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Revision of the *Quedius* fauna of Middle Asia (Coleoptera, Staphylinidae, Staphylininae)

Maria Salnitska[1], Alexey Solodovnikov[2]

1 *Department of Entomology, St. Petersburg State University, Universitetskaya Embankment 7/9, Saint-Petersburg, Russia*
2 *Natural History Museum of Denmark, Zoological Museum, Universitetsparken 15, Copenhagen 2100 Denmark*

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Corresponding authors: *Maria Salnitska* (m.salnitska@gmail.com); *Alexey Solodovnikov* (asolodovnikov@snm.ku.dk)

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Abstract

Twenty eight species of the genus *Quedius* from Middle Asia comprising Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan, are revised. *Quedius altaicus* Korge, 1962, *Q. capitalis* Eppelsheim, 1892, *Q. fusicornis* Luze, 1904, *Q. solskyi* Luze, 1904 and *Q. cohaesus* Eppelsheim, 1888 are redescribed. The following new synonymies are established: *Q. solskyi* Luze, 1904 = *Q. asiaticus* Bernhauer, 1918, **syn. n.**; *Q. cohaesus* Eppelsheim, 1888 = *Q. turkmenicus* Coiffait, 1969, **syn. n.**, = *Q. afghanicus* Coiffait, 1977, **syn. n.**; *Q. hauseri* Bernhauer, 1918 = *Q. peneckei* Bernhauer, 1918, **syn. n.**, = *Q. ouzbekiscus* Coiffait, 1969, **syn. n.**; *Q. imitator* Luze, 1904 = *Q. tschinganensis* Coiffait, 1969, **syn. n.**; *Q. novus* Eppelsheim, 1892 = *Q. dzambulensis* Coiffait, 1967, **syn. n.**, *Q. pseudonigriceps* Reitter, 1909 = *Q. kirklarensis* Korge, 1971, **syn. n.** Lectotypes are designated for *Q. asiaticus* Bernhauer, 1918, *Q. fusicornis* Luze, 1904, *Q. hauseri* Bernhauer, 1918, *Q. imitator* Luze, 1904, *Q. novus* Eppelsheim, 1892 and *Q. solskyi* Luze, 1904. For all revised species, taxonomy, distribution and bionomics are summarized. *Quedius fuliginosus* (Gravenhorst, 1802), *Q. sundukovi* Smetana, 2003 and *Q. pseudonigriceps* Reitter, 1909 are recorded for Middle Asia for the first time. One species from the *Q. coloratus*-group, found to be new to science is not described due to shortage of material. Another possibly new species is tentatively identified as *Q. fulvicollis* Stephens, 1833 until the taxonomy of that widespread species is revised. An identification key to all species is provided.

Introduction

The rove beetle genus *Quedius* Stephens, 1829 is one of the largest in the family Staphylinidae. Even according to a recent phylogenetic study (Brunke et al. 2016) which restricted *Quedius* to a cluster of lineages confined mostly to the Holarctic region, it remains a very speciose taxon to deal with. The greatest diversity of *Quedius* in this restricted sense, ca. 700 species, is confined to the humid areas of the Palaearctic region (Herman 2001; Schülke and Smetana 2015). A satisfactory alpha-taxonomic knowledge of the mega-diverse Palaearctic fauna of *Quedius* is crucial for implementing a badly needed phylogenetic study and reclassification of this genus. Such taxonomic work is also important for an overall inventory and understanding of the Palaearctic entomofauna. Unfortunately, our knowledge of the Palaearctic *Quedius* is uneven and in some places very limited. For example, hardly anything has been done on *Quedius* of North Africa, Middle Asia, or Near and Middle East.

This paper aims to fill one of these knowledge gaps and focuses on *Quedius* of Middle Asia in the sense of Cowan (2007), i.e. the area covering five countries: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan (Fig. 1). These countries are indeed dominated by arid landscapes and their faunas have much in com-

Figure 1. Middle Asia, our study region comprising five countries according to Cowan (2007).

mon (Kryzhanovsky 1965). However, one must bear in mind the poor correspondence of this large territory to biogeography. Due to certain patterns of geography, landscape mosaic and biogeographic history, various areas of Middle Asia may show stronger faunal connections with other respective neighboring regions than to each other. Nevertheless, we limit our paper by the formal political borders of the listed countries for practical reasons. As the former republics of the Soviet Union, they often were (and often still are) studied together. As a result, legacy taxonomic and faunistic literature considers Middle Asia largely within these borders.

Where necessary, we have considered literature or material from areas outside Middle Asia. However, species known only from outside this region were not included in this paper. One rather specialized and distinct group of species related to *Quedius* (*Microsaurus*) *mutilatus*, which comprises endemic Middle Asian species with narrow montane distributions, has been revised in a separate publication (Salnitska and Solodovnikov 2018). However, species of the *Q. mutilatus* group are here included in the identification key to all species of *Quedius* currently known from Middle Asia. We hope that this taxonomic revision and the first specialized key of Middle Asian *Quedius* will stimulate further investigations of the genus in this and adjacent poorly known areas of the Palaearctic region.

Material and methods

Depositories of material

Material for this paper is deposited in the public institutions and private collections abbreviated as follows:

FMNH	Field Museum of Natural History, Chicago, USA (C. Mayer, M. Thayer, A. Newton)
HNHM	Hungarian Natural History Museum, Budapest, Hungary (G. Makranczy)
MNHN	National Museum of Natural History, Paris, France (A. Taghavian)
NHMD	Natural History Museum of Denmark (former ZMUC, Zoological Museum of the Univeristy of Copenhagen) (A. Solodovnikov, S. Selvantharan)
NMW	Natural History Museum, Vienna, Austria (H. Schillhammer)
ZIN	Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia (B.A. Korotyaev)
ZMLU	Zoological Museum (part of the Biological Museum, Lund University), Sweden (C. Fägerström)
ZMMU	Zoological Museum of Moscow University, Moscow, Russia (N.B. Nikitsky)

cAss Private collection of V. Assing, Hannover, Germany
cKoc Private collection of M. Kocián, Praha, Czech Republic
cKur Private collection of S.A. Kurbatov, Moscow, Russia
cRyv Private collection of A.B. Ryvkin, Moscow, Russia
cSch Private collection of M. Schülke, Berlin, Germany (to be deposited at the Museum of Natural History, Berlin, Germany)

Preparation, examination and illustration of specimens

Specimens were examined with Lomo MSP-2 ver. 2 and Leica M125 dissecting scopes. Habitus and genitalia photographs were obtained using a Nikon SMZ 1500 binocular microscope with a Nikon D700 digital SLR camera. Illustrations of the male genitalia were done from soft preparations of these structures in glycerin (after dissecting, maceration in 10% KOH, and rinsing in distilled water) using a drawing tube attached to a Nikon SMZ 1500 binocular microscope. All dissected aedeagi are kept in glycerin in genitalia microvials pinned under their respective specimens.

Measurements

Measurements were taken at X4.5 magnification using an ocular micrometer. They are abbreviated as follows: HL – head length (from base of labrum to neck constriction along the head midline); HW – head width (maximum, including eyes); PL – pronotum length (along midline); PW – pronotum width (maximum); EL – length of elytra (from humerus to the most distal part of the elytral posterior margin); EW – width of elytra (maximum, with elytra closed along suture). Overall body length was measured from apex of labrum to apex of abdomen.

Type material

Where possible type material was examined and supplied with our standard respective labels indicating the revised status or identity of the respective type specimens. All original labels of the type specimens are cited verbatim in the 'Material examined' sections and, where available, photographed.

Classification

We use conventional subdivision of the genus *Quedius* into subgenera as in e.g. Schülke and Smetana (2015). Within the subgenera we list species so that those we presume to be closely related appear close to each other. Except the recently defined *coloratus*-group (Assing 2017) and *mutilatus*-group (Salnitska and Solodovnikov 2018), we cannot use any of the hitherto proposed species groups in *Quedius*. Species groups of Coiffait (1978) for the West Palaearctic fauna are very outdated, inconsistent and even lack any diagnoses. Among those of Smetana (1971, 1988, 1992, 1995b, 1996, 2001, 2015a, 2017), species groups proposed for the fauna of China (Smetana 2017) are worth consideration, especially given that the large Xinjiang province of the north-western China borders with Middle Asia via Tajikistan, Kyrgyzstan and Kazakhstan. However, that large province of China seems to be one of the least explored areas there, what can be seen for example, from the lacking records for any wide-spread Middle Asian species from that province. Therefore, placing Middle Asian species in the species groups of Smetana (2017) was not possible, at least without extensive direct comparisons with the material from China. We can only propose that among the Middle Asian species, *Q. hauseri* and a species tentatively identified here as *Q. fulvicollis* may be related to the Chinese *muscicola*-group. Also, it should be noted that Smetana (2017) placed *Q. koltzei* in its own monotypic species group. We should also point to our disagreement with Smetana (2017) who considers *Q. equus* a member of the *przewalskii*-group, while we place it in the *mutilatus*-group (Salnitska and Solodovnikov 2018, and here). These disagreements are not essential for the taxonomic purposes of this paper and they once again call for a necessity of a large-scale phylogenetic study of *Quedius*. All species treated in this revision are also listed alphabetically in Table 1.

Distribution maps

All distributions were mapped using QGIS 2.12.0 and geographical coordinates indicated on the original locality labels of the specimens. In the case of older, non-georeferenced labels, we used approximate geographic coordinates that we were able to find for the respective toponyms with the aid of various printed maps or online systems (Google Maps, Google Earth, Global Gazetteer version 2.3 and others). Ambiguously indicated localities are cited verbatim in the 'Material examined' sections and taken in quotation marks. All our interpretations for such localities are given in square brackets. Those of which that are mapped are also given with their approximate coordinates in Table 2.

Results

Borders and geography of Middle Asia

The term "Middle Asia" is somewhat fuzzy in the geographical or historical literature. For example, sometimes Kazakhstan is considered as a part of Middle Asia, sometimes an expression "Middle Asia and Kazakhstan" is used. Often the distinction between "Middle Asia" and "Central Asia" is not clear. English-language publications have used "Central Asia" to refer to areas of the former USSR, to areas of China and Mongolia and to areas that cross the former Soviet/Chinese border. To avoid this ambiguity we follow Cowan (2007) and use "Middle Asia" to refer to Kazakhstan, Turkmenistan, Uzbekistan, Tajikistan and Kyrgyzstan collectively. The geographic area covered by these five countries is a subject of this paper (Fig.1). In

the west, Middle Asia is bordered by the Caspian Sea and the state border between Russia and Kazakhstan, nearly coinciding with the Volga River. In the north, Middle Asia is outlined by the long administrative border between Kazakhstan and Russia. In the east, Middle Asia borders with north-western China through the eastern administrative borders of Kazakhstan, Kyrgyzstan and Tajikistan. In the south, it is outlined by the northern borders of Afghanistan and Iran. While large areas of Kazakhstan and Turkmenistan are covered by more or less flat, desert landscape, eastern and south-eastern Kazakhstan, as well as Kyrgyzstan and Tajikistan are mainly montane countries with complex relief and a diverse landscape mosaic. In north-eastern Kazakhstan, the Altai mountain chain stretches into Middle Asia from Russia. In eastern Kazakhstan, as well as in Kyrgyzstan and Tajikistan, the area is dominated by the vast mountain systems of Tien Shan and Pamir. Large lakes like the Aral Sea, Balkhash, Issyk-Kul, and rivers like Amu Darya or Syr Darya are significant elements in the geography of Middle Asia as well.

History of the study of *Quedius* of Middle Asia

Middle Asia is the region in the western Palaearctic where published data about *Quedius* remained the most fragmentary and confusing, limited to a number of scattered and mostly outdated species descriptions. Eppelsheim (1888, 1892) was the first who studied *Quedius* material collected in Middle Asia by the early explorers such as Hauser, Staudinger, Akinin and described four new species: *Q.* (*M.*) *mutilatus* Eppelsheim, 1888, *Q.* (*Raphirus*) *cohaesus* Eppelsheim, 1888, *Q.* (*M.*) *capitalis* Eppelsheim, 1892 and *Q.* (*R.*) *novus* Eppelsheim, 1892. Later, based on the material from Semenov and Hauser, Luze (1904) and Bernhauer (1918), respectively, described five more new species from Middle Asia: *Q.* (*M.*) *solskyi* Luze, 1904, *Q.* (*M.*) *rufilabris* Luze, 1904, *Q.* (*M.*) *fusicornis* Luze, 1904, *Q.* (*R.*) *imitator* Luze, 1904, *Q.* (*M.*) *asiaticus* Bernhauer, 1918, *Q.* (*M.*) *bucharensis* Bernhauer, 1918 and *Q.* (*R.*) *hauseri* Bernhauer, 1918. These species descriptions varied in quality and, in accordance with the time, were based exclusively on external morphology. Some of these species have been re-examined in the monograph by Gridelli (1924), while the first drawings of the aedeagi for some of them appeared in Wüsthoff (1938).

The next notable contribution to the study of Middle Asian *Quedius* was made in the papers by Coiffait (1954, 1955, 1963, 1967, 1969, 1970, 1975, 1978) devoted to the Western Palearctic fauna. Henry Coiffait added aedeagus illustrations for many Middle Asian species and integrated them in his identifications keys for the Western Palearctic *Quedius*. He also described *Q.* (*R.*) *dzambulensis* Coiffait, 1967, *Q.* (*R.*) *ouzbekiscus* Coiffait, 1969, *Q.* (*R.*) *tschinganensis* Coiffait, 1969, *Q.* (*R.*) *turkmenicus* Coiffait, 1969, and *Q.* (*M.*) *tadjikiscus* Coiffait, 1975, all from Middle Asia. Unfortunately, Coiffait's input was based on very limited material from Middle Asia and additionally suffered from inconsistent study of type material and omissions of the earlier literature. For example, three species described from Middle Asia by Luze (1904), *Q.* (*M.*) *fusicornis*, *Q.* (*M.*) *rufilabris* and *Q.* (*M.*) *solskyi*, were entirely overlooked in the influential monograph of Coiffait (1978) and have not been studied since their original description. The most unfortunate flaw of Coiffait's taxonomy was an artificial and over-splitting approach to species. As a result, all species of *Quedius* from Middle Asia he described as new, except *Q.* (*M.*) *tadjikiscus*, turned out to be synonyms here.

Finally, some bionomic and distributional data on Middle Asian *Quedius* were published by local authors stationed in that region (Kascheev, 1984–2002; Kadyrov et al., 2014a, b; Gabdullina, 2016). With the scattered, confusing and then poorly accessible taxonomic literature on *Quedius*, no surprise that their local faunistic papers were greatly infested by incorrect species identifications. Examination of the material collected by Kascheev (1984–2002), now deposited at ZIN, largely helped to reveal such misidentifications summed up in the Table 1 here.

Overall, due to a hitherto lacking targeted contemporary taxonomic investigation of the Middle Asian *Quedius*, identity of the majority of species described from, or recorded for, that region remained highly ambiguous. Most of the species described from Middle Asia needed broader comparisons and a revision of the type material. At the same time, a number of widespread species from Middle Asia were misidentified or overlooked. A large amount of *Quedius* material from Middle Asia remained undetermined and scattered in some institutional and private collections. The revision of *Q.* (*M.*) *mutilatus* species group by Salnitska and Solodovnikov (2018) was the only recent taxonomic work that touched upon Middle Asian *Quedius*.

Taxonomic part

Genus *Quedius* Stephens, 1829

Type species. *Quedius levicollis* (Brullé, 1832).

According to the latest phylogenetic hypotheses (Solodovnikov, 2006; Chatzimanolis et al., 2010; Brunke et al., 2016) the genus *Quedius* as it stands now in the taxonomic literature (e.g., summaries in Herman, 2001 or Schülke and Smetana, 2015) is a polyphyletic assemblage of species belonging to several different subtribes of Staphylinini. Within the Palaearctic or Middle Asia, all species of *Quedius* are members of the subtribe Quediina in the restricted sense of Brunke et al. (2016). Because of the polyphyly, *Quedius* in the current composition lacks synapomorphies and clear diagnosis. However, genus descriptions and diagnostic combination of characters that can define any Palaearctic species as a member of the genus *Quedius* are available in Coiffait (1978), Smetana (1988), Assing and Schülke (2012) and other sources. The diagnosis of the genus *Quedius* and comparative notes we provide here are tuned for the fauna of Middle Asia.

Adults and larvae of *Quedius* seem to be predators hunting small invertebrates in various, sufficiently hu-

mid ground-based debris, mostly in forest leaf litter. In a largely arid region like Middle Asia, *Quedius* are mainly confined to humid open or forested habitats along creeks or rivers in the lowland or forests, meadows, snowfield margins and talus in the mountains. Some members of the subgenus *Microsaurus* are specialized inhabitants of mammal burrows. Overall, bionomics of the genus in Middle Asia remain largely unstudied.

Diagnosis. Medium to large size (body length 3.5–24.0 mm) rove beetles with glossy forebody, infraorbital ridges extended from neck to base of mandibles and pronotal hypomera strongly inflexed under pronotal disk (not visible in lateral view). First segment of antennae at most slightly longer than second and third segments together. Last segment of maxillary palps fusiform, not densely setose. Tarsal formula 5–5–5; anterior tarsi widened in both sexes, with pale adhesive setae ventrally, with pair of empodial setae. Males always with distinct apical emargination on abdominal sternite VIII. Aedeagus varies in shape, paramere mostly with sensory peg setae.

Comparison. Among other Staphylinini in Middle Asia *Quedius* can be sometimes confused with *Philonthus* (subtribe Philonthina), a genus with somewhat similar habitus and very abundant in the region. Species of *Philonthus*, however, do not have long infraorbital ridges, they lack empodial setae and mostly have a pronotal hypomeron well visible in lateral view. Also, *Philonthus* mostly possess multiple setiferous punctures in dorsal rows of pronotum (usually at most three in *Quedius*). Smaller species of *Quedius* may be confused with the genus *Heterothops* (subtribe Amblyopinina), but the latter have very thin acicular apical segments of maxillary palps, and a very different aedeagus without sensory peg setae and reduced median lobe giving the appearance of an absent paramere).

Table 1. Alphabetical list of *Quedius* species recorded for Middle Asia, with new synonyms. Boldfaced species are those confirmed by material in our study; species in regular font not given in square brackets are those known from literature only, presumably absent in Middle Asia; species in regular font and given in square brackets are those previously recorded for the region in literature based on misidentifications and here excluded from the fauna.

Species	Subgenus	Records from Middle Asia	Notes	Page here
[*Q. acuminatus acuminatus* Hochhuth, 1849]	*Raphirus*	Kascheev 2001, 102; 2002, 181	Misidentification of *Q. hauseri*	150
Q. altaicus Korge, 1962	*Quedius* (s. str.)	Toleutaev 2014, 44		128
[*Q. auricomus* Kiesenwetter, 1850]	*Raphirus*	Kascheev 1989, 36	Based on misidentification; here not confirmed by material	–
Q. balticus Korge, 1960	*Quedius* (s. str.)	Klimenko 1996, 121		–
[*Q. boopoides* Munster, 1923]	*Raphirus*	Kascheev 2002, 181	Apparently misidentification of *Q. hauseri*	150
[*Q. boops boops* Gravenhorst, 1802]	*Raphirus*	Eppelsheim 1892, 332; Kascheev 2001, 102; Toleutaev 2014, 44	Apparently misidentification of *Q. hauseri*	150
Q. brevis Erichson, 1840	*Microsaurus*	Gabdullina 2016, 61		–
***Q. bucharensis* Bernhauer, 1918**	*Microsaurus*	Bernhauer 1918, 93; Gridelli 1924, 56; Coiffait 1978, 186; Kadyrov et al. 2014a, 31; 2014b, 49		138
***Q. capitalis* Eppelsheim, 1892**	*Microsaurus*	Eppelsheim 1892, 329; Gridelli 1924, 40; Coiffait 1978, 148; Kadyrov et al. 2014a, 31; 2014b, 49		132
[*Q. cincticollis cincticollis* Kraatz, 1857]	*Raphirus*	Toleutaev 2014, 44 (cited as *Q. cincticollis* Kr.)	Misidentification, likely of *Q. hauseri*	150
***Q. cohaesus* Eppelsheim, 1888**	*Raphirus*	*Q. cohaesus*: Eppelsheim 1888, 60; Gridelli 1925, 126; Coiffait 1963, 393; 1978, 248; Toleutaev 2014, 44; *Q. turkmenicus*: Coiffait 1969, 49; *Q. afghanicus*: Coiffait 1977: 139; Coiffait 1978, 232		142
=*Q. turkmenicus* Coiffait, 1969, syn. n.				
=*Q. afghanicus* Coiffait, 1977, syn. n.				
Q. sp. aff. Q. coloratus	*Raphirus*			149
***Q. curtipennis* Bernhauer, 1908**	*Quedius* (s. str.)	Bernhauer 1908, 335		125
***Q. equus* Smetana, 2004**	*Microsaurus*	Salnitska and Solodovnikov 2018, 10		139
Q. fulgidus fulgidus Fabricius, 1792	*Microsaurus*	Kascheev 2002, 181 (cited as *Q. fulgidus* F.)		–
***Q. fuliginosus* Gravenhorst, 1802**	*Quedius* (s. str.)		First record from Middle Asia	125
***Q. fulvicollis* Stephens, 1833** (tentative identification)	*Raphirus*	Klimenko 1996, 121 (based on uncertain reference)		155
[*Q. fumatus* Stephens, 1833]	*Raphirus*	Kascheev 2001, 102; Toleutaev 2014, 44; Gabdullina 2016, 61	Presumed misidentification	–
***Q. fusicornis* Luze, 1904**	*Microsaurus*	Luze 1904, 101; Gridelli 1924, 40		134
***Q. hauseri* Bernhauer, 1918**	*Raphirus*	*Q. hauseri*: Bernhauer 1918, 94; Tronquet 1981, 71; Klimenko 1996, 121; *Q. peneckei*: Bernhauer 1918, 95; *Q. ouzbeciscus*: Coiffait 1969, 52; 1970, 143; 1978, 278; Kascheev 2001, 102	Records of *Q. acuminatus acuminatus*, *Q. boops* and *Q. boopoides* likely belong to this species	150
=*Q. peneckei* Bernhauer, 1918, syn. n.				
=*Q. ouzbekiscus* Coiffait, 1969, syn. n.				

Species	Subgenus	Records from Middle Asia	Notes	Page here
Q. humeralis Stephens, 1832	*Raphirus*	Eppelsheim 1892, 332; Gridelli 1922, 130, 134	Presumed misidentification	–
***Q. imitator* Luze, 1904**	*Raphirus*	*Q. imitator*: Luze 1904, 102; Coiffait 1967, 406; 1978, 237; Bohác 1988, 556; Kadyrov et al. 2014a, 31; 2014b, 49; *Q. tschinganensis*: Coiffait 1969, 50; 1970, 143; 1978, 237; Klimenko 1996, 121; Kascheev 2001, 102		143
=*Q. tschinganensis* Coiffait, 1969, syn. n.				
Q. infuscatus Erichson, 1840	*Microsaurus*	Kascheev 1984, 28; 1985, 46		–
***Q. limbatus* Heer, 1839**	*Raphirus*	Eppelsheim 1892, 332; Smetana 1962, 146; Horion 1965, 284; 32; Kascheev 2001, 102; 2002, 181		139
[*Q. longicornis* Kraatz, 1857]	*Microsaurus*	Kascheev 2002, 181	Presumed misidentification	–
[*Q. maurorufus* Gravenhorst, 1806]	*Raphirus*	Toleutaev 2014, 44	Presumed misidentification of *Q. pseudonigriceps*	140
Q. meridiocarpathicus Smetana, 1958	*Quedius* (s. str.)	Klimenko 1996, 121 (based on uncertain reference)		–
***Q. mutilatus* Eppelsheim, 1888**	*Microsaurus*	Eppelsheim 1888, 58; Gridelli 1924, 23; Coiffait 1978, 161; Klimenko 1996, 121; Smetana 1998, 118; Solodovnikov and Hansen 2016, 3–8; Salnitska and Solodovnikov 2018, 4		139
***Q. kalabi* Smetana, 1995**	*Microsaurus*	Smetana 1995a, 77; 1998, 119; Salnitska and Solodovnikov 2018, 9		139
***Q. koltzei* Eppelsheim, 1892**	*Microsaurus*	Coiffait 1978, 164		137
Q. molochinus Gravenhorst, 1806	*Quedius* (s. str.)	Protopoyan 1967, 168 (cited as *Q.* '*nittidipennis* Steph. [sic!]')		–
***Q. kungeicus* Solodovnikov & Salnitska**	*Microsaurus*	Salnitska and Solodovnikov 2018, 13		139
[*Q. nigriceps* Kraatz, 1857]	*Raphirus*	Kascheev 2001, 102; 2002, 181; Kadyrov et al. 2014a, 31; 2014b, 49	Presumed misidentification	–
[*Q. nigrocaeruleus* Fauvel, 1876]	*Microsaurus*	Gabdullina 2016, 61	Presumed misidentification	–
***Q. novus* Eppelsheim, 1892**	*Raphirus*	*Q. novus*:Eppelsheim 1892, 331; Gridelli 1925, 125; Coiffait 1963, 389; 1970, 143; 1978, 228; Bohác 1988, 556; Smetana 1995a, 84; Klimenko 1996, 121; Kadyrov et al. 2014a, 31; 2014b, 49; *Q. dzambulensis*: Coiffait 1967, 403; Coiffait 1978, 229; Bohác 1988, 556; Kascheev 2001, 102		146
=*Q. dzambulensis* Coiffait, 1967, syn. n.				
***Q. ochripennis* Ménetries, 1832**	*Microsaurus*	Gridelli 1929, 21; Klimenko 1996, 121; Kascheev 2001, 102; Kadyrov et al. 2014a, 31; 2014b,49		131
[*Q. persimilis* Mulsant & Rey, 1876]	*Raphirus*	Kascheev 2001, 102; 2002, 181 (cited as *Q. joyi* Fagel)	Presumed misidentification of *Q. hauseri*	–
***Q. pseudonigriceps* Reitter, 1909**	*Raphirus*		First record for Middle Asia	140
=*Q. kirklarensis* Korge, 1971, syn. n.				
[*Q. picipes* Mannerheim, 1830]	*Microsaurus*	Kascheev 2001, 102	Presumed misidentification	–
***Q. puncticollis* Thomson, 1867**	*Microsaurus*	Kascheev 2001, 102		132
***Q. rufilabris* Luze, 1904**	*Microsaurus*	Luze 1904, 100; Gridelli 1924, 72; Kadyrov et al. 2014a, 31; 2014b, 49	Type material not found	138
***Q. scintillans* Gravenhorst, 1806**	*Raphirus*	Eppelsheim 1892, 332;		155
[*Q. scitus* Gravenhorst, 1806]	*Microsaurus*	Kascheev 2001, 102	Presumed misidentification	–
***Q. solskyi* Luze, 1904**	*Microsaurus*	*Q. solskyi*: Luze 1904, 99; Gridelli 1924, 72; *Q. asiaticus*: Bernhauer 1918, 92; Gridelli 1924, 57; Coiffait 1978, 183; Kascheev 2002, 181		135
=*Q. asiaticus* Bernhauer, 1918, syn. n.				
***Q. sundukovi* Smetana, 2003**	*Quedius* (s. str.)		First record for Middle Asia	130
***Q. tadjikiscus* Coiffait, 1975**	*Microsaurus*	Coiffait 1975, 32; 1978, 149; Kadyrov et al. 2014a, 31; 2014b, 49		138
***Q. umbrinus* Erichson, 1839**	*Raphirus*	Kascheev 1989, 36		149
***Q. vicinus* Ménetries, 1832**	*Quedius* (s. str.)	Boháč 1988, 554		131

Table 2. Suggested georeferencing for ambiguous toponyms from old labels.

