Patuca (DBCN); 13 – Ecuador, San Ramon, Rio Napo (CCJM); 14 – Peru, Loreto (DBCN). Bar = 1 mm.



Figs 15–23. *Pentacomia* (*P.*) *chrysamma*. 15–16 – pronotum (all from Ecuador): 15 – ♀, Ecuador, Macas, PLT (MNHN); 16 – ♀, El Reventador (CCJM); 17–18: head: 17 – ♂, Rio Napo (CCJM); 18 – ♀, Macas, PLT (MNHN); 19–23 – labrum: 19 – ♂, Macas, LT (BMNH); 20 – ♂, Rio Napo (CCJM); 21 – ♂, Patuca (DBCN); 22 – ♀, Macas, PLT (MNHN); 23 – ♀, Rio Napo (CCJM). Bars = 1 mm.

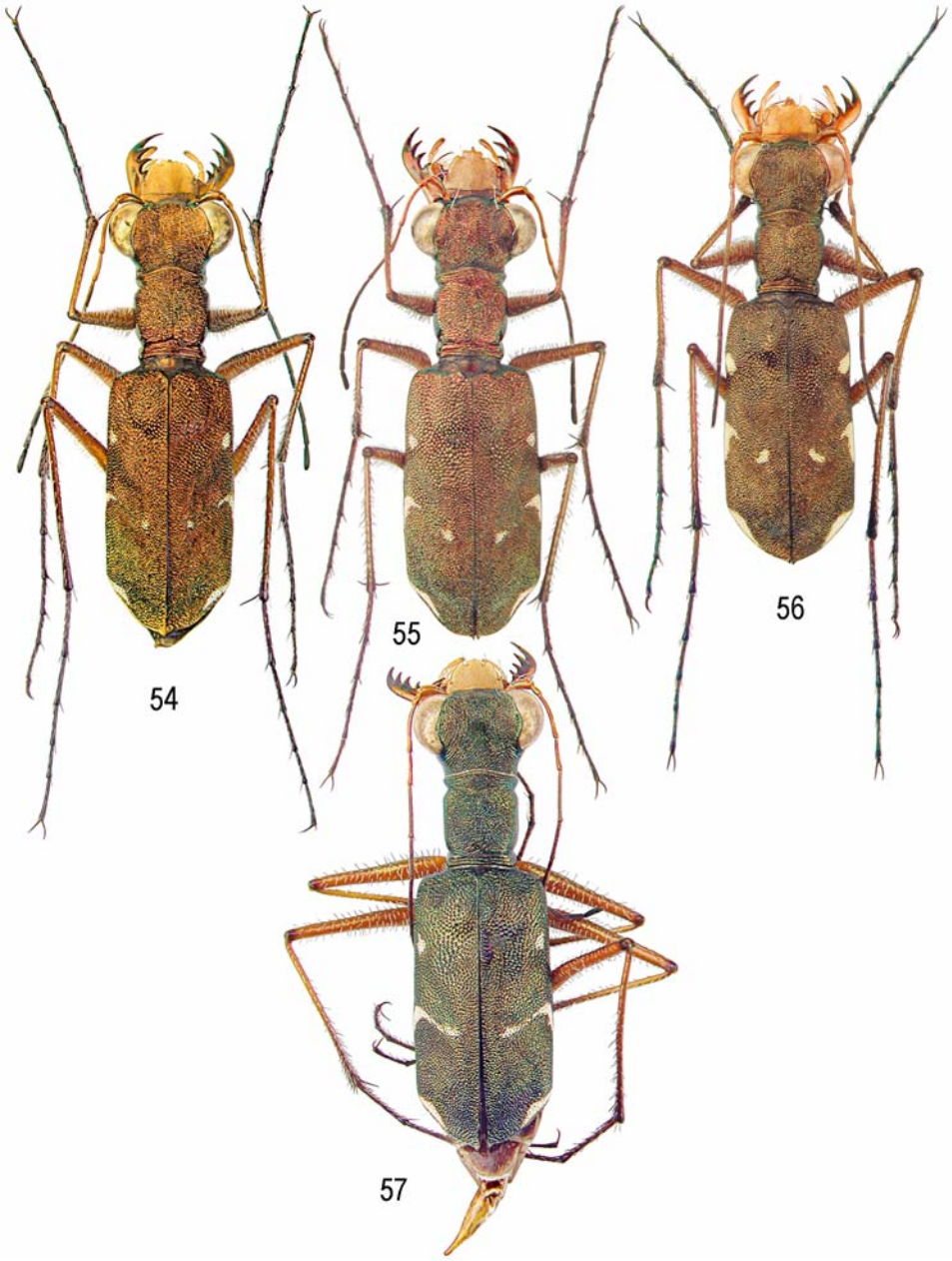


Figs 24–32. *Pentacomia* (*P.*) *chrysamma*, elytron: 24 – ♂, Ecuador, Macas, LT (BMNH); 25–26 – ♂, Ecuador, Puyo – Macas (DBCN); 27 – ♂, Ecuador, Rio Napo (CCJM); 28 – ♂, Ecuador, San Ramon, Rio Napo (CCJM); 29 – ♂, Ecuador, Patuca (DBCN); 30 – ♂, Bolivia, Yungas La Paz (MFNB); 31 – ♀, Ecuador, Macas, PLT (MNHN); 32 – ♀, "Pérou" (MNHN). Bar = 1 mm.

