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## Research article

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# Review of *Quedius* (Coleoptera, Staphylinidae) described from the 1934 expedition by R. Malaise to Myanmar

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**Abstract.** A taxonomic review was conducted of the type material of *Quedius* rove beetles (including *Indoquedius*, previously a subgenus) described by Otto Scheerpeltz from the 1934 Swedish expedition by René Malaise to Kambaiti, Myanmar. The specimens were mistakenly thought to be lost or compromised during the Second World War, and so the corresponding available names were not considered in the extensive taxonomic study of *Quedius* from the Himalayan Region and mainland China that has followed. This has resulted in the following synonyms: *Indoquedius nonparallelus* Zhao & Zhou, 2010 syn. nov. = *I. malaisei* (Scheerpeltz, 1965); *I. baliyo* Smetana, 1988 syn. nov. = *I. micantiventris* (Scheerpeltz, 1965); *I. sanguinipennis* (Scheerpeltz, 1965) syn. nov., *I. bicoloris* Smetana, 2014 syn. nov. = *I. parallelicollis* (Scheerpeltz, 1965); *Quedius cornutus* Cai *et al.*, 2015 syn. nov. = *Q. rutilipennis* Scheerpeltz, 1965; *Q. sundar* Smetana, 1988 syn. nov., *Q. hecato* Smetana, 2012 syn. nov. = *Q. semilaeiventris* Scheerpeltz, 1965; *Q. kambaitiensis* Scheerpeltz, 1965 syn. nov. = *Q. muscicola* Cameron, 1932. The species collected by Malaise were treated within the most recent phylogenetic context, resulting in *Malaisdius* gen. nov., *M. ruficeps* (Scheerpeltz) comb. nov., and new or revised morphological concepts for the Apicicornis and Masasatoi species groups of *Quedius* (*Microsaurus*), and the *Muscicola* group of *Quedius* (*Raphirus*). *Malaisdius smetanai* gen. et sp. nov. is described from Nepal.

**Keywords.** Rove beetles, Staphylininae, Quediini, Oriental region, new genus.

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## Introduction

The Malaise trap is an incredibly efficient and productive insect trap that has become standard in biodiversity sampling (Biological Survey of Canada 1994), especially the adaption of Townes (Townes 1972). The trap was invented by the Swedish entomologist and explorer René Malaise (Sjöberg 2014). Although he technically invented and first tested his insect trap in Europe, it was not until a Swedish expedition to Myanmar in 1934, led by Malaise, that the ‘Malaise trap’ was first used for science (Sjöberg 2014). The collecting locality of the first scientific Malaise samples was ‘Kambaiti’, which is a mountain pass near the town Kan Paik Ti, in Kachin State, located in northeastern Myanmar. This region, which is close to the border with China, has since been difficult for foreigners to access and visits are generally

prohibited. Thus, these samples remain a critical resource for understanding the biodiversity of Myanmar and the Oriental region in general.

Among the vast numbers of insects collected by Malaise in Kambaiti, at least 275 species of rove beetles (Coleoptera: Staphylinidae) were collected, with about 57% of them new to science (Benick 1942; Scheerpeltz 1965). The majority of the new species were described in the abovementioned paper by Otto Scheerpeltz in 1965, many years after receiving the material from Malaise. Smetana (1988) was the next major taxonomic worker on staphylinids to include the fauna of Myanmar. Smetana (1988) focused largely on the genera *Quedius* Stephens, 1829 and *Indoquedius* Blackwelder, 1952 (the latter previously included as a subgenus of the former) from the Himalayan region. However, he did not include the species described by Scheerpeltz (1965), largely for practical reasons as he assumed the aedeagi were mounted on slides and lost around the end of the Second World War, based on a misinterpretation of Scheerpeltz, citing (1965: 93–95). In fact, the Malaise staphylinids were never dissected by Scheerpeltz and were safely stored in a bomb-proof underground facility of a bank in Vienna, Austria (Scheerpeltz 1965). Scheerpeltz's notes, manuscripts and illustrations (presumably of external features) of the Kambaiti material, not the specimens themselves, were stored out of the country and, unfortunately, were thought to be stolen (Scheerpeltz 1965). Although not mentioned in his 1965 paper, Scheerpeltz later distributed the type specimens between the Naturhistoriska Riksmuseet (Stockholm, Sweden), and the Naturhistorisches Museum Wien (Vienna, Austria), leaving a detailed count of specimens at each institution (H. Schillhammer, pers. comm.).

Alpha taxonomic knowledge of *Quedius* and *Indoquedius* has increased significantly since Smetana (1988) (references summarized by Smetana (2017a) and Brunke *et al.* (2021)). Furthermore, *Indoquedius* is now treated in an entirely separate tribe (Indoquediini) and not closely related to *Quedius* or other Quediini Kraatz, 1857 (Brunke *et al.* 2021). However, the species described originally in *Quedius* by Scheerpeltz (1965) have been entirely ignored by recent authors and they are now the most poorly known in the Oriental region.

The goal of the present study was to gather the type material deposited across the two museums, redescribe and illustrate the species described by Scheerpeltz (1965) and place them in the most up-to-date taxonomic context. Among the twelve species of *Quedius* described from Kambaiti, five were found to have been described by later authors from the Himalaya proper or Yunnan, China, while two of Scheerpeltz's species were found to be junior synonyms. One of these taxa was found to belong to an undescribed genus, earlier included in a phylogenomic study of Quediini (Brunke *et al.* 2021). It was described in honor of René Malaise, without whom we would not have these remarkable specimens or the Malaise trap itself.

## Material and methods

### Institutional abbreviations

- ASC = Ales Smetana Collection, Museum of Nature and Science, Toshiba, Japan
- CNC = Canadian National Collection of Insects, Arachnids and Nematodes, Ottawa, Canada
- NHRS = Naturhistoriska Riksmuseet, Stockholm, Sweden
- NHW = Naturhistorisches Museum Wien, Vienna, Austria
- NME = Naturkundemuseum Erfurt, Erfurt, Germany

All specimens were examined dry using a Nikon SMZ25 stereo microscope. Genitalia and terminal segments of the abdomen were dissected and placed in glycerin filled vials, pinned with their respective specimens. Line illustrations were made from standard images and then digitally inked in Adobe Illustrator CC-2022. All imaging, including photomontage was accomplished using a motorized Nikon

SMZ25 microscope and NIS Elements BR ver. 4.5. Photos were post-processed in Adobe Photoshop CC-2022.

Type label data are given verbatim, with labels separated by “/” and comments indicated in square brackets.

## Results

### *Taxonomy*

Class Insecta Linnaeus, 1758  
Order Coleoptera Linnaeus, 1758  
Family Staphylinidae Latreille, 1802  
Subfamily Staphylininae Latreille, 1802  
Tribe Indoquediini Brunke & Solodovnikov, 2016

Genus *Indoquedius* Blackwelder, 1952

### *Sikkimensis group*

Smetana (2017a) defined this group by the position of the large lateral puncture of the pronotum, which is not touching the marginal bead, and the lack of micropunctures on the disc of the head and pronotum.

*Indoquedius malaisei* (Scheerpeltz, 1965)

Fig. 1A

*Quedius (Indoquedius) malaisei* Scheerpeltz, 1965: 290.

*Indoquedius nonparallelus* Zhao & Zhou, 2010: 34 **syn. nov.**

### Diagnosis

*Indoquedius malaisei* can be distinguished from other members of the Sikkimensis group in the mainland Oriental region by the combination of: antennomeres 6–11 milky yellow; elytra reddish and paler than head and pronotum.

### Material examined

#### Holotype

MYANMAR – **Kachin State** • ♂; “N.E. Burma, Kambaiti; 2000 m; 12–17/6.34; Malaise [printed label] / HOLOTYPUS [red, handwritten label] / TYPUS *Quedius malaisei*, O. Scheerpeltz [dark red-pink label] / *Quedius (Indoquedius) Malaisei* n.sp., det. Scheerpeltz, 1944 [white printed label] / 6625 E91 [printed blue label] / Malaisei Scheerpeltz [large, printed folded label] / NHRS -JLKB 000021047”; NHRS.

### Redescription

The species was recently redescribed and diagnosed by Smetana (2017a) under the name *I. nonparallelus*. For additional details, see Zhao & Zhou (2010). A dorsal habitus is provided in Fig. 1A.

### Distribution

Myanmar (Kachin), China (Yunnan).

## Remarks

Although Scheerpeltz stated the holotype of *I. malaisei* was a female, it is in fact a male whose aedeagus corresponds perfectly to that of *I. nonparallelus* syn. nov., which becomes a junior synonym. The type locality of *I. nonparallelus* (“Gonggashan County, Yunnan” = Gongshan Derung and Nu Autonomous County) is north of Kambaiti Pass and near the Chinese border with Myanmar. The holotype of *I. nonparallelus* was not examined but it was examined by Smetana (2017a) and illustrated in the original description with detail sufficient to make the above synonymy.

## *Indoquedius micantiventris* (Scheerpeltz, 1965)

Fig. 1B

*Quedius* (*Indoquedius*) *micantiventris* Scheerpeltz, 1965: 292.

*Indoquedius baliyo* Smetana, 1988: 304 **syn. nov.**

## Diagnosis

*Indoquedius micantiventris* can be distinguished from other members of the Sikkimensis group by the combination of: antennomeres 1–3 dark, 4–11 testaceous and becoming paler toward apex (but not milky-yellow); legs entirely dark except for vaguely paler tarsi; elytra dark, non-metallic.

## Material examined

### Holotype

MYANMAR – **Kachin State** • ♂; “N.E. Burma, Kambaiti; 7000 ft.; 1/5 1934; R. Malaise [printed label] / HOLOTYPUS [red handwritten label] / TYPUS *Quedius micantiventris*, O. Scheerpeltz [dark red-pink label] / *Quedius* (*Indoquedius*) *micantiventris* nov. spec., det. Scheerpeltz, 1944 [white handwritten label] / 6641 E91 [printed blue label] / *micantiventris* Scheerpeltz [large, printed folded label] / NHRS-JLKB 000021048”; NHRS.

### Paratype

MYANMAR – **Kachin State** • ♀; “[female symbol on card] / N.E. Burma, Kambaiti; 7000 ft.; 1/5 1934; R. Malaise [printed label] / Schwedisch Indian-Burma Expedition 1934 [printed label] / ex. coll. Scheerpeltz [printed blue label] / ALLOTYPUS [red handwritten label] / TYPUS *Quedius micantiventris*, O. Scheerpeltz [dark red-pink label] / *micantiventris* [pink card]”; NHW.

## *Indoquedius baliyo* Smetana, 1988 syn. nov.

## Material examined

### Paratype

NEPAL – **Bagmati Province** • ♀; “Nepal (Prov. Bagmati), Malemchi; 2800 m; 17.IV.81; Löbl and Smetana / Paratype *Indoquedius baliyo* A. Smetana 1986 [yellow printed label] / PARATYPE CNC No. 20724 [yellow printed label] / CNC 978889 [identifier]”; CNC.