Label data verbatim	Locality	Long	Lat	Country
"ISKANDER-KUL ISKANDER-DARIA Glasunov 1892"	Iskanderkul Lake, Iskander Darya river, Ayni Distr.	[39°4.2']	[68°22.2']	Tajikistan
"Seravschan Kumar Glasunov 1892"	Kumar River valley, Ayni Distr.	[68°31.8']	[39 16.2]	Tajikistan
"JAGNOB KARSAU Glasunov 1892"	Yaghnob River valley, Sughd Distr.	[68°32.4']	[39°11.4']	Tajikistan
"JAGNOB CHISHARTOB Glasunov 1892"	Yaghnob River valley, Sughd Distr.	[68°32.4']	[39°11.4']	Tajikistan
"Trkst. Jagnob Kol Schach-Sara Glasunov 1892"	Yaghnob River valley, Sughd Distr.	[68°32.4']	[39°11.4']	Tajikistan
"SERAVSCHAN DARCH Glasunov 1892"	Darg, Sughd Distr.	[68°58.8']	[39°21']	Tajikistan
"Seravschan Kschtut. Artutsch. Glasunov 1982"	Kylali, Sughd Distr.	[68°2.4']	[39°21.6']	Tajikistan
"Seravschan Fl. Magian Glasunov 1892"	Seravschan Mt. Ridge, Mogiyon, Panjakent Distr.	[67°39.6']	[39°15']	Tajikistan
"SERAVSCHAN OBBURDEN Glasunov 1892"	Obburdon, Mastchoh Distr.	[69°18']	[40°25.8']	Tajikistan
"Mts. Karateghin Baldschuan 924 m. F. Hauser 1898"	Karateghin Mts, Baljuvon, Baljuvon Distr.	[69°40.2']	[38°18']	Tajikistan
"Mt. Karateghin Sary-pul 1482 m. F. Hauser 1898"	Karateghin Mts, Saripul, Khatlon Distr.	[70°7.8']	[38°25.2']	Tajikistan
"PROV. KULIAB, Ak-sou-Tal, F. Hauser 1898/ Gift from Nat. Mus. Praha. 2009"	Ak-Su, Khatlon Distr.	[68°34.8']	[38°7.2']	Tajikistan
"Gaudan, Transcaspian reg., 15.I.1898, E. Fimyanovich"	Gaudan, Ashgabat Distr.	[58°24']	[37°39']	Turkmenistan
"Trkst. Mnt. Nurata UCHUN Glasunov 1892"	Nurata Mt., Nurata Distr.	[65°41.4']	[40°32.4']	Uzbekistan
"Fergana valley, tract Aral, Achinsk, L. Arnoldi"	Aral, Namangan Distr.	[71°55.2']	[41°00']	Uzbekistan

Key to species of *Quedius* of Middle Asia

1 Anterior margin of labrum entire so that labrum never bilobed or notched in the middle. Large species with body length 9.0–15.0 mm (fig. 187a in Assing and Schülke 2012) ..... 2 (Subgenus *Quedius* s. str.)

– Anterior margin of labrum either with distinct notch in the middle, or with deep emargination so that labrum looks bilobed. Mostly smaller species with body length 5.0–12.0 mm (fig. 187b–d in Assing and Schülke 2012) 6

2 Scutellum without setiferous punctures, glabrous. Frons with additional setiferous punctures (that only occasionally maybe lost) between anterior frontal punctures 3

– Scutellum with setiferous punctures, setose. Frons without additional setiferous punctures between anterior frontal punctures 4

3 Aedeagus (in parameral view): apical portion of paramere lanceolate, wider than its sinuate middle part; rows of sensory peg setae on the parameral underside, in their basal half, extended more medially from parameral lateral margins (fig. 188c in Assing and Schülke 2012); lateral contours of apical part of median lobe not visible from under paramere (fig. 188a in Assing and Schülke 2012)..... *Q. fuliginosus* (Habitus Fig. 2A).

– Aedeagus (in parameral view): apical portion of paramere gradually narrowing apicad, medially not sinuate and not narrower than its more apical part; rows of sensory peg setae on the parameral underside, in their basal half, extended more laterally, closer to parameral lateral margins (fig. 188f in Assing and Schülke 2012); lateral contours of median lobe apically visible from under paramere (fig. 188d in Assing and Schülke 2012) ..... *Q. curtipennis*

4 Body dark brown, with paler (sometimes reddish) elytra (Habitus as in Fig. 2C). Aedeagus (in lateral view): apex of paramere protruding beyond median lobe in the form of a distinct hook (fig. 1 in Hachikov 2003) ..... *Q. vicinus*

– Body and elytra black, or at most dark brown. Aedeagus (in lateral view): apex of paramere straight, not pointing out from median lobe as a distinct hook 5

5 Elytra shortened, distinctly shorter than pronotum. Obviously brachypterous species, without whitish apical seam on abdominal tergite VII. Smaller: body length 7.50–9.00 mm (Habitus Fig. 2B). Aedeagus as in figs 4–6 in Smetana 2002..... ..... *Q. sundukovi*

– Elytra normal, about as long as pronotum. Species with whitish apical seam on abdominal tergite VII. Larger: body length 8.6–12.5 mm. Habitus and aedeagus as in Fig. 5E–G ..... *Q. altaicus*

6 Eyes small or moderate in size, always distinctly shorter than temples (fig. 187d in Assing and Schülke 2012). Vertex (at least one side) with two basal punctures postero-medially from posterior frontal puncture (fig. 186b in Assing and Schülke 2012). Postero-lateral areas of pronotum somewhat explanate ..... 7 (Subgenus *Microsaurus*)

– Eyes large and convex, always longer than temples (fig. 187b, c in Assing and Schülke 2012). Vertex with one basal puncture postero-medially from posterior frontal puncture (fig. 186a in Assing and Schülke 2012). Postero-lateral areas of pronotum not explanate ..... 18 (Subgenus *Raphirus*)

7 Elytra brownish, of about same or very similar coloration as the rest of the body. Eyes very small, 2.5–2.7 times as long as temples. Elytra shorter than pronotum. Distinctly brachypterous species without whitish apical seam on abdominal tergite VII (Fig. 2E) 8

– Elytra reddish, always different in coloration from the rest of the body, which is black or at most dark brown. Eyes larger, ca. 0.5–1 times as long as temples. Elytra longer than, or as long as pronotum. Apical seam on abdominal tergite VII always distinct 11

8 Aedeagus (fig. 4G–N in Salnitska & Solodovnikov 2018), in parameral view: paramere apically deeply incised, appearing bilobed ..... *Q. equus*
– Aedeagus (in parameral view): paramere apically at most slightly incised..... 9
9 Aedeagus (fig. 4E, F Salnitska & Solodovnikov 2018), parameral view: apical portion of paramere ovoid (lanceolate), not rhomboid ..... *Q. kungeicus*
– Aedeagus, in parameral view: apical portion of paramere somewhat rhomboid (fig. 4B, D in Salnitska & Solodovnikov 2018) 10
10 Aedeagus (fig. 4C, D in Salnitska & Solodovnikov 2018), in lateral view: apical portion of median lobe relatively narrower and acute) ..... *Q. kalabi*
– Aedeagus (fig. 4A, B in Salnitska & Solodovnikov 2018), in lateral view: apical portion of median lobe relatively broader and blunt ..... *Q. mutilatus*
11 Smaller species: body length around 6.0–9.3 mm. Aedeagus, underside of the paramere: peg setae arranged in rows with maximum 6–8 pegs in each row extending basad from pairs of lateral setae (Figs 7D, 8D)..... 12
– Larger species: body length around 8.0–11.0 mm. Aedeagus, underside of the paramere: peg setae located at the apex of paramere only (*Q. solskyi*, Fig. 9C) or arranged in groups extending basad from the parameral apical margin, beyond the pairs of lateral setae (fig. 191j–k, t–v in Assing and Schülke 2012)..... 13
12 Aedeagus: underside of the paramere (Fig. 7D): with ca. 4–8 sensory peg setae in each of two rows curved along lateral sides of paramere ..... *Q. capitalis*
– Aedeagus: underside of paramere (Fig. 8D): with ca. 3 sensory peg setae in each of two linear rows..... *Q. fusicornis*
13 Aedeagus, paramere (Fig. 9C) parallel-sided along most of its length, not lanceolate, with only 1–2 peg setae at apical margin on each side of the mid-apical incision 14
– Aedeagus, paramere not parallel-sided, with more or less lanceolate or rhomboid apical portion (fig. 191j, l in Assing and Schülke 2012); peg setae on parameral underside more numerous and arranged in irregular rows or groups. 15
14 Larger species with body length 8.9–9.7 mm; head distinctly wider than long (HL/HW ratio 0.7–0.8) with posterior frontal puncture situated in the middle of distance between posterior margin of eye and nuchal ridge. (Habitus and aedeagus as in Fig. 9A–D) ..... *Q. solskyi*
– Smaller species with body length 8.5–9.4 mm; head from nearly as long as wide to longer that wide (HL/HW ratio 0.9–1.1) and posterior frontal puncture situated closer to posterior margin of eye than to nuchal ridge. Structure of the aedeagus unknown (for details see below) ..... *Q. bucharensis*
15 Pronotum with basalmost setiferous puncture of sublateral group (sometimes may be lost at one side) situated distinctly behind the level of large lateral puncture (fig. 186a in Assing and Schülke 2012)..... 16
– Pronotum with punctures of sublateral group always situated before or at most at the same level as large lateral puncture (fig. 186b in Assing and Schülke 2012) 17
16 Aedeagus, in parameral view: apical portion of the paramere lanceolate with bluntly pointed apical contour (fig. 191j, l in Assing and Schülke 2012) ..... *Q. ochripennis*
– Aedeagus, in parameral view: apical portion of the paramere not lanceolate, with broad and shallow apical emargination (fig. 191t, v in Assing and Schülke 2012)..... *Q. puncticollis*
17 Pronotum with dorsal rows each with only two punctures. Aedeagus, underside of the paramere: peg setae arranged in four irregular groups: a pair of apical groups and a pair of subapical groups (fig. 11C in Coiffait, 1978)..... *Q. koltzei* (externally *Q. rufilabris*, an ambiguous species described from 'Zeravshan' also fits here; for details see the section on this species)
– Pronotum with dorsal rows each with three punctures. Aedeagus, underside of the paramere: peg setae arranged only in two subapical groups, the pair of apical groups absent (fig. 7K–M in Coiffait 1978)..... *Q. tadjikiscus*
18 Scutellum with setiferous punctation; eyes large and convex, occupying almost entire lateral side of head; rather small species. Body not longer than 6.0 mm. Aedeagus as in (Figs 19B–D, 21B, C) 19
– Scutellum glabrous, without setiferous punctation; eyes smaller and more flat; temples more distinct. Body length varies but includes larger species. Aedeagus different..... 20
19 Aedeagus: paramere almost parallel-sided, only slightly narrowing in the middle portion, rows of peg setae long and regular (Fig. 19C) Habitus and aedeagus as in Fig. 19A–D ..... *Q. hauseri*
– Aedeagus: paramere not parallel-sided, strongly narrowing in the middle portion, rows of peg setae shorter and irregular (Fig. 23C). Habitus and aedeagus as in Fig. 23A–C ..... *Q. fulvicollis*
20 Frons with two additional punctures between anterior frontal punctures. Rather small species, body not longer than 6.0 mm ..... *Q. scintillans*
– Frons without punctures between anterior frontal punctures. Species varying in size 21
21 Elytra shortened, slightly shorter than, or at maximum, as long as pronotum. Brachypterous species without whitish apical seam on abdominal tergite VII (Fig. 3F). Aedeagus as in Fig. 11 ..... *Q. pseudonigriceps*
– Elytra longer than, or at minimum, as long as pronotum. Species with whitish apical seam on abdominal tergite VII (Fig. 3C). Aedeagus different 22

22 Relatively large species, body length 8.1–11.7 mm. Aedeagus: paramere shorter, its apex far from reaching apex of median lobe (in lateral view) with subapical tooth located far basad from its apex (Fig. 18B). Habitus and aedeagus as in Fig. 18A–C..... *Q.* sp. aff. *Q. coloratus*
– Mostly smaller species, body length 5.0–7.5 mm. Aedeagus different..... 23
23 Aedeagus: median lobe (in lateral view) distinctly curved; multiple sensory peg setae on the underside of the paramere arranged in one or two irregular longitudinal groups, never in clear straight rows along parameral margins (e.g., Fig. 17). Larger species 6.0–8.0 mm..... 24
– Aedeagus, in lateral view: median lobe straight, not curved dorso-ventrally (fig. 193r–t in Assing and Schülke 2012). Smaller species, body not longer than 6.5 mm..... 25
24 Body brown to dark brown, sometimes elytra paler or reddish. Larger (body length 6.0–8.0 mm) and more robust species (Fig. 4B). Aedeagus (fig. 194j–l in Assing and Schülke 2012): median lobe in lateral view with subapical tooth situated close to its apex (fig. 194k in Assing and Schülke 2012); underside of paramere with sensory peg setae arranged in wide irregular rows diverging from each other basad..... *Q. umbrinus*
– Body light-brown to brown, but never black, elytra brownish; larger (body length 6.0–7.0 mm) and more slender species (Figs 3E, 16A). Aedeagus (Figs 16B, C, 17): median lobe in lateral view with subapical tooth situated far basad from its apex; underside of paramere with ca. 40–50 peg setae arranged in one irregular median row..... *Q. novus*
25 Aedeagus (fig. 193r–t in Assing and Schülke 2012): underside of paramere with ca. 4–5 sensory peg setae in each of two rows along its lateral margins. Habitus as in Fig. 3D..... *Q. limbatus*
– Aedeagus (Figs 12C, D, 15): underside of paramere with many more (ca. 8–18) sensory peg setae in each of two rows along its lateral margins..... 26
26 Aedeagus (Figs 15, 14B, C, F, G): median lobe in lateral view with subapical tooth located distinctly more basad from its apex (Figs 14B, F; 15); underside of paramere with sensory peg arranged in two regular rows very close to each other (Figs 14C, G, 15)..... *Q. imitator*
– Aedeagus (Figs 12C, D, 13B, C): median lobe in lateral view with subapical tooth located close to its apex (Figs 12C, 13B); underside of paramere with sensory peg setae arranged in two irregular rows more remote from each other (Figs 12D, 13C)..... *Q. cohaesus*

*S*ubgenus *Quedius* Stephens, 1829

Quedius (s. str.) *curtipennis* Bernhauer, 1908

Quedius fuliginosus var. *curtipennis* Bernhauer, 1908, 335 (original description)
Quedius curtipennis: Herman 2001, 3134 (summary of literature); Assing and Schülke 2012, 457, 458 (diagnosis, distribution and bionomics, aedeagus illustration).

Type material examined. Syntypes (all in FMNH): Faroe Islands: 1 ♂, "Suderö Faroer Ins./ Dr. Cornu 1907/ v. curtipennis Brh. Typus [handwritten]/fuliginosus Grav. Scheerp. [handwritten]/ Chicago NHMus M. Bernhauer Collection [printed]/ D. Drugmand det. 1994 Quedius (s. str.) curtipennis Brnh. [preprinted handwritten]"; 1 ♂, "Nördl. Faroer Ins./ Dr. Cornu 1907/ v. curtipennis Brh. Typus [handwritten]/ fuliginosor Scheerp. [sic!] det. [illegible] [handwritten]/ Chicago NHMus M. Bernhauer Collection [printed]/ D. Drugmand det. 1994 Quedius (s. str.) curtipennis Brnh. [preprinted handwritten]"; Uzbekistan: 1 ♂, "v. curtipennis Buchara Bang Haas det. Bernh. [preprinted handwritten]/ Chicago NHMus M. Bernhauer Collection [printed]".

Comments on taxonomy, distribution and bionomics. Bernhauer (1908) described *Q. curtipennis* as a variety of *Q. fuliginosus* without clear information on the type material. In addition to the morphological diagnosis of a new variety Bernhauer (1908) mentioned that it is common on the Faroe Islands and also occurs in "Vorarlberg, Buchara and Böhmen (Wrana. Moldau)". Interestingly, revision of the type material has never been published for this common widespread species since its original description. We have examined three male syntypes of *Q. curtipennis* kept at the FMNH, two from Faroe Islands and one from 'Buchara' in Uzbekistan, all listed above. Our examination of the syntypes confirms that they are conspecific and matching current interpretation of this species (e.g. in Assing and Schülke 2012). *Quedius curtipennis* is a common species widely distributed in the forests and humid microhabitats of the open landscapes of the Western Palaearctic (Herman 2001; Assing and Schülke 2012). Because of the strong morphological similarity, *Q. curtipennis* can be easily confused with *Q. fuliginosus*. As a result, current broad distributions for both species as recently summarized in Assing and Schülke (2012), especially outside Europe, need revision. A male syntype of *Q. curtipennis* from "Buchara" (Uzbekistan) collected more than a century ago (see below) and overlooked in the subsequent literature is the only specimen of this species known from Middle Asia. Since the original description *Q. curtipennis* has not been recorded from any of the countries of Middle Asia.

Quedius (s. str.) *fuliginosus* Gravenhorst, 1802

Fig. 2A

Quedius fuliginosus: Herman 2001, 3155 (summary of literature); Assing and Schülke 2012, 457, 458 (diagnosis, distribution and bionomics, aedeagus illustration).

Material examined. Kazakhstan: 1 ♂, Akshatau Mt., NW Ayaguz, Semipalat, forest leaf litter, 17.VII.1962,

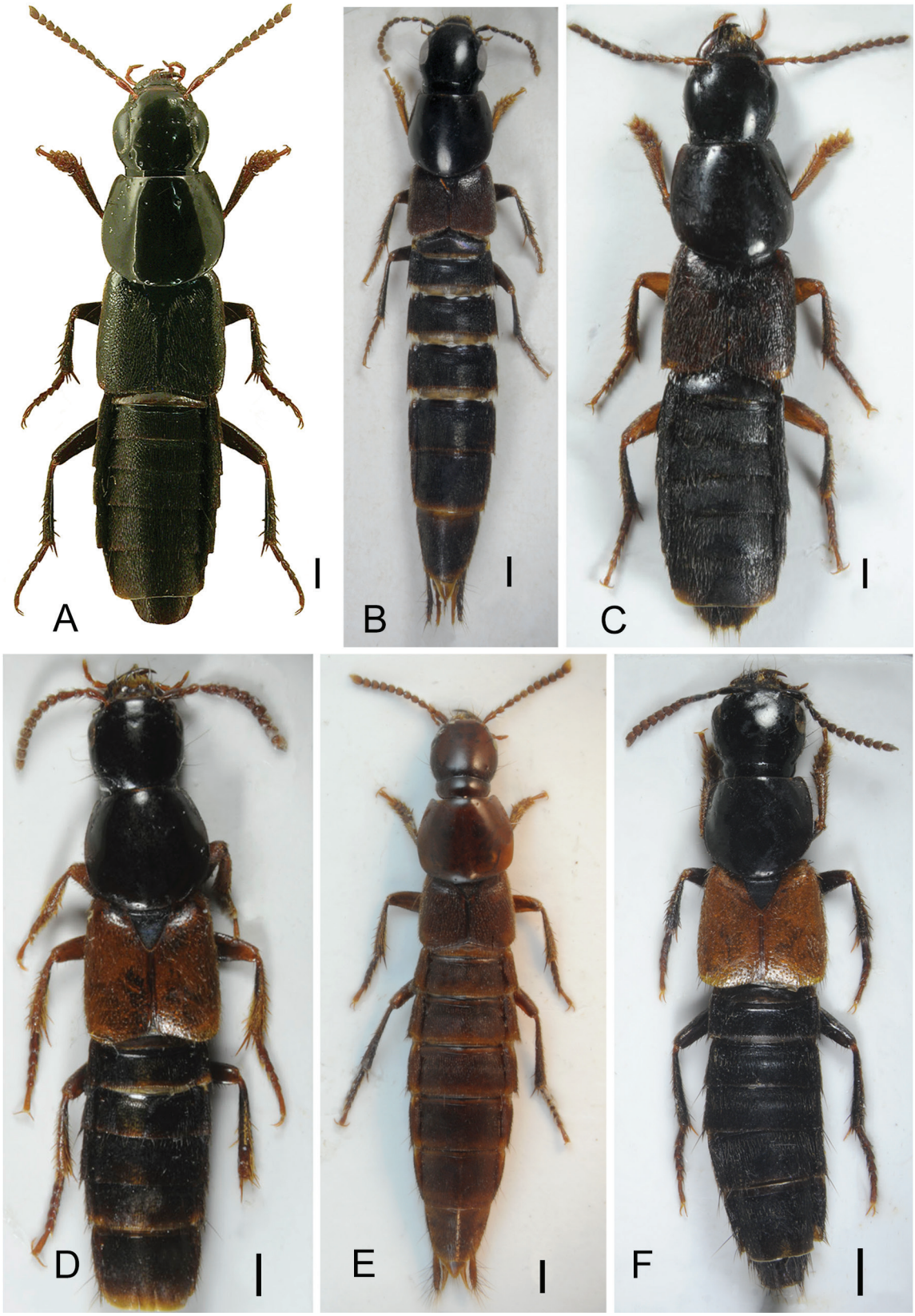

Figure 2. Habitus of *Quedius* recorded in Middle Asia. **A** *Q. fuliginosus* (photo Lech Borowiec) **B** *Q. sundukovi* **C** *Q. vicinus* **D** *Q. koltzei* **E** *Q. mutilatus* **F** *Q. ochripennis*. Scale bars: 1 mm.

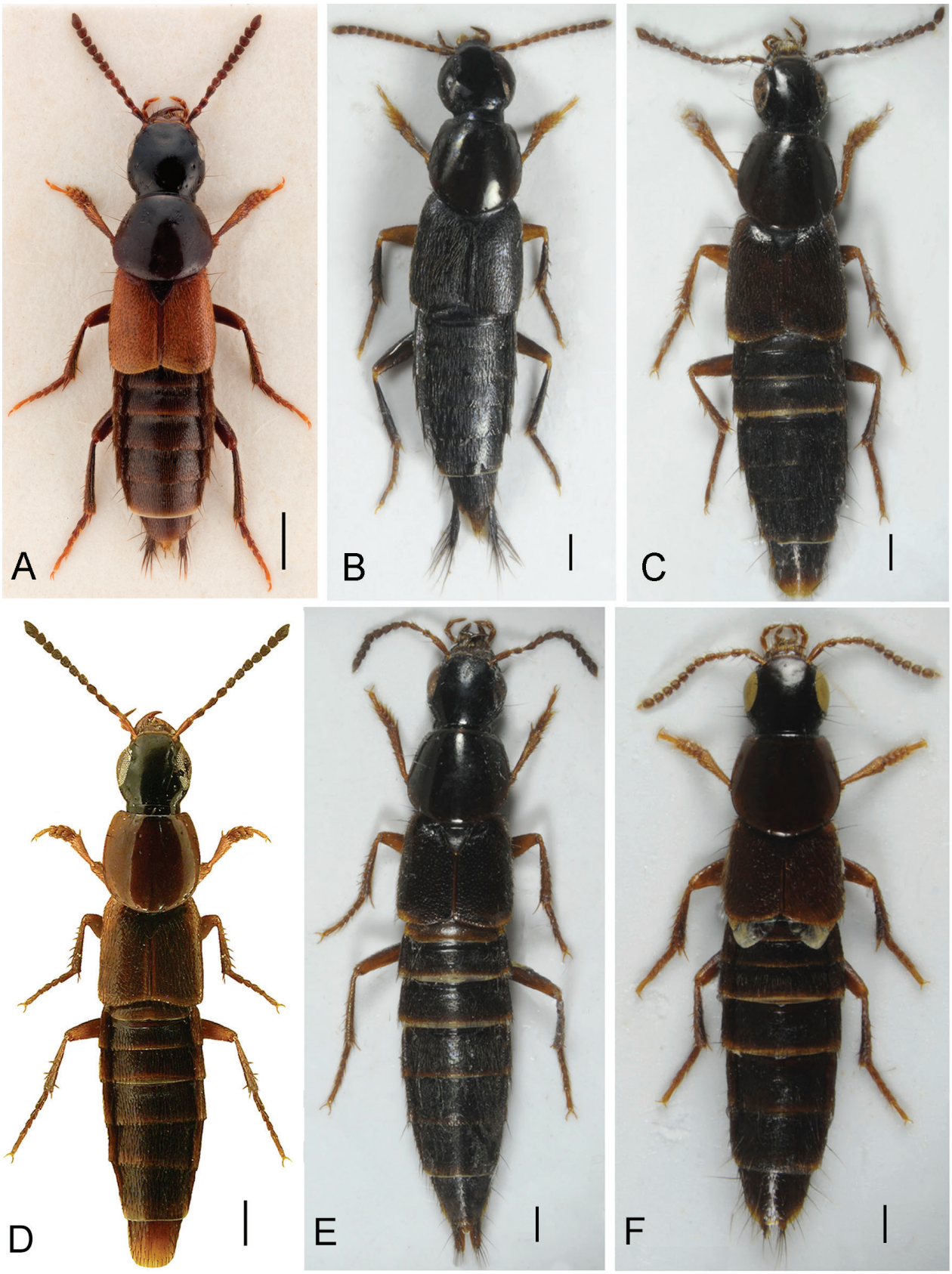

Figure 3. Habitus of *Quedius* recorded in Middle Asia. **A** *Q. puncticollis* (photo http://danbiller.dk) **B** *Q. hauseri* **C** *Q. imitator* **D** *Q. limbatus* (photo Lech Borowiec) **E** *Q. novus* **F** *Q. pseudonigriceps*. Scale bars: 1 mm.

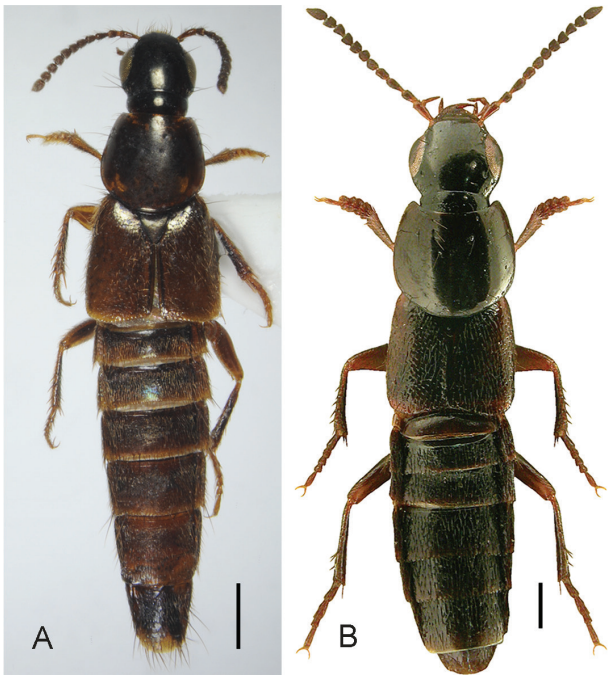

Figure 4. Habitus of *Quedius* recorded in Middle Asia. **A,** *Q. scintillans*; **B,** *Q. umbrinus* (Lech Borowiec). Scale bars: 1 mm.

