

A new rove beetle genus of the *Ocypus* group from the Himalaya (Insecta: Staphylinidae: Staphylininae: Staphylinini) and notes on other Staphylinina

ADAM JAMES BRUNKE & ALEŠ SMETANA

Summary

Acupronotes cervus Smetana & Brunke **gen. et sp. nov.** is described from Nepal and is placed in the *Ocypus* group of Staphylinina despite a remarkable level of convergence in mouthpart morphology with hyperdiverse genus *Platydracus* of the *Platydracus* group. *Acupronotes* is an apomorphy-rich and rather divergent taxon among members of the *Ocypus* group and a potential sister group could not be identified despite comparisons to all described genera of this higher lineage.

A list of genera confirmed to belong to the *Ocypus* group is provided and *Philetaerius*, a myrmecophilous genus generally considered to belong to the *Eucibdelus* lineage of the *Ocypus* group, is here demonstrated to belong to the *Platydracus* group. Genera *Apostenolinus* and *Staphylinus* are only provisionally associated with the *Ocypus* group until their sister group can be determined.

Key words: Coleoptera, Staphylinidae, Staphylinini, new genus, new species, taxonomy, morphology, Nepal Himalaya, Palaearctic Region

1. Introduction

Although the Staphylinina are among the largest, most charismatic rove beetles, new species and even genera continue to be described at a steady rate, especially from China (e.g., HE & ZHOU 2017, 2018; BRUNKE & SMETANA 2019, HE & ZHOU in press, ZHAO & TANG in press). Recently, a total evidence analysis of morphology and the available molecular data for Staphylinina supported three major lineages: the *Creophilus*, *Ocypus* and *Platydracus* groups (BRUNKE & SMETANA 2019). This study built upon several important papers on Staphylinina systematics (e.g., SMETANA & DAVIES 2000, CLARKE 2011, HAYASHI 2011) and provided morphological synapomorphies for each lineage.

Unlike the *Creophilus* and *Platydracus* groups, almost nothing is known about the sister group relationships within the diverse *Ocypus* group of over 20 genera, making comparisons between existing and potentially new taxa cumbersome. An unusual new genus from Nepal with the habitus of *Platydracus*, but better fitting the *Ocypus* group, created an opportunity to test the utility of these three higher lineages and to provide some preliminary but broad comparisons between taxa of the *Ocypus* group.

2. Material and methods

The photographs were taken using a Canon EOS 7D with a EF-100 mm lens, mounted on a Stackshot automated Macro rail. Photomontage was accomplished using Zerene Stacker. Photos were post-processed in Photoshop CC (2019) and plates were assembled using InDesign CC (2019).

3. Results

Staphylinina Latreille, 1802

Acupronotes gen. nov. (Fig.1)

Type species. *Acupronotes cervus* sp. nov. by monotypy.

Diagnosis. *Acupronotes* is easily distinguished among all genera of Staphylinina by the pronotum, which bears a wide impunctate median line and distinct posterior angles (Fig. 1A). The only other genus of Staphylinina known to us with posterior pronotal angles is *Rhyncocheilus* but that genus lacks a median impunctate line and is radically different in numerous aspects. *Acupronotes* is superficially similar (but unrelated) to *Platydracus* in habitus (Fig. 1) but can be readily distinguished by the several character states given below

for the *Ocypus* lineage and the following combination of characters: antennomeres 1–9 elongate, 10 about as wide as long (Fig. 1A); pronotum with slightly explanate posterior angles; abdominal tergites lacking tomentose patches of setae (Fig. 1A).

Description.

