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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)

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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* (Brno) **98(1)**: 53–73. – Three species of *Odontocheila* Laporte de Castelnau, 1834 are presented. *Odontocheila howdeni* Nidek, 1980 syn.nov. is here synonymized with *O. hamulipenis* W. Horn, 1933, and an externally similar *O. davidbrzoskai* sp.nov. is described as a new species for science. While *O. hamulipenis* is known only from Colombia, the new species, distinguished particularly by the different shape of its aedeagus, is described from two rather distant localities in Panama. Detailed redescriptions of *O. hamulipenis* according to the male holotype (by monotypy) and other specimens, as well as of another barely known species *O. angulipenis* W. Horn, 1932, are presented, and a lectotype of the latter here designated. Illustrations of diagnostic characters of the type and other specimens of all these taxa are presented in colour photographs. In addition, *O. iodopleuroides* Mandl, 1972 (originally lacking a locality label), is here excluded from the genus *Odontocheila*, because examination of the holotype (by monotypy) has revealed that it is East Asian species *Prothyma heteromala* MacLaey, 1825.

Keywords. Coleoptera, Cicindelidae, *Odontocheila*, taxonomy, new synonymy, new species, excluded species

Introduction

The present paper follows the previously published papers (MORAVEC 2012a,b,c; DURAN & MORAVEC 2013) submitted in order to publish important taxonomic and nomenclatorial results to be available before the completion of a final comprehensive publication which will provide a thorough revision of the Neotropical genera of the subtribe Odontochilina W. Horn, 1899 in a new sense. The subtribe is here defined exclusively for the Neotropical genera, thus tentatively separated from the subtribe Prothymina W. Horn, 1910 sensu RIVALIER (1969, 1971). The reason for such a classification, as discussed in MORAVEC (2012a), is that in contrast to the characters given by RIVALIER (1969, 1971) for his wide concept of the subtribe Prothymina, many species of the Neotropical Odontochilina placed within Prothymina by Rivalier, possess a setal vesture developed to various degrees. Alternatively, the wider concept of the subtribe Prothymina may be maintained, but newly defined regarding the chaetotaxy, and thus extended to include also genera with developed setal vesture.

In this paper, three species of *Odontocheila* Laporte de Castelnau, 1834 are presented. Two of them are externally similar: *O. hamulipenis* W. Horn, 1933 occurring in Colombia, and *Odontocheila davidbrzoskai* sp.nov. from Panama, described here as a new species for science, distinguished particularly by the shape of its aedeagus.

Based on type examination, *O. howdeni* Nidek, 1980 proved to be a junior synonym of *O. hamulipenis* W. Horn, 1933. Detailed redescriptions of *O. hamulipenis* (originally based on only male holotype) and of the here designated lectotype of *Odontocheila angulipenis* W. Horn, 1932, are presented. These two species were not treated by RIVALIER (1969) in his incomplete revision of *Odontocheila*.

Illustrations of diagnostic characters in colour photographs here presented reflect also a certain variability of these three species.

Examination of the holotype (by monotypy) of *Odontocheila iodopleuroides* Mandl, 1972, originally lacking a locality label, has revealed that it is East Asian species *Prothyma heteromala* MacLaey, 1825. Therefore, this species is here excluded from the genus *Odontocheila*.

It should also be noted that the spelling "*Odontochila*" is an unjustified emendation of the genus-group name by AGASSIZ (1846), also followed by several other authors, including RIVALIER (1969).

Material and Methods

The body length is measured without the labrum and means the distance from the anterior margin of the clypeus to the elytral apex (including the sutural spine). The width of the pronotum is measured including lateral margins of proepisterna (when the proepisterna and the notopleural sutures are visible in dorsal view). The width of the head is measured across the eyes and means the distance between the outer margin of the eyes. All dimensions of the aedeagi are measured (and primarily figured) in their left lateral position where the basal portion (with basal orifice) points to the right while the left lateral outline (with dorsoapical orifice) faces dorsally. The treatment and mounting of the aedeagi, in order to observe the structure of the internal sac were made by the usual method modified (and the structure explained) in MORAVEC (2002, 2010). The colour photographs (both of the habitat and diagnostic characters, including aedeagi) were taken with a Nikon digital camera Coolpix 990 through an MBS-10 binocular stereomicroscope.

Labels are cited by following way: lines on the same label are separated by slash /, the labels by double-slash //. The colour of the label and mode of writing appear in square brackets (in type specimens only).

Following abbreviations of type status are used in legends under the illustrations: HT = holotype; PT = paratype, AT = allotype; LT = lectotype; PLT = paralectotype.

Abbreviations for the collections in which the material is held:

BMNH . . . . . The Natural History Museum London, U.K.
CCJM . . . . . Collection Cicindelidae Jiří Moravec, Adamov, Czech Republic
CMNC . . . . . Canadian Museum of Nature, Ottawa, Canada
DBCN . . . . . David W. Brzoska Collection, Naples, Florida, U.S.A.
DDCP . . . . . Daniel P. Duran Collection, Philadelphia, Pennsylvania, U.S.A.
IAVH . . . . . Alexander von Humboldt Institute, Medellin, Colombia
IRSNB . . . . . Institut Royal des Sciences Naturelles de Belgique, Brussels, Belgium

MNHN . . . . . Muséum national d'Histoire naturelle, Paris, France
MFNB . . . . . Museum für Naturkunde – Leibniz Institute for Research on Evolution and Biodiversity at the Humboldt University, Berlin, Germany
MZMB . . . . . Entomology department of the Moravian Museum, Brno, Czech Republic
NHMK . . . . . .Natural History Museum, University of Kansas, Lawrence, Kansas U.S.A
NMPC . . . . . National Museum (Entomological Department), Prague, Czech Republic
RLHC . . . . . Collection Ronald L. Huber, Bloomington, Minnesota, U.S.A.
SDEI . . . . . Senckenberg Deutsches Entomologisches Institut, Müncheberg (formerly DEI, Eberswalde), Germany
STRI . . . . . The Smithsonian Tropical Institute, Panama
USNM . . . . . Smithsonian Institution, Entomology, Washington DC, U.S.A.
ZMAN . . . . . Zoological Museum Amsterdam (later BDC, Naturalist, Leiden) Netherlands

T a x o n o m y

Odontocheila hamulipenis W. Horn, 1933 (Figs 1–3, 7–26)

Odontochila hamulipenis W. Horn, 1933: 76, fig. 18.
Type locality. Colombia.

Odontochila howdeni Nidek, 1980: 130, fig. 3, **syn.nov.**
Type locality. Colombia: Anchicaya Dam, 70 km east of the Buenaventura (Valle de Cauca province).

Odontocheila hamulipenis Wiesner 1992: 78
Odontocheila howdeni: Wiesner 1992: 80.

Type material. Holotype (by monotypy) of *O. hamulipenis* W. Horn: ♂ in SDEI, labelled: "Columbia, ex cab. Brown [handwritten] // "Col. Ehlers / V. de Pol" [printed] // "Od. hamulipenis m" [handwritten] // "Type / W. Horn" [printed] // "Holotypus" [red, printed] // "Hamulipe- / nis / m [greenish with black frame, handwritten] // "Odontocheila hamulipenis / W. HORN TYPE (DEI–Eberswalde) / borrowed by D. L. Pearson / 23. Oct. 1996 (drawer 59)" [printed] // "Revision Jiří Moravec 2012: / HOLOTYPE (by monotypy) / Odontochila / hamulipenis W. Horn, 1933" [red, printed] // "Odontocheila / hamulipenis W. Horn. 1933 / det. Jiří Moravec 2012" [printed].
Type material of synonyms. Holotype of *O. howdeni* Nidek in CMNC labelled: "1200′, Anchicaya Dam, / 70 km E. Buenaventura, / Valle, Colombia, VII.27, / 1970, H. & A. Howden" [printed] // Holotype ♂, det. C. V. Nidek [printed] / Odontochila / howdeni /nov. spec." [handwritten] // "Canadian Museum of / Musée Canadien, de la / NATURE, CMNEM 00011120" [with black frame and linear code, printed]. Allotype ♀ in ZMAN: "1200′, Anchicaya Dam, / 70 km E. Buenaventura, / Valle, Colombia, VII.24. / 1970, H. & A. Howden" [printed] // Allotype ♀, / det. C. V. Nidek [printed] / Odontochila / howdeni / nov. spec." [handwritten] // Odontochila / howdeni / Van Nidek, 1980 / ZMAN type 2426.1" [red, printed]; "ex coll. C.V.Nidek" [printed]. Both type specimens labelled: "Revision Jiří Moravec 2012: / HOLOTYPE (ALLOTYPE respectively) / "Odontochila / howdeni Nidek, 1980" [red, printed] // "Odontocheila / hamulipenis W. Horn, 1933 / = *O. howdeni* Nidek, 1980 syn.nov. / det. Jiří Moravec 2013" [printed].
Other material examined. 3 ♂♂ in USNM: "B. Dagua Valle / Escalarete C D / Jul.18–21.91 / L. C. Pardo leg / Colombia" // "Homeotype male / *Odontochila howdeni* / Brouerius van Nidek / compared to Holotype / R. L. Huber, 25.X.2002". 1 ♂ in MFNB: "Nr 96" // "COLUMBIEN / depto. Valle, Bajo Anchicayá / 03°46′N/77°10′W / 6.III.–23.VI.1992 / leg. K. K. GÜNTHER". 1 ♀ in RLHC: "COLOMBIA: Valle del Cauca / PN Farallones de Call Anchicayá / 3°26′N:76°48′W (730 m) / 13–27 March 2001 S. Sarria" // "Odontocheila howdeni / Brouerius van Nidek / compared to Holotype / R. L. Huber, 25.X.2002". 1 ♀ in FCCR: "COLOMBIA Chocó / Nuquí Arusí Res. "El / Amargal" 30m 30.i.94 / M.A. Bonilla" // "Da F. Fernandez / Giugno, 1998" // "ODONTOCHEILA / n. sp. ? / apud iodopleura Bates / det. F. Cassola 2000". All specimens labelled: "Odontocheila / hamulipenis W. Horn, 1933 / = *O. howdeni* Nidek, 1980 syn.nov. / det. Jiří Moravec 2013".