L.V. Arnoldi leg. (ZIN); 2 ♂ Stepnyak, Zhukey Lake, 10.VII.2002, V.A. Kastcheev leg.; 1 ♂, Ivanovsky Mt. Ridge, 32 km S Leninogorsk, 1300 m a.s.l. 14.VIII.1986, I.I. Kabak leg. (ZIN); **Uzbekistan:** 1 ♂, 1 ♀, Tashkent, near railway station, plant residues, 24.V.1986, S.A. Kurbatov leg. (cKur).

Comments on taxonomy, distribution and bionomics. Similarly to *Q. curtipennis* (see above), *Q. fuliginosus* is a widespread and common species in the Western Palaearctic, and subject of numerous publications. The most recent summary of its diagnostic characters, bionomics and distribution can be found in Assing and Schülke (2012). For the same reasons as *Q. curtipennis* above, the exact distribution of *Q. fuliginosus* needs careful revision. Limited material from Kazakhstan and Uzbekistan examined here represents the first records of this species from Middle Asia.

Quedius (s. str.) *altaicus* Korge, 1962

Figs 5, 6

Quedius altaicus Korge, 1962, 152 (original description); Coiffait 1978 (characters), 194; Toleutaev 2014, 44 (distribution records).

Material examined. Holotype: *Russia:* female, "Zentral-Altai, lg. Leder, det. Bang-Haag [handwritten]/ unicolor Kies. det. Bernhauer [handwritten]/ ♀ Holotypus Quedius s. str. altaicus H. Korge [printed]/ Chicago NHMus M. Bernhauer Collection/ Holotype teste D.J. Clarke 2014 GDI Imaging Project [printed]/ Photographed Kelsey Keaton 2014 Emu Catalog/ FMNHINS 2819427 Field Museum [printed]" (FMNH);

Additional material. Kazakhstan: 1 ♂, West Altai, Ivanovsky Mt. Ridge, 32 km Leninogorsk [Ridder], 14.VIII.1986, 1300 m a.s.l., I.I. Kabak leg. (ZIN); 1 ♂, SW Altai, E Narymsky Mt. Ridge, upper reaches of Shurshutsu River [Forpostnaya], lower forest zone, 21.VII.1997, 1300 m a.s.l., R.Yu. Dudko, V.K. Zinchenko leg.; 2 ♂, 1 ♀, SW Altai, E of Markakol Lake, Urunhayka, ground traps, 21.VI–07.VII.1997, 1500 m a.s.l., R.Yu. Dudko, V.K. Zinchenko leg.; 1 ♂, same locality and collectors, but 8 km ESE Matabai, north slope of Matabai Mt. Ridge, forest, 10.VII.1997, 1600–2000 m a.s.l, (NHMD); 1 ♂, Manrak Mt. Ridge, 12 km Priozerny [Tugil], 16.VII.1986, I.I. Kabak leg. (ZIN); **Russia:** 1 ♂, Altai, Listvyaga Mt. Ridge, 10 km SSE Tesninskiy Belok Mt., Seredchiha River, forest, 27.VII.1997, 1200–1500 m a.s.l., R.Yu. Dudko, V.K. Zinchenko leg. (NHMD).

Comparative material on Quedius subunicolor. Type material: Paratypes: *Sweden*: 1 ♂, "Häggenäs s-n Jtl. *T. Palm* 4–8, 8 1945 [printed]/ det. H. Korge Quedius subunicolor Korge [printed]/ Paratypus subunicolor Korge [pre-printed]/ Quedius subunicolor Korge [handwritten]/ Type no. 1202:2 MZLU [printed]/ 2016 189 MZLU [printed]" (ZMLU); 3 ♀, same data, but two last labels as "Type no: 1202:3 MZLU/ 2016 190 MZLU [printed]" (Fig. 5D) (ZMLU); **Additional material:** *Norway*: 3 ♀, Fn. Nesseby h:d, Nyborg, 35483, 04–09.VI.1963, Gom. Israelson leg.; *Sweden*: 1 ♀, Nb. [Norbotten] Kihlangi, 10–17.VI.1947, T. Palm leg.; 1 ♀, Vittangi, 02–14.VIII.1963, Th. Palm leg.; 1 ♀, L. Lpm, Vittanger, 08.VI.1968, S. Lundberg leg.; 1 ♂, Lu. Lpm. Messaure, 09–16.VII.1973, K. Muller leg.; 2 ♂, 1 ♀, Jokkmokk, 21.V.1965, T.B. Engelmark leg. (ZMLU).

Comments on taxonomy and type material. The original description of *Quedius altaicus* was based on two female specimens (a holotype and a paratype) from "Central-Altai" without precise record of the type locality (Korge, 1962). Such ambiguity was stressed by Korge who noted that the status of *Q. altaicus*, which externally appeared very similar to *Q. unicolor* and *Q. subunicolor*, should be confirmed by the examination of male genitalia. Toleutaev (2014) recorded *Q. altaicus* from Saur Mountains (Eastern Kazakhstan), but that record needs verification.

In spite of the ambiguous original description of *Q. altaicus*, new material from Altai including males examined here for the first time can be safely attributed to that species. This material perfectly matches Korge's original description, and the information together with high quality photos of the holotype available from the Field Museum online beetle type database (FMNH, 2018). Besides, there are no other species in the Altai region that could be misidentified as *Q. altaicus*. *Quedus sundukovi*, the only other similar species distributed from the Russian Far East to the South-Western Altai is distinctly different (for details see below).

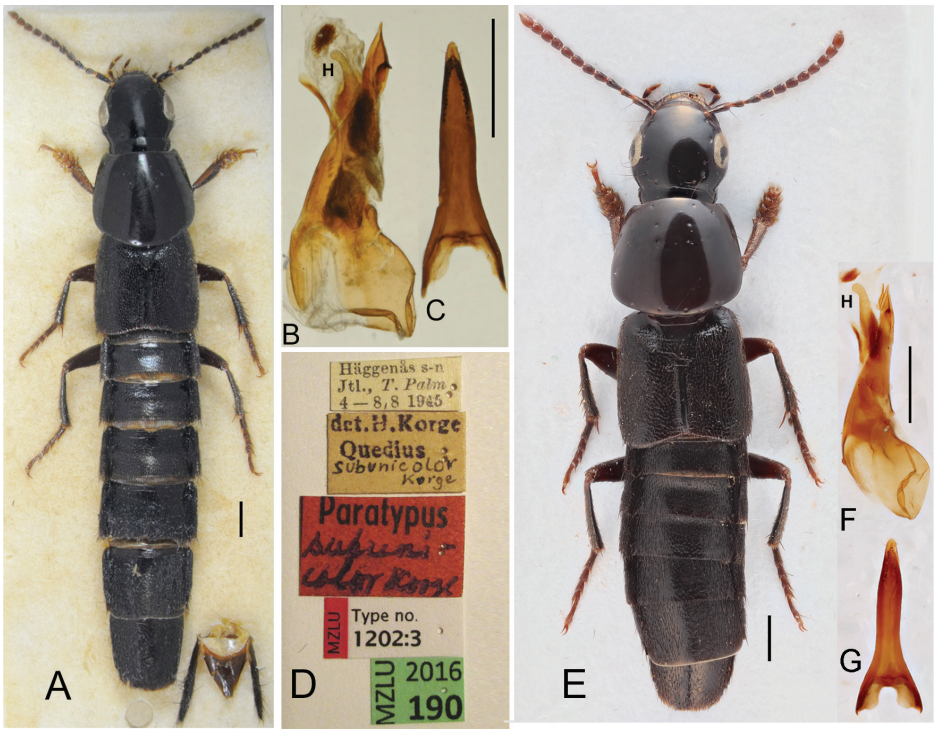

Figure 5. *Quedius subunicolor* (paratype, male): **A–D**; *Quedius altaicus* (male): **E–G**. **A, E,** habitus; **B, C, F, G,** aedeagus. **D,** labels. **B, F,** median lobe, lateral view. **C, G,** paramere, underside; **H,** sclerite of internal sac. Scale bars: 1 mm.

The aedeagus of *Q. altaicus* (Fig. 5F, G) here examined for the first time is nearly identical with the aedeagus of the northern European *Q. subunicolor* (Fig. 5B, C). Both species slightly differ from each other in the shape of a large sclerite in the internal sac (labeled as H in Fig. 5B, F) and the degree of development of the subapical teeth of the median lobe (less pronounced in *Q. altaicus*, compare Fig. 5B, F). Comparison of the external morphology of the multiple specimens of *Q. altaicus* to each other and with the available specimens of *Q. subunicolor*, including its paratypes, demonstrates that the external characters provided by Korge (1962) as unique for *Q. altaicus* (microstructure of the head, proportions of the pronotum, chaetotaxy of the head and pronotum) do not hold. Given a subtle morphological difference between both species and poorly sampled areas of Russia, there remains a possibility that *Q. subunicolor* may be a polytypic species continuously distributed from the Northern Europe to Altai. Or, *Q. subunicolor* and *Q. altaicus* may be a hitherto unrecorded case of the boreo-montane distribution. Both species should be subject to further sampling in the area which seems as a distribution gap between them. Also, a DNA-based phylogeographic investigation would be interesting. Below we provide a redescription of *Q. altaicus*.

Redescription. Measurements and ratios (range, arithmetic mean; n = 8): HL: 1.4–1.5 (1.5); HW: 1.4–1.5 (1.5); PL: 1.7–1.8 (1.8); PW: 1.9–2.0 (2.0); EL: 1.7–1.8 (1.8); EW: 1.8–2.0 (1.9); FB: 5.0–5.2 (5.1); TL: 8.6–11.4 (10.0); HL/HW: 0.9–1.0 (1.00); PL/PW: 0.9–1.0 (1.0); EL/EW: 0.9–1.1 (1.0).

Body piceous black, only sometimes dark brownish; apical margin of abdominal segments vaguely paler; maxillary, labial palpi, and antennae dark-reddish; legs dark with paler brownish tarsi (Fig. 5E).

Head with broadly rounded, but distinct hind angles with microsculpture consisting of transverse waves; eyes as a long as or slightly longer than tempora; posterior frontal puncture situated closer to posterior margin of head than to posteromedial margin of eye; two to four additional punctures present along medial margin of eye between anterior and posterior frontal punctures; temporal puncture situated close to posterior margin of eye at distance nearly equal to diameter of puncture.

Antennae moderately long, segment 3 somewhat longer than 2, segments 4–8 longer than wide, each gradually becoming shorter towards apex, segments 7–11 about as long as wide.

Pronotum wider than long PL/PW: 0.9–1.0 (1.0), widest at posterior third, narrowed anteriad; hind angles broadly rounded, but distinct; dorsal rows each with three punctures; sublateral rows each with two to three punctures; waves of microsculpture transverse, similar to that on head. Scutellum finely punctured in its posterior half, with transverse or slightly isodiametric microsculpture.

Elytra parallel-sided, as long as pronotum, at base narrower than pronotum at widest point; shiny, punctation moderately dense and shallow, interspaces larger than diameter of punctures, pubescence yellowish-grey.

Abdomen with tergite VII (5th visible) with fine distinct whitish apical seam of palisade fringe; punctation dense and fine gradually becoming sparser towards apex

Figure 6. Distribution of sister species *Quedius altaicus* (Altai Mts. in Kazakhstan and Russia) and *Q. subunicolor* (Northern Europe). Dots indicate material examined in this paper, colored areas summarise literature data. Black dots indicate type localities.

of abdomen, surface between punctures with very superficial transverse irregularities, pubescence as on elytra.

Male: aedeagus: median lobe with acute apex and small teeth on its parameral side near apex (Fig. 5B, F); paramere distinctly protruding over apex of median lobe, with two pairs of setae apically and two pairs of longer setae laterally below apex, its underside with numerous sensory peg setae forming two subapical longitudinal rows connected near apex (Fig. 5C, G). Internal sac (examined in situ) with two pairs of strongly sclerotized microstructures positioned laterally and one characteristically shaped medial sclerite (Fig. 5H) with rounded apex.

Comparison. Based on the structure of the aedeagus, especially the characteristic armature of the internal sac with the large middle sclerite 'H' (Fig. 5B, F; fig 189 in Assing and Schülke, 2012), *Q. altaicus* can be placed in the group with *Q. subunicolor*, *Q. balticus*, *Q. molochinus* and *Q. meridiocarpathicus*. *Quedius altaicus* differs from *Q. meridiocarpathicus* in the unicolorus black coloration of the body (brown reddish with paler elytra in *Q. meridiocarpathicus*) and in the shape of the medial sclerite of the internal sac that has rounded apex. Some authors stressed a strong similarity of *Q. subunicolor* (from which *Q. altaicus* is hardly distinct) with *Q. unicolor*, and the latter mainly Central European montane species was incorrectly cited as *Q. subunicolor* in a number of the faunistic papers (e.g., Ciceroni and Zanetti 1995; Geiser et al. 2003; Boháč et al. 2004, 2005; Wojas 2006). *Quedius subunicolor* (and *Q. altaicus*), however, can be easily distinguished from *Q. unicolor* by transversal (not isodimetric) microsculpture of the frons and the structure of the aedeagus, especially by the internal sac with the obvious medial sclerite. From similar species that occur in Middle Asia *Q. altaicus* can be easily distinguished by the following characters: from *Q. fuliginosus* by the punctured (setose) scutellum and absence of additional punctures between anterior frontal punctures; from *Q. sundukovi* by normally developed elytra (very short in distinctly brachypterous in *Q. sundukovi*), presence of fine whitish apical seam of palisade fringe on VII tergite (5th visible), and distinctly larger body.

Distribution. *Quedius altaicus* is known from "central" (Korge, 1962) and southwestern Altai. Records from the southwestern Altai stretching across the border between Russia and Kazakhstan, provided here, are the first exact distributional data for this subspecies. We were not able to examine the material on which Toleutaev (2014) recorded this species from Saur Mountains, the latter records remains ambiguous.

Bionomics. All clearly georeferenced specimens of *Q. altaicus* have been collected at the elevations between 1200 and 2000 m.

Quedius (s. str.) *sundukovi* Smetana, 2003

Fig. 2B

Quedius sundukovi Smetana, 2003, 189

Material examined. Kazakhstan: 1 ♂, SW Altai, East of Narymskij Mt. Ridge, upper course of Ozernaja River,

subalpine zone, 1900–2300 m a.s.l, 18.VII.1997, R.Yu. Dudko and V.K. Zinchenko leg. (NHMD); 3 ♂, 3 ♀, Stanovoe nagorje [highland], S part of Kodar Mt. Ridge, upper course of Chara River, 50 km WSW of village Novaja Chara, 1700–2000 m a.s.l., 26–27,VII.1995, A.Yu. and R.Yu. Dudko, and D.E. Lomakin leg (NHMD, ZIN); 1 ♀, same locality and collectors, but environs of lake Bolshoe Leprindo, 1000 m a.s.l., 23.VII.1995 (ZIN).

Comments on taxonomy, distribution and bionomics. *Quedius sundukovi* was known from the Russian Far East (Smetana, 2003) and from Irkutsk Province and Zabaikalsky Territory (Smetana and Shavrin 2018). From the newly examined material it has become clear that *Q. sundukovi* is distributed even wider: from the Russian Far East through southern Siberia to Altai Mountains in Northeastern Kazakhstan. In the material examined we here provide only new records for Middle Asia, because the detailed documentation of its entire distribution will be published elsewhere.

Detailed description and illustration of the species is available in Smetana (2003). *Quedius sundukovi* is one of the smallest species in the nominative subgenus *Quedius* s. str. and the smallest in this subgenus in the fauna of Middle Asia. Additionally, it stands out from all other *Quedius* s. str. species in Middle Asia as the only distinctly brachypterous species, with very short elytra and lacking whitish apical seam on abdominal tergite VII.

All hitherto known specimens of *Q. sundukovi* were collected by pitfall traps (Smetana 2003). Based on the newly examined material here, *Q. sundukovi* inhabits talus-associated debris. Also it is found in regular leaf litter and moss on the ground.

Quedius (s. str.) *vicinus* Ménétriés, 1832

Fig. 2C

Quedius vicinus Ménétriés, 1832, 144 (original description); Faldermann 1835, 129 (distribution records); Gusarov 1993, 73 (lectotype designation, = *Q. libanicus* Coiffait); Assing and Wunderle 2001, 37 (distribution records); Hachikov 2003, 46 (illustration of aedeagus); Ghahari 2009, 2012, 5; Assing and Feldmann 2012; Özgen et al. 2016, 621.

Quedius libanicus Coiffait, 1954, 160 (original description); 1955, 427 (notes); 1978, 195 (characters); Jarrige 1971, 497; Korge 1971, 11; Boháč 1988, 554 [= 1989: 38] (characters, distribution records).

Material examined. Kazakhstan: 1 ♂, 1 ♀, Karatau Mts, Khantagi River, 570 m a.s.l., 43°33’32.4N, 68°40’52.7E, 25.VI.2011, V.A. Kastcheev leg. (ZIN); **Turkmenistan:** 2 ♀, N Kopetdag, Firjusa-Cleft near Aschabad, 07.V.1989, D.W. Wrase leg. (cSch); 4 ♂, Firjusa, 25.V.1903, K.O. Anger, A. Jakovleva leg. (ZIN); 4 ♂, 2 ♂, Kopetdag, Chili River valley, 23–24.VIII.1935, L.V. Arnoldi leg.; 1 ♂, W Kopetdag, Kara-Kala [Garrygala], canyon Porchai, to light, village of the Nature Reserve, 05.IX.1986, A.L. Lobanov leg.; 3 ♂, Kopetdag, Firjusa, 07.V.1968, G.S. Medvedev leg. (ZIN); 1 ♂, Kara-Kala, 29.IV–03.V.1989, S. Bečvář leg. (cSch).

Comments on taxonomy, distribution and bionomics. Gusarov (1993) clarified the identity and synonymy of *Q. vicinus*. A description and the illustrations of the aedeagus for this species can be found, for example, in Coiffait (1954, 1978, as *Q. libanicus*), Boháč (1988, as *Q. libanicus*), and Hachikov (2003). By the brown body with reddish elytra, frons without additional setiferous punctures between anterior frontal punctures and by punctate scutellum, *Q. vicinus* can be distinguished from all other Middle Asian species of the nominal subgenus *Quedius* s. str. based on the external characters alone. The aedeagus of this species, with the parameral apex pointing outwards from the median lobe, is also very characteristic.

Based on literature data it is a common species in Western Asia. In Middle Asia it was known only from Turkmenistan (Boháč 1988, as *Q. libanicus*). Based on the newly examined material *Q. vicinus* is recorded for the first time from southern Kazakhstan (Karatau Mountains). The species prefers ground based debris and leaf litter, but also was found (Coiffait 1955, as *Q. libanicus*) in caves. Specimens from Middle Asia were collected along rivers, in ground traps and at light.

Subgenus *Microsaurus* Dejean, 1833

Quedius (*Microsaurus*) *ochripennis* Ménétriés, 1832

Fig. 2F

Herman 2001, 3227 (summary of literature); Kascheev 2001, 102 (records); Assing and Schülke 2012, 466, 467 (diagnosis, distribution and bionomics, aedeagus illustration).

Material examined. Kasakhstan: 1 ♂, Karatau Mts, Byzhi River, Rynagus stream, 24.VII.2010, V.A. Kastcheev leg.; 1 ♂, Karatau Mts, near stream, 11.VII.2010, 42°53’41.42N, 70°42’56.6E, 600 m a.s.l., V.A. Kastcheev leg.; 1 ♂, 1 ♀, Aksu-Dzhabagly, Taldy-Bulak River, 10–20.IV.1979, B.V. Iskakov leg.; 2 ♂, same locality and collector, but, 04.V.1986; 1 ♂, 1 ♀, Aksu-Dzhabagly, Ulken-Kaindy, near water in moss, 18.VII.1986, B.V. Iskakov leg.; 1 ♂, S Kazakhstan, Boralday, 12–15.VI.1983, B.V. Iskakov leg.; 1 ♂, Zalatayskiy Alatau Mts, Krasnogorka [Sulutor], near stream, under tree, 75°13’50.4N, 43°23’45.7E, 28.VII.2010, V.A. Kastcheev leg.; **Uzbekistan**: 1 ♂, 1 ♀, Aruk-Tau Mt. Ridge, 25 km W Kyzyl-Kala, 04.IV.1966, O.L. Kryzhanovsky leg. (ZIN); 1 ♂, 1 ♀, Tashkent, near railway station, plant debris, 24.V.1986, S.A. Kurbatov leg. (cKur); 1 ♂, Samarkand, Agalyk, 18.X.1935, Y.D. Kirschenblat leg.; 4 ♂, 4 ♀, Aman Kutan, 12.VI–06.VII.1932, V.V. Gussakovsky leg. (ZIN); 1 ♂, Yakkabag, *Convulvulus* sp. and thorny bushes, 02.XII.1941, K.V. Arnoldi leg. (cRyv); 1 ♂, 1 ♀, Yakkabag, hills S of the town, ravine in forest, cave, 30.XI.1941, K.V.

Arnoldi leg. (cRyv); 1 ♂, Ishkent, Kashkadarya River, 24.X.1947, K.V. Arnoldi leg. (ZMMU); **Kyrgyzstan:** 1 ♂, Kyrgyz-Alatoo Mts, 09.VII.2010, 72°28'38.6N, 42°48'49.2E, V.A. Kastcheev leg.; 1 ♂, 2 ♀, S Fergakskiy Mt. Ridge, Ak-Terek, 31.VIII–20.IX.1937, A.N. Kirichenko leg. (ZIN); 1 ♂, Kara-Alma, Ferganskiy Mt. Ridge, 26.VI.1945, K.V. Arnoldi leg. (ZMMU); **Turkmenistan**: 2 ♂, 3 ♀, Kopetdag Mts, 22.VI.1953, Ployvanova leg.; 5 ♂, 4 ♀, E Kopetdag Mts, Sunt Mt., in *Ulmus* sp. leaves rolled by aphids, 22–24.VI.1953, O.L. Kryzhanovsky leg.; same locality, but 1 ♂, *Ulmus* sp., Odyncova leg. (ZIN); 1 ♀, N Kopetdag Mts, Firjusa-Cleft, near Ashchabad, 07.V.1989, D.W. Wrase leg. (cSch); 3 ♂, 3 ♀, W Kopetdag Mts, N Karakala, 28.IX.1989, A.V. Puchkov (cSch); **Tajikistan:** 3 ♂, 2 ♀, 20 km S Danghara, 08.V.1962, Guryeva leg.; 1 ♂, Vakhsh Mt. Ridge, 10 km N Kangurt, 08.V.1970, G.S. Medvedev leg. (ZIN); 1 ♂, Pamir-Alai, Hisaar Mts, Adshuk-Cleft, near Warsob, 1200 m a.s.l., 01–03. VII.1990, M. Schülke & D.W. Wrase leg. (cSch); 1 ♂, 2 ♀, Gazimalyk Mt. Ridge, 15 km W Ganjin, 2000 m a.s.l, 17.V.1970, G.S. Medvedev leg. (ZIN); 2 ♂, Mountains near Kuljab, 1500–2000 m a.s.l., 20.VI.1963, A.V. Bogachev leg. (ZMMU).

Comments on taxonomy, distribution and bionomics. The diagnostic characters including illustrations of the aedeagus and the most recent summary of the bionomic and distribution data of this widespread and rather common Western Palaearctic species can be found in Assing and Schülke (2012). From similar Middle Asian species *Q. capitalis* and *Q. fusicornis*, *Q. ochripennis* is distinguished by the larger body and shape of the aedeagus. From the larger *Q. solskyi* it can be safely distinguished by the characters of aedeagus.

Quedius ochripennis is widely distributed in Europe and in the Mediterranean region. It is also known from Simla Hills in Himalaya, India (Smetana, 1988) and from Middle Asia where, based on earlier records (Table 1) and material examined here, it occurs in southwestern Turkmenistan, entire territory of Tajikistan, and southern Uzbekistan.

Quedius ochripennis inhabits various ground based debris, often associated with decaying wood, also in nests of mammals, ants and wasps (Assing and Schülke 2012). Based on the material examined here, in Middle Asia *Q. ochripennis* prefers humid plant debris usually near water bodies, also it was found in caves and in tree foliage in an aphid nest. In the mountains it was recorded at elevations up to 2000 m.

Quedius (*Microsaurus*) *puncticollis* Thomson, 1867

Fig. 3A

Herman 2001, 3249 (summary of literature); Kascheev 2001, 102 (distribution records); Assing and Schülke 2012, 466, 467 (diagnosis, distribution and bionomics, aedeagus illustration).

Material examined. Tajikistan: 3 ♂, 1 ♀, Pamir-Alai, Hisaar Mts, Adshuk-Cleft near Warsob, Bachufer, 01–03. VII.1990, M. Schülke leg. (cSch).

Comments on taxonomy, distribution and bionomics. *Quedius puncticollis* is widely distributed in Northern, Central and Eastern Europe for which the latest summary of diagnostic characters, distribution and biology can be found in Assing and Schülke (2012). It is most similar to *Q. ochripennis* from which it can be easily distinguished by the apically not lanceolate paramere with a broad and shallow apical emargination.

Quedis puncticollis is commonly found in the burrows of small mammals, especially moles, also in bee and wasp nests (Assing and Schülke 2012). Based on literature data (Table 1) and material examined here, there are only few records of *Q. puncticollis* in Middle Asia: from southern Kazakhstan and southern Tajikistan.

Quedius (*Microsaurus*) *capitalis* Eppelsheim, 1892

Fig. 7

Quedius capitalis Eppelsheim 1892, 329 (original description); Gridelli 1924, 40 (characters); Coiffait 1978, 148 (characters and illustration of aedeagus); Kadyrov et al. 2014a, 31 and 2014b, 49 (distributional records).

Material examined. Type material: **Uzbekistan:** Syntypes: 1 ♂, "♂/ c.Epplsh. Steind. d. [printed]/ Qu. capitalis Epp. Type Taschkent, Leder [handwritten]/ Typus"; 1 ♂, "♂/ capitalis Epp. Taschkent Leder. [handwritten]/ Typus" (Fig. 7E, F) (NMW).

Additional material. Uzbekistan: 2 ♀, Tien Shan, Aktasch, near Taschkent, 2000 m a.s.l., 13.VII.1984, D.W. Wrase leg. (cSch); **Kazakhstan**: 3 ♂, Karatau Mts, Khantagi River, 570 m a.s.l., 43°33'32.4N, 68°40'52.7E, 25.VI.2011, V.A. Kastcheev leg. (ZIN); **Tajikistan:** 3 ♂, Mountains near Kuljab, 1500–2000 m a.s.l., 20.VI.1963, A.V. Bogachev leg. (ZMMU).

Comments on taxonomy and type material. In the original description, Eppelsheim (1892) mentioned morphological characters of both males and females and stated that the species was known to him from a few specimens from ''Tashkent''. As we learn from the introduction in his paper, specimens were collected by Hans Leder. Both male specimens from NMW labeled as "types" of *Q. capitalis* originally come from Eppelsheim's collection and their morphology and label information fit the original description; therefore they are syntypes.