Macrosetae of dorsal surface long and prominent (Fig. 1A). Dorsal surface of head with posterior temporal puncture at approximately halfway between hind margin of head and hind margin of head (Fig. 1B); temples with short dense and stiff setae laterally and posteriorly; ventral basal ridge convergent with and joining postoccipital suture; postmandibular ridge present as short fragment under eye. Both mandibles with teeth on different planes and with distinct subbasal excavation, creating tooth at base from original inner margin (Fig. 1B); left mandible with two dorsal teeth and one ventral one between these, right mandible with one dorsal tooth and two approximate ventral teeth, the apicalmost being T3 (T3 not easily seen from above) (Fig. 1B); mandibular prosthema with single supporting structure as a distinct, short stalk, setae long, creating a fan-like appearance (Fig. 1B); maxillary palpus elongate, last segment long, aetose, fusiform (Fig. 1B); labial palpus elongate with last segment long, fusiform and aetose (Fig. 1B); mentum with alpha and beta seta, with additional seta; ligula well developed and distinctly bilobed; gular sutures separate throughout but strongly convergent at middle. Antennae with segments 1–3 without tomentose pubescence.

Pronotum with wide (2–3 puncture diameters), nearly complete impunctate median line that runs from posterior margin to almost the anterior margin (Fig. 1A); disc lacking appressed pale microsetae; parascutellar seta 2 absent; anterior disc of pronotum gradually sloping ventrad at anterior angles (Fig. 1A); pronotum with distinct, slightly explanate posterior angles and sinuate posterior margin (Fig. 1A); anterior pronotal macroseta present; ventral most large lateral puncture of pronotum situated from superior marginal line by a distance far more than three puncture diameters; without flattened supepimeral area; anterolaterally with short, dense and stiff setae; superior marginal line of hypomeron sharply deflected ventrad, joining with inferior line far posterior of anterior angle, anterior portion of superior line situated distinctly below basal portion in lateral view; post-

coxal process present, interrupted at base by inferior marginal line; prosternum with basisternal macrosetae present; furcasternum without foveae.

Elytra each with three humeral macrosetae, posterior-most of these extremely long and becoming quite fine apically, disc with pair of long macrosetae in anterior third and in posterior third (Fig. 1A); sides and posterior margin of elytra with stiff, dense setae. Mesoventrite without longitudinal ridge; mesocoxal area distinctly recessed below mesoventrital process but on same plane as metaventrital process. Abdominal tergites without accessory basal ridges (Fig. 1A) ('oblique ridges' of others). Protibia densely covered by short, stiff setae, without spines on lateral margin; mesotibia densely covered by short, stiff setae, with numerous spines at lateral margin; metatibia with two spines on lateral margin; metacoxa with three well developed spines.

Etymology. The generic epithet is the combination of Latin adjective *acutus* (sharp), the part of the noun *pronotum*, and the ending *-es*. It refers to the distinct posterior angles of the pronotum. Gender masculine.

Acupronotes cervus sp. nov.

(Figs 1,2)

Type locality. Nepal, Khandbari Distr., Induwa Khola Valley, 2150 m.

Type material. Holotype (♀): „NEPAL Khandbari Distr. Induwa Khola Valley 2150 m, 18.IV.84, Smetana & Löbl“ (Canadian National Collection of Insects, Arachnids and Nematodes, Ottawa, Ontario, Canada).

Description. Head, pronotum and elytra deep blue, abdominal tergites 3–6 and corresponding sternites black, tergites 7 and 8 and corresponding sternites yellow (Fig. 1A); pubescence on head, pronotum, elytra black, that on abdomen piceous and that on abdominal apex golden-yellow; mandibles black; maxillary and labial palpi piceous, each with apical segment slightly paler; antennae with first five segments black, remaining segments milky yellow with last segment slightly darkened (Fig. 1A); legs black. Head of rounded quadrangular shape with rounded posterior angles, somewhat wider than long (ratio 1.18), eyes moderately large, slightly convex, slightly shifted dorsad, tempora longer than length of eyes seen from above (ratio 1.55) (Fig. 1B);

disc of head densely and relatively finely punctate, punctuation becoming gradually finer and denser posteriad and posteriolaterad (Fig. 1B); indistinct trace of impunctate midline apparent posteriorly; interspaces between punctures on disc with extremely fine, rudimentary microsculpture. Antennae moderately long, slightly thickened toward apex, segment 3 longer than segment 2 (ratio 1.25), following segments longer than wide, gradually becoming shorter, segment 10 vaguely longer than wide (ratio 1.10), last segment short, asymmetrically emarginate, along lateral margin as long as penultimate segment (Fig. 1A); neck with very fine and dense punctuation, markedly finer than that on head.