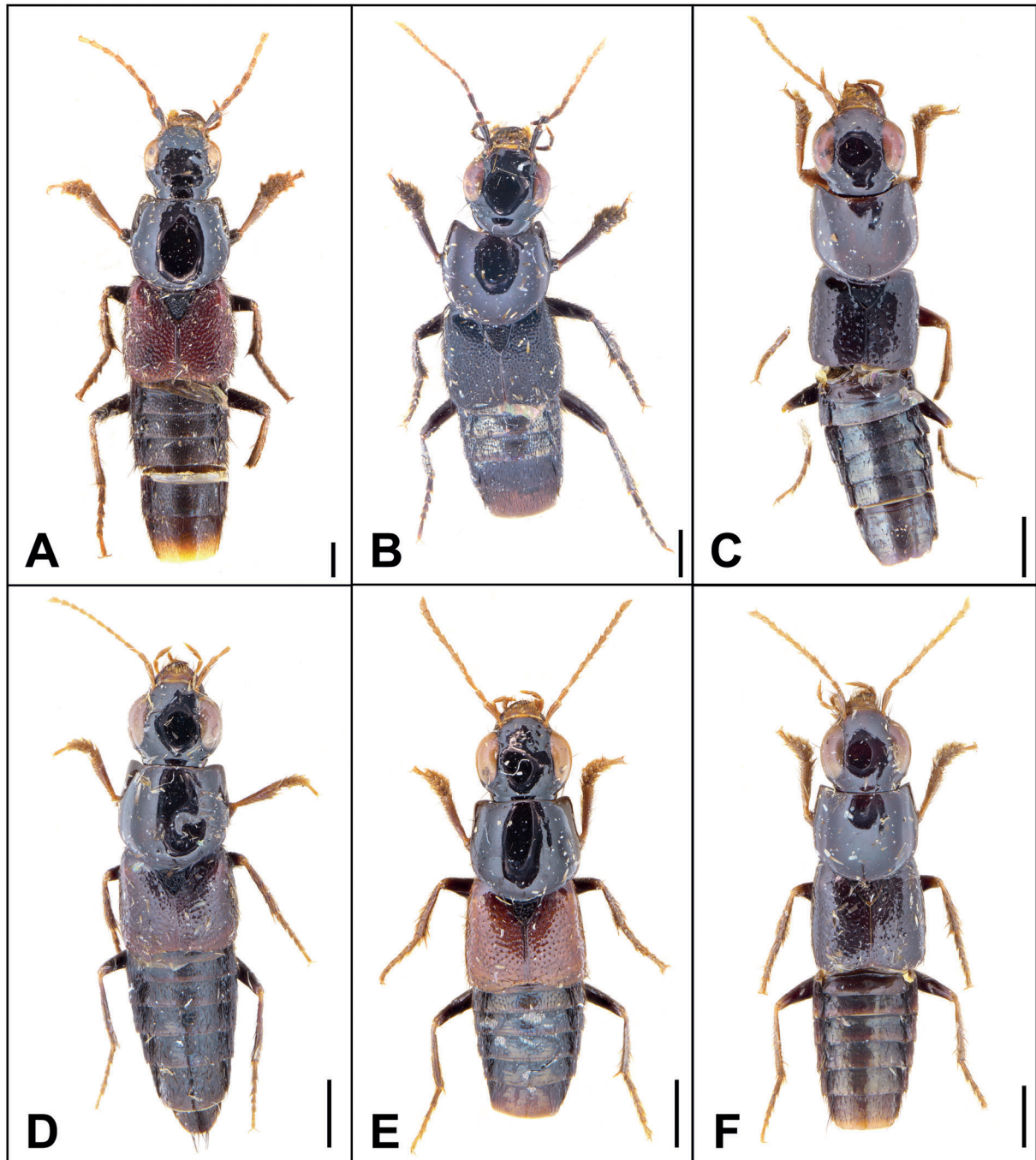
### Non-type material

MYANMAR – **Kachin State** • 1 ♂; Three River Junction; 26°23'12.6" N, 98°39'36.3" E; 3 Oct. 2010; M. Langer, S. Naumann and S. Löffler leg.; under wood/stones; ASC.

NEPAL • 1 ♂; Manaslu Mts, E slope of Ngadi Khola valley; 28°22' N, 84°29' E; 2000–2300 m; 14–16 May 2005; J. Schmidt leg.; CNC • 2 ♂♂; same collection data as for preceding; ASC.

### Redescription

Apart from Scheerpeltz (1965), the species has been described and diagnosed by Smetana (1988, 2017a) under the name *I. baliyo*. A dorsal habitus of the holotype of *I. micantiventris* is given in Fig. 1B.



**Fig. 1.** Habitus of *Indoquedius* described by Scheerpeltz (1965). **A.** *I. malaisei*, ♂, holotype (NHRS). **B.** *I. micantiventris*, ♂, holotype (NHRS). **C.** *I. dispersepunctatus*, ♀, holotype (NHRS). **D.** *I. parallelicollis*, ♀, paratype (NHW). **E.** *I. sanguinipennis* syn. nov. (= *I. parallelicollis*), ♀, holotype (NHRS). **F.** *I. recticollis*, ♀, holotype (NHRS). Scale bars = 1 mm.



### Distribution

Nepal, India (West Bengal), Myanmar (Kachin), and China (Tibet/Xizang, Yunnan, Sichuan) (Smetana 2017a).

### Remarks

The type series of *Indoquedius micantiventris* includes one male and one female. The male was dissected to reveal an aedeagus identical to the common, widespread species *I. baliyo*. Therefore *I. baliyo* syn. nov., becomes a junior synonym of *I. micantiventris*.

Both specimens of the type series of *I. micantiventris* have slightly darkened antennomeres 4–11 (especially 4–5) compared to all other specimens of *I. baliyo* seen. However, no other differences were observed and the darkening is likely an artefact of preservation. The recently collected, non-type specimen examined from Myanmar (~120 km northeast of Kambaiti) has entirely normal coloration.

### *Bipunctatus* group

Smetana (2017a) defined this group by the position of the large lateral puncture of the pronotum, which is touching the marginal bead.

### *Indoquedius dispersepunctatus* (Scheerpeltz, 1965) Figs 1C, 4A–B, 7A

*Quedius* (*Indoquedius*) *dispersepunctatus* Scheerpeltz, 1965: 293.

### Diagnosis

This species is unique among all *Indoquedius* described from the mainland Oriental region for the combination of: sparse, irregular elytral punctation (Fig. 4A); short elytra with strongly transverse scutellum (Fig. 1C); and extremely finely and sparsely punctate abdominal tergites III–VI, IV–VI with the apical half to two-thirds impunctate (Fig. 4B). Widespread and possibly sympatric *I. filicornis* (Eppelsheim) is somewhat similar in the short elytra but the elytral punctures are coarser and denser, the scutellum is densely and coarsely punctate and the abdominal punctures are much coarser. Although it has been reported that *I. filicornis* always lacks a palisade seam on abdominal tergite VII (Smetana 2017a), it was present on one dark female specimen (ASC) from Yunnan, China, determined by A. Smetana and otherwise consistent with the species.

### Type material

#### Holotype

MYANMAR – **Kachin State** • ♀; “N.E. Burma, Kambaiti; 7000 ft.; 3–7/5.1934; R. Malaise [printed label] / HOLOTYPUS [red handwritten label] / TYPUS *Quedius dispersepunctatus*, O. Scheerpeltz [dark red-pink label] / *Quedius* (*Indoquedius*) *dispersepunctatus* nov. spec., det. Scheerpeltz [printed label] / 6476 E91 [blue printed label] / NHRS-JLKB 000073667”; NHRS.

### Redescription

Body entirely dark, maxillary and labial palpi testaceous, antennae testaceous without any obviously darkened segments, legs yellowish-brown with dark brown middle and hind femora.

Head distinctly transverse; eyes very large and convex; tempora almost non-existent, with three parocular punctures along inner margin of eye; posterior frontal puncture slightly anterior of hind margin of eye, puncture touching border; temporal puncture absent; nuchal ridge indistinct at middle of neck;

antennomere 3 about  $1.3 \times$  as long as 2, antennomeres elongate and symmetrical, becoming shorter toward apical antennomere, antennomere 10 about  $1.3 \times$  as long as wide. Pronotum distinctly transverse, slightly convergent anteriorly, with broadly rounded posterior margin, dorsal rows each with three punctures, sublateral rows absent, large lateral puncture touching marginal bead. Scutellum transverse, with seven moderately coarse punctures, most of scutellum surface impunctate; elytra short, slightly broader than pronotum, suture markedly shorter than pronotum at midline, at sides, slightly longer than pronotum at midline, punctures moderately coarse, sparsely and irregularly distributed, separated by at least one puncture diameter but most by several times that amount; wings fully developed; abdominal tergite VII with palisade fringe; abdominal punctures extremely fine and sparse; tergite III with only a short transverse row of basal punctures; tergites VI–VI with posterior  $\frac{1}{2}$  to  $\frac{2}{3}$  impunctate; segments with extremely fine and dense microsculpture of transverse waves.

#### Male

Unknown.

#### Female

Tergite X strongly narrowed to deeply and narrowly emarginate apex (Fig. 7A).

#### Distribution

Known only from the type locality in Myanmar (Kachin).

#### Remarks

The type material includes only a single female holotype. The holotype was dissected and female tergite X is illustrated in Fig. 7A. Based on external morphology alone, *I. dispersepunctatus* does not have any synonyms and can be easily recognized.

***Indoquedius parallellicollis*** (Scheerpeltz, 1965)  
Figs 1D–E, 7B

*Quedius* (*Indoquedius*) *parallellicollis* Scheerpeltz, 1965: 295.

*Quedius* (*Indoquedius*) *sanguinipennis* Scheerpeltz, 1965: 296 **syn. nov.**

*Indoquedius bicoloris* Smetana, 2014: 184 **syn. nov.**

*Indoquedius qiuae* Yan *et al.* 2017: 108 (synonymized by Smetana 2017b).

#### Diagnosis

Among members of the *Bipunctatus* group, *Indoquedius parallellicollis* can be distinguished by the darkened femora and tibiae (at least outer face) on all legs, the overall pale antennae without any markedly darkened segments, and the moderately coarse and sparse punctation of the elytra. Sympatric *Indoquedius bicornutus* Zhao & Zhou, 2010 is very similar but can be distinguished by the pale tibiae, coarser and denser elytral punctation. Smetana (2017a) had stated that the elytra of *I. parallellicollis* (as *I. bicoloris*) were either entirely red or entirely dark but among the paratype specimens examined was one specimen with dark elytra and a faint basolateral red spot, similar to what can occur in *I. bicornutus*. The paratype of *I. parallellicollis* represents another transitional color pattern with less obvious pale areas of the elytra basally and posteriorly (Fig. 1D). The abdominal coloration is also slightly more variable than previously stated (Smetana 2017a), with the apices of tergites narrowly paler in some specimens, while they are broadly paler in *I. bicornutus*.

### Type material

#### Holotype

MYANMAR – **Kachin State** • ♂; “N.E. Burma, Kambaiti; 2000 m; 4/6.1934; Malaise [printed label] / HOLOTYPUS [red handwritten label] / TYPUS *Quedius parallelicollis*, O. Scheerpeltz [dark red-pink label] / *Quedius* (*Indoquedius*) *parallelicollis* nov. spec., det. Scheerpeltz 1944 [printed label] / 6664 E91 [printed blue label] / *parallelicollis* Scheerpeltz [large, printed, folded label] / NHRS-JLKB 000021050”; NHRS.

#### Paratype

MYANMAR – **Kachin State** • 1 ♀; “N.E. Burma, Kambaiti; 2000 m; 4/6.1934; Malaise [printed label] / Schwedisch Indian-Burma Expedition 1934 [printed label] / ex. coll. Scheerpeltz [printed blue label] / ALLOTYPUS [red handwritten label] / TYPUS *Quedius parallelicollis*, O. Scheerpeltz [dark red-pink label] / *parallelicollis* [pink card]”; NHW.

*Quedius* (*Indoquedius*) *sanguinipennis* Scheerpeltz, 1965 syn. nov.

### Type material

#### Holotype

MYANMAR – **Kachin State** • ♀; “N.E. Burma, Kambaiti; 7000 ft.; 28/5.1934; R. Malaise [printed label] / HOLOTYPUS [red handwritten label] / TYPUS *Quedius sanguinipennis*, O. Scheerpeltz [dark red-pink label] / *Quedius* (*Indoquedius*) *sanguinipennis* nov. spec., det. Scheerpeltz [printed label] / 6706 E91 [printed blue label] / NHRS-JLKB 000073670”; NHRS.

*Indoquedius bicoloris* Smetana, 2014 syn. nov.