We have examined aedeagi of both syntypes and confirm they are conspecific. Eppelsheim (1892) compared *Q. capitalis* with *Q. ragusai* Eppelsheim, 1889. Gridelli (1924), based on the examination of a syntype, provided additional morphological details for the species including verbal description of its aedeagus (but no illustration) and placed it near *Q. ochripennis*. Based on a syntype male, Coiffait (1978) again redescribed this species and

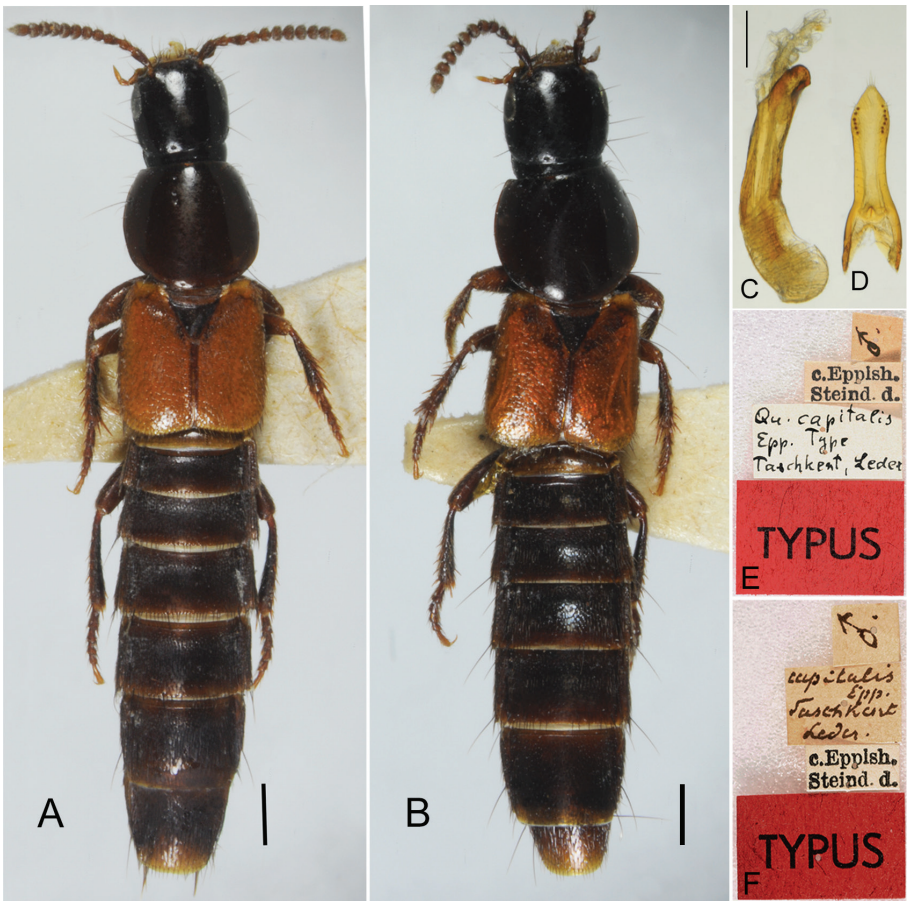

Figure 7. *Quedius capitalis*, syntypes, males. **A, B,** habitus; **C, D,** aedeagus of the syntype in the photo **A**. **E** (of the syntype in the photo **A**), **F** (of the syntype in the photo **B**), labels. **C,** median lobe, lateral view; **D,** paramere, underside. Scale bars: **A, B** = 1 mm; **C** = 0.5 mm.

provided its first and hitherto the only available illustration of the aedeagus. Our examination of the syntypes of *Q. capitalis* confirms the correct identification of this species by both Gridelli (1924) and Coiffait (1978). In Schülke and Smetana (2015) *Q. capitalis* was erroneously placed in the subgenus *Raphirus*. Here we redescribe this poorly known species and provide further data on its distribution.

Redescription. Measurements and ratios (range, arithmetic mean; n = 10): HL: 0.8–1.3 (1.0); HW: 0.8–1.5 (1.1); PL: 0.9–1.6 (1.3); PW: 1.1–1.8 (1.4); EL: 1.2–2.0 (1.6); EW: 1.2–1.9 (1.5); FB: 2.9–4.7 (3.9); TL: 6.5–9.3 (7.8); HL/HW: 0.8–1.1 (1.0); PL/PW: 0.8–1.0 (0.9); EL/EW: 1.0–1.2 (1.1).

Body black to dark brown, hind margins of abdominal tergites slightly paler; elytra reddish; palpi and other appendages slightly lighter; body glossy (Fig. 7A, B).

Head approximately as wide as long or slightly longer; eyes small, not convex; temples as long as longitudinal diameter of eye; posterior frontal puncture closer to posterior margin of head than to anterior frontal puncture; temporal puncture closer to posterior margin of head than to posterior margin of eye; two vertical punctures behind posterior frontal puncture arranged as slightly oblique line between posterior margin of eye and dorsal part of neck; microsculpture of head with transverse distinct wavelines.

Antennae moderately long, antennal segments: 3rd longer than 2nd, 4th–10th gradually widening towards apex of antenna.

Pronotum slightly wider than long, widest at about middle to posterior third; hind angles rounded but distinct; dorsal and sublateral rows each with three punctures; microsculpture with transverse waves as on posterior part of head. Scutellum impunctate with microsculpture slightly coarser than on pronotum. Elytra parallel-sided, slightly longer than wide, longer than pronotum, their punctation dense, interspaces shiny with distinct minute irregularities.

Abdomen: punctation fine and dense; interspaces with minute irregularities; posterior margin of tergite VII with palisade fringe.

Male: protarsi with tarsomeres 1–4 dilated stronger than in females. Sternite VIII with weak triangular medio-apical emargination; tergite X triangular with setae; sternite IX elongate, gradually narrowed apically, with moderately wide and long basal portion and obtusely rounded apical margin with numerous setae. Aedeagus (Fig. 7C, D): median lobe parallel-sided with broad and obtuse apex and tooth located near apex (Fig. 7 C). Paramere rhomboid sharply narrowing apicad; its apex almost reaching apex of median lobe, with two pairs of apical setae and two pairs of lateral setae below apex;

paramere (underside) with ca. 4–8 sensory peg setae in each of two sinuate lateral rows that extend basad over pairs of lateral setae (Fig. 7D).

Comparison. *Quedius capitalis* seems to be closely related to *Q. fusicornis* and *Q. ochripennis* from which it can be easily distinguished externally by smaller body size and proportions, and by the structure of paramere with two sinuate lateral rows of peg setae (ca.4–8 in each row) extending basad over pairs of lateral setae.

Distribution. Based on the literature data (Table 1) and newly examined material, *Q. capitalis* is known from several localities near Tashkent (Uzbekistan), Karatau Mountains (southwestern Kazakhstan) and Hazratisho Mountains (southern Tajikistan).

Bionomics. Unknown.

Quedius (*Microsaurus*) *fusicornis* Luze, 1904

Fig. 8

Quedius fusicornis Luze, 1904, 28 (original description); Gridelli 1924, 69 (characters, notes)

Material examined. Type material: Tajikistan or Uzbekistan: Lectotype (here designated): ♂, "♂/ Seravchan Putchin Pass. Glasunov 1892 [printed]/ Type fusicornis Luze [handwritten]/ ex. coll. Luze [printed]/ ex. coll. Scheerpeltz [printed]/ Typus Quedius fusicornis Luze [pre-printed]"; Paralectotypes: 1 ♀, "Seravchan Putchin Pass. Glasunov 1892 [printed]/ Type fusicornis Luze [handwritten]/ Quedius fusicornis Luze [handwritten]/ [square orange piece of paper]"; 1 ♀, "Seravchan Boschara Glasunow 1892 [printed]/ Type fusicornis Luze [handwritten]/ Quedius fusicornis Luze [pre-printed]" (Fig. 8F, G) (NMW).

Additional material. Uzbekistan: 1 ♂, Samarqand Region, Aman Kutan, 04.VII.1932, V.V. Gussakovsky leg.; **Kyrgyzstan:** 1 ♂, Kyrgyz-Alatoo Mts, 09.VII.2010, 72°28'38.6N, 42°48'49.2E, V.A. Kastcheev leg. (ZIN).

Comments on taxonomy and type material. In the original description, Luze (1904) provided no information on the type material, but he indicated 7.7–8.5 mm body size range for the species. This suggests that he must have had more than one specimen to base a description on. He also indicated "Seravschan: Putschin-Pass, Boschara" as a locality that his material was from. Finally, we know from the introduction in Luze's paper that the material he examined was collected by Glasunov. Therefore, a single male (NMW) and two females (ZIN) that we examined and that match the original description morphologically and in the label data, are syntypes. Luze (1904) compared *Quedius fusicornis* with his *Q. solskyi* and the widespread *Q. cruentus* Ol. Gridelli (1924) apparently based his short notes about this species exclusively on Luze's description, without seeing any material. Similarly to other species of *Quedius* described by Luze (1904), *Q. fusicornis* is missing in the monograph by Coiffait (1978) who apparently overlooked Luze's publication. Here we provide a redescription and first illustrations of this poorly known species, including its aedeagus.

Redescription. Measurements and ratios (range, arithmetic mean; n = 6): HL: 1.0–1.2 (1.1); HW: 1.0–1.4 (1.1); PL: 1.1–1.5 (1.3); PW: 1.3–1.6 (1.4); EL: 1.5–1.7 (1.6); EW: 1.3–1.6 (1.5); FB: 3.7–4.4 (4.0); TL: 6.0–8.6 (7.3); HL/HW: 0.9–1.1 (1.0); PL/PW: 0.8–0.9 (0.9); EL/EW: 1.00–1.2 (1.1).

Body length: 6.0–8.6 (7.3); head, scutellum and abdomen blackish, pronotum and hind margins of abdominal tergites slightly paler; elytra light red or orange; palpi, antennae and legs brown; body glossy (Fig. 8A, B).

Head approximately as wide as long HL/HW: 0.9–1.1 (1.0); eyes small, not convex; temples slightly longer or as long as longitudinal diameter of eye; posterior frontal puncture closer to posterior margin of head than to anterior frontal puncture; temporal puncture closer to posterior margin of head than to posterior margin of eye; two vertical punctures behind posterior frontal puncture arranged as slightly oblique line between posterior margin of eye and dorsal part of neck; microsculpture of entire surface of head with transverse waves.

Antennae moderately long, antennal segments: 3rd longer than 2nd, 4th–10th gradually widening towards apex of antenna.

Pronotum slightly wider than long PL/PW: 0.8–0.9 (0.9), widest at about posterior third, gradually narrowing anteriad; hind angles rounded but distinct; dorsal and sublateral rows each with three punctures; microsculpture with transverse waves similar to that on posterior part of head. Scutellum impunctate with microsculpture as on pronotum. Elytra parallel-sided, slightly longer than wide, as long as or slightly longer than pronotum and narrower than maximum width of pronotum; punctation dense; setation gray; interspaces shiny, with distinct minute irregularities.

Abdomen: punctation fine and moderately dense; interspaces with vaguely distinct minute irregularities; posterior margin of tergite VII with palisade fringe.

Male: protarsi with tarsomeres 1–4 dilated stronger than in females. Aedeagus (Fig. 8C–E: median lobe parallel-sided along most of its length with broad and obtuse apex and tooth located near apex (Fig. 8C). Paramere parallel-sided, narrowing only in rhomboid apical portion; its apex almost reaching apex of median lobe, with two pairs of apical setae and two pairs of lateral setae below apex, with 6 peg setae arranged in two regular longitudinal rows apically extending basad over pairs of lateral setae (Fig. 8D).

Comparison. *Quedius fusicornis* is similar to *Q. capitalis*. For comparison, see the latter species above. From other similar species such as *Q. solskyi*, *Q. cruentus* and *Q. ochripennis*, it can be easily distinguished by the structure of the apical part of the paramere with two medially situated short rows of peg setae (3 in each row) extending basad the pairs of lateral setae.

Distribution. We were not able to locate the type locality "Putchin Pass" situated somewhere along Zeravchan River that is extended from eastern Uzbekistan to western Tajikistan. Additional material was studied from eastern Uzbekistan (near Aman-Kutan) and north-west-

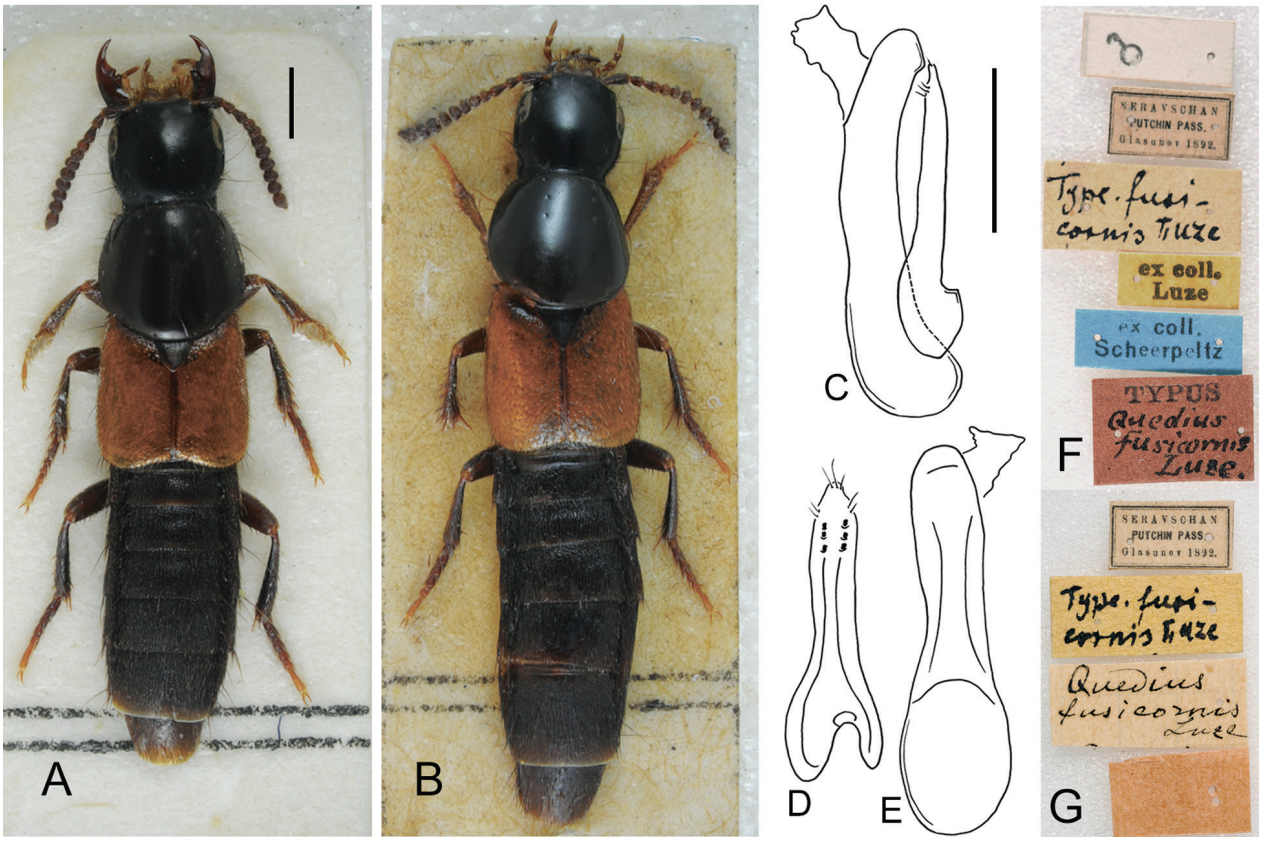

Figure 8. *Quedius fusicornis*, types. **A,** lectotype, male, habitus; **B,** paralectotype, female, habitus. **C–E,** aedeagus of the lectotype: **C,** lateral view; **D,** paramere, underside; **E,** median lobe, ventral view. **F** (lectotype), **G,** (paralectotype), labels. Scale bars: 1 mm.

ern Kyrgyzstan (Kyrgyz-Alatoo). Finally, one specimen was from 'Tangi-Gharuh', a toponym in Afghanistan that we could not locate.

Bionomics. Unknown.

Quedius (*Microsaurus*) *solskyi* Luze, 1904

Figs 9, 10

Quedius asiaticus Bernhauer, 1918, **syn. n.**

Quedius solskyi Luze, 1904, 99 (original description); Gridelli 1924, 72 (characteres, notes);

Quedius asiaticus Bernhauer, 1918, 92 (original desription); Gridelli 1924, 57 (characters); Coiffait 1978, 183 (characters); Kascheev 2002, 181 (distribution records).

Material examined. Type material: *Quedius solskyi*: **Tajikistan:** Lectotype (here designated): ♂, "♂/ Trkst. Jagnob Schach-Sara, Glasunov 1892 [printed]/ Type solskyi Luze [handwritten]/ ex. coll. Luze/ ex. coll. Scheerpeltz [printed]/ Typus Quedius solskyi Luze [pre-printed] " (Fig. 9E) (NMW);

Quedius asiaticus: **Tajikistan or Uzbekistan:** Lectotype (here designated): ♂ "Ost. Buchara Rickmers. [handwritten]/ Mus. Bremen [handwritten]/ asiaticus Bernh. Typus [handwritten]/ Chicago NHMus M. Bernhauer Collection [printed]"; paralectotype: 1 ♂ "abietum [illegible word] [handwritten]/ asiaticus Bernh. Cotypus. [handwritten]/ Chicago NHMus M. Bernhauer Collection [printed]" (Fig. 10G, H) (FMHN),

Additional material. Tajikistan: 1 ♂, Ramid [Ramit], Kafirnigan River, 27.VII.1939, A. Romanov leg. (ZMMU).

Comments on taxonomy, lectotype designation and new synonymy. In the original description of *Q. solskyi*, Luze (1904) did not specify the number of specimens he studied, but provided characters for both sexes and the locality "Jagnob: Kol, Schach-Sara" [Tajikistan, Yaghnob river, Sughd Distr.]. Therefore, a male from NMW with the locality label "Trkst. Jagnob Schach-Sara" is considered a syntype. We could not locate other syntypes. Gridelli (1924), similarly to the case with *Q. fusicornis*, based his notes about *Q. solskyi* only on Luze's description, without checking type material. And as with other species of *Quedius* described by Luze (1904), *Q. solskyi* is missing in the monograph of Coiffait (1978). Under the circumstances of uncertain identity of other syntypes, we designate the only available male syntype as a lectotype to unambigiously fix the identity of *Q. solskyi*.

Bernhauer (1918) described *Q. asiaticus* from ''Ost. Buchara" and compared it with *Q. abietum* distributed in southern Europe. Bernhauer (1918) did not even mention Luze's *Q. solskyi*, even though his description matches the latter species. Both examined syntypes of *Q. asiaticus* are clearly conspecific in morphology. In order to fix the identity of the species, we designate here one better

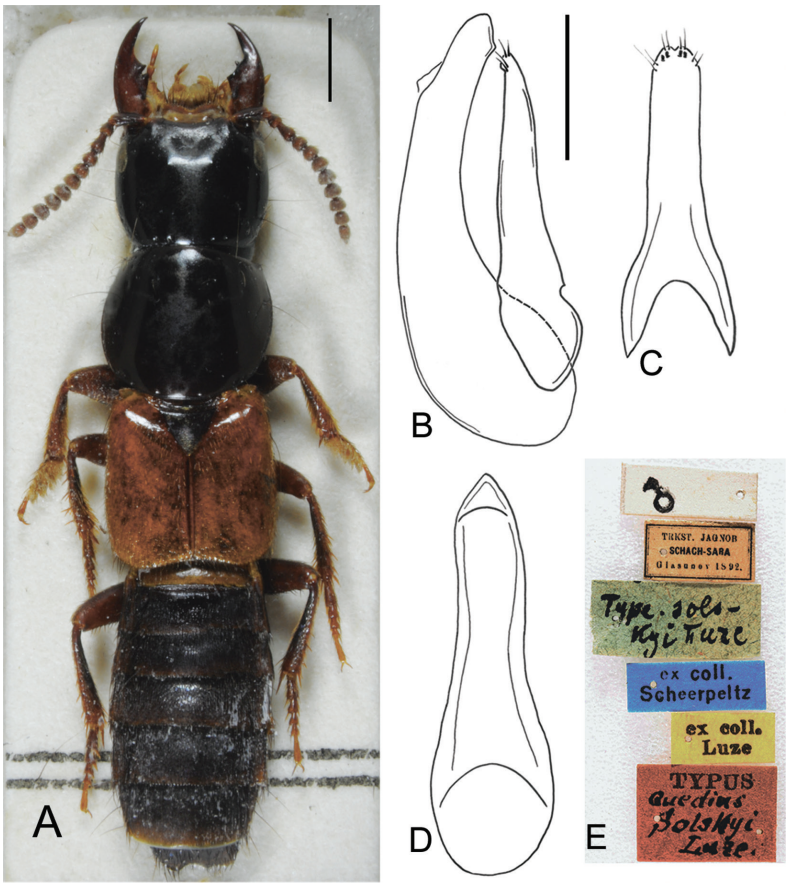

Figure 9. *Quedius solskyi*, lectotype. **A,** habitus. **B–D,** aedeagus: **B,** lateral view; **C,** paramere, underside. **D,** median lobe, ventral view. **E,** labels. Scale bars: 1 mm.

Figure 10. *Quedius asiaticus* (new synonym of *Q. solskyi*), syntypes. **A, B,** habitus. **C–F**, aedeagus. **C, E,** median lobe, lateral view; **D, F,** paramere, underside. **G, H,** labels. Scale bars: 1 mm.

preserved male syntype (Fig. 10A, B) with the locality label "Ost. Buchara" exactly matching the data from the original description and the identification label "asiaticus Bernh. Typus" hand written by Bernhauer as a lectotype.

Our examination of the mentioned types of both *Q. solskyi* and *Q. asiaticus* undoubtedly reveal they are conspecific. Thus we place *Q. asiaticus* Bernhauer, 1918 in synonymy with *Q. solskyi* Luze, 1904 and provide a redescription with the first illustration of the aedeagus of this poorly known species.

Redescription. Measurements and ratios (arithmetic mean = 4): HL: 1.4–1.6 (1.5); HW: 1.7–1.9 (1.9); PL: 1.6–1.8 (1.7); PW: 1.9–2.1 (2.1); EL: 2.0–2.2 (2.1); EW: 1.9–2.1 (2.0); FB: 5.1–5.6 (5.3); TL: 8.1–9.7 (9.1); HL/HW: 0.7–0.8 (0.8); PL/PW: 0.8–0.9 (0.9); EL/EW: 1.0–1.1 (1.1).

Body dark brown to brown; apical margin of abdominal tergites vaguely paler; elytra reddish; maxillary and labial palpi, as well as antennae dark-brownish; body glossy (Figs 9A, 10A–B).

Head wider than long HL/HW: 0.7–0.8 (0.8), eyes very small, not convex; temples more than two times as long as longitudinal diameter of eye; posterior frontal puncture in the middle between anterior puncture and posterior margin of head; temporal puncture closer to posterior margin of head than to posterior margin of eye; two vertical punctures arranged in almost straight line between posterior frontal puncture and neck; microsculpture with transverse waves. Antennae long: antennal segments: 3rd longer than 2nd; 4th-10th slightly widening towards apex of antenna.

Pronotum slightly wider than long PL/PW: 0.8–0.9 (0.9), widest at its middle, slightly narrowing anteriad; hind angles rounded, barely distinct; dorsal and sublateral rows each with three punctures; microsculpture with transverse waves similar to that on posterior part of head. Scutellum impunctate, with microsculpture as on pronotum. Elytra parallel-sided, as long as or longer than wide, narrower and longer than pronotum; punctation dense, setation brownish, interspaces shiny and with distinct minute irregularities.

Abdomen: punctation fine and moderately dense; interspaces with vaguely distinct minute irregularities; posterior margin of tergite VII with palisade fringe.

Male: head wider than long, larger than in females and with longer temples (Luze 1904). Aedeagus (Figs 9B–D, 10C, D, E, F): Median lobe (in parameral view) parallel-sided along most of its length with obtusely pointed apex, with tooth located near apex (Figs 9B, 10C, E). Paramere parallel-sided, its apex almost reaching apex of median lobe; with two pairs of apical setae and two pairs of lateral setae below apex; underside with pair of peg setae close to apical margin on each side of medial emargination (Figs 9C, 10D, F).

Comparison. *Quedius solskyi* is similar to *Q. fusicornis* and *Q. ochripennis*, but it can be externally distinguished from both by the larger body size, distinctly elongated elytra and smaller eyes with their diameter two times as short as tempora. In the structure of the aedeagus *Q. solskyi* is more similar to *Q. fusicornis* but differs from the latter by the paramere with incised apex and two pairs of sensory peg setae. The aedeagi of *Q. solskyi* and *Q. ochripennis* differ in many ways.

Distribution. Vaguely recorded type localities for *Q. solskyi* and *Q. asiaticus* are located somewhere in northern Tajikistan and in eastern Uzbekistan or western Tajikistan. The only additional and better georeferenced specimen examined here comes from western Tajikistan: Ramid, Kafirnigan River.

Bionomics. Unknown.

Quedius (*Microsaurus*) *koltzei* Eppelsheim, 1887

Fig. 2D

Quedius koltzei Eppelsheim, 1887, 420 (original description); Bernhauer and Schubert1916, 425 (calalog); Gridelli 1924, 24 (characters, new records); Scheerpeltz 1933, 1445 (catalog); Coiffait 1978, 164 (new records, characters, first illustration of the aedeagus); Smetana 1998, 115 (study of the holotype, redescription, comments); Smetana 2015b, (new records, characters).

Material examined. Kazakhstan: 2 ♂, 1 ♀, Dzhungarskiy Alatau, Keskenterek River, 10–20.VII.1988, V.A. Kastcheev leg.; 3 ♂, same locality and collector, but 20–30.VIII.1988 (ZIN); 1 ♂, Aksu-Dzhabagly, Taldy-Bulak River, 10–20.IV.1979, B.V. Iskakov leg. (ZIN); 3 ♂, Terskey-Alatoo, VI.1957, Skopin leg. (MNHN).

Comments on taxonomy, type material and distribution. *Quedius koltzei* was described by Eppelsheim (1887) from "Chabarovka" [Khabarovsk, Far East, Russia] based on a single female specimen. Gridelli (1924) basically repeated the original description. Coiffait (1978) interpreted a few males as that species from Terskey-Alatoo, a mountain range in Kazakhstan very far from the type locality of *Q. koltzei*. Based on that material, he redescribed *Q. koltzei* again and provided the illustration of the aedeagus for the first time. Smetana (1998) also redescribed *Q. koltzei*, but based on the holotype. Later, Smetana (2015b) determined one male and one female from Heilongjiang province of China as *Q. koltzei* and illustrated their genital structures. Smetana's comparison of the Chinese specimens with the type material and geographic proximity of Heilongjiang province to the type locality of *Q. koltzei* corroborate his identification. Our examination of the male specimens from Terskey-Alatoo from Henry Coiffait's collection that he identified as *Q. koltzei* revealed that they match as far as we can observe, with the illustrations of *Q. koltzei* from China in Smetana (2015b). But since Smetana (2015b) did not illustrate the lateral view of the aedeagus, only the re-examination of Chinese and, preferably, additional material may help to clarify the status of Middle Asian specimens from Terskey-Alatoo. In the absence of neg-

a*tive evid*ence, we consider Q. koltzei as a potentially widespread Asian specie*s. It is also* possible that Q. rufilabris, whose identity currently remains amb*iguous, is conspecific with Q. koltzei* (for details see the former species below).