Pronotum about as long as wide (visually appearing slightly longer than wide), moderately convex, narrow marginal bead disappearing in dorsal view at about anterior third of pronotal length; lateral margins each in posterior half narrowed in straight line posteriad, joining with the slightly sinuate lateral portion of basal margin at obtuse angle; punctuation very dense and finer than that on disc of head, except anteromedially, interspaces between punctures without appreciable microsculpture. Scutellum densely and finely punctate/setose on surface with rudimentary microsculpture. Elytra relatively long, vaguely dilated posteriad, at suture about as long as pronotum at midline, at sides distinctly longer (ratio 1.30) than pronotum at midline; punctuation very fine and very dense on ground with granulose microsculpture, elytra therefore appearing slightly dull. Abdomen with fifth visible tergite with distinct pale apical seam of palisade setae; first three visible tergites with basal transverse impression, tergites evenly, extremely finely and densely punctate; surface between punctures with extremely fine microsculpture.

Female. First four segments of front tarsus markedly dilated, sub-bilobed, each densely covered by tenent setae ventrally, segment 2 distinctly wider than apex of tibia. Tergite 10 of genital segment markedly narrowed toward narrowly arcuate apex (Fig. 2). Disc with markedly long setae and apex with relatively short setae (Fig. 2).

Length 16.5 mm.

Geographical distribution. The species is at present known only from the type locality in eastern Nepal.

Bionomics. The holotype was taken by sifting deep layers of leaf litter and underlying humus between huge rocks in an original deciduous forest.

Comments. The setation of female tergite X is rather unusual among species of the *Ocypus* group.

Etymology. The specific epithet is the Latin noun *cervus*, -i, m, (deer) in apposition. It refers to the shape of the mandibles that resemble deer antlers.

Systematic placement and taxonomic comparison

The following discussion is based on the results of BRUNKE & SMETANA (2019) unless otherwise cited. *Acupronotes* can be confidently placed in the subtribe Staphylinina of Staphylinini based on the following character states: ligula distinctly bilobed; dorsal forebody with umbilicate punctures; superior and inferior lines of the pronotum joined anteriorly. It can be excluded from the *Creophilus* group based on the following characters states: presence of anterior lateral macroseta on pronotum, ventral basal ridge of the head convergent with and joining postoccipital suture; pronotal disc with umbilicate punctures. The absence of parascutellar seta 2 and the anterior angles of pronotum gradually sloping ventrad are consistent with placement in the *Ocypus* group. The characteristic asymmetrical aedeagus of the *Ocypus* group could not be observed in *Acupronotes* as the only known specimen is a female. The only character inconsistent with the *Ocypus* group is the presence of tooth T3 on the right mandible, which is present throughout the *Platydacus* group and independently in some species of *Creophilus* of the *Creophilus* group. We consider the configuration in *Acupronotes* as another instance of convergence for this character state. Remarkably, *Acupronotes* resembles the diverse genus *Platydacus* in dorsal habitus, mandibular dentition (a few large species with subbasal excavation), simple, elongate maxillary and labial palpi and the fan-shaped mandibular prostheca, though the latter has a distinct stalk in *Acupronotes*. However, we consider this similarity in the mouthparts of the two genera to represent convergent evolution, possibly as a result of similar prey preferences. Additional characters to distinguish this genus from *Platydacus* can be found under Diagnosis.