Redescription. Body (Figs 1–3) medium-sized, 9.20–9.70 (holotype 9.20) mm long, 2.80–3.05 (holotype 2.80) mm wide, dorsal surface dark reddish-copper with brighter cupreous areas on elytral base and pronotum with iridescent-green or blue sublateral areas of pronotum and elytra, greenish coloration sometimes prevailing.

Head (Fig.7) notably large with pronounced eyes, as wide as the body or only very slightly narrower, 2.80–3.00 mm wide, all head portions glabrous.

Frons obliquely declined towards clypeus, with distinctly convex median area, sharply delimited from clypeus and confluent with vertex over rounded frons-vertex fold, only indistinctly edged laterally above supraantennal plates which are flat and with strong metallic-green lustre; frons surface bright reddish-cupreous, sometimes with greenish lustre on lateral areas which are almost smooth or only finely longitudinally wrinkled, median area on frons-vertex fold ornamented with mostly transverse-wavy rugae which are usually surrounded by arcuate arranged wavy rugae.

Vertex with two usual juxtaorbital sensory setae (on each side), almost flat, bright reddish cupreous with greenish and bronze reflections; anteromedian area irregularly transversely wavy and arcuate rugulose (sculpture passing from frons), large juxtaorbital areas finely longitudinal parallel-striate, striae on sublateral areas coarser, longitudinal, usually divergent posteriad passing onto postgenae; occipital area very finely irregularly asperate-rugulose.

Clypeus iridescent green, sometimes with bluish lustre, rather distinctly irregularly wrinkled.

Genae metallic green-blue usually with dark violaceous lustre, almost smooth or indistinctly shallowly parallel-striate.

Labrum 4-setose, male labrum (Figs 8–10) 0.65–0.70 mm long, 1.20–1.25 mm wide, ochre to reddish-testaceous except for black basomedian or whole basal area and dark anterior border, with small, blunt or subacute lateral teeth, right-angled or rounded anterolateral teeth, anterior margin usually shallowly emarginate between subacute anterior teeth, rarely with small, or only indicated median tooth; female labrum (Fig. 11) much longer, length 1.20 mm, width 1.35 mm, testaceous to reddish-brown, with small, right-angled or subacute lateral teeth, rounded anterolateral teeth and prominent, acutely tridentate median lobe with protruding median tooth.

Mandibles (Fig.7) normally shaped with arcuate lateral margins, mahogany-brown except for narrow, ivory-ochre lateral stripe, subsymmetrical, each mandible with four teeth (and basal molar), the three inner teeth gradually smaller towards the basal molar.

Palpi. Both maxillary and labial palpi with normal (elongate) shape of terminal palpomeres, ivory-yellow to ochre-testaceous except for black-brown to black terminal palpomeres; penultimate (longest) palpomere of labial palpus rather narrow with subparallel lateral margins, only gradually dilated towards apex (width up to 0.22 mm).

Antennae long, in male markedly surpassing elytral half, in female somewhat shorter; scape with only apical seta, ochre-testaceous to brownish-testaceous with paler ventral area, pedicel metallic-black with greenish or violaceous lustre, usually with testaceous base; antennomeres 3–4 metallic-black with mahogany or purple-violaceous lustre and with indistinct, sparse setae; antennomeres 5–11 smoky black with usual micropubescence.

Thorax. Pronotum (Figs 12–15) only slightly longer than wide, 1.90–2.00 mm long, 1.80–1.90 mm wide; anterior and posterior sulci well pronounced; anterior lobe metallic-green or with violaceous tinge, always wider than the posterior, densely but distinctly irregularly wavy-rugulose; lateral margins of disc variably subparallel or moderately convex and variably more or less distinctly attenuated towards posterior lobe; discal surface usually reddish-cupreous with notably metallic black-copper or black-green median area, while lateral areas are deep iridescent-green to violaceous-blue, rarely whole surface with prevailing greenish tinge; notopleural sutures moderately but noticeably elevated and edged, markedly obvious in dorsal view; medial line deep but very irregular as merging with surface sculpture; discal surface notably diversely sculptured: large sublateral areas densely but distinctly wavy rugulose, while the darker coloured median area covered with much coarser and more regular, oblique-radiate ridges converging towards the median line forming a rib-like ornament; irregular rugae on lateral areas become also coarser towards notopleural sutures, but not surpassing them; posterior lobe with distinct posterior rim and dorsolateral bulges, surface iridescent green, green-blue to violaceous, rather coarsely and very irregularly rugulose; all thoracic sterna glabrous; prosternum, mesosternum and metasternum deep iridescent metallic-green, smooth; proepisterna, mesepisterna and metepisterna shiny metallic-black with strong violaceous lustre, smooth, metepisterna usually indistinctly coriaceous-wrinkled; female mesepisternal coupling sulci unrecognizable, in form of longitudinal sulcus only somewhat deeper than in male.

Elytra (Figs 16–19) elongate, length 5.70–5.90 mm, with rounded humeri, lateral margins almost parallel in both sexes, anteapical angles arcuate, then obliquely running towards apices which are rounded in both sexes; sutural spine short but distinct; microserrulation indistinct or very irregular; elytral dorsal surface regularly convex on posterior half of elytral disc, humeral and discal impressions moderate, but clearly delimiting moderate basodiscal convexity; apical impressions moderate; whole elytral surface rather finely and almost regularly punctate, punctures larger and mostly isolated on anterior area particularly within humeral impressions and on basodiscal convexity, anastomosing within the discal impression, becoming smaller posteriad and commonly anastomosing in chains on posterior declivity towards apices, on anteapical and apical areas appear to form very irregular sculpture (depending on angle of illumination); elytral surface glabrous except for a few, usual hairlike sensory setae indistinctly scattered mostly on basal area, and a few others adjacent to epipleura; elytral coloration usually reddish-cupreous, sublateral areas and sometimes also apical area vividly iridescent green passing to green-blue on lateral margins and black-violaceous or purple on juxtaepipleural area; whitish elytral maculation in both sexes consisting of three maculae: moderately to more distinctly elongated humeral macula running posteriad along the outer margin and thus only partly visible in dorsal view, rather large, often triangular sublateral-median macula, and irregularly triangular anteapical macula.

Abdomen. Ventrites metallic-black with greenish, blue and violaceous lustre, glabrous, except for usual (easily abraded) hairlike sensory setae on posterior margins of ventrites.

Legs. Coxae metallic-green with bronze, blue, and violaceous lustre, pro- and mesocoxae densely white setose, metacoxae with only lateral margin densely setose; trochanters glabrous (except for usual apical seta), yellow-testaceous; femora dorsally brownish-testaceous with mahogany lustre, or dark mahogany; whole ventral area ivory-yellow to ochre, pro- and mesofemora covered with rows of white to greyish, short and semierect setae which are much sparser on metafemora; pro- and mesotibiae metallic black with mahogany or purple-brown apical third, covered with scattered white semierect setae; tibial basal third to half ventrally covered by dense pad of greyish setae; metatibiae with only sparse semierect and stiffer short setae; tarsi black-violaceous with strong metallic-blue, greenish and purple lustre, first three tarsomeres in male with usual pad of dense, greyish-white setae.

Aedeagus (Figs 20–26) moderately voluminous in middle, 3.20–3.40 mm long, 0.80–0.85 mm wide, apical portion gradually attenuated, ventrally moderately emarginate and then arcuate forming rather thick, shortly hooked apex. Internal sac (partly visible in Fig. 26) with voluminous reniform central-ventral piece, thin upper dorsal arciform piece; other sclerites, including the long, multicoiled flagellum often protruding from dorsoapical orifice, similar to other species of the genus.

Variability. Except for the coloration mentioned in the redescription, there is no significant variability.

Differential diagnosis. Immediately recognizable from all species with similarly hooked apex of the aedeagus, by the shape of its pronotum with notably edged notopleural suture well obvious in dorsal view, and the coarser and darker rib-like sculpture on the median area of pronotal disc, markedly differing from the sculpture on lateral areas. *O. molesta* Nidek has the most similar apex of the aedeagus, but this species of the *Odontocheila cajennensis* (Fabricius, 1787) species group clearly differs by its mandibles with only three teeth, and a very different shape and surface of its pronotum and elytra, including elytral maculation.