Quedius koltzei differs from other similar Middle Asian *Microsaurus* as follows: from *Q. fusicornis*, *Q. capitalis* and *Q. solskyi* in peg setae on paramere arranged in irregular lines or groups; from *Q. ochripennis*, *Q. punctipollis* and *Q. tadjikiscus* in median lobe (in lateral view) narrowing into a blunt, but clear apex and peg setae on paramere arranged in four irregular groups. From *Q. bucharensis*, a species whose identity remains ambiguous (for details see that species below) *Q. koltzei* differs in the chaetotaxy of head (posterior frontal puncture situated closer to nuchal ridge than to posterior margin of eye) and pronotum (two punctures in dorsal row and sublateral group always situated before or at most at the same level as large lateral puncture).

Based on the material examined here, we have additional records for *Q. koltzei* from Kazakhstan. Bionomics remains unknown.

Quedius (*Microsaurus*) *rufilabris* Luze, 1904

Quedius rufilabris Luze, 1904, 100 (original description); Gridelli 1924, 72 (characters, notes).

Comments on taxonomy. Luze (1904) described *Quedius rufilabris* from "Seravschan: Putschin Pass" [Mountain Range or river Zeravshan in Tajikistan or Uzbekistan]. The description was based on a single female specimen. Gridelli (1924) based his knowledge of this species on Solsky's original description only and placed *Q. rufilabris* near *Q. solskyi*. Similarly to Luze's other species, Coiffait (1978) overlooked this species in his monograph. Unfortunately, we were unable to find the holotype of *Q. rufilabris*, but based on its original description all diagnostic characters, especially chaetotaxy of the head and pronotum, match *Q. koltzei*. Since the presumed type locality of *Q. rufilabris* is rather remote from the distribution of *Q. koltzei*, if the latter even occurs in Middle Asia (see above), we treat the former species as different from *Q. koltzei*, at least until more material from relevant geographic areas will be studied.

Quedius (*Microsaurus*) *tadjikiscus* Coiffait, 1975

Quedius tadjikiscus Coiffait, 1975, 32 (original description); 1978, 149 (notes).

Comments on taxonomy. We could not locate and examine the type material of *Q. tadjikiscus* described from "Tadjikabad, Daran-Nazaran" in Tajikistan, and did not come across any material that could be identified as that species. The description and the illustrations of the aedeagus of *Q. tadjikiscus* available from Coiffait (1975, 1978) suggest that this may be a species very similar to *Q. koltzei*. But *Quedius tadjikiscus* differs from *Q. koltzei* in the presence of three punctures in the dorsal row of pronotum and the absence of apical groups of peg setae on the paramere.

Quedius (*Microsaurus*) *bucharensis* Bernhauer, 1918

Quedius bucharensis Bernhauer, 1918, 93 (original description); Gridelli 1924, 56 (characters, distribution); Scheerpeltz 1933, 1435 (catalog); Coiffait 1978, 186 (external characters).

Type material examined. Syntypes: Tajikistan: 1 ♂, "Mts. Karateghin Balfdschuan 924 m. F. Hauser 1898 [printed]/ bucharicus Bern. det. Bernh. det. Bernh. [handwritten]/ bucharensis Bernh. Typus [handwritten]/ Chicago NHmus M. Bernhauer Collection [printed]"; 1 ♀, "Buchara Handiger [handwritten]/ ochripennis Asia centr. Handiger [handwritten]/ bucharensis Bernh. Cotypus [handwritten]/ bucharensis Bernh. [handwritten]/ Chicago NHmus M. Bernhauer Collection [printed]" (FMNH); **Turkmenistan:** 1 ♀, "♀/ Pers. Kopet-Dagh. Siaret 1160 m 5.99. Coll. Hauser [printed]/ Quedius persicus Brh. [handwritten]/ solskyi Luze [handwritten]/ ex. coll. Moczarski [printed]/ ex. coll. Scheerpeltz [printed]"; 1 ♀, "♀/ Pers. Kopet-Dagh. Siaret 1160 m 6.99. Coll. Hauser [printed]/ solskyi ? [sic!] Luze [handwritten]/ ex. coll. Moczarski [printed]/ ex. coll. Scheerpeltz [printed]" (NMW).

Comments on taxonomy. *Quedius bucharensis* was described from an unspecified number of specimens of both sexes coming from localities in Uzbekistan, Turkmenistan and Tajikistan indicated as "Karateghingebirge (Baldschuan, 924 m, Hauser), Buchara (ohne nähere Fundortangabe, Bang-Haas) und Persien (Kopet-Dagh, Siaret, 1160 m, V. 1899, Hauser)" (Bernhauer 1918).

We have examined one male and one female from the FMNH which are clearly syntypes of *Q. bucharensis*. Of them, a male specimen was earlier dissected and its aedeagus must have been glued on the card point beside the specimen, but was obviously lost. Since there were no publications with the structure of *Q. bucharensis* aedeagus, the identity of this species remains ambiguous. An additional two females from NHMW with the same locality labels as in the original description but without Bernhauer's handwritten type labels, seem conspecific with both mentioned syntypes even though they are somewhat smaller than the latter. Their earlier identifications as *Q. solskyi*, evident from the labels, are wrong because of the following characters: chaetotaxy of head with posterior frontal puncture closer to posterior margin of eye than to nuchal ridge, larger eyes, head longer than wide and as long and as wide as elytra.

The material used by Bernhauer (1918) in the original description of *Q. bucharensis* comes from localities rather remote from each other. Given that and the body size

variation among the examined specimens from different localities, it is possible that they are not conspecific. On the other hand, significant intraspecific variability in body size and proportions is usual in some *Microsaurus* species. More extensive material including males is needed to clarify the case.

Quedius (*Microsaurus*) *mutilatus*-group

Fig. 2E

Comments. We have proposed the *mutilatus*-group for several Middle Asian species in Salnitska and Solodovnikov (2018), where we revised all available material. Thus only brief information for each of these species is provided with reference to the revision for details.

Diagnosis. The *mutilatus*-group is characterized by the following: brown to dark brown dorso-ventrally flattened body, notably small eyes, short elytra, absence of palisade fringe on abdominal tergite VII; aedeagus robust, with apical portion of median lobe slightly curved towards paramere with characteristic tooth near apex (in lateral view), with paramere widest shortly before apex (in parameral view) having four distinct groups of sensory peg setae on the underside: two apical and two lateral.

Distribution and biology. The *mutilatus*-group is restricted to the Tien-Shan Mountains where all species of the group are confined to high elevations, up to 3600 m. Based on the morphology and limited bionomic data, all species of the group are hypogean and are mostly found under stones or deep in leaf litter.

Quedius (*Microsaurus*) *mutilatus* Eppelsheim, 1888

figs 1–2, 4A–B in Salnitska and Solodovnikov 2018

Diagnosis. *Quedius mutilatus* is most similar to *Q. kungeicus* from which it can be distinguished by the rhomboid shape of the paramere with slight apical incision; by the less curved apical portion of the median lobe (lateral view) with more stronger ventral sub-apical tooth. From *Q. kalabi* and *Q. equus* it differs by the not so deeply incised apex of paramere and distinctly larger number of sensory peg setae in lateral groups on the paramere.

Distribution. *Quedius mutilatus* is restricted to the central part of Terskey-Alatoo Mountains south from Issyk-Kul lake in Kyrgyzstan.

Quedius (*Microsaurus*) *kalabi* Smetana, 1995

figs 1, 3, 4C–D in Salnitska and Solodovnikov 2018

Diagnosis. *Quedius kalabi* differs from all other species of the *mutilatus*-group by its narrower and somewhat curved apical portion of the median lobe of the aedeagus with relatively short blade of its subapical tooth (aedeagus in lateral view). In shape of the apical portion of the paramere and degree of its incision *Q. kalabi* displays a transition between *Q. mutilatus* having lesser incised paramere with more peg setae in lateral groups, and *Q. equus* having deeper incised paramere with lesser peg setae in lateral groups.

Distribution. *Quedius kalabi* replaces *Q. mutilatus* in the eastern part of Terskey-Alatoo Mountains in Kyrgyzstan.

Quedius (*Microsaurus*) *equus* Smetana, 2014

figs 1, 4G–N in Salnitska and Solodovnikov 2018

Diagnosis. *Quedius equus* distinctly differs from all other species of the *mutilatus*-group by the deep apical incision of the paramere and by low number (1–3) of sensory peg setae on its underside arranged in lateral longitudinal rows.

Distribution. *Quedius equus* is known from northeast Terskey-Alatoo Mountains in Kazakhstan and from Xinjiang province of China. Presumably it has a broader continuous distribution in this area.

Quedius (*Microsaurus*) *kungeicus* Solodovnikov & Salnitska, 2018

figs 1, 4E–F, 5 in Salnitska and Solodovnikov 2018

Diagnosis. Among all species of the group, *Quedius kungeicus* can be distinguished by the ovoid apical part of the paramere without a distinct apical incision (in parameral view) and by the distinctly curved apical portion of the median lobe (in lateral view) with longer tip and without distinct sub-apical tooth.

Distribution. *Quedius kungeicus* is known only from the holotype collected in the Kungey-Alatoo Mountains of Kazakhstan.

Subgenus *Raphirus* Stephens, 1829

Quedius (*Raphirus*) *limbatus* Heer, 1839

Fig. 3D

Herman 2001, 3187 (summary of literature); Kascheev 2001, 102; 2002, 181 (distribution records); Assing and Schülke 2012, 473, 474 (diagnosis, distribution and bionomics, aedeagus illustration).

Material examined. Kazakhstan: 2 ♂, 1 ♀, 7 Almaty area, Dzhungarskiy Alatau, 7 km E Lepsinsk, Chornaya River canyon, 1200–1400 m a.s.l., *Betula* sp., *Malus*, *Populus* etc. forest, 45°31’N, 80°43’E, 13–15.VI.2001, S.I. Golovatch leg. (cRyv); 3 ♂, 6 km SE Rudnichnyi, Koksu River canyon, 1300–1400 m a.s.l., 44°41’N, 78°58’E, *Betula* sp., *Populus*, *Picea* etc. forest, 09–10. VI.2001, S.I. Golovatch leg. (cRyv); 2 ♂, 3 km SSE Lepsinsk, Bulinka River canyon, 1100–1800 m a.s.l., 45°30’N, 80°38’E, 16–17.VI.2001, S.I. Golovatch leg.

(*cRyv*); *1 ♂, Z*ailiy*sky A*latau Mts, ca. 20 km Turgen, Turgen River canyon, near Batan , 1750 m a.s.l., Picea, Betula sp., Salix etc. forest, 25.V.2001, 43°14'N, 77°46'E, S.I. Golovatch leg. (cRyv); 1 ♂, Urjar Distr., Tarbagatay River valley, ca. 1000 m a.s.l., highly disturbed *Populus* forest with *Salix*, *Rosa*, *Lonicera*, *Crataegus*, 47°17'N, 81°34'E, 24–25.VI.2001, S.I. Golovach leg. (cRyv); 3 ♂, Makanchi Distr., Tarbagatay Mts, 4 km NE Petrovskoe (=Kyzylbulak), Kyzylbulak River valley, 1100–1200 m a.s.l., riverine, *Populus*, *Malus*, *Salix* forest, 22.VI.2001, 47°03'N, 82°18′E, S.I. Golovatch leg. (cRyv).

Comments on taxonomy, distributon and bionomics. The latest summary of diagnostic characters, bionomics and distribution of *Q. limbatus*, a common Western Palearctic species can be found in Assing and Schülke (2012). Based on earlier records (Table 1) and newly examined material in Middle Asia it is known from southern Kazakhstan and Turkmenistan.

Among all Middle Asian species *Q. limbatus* is more similar to *Q. cohaesus* from which it can be easily distinguished by the structure of aedeagus with a sharper apex of the median lobe (in lateral view) and sensory peg setae of the paramere (underside) arranged in short regular rows, slightly diverging from each other basally.

Usually this species occurs in lowlands up to the subalpine zone, but is mostly confined to forests and humid ground-based debris, often near streams (Assing and Schülke 2012). In Middle Asia *Q. limbatus* was collected at elevations up to 1750 m near rivers in forested landscapes.

Quedius (*Raphirus*) *pseudonigriceps* Reitter, 1909

Fig. 3F, 11

Quedius kirklarensis Korge, 1971, **syn. n.**

Quedius pseudonigriceps: Herman 2001, 3247 (summary of literature); Assing and Schülke 2012, 473, 474 (diagnosis, distribution and bionomics, aedeagus illustration); Solodovnikov 2004, 223 (characters, synonymy, notes).

Quedius kirklarensis Korge, 1971, 52 (original description); Coiffait 1978, 257 (notes, distribution records).

Material examined. Kazakhstan: 1 ♀, Altai, Bukhtarma River, Uryl-Chingistai, 13.VI.1987, V.A. Kastcheev leg. (ZIN); 3 ♂, 1 ♀, Saur Mt. Ridge, 15 km S Kindirlik, 2000 m a.s.l., 10.VII.1962, L.V. Arnoldi leg. (ZIN); 1 ♂, Almaty Area, Dzhungarskiy Alatau Mts, 7 km E Lepsinsk, Chyornaya River canyon, 1200–1400 m a.s.l., 45°31'N, 80°43'E, *Betula* sp., *Malus*, *Populus* etc. forest, 13–15.VI.2001, S.I. Golovatch leg. (cRyv); 1 ♂, Dzhungarskiy Alatau Mts, upper reaches of Sarydzhaz River, 3500 m a.s.l., 13.VII.1991, V.A. Kastcheev leg. (cRyv); 1 ♂, 1 ♀, W part of Dzhungarskiy Alatau Mts, N slope, upper reaches of Aktau River S of Glinovka, 2500–2800 м, 06.VIII.1991, A.V. Tishechkin leg. (cRyv); 1 ♂, Dzhungarskiy Alatau Mts, E slope of Sandyktas Mt., right side of Mynteke River, leaf litter, 2100 m a.s.l., 11.VIII.1991, A.V. Tishechkin leg. (cRyv); 2 ♂, Lle-Alatau NP Talgar env., SW slope, leaf litter sifting, 2745 m a.s.l., 43.24846N, 77.40380E, 10–11.V.2014, M. Kocián leg. (cKoc); 1 ♂, Almaty Area, Talgar district, Ak-Bulak, 2700 m a.s.l., 43.1454N, 77.2404E, 24.V.2014, O. Nakladal leg. (cKoc); 3 ♂, Zailiyskiy Alatau Mts, 2300 m a.s.l., Levyi Talgar River, 22.VIII.2009, V.A. Kastcheev leg. (cRyv); 2 ♂, Almaty Area, Zailiyskiy Alatau Mts, ca. 20 km Turgen, Turgen River canyon, near Batun, 1750 m a.s.l., 43°14'N, 77°46'E, *Picea*, *Betula*, *Salix*, etc. forest, 25.V.2001, S.I. Golovatch leg. (cRyv); 1 ♂, Almaty Area, Uygurskiy District, Ketmen Mts, 5 km SE Kyrghyzsay (=Podgornoye), 1500–1900 m a.s.l., 43°17'N, 79°31'E, *Picea*, *Betula*, *Populus*, etc. forest, 01–02.VI.2001, S.I. Golovatch leg. (cRyv); 1 ♂, Tastau, 2–3 km up-stream of river mouth, leaf litter, 09.VIII.1991, A.V. Tishechkin leg.(cRyv); 1 ♂, 1 ♀, Ketmen Mts, near Ketmen, 2500 m a.s.l., 28.VII.1991, S.V. Saluk leg. (cRyv); 1 ♂, E Zailyiskiy Alatau Mts., Belshabdar River, 2600 m a.s.l., 26.VI.2002, A.V. Puchkov leg. (cSch); 2 ♂, Zailiyskiy Alatau, Semirechye, Kargalinka valley, 2000–2350 m a.s.l., 01–07.VI.1907, A.[sic!] Jacobson leg.; same locality and collector, but 1 ♀, 1800–2350 m a.s.l., 05.VI.1907 (ZIN); 1 ♂, Kungey-Alatoo Mts, Kulbastau canyon, 20–27.VII.1988, V.A. Kastcheev leg. (ZIN); 2 ♂, Kungey-Alatoo, Chilik River, Sarybastau, 12–15.VI.1988, V.A. Kastcheev leg. (ZIN); **Kyrgyzstan:** 2 ♂, 2 ♀, Kungey-Alatoo Mts, upper reaches of Tschon-Kemin River, 2200–2500 m a.s.l., VII.1999, J. Frisch leg. (cKoc); 1 ♂, Kungey-Alatoo, Kurmenti River, 09–11.VII.1987, V.A. Kastcheev leg. (ZIN); 2♂, Issyk-Kul' Area, Kungey-Alatoo Mts, valley of left confluent of Chon-Uryukty River, leaf litter in slope forest with *Picea schrenkiana*, *Sorbus tianschanica*, etc, 10.IX.1983, A.B. Ryvkin leg. (cRyv); 1♂, Issyk-Kul' Area, Terskey-Alatoo Mts, Chon-Kyzyl-Suu River valley near Geographical Field Research Station, 2500 m a.s.l., moss in forest with *Picea schrenkiana* (He+Hm+C), 02.IX.1983, A.B. Ryvkin leg.; 1 ♂, Terskey-Alatoo Mts, Barskoon Valley, Chuli River, 15.VII.1983, S.K. Alekseev leg. (cRyv); 1 ♂, Terskey Alatoo Mts, Kochevnikov field research station, meadow, 19.VI.1984, N. Turtseva leg. (cRyv).

Comments on taxonomy, distribution and bionomics. The latest summary about *Quedius pseudonigriceps* can be found in Solodovnikov (2004) and Assing and Schülke (2012). *Quedius pseudonigriceps* is widespread in Southern Europe and Western Asia. We here record it for the first time from Middle Asia: from southern Kazakhstan and northern Kyrgyzstan. It can be easily distinguished from all similar Middle Asian species by the shortened elytra and absence of fine whitish apical seam of palisade fringe on tergite VII.

In Middle Asia *Q. pseudonigriceps* is brachypterous (Fig. 3F) and characterized by the significant variability in the structure of aedeagus which nevertheless has no geographical pattern and leaves no doubt about species identity (Fig. 11). Solodovnikov (2004) noted that *Que-*

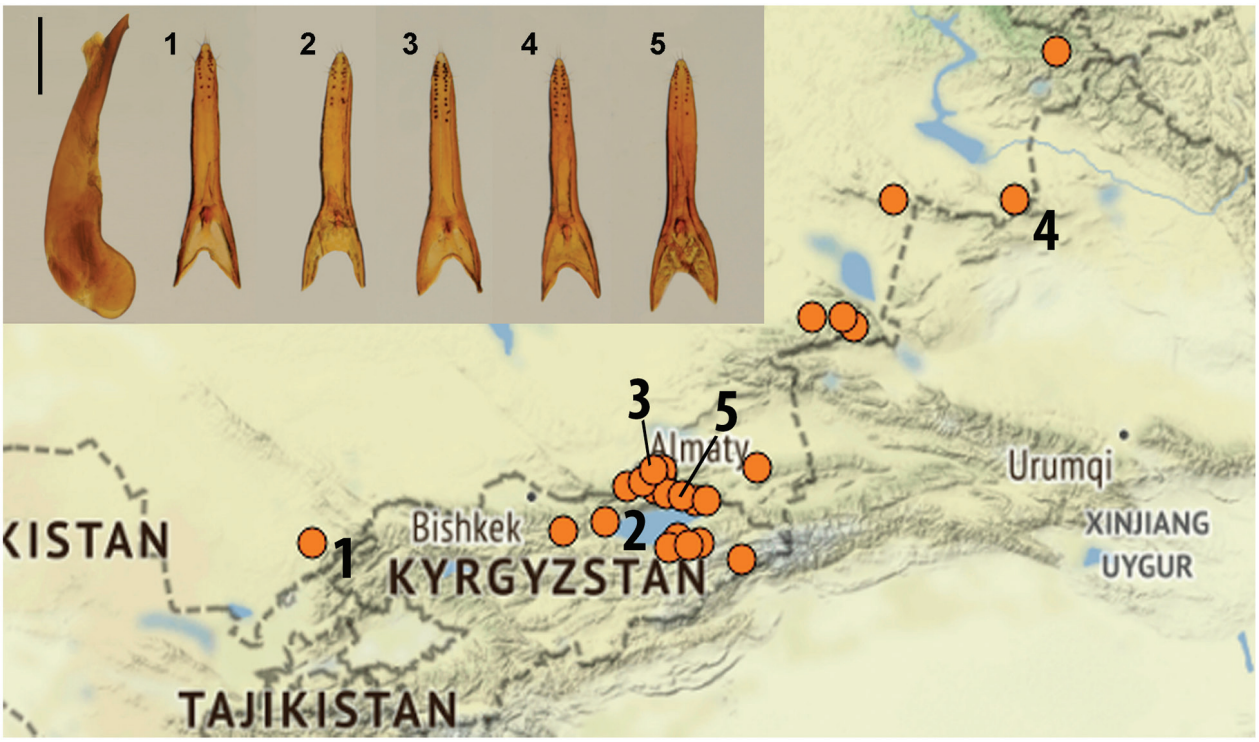

Figure 11. *Quedius pseudonigriceps*, distribution, median lobe of the aedeagus laterally, and variability of the paramere (as examples specimens from various localities numbered respectively on the map). Scale bars: 0.5 mm.

dius kirklarensis from Turkey is almost identical with *Q. pseudonigriceps* from South Europe and Western Asia except for the absence of palisade fringe on abdominal tergite VII in the former. Therefore he suggested that *Q. kirklarensis* may be a brachypterous form of *Q. pseudonigriceps.* A new synonymy could not be established back then because of the limited material and also due to the similar species *Quedius cohaesus* and *Quedius turkmenicus* from Middle Asia. With more material available here for all relevant taxa we can undoubtedly place *Quedius kirklarensis* Korge, 1971 in synonymy to *Q. pseudonigriceps* Reitter, 1909. For details on *Quedius cohaesus* and *Quedius turkmenicus*, see below.

In Middle Asia *Q. pseudonigriceps* usually inhabits moist leaf litter in deciduous and mixed forests and wet ground debris near streams in the mountains at the altitudes up to 2800 m.

Quedius (*Raphirus*) *cohaesus* Eppelsheim, 1888

Fig. 12

Q. afghanicus Coiffait, 1977, **syn. n.** (Fig. 13)
Q. turkmenicus Coiffait, 1969, **syn. n.**
Quedius cohaesus Eppelsheim, 1888, 60 (original description); Bernhauer and Schubert 1916, 421 (catalog); Gridelli 1925, 26 (characters, distribution records); Coiffait 1963, 393 (characters); Korge 1964, 122 (distribution records); Smetana 1967, 558 (distribution records); Coiffait 1978, 248 (characters, distribution records); Solodovnikov 2004, 227 (=*Q. meurguesae* Coiff., notes, distribution records); Toleutaev 2014, 44 (distribution records).
Quedius afghanicus Coiffait, 1977, 139 (original description).
Quedius turkmenicus Coiffait, 1969, 49 (original description); Coiffait 1978, 245 (characters, notes).

Type material examined. *Quedius cohaesus*: Lectotype, ♂, "Turcmenia Leder. Reitter [printed]/ c. Eppelsh. Steind. d. [printed]/ ♂ [handwritten]/ *cohaesus* mihi [handwritten]/ Lectotype Quedius cohaesus Eppelsheim, 1888 A. Solodovnikov des. 2003 [printed]" (NMW); Paralectotype, ♀, "Turcmenia Leder. Reitter [printed]/ c. Eppelsh. Steind. d. [printed]/ *cohaesus* mihi/ ♀ [handwritten]/ Paralectotypus Quedius cohaesus Eppelsheim, 1888 A. Solodovnikov des. 2013 [printed]" (Fig. 12E, F) (NMW).

Quedius afghanicus: Holotype, ♂, "Khat Chaï 2600 m. 22.VIII.74 [handwritten]/ Paktui Afghan. [handwritten]/ G.M.uG.L. [handwritten]/ Type [printed]/ Museum Paris Coll. H. Coiffait [printed]/ *Q.* (*Sauridus*) *afghanicus* H. Coiffait 1977 [pre-printed" (Fig. 13D) (MNHN).

Additional material. Turkmenistan: 1 ♂, Asia. centr., N-Kopet-Dagh, Firjusa-Cleft, near Ashchabad, 07.V.1989, D.W. Wrase leg. (cSch); 1 ♂, Kopetdag Mts, Karakala env., 28.IX.1989, A.V. Puchkov leg. (cSch); **Tajikistan:** 1 ♂, Gazimalyk Mt. Ridge, 15 km NW Ganjin, 2000 m a.s.l, 14.V.1970, G.S. Medvedev leg. (ZIN).

Comments on taxonomy and new synonymy. Coiffait (1969, 1977) described *Q. turkmenicus* and *Q. afghanicus* from Turkmenistan and Afghanistan, respectively.

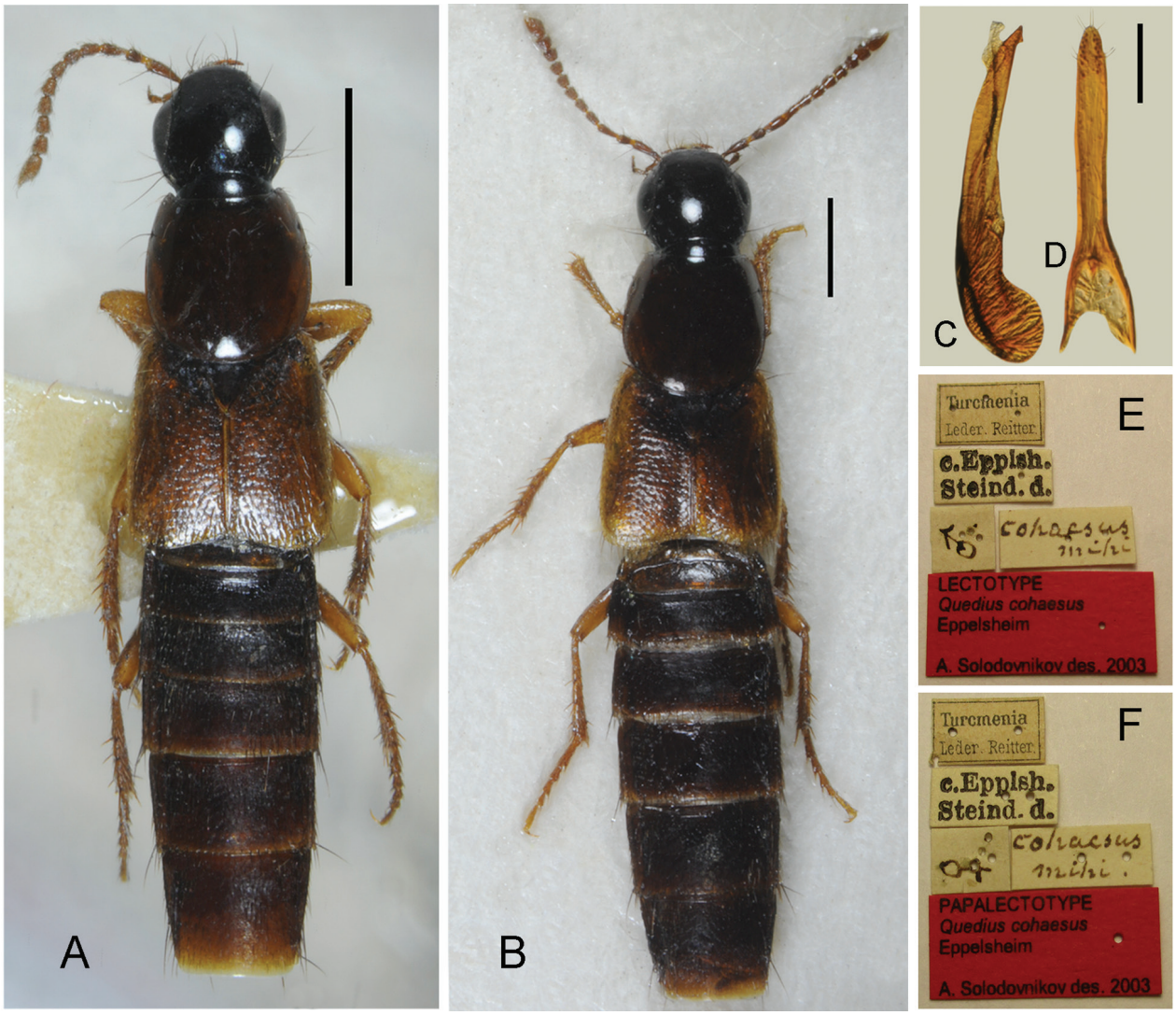

Figure 12. *Quedius cohaesus*, types: **A** (lectotype, male), **B** (paralectotype, female), habitus. **C, D,** aedeagus of the lectotype: **C,** median lobe, lateral view; **D,** paramere, underside. **E, F,** labels. Scale bars: **A, B** = 1 mm; **C, D** = 0.3 mm.