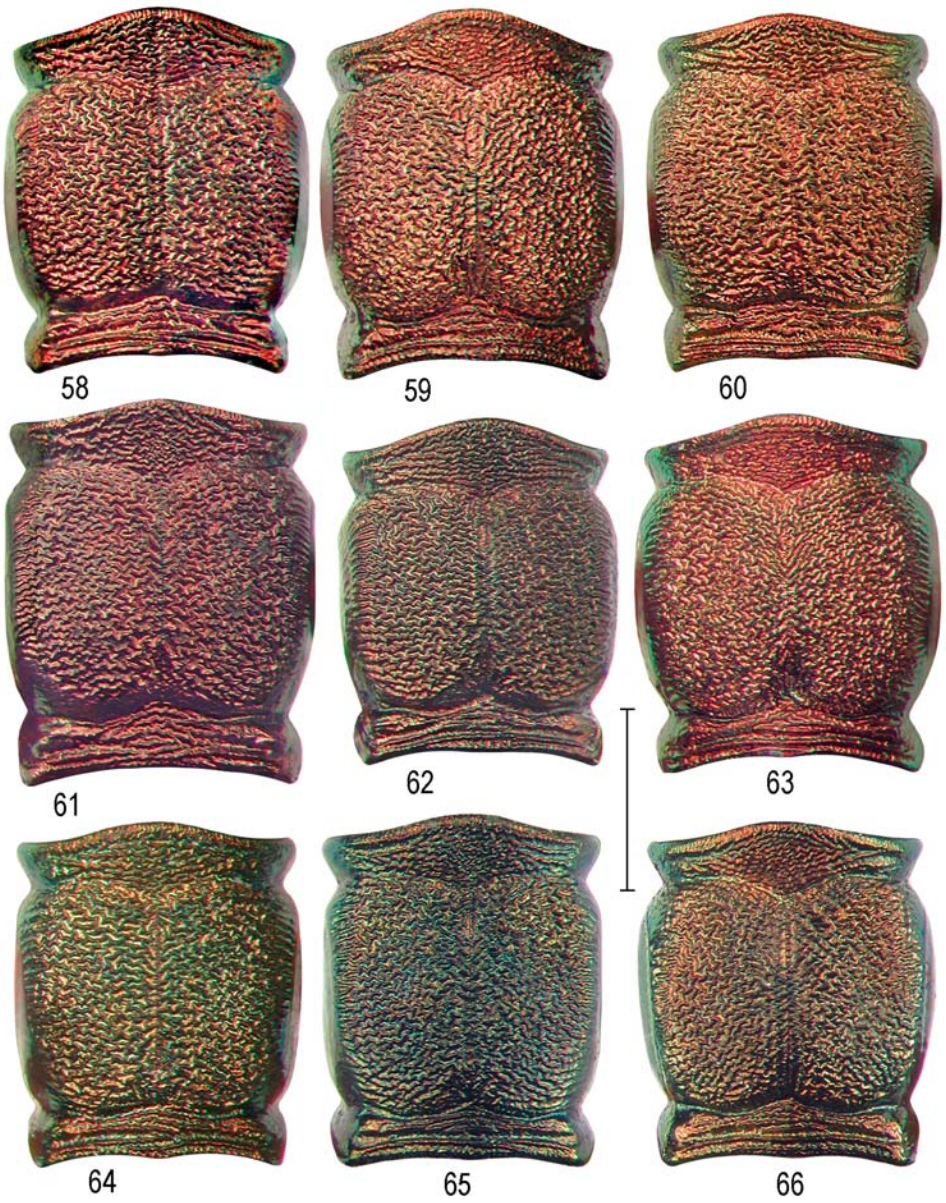


Figs 33–48. *Pentacomia* (*P.*) *chrysamma*. 33 – 39 – aedeagi: 33–34 – Ecuador, Puyo – Macas (DBCN); 35–36 – Ecuador, Patuca (DBCN); 37 – Peru, Marcapata (SDEI); 38 – Peru, Loreto (DBCN); 39 – Ecuador, Rio Napo (CCJM). 40–48 – internal sac in left and right lateral view: 40–41 – Ecuador, Puyo – Macas (DBCN); 42–44 – Ecuador, Rio Napo (CCJM); 45–46 – Ecuador, Patuca (DBCN); 47–48 – Peru, Loreto (DBCN). Bar = 1 mm.

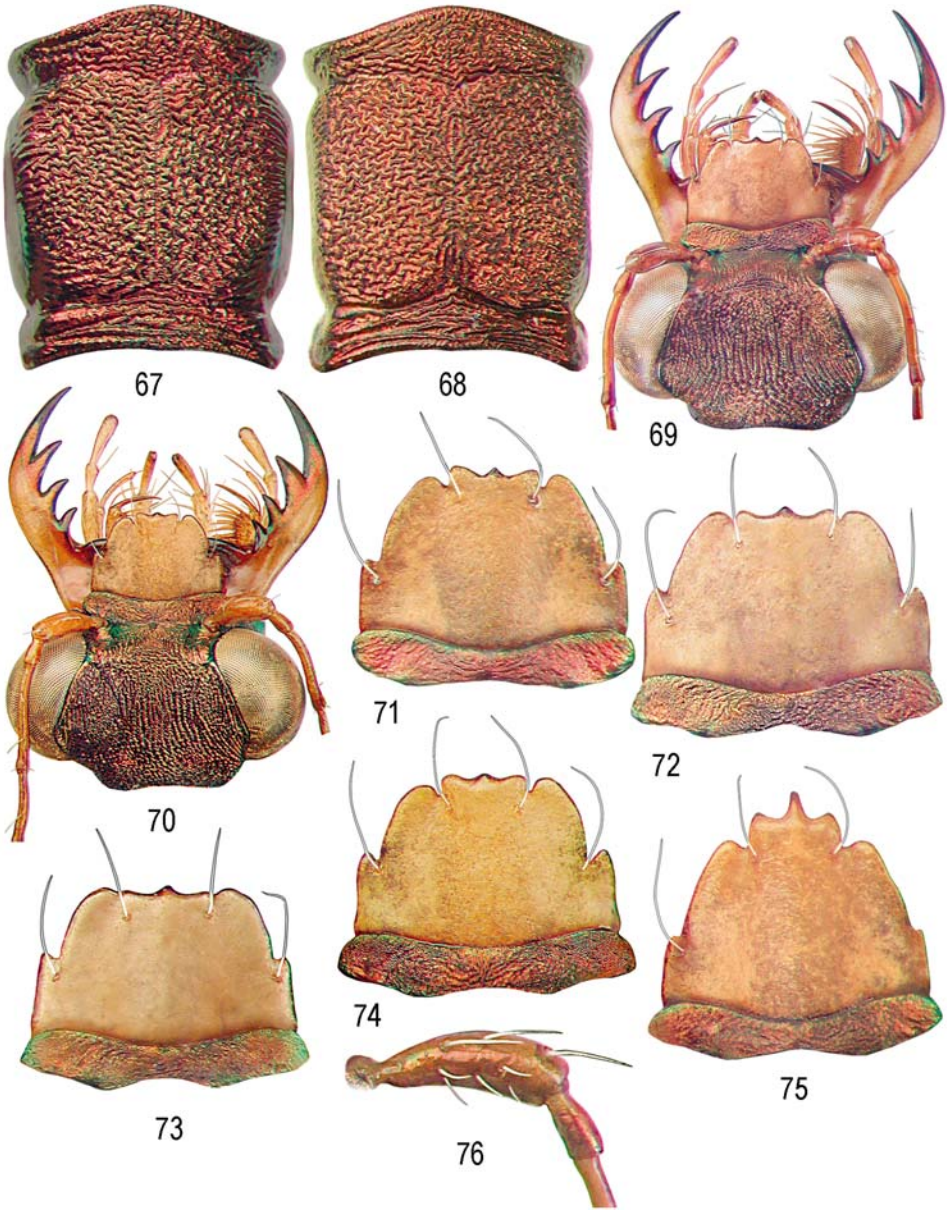