Similar pronotum with distinct notopleural sutures possess also *O. davidbrzoskai* sp.nov., but the sculpture on the median area of its pronotal disc is not so notably differentiated as in *O. hamulipenis*. Moreover, male of O. *davidbrzoskai* sp.nov. is immediately recognizable by the very different apex of the aedeagus (see the description below).

Biology and distribution. Known from Colombia only. The holotype (SDEI) of *O. hamulipenis* was described from Colombia, but without exact locality. Horn (1933) only noted that the only male came from the Collection Brown-Ehlers-Van de Poll. Most of the other examined adults come from an area of the type locality of the synonymous *O. howdeni* in the province of Valle de Cauca.. Anchicaya is situated about 70 km southeast from the Buenaventura town in western Colombia, while Dagua, the area of Río Escalarete, lies some 25 km east of Anchicaya. The female (FCCR) from the Chocó Province was caught in the coastal rainforest research station El Amargal, 5 km southwest of Arusí, Nuquí municipality. The specimens mentioned from Panama as *O. howdeni* by Johnson (1996) are evidently *O. davidbrzoskai* sp.nov. described below.

Erwin & Pearson (2008) discussion of *O. howdeni* mentioned the habitat as: "lowlands and midlands, 150 – 900 m a.s.l. in primary and tall secondary forests, and in premontane rainforests"; these authors also mentioned a behaviour of adults as: "diurnal, fast running, ground-dwelling on moist substrates, on paths and small clearings on the forest floor, roosting on low foliage during the nigh; they fly up from the forest floor to land on the leaves of understory plants at the forest edge when disturbed".

Remarks. *O. hamulipenis* was described from the only male holotype by Horn (1933). The holotype (SDEI) has incomplete its left elytron, therefore its right elytron is illustrated here. Examination of the holotype of *O. howdeni* Nidek, 1980 has revealed that these two taxa are conspecific. The holotype of *O. hamulipenis* (SDEI) was not examined by Rivalier and therefore he did not mention this species in his incomplete revision (Rivalier 1969). Consequently, Nidek (1980), when he described *O. howdeni*, failed to compare his new species to *O. hamulipenis*, and also Wiesner (1992), Fernandez et al. (1994) as well as Vítolo (2004) and Erwin & Pearson (2008) listed *O. hamulipenis* and *O. howdeni* from Colombia as two separate species.

***Odontocheila davidbrzoskai* sp.nov.** (Figs 4–5, 27–47)

Type locality. PANAMA: Darien Province, Park National Darien–Cana, Cerro, Pierre Camp, 1330 m. a.s.l., 07°45,8′N, 77°43.3′W.

Type material. HOLOTYPE: ♂ in USNM, labelled: "PANAMA: DARIEN / P. N. Darien–Cana, Cerro / Pierre Camp 1330m / 07°45.8′N,77°43.3′W / D. Brzoska, 19-VI-2004" [printed]. ALLOTYPE: ♀ in NHMK: "PANAMA: DARIEN, 550m / P. N. Darien–Cana / Cerro Pierre Trail / 07°45.3′N,77°40.1′W / D. Brzoska, 15-VI-2004" [printed]. PARATYPES: 4 ♂♂ in DBCN: same label as in holotype. 1 ♂ in CCJM, 1 ♂ in SDEI, 1 ♂ in MNHN: same label as in allotype. 1 ♂ in CCJM: same label as in allotype except for: "07°45.3′N,77°40.1′W / 20-VI-2004". 1 ♂ in USNM: "PANAMA: Darien / Cana N. P. Cerro Pitte / 28 Apr., 1995 / R. L. Fisher" [printed] // "*Odontocheila* sp.? / near *O. howdeni* / except apex of / aedeagus differs / R. Huber 25-X-2002" [printed]. 6 ♂♂, 2 ♀♀ in DBCN (some of them later in STRI), 3 ♂♂, 2 ♀♀ in CCJM, 1 ♂ in NMPC, 1 ♂ in MZNB: "PANAMA – SAN BLAS / Nusagandi Reserve, 350m / D. Brzoska 17-V-1996" [printed]. 2 ♂♂ in DBCN, 1 ♂ in CCJM: "PANAMA–PANAMA / Res. Forest Cerro Jefe / Brzoska 28-V-1995" [printed]. 1 ♂ in DDCP: "PANAMA, Panama / Cerro Azul/Cerro Jefe / 17.V.2003 / leg. Daniel Duran" [printed].

Description. Body (Figs 4–5) medium-sized, 9.80–11.6 (holotype 10.7, allotype 10.9) mm long, 2.90–3.50 (holotype 3.15, allotype 3.35) mm wide, dorsal surface reddish-cupreous with iridescent green or blue-green lateral areas; elytra with reddish-cupreous elytral disc in contrast to iridescent-green or blue-green sublateral and large apical areas.

Head (Fig. 36–37) notably large with pronounced eyes, as wide as the body or only slightly narrower, 2.90–3.20 mm wide, all head portions glabrous.

Frons obliquely declined towards clypeus, with distinctly convex median area, sharply delimited from clypeus and fluently passing to vertex over rounded frons-vertex fold which is only indistinctly edged laterally; supraantennal plates flat, elongate, irregularly triangular, with strong metallic-green lustre, their inner margins barely delimited as merging with frons sculpture; frons surface bright reddish-cupreous, usually with greenish lustre on lateral areas which are finely or more coarsely longitudinally

striate, juxtaclypeal area nearly smooth, median area on frons-vertex fold mostly transverse-wavy to vermicular rugulose forming conspicuous ornament surrounded by arcuate wavy rugae.

Vertex on each side with two usual juxtaorbital sensory setae (usually abraded), almost flat, bright reddish cupreous with greenish and bronze reflections; anteromedian area irregularly transversely wavy and arcuate rugulose (sculpture passing from frons), large juxtaorbital areas rather finely longitudinal parallel-striate, striae on sublateral areas coarser and longitudinal, wavy, usually divergent posteriad passing onto postgenae; occipital area very finely irregularly rugulose.

Clypeus iridescent green, with bluish or bronze lustre, rather distinctly irregularly wrinkled.

Genae metallic green-blue, usually with dark violaceous lustre, indistinctly shallowly parallel-striate, ventral area almost smooth.

Labrum 4-setose, male labrum (Figs 38–40) notably transverse in adults from type locality, slightly longer in others, 0.55–0.70 mm long, 1.15–1.35 mm wide, ochre to testaceous except for black whole basal area, with small, right-angled or subacute to acute lateral teeth, larger right-angled or rounded anterolateral teeth; anterior margin usually shallowly or more deeply emarginate between subacute anterior teeth, usually with small, or only indicated median tooth; female labrum (Figs 41–42) much longer, length 1.10–1.30 mm, width 1.30–1.40 mm, ochre-testaceous to reddish-testaceous, with small, right-angled or subacute lateral teeth, rounded anterolateral teeth and prominent, acutely tridentate median lobe with protruding median tooth.

Mandibles (Figs 36–37) normally shaped with arcuate lateral margins, mahogany-brown except for narrow, ivory-ochre lateral stripe, subsymmetrical, each mandible with four teeth (and basal molar), the three inner teeth gradually smaller towards the basal molar.

Palpi (Figs 36–37). Both maxillary and labial palpi with normal (elongate) shape of terminal palpomeres, ivory-yellow to ochre-testaceous except for brown, rarely black-brown terminal palpomeres; penultimate (longest) palpomere of labial palpus rather narrow with subparallel lateral margins, only gradually dilated towards apex (width up to 0.25 mm).

Antennae long, in male reaching elytral two thirds, in female somewhat shorter; scape with only apical seta, ochre-testaceous to brownish-testaceous with paler ventral area, sometimes with faint purple lustre; pedicel metallic-black with greenish or violaceous lustre and testaceous base; antennomeres 3–4 metallic-black with mahogany or purple-violaceous lustre, sparsely covered with indistinct setae; antennomeres 5–11 smoky black with normal micropubescence.

Thorax. Pronotum (Figs 43–44) as long as wide, or often slightly wider, very rarely slightly longer, 2.00–2.25 mm long, 2.05–2.20 mm wide, both anterior and posterior sulci well pronounced; anterior lobe metallic-green or reddish-cupreous in middle, always wider than the posterior, irregularly wavy-rugulose to vermicular rugulose; lateral margins of disc (including dorsally visible proepisternal margins) moderately or more distinctly convex, conspicuous notopleural sutures subparallel; discal surface bright

reddish-cupreous with golden-bronze iridescence, limited lateral areas deep iridescent-green to violaceous-blue; notopleural sutures iridescent blue-green, moderately but conspicuously elevated and bluntly edged, markedly obvious in dorsal view; medial line thin but clearly marked, its posterior part usually merging with surface sculpture; discal surface on large sublateral areas densely but distinctly wavy rugulose, rugae on median area coarser and more regular, converging towards the median line; rugae on lateral areas towards notopleural sutures become coarser and almost transverse; posterior lobe with distinct dorsolateral bulges and double-sutured posterior rim, surface iridescent green, green-blue to violaceous, rather coarsely and very irregularly rugulose; all thoracic sterna glabrous; prosternum, mesosternum and metasternum deep iridescent metallic-green, smooth; proepisterna, mesepisterna and metepisterna shiny metallic-black with strong violaceous lustre, smooth, metepisterna usually indistinctly coriaceous-wrinkled; female mesepisternal coupling sulci unrecognizable, in form of longitudinal sulcus only somewhat deeper than in male.