### Type material

#### Paratypes

CHINA – **Yunnan Province** • 1 ♂; “*Indoquedius bicoloris* A. Smetana 2013 [printed yellow label]”; Pu’er Pref., Ailao Shan, 37 km NW Jingdong; 24°45’12” N, 100°41’24.5” E; alt. 2300 m; 13. Oct. 2009; D. Wrase leg.; devastated forest remnant, litter/moss/grass roots sifted; ASC • 1 ♂; “*Indoquedius bicoloris* A. Smetana 2013 [printed yellow label]”; Dai Bai Nat. Aut. Pref., Diancang Shan, 3 km W Dali old town, pine forest at Cloud Road, right upper chair-lift station; 25°41.1’ N, 100°6.8’ E; alt. 2650–2750 m; 1 Sep. 2003; D. Wrase leg.; needleleaf litter; ASC • 1 ♀; “*Indoquedius bicoloris* A. Smetana 2013 [printed yellow label]”; E slope N Gaoligongshan; 27°45’27.1” N, 98° 35’ 34.5” E; 2 Jun. 2010; alt. 2600 m; V. Grebennikov; sifting; ASC.

### Redescription

The species has been recently redescribed and diagnosed in detail by Smetana (2017a) under the name *I. bicoloris*. This description is supplemented here only by the comments above and Figs 1D–E, 7B.

### Distribution

This widespread, potentially common species is known from medium elevations in northern Myanmar, and Yunnan and Sichuan, China (Smetana 2017a, 2017b).

### Bionomics

*Indoquedius parallelicollis* appears to be tolerant to human disturbance and has been collected in a haystack and plant debris in a ruderal habitat (Smetana 2014, 2017a; Yan *et al.* 2017). Other specimens have been collected in a mixed forest by sifting litter, twigs and roots (Smetana 2015)



**Remarks**

The type series of *I. parallelicollis* includes one male and one female (Fig. 1D). The male was dissected to reveal an aedeagus identical to the color polymorphic species *I. bicoloris*. The current distribution of *I. bicoloris* includes the narrow part of Yunnan, China, west of the Salween River (Smetana 2014) and not far from Kambaiti Pass in Myanmar. Therefore *I. bicoloris* syn. nov., becomes a junior synonym of *I. parallelicollis*.

The female holotype of *I. sanguinipennis* (Fig. 1E) corresponds perfectly (coloration of legs and abdomen, elytral punctation) with a female paratype (ASC) of the red elytra morph of *I. bicoloris*. Female tergite X was also consistent with that of *I. bicoloris* and the paratype of *I. parallelicollis*, including the deep emargination (Fig. 7B). Therefore, along with *I. bicoloris*, *I. sanguinipennis* syn. nov., becomes a junior synonym of *I. parallelicollis*.

***Indoquedius recticollis* (Scheerpeltz, 1965)**

Figs 1F, 4C–D, 7C

*Quedius (Indoquedius) recticollis* Scheerpeltz, 1965: 294.

**Diagnosis**

Among members of the *Bipunctatus* group, *I. recticollis* can be easily recognized by the combination of: impunctate middle areas and posterior half to two-thirds of abdominal tergites III–VI (Fig. 4D); the sparse but regularly spaced elytral punctures (Fig. 4C); and the darkened middle and hind femora (Fig. 1F). *Indoquedius recticollis* is somewhat similar to *I. dispersepunctatus* in the sparsely punctate abdomen and darkened middle and hind femora but can easily be distinguished by the darkened first antennomere, much finer and regularly spaced elytral punctures, the longer elytra, the coarser abdominal punctures and the pale apices of the abdominal tergites. These two species may be related as they share a similar shape of female tergite X (Fig. 7A, C).

**Type material****Holotype**

MYANMAR – **Kachin State** • ♀; “N.E. Burma, Kambaiti; 2000 m; 4/6.1934; Malaise [printed label] / HOLOTYPUS [red handwritten label] / TYPUS *Quedius recticollis*, O. Scheerpeltz [dark red-pink label] / *Quedius (Indoquedius) recticollis* nov. spec., det. Scheerpeltz [printed label] / 6692 E91 [blue printed label] / NHRS-JLKB 000073669”; NHRS.

**Redescription**

Similar to *Indoquedius dispersepunctatus* and differing only in the following: antennomere 1 darkened on dorsal surface; abdominal tergites broadly paler apically; head with two parocular punctures; temples slightly smaller; antennomere 3 slightly longer than 2, about 1.4 ×; antennomere 10 distinctly broader at apex, shape more obviously triangular; pronotum slightly transverse, more strongly convergent anteriorly; scutellum longer, more typical of the genus, densely punctate with only outer margins impunctate; elytra longer at both suture and at sides, at sides distinctly longer than pronotum at midline; elytral punctures much finer and less strongly impressed, regularly distributed though sparse, separated by more than one puncture diameter; abdominal punctation coarser, tergite III with sparse punctures across disc, middle of tergites impunctate or nearly so on tergites III–VI; female tergite X slightly less strongly narrowed to apex, which is broader overall and more shallowly and broadly emarginate (Fig. 7C).

### Distribution

Known only from the type locality in Myanmar (Kachin).

### Remarks

The type material contains only the female holotype, which was dissected. Based on external morphology, this species does not appear to have any synonyms and can be recognized based on external morphology alone.

Tribe **Quediini** Kraatz, 1857

### *Microsaurus* lineage, sensu Brunke *et al.* (2021)

Members of this large, monophyletic group can be recognized by the combination of: genal puncture present; basal puncture doubled; elytra with evenly distributed punctures or with at least asetose punctures on disc among serial rows of setose punctures. This lineage currently consists of *Anthosaurus* Smetana, 2015, *Pseudorientis* Watanabe, 1970, *Korgella* Özdikmen, 2005, *Quedius (Velleius)* (Fabricius, 1787) and the large polyphyletic subgenus *Quedius (Microsaurus)* Stephens, 1829, inside which all the aforementioned taxa are nested. To avoid treating all members of the *Microsaurus* lineage as a single, morphologically heterogeneous genus, and to avoid a major priority issue (*Velleius* Leach, 1819 has priority over *Microsaurus* Dejean, 1833), the major subclades of this lineage should be ranked as genera, pending comprehensive morphological study (Brunke *et al.* 2021). One of these taxa is described below.

Genus *Malaisdius* gen. nov.

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Figs 2A–B, 4E–F, 5A–B, 6A–G, 7D

### Type species

*Quedius ruficeps* Scheerpeltz, 1965.

### Diagnosis

Within the *Microsaurus* lineage, *Malaisdius* gen. nov. can be recognized by the following: elytral disc distinctive, uneven and with deeply impressed, foveate and setose punctures (Fig. 4F); abdominal tergites III–VI with distinct, coarsely punctate basal impressions, disc otherwise impunctate or nearly so, punctures elongate (Fig. 5A–B). In the latter two features, species of *Malaisdius* gen. nov. superficially resemble some members of cyrtosquediine genus *Bolitogyrus* Chevrolat, 1842 though asetose punctures are always present in *Bolitogyrus* and the forebody is entirely without microsculpture.

### Etymology

This genus is dedicated to the Swedish explorer and entomologist René Malaise, who collected a diversity of rove beetles at Kambaiti Pass, Kachin, Myanmar. Malaise is also famous for the invention of the insect trap that bears his name, which has revolutionized our knowledge of insect biodiversity and was first used on a significant scale in Kambaiti (Sjöberg 2014).

### Description

Medium-sized, glossy beetles, with bright coloration. With the character states of Quediini (sensu Brunke *et al.* 2021) and the following: antennomere 3 longer than 2, without dense setation or tomentose pubescence; outer antennomeres (6–10 or 8–10) weakly transverse and slightly asymmetrical; antennae inserted far from eyes, about  $2.0 \times$  the width of antennal sclerite; head with eyes large, strongly convex, protruding from lateral head margin, temples distinct, about half the length of eyes; eyes subparallel,

inner margin forming acute angle with supra-antennal ridge; basal puncture doubled, interocular punctures absent, genal puncture present but extremely small, rudimentary; frons not well developed anterolaterad of antennal insertions; labrum notched medially creating two lobes; apical maxillary and labial palpomeres fusiform and glabrous; infraorbital ridge complete to base of mandibles; gular sutures convergent towards neck, narrowly spaced posteriad; mandibles with small dorsolateral groove; right mandible with two teeth, distal tooth on lower plane compared to proximal; pronotum shield-shaped, slightly explanate; marginal punctures touching marginal bead, dorsal rows with three punctures, sublateral rows with only one puncture, therefore not extended posteriad of large lateral puncture (two female specimens with puncture-like elements (without sockets) giving superficial appearance of 2–3 punctures in the sublateral row), with single large lateral puncture; hypomerion strongly inflexed, hypomerion not visible; basisternum with pair of small, pale macrosetae, with well-developed longitudinal carina; scutellum impunctate; elytron with subbasal ridge complete, forming scutellar collar; row of humeral spines present but short (2–4 spines); disc of elytra without microsculpture between the punctures, surface uneven, punctures irregularly and sparsely distributed, or in very loose rows, punctures bearing setae and situated in broad depressions; foretibia without lateral spines but with apical spur; metatibia with only two slender spines on lateral face; metatarsomeres with disc setose; prototergal glands likely absent, with only vague, shallow impression lacking marginal setae; abdominal tergites III–VI with distinct basal depressions bearing elongate punctures, remainder of disc impunctate or nearly so; abdominal sternite III transverse basal line acutely and sharply produced posteriad at middle; males without modifications on sternite VII; aedeagus asymmetrical in known species, with well-developed paramere, paramere without peg setae; aedeagus without large copulatory sclerites in internal sac.

### Distribution

*Malaisdius* gen. nov. is known from the Himalaya of Nepal and the mountains of northern Myanmar.

### Bionomics

Nothing is currently known about the natural history of *Malaisdius* gen. nov.

### Remarks

According to phylogenomic analyses (Brunke *et al.* 2021), the sister group of *Malaisdius* gen. nov. is the more generalized Masasatoi group (see below), currently included within polyphyletic *Quedius* (*Microsaurus*) but will be treated as a separate genus in a future study.

### Key to the species of *Malaisdius* gen. nov.

1. Body bicolored, head and pronotum orange-red, sharply contrasting with elytra and abdomen (Fig. 2A); legs entirely pale (Fig. 2A); elytral punctures irregularly placed; paramere in basal half subequal in width to median lobe, apex not hooked (Fig. 6A); Myanmar ..... *M. ruficeps* (Scheerpeltz, 1965) comb. nov.
- Body more evenly colored, yellow-orange, with darker areas on the elytra (Fig. 2B); hind femur with apical dark band (Fig. 2B); elytral punctures in loose rows (Fig. 4F); paramere in basal half distinctly narrower than median lobe, apex hooked (Fig. 6F); Nepal ..... *M. smetanai* gen. et sp. nov.

*Malaisdius ruficeps* (Scheerpeltz, 1965) comb. nov.  
Figs 2A, 5A, 6A–E, 7D

*Quedius* (*Microsaurus*) *ruficeps* Scheerpeltz, 1965: 286.

### Diagnosis

Within the genus, *M. ruficeps* comb. nov. is easily distinguished from *M. smetanai* gen. et sp. nov. by the strikingly bicolored body (Fig. 2A).

### Type material

#### Holotype

MYANMAR – **Kachin State** • ♂; “N.E. Burma, Kambaiti; 7000 ft.; 12/5 193; R. Malaise [printed label] / Holotypus [handwritten red label] / TYPUS *Quedius ruficeps*, O. Scheerpeltz [typed dark red-pink label] / *Quedius* (*Microsaurus*) *ruficeps* nov. spec., det. Scheerpeltz, 1974 [white label] / 6693 E91 [typed blue label] / NHRS-JLKB 000021051 [identifier]”; NHRS.