Figs 49–53. Protarsus of two species. 49–51 – *Pentacomia* (*P.*) *chrysamma*: 49 – ♂, Ecuador, Puyo – Macas (DBCN); 50 – ♂, Ecuador, Macas PLT (MNHN); 51 – ♀, Ecuador, Puyo – Macas (DBCN). 52–53 – (*P.*) *chrysammoides* sp.nov.: 52 – ♂, Bolivia, Amboro, HT (MNHN); 53 – ♀ Amboro, AT (COSJ). Bars = 1 mm.



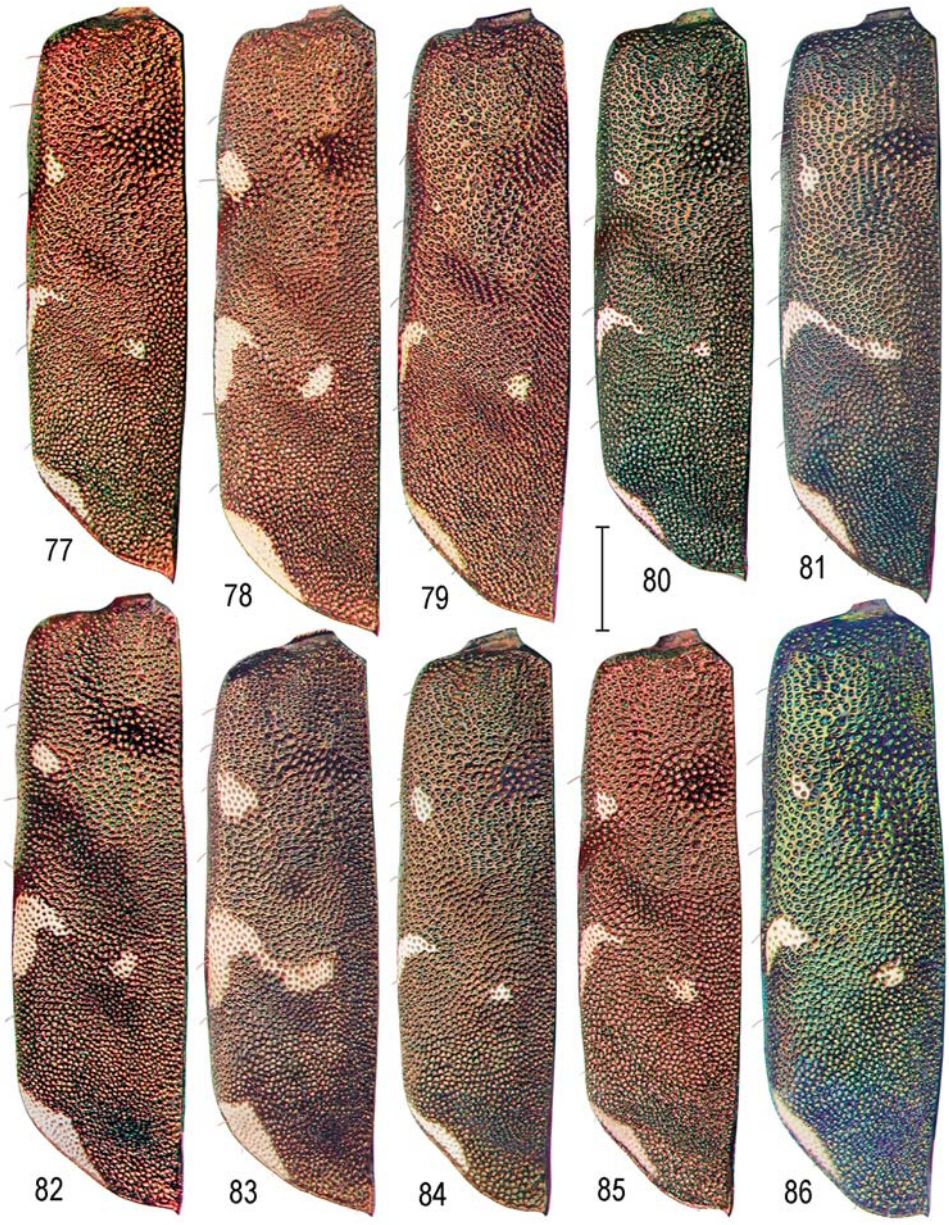
Figs 54–57. *Pentacomia* (*P.*) *chrysammoides* sp.nov. 54 – ♂, 9.2 mm, Bolivia, Amboro, HT (MNHN); 55 – ♀, 9.3 mm, Amboro, AT (COSJ); 56 – ♂, 9.7 mm, Amboro, PT (CCJM); 57 – ♂, 8 mm, Bolivia, Rio Chimore (DBCN).