Elytra (Figs 45–47) elongate, length 5.90–7.00 mm, with rounded humeri, lateral margins almost parallel in both sexes, anteapical angles arcuate, then obliquely running towards apices which are rounded in both sexes; sutural spine short but distinct; microserrulation indistinct, very irregular; elytral dorsal surface regularly convex on posterior half of elytral disc, humeral and discal impressions moderate, but clearly delimiting moderate basodiscal convexity; apical impressions moderate; whole elytral surface rather finely and almost regularly punctate, punctures larger and mostly isolated on anterior area particularly within humeral impressions and on basodiscal convexity, anastomosing within the discal impression, becoming smaller posteriad and commonly anastomosing in chains on posterior declivity towards apices, on anteapical and apical areas the sculpture appears (depending on angle of illumination) very irregular with cristulate intervals; elytral surface glabrous except for usual indistinct hairlike sensory setae scattered mostly on basal area and sparsely adjacent to epipleura; elytral coloration cupreous or bright reddish-cupreous, but wide sublateral and apical areas clearly delimited, vividly iridescent green passing to green-blue on lateral margins and black-violaceous or purple on juxtaepipleural area; whitish elytral maculation in both sexes consisting of three maculae: moderately to more distinctly elongate humeral macula running posteriad along the outer margin and thus only partly visible in dorsal view, rather large, often triangular sublateral-median macula, and narrower, mostly mesad-elongated anteapical macula.

Abdomen. Ventrites metallic-black with greenish, blue and violaceous lustre, glabrous, except for usual (easily abraded) hairlike sensory setae on posterior margins of ventrites.

Legs. Coxae metallic-black-green with mahogany, bronze, blue, and violaceous lustre, pro- and mesocoxae densely white-setose, metacoxae with only lateral margin densely setose; trochanters yellow-testaceous; femora dorsally brownish-testaceous with mahogany lustre, or dark mahogany, whole ventral area ivory-yellow to ochre, pro- and mesofemora covered with rows of white to greyish, short semierect setae which are much sparser on metafemora; pro- and mesotibiae metallic black with mahogany or purple-

brown apical third with scattered, white, semierect setae; tibial basal third to half ventrally covered by dense pad of greyish setae; metatibiae with only sparse, semierect and stiffer short setae; tarsi black-violaceous with strong metallic-blue, greenish and purple lustre, first three tarsomeres in male with usual pad of dense, greyish-white setae.

Aedeagus (Figs 27–35) moderately voluminous in middle, 3.70–3.90 mm long, 0.75–0.85 mm wide, apical portion gradually attenuated towards apex, ventrally moderately emarginate and then passing to rather narrow, ventrally blunt or subangular, almost horizontally dorsad-directed, elongate, beak-like sharpened (not hooked) apex. Internal sac (Fig. 29) with notably voluminous reniform central-ventral piece and narrowly elongate upper dorsal arciform piece; other sclerites similar to other species of the genus, including the long, multicoiled flagellum often protruding from dorsoapical orifice.

Variability. Males from the type locality have more transverse labrum than those from the San Blas and Cerro Jefe areas which possess slightly longer labrum and are brighter coloured, particularly on the elytra with more conspicuous contrast between bright reddish-cupreous elytral disc and iridescent green lateral and apical areas.

Differential diagnosis. Externally similar to *O. hamulipenis*, particularly due to the distinctly edged notopleural sutures of the pronotum but males are immediately recognizable by the very different apex of the aedeagus both in its lateral and ventral aspect. Moreover, the body of *O. davidbrzoskai* sp.nov. is notably larger and more reddish-cupreous with more conspicuous contrast between the bright reddish-cupreous elytral disc and iridescent green-blue lateral and apical areas, the pronotum is wider and the surface sculpture lacks the contrasting coarse ridges on the median area of the pronotal disc which is characteristic of *O. hamulipenis*.

The apex of the aedeagus may resemble that of *O. angulipenis* W. Horn, 1932 described from Colombia. Nevertheless, the apex of the aedeagus of the examined male syntype (SDEI) of *O. angulipenis* is shorter and blunter, and despite a variability in its length in other Colombian and Venezuelan males (see "Differential diagnosis under *O. angulipenis*), the apex is never sharpened. Moreover, this Horn's species can be clearly distinguished by its differently shaped and finely sculptured pronotum with less conspicuously shaped notopleural sutures, different coloration of its elytra, and particularly by minute, appressed white setae covering the surface of most abdominal ventrites (a few, easily abraded setae present also on the prosternum and metasternum).

Etymology. Dedicated to my good friend and colleague, well known entomologist David W. Brzoska (Naples, Florida), the collector of the new species.

Biology and distribution. Occurring in two areas in Panama. The type locality Darien Cana near the Colombian border lies in a long way from the central areas of Cerro Azul (Cerro Campana, Cerro Jefe) and the Indian Nusagandi Reserve in the San Blas mountain area.

The Panamanian localities mentioned by Johnson (1996) for "*O. howdeni*", the Chepo Carti Road (Nusagandi area) and Cerro Azul are evidently based on his confusion with *O. davidbrzoskai* sp.nov., because the places are practically the same as the Central Panamanian localities of *O. davidbrzoskai* sp.nov.

Remarks. Examination of the male syntype (SDEI) of *O. angulipenis* has confirmed that *O. davidbrzoskai* sp.nov. markedly differs both in its internal and external characters (see "Differential diagnosis" above and the redescription of the lectotype of *O. angulipenis* and "Differential diagnosis" under that species below). All type specimens of *O. davidbrzoskai* sp.nov. from the two Panamanian localities possess entirely constant shape of their aedeagi and glabrous surface of their ventrites.

Odontocheila angulipenis W. Horn, 1932 (Figs 6, 48–61)

Odontochila angulipenis W. Horn, 1932: 404, 405, fig. 2, 407.
Type locality. "Columbia orient., Río Negro (500 m a.s.l.)".

Odontocheila angulipenis: Wiesner, 1992: 79.

Type material. Lectotype (designated here) ♂ in SDEI, labelled: "Fassl. 500 m / Rio Negro / O. Columbia" [handwritten] // "angulipenis, m" [green with black frame, handwritten] // "Type, W. Horn" [printed] // "Coll. W. Horn / DEI Eberswalde" [printed] // "*Odontocheila angulipenis* / W. Horn type (DEI-Eberswalde) / borrowed by D. L. Pearson / 23.Oct.1996 (drawer ♂ 58"[printed] // "Lectotype / Odontochila angulipenis, W. Horn, 1932 / design. Jiří Moravec, 2012" [red, printed] // "Odontocheila / angulipenis W. Horn, 1932 / det. Jiří Moravec 2012" [printed].
Other specimens examined. 1 ♂ in JWCW: "Venezuela, KRAN / BF 10 (4d) Protium / 11/06/1998; leg S. Kirmse". 1 ♀ in RLHC: "Venezuela, T.F. / Amazonas / Parque Nacional / Duida Marahuaca // "Calebra 250 m. / 3° 33′N-65°55′W / 31-III-1983" // "Exp. Maravaca / Fund Terramar". 1 ♂ in JWCW: "Venez. Amazonas / 35 km N Pto. Ayacucho / 19 May 1990 / D. L. Pearson" // "GALLERY FOREST". 1 ♀ in RLHC: "Caraugueijo [Brazil] / 6.V.69 / J & B".
Following specimens examined from macro-photographs: 1 ♂ in IAVH: "COLOMBIA Vichada / PNN Tuparro Rio Tomo / 05°21′N 67°51′W 250 m / Malaise 22.v– 3.vii.2001 / W. Villalba, Leg. M. 1795" // "AvH-E 107282". 1 ♂ in IAVH: "COLOMBIA Vichada / PNN Tuparro Centro / Administrativo 05°21′N 67°51′W /100 m Malaise 15–19.vii. 2000 / W. Villalba, Leg. M M.510" // "Odontocheila / angulipenis / Horn, 1932 / Det.: A. Vítolo, 2002" // "IAvH-E 107280". 1 ♂ in IAVH with same label data except for: "12–22.v.2001" and "1788" // "IAvH-E 107281". 1 ♂ in IAVH: "COLOMBIA Meta / PNN Macarena Cańo Curia / Sendero Cachicamos / 03°21′N 73°56′W 260 m / Malaise 24–31.Xii.2001 / D. Campos, leg. M.2608" // "IAvH-E 107279".

Redescription (of the male, lectotype). Body (Fig. 6) medium-sized, 9.40 mm long, 3.00 mm wide, dorsal surface reddish-cupreous, lateral areas iridescent green, but only indistinctly on elytra; dorsal surface glabrous, ventrites finely setose.

Head (Fig. 48–49) large, with pronounced eyes, but narrower than body, 2.70 mm wide, all head portions glabrous.