We were able to study the type material for *Q. afghanicus* only (Fig. 13), which turns out to be conspecific with *Q. cohaesus* and therefore is placed here into synonymy with the latter. Unfortunately, we were unable to examine the type material of *Q. turkmenicus* which, according to Coiffait (1969) is deposited in the collection of the Paul Sabatier University at Toulouse, France. Nevertheless, because it is obvious from the original descriptions and illustrations that *Q. turkmenicus* is conspecific with *Q. cohaesus*, the former is also placed into synonymy with the latter. These new synonymies are consistent with the earlier revealed synonymy of *Q. cohaesus* with *Q. meurguesae* Coiffait, 1977 from Iran (Solodovnikov 2004). Below we redescribe this insufficiently known widespread species and provide data on its distribution and bionomics.

Redescription. Measurements and ratios (range, arithmetic mean; n = 3): HL: 0.7–0.9 (0.8); HW: 0.8–0.9 (0.9); PL: 0.9–1.2 (1.0); PW: 0.9–1.1 (1.0); EL: 1.2–1.5 (1.4); EW: 1.2–1.3 (1.3); FB: 2.9–3.6 (3.2); TL: 5.6–6.7 (6.2); HL/HW: 0.9–1.1 (1.0); PL/PW: 0.9–1.1 (1.0); EL/EW: 1.0–1.2 (1.1).

Body light to dark brownish; head black, pronotum dark brown to brown; elytra brownish with hind angles paler; abdomen dark brown with posterior margins distinctly lighter; hind legs yellowish, antennae, maxillary and labial palps darker, body glossy (Figs 12A; 13A).

Head slightly wider than long HL/HW: 0.9–1.1 (1.0), eyes large and convex; temples distinctly shorter than eyes (ratio 0.2–0.3 (0.3); with shallow, but dense transverse microsculpture; punctation: one puncture at anterior margin near antennal pit, anterior frontal puncture at posterior margin of antennal pit, posterior frontal and temporal punctures closer to posterior margin of eye than to posterior margin of head; vertical punctures (ca. 1–2) closer to neck than to posterior margin of eye.

Antennae long: antennal segments: 3rd longer than 2nd; 4th–10th distinctly widening towards apex of antennae.

Pronotum slightly wider than long or transverse PL/PW: 0.9–1.1 (1.0), widest at its posterior half, vaguely narrowing anteriad, wider and longer than head; hind angles rounded barely distinct; dorsal rows each with three

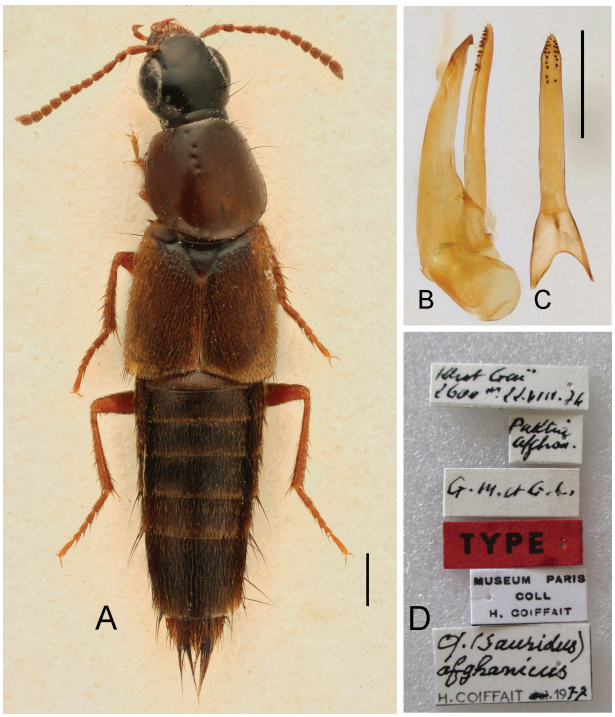

Figure 13. *Quedius afghanicus* (new synonym of *Q. cohaesus*), holotype, male. **A,** habitus. **B,** aedeagus, lateral view; **C,** paramere, underside. **D,** labels. Scale bars: 0.5 mm.

punctures; sublateral rows each with two punctures; microsculpture with shallow hardly visible transverse waves.

Scutellum punctate with microsculpture distinctly denser as on pronotum.

Elytra parallel-sided, hardly narrowing anteriad, as long as wide or slightly longer than wide EL/EW: 1.0–1.2 (1.1); wider and slightly longer than pronotum; punctation dense with interspaces wider than diameter of punctures, interspaces shiny, with distinct minute irregularities; setation brownish.

Abdomen: punctation fine and dense; interspaces with minute irregularities; posterior margin of tergite VII with palisade fringe.

Male: protarsi with tarsomers 1–4 dilated stronger than in females. Aedeagus (Figs 12C, D; 13B, C): Median lobe parallel-sided with moderately acute apex, tooth situated close to its apex (Figs 12C, 13B). Paramere parallel-sided, slightly narrowing basad; its apex almost reaching apex of median lobe; sensory peg setae arranged in two irregular and wide longitudinal rows along each lateral margin of apical portion extending over pairs of lateral setae below apex (Figs 12D, 13C).

Comparison. Among other *Raphirus* that occurs in Middle Asia, *Q. cohaesus* is most similar to *Q. pseudonigriceps* from which it can be easily distinguished by the presence of an apical seam of palisade fringe VII and normally developed elytra, as well as by the characters of the aedeagus.

Distribution. *Quedius cohaesus* was described from "Turcmenia" which is not necessarily Turkmenistan in the modern sense, but certainly some locality in Middle Asia (Eppelsheim, 1888). Based on the literature (Table 1) and material examined here, *Q. cohaesus* is known from Iran (material not recorded here), Turkmenistan, Tajikistan and Afghanistan (most of the material not recorded here).

Bionomics. It is only known that *Q. cohaesus* can be found at rather high elevations, up to 2600 m (Coiffait, 1977).

Quedius (*Raphirus*) *imitator* Luze, 1904

Figs 3C, 15

Quedius tschinganensis Coiffait, 1969, **syn. n.** (Fig. 14)
Quedius imitator Luze, 1904, 102 (original description); Bernhauer 1905, 596 (notes); Bernhauer and Schubert 1916, 429 (list with synonyms); Gridelli 1924, 135 (characters, notes); Coiffait 1967, 406 (characters); Coiffait 1978, 237 (characters, distribution records); Boháč 1988, 556 (distribution records); Klimenko 1996, 121;
Quedius tschinganensis Coiffait, 1969, 50 (original description); Coiffait 1970, 143 (list); Coiffait 1978, 237 (characters); Kascheev 2001, 102 (distribution records);
Quedius tschinganensis var. *gracilicornis* Coiffait, 1977, 139 (original description);
Quedius tschinganensis var. *debilicornis* Coiffait, 1978, 237 (replacement name for *gracilicornis*).

Type material examined. ***Quedius imitator:*** **Tajikistan or Uzbekistan**: Lectotype (here designated): 1 ♂, "Seravschan Darch Glasunov 1892 [printed]/ Q. imitator Luze J. Boháč det. 1983 [pre-printed]"; paralectotypes: 1 ♂, "[square orange piece of paper]/ Seravschan Putchin Pass. Glasunov, 1892 [printed]/ Quedius imitator Luze [handwritten]/ Q. imitator Luze J. Boháč det. 1983 [pre-printed]"; paralectotypes: 1 ♂, "Seravschan Putchin Pass. Glasunov, 1892 [printed]/ Quedius imitator Luze [handwritten]/ Q. imitator Luze J. Boháč det. 1983 [pre-printed]/ Quedius sp.1. cf. suturalis Ksw. A. Solodovnikov 1997 [handwritten]"; 3 ♂, "Seravschan Putchin Pass. Glasunov 1892 [printed]/ Q. imitator Luze J. Boháč det. 1983 [pre-printed]/ Quedius sp.1. cf. suturalis Ksw. A. Solodovnikov 1997 [handwritten]"; 2 ♀, "Seravschan Putchin Pass. Glasunov 1892[printed]"; 2 ♂, "Seravschan Obburden Glasunov, 1892 [printed]/ Q. imitator Luze J. Boháč det. 1983 [pre-printed]/ Quedius sp.1. cf. suturalis Ksw. A. Solodovnikov 1997 [handwritten]"; 1 ♀, "Iskander-Kul Iskander-Darja Glasunov 1892 [printed]/ Q. imitator Luze J. Boháč det. 1983 [pre-printed]" (ZIN).

***Quedius tschinganensis*: Uzbekistan:** Holotype: ♂, "Ouzbekistan 8-68 Mts Tschingan 1500 m. H.C. [printed]/ *Q.* (*Sauridus*) *tschinganus* [sic!] Coiff. H. Coiffait det. 1968 [pre-printed]/ Holotype [printed]"; 5 ♂, 1 ♀, "Ouzbekistan 8-68 Mts Tschingan 1500 m. H.C. [printed]/ Paralectotype [printed]" (Fig. 14D, H) (MNHN).

***Quedius tschinganensis gracilicornis*: Tajikistan:** ♂, "Karatak Buchara [printed]/ Type [printed]/ *Q.* (*Sau-*

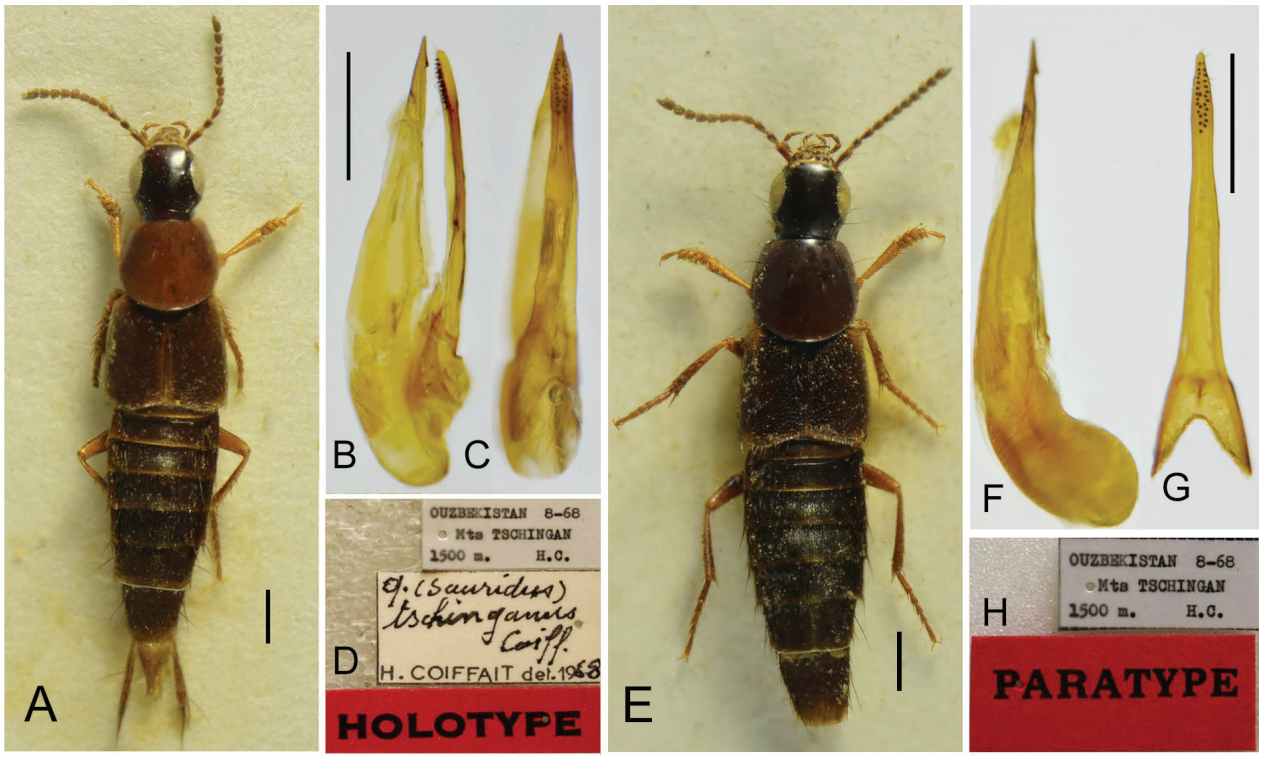

Figure 14. *Quedius tschinganensis* (new synonym of *Q. imitator*), types. **A–D**, holotype; **E–H**, paratype. **A, E,** habitus. **B, C, F, G,** aedeagus: **B,** lateral view; **C,** dorsal view; **F,** median lobe, lateral view; **G,** paramare, underside. **D, H,** labels. Scale bars: **A, E** = 1 mm; **B, C, F, G** = 0.5 mm.

ridus) *tschinhganensis* v. *gracilicornis* H. Coiffait ~~det.~~ [sic!] 1977 [pre-printed]" (MNHN).

Additional material. Tajikistan: 3 ♂, Zeravshan Mt. Ridge, Chap-Dara River valley, 2500 m a.s.l., 26.VI.1983, S.K. Alekseev leg. (cRyv); 1 ♂, Pamir-Alai, Zeravshan Mt Ridge, Zavron valley, 2100–3000 m a.s.l., 12–13.VII.1990, M. Schülke & D.W. Wrase leg (cSch); 1 ♂, Zeravshan Mt. Ridge, near Mazor, 14.VIII.1989, K.G. Michailov leg. (NHMD); **Kazakhstan**: 1 ♂, Makanchi District, Tarbagatay Mts, 6 km NE Kirovka (=Karatuma), Sholakterek River valley, ca. 1200 m a.s.l., 47°10'N, 82°06'E, highly disturbed *Populus* forest with *Salix*, *Rosa*, *Lonicera*, *Crataegus*, etc., 23–24.VI.2001, S.I. Golovatch leg. (cRyv); 1 ♂, Dzhungarskiy Alatau, S Koktuma, Alakol Lake, 05.VI.1962, L.V. Arnoldi leg. (ZIN); 2 ♂, Almaty Area, Dzhungarskiy Alatau Mts, 6 km NE Rudnichnyi, Koksu River canyon, 1300–1400 m a.s.l., 44°41'N, 78°58'E, *Betula* sp., *Populus*, *Picea* etc. forest, 09–10.VI.2001, S.I. Golovatch leg. (cRyv); 2 ♂, Zalataysky Alatau, Krasnogorka [Sulutor], stream beach under tree, 75.13504E, 43.23457N, 28.VII.2010, V.A. Kastcheev leg. (ZIN); 2 ♂, 1 ♀, Lle-Alatau NP Talgar env., Ak-Bulak Resort horse and cow dung, 1750 m a.s.l., 43.26897N, 77.37145E, 08.V.2014, M. Kocián leg. (cKoc); 2 ♀, Lle-Alatau NP Talgar env., Ak-Bulak Resort, horse and cow dung, 1690 m a.s.l., 43.27039N, 77.37137E, 12–15.V.2014, M. Kocián leg. (cKoc); 1 ♂, Almaty Area, Zailiyskiy Alatau Mts, Medeo near Almaty, 1500–1600 m a.s.l., 43°10'N, 77°04'E, *Picea*, *Betula*, etc. forest, 27.V.2001, S.I. Golovatch leg. (cRyv); 3 ♂, Almaty Area, Zailiyskiy Alatau Mts, ca. 20 km SE Turgen, Turgen River canyon, near Batun, 1750 m a.s.l., 43°14'N, 77°46'E, *Picea*, *Betula* sp., *Salix*, etc. forest, 25.V.2001, S.I. Golovatch leg. (cRyv); 1 ♂, Zailiysky Alatau, Chilik River, Sarybastau, 15.VI.1988, V.A. Kastcheev leg. (ZIN); 4 ♂, 1 ♀, Almaty Area, Uygurskiy Distr., Ketmen Mts, 5 km SE Kyrghyzsay (=Podgornoye), 1500–1900 m a.s.l., 43°17'N, 79°31'E, *Picea*, *Betula* sp., *Populus*, etc. forest, 01–02.VI.2001, S.I. Golovatch leg. (cRyv);1 ♂, Ketmen Mts, Malyi Kyrgisai, 28.VII.1987, V.A. Kastcheev leg., (ZIN); 3 ♂, Karatau Mts, 660 m a.s.l., 42°53'41.42N, 70°42'56.6E, leaf litter along stream, 11.VII.2010, V.A. Kastcheev leg. (ZIN); 8 ♂, 1 ♀, Karatau Mts, Byzhi River, Rynagus stream, 757 m a.s.l., 43°57'08.7N, 68°12'04.2E, 24–25.VII.2010, V.A. Kastcheev leg. (ZIN); 2 ♂, 1, Karatau Mts, Aktobe River, grove, 25.VII.2010, V.A. Kastcheev leg. (ZIN); 6 ♂, 1 ♀, Karatau Mts, Khantagi River, 570 m a.s.l., 43°33'32.4N, 68°40'52.7E, 25.VI.2011, V.A. Kastcheev leg. (ZIN); same locality and collector, but 1 ♂, leaf litter under *Salix* sp., 536 m a.s.l., 43°32'46.5N, 68°39'50.6E, 21.VII.2010 (ZIN); ♂, 1 ♀, 27 km S Chulak-Kurgan, 04.VI.1983, B.V. Iskakov leg. (ZIN); 1 ♂, 1, Chimkent, Aksukent, Aksu River, 29.VI.1983, V.A. Kastcheev leg. (ZIN); 2 ♂, Aksu-Zhabagly Nature Reserve, Tokmak River, near border, under stones, 1600 m a.s.l., 30.V.1974, E.V. Ishkov leg. (ZIN); 1 ♂, 2 ♀, Aksu-Dzhabagly, Taldy-Bulak River, 15–25.VI.1983, B.V. Iskakov leg. (ZIN); 1 ♂, Aksu-Dzhabagly, Isbala River, 18.VII.1986, (ZIN); 1 ♂, Aksu-Djabagly, Djabagly River, tract Ulken-Kaindy, IV.1986, B.V. Iskakov leg. (ZIN); same locality and collector, but 1 ♂, Kshi-Kaindy River, 01.V.1986 (ZIN); **Uzbekistan:** 1 ♂, Kitab, 30.VII.1933, V.V.

Figure 15. *Quedius imitator*, distribution, median lobe of the aedeagus laterally, and variability of the paramere (as an example specimens from one locality, indicated by black dot). Scale bars: 1 mm.

Gussakovsky leg. (ZIN); **Kyrgyzstan:** 1 ♂, Terskey Alatoo Mts, Barskoon Valley, Chuli River, 15.VII.1983, S.K. Alekseev leg. (cRyv); 1 ♂, 1 ♀, Osh Area, Sary-Chelek Biosphere Reserve, near Arkit, Bakay-say Tract, 14.VII.1983, K.G. Mikhailov leg. (cRyv); 1 ♂, Chatkal Mt. Ridge, near Arkit, nut-fruit forest, 16.V.1961, V.A. Zaslavsky leg. (ZIN); 2 ♂, Tien Shan, Kichik-Alai Mt. Ridge, upper reaches of Kyrghyz-Ata River, Kara-Goy, 2400–2850 m a.s.l., *Juniperus* stand, 21–23.V.1993, S.I. Golovatch leg. (cRyv); 1 ♂, Osh Area, environs of Sary-Chelek Biosphere Reserve, confluent of Aflatun River, Batrakhan (=Baltyrkan) Tract, moss and leaf litter in birch forest & under *Picea schrenkiana* at stream bank, 31.VII.1983, A.B. Ryvkin leg. (cRyv); 3 ♂, Tien Shan, Chatkal Mt. Ridge, Sary-Chelek Biosphere Reserve, 1550–2200 m a.s.l., forests, 29–31.V.1993, S.I.Golovatch leg. (cRyv); 2 ♂, 1 ♀, Osh Area, W Tien Shan, Ferganskiy Mt. Ridge, near Yarodar, 1100–1200 m a.s.l., *Juglans* forest, in leaf litter, 27–28.IX.1983, K.Yu. Eskov leg. (cRyv); 1 ♂, Osh Area, W Tien Shan, Ferganskiy Mt. Ridge, Yarodar, 1300 m a.s.l., rill bank, in leaf litter and under stones, 24–25.IX.1983, K.Yu. Eskov leg. (cRyv); 3 ♂, Tien Shan, Baubash-Ata Mt. Ridge, near Arslanbob, 1800–1900 m a.s.l., scrub, litter & under stones. 19.V.1993. S.I. Golovatch leg. (cRyv); 10 ♂, 1 ♀, Tien Shan, Baubash-Ata

Mt. Ridge, near Yarodar, 1400–1700 m a.s.l., *Juglans* forest, litter & under bark. 16–17.V.1993. S.I. Golovatch leg. (cRyv); 4 ♂, 1 ♀, Ferganskiy Mt. Ridge, Kara-Alma, 1800 m a.s.l., 22–24.VI.1945, K.V. Arnoldi leg. (ZMMU); ♂ 1 ♂, 3 ♀, Gava, Fergana Valley, Jalal-Abad Region, near station of Forest Institute of Russian Academy of Sciences, 04.IX.1950, L.V. Arnoldi leg. (ZIN); 1 ♂, Fergana Valley, Kulun Lake, 3000 m a.s.l., 07.V.1993, I.I. Kabak leg. (ZIN); 2 ♂, 1 ♀, S Fergana Valley, Ak-Terek, 25.IX.1937, A.N. Kirichenko leg. (ZIN).

Comments on the lectotype designation. In the original description of *Q. imitator*, Luze (1904) did not specify the number of syntypes but provided geographical data that indicated multiple syntypes collected in the localities "Seravschan, Putchin-Pass, Darch, Obburden, Urmitan, Kumar; Jagnob, Varsaut; Iskander-Kul, Iskander-Darja" (approximate coordinates as we interpret these localities are given in the Table. 2). Also, the syntype series must have included both sexes because male characters were specified separately in the description. In the ZIN collection we found 11 specimens from several localities along Zeravchan and Iskander Darya Rivers matching those in the original description (for details see 'Material examined' above). Based on that and additional information from the specimen labels, there is no doubt that they are syntypes. Earlier they were identified by Boháč (1988) as *Q. imitator* without recognizing them as syntypes. In order to fix the identity of the species, we designate here one male syntype with more preciselocality "Seravschan Darch Glasunov 1892" (Darg, Sughd Distr.) as the lectotype. Bernhauer (1905) considered *Q. imitator* as a "rough form" of *Q. oblitteratus* (now synonym of *Q. humeralis* Stephens, 1832). Gridelli (1924) not seeing types or any other material of *Q. imitator* was not sure about the status of this species. Based on the non-type material, Coiffait (1967, 1978) illustrated its aedeagus for the first time that here is shown to be the correct species interpretation. Boháč (1988) provided new records for the species from Uzbekistan and Turkmenistan that are reliable because he examined syntypes.

Comments on the new synonym. Coiffait (1969) described *Quedius tschinganensis* (Fig. 14) from Uzbekistan and separated it from *Q. imitator* by darker body coloration, antennal segment 3 longer than 2, presence of 'lateral' puncture on pronotum, denser punctation of the elytra and more elongated median lobe. Additionally Coiffait (1977) described *Q. tschinganensis gracilicornis*, a variety of *Q. tschinganensis* from Tajikistan based on some differences in coloration of the body and the proportions of antennae. Later (1977), he replaced the preoccupied name *gracilicornis* by the new name *debilicornis*. Both are unavailable names due to ICZN Article 15.2 as already noted in Herman (2001).

Our examination of the material from Middle Asia, including types, showed continuous variability in the external morphology and aedeagus that connects the states of *Q. imitator* and *Q. tschinganensis*. The shape of the paramere varies from the state with narrow and sharp apex with lesser number of sensory peg setae arranged in regular rows away from the apex, to the state with obtuse apex and with more sensory peg setae arranged denser and closer to the apex (Figs 14C, G; 15). Shape of the median lobe is more stable and varies only slightly in length and degree of sharpness of its apex (Figs 14B, F; 15). Mapping of this variability across the species distribution does not show any geographical patterns. Externally all specimens including females, also show no traits that would correspond to variants different in the shape of the paramere. Thus we place *Q. tschinganensis* Coiffait, 1969 in synonymy with *Q. imitator* Luze, 1904. Our study of the type specimen of *Q. tschinganensis debilicornis* also shows it to be conspecifc with *Q. imitator*.

Comments on taxonomy, distribution and bionomics. *Quedius imitator* can be diagnosed by the following character combination: body dark brown with darker head and abdomen; elytra with slightly yellowish anterior angles; antennae usually pale; scutellum without setiferous punctation; aedeagus with ventral tooth of median lobe located remotely from its apex, with median lobe and paramere very narrow, apex of paramere obtusely sharpened and sensory peg setae arranged in two regular rows convergent to each other. Among other *Raphirus* that occur in Middle Asia, *Q. imitator* is most similar to *Q. cohaesus* from which it can be easily distinguished by the mentioned diagnostic characters of the aedeagus.

Based on the examined material and literature (Table 1), *Q. imitator* is widely distributed in all countries of Middle Asia (Fig. 15). According to the label data of the examined material, *Q. imitator* inhabits ground based debris and leaf litter of mainly deciduous forests along rivers and streams at various elevations, up to 3000 m. Also it can be found in dung or under stones.

Quedius (*Raphirus*) *novus* Eppelsheim, 1892

Figs 3E, 17

Quedius dzambulensis Coiffait, 1967, **syn. n.** (Fig. 16)

Quedius novus Eppelsheim, 1892, 331 (original description); Gridelli 1925, 125; Wüsthoff 1938 (illustration of aedeagus); Coiffait 1963, 389 (characters); Coiffait 1970, 143 (distribution records); Coiffait 1978, 228 (notes); Boháč 1988, 556 (distribution records; notes); Smetana 1995a, 84 (distribution records); Klimenko 1996, 121 (distribution records); Kadyrov et al. 2014a, 31; 2014b, 49 (distribution records).

Quedius dzambulensis Coiffait, 1967, 403 (original description); Coiffait 1978, 229 (characters, distribution records); Boháč 1988, 556 (notes); Kascheev 2001, 102 (distribution records).

Material examined.