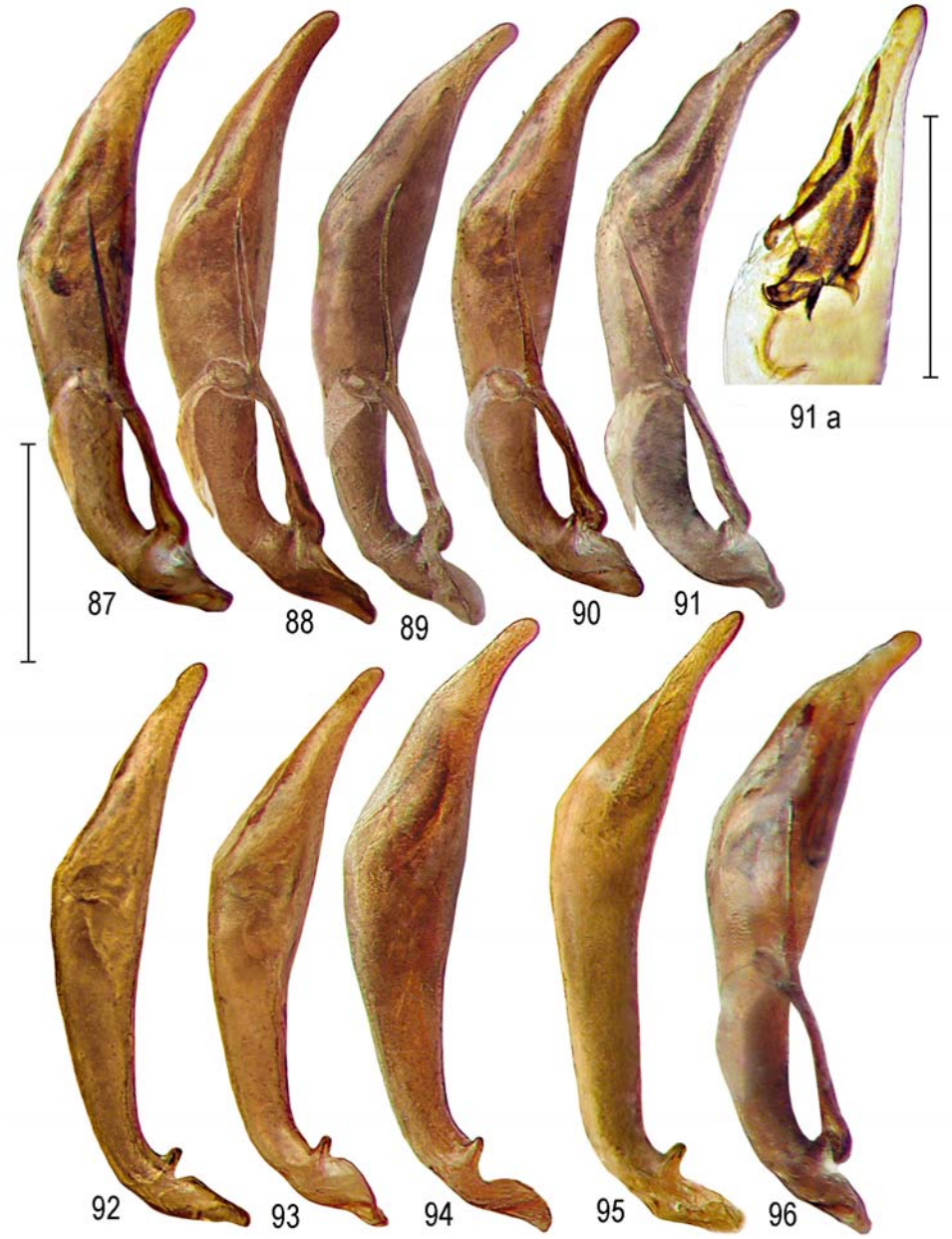
Figs 58–66. *Pentacomia* (*P.*) *chrysammoides* sp.nov. from Bolivia, male pronotum: 58 – Amboro, HT (MNHN); 59 – Amboro, PT (CCJM); 60 –Rio Estijo (CCJM); 61 – Buena Vista (CCJM); 62 – Buena Vista (CCJM); 63 – Alto Madidi (CDCL); 64–65 – Rio Chimore (DBCN); 66 – Villa Tunari (ASUT). Bar = 1 mm.



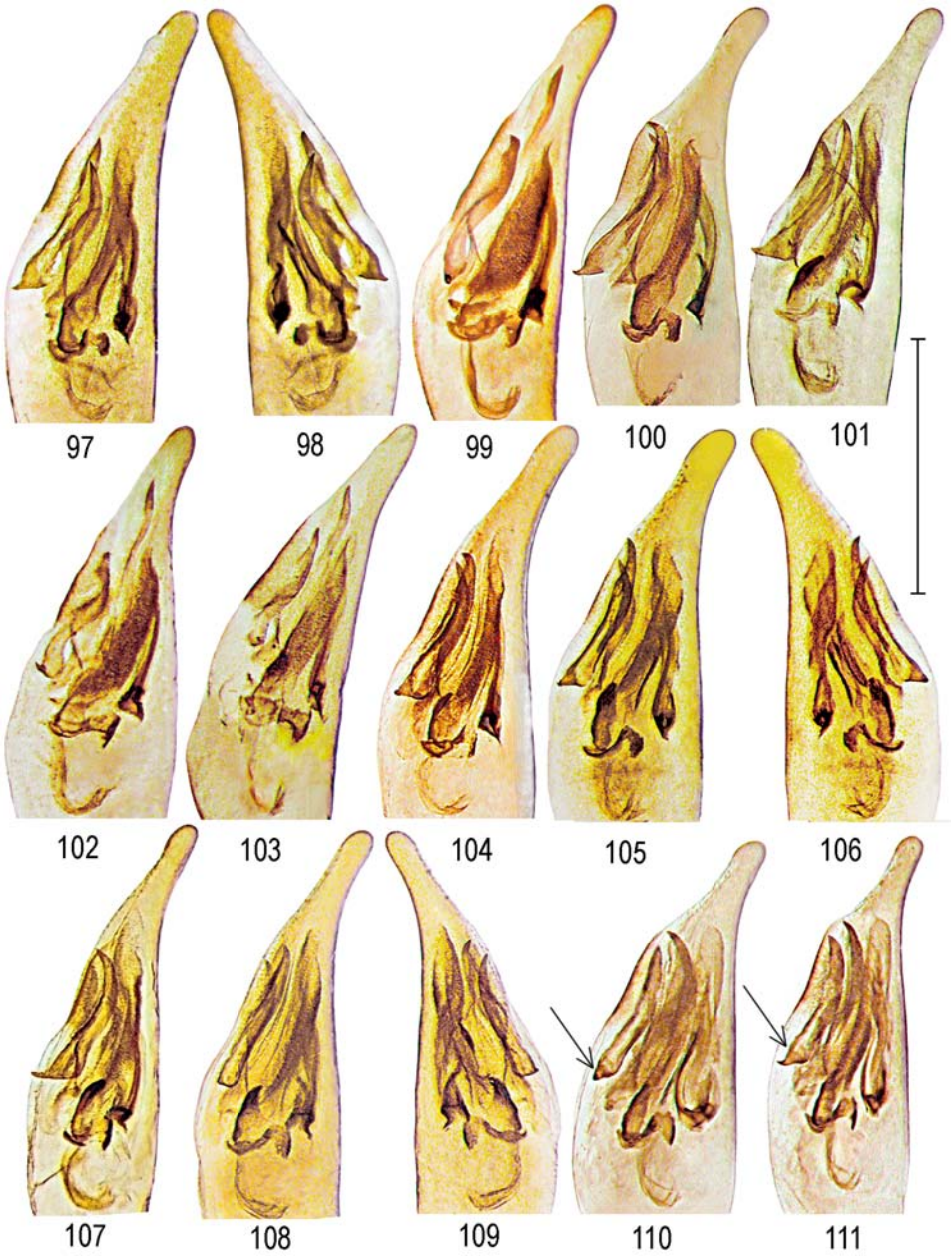
Figs 67–76. *Pentacomia* (*P.*) *chrysammoides* sp.nov. 67–68 – pronotum: 67 – ♀, Bolivia, Amboro, AT (COSJ); 68 – ♀, Peru, Rio Alto Madre de Dios (DBCN); 69–70 (all