#### Paratypes

MYANMAR – **Kachin State** • 1 ♀; “[card with female symbol] / N.E. Burma, Kambaiti; 2000 m; 24/5.1934; Malaise [typed label] / Schwedisch Indian-Burma Expedition 1934 [typed label] / ex. coll. Scheerpeltz [typed blue label] / Allotypus [handwritten red label] / TYPUS *Quedius ruficeps*, O. Scheerpeltz [typed dark red-pink label] / *ruficeps* Schp [handwritten pink card]; NHW • 1 ♀; “[card with female symbol] / N.E. Burma, Kambaiti; 7000 ft.; 28/5 1934; R. Malaise [printed label] / Schwedisch Indian-Burma Expedition 1934 [typed label] / ex. coll. Scheerpeltz [typed blue label] / COTYPUS *Quedius ruficeps* O. Scheerpeltz [pink label]”; NHW • 1 ♂; “N.E. Burma, Kambaiti; 2000 m; 25/5.1934; Malaise [typed label] / COTYPUS *Quedius ruficeps* O. Scheerpeltz [pink label] / 6694 E91 [typed blue label] / NHRS-JLKB 000021052 [identifier] / *ruficeps* Scheer [large folded label]”; NHRS.

### Redescription

Head and pronotum pale orange-red, sharply contrasting with dark, vaguely bluish elytra and abdomen, scutellum very dark red, abdomen with iridescent reflection, antennomeres 1–4 pale, yellow, antennomeres 5–11 darker, brown to dark brown, becoming darker toward apex of antenna, legs entirely pale, yellow, palpi entirely pale, yellow. Body length (minus abdomen): 3.8–4.3 mm. Head slightly wider than long (1.12–1.15), with posterior angles absent; neck varying from moderately wide to narrow, creating an impression of a more elongate head; eyes large and clearly protruding from lateral head outline, tempora shorter than eyes (0.4–0.6); temporal puncture much closer to eye margin than hind margin of head; surface of head with extremely fine and superficial microsculpture of dense transverse waves. Antennae long, all segments longer than wide except 8–10, which are weakly transverse and slightly asymmetrical. Pronotum strongly convex, about as wide as long to distinctly wider than long (1.20), slightly explanate, punctures arranged as in generic description, microsculpture similar to that on head. Scutellum impunctate. Elytra at base slightly broader than pronotum, at middle and sides distinctly longer than pronotum at midline; disc without microsculpture, punctures sparsely and irregularly spaced, deeply impressed and foveate. Wings fully developed. Abdomen with tergite VII with palisade fringe; punctuation as in generic description; tergites with extremely fine microsculpture of transverse waves.

### Male

Sternite VIII with distinct but shallow emargination that is about 3.0 × as wide as long; sternite IX with long, asymmetrical basal part, most of disc setose, narrowing to asymmetrically rounded and entire apex; tergite X weakly narrowed to truncate and loosely crenulate apex, projections bearing setae; median lobe and paramere asymmetrical; median lobe in ventral view with apical third delimited by

slight constriction, narrowed to rounded acute apex, with one lateral and one median fin-like tooth (Fig. 6A–B); median lobe in lateral view with narrowed apical part distad of emargination, this part with a tooth corresponding to the lateral tooth in ventral view, median tooth clearly visible (Fig. 6C); in the alternate lateral view, median lobe with apical part appearing broader and median tooth less visible (Fig. 6D); paramere broad and subparallel over much of its length, narrowing into a finger-like lobe, with a small lateral bulge, apex with four pairs of small setae, peg setae absent (Fig. 6E).

### Female

Tergite X (Fig. 7D) nearly oval in shape, narrowed to moderately wide and slightly acuminate apex, disc with distinct oval impression, apex with pair of very long setae.

### Distribution

Known only from the type locality in Myanmar (Kachin).

### Remarks

One of the female paratypes is slightly paler than the other individuals, the antennae appear narrower, with antennomeres 7–10 weakly transverse, and the elytra appear vaguely narrower. However, this is considered to be intraspecific variation.

### *Malaisdius smetanai* gen. et sp. nov.

urn:lsid:zoobank.org:act:2868C1D2-F3E2-42CE-B4DF-48F4B5D4705F

Figs 2B, 4E–F, 5B, 6F–G

‘*Genus 2 sp. 1* (Nepal)’: Brunke *et al.* 2021 (phylogeny, undescribed genus of *Microsaurus* lineage).

### Diagnosis

*Malaisdius smetanai* gen. et sp. nov. is easily recognized by the overall pale coloration of the body (Fig 2B). The only other species of the genus is strikingly bicolored. Additionally, the bicolored hind femur and the elytra with loose rows of punctures will distinguish this species from *M. ruficeps* comb. nov.

### Etymology

This species is dedicated to the late Dr Aleš Smetana, who was working with me on an early morphological concept of *Malaisdius* gen. nov. (and who created the name) several years before his passing in 2021. Aleš spent his career uncovering the great diversity of Quediini and without this enormous contribution, a generic revision of the tribe would not be possible.

### Type material

#### Holotype

NEPAL – **Gandaki Province** • ♂; “E-Nepal, Arun Valley, Deurali; ca. 2100 mNN; 27°30' N, 87°16' E; 10.V.2014; J. Schmidt leg. [typed label] / collection NATURKUNDE MUSEUM ERFURT [typed yellow label] / AJB0001337 [identifier] / Quediini phylogeny DNA Voucher Specimen, SeqDB: AKH-07, Specimen AJB0001337 [blue label] / *Malaisdius smetanai* Brunke, des Brunke 2023 [red label]”; NME.

### Description

Similar to *M. ruficeps* and differing only by the following: body (minus abdomen) 4.2 mm, paler overall, not sharply bicolored, head, centre of elytra, and abdominal tergites dark orange-brown to dark brown, pronotum, lateral parts of elytra and paratergites paler, brownish-orange; antennomeres 1–5



paler, orange-brown, 6–10 darker, brown; hind femora with dark apical band, hind tibia with very base darker; antennomeres 6–10 weakly transverse and slightly asymmetrical; pronotum less convex; elytral punctures arranged in loose rows, impressions even broader; abdominal tergites with punctures even more strongly impressed, slightly more numerous but still mostly restricted to basal impressions.

#### Male

Sternite VIII with emargination slightly wider; male sternite IX with basal part more strongly narrowed and hooked at the end, with distinct expansion opposite to this, apex slightly more rounded; male tergite X shorter, more strongly narrowed to apex, which is more rounded and without large setose crenulations; median lobe in ventral view slightly broader, gradually narrowed to apical part, apex slightly broader, lateral tooth smaller and facing opposite direction (Fig. 6F) [median tooth and entire lateral view not visible due to previous mounting of genitalia in Canada balsam]; paramere narrower than median lobe in ventral view, slightly convergent apicad over much of its length, finger-like lobe hooked and on opposite side of paramere, one side of apex crenulate, crenulations bearing pairs of setae (Fig. 6G).

#### Female

Unknown.

#### Distribution

Known only from the type locality in eastern Nepal.

Genus *Quedius* Stephens, 1829

Subgenus *Microsaurus* Dejean, 1833

#### Remarks

This diverse subgenus is in great need of generic revision as it is rendered polyphyletic by several genera and subgenera of Quediini, including *Malaisdius* (see further comments above under “*Microsaurus* lineage”). Currently, it is not possible to give a meaningful diagnosis of *Quedius* (*Microsaurus*). The species groups listed below are redefined from Smetana (2017a), likely monophyletic and correspond to clades in Brunke *et al.* (2021). They will be treated in much greater detail in a future publication.

#### *Apicicornis* group, *sensu nov.*

Smetana (2017a) (and additional references listed therein) have recognized the Beesoni and Apicicornis species groups of *Quedius* (*Microsaurus*) as separate yet similar taxa that are commonly collected and abundant components of the East Palearctic and Oriental fauna. Recently, it was shown that the Beesoni group rendered the Apicicornis group paraphyletic but they together formed a monophyletic ‘Clade D’ within the *Microsaurus* lineage, with the exception of *Quedius masatakai* Smetana, 2007 and *Q. masasatoi* Smetana, 2007 (Brunke *et al.* 2021). Here the former two groups, minus the Masasatoi group (see below), are combined to form a newly defined Apicicornis species group that can be recognized globally within the lineage of *Microsaurus* by the following combination of character states: antennomeres 6–10 simple (not serrate or bipectinate) but inflated (i.e., not flattened, Fig. 5C), antennomere 10 at most weakly transverse, many species with all antennomeres elongate; eyes large but with distinct temple, eye strongly protruding from head outline and with posterior frontal puncture situated at about the hind margin of eye (Fig. 5D); pronotum at least slightly explanate, with at least some marginal punctures removed from the marginal bead (Fig. 5D), anterior angles broadly rounded and with marginal bead entirely visible as seen in dorsal view (Fig. 5D); scutellum impunctate; elytral punctures uniform in size, setose and evenly distributed (Fig. 5E), in most species (not *Q. rutilipennis* and several others) fine and dense. The Apicicornis group as defined here should be treated as a separate

genus but this is outside of the scope of this paper and a more thorough morphological study is needed for a formal description.

***Quedius (Microsaurus) rutilipennis* Scheerpeltz, 1965**

Figs 2C, 5C–E, 7E

*Quedius (Microsaurus) rutilipennis* Scheerpeltz, 1965: 283.

*Quedius (Microsaurus) cornutus* Cai *et al.*, 2015: 571 **syn. nov.**

**Diagnosis**

Within the Apicicornis group, *Q. rutilipennis* can be recognized by a combination of: the sublateral rows of the pronotum reaching posterior of the large lateral puncture; and the sparsely punctate to impunctate disc of tergites III–IV (Fig. 5E).

**Type material**

**Holotype**

MYANMAR – **Kachin State** • ♂; “N.E. Burma, Kambaiti; 7000 ft.; 9/6.1934; R. Malaise [printed label] / HOLOTYPUS [red handwritten label] / TYPUS *Quedius rutilipennis*, O. Scheerpeltz [dark red-pink label] / *Quedius (Microsaurus) rutilipennis* nov. spec., det. Scheerpeltz 1944 [printed label] / 6703 E91 [printed blue label] / NHRS-JLKB 000021053”; NHRS.

**Paratypes**

MYANMAR – **Kachin State** • 1 ♀; “N.E. Burma, Kambaiti; 2000 m; 7–9/6.1934; Malaise [printed label] / Schwedisch Indian-Burma Expedition 1934 [printed label] / ex. coll. Scheerpeltz [printed blue label] / ALLOTYPUS [red handwritten label] / TYPUS *Quedius rutilipennis*, O. Scheerpeltz [dark red-pink label] / *rutilipennis* [orange card]”; NHW • 1 ♀; “[female symbol on card] / N.E. Burma, Kambaiti; 7000 ft.; 9/6.1934; R. Malaise [printed label] / Schwedisch Indian-Burma Expedition 1934 [printed label] / ex. coll. Scheerpeltz [printed blue label] / *Cotypus Quedius rutilipennis* O. Scheerpeltz [pink label]”; NMW.

**Redescription**

This species was recently described (as *Q. cornutus*) by Cai *et al.* (2015) with sufficient detail. That description is supplemented here with a complete habitus illustration (Fig. 2C) and some additional images of the antennae, forebody and abdomen (Fig. 5C–E). The female was previously undescribed and so tergite X is illustrated in Fig. 7E.

**Distribution**

The species is known from Myanmar (Kachin) and an adjacent area of Yunnan, China.

**Remarks**

The type series includes the male holotype and two female paratypes. The male was dissected to reveal an aedeagus identical to *Q. cornutus* Cai, Yan-Peng, Zong-Yi Zhao & Hong-Zhang Zhou 2015. The type locality of *Q. cornutus* is located in the narrow part of Yunnan west of the Salween River (Cai *et al.* 2015) and not far from the type locality of *Q. rutilipennis* in Myanmar. Therefore *Q. cornutus* syn. nov., becomes a junior synonym of *Q. rutilipennis*.