Type material examined. *Quedius novus*: **Uzbekistan**: Lectotype (here designated), ♂, "novus Epp. Taschkent Leder. [handwritten]/ c. Epplsh. Steind. d. [printed]/ Typus [printed]" (NMW); Paralectotypes, 2 ♀, same data as in lectotype; 2 ♂, 2 ♀, same data as in lectotype, but without "novus Epp. Taschkent Leder."; 1 ♂, same data as in lectotype,

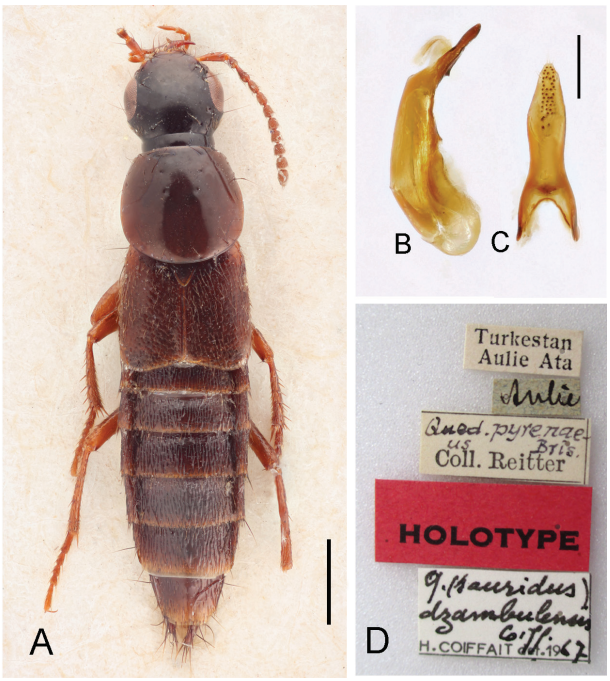

Figure 16. *Quedius dzambulensis* (new synonym of *Q. novus*), holotype, male. **A,** habitus. **B,** median lobe, lateral view; **C,** paramere, unserside. **D,** labels. Scale bars: 1 mm.

but "♂/ novus Epp. Deutsch. ent. Zeit. 1892. P. 331 [handwritten]"; 1 ♀, "Taschkent Leder.Reitter. [printed]/ Quedius novus Epph. n.sp. [handwritten]/ 95"; 1 ♀, "Tasckkend [sic!] Reitter. [printed]/ Collect. Hauser [printed]"; 1 ♀, "Taschkend Leder. Reitter. [printed]" (NMW); 1 ♂, "Tashkent, Leder, Reitter [printed]/ Q. novus Epp. J. Boháč det. 1983 [handwritten]" (ZIN); 1 ♀, "Tashkent, Leder, Reitter [printed]/ Q. novus Epp. [handwritten]/ Q. novus Epp. J. Boháč det. 1983 [handwritten]/ Quedius dzambulensis Coiff. A. Solodovnikov det. 1997 [handwritten]" (ZIN)

Quedius dzambulensis: Holotype, "Turkestan Aulie Ata [printed]/ Aulie [handwritten]/ *Quedius pyrenaeus* Coll. Reitter [pre-printed]/ Holotype [printed]/ *Q.* (*Sauridus*) *dzambulensis* Coiff. H. Coiffait det. 1967" (Fig. 16D) (HNHM).

Additional material examined. Uzbekistan: 2 ♂, 1 ♀, Chatkal Mt. Ridge, Ters River bank up-stream of Yangibazar, 27.IV.1986, I.A. Belousov leg. (cRyv);1 ♂, Chatkal Nature Reserve, bank of small rill, wet ground, *Poaceae* gen. sp., *Equisetum* sp., moss, 19.IX.1983, K.Yu. Eskov leg. (cRyv); 1 ♂, 60 km W Jizzakh, near Asmansay, by the stream, 15.V.1986, B.V. Iskakov leg. (ZIN); 1 ♂, 2 ♀, 60 km W Jizzakh, by the stream, Nuratau Mt., 14.V.1986, B.V. Iskakov leg. (ZIN); 1 ♂, "Trkst., Mnt. Nurata, UCHUN Glasunov 1892" [Nurata Distr., Nurata] (ZIN); 3 ♂, 1 ♀, Aman Kutan River 12.VI.1932, V.V. Gussakovsky leg. (ZIN); same locality and collector, but 1 ♀, 05.VII.1932 (ZIN); 4 ♂, 3 ♀, Agalyk, Samarkand, 22–23.X.1935, Y.D. Kirschenblat leg. (ZIN); 4 ♂, 2 ♂, Kugitangtau Mts, near Kampyrtepa, Kampyrtepa say, under stones near stream, 1400 m a.s.l., 10.V.1984, A.V. Tanasevitch leg. (cRyv); same locality and collector, leaf litter near stream, 1600–1700 m a.s.l., 17–19.V.1984 (cRyv); **Kazakhstan:** 1 ♂, Almaty Area, Dzhungarskiy Alatau Mts, 6 km NE Rudnichnyi, Koksu River canyon, 1300–1400 m a.s.l., 44°41'N, 78°58'E, *Betula* sp., *Populus*, *Picea* etc. forest, 09–10. VI.2001, S.I. Golovatch leg. (cRyv); 1 ♂, Dzhungarskiy Alatau Mts, S slope, E ridge, middle reaches of Ispul River, 1900 m a.s.l., litter in *Abies* forest, 14.VIII.1991, A.V. Tishechkin leg. (cRyv); 1 ♂, Almaty Area, Talgar District, Ak-Bulak, 2700 m a.s.l., 43.1613N, 77.2404E, 24.V.2014, O. Nakladal leg. (cKoc); 3 ♂, 1 ♀, Aksu-Dzhabagly, Isbala River, 15–25.VI.1983, B.V. Iskakov leg. (ZIN); 2 ♂, 1 ♀, Aksu-Dzhabagly, Taldy-Bulak River, 10–20.IV.1979, B.V. Iskakov leg. (ZIN); 1 ♂, Aksu-Dzhabagly, Ulken-Kaindy River, 15.VI.1991, V.A. Kastcheev leg. (ZIN); 1 ♂, SW slopes of Ugamskij Range, Silbili River, 18.VI.2004, A.V. Matalin leg. (cSch); 2 ♂, 1 ♀, Karzhantau, Kaskasu River, 10–12.VII.1983, B.V. Iskakov leg. (ZIN); 2 ♂, 2 ♀, Karzhantau, 30 km E Leninskoe, Karabau River valley, 01–05. VII.1983, B.V. Iskakov leg. (ZIN); 1 ♂, Urochishe Shilikti, 05.VI.2010, K.V. Makarov, A.V. Matalin leg. (cSch); **Kyrgyzstan:** 1 ♂, Kyrgyz Alatau, under *Salix* sp., 09.VII.2010, 72°28'38.6N, 42°48'49.2E, V.A. Kastcheev leg. (ZIN); 3 ♂, Osh Area, Sary-Chelek Biosphere Reserve, "head" of Sary-Chelek Lake, 1940–1945 m a.s.l., lake shore and bottom of partly dried rill with *Carex* spp., *Equisetum* sp., *Juncus* sp., *Phragmites australis*, etc., 12.VIII.1983, A.B. Ryvkin leg. (cRyv); 1 ♂, Tien Shan, Baubash-Ata Mt. Ridge, near Arslanbob, 1800–1900 m a.s.l., scrub, litter & under stones, 19.V.1993, S.I. Golovatch leg. (cRyv);1 ♂, Aruktau 25 km Kyzyl-Kiya, IV.1966, O.L. Kryzhanovsky leg. (ZIN); **Tajikistan:** 1 ♀, "Seravshan Kumar Glasunov 1892/ Q. dzambulensis J.Boháč det. 1983" (ZIN); 1 ♂, "Seravshan Kschtut. Artutsch. Glasunov 1892/ Q. dzambulensis J.Boháč det. 1983/ Quedius dzambulensis Coiff. A. Solodovnikov det. 1997" (ZIN); 1 ♀, "Seravshan Fl. Magian Glasunov 1892/ Q. dzambulen sis J. Boháč det. 1983/ Quedius dzambulensis Coiff. A. Solodovnikov det. 1997" (ZIN); 1 ♂, "Trkst. Jagnob Kol Glasunov 1892/ Q. dzambulensis Epp. J. Boháč det. 1983" (ZIN); 3 ♂, Zeravshan Mt. Ridge, Chap-Dara River valley, 2500 m a.s.l., 26.VI.1983, S.K. Alekseev leg. (cRyv); 1 ♂, Kondara, under stones near aryk, 03.VI.1973, V.V. Yanushev leg. (cRyv); 1 ♂, Warsob, 03.V.1988, S.V. Saluk leg. (cRyv); 1 ♂, Pamir-Alai, Hisaar Mts, Adshuk-Cleft near Warsob, 1200 m a.s.l., 01–03.VII.1990, M. Schülke & D.W. Wrase leg. (CSch); 1 ♂, 2 ♀, "♀ or ♂/ Mts Karateghin Baldschuan 924 m. F. Hauser 1898/ novus/ ex. coll. Scheerpleltz" (NMW); 2 ♂, 1 ♀, "♀ or ♂/ Mts. Karateghin Baldschuan 924 m. F. Hauser 1898/ novus Epp./ ex. coll. Breit/ ex. coll. Scheerpleltz" (NMW); 1 ♂, "♀/ Mts. Karateghin Baldschuan 924 m. F. Hauser 1898/ Quedius novus Epp. det. Bernhauer/ ex. coll. Scheerpleltz" (NMW); 2 ♂, 1 ♀,"♀/ Mts. Karateghin Baldschuan 924 m. F. Hauser 1898/ Collect. Hauser /Q. novus Epp. Bernh.d." (NMW); 3 ♀, "♀/ Mts. Karateghin Baldschuan 924 m. F. Hauser 1898/ Collect. Hauser" (NMW); 3 ♀, "♀/ Mt. Karateghin Sary-pul 1482 m. F. Hauser 1898/ Collect. Hauser" (NMW); 1 ♂,

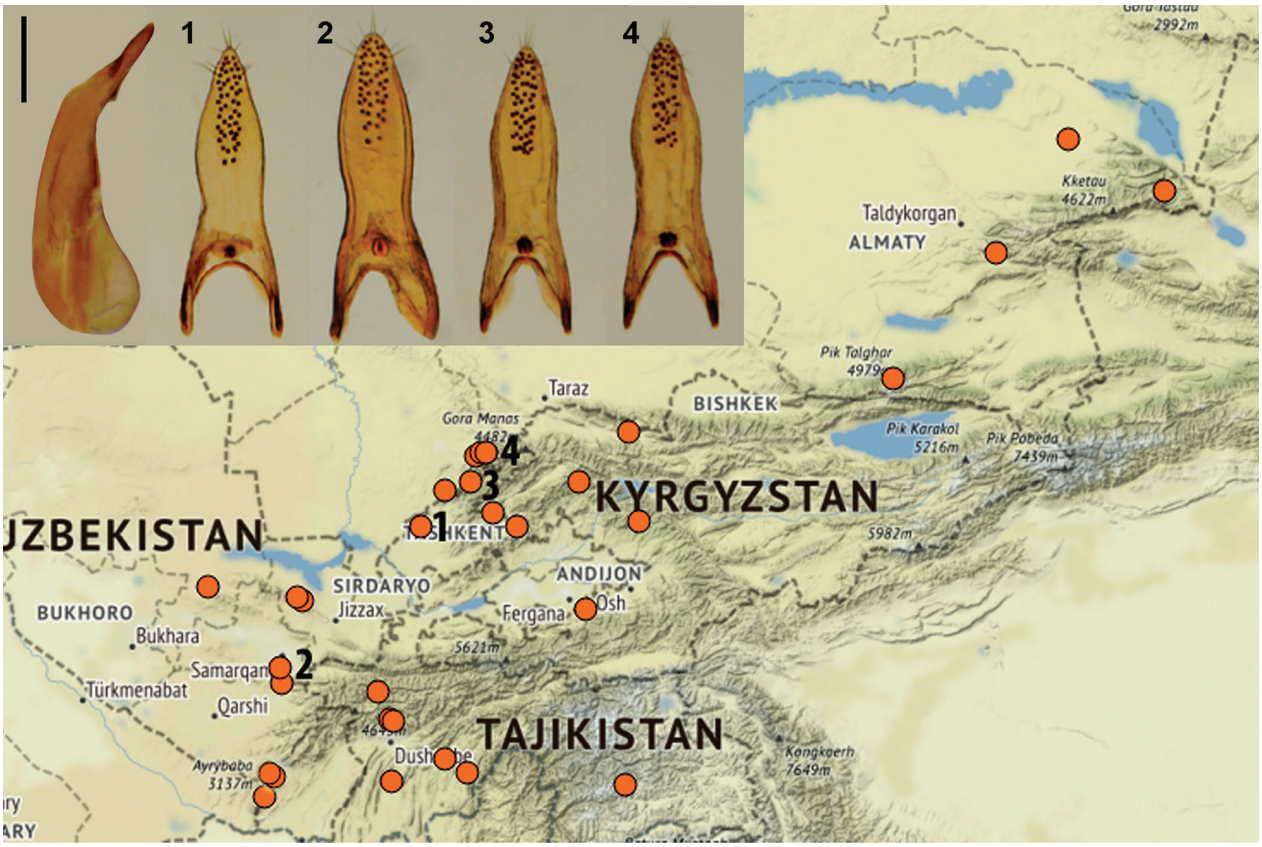

Figure 17. *Quedius novus*, distribution, median lobe of the aedeagus laterally, and variability of the paramere (as examples specimens from various localities numbered respectively on the map). Scale bars: 0.5 mm.

2 ♀, "Collect. Hauser" (NMW); 1 ♀, near Muminobod, 1300 m a.s.l., 15.V.1962, O.L. Kryzhanovsky leg. (ZIN); **Tajikistan or Uzbekistan:** 1 ♂, "Seravshan Boschara Glasunov 1892/ Q. dzambulensis J. Boháč det. 1983" (ZIN); 4 ♂, 2 ♀, "Seravshan Putchin pass. Glasunov 1892/ Q. dzambulensis J. Boháč det. 1983" (ZIN).

Comments on taxonomy and lectotype designation. In the original description of *Q. novus*, Eppelsheim (1892) stated that he had examined numerous specimens from Tashkent and one from Margelan [Margilan in Uzbekistan]. He also stated in the introduction of that study that he received material from 'Turkestan' from multiple collections of Hauser, Staudinger and Reitter. In particular, he mentioned that the material from Tashkent from Reitter's collection was collected by Leder. In NMW altogether we found 11 conspecific specimens, all originally from Eppelsheim's collection (with printed label "c.Epplsh. Steind."), whose morphology and label data match with the original description. We consider all of them to be syntypes. Of them, 8 specimens (on 5 pins) were earlier supplied with the curatorial printed red labels "types"; only two specimens have what we consider Eppelsheim's hand written labels "novus Epp. Taschkent Leder." and one specimen having "novus Epp. Deutsch. ent. Zeit. 1892. P. 331" label in a different handwriting probably attached by somebody later, after the species description was published. Also in the ZIN collection we found two more specimens conspecific with the syntypes at NMW and with the label "Taschkent Leder. Reitter" indicating that they are likely to be syntypes as well. Examination of all syntypes confirms that previous authors correctly interpreted this species. In order to fix its identity, here we designate one male syntype from NMW as the lectotype. Due to the intraspecific variability (Figs 16, 17) and resulting new synonymy *Q. novus* = *Q. dzhambulensis* (see below), we chose a syntype for lectotypification which has a more narrow longitudinal row of sensory peg setae on the paramere, best matching Coiffait's (1967) illustration for *Q. novus*.

Comments on the new synonym. The aedeagus of *Q. novus* was first illustrated by Wüsthoff (1938) based on non-type material. Coiffait (1963, 1970, 1978) redescribed the species, also illustrated the aedeagus and provided more records for *Q. novus* from Uzbekistan. Our examination of syntypes proved both Wüsthoff's and Coiffait's interpretation of this species was correct. Also Coiffait (1967) described *Q. dzambulensis* from Dzambul (Kazakhstan) (Fig. 16), a species which seemed to be very similar to *Q. novus* even from the illustrations of the aedeagi for both species.

Later, Boháč (1988) examined material from the ZIN collection and provided new records from Uzbekistan, Tajikistan, Kyrgyzstan of *Q. dzambulensis* and only one record from Uzbekistan for *Q. novus*. He also stated that *Q. novus* is very closely related to *Q. dzambulensis* with which it can be easily confused. We checked all material from ZIN studied by Boháč (1988) and found that, without knowing it, the only specimens he identified as *Q. no-*

vus were the syntypes of that species. All other specimens he identified as *Q. dzambulensis*.

Our examination of a broader sample from Middle Asia, including types of both species, showed continuous variability in the structure of the aedeagus connecting the state of *Q. novus* with the state of *Q. dzambulensis*. Sensory peg setae on the paramere vary in arrangement, from denser (as in Coiffait's illustration for *Q. novus*) to sparser (as in Coiffait's illustration for *Q. dzambulenisis*) witin a longitudinal group (Fig. 17). The mentioned variability has no geographic pattern. Therefore, we consider *Q. dzambulensis* Coiffait, 1967 to be a junior synonym of *Q. novus* Epp.

Diagnosis. Body dark brown; elytra with lighter colored humeri and shallow micropunctation between punctures; antennae slightly paler; scutellum without setiferous punctation. (Figs 3E, 16A) Aedeagus (Figs 16B, C; 17): ventral tooth of median lobe located remotely from its apex; median lobe and paramere very broad (Figs 16B, 17); apex of paramere obtusely pointed and sensory peg setae arranged in long wide band in the middle of paramere (Figs 16C, 17). *Quedius novus* can be easily distinguished from the similar Middle Asian species *Quedius umbrinus* by the coloration and micropunctation of elytra and also by the mentioned above aedeagal characters.

Distribution. Based on the literature data (Table 1) that proved to be reliable for this species and the material examined here, *Q. novus* is widely distributed in Middle Asia and appears the most common in southern Kazakhstan, eastern Uzbekistan, western Kyrgyzstan and northeastern Tajikistan (Fig.17).

Bionomics. *Quedius novus* prefers various wet ground based plant debris or moss usually near water bodies. It seems to occur both in forested and open habitats, up to 2700 m. Occasionally it was also found under stones and in dung.

Quedius (*Raphirus*) *umbrinus* Erichson, 1839

Fig. 4B

Quedius umbrinus: Herman 2001, 3287 (summary of literature); Kascheev 1989, 36 (records); Assing and Schülke 2012, 475, 477 (diagnosis, distribution and bionomics, aedeagus illustration).

Material examined. Kazakhstan: 1 ♂, Almaty Area, Dzhungarskiy Alatau Mts, 3 km SSE Lepsinsk, Bulinka River canyon, 1100–1800 m a.s.l., 45°30'N, 80°38'E, *Betula* sp., *Malus*, *Populus* etc. forest, 16–17.VI.2001, S.I. Golovatch leg. (cRyv); 1 ♂, Almaty Area, Talgar District., Ak-Bulak, 43.1613N, 77.2214E, 10–15.V.2014, O. Nakladal leg. (cKoc); 1 ♂, Lle-Alatau NP Talgar env., Ak-Bulak Resort, horse and cow dung, 1690 m a.s.l., 43.27039N, 77.37137E, 12–15.V.2014, M. Kocián leg. (cKoc); 1 ♂, 1 ♀, Lle-Alatau NP Talgar env., SW slope, leaf litter sifting, 1845 m a.s.l., 43.25851N, 77.38501E, 09.V.2014, M. Kocián leg. (cKoc).

Comments on taxonomy, distribution and bionomics. Among all Middle Asian *Raphirus*, *Q. umbrinus* is most similar to *Q. novus* from which it can be distinguished by the structure of aedeagus: median lobe with distinct ventral tooth near its apex and apical portion slightly curved dorso-ventrally (in lateral view); paramere (underside) with sensory peg setae arranged in wide lateral rows merging at parameral anterior margin.

As a common and widespread species in Europe, *Q. umbrinus* was noted and illustrated in numerous papers. The latest summary can be found in Assing & Schülke (2012). Based on Kascheev (1989) and material examined here, *Q. umbrinus* occurs in the mountains of southern Kazakhstan where it can be found in leaf litter and dung at elevations up to 1845 m.

Quedius (*Raphirus*) sp. aff *Q. coloratus* Fauvel, 1875

Fig. 18

Quedius coloratus: Herman 2001, 3129 (summary of literature); Assing 2017, 207 (characters, distribution records, bionomics).

Figure 18. *Quedius* sp. aff *Q. coloratus* (specimen from Kygyzstan). **A,** habitus. **B,** median lobe, lateral view; **C,** paramere, underside. Scale bars: **A** = 1 mm; **B, C** = 0.5 mm.

Material examined. Kyrgyzstan: 1 ♂, N Tien-Shan, Kyrgyz Alatoo Mts, S Tokmak, near Kegety Pass, left tributary of Tuyuk River, 3000 m a.s.l., 42°24'43"N, 75°00'52"E, 13.V.1986, I.A. Belousov leg. (cRyv).

Comments on taxonomy, distribution and bionomics. Externally and by the structure of the aedeagus, a single male specimen from Kyrgyzstan (Fig.18) examined here seems to be a new species from the *coloratus*-group, recently revised by Assing (2017). *Quedius coloratus* and allied species forming that group are regional Mediterranean endemics with allopatric distributions, altogether extending from Greece, through Turkey to Jordan. Our specimen differs from all known species of the *coloratus*-group in the structure of aedeagus (sharp apex of median lobe, subapical tooth located much further away form the apex, peg setae of the paramere less distinctly arranged in longitudinal rows and situated more medially (Fig. 18B, C).

This specimen from the high elevations of Kyrgyz Alatoo, far from the Mediterranean region, is a noteworthy finding for the *coloratus*-group. More material is needed for a clearer understanding of its identity and formal description.

Quedius (*Raphirus*) *hauseri* Bernhauer, 1918

Figs 19, 22

Quedius peneckei Bernhauer, 1918, **syn. n.** (Fig. 20)
Quedius ouzbekiscus Coiffait, 1969, **syn. n.** (Fig. 21)
Quedius hauseri Bernhauer, 1918, 94 (original description); Gridelli 1925, 154 (characters); Scheerpeltz 1933, 1443 14 (= *Q. peneckei* Bern.); Wüsthoff 1938, 221 (illustration of aedeagus); Coiffait 1978, 264 (characters, distribution records); Tronquet 1981, 71 (distribution records); Klimenko 1996, 121 (distribution records).
Quedius peneckei Bernhauer, 1918, 95 (original description); Gridelli 1925, 154 (variety of *Q. hauseri*); Scheerpeltz 1933, 1443 (variety of *Q. hauseri*); Coiffait 1978, 264 (variety of *Q. hauseri*, characters).
Quedius ouzbekiscus Coiffait, 1969, 52 (original description); Coiffait 1970, 143 (list); Coiffait 1978, 278 (characters, notes); Kascheev 2001, 102 (distribution records).

Type material examined. *Quedius hauseri*: **Lectotype (here designated): Tajikistan:** 1 ♂, "Mts. Karateghin Baldschuan 924 m. F. Hauser 1898. [printed]/ hauseri Bern. Typus [handwritten]/ Chicago NHMus M. Bernhauer [printed]/ Syntype teste D.J. Clarke 2014 GDI Imaging Project [printed]/ Photographed Kelsey Keaton 2014 Emu Catalog [printed]/ FMNHINS 2819454 Field Museum [printed]" (Fig. 19E) (FMNH).

Quedius peneckei: **Syntype: Kyrgyzstan:** 1 ♀, "Tienschan. [sic!] Przewalsk. Karakolthal [printed]/ picipennis Hr. Turkest. Penecke det. Bernhauer [pre-handwritten]/ acuminatus Hoch. var. elytris brevibus det. Bernh. [pre-printed]/ var. Peneckei Bern. Typus. [handwritten]/ Chicago NHMus M. Bernhauer Collection [printed]/ Syntype teste D.J. Clarke 2014 GDI Imaging Project [printed]/ Photographed Kelsey Keaton 2014 Emu Catalog [printed]/ FMNHINS 2819453 Field Museum [printed]" (Fig. 20B) (FMNH).

Quedius ouzbekiscus: **Holotype: Uzbekistan:** ♂: "Ouzbekistan 8-68 Mts Tschingan 1500 m. H.C. [printed]/ *Q.* (*Raphirus*) *ouzbekiscus* Coiff. H. Coiffait det. 1968 [pre-printed]/ Holotype [printed]" (Fig. 21D); paratypes, 3 ♂, 35 ♀: same data, but "paratype [printed]" (MNHN) (one of the male paratypes is *Q. fulvicollis*, see that species below).