Frons steeply declined towards clypeus, flat except for more or less distinct small anteromedian bulge, clearly delimited from clypeus and separated from vertex by vertex fold which is blunt in middle and indistinctly edged laterally, surface metallic cupreous with greenish lustre, mostly irregularly rugulose, posteromedian area distinctly vermicular-rugulose; supraantennal plates flat, almost triangular and well delimited, smooth, iridescently purple-violaceous.

Vertex with two usual juxtaorbital sensory setae (on each side), almost flat and metallic cupreous with greenish reflections; anteromedian area irregularly transversely wavy and arcuate-rugulose (sculpture passing from frons), juxtaorbital areas distinctly longitudinal parallel-striate, striae on sublateral areas longitudinal but irregularly wavy, usually divergent posteriad and become very irregular when passing on postgenae; rugae

on posteromedian and occipital areas becoming irregular, braking up into finer, irregularly rugulose sculpture.

Clypeus metallic-cupreous with iridescent-green lateral areas, rather distinctly wrinkled.

Genae iridescent green-blue, nearly smooth, with only few shallow wrinkles on juxtaorbital area.

Labrum (male lectotype, Fig. 51) 4-setose, 0.70 mm long, 1.15 mm wide, ochre-testaceous except for reddish-black basomedian area and narrow, dark anterior border, with subacute lateral teeth, blunt anterolateral teeth; anterior margin between acute anterior teeth moderately convex.

Mandibles (Fig. 48) normally shaped; inner teeth not showed because the mandibles of the lectotype are firmly closed.

Palpi. Maxillary palpi ochre, except for black terminal palpomeres which are normally shaped, elongate, only gradually moderately dilated; penultimate (longest) palpomere of labial palpi pale yellow, elongate-cylindric, but rather thick, moderately dilated towards apices (width 0.21 mm).

Antennae in the lectotype incomplete: scape with only one subapical seta, reddish-testaceous with paler ventral area, pedicel darker with paler base; other antennomeres missing.

Thorax. Pronotum (Fig. 50) glabrous, as long as wide, 1.75 mm long, 1.75 mm wide; anterior and posterior sulci only moderately pronounced; anterior lobe only slightly wider than the posterior, rather high in middle, densely irregularly vermicular-rugulose; disc rather flat, lateral margins subparallel, only moderately attenuated towards posterior sulcus; notopleural sutures moderately raised, well obvious in dorsal view running parallel with the outer margins; medial line indistinct, partly merging with discal surface sculpture consisting of densely and irregularly arranged, wavy to vermicular rugae which only very irregularly converge towards the median line; rugae on lateral areas towards the notopleural sutures become thicker and elongate-transverse; posterior lobe with very indistinct posterior rim, rather coarsely, irregularly wavy- to vermicular-rugulose including only moderately bulged lateral areas; lateral thoracic sterna metallic black, glabrous, smooth, but metepisterna with up to three deep, probably setigerous punctures on posterior area; ventral thoracic sterna metallic black, with strong blue and blue-green lustre, smooth and glabrous except for individual few setae on prosternum and metasternum and a few irregular pits at juxtacoxal area of metasternum.

Elytra (Fig. 55) elongate, length 6.00 mm, with rounded humeri, lateral margins almost parallel, anteapical angles arcuate, then obliquely running towards rounded apices; sutural spine small but distinct; microserrulation fine and irregular, more distinct only in rounded apical margin; elytral dorsal surface nearly even, only slightly convex on posterior half of elytral disc, humeral impressions moderate, basodiscal convexity and discal impression rather indistinct, shallow, apical impressions indistinct; elytral coloration almost uniformly cupreous, somewhat darkened towards sutures and with narrow iridescent-green sublateral stripe and black-violaceous juxtaepipleural area; whole elytral surface rather finely punctate, punctures mostly isolated and larger on anterior and subhumeral areas, on elytral disc commonly anastomosing in irregular

chains, becoming smaller posteriad and commonly anastomosing in finer chains, while punctures on apical areas are more regular; elytral surface glabrous except for usual a few, long, indistinct hairlike sensory setae scattered mostly on basal area and others adjacent to epipleura; whitish elytral maculation consisting of moderately elongate humeral macula which is only partly obvious dorsally, better visible in lateral view, lateral-median macula which is rather large and of irregular shape, and smaller, elongate-triangular anteapical macula.

Abdomen. Ventrites metallic-black with blue-green to violaceous iridescence, smooth, and apart of usual sparse sensory setae at margins, surface of most sternites covered by minute appressed white setae.

Legs. Pro- and mesocoxae metallic green-blue, rather densely setose, metacoxae dark metallic-blue, with only individual seta and lateral margin densely fringed by white setae; pro- and mesotrochanters ochre-testaceous, metatrochanters reddish-brown darkened; femora brownish-testaceous to mahogany, basoventral area paler, ochre-testaceous; femoral surface covered with rows of whitish, short semierect setae which are sparser on metafemora; pro- and mesotibiae testaceous with black-mahogany apical half with scattered white, short semierect setae and basal third to half ventrally covered by dense pad of greyish setae, darker on mesotibiae; metatibiae with sparser semierect, stiffer and short setae; tarsi black with strong metallic-blue lustre particularly on protarsi, first three tarsomeres in male with usual pad of dense, whitish setae.

Aedeagus (of lectotype Figs 57–58) moderately voluminous in middle, rather short, 3.30 mm long, 0.75 mm wide, apical portion gradually attenuated towards apex, passing to ventrally almost angular and dorsad-directed, blunt (not sharpened) apex. Internal sac (Fig. 58) as in most other species of the genus with voluminous reniform central-ventral piece and narrowly elongate upper dorsal arciform piece; the long, multicoiled flagellum protruding from dorsoapical orifice is notably thinner and with wider basal portion than usually; other sclerites as in other species of the genus.

Aedeagi of Venezuelan males in Figs 59–61.

Redescription of the female from Venezuela. Differing from the male lectotype in having a larger body, and a wider pronotum (but with the same fine surface sculpture); other characters, including coloration and the setose ventrites correspond well with the male lectotype.

Body 11.3 mm long, 3.50 mm wide.

Labrum (Fig. 54) much longer (as usual in females), with protruding median lobe, 1.30 mm long, 1.45 mm wide

Antennae somewhat darkened and rather short.

Pronotum of the same surface sculpture as in the male lectotype, but slightly wider than long, length 2.30 mm, width 2.35 mm.

Elytra (Fig. 56) as in male but with smaller humeral macula, 7.10 mm long.

Differential diagnosis. Distinguished from all similar species of *Odontocheila* by the finely setose surface of abdominal ventrites. *O. chrysis* (Fabricius, 1801), a species of a very wide distribution, also possesses minutely setose abdomen, and *O. divergentehamulata* W. Horn occurring in Bolivia has very indistinct setae, but these

species differ in the shape of the pronotum and particularly by a very different apex of the aedeagus. All other examined species of *Odontocheila* have the surface of ventrites glabrous, with only usual sensory hair-like setae at the posterior margins of the ventrites. The finely setose ventrites immediately distinguish *O. angulipenis* also from *O. davidbrzoskai* sp.nov. Moreover, the apex of the aedeagus of *O. angulipenis* is blunter, never sharpened.

The Venezuelan specimens of *O. angulipenis* externally differ in having their pronotum somewhat wider (particularly in female) but of the similar fine surface sculpture and also the male labrum (Figs 52–53) is of the same shape and length as in the lectotype. Their aedeagi in lateral view (Figs 59–60) have blunt apex, but the apex is notably longer than in the lectotype. Despite the certain variability in the pronotal shape, females of *O. angulipenis* can be reliably differentiated from *O. davidbrzoskai* sp.nov. by their setose abdominal ventrites. The apex of the aedeagi is rather variable also in the Colombian specimens recorded by Vítolo (2004), cited also here in "Other specimens examined", as obvious from the macro-photographs kindly sent to me from IAVH. Their apex is mostly more elongated (as in the males from Venezuela) than in the lectotype, but never sharpened as in *O. davidbrzoskai* and as schematically illustrated by Vítolo (2004 fig. 10).

Biology and distribution. Apart from the type locality Río Negro in northeaster Colombia (province Antioquia), this species was reported by Vítolo (2004) from three localities in Central Colombia of the Meta province, and from the eastern province of Vichada near Venezuelan border, and Fernandez et al. (1994) reported *O. angulipenis* also from Venezuela (see "Other specimens examined" and "Differential diagnosis" above).

Remarks. *O. angulipenis* was described by Horn (1932) from two males, but only one of the two syntypes is deposited in SDEI, here designated as the lectotype. The shape of its aedeagus (Fig. 57) perfectly corresponds with that illustrated by Horn (1932, fig. 2), as well as the setose surface of abdominal ventrites described by Horn as "*abdomine discoidaliter and lateraliter sparsim breviter pilosulo*". For the variability in other specimens examined see the "Differential diagnosis" above.

O. angulipenis, as well as many other species described by Walther Horn, was not mentioned by Rivalier (1969) in his incomplete revision of *Odontocheila*.

***Odontocheila iodopleuroides* Mandl, 1972** (excluded from *Odontocheila*)

Odontochila iodopleuroides Mandl, 1972: 105, 106, fig. 2.
Type locality. unknown.