### **Masasatoi group**

*Quedius masasatoi* Smetana, 2007, from China (Fujian, Yunnan), Laos and Vietnam, was previously included in the Apicicornis group of Smetana (2017a), likely out of convenience as it is rather different in habitus. In a similar way, Smetana (2007) placed *Q. masatakai* Smetana, 2007, from Laos and Vietnam (Smetana & Brunke 2021), in the Ripicola group even though it was rather different in habitus. Recently, these two species were shown to be sister groups within ‘Clade E’ of the *Microsaurus* lineage, and together were sister to a species here described as *Malaisdius smetanai* gen. et sp. nov. (Brunke *et al.* 2021). *Quedius masasatoi* and *Q. masatakai* are here included in a newly delineated group, which also includes *Q. piceolineatus* Scheerpeltz, 1965 from the Malaise material collected in northern Myanmar. A new genus will need to be described for this group but additional morphological study is required in order to provide a more robust diagnosis. The Masasatoi group is provisionally diagnosed within the *Microsaurus* lineage by the following combination of characters: head with eyes large, clearly longer than temples but temples well-developed (Fig. 2D), eyes protruding from lateral head margin, posterior frontal puncture situated at about hind margin of eye, without additional punctures between posterior frontal puncture and basal punctures; antennomeres 6–10 flattened as typical for Quediini, not inflated; pronotum slightly explanate, marginal punctures not removed from marginal bead, anterior angles with marginal bead partly hidden in dorsal view, dorsal row with second and third punctures rather close together (about one puncture diameter or less) and separated from the first by a long gap (Fig. 5F), at least on one side; sublateral row not extended posteriad of large lateral puncture, without additional punctures between dorsal and sublateral rows (Fig. 5F); scutellum impunctate but sometimes with micropunctures or scratch-like elements, elytra sparsely but evenly punctate, punctures setose (Fig. 5F); abdominal tergites III or III–IV with median impunctate area (Fig. 2D); mesotarsomeres 2–4 short, triangular.

#### ***Quedius (Microsaurus) piceolineatus* Scheerpeltz, 1965**

Figs 2D, 6H–J

*Quedius (Microsaurus) piceolineatus* Scheerpeltz, 1965: 284.

#### **Diagnosis**

Within the Masasatoi group, *Q. piceolineatus* can be recognized by the pale yellow-orange body and medial darkening on the sutural area of the elytra (Fig. 2D). It is most similar to *Q. masasatoi* but the latter species is darker, bicolored reddish to orange-yellow and dark-brown (Fig. 5F), with darkened parts of the abdominal tergites. Additionally, the median lobe in ventral view and paramere of *Q. masasatoi* (Fig. 6K, M) are distinctly more slender than those of *Q. piceolineatus* (Fig. 6H, J) and the apex of the median lobe in lateral view is broader in *Q. masasatoi* (Fig. 6L). *Quedius masatakai* is entirely dark bodied and easily distinguished from pale *Q. piceolineatus*.

#### **Type material**

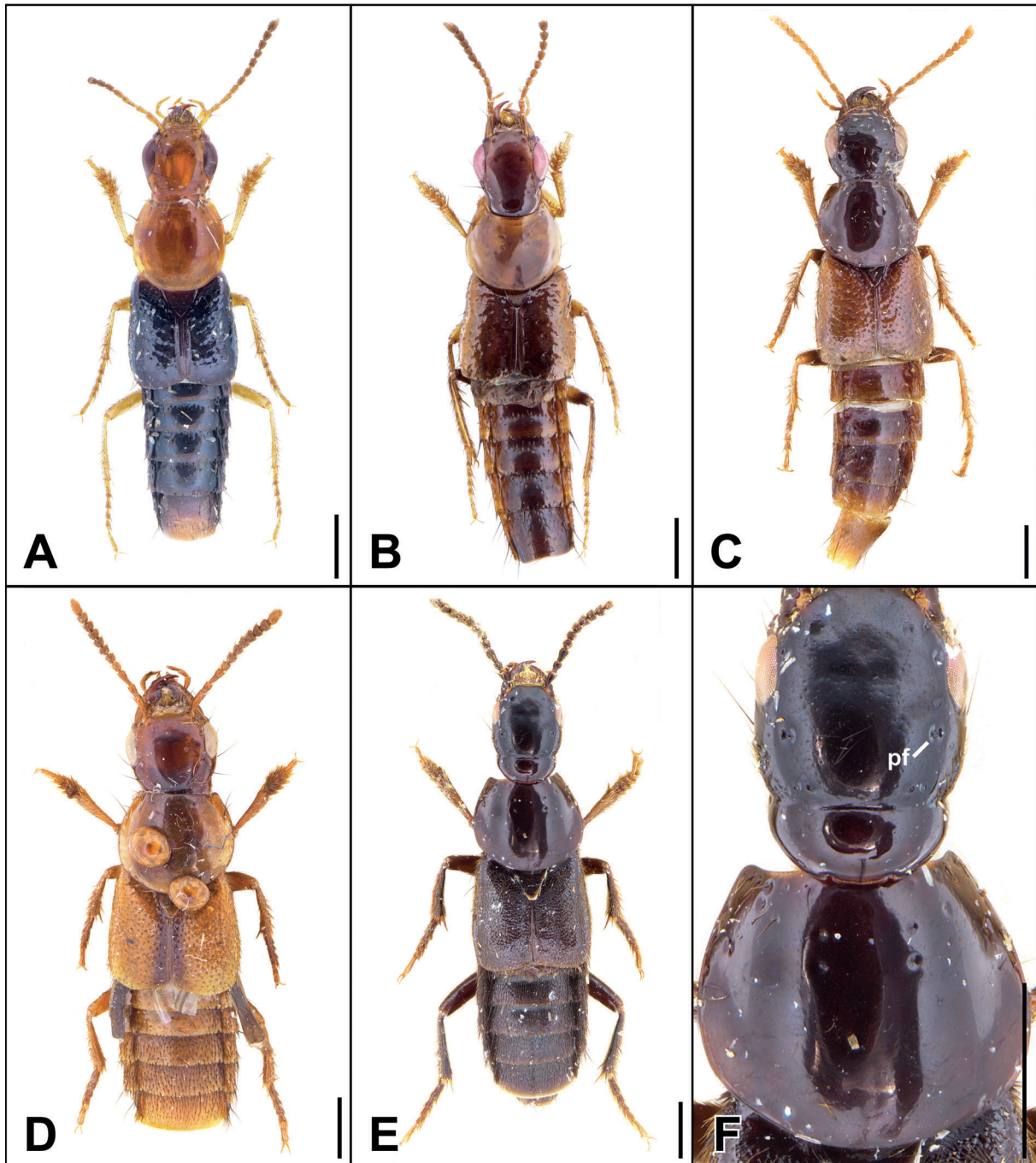
##### **Holotype**

MYANMAR – **Kachin State** • ♂; “N.E. Burma, Kambaiti; 2000 m; 14/5.1934; Malaise [printed label] / HOLOTYPUS [red handwritten label] / TYPUS *Quedius piceolineatus*, O. Scheerpeltz [dark red-pink label] / *Quedius (Microsaurus) piceolineatus* nov. spec., det. Scheerpeltz [printed label] / 6673 E91 [blue printed label] / piceolineatus Scheerpeltz [large, printed, folded label] / NHRS-JLKB 000021049”; NHRS.

#### **Redescription**

Rather similar to *Q. masasatoi* (description in Smetana 2007; supplemented by Smetana 2012a) and differing in the following: paler areas of the body in general lighter, brownish-yellow, abdominal tergites

entirely pale; antennomeres 7–10 slightly less transverse but still wider than long; tergites III–IV with median impunctate area; male tergite X very similar but with slightly and minutely emarginate apex; male sternite IX similar but with expanded middle part more symmetrical and elongate basal part shorter and less elongate; median lobe in ventral view shorter and broader, pair of median teeth slightly farther



**Fig. 2.** A–E. Dorsal habitus. A. *Malaisdius ruficeps* (Scheerpeltz, 1965), ♂, paratype (NHW). B. *Malaisdius smetanai* gen. et. sp. nov., ♂, holotype (NME). C. *Quedius (Microsaurus) rutilipennis* Scheerpeltz, 1965, ♂, holotype (NHRS). D. *Q. (M.) piceolineatus* Scheerpeltz, 1965, ♂ holotype (NHRS). E. *Q. (M.) impressithorax* Scheerpeltz, 1965, ♀ holotype (NHRS). F. Forebody of *Q. (M.) impressithorax* Scheerpeltz, 1965. Abbreviation: Pf = posterior frontal puncture. Scale bars = 1 mm.



apart (Fig. 6H), median lobe in lateral view more strongly narrowed at apex (Fig. 6I); paramere shorter and more strongly narrowed to apex, which is more rounded, setae on underside in slightly different arrangement (Fig. 6J).

#### Female

Unknown.

#### Distribution

Known only from the type locality in Myanmar (Kachin).

#### Bionomics

Nothing is known about the natural history of this species but the holotype has two deutonymphs of a uropodine mite attached to the pronotum (Fig. 2D).

#### Remarks

Based on the rather similar male genitalia, slightly emarginate tergite VIII and overall habitus (Fig. 6H–M), *Q. piceolineatus* is probably the sister species of *Q. masasatoi*.

#### *Kiangsiensis* group

This species group of *Quedius* (*Microsaurus*) was defined by Smetana (2017a) to include those East Palaearctic species with a punctate scutellum. Recently, the members of the Kiangsiensis group were shown to belong to a monophyletic group within subclade G3, which also included most members of West Palaearctic *Quedius* (*Microsaurus*) with a punctate scutellum (Brunke *et al.* 2021). Subclade G3 was recovered within the ‘core *Microsaurus*’ clade, which will be treated as genus *Microsaurus* in a future work.

#### *Quedius* (*Microsaurus*) *impressithorax* Scheerpeltz, 1965 Figs 2E–F, 7F

*Quedius* (*Microsaurus*) *impressithorax* Scheerpeltz, 1965: 281.

#### Diagnosis

Within the Kiangsiensis group, *Quedius impressithorax* may be distinguished by a combination of: small eyes, temples about 1.5 × as long as eyes (Fig. 2F); head slightly elongate, with posterior frontal puncture about three puncture diameters from eye margin (Fig. 2F); body entirely dark (Fig. 2E).

#### Type material

##### Holotype

MYANMAR – **Kachin State** • ♀; “N.E. Burma, Kambaiti; 7000 ft.; 1/5.1934; R. Malaise [printed label] / HOLOTYPUS [red handwritten label] / TYPUS *Quedius impressithorax*, O. Scheerpeltz [dark red-pink label] / *Quedius* (*Microsaurus*) *impressithorax* nov. spec., det. Scheerpeltz [printed label] / 6590 E91 [blue printed label] / *impressithorax* Scheerpeltz [large, printed, folded label] / JLKB 000021054”; NHRS.

#### Redescription

Head, elytra, abdomen, antennae and legs dark brown, pronotum and apices of abdominal tergites slightly paler, dark reddish brown; apical tarsomeres of all legs paler, yellow-brown; abdomen vaguely iridescent. Head slightly longer than wide, with posterior angles indistinct; eyes small and only slightly



protruding from lateral head outline, tempora longer than eyes, about 1.5 ×; without interocular punctures or additional punctures near the eye margin; posterior frontal puncture somewhat close to posterior margin of eye, about three puncture diameters, situated closer to margin of eye than to hind margin of head; temporal puncture slightly closer to posterior margin of head than margin of eye; surface of head with fine and dense microsculpture of transverse waves, becoming meshed at middle of disc, with distinct micropunctures moderately densely distributed. Antennae somewhat bulky, antennomere 4 only slightly transverse, 5–10 distinctly transverse, symmetrical, last segment shorter than previous two. Pronotum distinctly transverse, much wider than long, distinctly explanate laterally; dorsal rows with three punctures, sublateral rows with two punctures, not extended posteriad of large lateral puncture; microsculpture similar to that on head. Scutellum entirely and moderately densely punctate. Elytra at base distinctly narrower than pronotum, at both middle and sides, clearly longer than pronotum; punctures rather fine and dense, many punctures touching laterally; pubescence pale, yellow-brown; disc without microsculpture. Wing fully developed. Abdomen with tergite VII with palisade fringe; punctation sparser than that of elytra, punctures clearly separated by their diameter or more; tergite III with very small sparsely punctate area at middle; tergites with extremely fine microsculpture of transverse waves.