Within the *Ocypus* group, the sister group of *Acupronotes* is not readily apparent despite a comparison with all known genera. Mandibular dentition has become

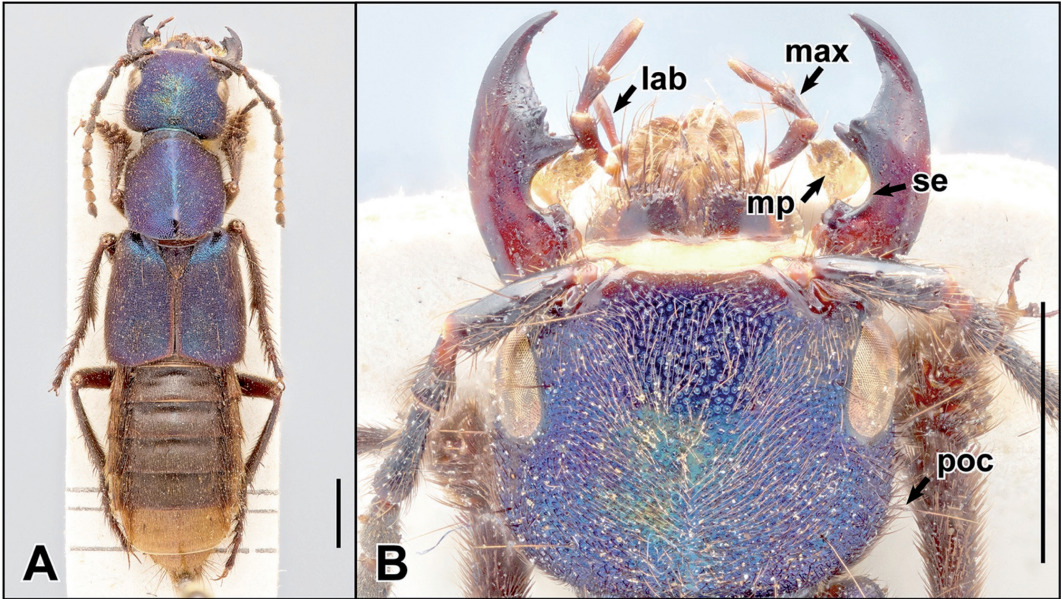


Figure 1. *Acupronotes cervus* Smetana and Brunke. A) dorsal habitus; B) dorsal head. Scale bars = 2 mm. Abbreviations: lab = labial palpus; max = maxillary palpus; mp = mandibular prosthema; poc = post-ocular seta; se = subbasal excavation.

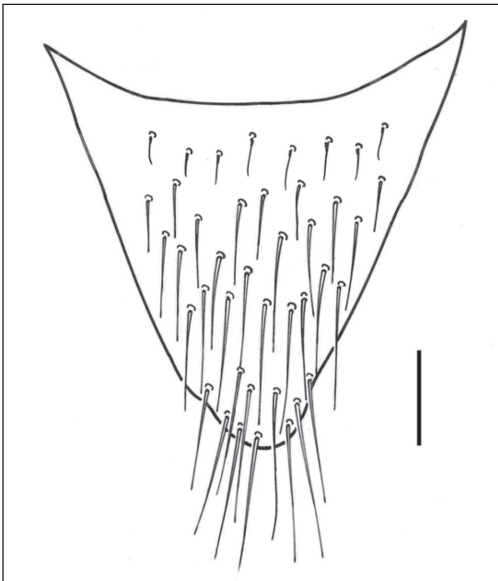


Figure 2. *Acupronotes cervus* Smetana and Brunke, female tergite 10. Scale bar = 0.2 mm.