Odontocheila iodopleuroides: Wiesner, 1992: 79

Type material. Holotype (by monotypy) in NHMW, originally without a label, subsequently labelled by Mandl: "Zentral / America" [handwritten] // "Odontochila iodopleuroides / m [handwritten] / HT [red ink] Det. Dr. K. Mandl 72" [printed/handwritten] // "HOLOTYPUS" [red, printed] // "Coll. K. Mandl" [printed] // "120 Odontochila / iodopleuroides / Mandl" [handwritten] // "Revision Jiří Moravec 2012: / HOLOTYPE (by

monotypy) / Odontochila / iodopleuroides Mandl, 1972" [red, printed] // "Revision Jiří Moravec 2012 / the locality of this East Asian species / was confused by / Mandl (1972) as Central America" [printed] // "this is East Asian / Prothyma (Prothyma) / heteromala MacLaey, 1825" / det. Jiøí Moravec 2012" [printed].

Remarks. The holotype (by monotypy) was originally without any label (MANDL 1972). Because of an external similarity with *Odontocheila iodopleura* Bates, 1872, the type locality was erroneously supposed by Mandl as Central America, probably Nicaragua (the type locality of *O. iodopleura*). Therefore, the holotype was subsequently labelled by him as "Zentral America", but my examination has revealed that it is in fact East Asian species *Prothyma heteromala* MacLaey, 1825.

In fact, this species immediately differs from all known species of *Odontocheila* by its white elytral maculation possessing doubled sublateral-median macula. Surprisingly enough, MANDL (1972) was fully aware of this character when he noted that such a maculation occurs only in some species of the genus *Prothyma* Hope, 1838. Moreover, the shape and coloration of its labrum as well as the shape of the aedeagus markedly differ from those in *Odontocheila* and related genera *Cenothyla* Rivalier, 1969 and *Pentacomia* Bates, 1872.

Consequently, this species is here excluded from the genus *Odontocheila*.

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References

Duran D. & 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, Bulgaria.

Fernandez F., Amat G. & Pearson D. L. 1994: Preliminary list of the species of tiger beetles of Colombia (*Coleoptera*: *Cicindelidae*). Cicindela **26:** 27–30.

Horn W. 1932: Ueber die Bewertung der äusseren Geschlechts-Merkmale für die Systematik und Neues über neotropische *Odontochilae* (*Cicind*.). Revista de Entomologia **2:** 401–410.

Horn W. 1933: Two new neotropical *Odontochilini* (*Cicind*.). Revista Chilena de Historia Natural **37:** 76–77.

Johnson, W. 1996: A new species of *Odontocheila* from Honduras with notes on other Central American species (*Coleoptera*: *Cicindelidae*). Cicindela **28:** 37–44.

Mandl K. 1972: Bausteine zur Kenntnis der Familie *Cicindelidae*. Beschreibung neuer Formen und Bemerkungen zu bekannten Formen. *Zeitschrift der Arbeitsgemeinschaft österreichischer Entomologen* **24:** 102–110.

Moravec J. 2002: *A monograph of the genus Physodeutera (Coleoptera: Cicindelidae). Tiger beetles of Madagascar 2*. Kabourek, Zlín, 290 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* (Brno) **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 – 3. *Pentacomia* (*Mesacanthina*) *punctum* (Klug) and *P.* (*M*.) *ronhuberi* sp.nov. (Coleoptera: Cicindelidae). *Acta Musei Moraviae, Scientiae biologicae* (Brno) **97(2):** 49–63.

Moravec J. 2012c: 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* (Brno) **97(2):** 35–48.

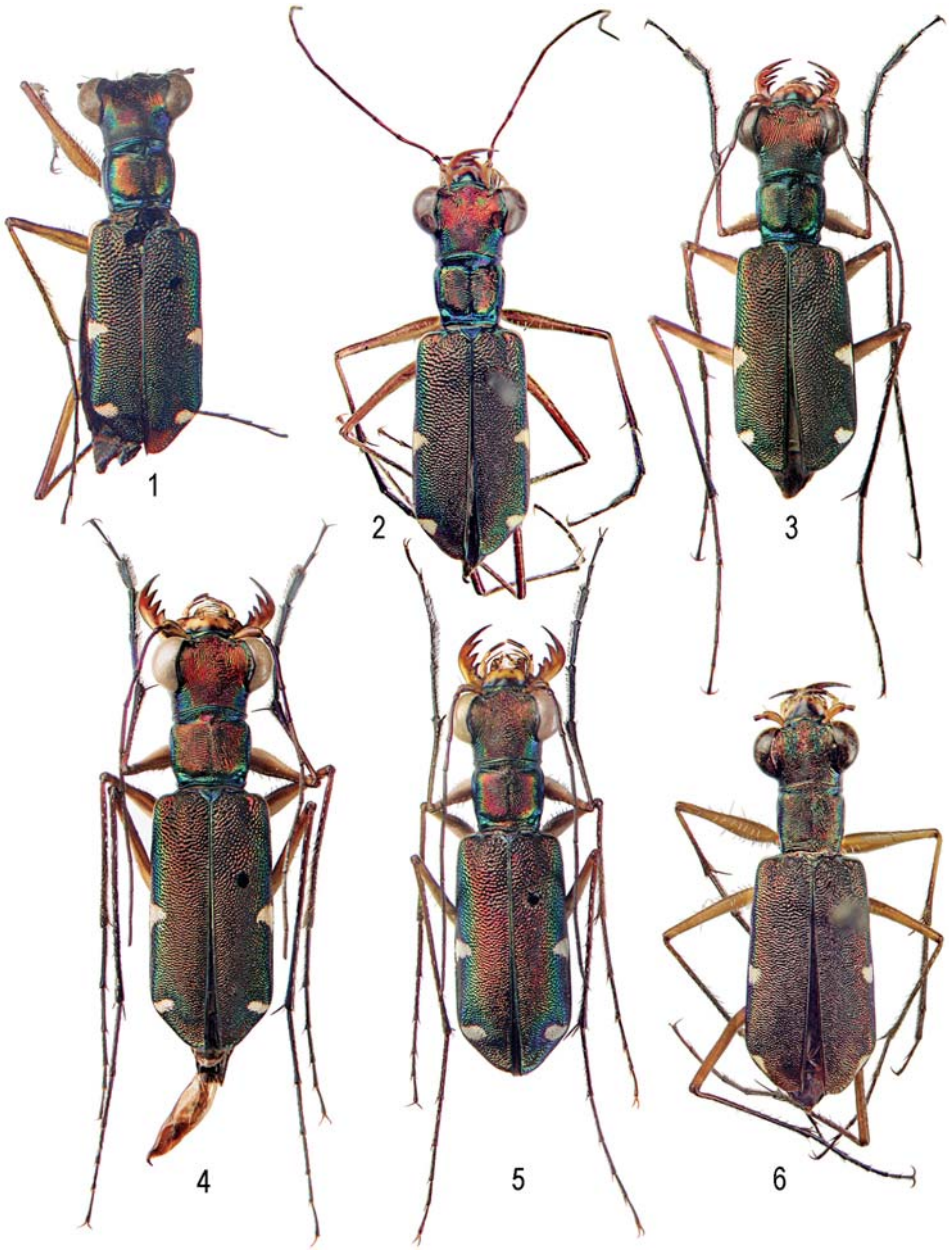
Nidek C. M. C. Brouerius van 1980: Description of some new *Cicindelinae* (Col.). Entomologische Blätter **75:** 129–137.

Rivalier E. 1969: Démemberment du genre Odontochila (col. Cicindelidae) et Révision des principales espèces. *Annales de la Sociéte entomologique de France* (N.S.) **5:** 195–237.