#### Male

Unknown.

#### Female

Tergite X elongate triangular, strongly narrowed to acutely projected apex, sides of apex sinuate, disc with median darkening from about posterior two-thirds to apex (Fig. 7F).

#### Distribution

Known only from the type locality in Myanmar (Kachin).

#### Remarks

The posterior frontal puncture is located at a distance from the eye that is similar to *Q. kubani* Smetana, 1996 and *Q. kuatunensis* Smetana, 2013 but in these species the head is clearly transverse, the eyes are larger and the apical antennomeres are asymmetrical. *Quedius impressithorax* keys to *Q. albiorix* Smetana, 2012 (Sichuan, China) in Smetana (2017a) but is quite different in habitus, with entirely dark antennae, a longer head and a distinctly less distant posterior frontal puncture (4–5 puncture diameters in *Q. albiorix*). *Quedius impressithorax* is here provisionally treated as a valid species until males are found at or near the type locality.

#### Subgenus *Raphirus* Stephens, 1833

In its current composition, subgenus *Quedius* (*Raphirus*) is highly polyphyletic and it is not possible to provide a useful diagnosis. Currently, it is more practical to work with species groups until a generic revision of the *Raphirus* lineage is completed.

#### *Muscicola* group, *sensu nov.*

The *Muscicola* group of *Quedius* (*Raphirus*) as defined here is equivalent to ‘Clade W’ recovered by the phylogenomic analyses of Brunke *et al.* (2021). Its members can be recognized by the following combination of characters: head with single basal puncture; eyes large and occupying most of the lateral side of head; antennomere 2 shorter than to about as long as 3; scutellum punctate. Recently, the mainland Chinese species of this group (= part of subclade W1 of Brunke *et al.* 2021) were treated together with *Q. microsaurioides* Smetana, 2008 (Smetana 2017a) as the *Muscicola* group. However,

*Q. microsaurioides* probably belongs to Clade X of Brunke *et al.* (2021) as it has an impunctate scutellum and much different habitus.

***Quedius (Raphirus) semilaeiventris* Scheerpeltz, 1965**

Fig. 3A

*Quedius (Raphirus) semilaeiventris* Scheerpeltz, 1965: 288.

*Quedius (Raphirus) sundar* Smetana, 1988: 258 **syn. nov.**

*Quedius (Raphirus) hecato* Smetana, 2012b: 48 **syn. nov.**

**Diagnosis**

Among members of the Muscicola group in the Oriental region, *Quedius semilaeiventris* may be easily distinguished by a combination of: forebody very dark; pronotum narrow, vaguely longer than wide, strongly narrowed anteriorly; elytra with sparse punctuation; legs entirely pale; abdominal tergites with large impunctate areas at middle; tergite VII with palisade fringe. A dorsal habitus is given in Fig. 3A.

**Type material**

**Holotype**

MYANMAR – **Kachin State** • ♂; “N.E. Burma, Kambaiti; 7000 ft.; 12/4.1934; R. Malaise [printed label] / HOLOTYPE [red handwritten label] / TYPUS *Quedius semilaeiventris*, O. Scheerpeltz [dark red-pink label] / *Quedius (Raphirus) semilaeiventris* nov. spec., det. Scheerpeltz 1944 [printed label] / 6711 E91 [printed blue label] / NHRS-JLKB 000073671”; NHRS.

***Quedius sundar* Smetana, 1988 syn. nov.**

**Type material**

**Holotype**

NEPAL – **Province Number 1** • ♂; “Nepal, Khand-bari District / For. NE Kuwapani; 2500 m; 28.III.82; A.&Z. Smetana leg. / HOLOTYPE *Quedius sundar* A. Smetana 1986 [red handwritten label]”; ASC.

**Paratypes**

NEPAL – **Province Number 1** • 2 ♂♂; “Nepal, Khand-bari District / For. above Ahele; 2300 m; 26.III.1982; A.&Z. Smetana leg. / PARATYPE *Quedius sundar* A. Smetana 1986 [yellow handwritten label]”; ASC.

***Quedius hecato* Smetana, 2012 syn. nov.**

**Type material**

**Holotype**

CHINA – **Yunnan Province** • ♂; “CHINA (Yunnan) Baoshan Pref., Gaoligong Shan, 33 km SE Tengchong; 24°51'22" N, 98°45'36" E; 2100–2200 m; (prim. decid. forest, brook bank, litter, moss sifted); 31.V.2007; D.W. Wrase leg.; [14B]; / HOLOTYPE *Quedius hecato* A. Smetana 2010 [red label]”; ASC.

**Redescription**

The species has been redescribed and diagnosed by Smetana (2017a) under the name *Quedius hecato* and described by Smetana (1988) under *Q. sundar*. These descriptions are only supplemented by the diagnosis above and a dorsal habitus image (Fig. 3A).

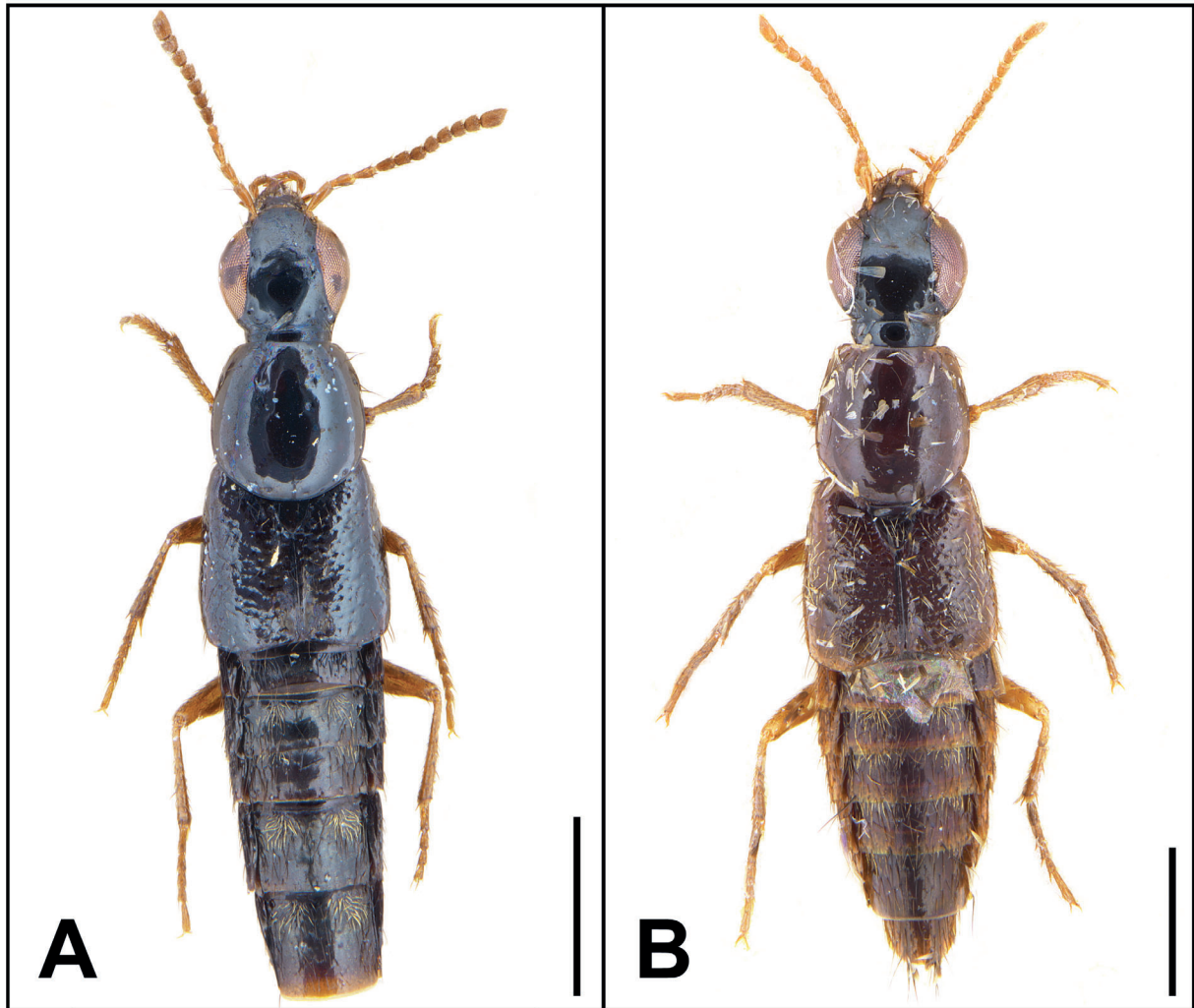
### Distribution

This species is now known from Nepal, Myanmar (Kachin) and China (Yunnan).

### Remarks

The type material of *Q. semilaeiventris* contains only the male holotype, which was dissected. The aedeagus and external morphology closely matched that of *Q. hecato* Smetana. The paramere of the type of *Q. semilaeiventris* is slightly more constricted basally than in the type of *Q. hecato* but this is considered to be intraspecific variation. As might be expected, the ‘dark pigmented aedeagus’ of *Q. hecato* (Smetana 2012b) is not typical of the species as the aedeagus is normally pigmented in the type of *Q. semilaeiventris*. The type locality of *Q. hecato* is Gaoligong Shan, Yunnan, China, which is rather close to Kambaiti Pass in Myanmar.