from Bolivia) – head: 69 – ♂, Amboro, PT (CCJM); 70 – ♂, Alto Madidi (CDCL); 71–75 labrum: 71 – ♂, Amboro, HT; 72 – ♂, Amboro, PT (CCJM); 73 – ♂, Villa Tunari (ASUT); 74 – ♂, Alto Madidi (CDCL); 75 – ♀, Amboro, AT (COSJ); 76 – antennal scape, La Paz, Sapecho (CCJM). Bars = 1 mm.



Figs 77–86. *Pentacomia* (*P.*) *chrysammoides* sp.nov. (from Bolivia), elytron: 77 – ♂, Amboro, HT (MNHN); 78 – ♂, Amboro, PT (CCJM); 79 – ♂, Rio Yucumo (DBCN); 80–81 – ♂, Rio Chimore (DBCN); 82 – ♂, Alto Madidi (CDCL); 83 – ♂, Villa Tunari (DBCN); 84 – ♀, ibid.; 85 – ♀, Amboro, AT (COSJ); 86 – ♀, Rio Chimore (DBCN). Bar = 1 mm.



Figs 87–96. *Pentacomia* (*P.*) *chrysammoides* sp.nov., aedeagi (87–95 from Bolivia): 87 – Amboro, HT (MNHN); 88 – ♂, Rio Estijo (CCJM); 89 – La Paz, Sapecho (CCJM). 90 – Rio Yucumo (CCJM); 91 – Guanay (CCJM); 91a – ditto, internal sac; 92 – Rio Chimore (ASUT); 93 – Rio Chimore (DBCN); 94 – Santa Cruz, Espejillos (CCJM ex COSJ); 95 – Alto Madidi (CDCL); 96 – Peru, Rio Alto Madre de Dios (CCJM). Bar = 1 mm.



Figs 97–111. *Pentacomia* (*P.*) *chrysammoides* sp.nov., internal sac (left and right lateral view, 97–109 from Bolivia): 97–98 – Amboro, HT (MNHN); 99 – Amboro, PT (CCJM); 100 – Santa Cruz, Espejillos, (CCJM); 101 – Villa Tunari (ASUT); 102 – Rio Estijo (CCJM); 103 – Alto Madidi (CDCL); 104 – Buena Vista (CCJM); 105–106 – Rio Yucumo (CCJM); 107 – Rio Chimore (ASUT); 108–109 – La Paz, Sapecho (CCJM); 110 – Peru, Rio Alto Madre de Dios (CCJM); 111 – ditto, slightly turned – note the changed appearance, particularly of the mucronate base of the dorsal piece (arrows). Bar = 1 mm.