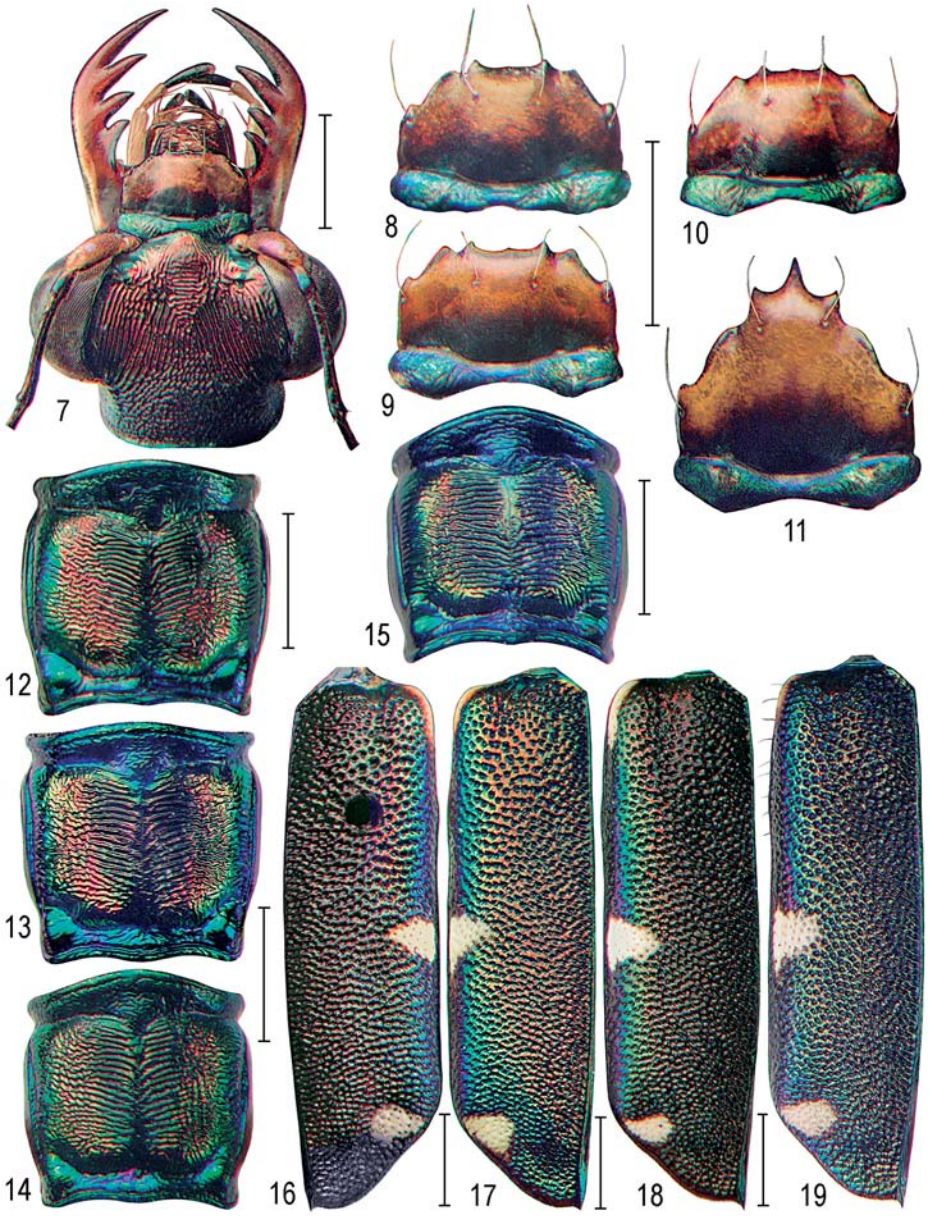
Rivalier E. 1971: Remarques sur La tribu des Cicindelini (Col. Cicindelidae) et sa subdivision en sous-tribus. *Nouvelle Revue d'Entomologie* **1:** 135–143.

Vítolo A. L. 2004: *Guia para la identificación de los escarabajos tigre (Coleoptera: Cicindelidae) de Colombia*. Instituto de Investigación de Recurcos Biológicos Alexander von Humboldt, Bogotá, Colombia.

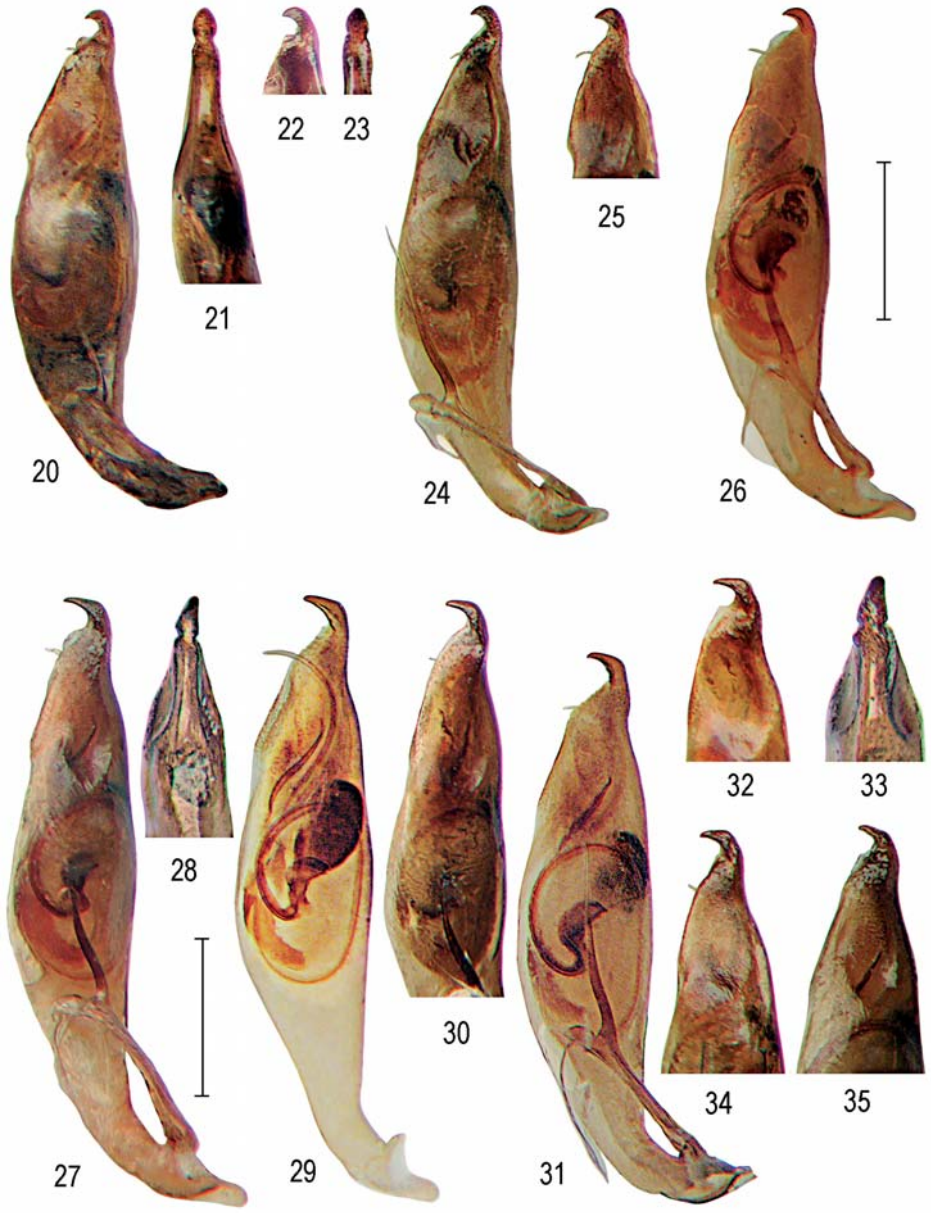
Wiesner J. 1992: *Verzeichnis der Sandlaufkäfer der Welt. Checklist of the tiger beetles of the world (Coleoptera, Cicindelidae)*. Keltern, Verlag Erna Bauer, 364 pp.



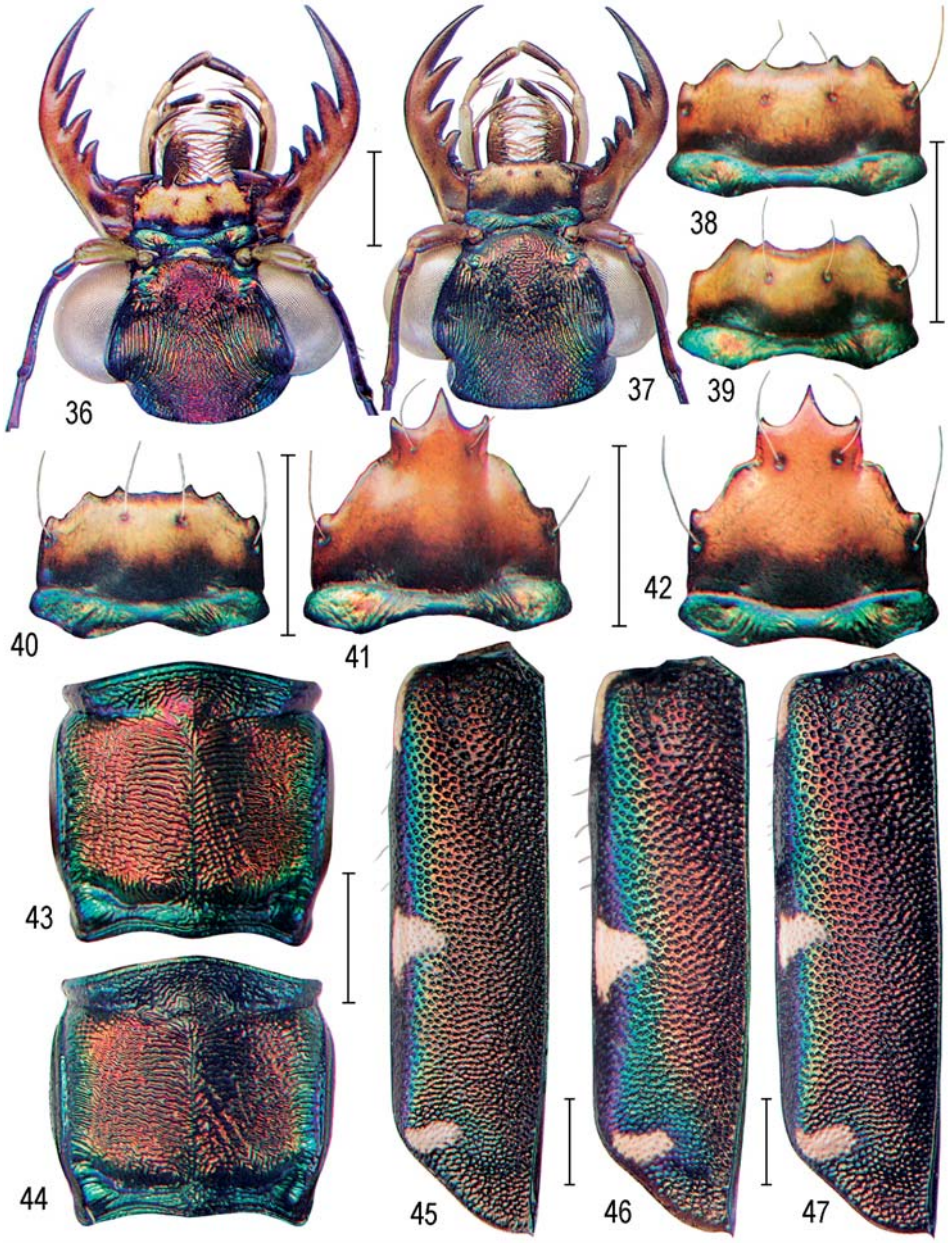
Figs 1–6. Habitus. 1–3: *Odontocheila hamulipenis* W. Horn. 1 – ♂, 9.2 mm, "Columbia", HT (SDEI); 2 – ♂, 9.3 mm, Colombia, Anchicaya, HT (CMNC) of syn. *O. howdeni* Nidek; 3 – ♂, 9 mm, Colombia, Bajo Anchicaya (MFNB). 4–5: *O. davidbrzoskai* sp.nov. 4 – ♂, 10.7 mm, Panama, Darien–Cana, HT (USNM); 5 – ♂, 10 mm, Panama, Nusagandi, PT (CCJM). 6: *O. angulipenis* W. Horn, ♂, 9.4 mm, Colombia, Río Negro, LT (SDEI).