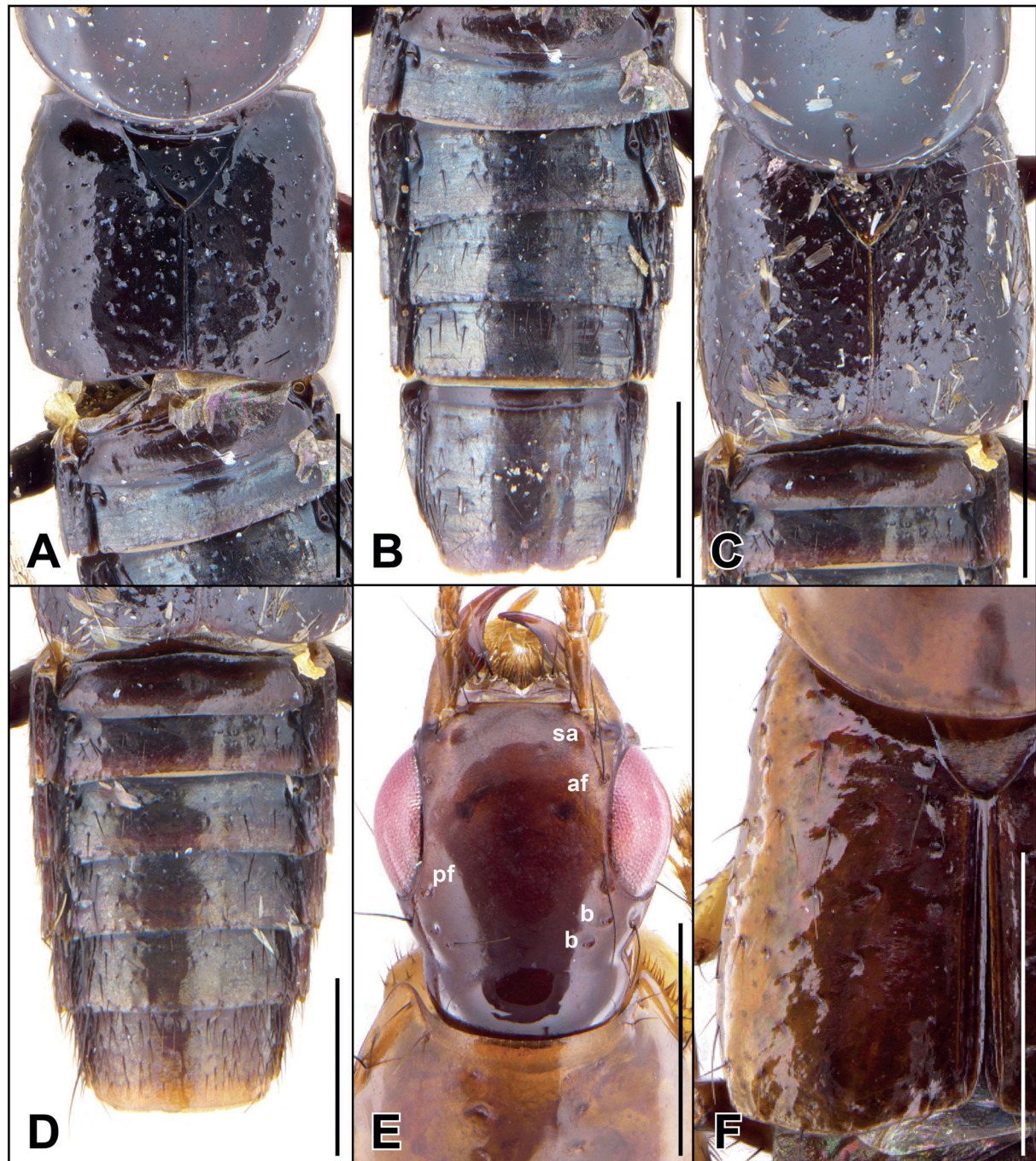
In its description (Smetana 2012b), *Quedius hecato* from China was unfortunately never compared to Himalayan *Q. sundar*. Using only the available illustrations of the aedeagus (Smetana 1988, 2012b), it would appear that the paramere in *Q. hecato* was slightly shorter than the median lobe, while it was about



**Fig. 3.** Dorsal habitus. **A.** *Quedius (Raphirus) semilaeiventris* Scheerpeltz, 1965, holotype, ♂ (NHRS). **B.** *Q. (R.) kambaitiensis* Scheerpeltz, 1965 syn. nov. (= *Q. (R.) muscicola* Cameron, 1932), ♀, holotype (NHRS). Scale bars = 1 mm.



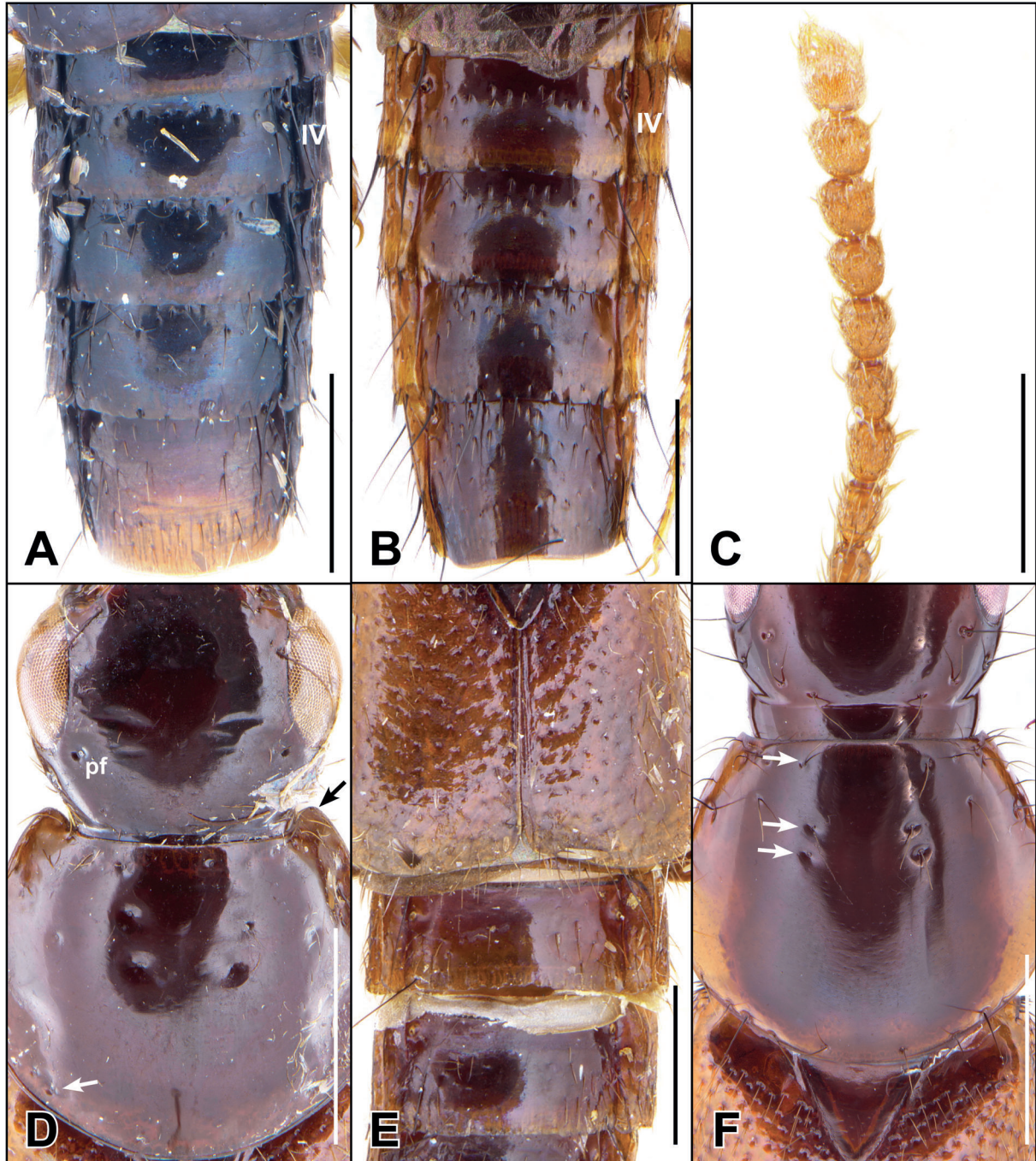
the same length in *Q. sundar*. The male holotype of *Q. sundar*, previously undissected and therefore not mounted into Canada balsam, was dissected and the aedeagus was examined in both ventral and lateral view. The paramere of the holotype is distinctly shorter than the median lobe and, in general, intermediate between the holotypes of *Q. semilaeviventris* and *Q. hecato*, and the available paratype of *Q. sundar* with the paramere still attached to the median lobe. The arrangement of the two rows of peg



**Fig. 4.** A–B. *Indoquedius dispersepunctatus* (Scheerpeltz, 1965). A. Elytra. B. Dorsal abdomen. C–D. *I. recticollis* (Scheerpeltz, 1965). C. Elytra. D. Dorsal abdomen. E–F. *Malaisdius smetanai* gen. et sp. nov. E. Head. F. Elytra. Abbreviations: Af = anterior frontal puncture; b = basal puncture; pf = posterior frontal puncture; sa = supra-antennal puncture. Scale bars = 1 mm.



setae varies between well organized and highly irregular. The shape of the median lobe in lateral view, where available, was identical across all examined specimens. Therefore both *Q. sundar* and *Q. hecato* become junior synonyms of *Q. semilaeiventris*.



**Fig. 5.** A. *Malaisdius ruficeps* (Scheerpeltz, 1965), dorsal abdomen. B. *M. smetanai* gen. et sp. nov., dorsal abdomen. C–E. *Quedius* (*Microsaurus*) *rutilipennis* Scheerpeltz, 1965. C. Antenna. D. Pronotum (white arrow: marginal punctures removed from marginal bead; black arrow: anterior angles with marginal bead entirely visible in dorsal view). E. Elytra and basal abdomen. F. *Q.* (*M.*) *masasatoi* Smetana, 2007, pronotum (arrows indicating punctures of the dorsal row). Abbreviation: Pf = posterior frontal puncture. Scale bars: A–B, D–E = 1 mm; C, F = 0.5 mm.



*Quedius (Raphirus) muscicola* Cameron, 1932

Fig. 3B

*Quedius (Raphirus) muscicola* Cameron, 1932: 295.

*Quedius (Raphirus) doherlyi* Cameron, 1932: 297 (synonymized by Smetana (1988)).

*Quedius (Raphirus) heterogaster* Cameron, 1944: 14 (synonymized by Smetana (1988)).

*Quedius (Raphirus) kambaitiensis* Scheerpeltz, 1965: 287 **syn. nov.**

### Diagnosis

Among members of the *Muscicola* group in the Oriental region, *Quedius muscicola* may be distinguished by a combination of: pronotum no more than moderately narrowed anteriorly; elytra with fine and dense punctation; legs entirely pale; abdominal tergites with sparsely punctate to impunctate areas at middle of apical half; tergite VII with palisade fringe; median lobe in ventral view with arcuate, broadly rounded apex. A dorsal habitus is given in Fig. 3B.

*Quedius kambaitiensis* Scheerpeltz, 1965 **syn. nov.**

### Type material

#### Holotype

MYANMAR – **Kachin State** • ♀; “N.E. Burma, Kambaiti; 2000 m; 4/6.1934; Malaise [printed label] / HOLOTYPUS [red handwritten label] / TYPUS *Quedius kambaitiensis*, O. Scheerpeltz [dark red-pink label] / *Quedius (Raphirus) kambaitiensis* nov. spec., det. Scheerpeltz 1944 [printed label] / 6599 E91 / [printed blue label] / NHRS-JLKB 000073668”; NHRS.

#### Paratype

MYANMAR – **Kachin State** • 1 ♂; “[male symbol on card] / N.E. Burma, Kambaiti; 2000 m; 4/6.1934; Malaise [printed label] / Schwedisch Indian-Burma Expedition 1934 [printed label] / ex. coll. Scheerpeltz [printed blue label] / COTYPUS *Quedius kambaitiensis* O. Scheerpeltz [pink label] / *kambaitiensis* [orange card] / *Quedius muscicola* Cam., det. A. Smetana 2018”; NHW.

#### Non-type material

CHINA – **Yunnan Province** • 1 ♂; Nukiang Lisu, Autonomous Prefecture, Gongshan County, Gaoligong Shan, above ranger station; 27°47.65' N, 98°35.41' E; alt. 2000 m; 19 Jun. 2005; A. Smetana leg.; ASC.

NEPAL – **Province Number 1** • 1 ♂; East Nepal, Kosi, Chinchilla, “s/Ahale”; alt. 2200 m; 4 Apr. 1984; Löbl & Smetana leg.; ASC • 1 ♂; Khandbari District, forest northeast of Kuwapani; alt. 2400 m; 5 Apr. 1984; Smetana & Löbl leg.; ASC.

### Redescription

*Quedius muscicola* has been redescribed and diagnosed by Smetana (2017a). This redescription is only supplemented by the above diagnosis and illustration of the dorsal habitus (Fig. 3B).

### Distribution

This widespread species is known from India (West Bengal: Darjeeling Distr., Himachal Pradesh, Uttar Pradesh), Nepal, Myanmar, and China (Gansu, Guizhou, Hubei, Shaanxi, Sichuan, Yunnan).