critical for generic level taxonomy in this lineage and appears to be consistent within most genera (SMETANA 2003, 2006). Genera of the *Ocytus* lineage with some form of a subbasal incision on each mandible include *Agelosus* Sharp, *Cyanocyclus* He & Zhou, *Dinothenarus* Thomson s.str., *Nelmanwaslus* Smetana, *Protocyclus* Müller, *Wasmannellus* Bernhauer and now *Acupronotes*. However, these incisions can be broken down into more formal character states: tooth-shaped notches, where the incision is about the size of the tooth that follows it or smaller (*Agelosus*, *Nelmanwaslus* and *Wasmannellus*, see fig. 97 in SMETANA 2018); broad subbasal excavations (*Acupronotes*, *Cyanocyclus* and *Protocyclus*), where the excavation forms a tooth-like structure basally at the point of the original inner margin, such that the tooth does not extend beyond this margin (Fig. 1B); shallower, tooth-bearing emargination, where a small tooth at the base of a shallow emargination protrudes beyond the inner margin (*Dinothenarus* s.str. and also *Abemus* Mulsant and Rey of the *Platydracus* group). Among those genera with the broad subbasal excavations on each mandible, the mandibles of *Acupronotes* differ by the multiple teeth (single tooth in *Cyanocyclus*) in different planes (single plane in *Protocyclus*).

Acupronotes also lacks the accessory basal lines found in *Cyanocypus* (and potentially related genera *Aulacocypus* J. Müller, *Sphaerobulbus* Smetana) and lacks the setose hypomeron and short, setose apical labial palpomere of *Protocypus*. The long, glabrous maxillary and labial palpi are more typical of both the *Creophilus* and *Platydracus* groups and may be the plesiomorphic state for the *Ocypus* group. The apparent morphological isolation of *Acupronotes* within Staphylinina makes it a key taxon for future phylogenetic analyses, which are outside of the scope of this study.

Notes on the genera of the *Ocypus* group

Over the course of this study, twenty-five genera were confirmed to belong to the *Ocypus* lineage based on the character states given by BRUNKE & SMETANA (2019).

Acupronotes Smetana & Brunke
Agelosus Sharp
Apecholinus Bernhauer
Aulacocypus J. Müller
Collocypus Smetana
Cyanocypus He & Zhou
Dinothenarus Thomson
Eucibdelus Kraatz
Guillaumius Schillhammer
Miobdelus Sharp
Nelmanwaslus Smetana
Ocychinus Smetana
Ocypus Leach
Paraphytolinus Hayashi
Physetops Mannerheim
Phytolinus Sharp
Protocypus J. Müller
Protogeterius Coiffait
Rhynchocheilus Sharp
Rhynchocheilus Fauvel
Sphaerobulbus Smetana
Sphaeromacrops Schillhammer
Tasgius Stephens
Trichocosmetes Kraatz
Wasmannellus Bernhauer

Apostenolinus Bernhauer [provisional]
Staphylinus Linnaeus [provisional]

Palaestrinus Erichson, *Parapalaestrinus* Bernhauer and *Menoedius* Fauvel were not available for study but are considered to belong to the *Eucibdelus*-lineage of the *Ocypus* group (SCHILLHAMMER 2001)

The myrmecophilous genus *Philetaerius* (MARUYAMA et al. 2000), with one species each in Japan and China (HAYASHI 2005), has previously been associated with members of the *Eucibdelus* lineage (e.g. SCHILLHAMMER 2001), which belong to the larger *Ocypus* group. However, this genus exhibits all synapomorphies of the *Platydracus* group (see BRUNKE & SMETANA 2019), and has the plesiomorphic character states: parascutellar seta 2 present and aedeagus symmetrical (see illustrations in HAYASHI 2005). It should therefore be treated as a member of the *Platydracus* group, as a potential sister group of *Thoracostrongylus*, to which it is similar. During the present study, it was discovered that, like *Staphylinus* (BRUNKE & SMETANA 2019), genus *Apostenolinus* has parascutellar seta 2 present but is otherwise morphologically consistent with the definition of the *Ocypus* lineage. These genera are only provisionally associated with the *Ocypus* group pending future research.

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Authors address:

Adam James Brunke & Aleš Smetana
 Canadian National Collection of Insects,
 Arachnids and Nematodes
 Agriculture and Agri-Food Canada
 960 Carling Avenue, Ottawa,
 Ontario K1A 0C6
 Canada
 E-mail: adam.brunke @canada.ca
 E-mail: ales.smetana@canada.ca

ZOBODAT - www.zobodat.at

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