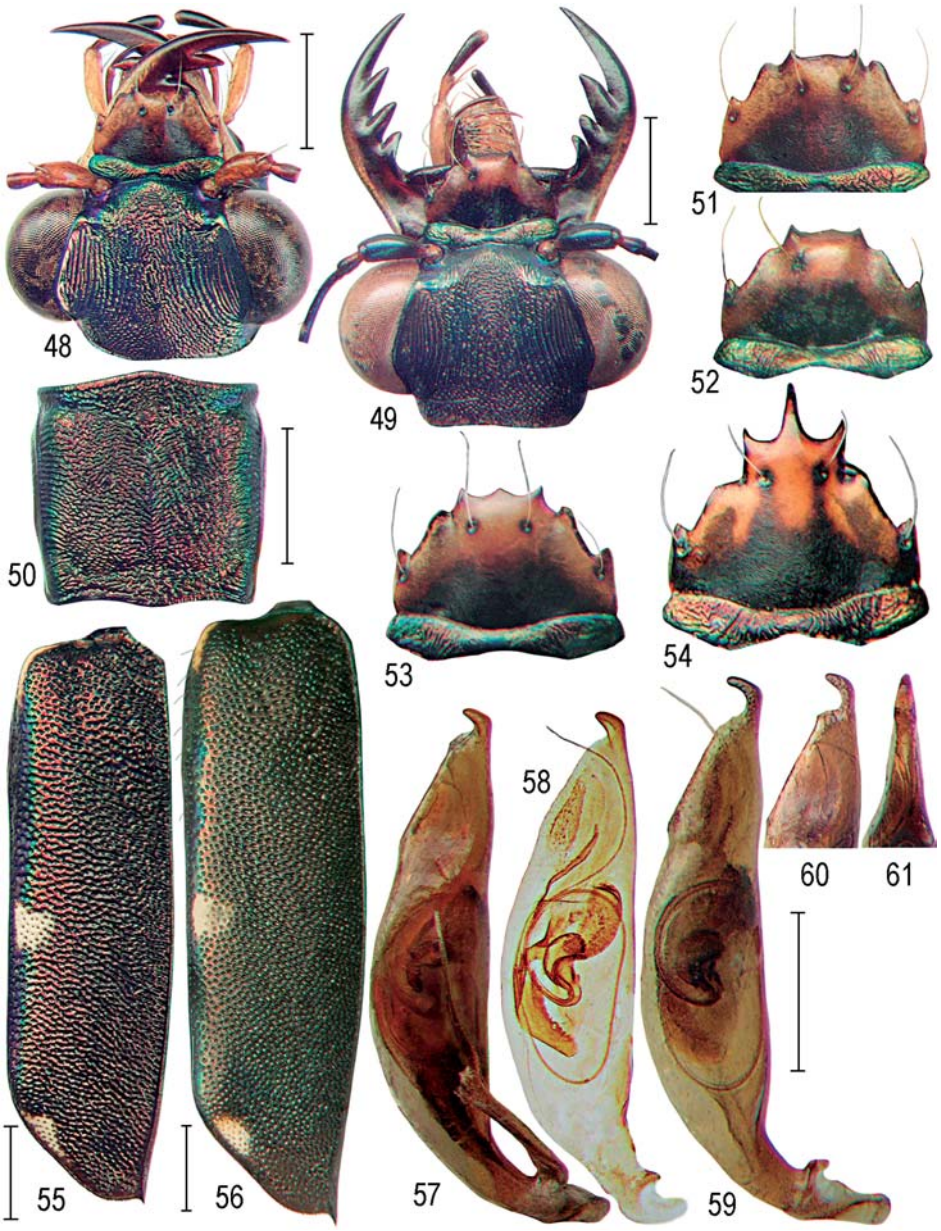
Figs 7–19. *Odontocheila hamulipenis* W. Horn, from Colombia: 7 – head, ♂, Bajo Anchicaya (MFNB). 8–11 – labrum: 8 – ♂, "Columbia", HT (SDEI); 9 – ♂, HT of syn. *O. howdeni* Nidek; 10 – ♂, Bajo Anchicaya (MFNB); 11 – ♀, AT of syn. *O. howdeni* Nidek (ZMAN). 12–15 – pronotum: 12 – ♂, HT; 13 – ♂, HT of syn. *O. howdeni* Nidek; 14 – ♂, Bajo Anchicaya (MFNB); 15 – ♀, AT of syn. *O. howdeni* Nidek (ZMAN). 16–19 – elytron: 16 – right elytron, ♂, HT; 17–19 – left elytron: 17 – ♂, HT of syn. *O. howdeni* Nidek; 18 – ♂, Dagua Valle (USNM); 19 – ♀, AT of syn. *O. howdeni* Nidek (ZMAN). Bars = 1 mm.



Figs 20–35. Aedeagi or their apices. 20–26: *Odontocheila hamulipenis* W. Horn, from Colombia: 20 – HT (SDEI); 21 – ditto, ventral view; 22 – HT of syn. *O. howdeni* Nidek; 23 – ditto, ventral view; 24–25 – Dagua Valle (USNM); 26 – Bajo Anchicaya (MFNB). 27–35: *Odontocheila davidbrzoskai* sp.nov., from Panama: 27 – Darien–Cana, PT (CCJM); 28 – ditto, ventral view; 29 – ditto, showing internal sac; 30 – Darien Cana, HT (USNM); 31–32 – Nusagandi, PT (CCJM); 33 – ditto, ventral view; 34 – Nusagandi, PT (NMPC); 35 – Cerro Azul, PT (DDCP). Bars = 1 mm.



Figs 36–47. *Odontocheila davidbrzoskai* sp.nov., from Panama: 36–37 – head: 36 – ♂, Darien Cana, HT (USNM); 37 – ♂, Nusagandi, PT (CCJM). 38–42 – labrum: 38 – ♂, HT; 39 – ♂, Darien–Cana, PT (DBCN); 40 – ♂, Nusagandi, PT (CCJM); 41 – ♀, Darien–Cana, AT (NHMK); 42 – ♀, Nusagandi, PT (CCJM). 43–44 pronotum: 43 – ♂, HT; 44 – ♀, AT. 45–47 elytron: 45 – ♂, HT; 46 – ♂, Nusagandi, PT (CCJM); 47 – ♀, AT. Bars = 1 mm.



Figs 48–61. *Odontocheila angulipenis* W. Horn. 48–49 – head: 48 – ♂, Colombia, Río Negro, LT (SDEI); 49 – ♂, Venezuela "Kran" (JWCW). 50 – pronotum, ♂, LT. 51–54 – labrum: 51 – ♂, LT; 52 – ♂, Venezuela, "Kran" (JWCW); 53 – ♂, Venezuela, Duida-Marahuaka (RLHC); 54 – ♀, Venezuela, Ayacucho (RLHC). 55–56 – elytron: 55 – ♂, LT; 56 – ♀, Venezuela, Ayacucho (RLHC). 57–61 aedeagi: 57 – LT; 58 – ditto, cleared, showing internal sac; 59 – Venezuela, "Kran" (JWCW); 60 – Venezuela, Duida-Marahuaka (RLHC); 61 – ditto, apex in ventral view. Bars = 1 mm.