Additional material examined. Kazakhstan: 1 ♂, Almaty Area, Dzhungarskiy Alatau Mts, 6 km NE Rudnichnyi, Koksu River canyon, 1300–1400 m a.s.l., 44°41'N, 78°58'E, *Betula* sp., *Populus*, *Picea* etc. forest, 09–10.VI.2001, S.I. Golovatch leg (cRyv).; 1 ♂, Kolbastau, under bark in *Abies* forest, spruce logs, 04.VI.1988, V.A. Kastcheev leg. (ZIN); 5 ♂, Karatau Mts, Byzhi River, Rynagus stream,757 m a.s.l., 43°57'08.7N, 68°12'04.2E, 24–25.VII.2010, V.A. Kastcheev leg. (ZIN); 1 ♂, 2 ♀, NW Karatau, 15 km NW Babai kurgan, 09.VI.1983, B.V. Iskakov leg. (ZIN); 1 ♂, Karatau Mts, 660 m a.s.l., 42°53'41.42N, 70°42'56.6E, 11.VII.2010, V.A. Kastcheev leg. (ZIN); 1 ♂, Karatau Mts, Khantagi River, 570 m a.s.l., 43°33'32.4N, 68°40'52.7E, 25. VI.2011, V.A. Kastcheev leg. (ZIN); 1 ♂, S Kazakhstan, near Merke, 10–15.VI.1988, B.V. Iskakov leg. (ZIN); 2 ♂, near Almaty, Zailiyskiy Alatau Mts, 2500–2800 m a.s.l, 29.VIII–03.IX.1992, K.Yu. Eskov leg.; 1 ♂, Almaty Area, Zailiyskiy Alatau Mts, Medeo near Almaty, *Picea*, *Betula* etc. forest, 1500–1600 m a.s.l., 43°10'N, 77°04'E, 27.V.2001, S.I. Golovatch leg.; 2 ♂, 2 ♀, S of Alma-Ata, upper reaches of Bolshaya Almatinka River, 2300–2500 m a.s.l., *Picea schrenkiana* forest, 06.VI.1993, S.I. Golovatch leg. (cRyv); 2 ♂, Almaty Area, Talgar district, Ak-Bulak, 2700 m a.s.l., 43.1454N, 77.2404E, 10.V.2014, O. Nakladal leg. (cKoc); 1 ♂, Lle-Alatau, NP Talgar env., Ak-Bulak, resort horse and cow dung, 1750 m a.s.l., 12–15.V.2014, 77.37145N, 43.26897 E.M. Kocián leg. (cKoc); 4 ♂, 1 ♀, Zailiysky Alatau, Sarybastau Valley, Chilik River, 12–15.VI.1988, V.A. Kastcheev leg. (ZIN); 5 ♂, 1 ♀, Ketmen Mts, Dolayty Valley, 15.VII.1988, V.A. Kastcheev leg. (ZIN); 2 ♂, same locality and collector, but 24.VIII.1987 (ZIN); 1 ♂, Kyrgyz Alatoo, 42°48'49.2E, 72°28'38.6N, 09.VII.2010, V.A. Kastcheev leg. (ZIN); 1 ♂, Aksu-Dzhabagly Nature Reserve, 27. VI.2004, A.V. Matalin leg. (ZIN); 1 ♂, Aksu-Dzhabagly Nature Reserve, Kish-Koyandy-Tau, meadow-steppe belt, 17.VII.1986, B.V. Iskakov leg.; 2 ♂, same locality and data, but in moss, 17.VII.1988, (ZIN); 1 ♂, 4 ♀, Aksu-Dzhabagly Nature Reserve, Taldy-Bulak River, 10–20.IV.1979, B.V. Iskakov leg.; 1 ♂, 2 ♀, same locality and collector, but same locality and collector, but 10–20.V.1979; 3 ♂, same locality and collector, but 04.V.1986 (ZIN); 2 ♂, Aksu-Dzhabagly Nature Reserve, Dzhatanskoi River., 18.V.1985, V.A. Kastcheev leg. (ZIN); 1 ♀, NW slopes of Ugamskiy Mt. Ridge, left tributary of Boldabrek River, 18.VI.2004, A.V. Matalin leg. (ZIN); 1

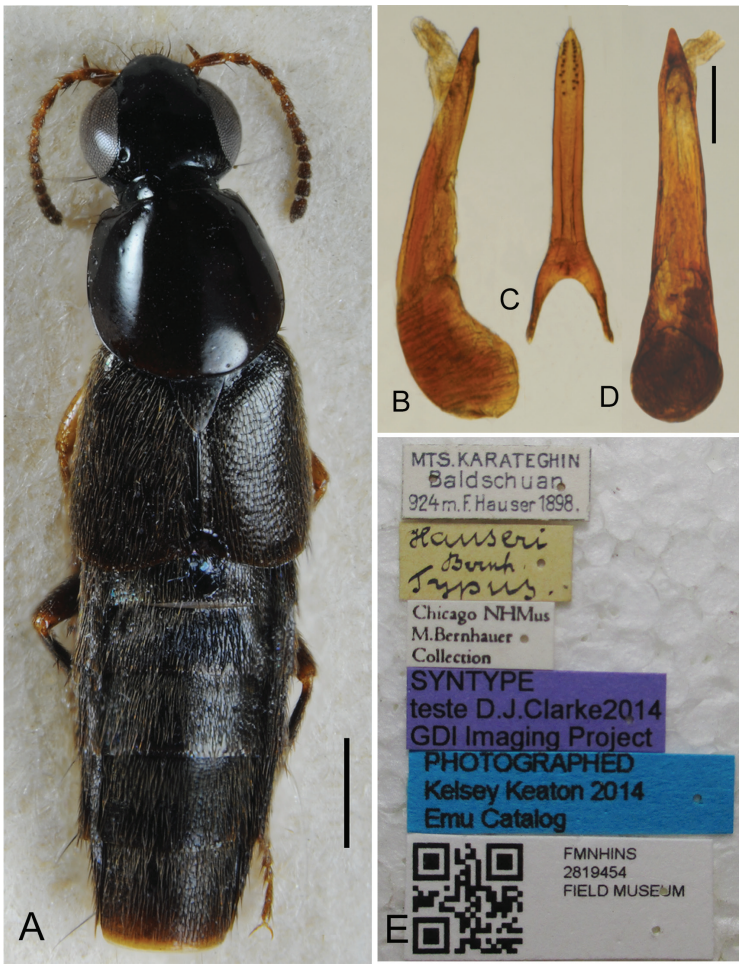

Figure 19. *Quedius hauseri*, lectotype, male. **A,** habitus. **B–D,** aedeagus: **B,** median lobe, lateral view; **C,** paramere, underside, **D,** median lobe, ventral view. **E,** labels. Scale bars: **A** = 1 mm; **B–D** = 0.2 mm.

♂, 2 ♀, Karzhantau, Kaskasu River, 10–12.VII.1983, B.V. Iskakov leg. (ZIN); **Uzbekistan:** 1 ♂, Chimgan Valley, bank of stream with *Equisetum* sp., 1984, A.V. Tanasevitch leg. (cRyv); 1 ♂, Tien Schan, Aktasch, Taschkent, 2000 m a.s.l., 13.VII.1984, D.W. Wrase leg. (cSch); 1 ♂, 2 ♀, Samarkand, Agalik, 23.X.1935, Y.D. Kirschenblat leg. (ZIN); 1 ♂, 1 ♀, Aman Kutan, 12.VI.1932, leg. V.V. Gussakovsky (ZIN); 1 ♂, same locality, but in dung, 29.V.1965, Guryeva leg. (ZIN); 1 ♂, "789[.] 24.5.62. Région de Boukhara. Ouest de Zeravchan [,] pris d'un ruisseau'[=789. 24.V.1962. Bukhara Area, Eastwards of Zeravshan, captured from a rill]/ '24.5.62. Китабский перевал [.] У ручья [.] пр [.] 121-124 [.]' [=24.V.1962. Kitab Pass. Near rill. Samples 121–124.] " (ZMMU); 5 ♂, 1 ♀, "797 [.] 11.5.62. Région de Boukhara. Ouest de Zeravchan. Pente marécageuse." [=797. 11.V.1962. Bukhara Area. Eastwards of Zeravshan. Swampy slope.] (ZMMU); 1 ♂, Shahrisabz, near city wall, 14.XII.1941, K.V. Arnoldi leg.; 1 ♂, 1 ♀, same locality and collector, gardens along road to Kitab, 27.XI.1941 (cRyv); 1 ♂, Kugitangtau Mts, near Kampyrtepa, Kampyrtepa say, under stones along stream, 1400 m a.s.l., 15.V.1984, A.V. Tanasevitch leg.; 3 ♂, same locality and collector, but in litter along stream, 1600–1700 m a.s.l., 17–19.V.1984 (cRyv); **Kyrgyzstan**: 1 ♂, Chuy Region, S Bishkek, SE Kashkasu, Kyzyl-Beles, 2010 m a.s.l., 74.3226N, 42.3904E, 05.VII.2011, J. Frisch leg. (cKoc); 1 ♂, Tien Shan, Ala Archa, 2000 m a.s.l., 09.VII.1984, D.W. Wrase leg. (cSch); 4 ♂, 1 ♀, Kungey-Alatoo, Chilik River, tract Sarybastau, 12–15.VI.1988, V.A. Kastcheev leg. (ZIN); 1 ♂, Issyk-Kul' Area, Tyupskiy District, Kungey-Alatoo Mts, valley 3–4 km N of Shaty, banks of river and rill: under stones, in moss, and among sedges, 30.VIII.1983, A.B. Ryvkin leg. (cRyv); 1 ♂, 1 ♀, Issyk-Kul', Kyzyl-Tuu-Kyzyl-Suu, Barskoon Barskaun Pass, *Picea schrenkiana*-forest, 2200 m a.s.l., 77.3551N, 42.0242E, 23. VI.2011, J. Frisch leg. (cKoc); 3 ♂, Issyk-Kul' Area, Terskey-Alatoo Mts, Chon-Kyzyl-Suu River basin, Kashkator River canyon near Geographical Field Research Station, 2900 m a.s.l., in moss & under stones near swampy rill in slope forest with *Picea schrenkiana* & *Juniperus turcomanica*, 25.VIII.1983, A.B.Ryvkin leg. (cRyv); 2 ♂, 1 ♀, Terskey-Alatoo Mts, Chon-Kyzyl-Suu River, spruce litter, motley grass, 2150 m a.s.l., 08.VII.1988, V.V. Yanushev leg. (cRyv); 1 ♂, Terskey-Alatoo, Chon-Kyzyl-Suu River, 2500 m a.s.l., 28.VI.1959, Panfilov leg. (ZIN); 1 ♂, 1 ♀, Terskey-Alatoo, Lahol River, 3300 m a.s.l., 25.VII.1992, D. Milko leg. (cSch); 1 ♂, East

Figure 20. *Quedius peneckei* (new synonym of *Q. hauseri*), syntype, female. **A,** habitus. **B,** labels. Scale bar: 1 mm.

Tien Shan, Turgen valley, Tshon Ashu Pass, 2900–3500 m a.s.l., VII.2001, V.G. Dolin & S. Andreeva leg. (cSch); 1 ♂, 1 ♀, Osh Area, Sary-Chelek Biosphere Reserve, shore of Iri-Kyol Lake, mosses and peat among *Carex* sp., *Juncus* sp., and *Phragmites australis*, 04–05. VIII.1983, A.B. Ryvkin leg.; 1 ♂, Osh Area, Sary-Chelek Biosphere Reserve, combe under pass from Khodzha-Ata River to the "head" of Sary-Chelek Lake, 2000 m a.s.l., at slope with *Carex* spp., *Brachypodium* sp., *Poa* sp., etc., 11.VIII.1983, A.B. Ryvkin leg.; 1 ♂, Osh Area, Sary-Chelek Biosphere Reserve, "head" of Sary-Chelek Lake, 1940–1945 m a.s.l., lake shore and bottom of partly dried rill with *Carex* spp., *Equisetum* sp., *Juncus* sp., *Phragmites australis*, etc., 12.VIII.1983, A.B. Ryvkin leg.; 2 ♂, 1 ♀, Sary-Chelek Biosphere Reserve, 04–10. VII.1983, S.K. Alekseev leg.; 1 ♂, Tien Shan, Chatkal Mt. Ridge, Sary-Chelek Biosphere Reserve, 1550–2200 m a.s.l., forests, 29–31.V.1993, S.I. Golovatch leg. (cRyv); 2 ♂, Osh Area, Sary-Chelek Biosphere Reserve, Keltesay stream valley, leaf litter in slope *Juglans* forest, 28.VI.1983, A.B.Ryvkin leg. (cRyv); 1 ♂, Ala Kul Pass, Kara Kol, 3860 m a.s.l., VII.1998, C. Reuter leg. (cSch); 1 ♀, Bajduly Mt., Dolon Pass, 1600 m a.s.l., 15–18. VII.2001, V.G. Dolin & S. Andreeva leg. (cSch);1 ♂, Tien Shan, Dolon Pass, 2500–3200 m, 23–25.VII.1991, J. Turna leg. (cSch); 1 ♂, Naryn Area, 50 km W Naryn City, Karatoo Mts, Ala-Myshik Tract, leaf litter in birch forest at river bank, 22.VIII.1983, A.B. Ryvkin leg.; 2 ♂, Ferganskiy Mt. Ridge, near Arslanbob, dry subalpine meadow, under stones, 2200 m a.s.l., 1.X.1983, K.Yu. Eskov leg. (cRyv); 2 ♂, Osh Area, W Tien Shan, Ferganskiy Mt. Ridge, Yarodar, 1300 m a.s.l., rill bank, in leaf litter and under stones, 24–25.IX.1983, K.Yu. Eskov leg. (cRyv); 1 ♂, Tien Shan, E slope Ferghanskiy Mt. Ridge, upper reaches of Urumbash River 2000 m a.s.l., 19.VII.2001, A.V. Puchkov leg. (cSch); 1 ♂, Tien Shan, Ferghanskiy Mt. Ridge, Burgut Pass, 3200 m a.s.l., 20. VII.2001, A.V. Puchkov leg. (cSch); 1 ♂, Ferganskiy Mt. Ridge, Kara-Unkur valley, 2150 m, 22–24.VII.2001, V.G. Dolin & S. Andreeva leg. (cSch); 1 ♂, Alay valley, Nyra, 19.VII.1960, Lopatin leg. (ZIN); **Tajikistan:** 1 ♂, 2 ♀, "Seravshan Kschtut. Artutsch. Glasunov 1892" (ZIN); 1 ♀, "Jagnob Karsau Glasunov 1892" (ZIN); 3 ♂, "Jagnob Chishartob Glasunov 1892" (ZIN); 1 ♂, 1 ♀, "Iskander-Kul/ Glasunov 1892"; 1 ♂, same collector, but "Iskander-Daria" (ZIN); 1 ♀, Pamir-Alai, Seravshan Valley, near Navobod, 10–01.VII.1990, M. Schülke & D.W. Wrase leg. (cSch); 3 ♂, 1 ♀, Pamir-Alai, Hisaar Mts, Adshuk-Cleft near Warsob, 1200 m a.s.l., 01–03.VII.1990, M. Schülke & D.W. Wrase leg. (cSch); 1 ♂, same locality and collectors, but snowfiled edge at km 55, 1800 m a.s.l., 28.VI.1990 (cSch); 8 ♂, 1 ♀, same locality and

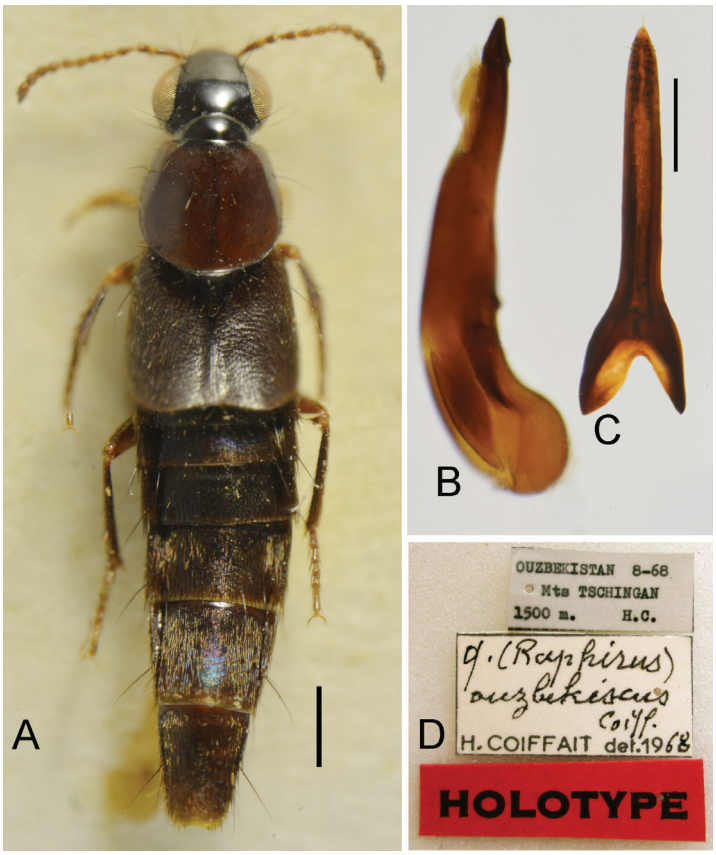

Figure 21. *Quedius ouzbekiscus* (new synonym of *Q. hauseri*), holotype, male. **A,** habitus; **B,** median lobe, lateral view; **C,** paramere, underside; **D,** labels. Scale bars: **A** = 1 mm; **B, C** = 0.2 mm.

collectors, but Bachufer, 01–03.VII.1990 (cSch); 2 ♀, "Gissaar: Karatag. (stgr.) E. Willberg" (ZIN); 5 ♂, 1 ♀, Dushanbe, Charangon River, 03.VI.1934, V.V. Gussakovky leg. (ZIN); 1 ♂, Dushanbe, foothills, 16.V.1963, A.V.Bogachev leg. (ZMMU); 1 ♂, "Prov. Kuliab, Aksou-Tal, F.Hauser 1898/ Gift from Nat. Mus. Praha. 2009" (ZMMU); 1 ♀, Schugnan, Sardym, Gunt River, 16.VII.1897, A. Kaznakov leg. (ZIN); **Uzbekistan or Tajikistan**: 1 ♂, "Buchara./ Staudinger./ 825./ boops/ Quedius (Raphirus) acuminatus" (ZMMU); 1 ♂, "Putchin Pass Glasunov 1892" (ZIN).

Comments on taxonomy, lectotype designation and new synonymy. In the original description of *Q. hauseri*, Bernhauer (1918) did not specify the type material but he mentioned localities "Baldschuan [Baljuvon], 924 m, Sary-pul, 1482 m" [Tadjikistan: Karateghin Mts.] (Fig.19E) and "Ost-Buchara: Tschitschantan, Karatag und Repetek, vor." [Tadjikistan: Vorukh jamoat, according to Frisch 2015] where his material came from. Also it is clear from the original description that he studied both sexes. All this suggests multiple syntypes. Bernhauer (1918) compared *Q. hauseri* with *Q. boops* and *Q. acuminatus*. Wüsthoff (1938) illustrated the structure of the aedeagus for *Q. hauseri* for the first time based on some material "aus Buchara" [from Buchara]. Next, the aedeagus for *Q. hauseri* was illustrated by Coiffait (1978), also based on some non-type material.

We were able to study a male specimen from the FMNH (for details see above) which is clearly a syntype and which we designate as the lectotype to fix the identity of that species. Our examination of the type specimen of *Q. hauseri* confirms the correct identification of this species by both Wüsthoff (1938) and Coiffait (1978).

In the same paper, Bernhauer (1918) described *Quedius peneckei* as a brachypterous variation of *Q. hauseri* from 'Tien-Shan, Przewalsk, Karakoltal' [now Karakol, Issyk-Kul region, Kyrgyzstan], also not specifying either a number or sex of the material he studied. He only stated that *Q. peneckei* was similar to *Q. fulvicollis* from which it could be distinguished by the elongate pronotum and more densely punctured abdomen. Gridelli (1924) and Coiffait (1978) also considered *Q. peneckei* as a variation of *Q. hauseri*. Of them, Gridelli (1924) stated that he had studied the type material but without details on sex or number of specimens. In catalogs *Q. peneckei* is given as a variation (Scheerpeltz, 1933; Hermann, 2001) or synonym (Schülke & Smetana, 2015) of *Q. hauseri*. There was not a single illustration of *Q. peneckei* ever published. We were able to study one female specimen from the FMNH which is clearly a syntype of *Q. peneckei*. It is conspecific with *Q. hauseri* and does not look to be distinctly brachypterous. Based on that and the fact that there is only one species of this type in Middle Asia,

Figure 22. *Quedius hauseri*, distribution and variability of the paramere (as an example specimens from one locality, indicated by black dot). Scale bar: 1 mm.

which is rather common and widespread (Fig. 22), we place *Q. peneckei* in synonymy with *Q. hauseri*.

Coiffait (1969) described *Q. ouzbekiscus* from Uzbekistan based on the male holotype (Fig. 21) and 40 paratypes (4 males and 36 females). He considered it similar to the species from the *boops*-group and stated that *Q. ouzbekiscus* can be distinguished from other members of the group by the structure of aedeagus and proportions of the body. Also he noticed that *Q. ouzbekiscus* is especially similar to *Q. fulvicollis*. Our examination of the type material of *Q. ouzbekiscus* reveals that this species is conspecific with *Q. hauseri* and therefore we place the former in synonymy with the latter.

Diagnosis. Head and abdomen usually black, pronotum, elytra and appendages pale-brown to brown; scutellum punctate (Figs 19A, 20A, 21A). Aedeagus (in lateral view) (Figs 19B, 21B): ventral contour of median lobe apically and basally from subapical tooth form one line, so that the tooth is protruding and median lobe apically from that does not look like an axe blade. Among all Middle Asian *Raphirus*, only *Q. hauseri* and *Q. fulvicollis* (see below) have the punctate scutellum. *Quedius hauseri* differs from *Q. fulvicollis* by the shape of the paramere (Figs 19C, 21C, 23C, respectively).

Distribution. *Quedius hauseri* is common and widely distributed in Middle Asia where it occurs from south-

eastern Kazakstan (southern border through Dzhungaskiy Alatau) to southern Tajikistan (Pamir Mountains, Schugnan) (Fig. 22). It was also recorded from Afganistan (Schülke and Smetana, 2015).

Bionomics. Based on the material examined here *Q. hauseri* usually inhabits various humid ground based plant debris or moss near water bodies. It occurs both in forested and open habitats. It also can be found under stones, bark and in dung, mostly at the medium to high elevations up to 3300 m.

Quedius (*Raphirus*) *fulvicollis* Stephens, 1833

Fig. 23

Quedius fulvicollis: Herman 2001, 3159 (summary of literature); Assing and Schülke 2012, 481, 482 (diagnosis, distribution and bionomics, aedeagus illustration); Klimenko 1960, 121 (distribution records)

Material examined. One of the male paratypes of *Q. ouzbekiscus* (new synonym of *Q. hauseri*, see above), for details see material examined for *Q. hauseri* and Fig. 23

Comments on taxonomy, distribution and bionomics. One of the male paratypes of *Q. ouzbekiscus* (new synonym of *Q. hauseri*) was in fact a different species that we tentatively identify as *Q. fulvicollis*. It can be easily distinguished from *Q. hauseri* by the shape of the paramere (compare Fig. 23C and Figs 19C, 21C, respectively). *Quedius fulvicollis* is considered a widely distributed Holarctic species, in Asia confined to Siberia and Russian Far East (Schülke and Smetana, 2015). The specimen from Chatkal Mountains in Uzbekistan examined here would be a distinct southernmost record for this species in the Palaearctic region and the first record for Middle Asia. In this respect it is noteworthy that it comes from ca. 1500 m of elevation. Also it is remarkable that this specimen from Middle Asia stands out from the variability range of *Q. fulvicollis* by the very narrow middle portion of the paramere and shorter and more irregular rows of peg setae. It well may be that our specimen represents a species new to science. Given the poorly studied variation of *Q. fulvicollis*, which itself maybe a complex of species and very limited material from Middle Asia, a decision on this matter is pending further study.

In general *Q. fulvicollis* prefers forest landscapes and usually can be found in wet ground-based debris, at banks of ponds, forest lakes and in swampy areas. Apart from the elevation, no bionomic data is available for the Middle Asian specimen. An earlier record of *Q. fulvicollis* from Tajikistan in Klimenko (1996) was based on uncertain material and needs verification.

Quedius (*Raphirus*) *scintillans* Gravenhorst, 1806

Fig. 4A

Quedius scintillans: Herman 2001, 3260 (summary of literature); Assing and Schülke 2012, 471, 473 (diagnosis, distribution and bionomics, aedeagus illustration)

Material examined.

Additional material. Kazakhstan: 3 ♂, Karatau Mts, 660 m a.s.l., 42°53’41.42N, 70°42’56.6E, 11.VII.2010, V.A. Kastcheev leg. (ZIN); **Uzbekistan**: 1 ♂, Chatkal Nature Reserve, bank of small rill, wet ground, *Poaceae* gen. sp., *Equisetum* sp., moss, 19.IX.1983, K.Yu. Eskov leg. (cRyv); 1 ♂, Golodnaya Step [Sirdaryo Reg., Guliston], 17.V.1903, G.G. Jacobson (ZIN); 1 ♂, “Trkst. Mnt. Nurata UCHUN Glasunov 1892” (ZIN); 1 ♂, Samarkand Reg., Kattakurgan, 18.V.1932, V.V. Gussakovsky leg. (ZIN); 1 ♂, Aman Kutan, shady wet say, near forestry building, 31.V.1942, K.V. Arnoldi leg. (ZMMU); 2 ♂, Qashqadaryo Reg., Kitab, 30.VII.1933, V.V. Gussakovsky leg. (ZIN); **Turkmenistan:** 1 ♂, Kov-Ata [Bacharden] 110 km NW Ashchabad, 10.V.1989, D.W. Wrase leg. (cSch); 2 ♂, 5 ♂, N Kopetdag, Firjusa-Cleft, near Ashchabad, 07.V.1989, D.W. Wrase leg. (cSch); 1 ♂, Kugitangtau Mts, near Svintsovyi Rudnik, 1300 m a.s.l., under stones, 11.V.1984, A.V. Tanasevitch leg. (cRyv); **Tajikistan**: 3 ♂, Warsobob, 03.VI.1988, S.V. Saluk leg. (cRyv); 1 ♂, Dushabe, Kharangon River, 03.VI.1934, V.V. Gussakovsky leg. (ZIN); 2 ♂, 15 km SE Shaahrtuz, Tuyntau Mt., 02–03.VI.1982, G.S. Medvedev

Figure 23. *Quedius 'fulvicollis'* (specimen from Uzbekistan). **A,** habitus. **B,** median lobe, lateral view; **C,** paramere, underside. Scale bars: **A** = 1 mm; **B, C** = 0.2 mm.

leg. (ZIN); 4 ♂, 1 ♀, Pyandj District, in hay, 28.IV.1988, S.V. Saluk leg. (cRyv); **Uzbekistan or Tajikistan:** 2 ♂, "Uzbekistan Buchara./ Staudinger. 823." (ZMMU).

Comments on taxonomy, distribution and bionomics. *Quedius scintillans* is widely distributed in Europe, Western and Middle Asia, and its diagnostic characters, distribution and biology were recently summarized in Assing and Schülke (2012). In Middle Asia, from the newly examined material here, the species is recorded in southern and eastern Turkmenistan and southwestern Tajikistan for the first time.

From all Middle Asian *Raphirus* species it can be easily distinguished by the presence of two additional punctures between anterior frontal punctures on the head.

Quedius scintillans prefers various wet ground-based debris mostly in lowland forests or open landscapes. In the mountains it can be found up to 1300 m elevation.

Discussion

This revision is the first focused summary on *Quedius* of Middle Asia. It clarifies the taxonomy of many poorly or very poorly known species such as *Q.* (s. str.) *subunicolor*, *Q.* (*M.*) *capitalis*, *Q.* (*M.*) *fusicornis*, *Q.* (*M.*) *solskyi* and *Q.* (*R.*) *cohaesus*, and it records from Middle Asia a few widely distributed species such as *Q.* (s. str.) *fuliginosus*, *Q.* (s. str.) *sundukovi* and *Q.* (*R.*) *pseudonigriceps* for the first time. It shows how confusing and incomplete the taxonomy was of the species that constitute the core of this fauna. In the course of this revision (including Salnitska and Solodovnikov 2018) the rate of new species dicovery was negligible compared to the rate of revealed misidentifications and synonymies. Many "endemic" species described from various regions of Middle Asia, mainly by H. Coiffait, turned out to be synonyms of the species described from this region at the border between XIX and XX centuries (Table 1). These species, with the newly examined material, expectedly turned out to be more widespread than they were previously thought. Several species, especially in the subgenus *Microsaurus*, remain very poorly known (e.g., *Q.* (*M.*) *bucharensis*, *Q.* (*M.*) *fusicornis*, *Q.* (*M.*) *solskyi*, *Q.* (*M.*) *koltzei* and *Q.* (*M.*) *tajikiscus*). Here they are represented by fragmentary, poorly georeferenced type material (often females only) and, at most, a few additional specimens. For *Q.* (s. str.) *subunicolor* and *Q.* (s. str.) *sundukovi* and *Q.* (*M.*) *koltzei*, new distributional records from Middle Asia change our idea of their distribution patterns and calls for their more thorough exploration. In general this revision made it obvious that, apart from a handful of species such as *Q.* (s. str.) *fuliginosus*, *Q.* (s. str.) *vicinus*, *Q.* (*M.*) *ochripennis*, *Q.* (*R.*) *hauseri*, *Q.* (*R.*) *imitator*, *Q.* (*R.*) *limbatus*, *Q.* (*R.*) *novus*, *Q.* (*R.*) *pseudonigriceps* and *Q.* (*R.*) *scintillans*, well represented in the examined material, the Middle Asian species are known from very scarce sampling. Because Middle Asia is mainly a warm and arid region that is not well suited to such a distinctly temperate and mesophilous genus, the fauna of *Quedius* is relatively poor. For example, the *Quedius* fauna of Denmark, a much smaller, geographically uniform and flat area, contains 41 species (http://danbiller.dk) as opposed to 28 species recorded from Middle Asia. It is not expected that the Middle Asian *Quedius* fauna will significantly grow with more explorations. But some increase of this number is likely, due to widespread species to be found there and new species for science to be discovered, especially from the mountain areas of Middle Asia. We hope that our work will encourage further field exploration of this diverse region by using collecting techniques targeting Staphylinidae, especially sifting.

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