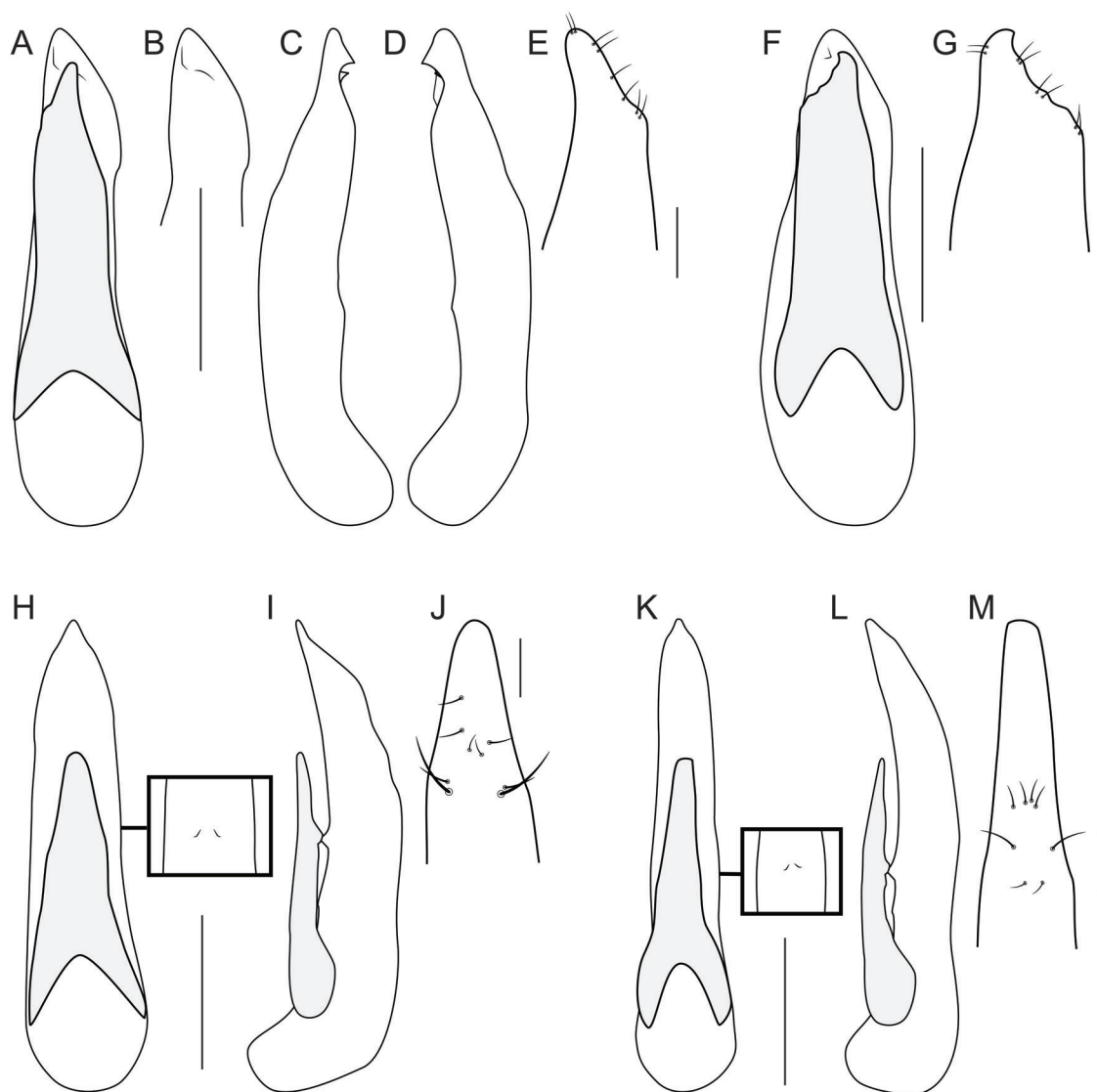
### Bionomics

*Quedius muscicola* has been collected from forests, field edges and other anthropogenic habitats in moist leaf litter, moss and grassy vegetation, rotting wood and bark, compost and flood debris (Smetana 2017a).

### Remarks

The male paratype of *Q. kambaitiensis* was dissected to reveal an aedeagus entirely consistent with that of widespread and variable species *Q. muscicola*. Therefore *Q. kambaitiensis* syn. nov., becomes a synonym of *Q. muscicola*. The determination was originally made by A. Smetana in 2018 but it is here confirmed after a comparison with similar species of the group occurring in both the Himalayan region and mainland China. Both the holotype and paratype are externally consistent with *Q. muscicola* and can be recognized as such by the features given in the diagnosis above.

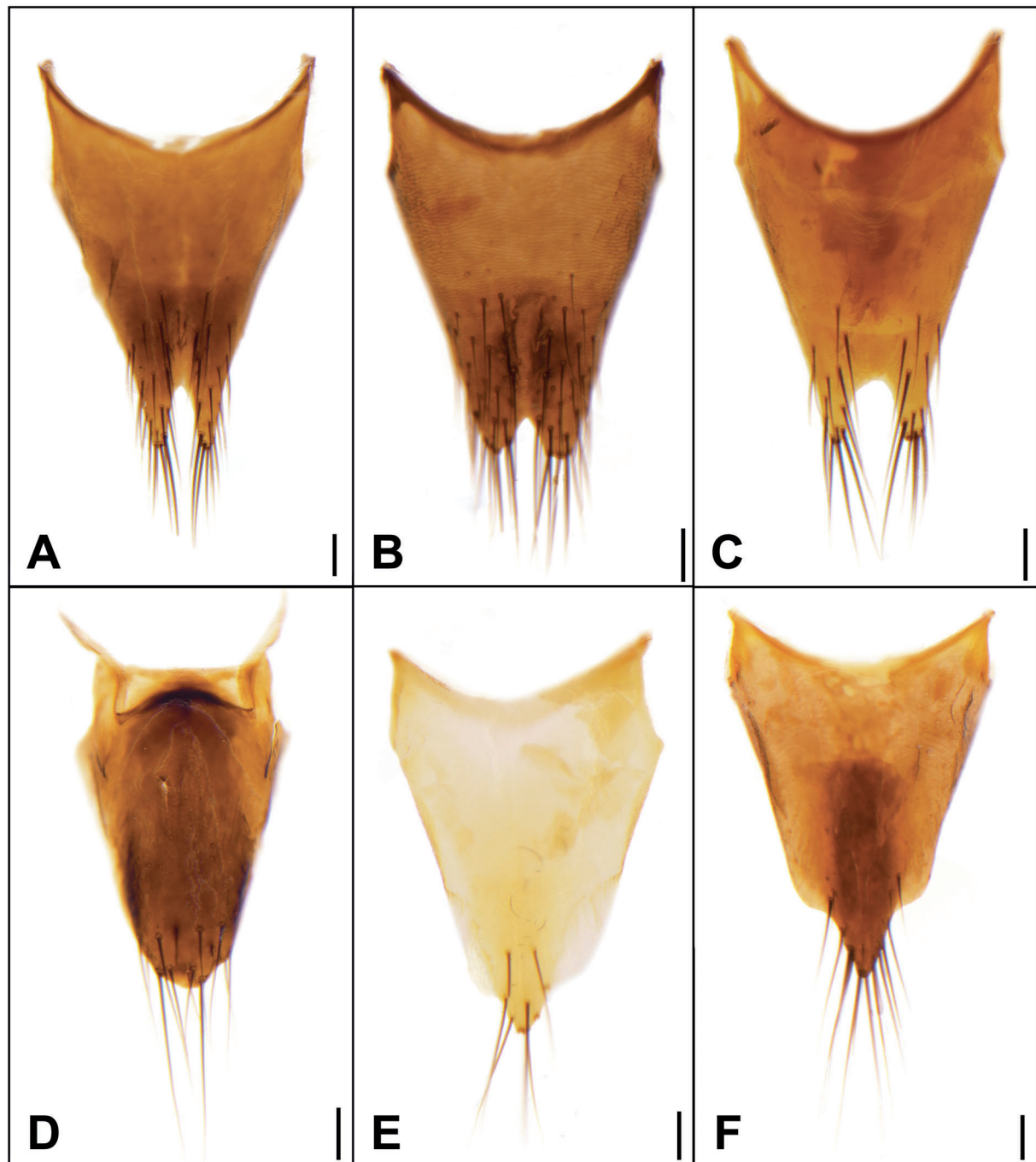
*Quedius muscicola* is a rather variable species, especially outside of mainland China (Smetana 2017a), so it is not unexpected that Scheerpeltz (1965) also reported *Q. muscicola* from Kambaiti, while describing *Q. kambaitiensis* in the same paper.



**Fig. 6.** A, F, H–I, K–L. Aedeagus, in situ. A, F, H, K. Ventral view (inset showing paired teeth). I, L. Lateral view. B–D. Median lobe. B. Ventral view. C–D. Lateral view. E, G, J, M. Underside of paramere. A–E. *Malaisdius ruficeps* (Scheerpeltz, 1965). F–G. *M. smetanai* gen. et sp. nov. H–J. *Quedius (Microsaurus) piceolineatus* Scheerpeltz, 1965. K–M. *Q. (M.) masatoi* Smetana, 2007. Scale bars: A–D, F, H–I, K–L = 0.5 mm; E, G, J, M = 0.1 mm.

## Discussion

The relatively high number of synonyms described by later authors from the Himalaya of Nepal and Yunnan, China, especially Gaoligongshan and other localities west of the Salween River ('Nujiang' in China), emphasize the strong faunal similarity of these regions. This could be expected, as mid-elevation (2000 m), moist montane forest habitat is continuous (at least before human intervention) in an arc, from



**Fig. 7.** Female tergite X. **A.** *Indoquedius dispersepunctatus* (Scheerpeltz, 1965). **B.** *I. parallelicollis* (Scheerpeltz, 1965). **C.** *I. recticollis* (Scheerpeltz, 1965). **D.** *Malaisdium ruficeps* (Scheerpeltz, 1965). **E.** *Quedius* (*Microsaurus*) *rutilipennis* Scheerpeltz, 1965. **F.** *Q. (M.) impressithorax* Scheerpeltz, 1965. Scale bars = 0.1 mm.

western Yunnan, west to at least Nepal. This pattern is also seen in *Hesperoschema malaisei* Scheerpeltz, 1965 (Staphylinidae), described from Kambaiti but recently reported from adjacent Yunnan, China (Cai & Tang 2022). More widespread species extend even further east to Sichuan, China in the case of *Indoquedius micantiventris*, *I. parallelcollis*, or much further north and east within China in the case of *Quedius muscicola*. Some of the species originally described from Kambaiti have been later found approximately 320 km further southwest, in the Mogok area (Mandalay Region) of Myanmar (e.g., *Rhyncocheilus rugulipennis* Cameron, 1932 (Staphylinidae); Schillhammer 2012).

A number of species collected only by R. Malaise have not been reported since, likely because Malaise traps have so far seen little use in staphylinid collecting in the Himalayan region or Yunnan, China. Endemism to the mountains around Kambaiti is unlikely in this case as the elevation is still rather low (~2000 m) and all of these species are flight-capable. It is unusual that so many species of *Indoquedius* and Quediini rove beetles were captured by the Malaise traps placed at Kambaiti, since these taxa are not usually efficiently collected by this method. It was only much later that collectors placed pans or trays underneath the middle interceptor to create the flight intercept trap (Biological Survey of Canada 1994), which is far more effective for collecting most Staphylinidae. It is worth noting that neither Benick (1942) nor Scheerpeltz (1965) were aware of the collecting method primarily used by Malaise and both assumed that the specimens were swept from the vegetation using a net, as samples lacked the small, often flightless species found in leaf litter. The presence of numerous Lepidoptera scales still stuck to the surface of every single specimen of the type material examined (e.g., Fig. 3B), an entomological annoyance typical of unwashed Malaise samples, argues against general sweeping.

After the results of the present study, all types of Quediini from the Oriental region are now more or less studied by modern taxonomic methods, though hundreds of new species likely await discovery and a badly needed global generic revision is currently underway by the author and collaborators. An opposite situation exists for *Indoquedius*, which has most of its true diversity concentrated in southeast Asia, where there has never been a comprehensive taxonomic review. It is hoped that the present review of the Kambaiti type material will remove some of the barriers to further exploration of *Indoquedius* and Quediini in Myanmar and in the surrounding Oriental region.

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