

Taxonomic and nomenclatural notes on *Orchestes testaceus* (MÜLLER) and *O. calceatus* (GERMAR) (Coleoptera: Curculionidae: Curculioninae)

M. KOŠTÁL & R. CALDARA

Abstract

Neotypes of two closely related species of Curculionidae (Curculioninae), *Orchestes testaceus* (MÜLLER, 1776) and *O. calceatus* (GERMAR, 1821), and their synonymous taxa, *O. rufus* (MÜLLER, 1776), *O. scutellaris* (FABRICIUS, 1801), *O. albopilosus* (REICHE, 1864) and *O. atratus* (PRELLER, 1867), are designated. The following new synonymies are established: *O. calceatus* (GERMAR, 1821) (= *O. semirufus* GYLLENHAL, 1827 syn.n.; = *O. pubescens* GYLLENHAL, 1835 syn.n.; = *O. quinque-maculatus* CHEVROLAT, 1867 syn.n.). The following synonymies are confirmed: *O. testaceus* (MÜLLER, 1776) (= *O. rufus* (MÜLLER, 1776); = *O. scutellaris* (FABRICIUS, 1801); = *O. carnifex* (GERMAR, 1821); = *O. suturalis* ZETTERSTEDT, 1840; = *O. albopilosus* (REICHE, 1864); = *O. oenipontanus* (GREDLER, 1866); = *O. atratus* (PRELLER, 1867); = *O. montanus* CHEVROLAT, 1874). A detailed taxonomic outline including differential diagnosis of both species is given and data on their biology and distribution are summarized.

Key words: Coleoptera, Curculionidae, Curculioninae, *Orchestes*, taxonomy, biology.

Introduction

The taxonomy of *Orchestes testaceus* (MÜLLER, 1776) and *O. calceatus* (GERMAR, 1821) has been treated quite conversely in the last 50 years. For instance, HOFFMANN (1950) treated *O. calceatus* (sub *O. semirufus* GYLLENHAL, 1827) as a subspecies of *testaceus* (sub *O. alni* (LINNAEUS)). VIRAMO (1970b) considered *O. testaceus* and *O. calceatus* as two distinct species, the latter with two subspecies (*O. calceatus calceatus* and *O. c. semirufus*). Although ANDERSON (1989) synonymized *O. testaceus* and *O. calceatus* again in his revision of the North American Rhamphini (sub Rhynchaeninae), all European authors followed Viramo's conclusion. However, according to ANDERSON (1989), the types of these species are no longer available and neotypes have never been designated. Therefore the question of what these two taxa really are remained open until today. The same is true for the numerous synonyms hitherto assigned to *O. testaceus* resp. *O. calceatus*.

In order to resolve this problem, the aim of this paper was to verify the taxonomy of these two species and their supposed synonyms based on study of the available type specimens. When these are not available, in accordance with the provisions of Article 75 of the Code (ICZN 1999), we designate neotypes as appropriate.

Interpretations of available names (in chronological order)

Curculio testaceus MÜLLER, 1776

Curculio testaceus MÜLLER 1776: 90.

The taxonomy of this species, which was described from Denmark and Norway, was widely discussed by VIRAMO (1970a, b) and ANDERSON (1989). A neotype is here designated because of the need to fix the taxonomic status of this species. The types are known to be lost, as reported by VIRAMO (1970a). The neotype was selected from the general collection of the Zoological Museum Copenhagen, a perfectly preserved yellowish-brown male of *Orchestes testaceus* as

currently understood collected in Denmark. A diagnosis of the species is given in 'Part B' below. This male is 3.03 mm long, fully corresponds to the original description of *Curculio testaceus*. It is labelled as follows: "Lolland Maltrup skov 16-8-1987 H.Hendriksen / Michael Košťál reprep. 2012 / NEOTYPUS *Curculio testaceus* Müller M.Košťál et R.Caldara des. 2012" and is deposited in the collection of the Zoological Museum Copenhagen, Denmark.

***Curculio rufus* MÜLLER, 1776**

Curculio rufus MÜLLER 1776: 90.

This taxon was described based on specimens from Denmark and Norway. As with the previous species, the type material is known to be lost, and a neotype is here designated because of the need to clarify the taxonomic status of this taxon. As with *C. testaceus*, the neotype was selected from the general collection of the Zoological Museum Copenhagen; we selected a perfectly preserved red-brown male of *Orchestes testaceus* as currently understood collected in Denmark, from the general collection of the Zoological Museum Copenhagen. This male is 3.03 mm long, fully corresponds to the original description of *Curculio rufus*. The neotype is labelled as follows: "Sjælland Løgtved grusgrav 1-5-1989 H.Hendriksen / Michael Košťál reprep. 2012 / NEOTYPUS *Curculio rufus* Müller M.Košťál et R.Caldara des. 2012 / *Orchestes testaceus* (Müller) Michael Košťál det. 2012" and is deposited in the collection of the Zoological Museum Copenhagen, Denmark.

***Rhynchaenus scutellaris* FABRICIUS, 1801**

Rhynchaenus scutellaris FABRICIUS 1801: 495.

This taxon was described based on specimens from Germany. In the Fabricius collection (Zoological Museum Copenhagen, Denmark), it was not possible to find syntypes of *Rhynchaenus scutellaris* in either part of the Fabricius collection. In the original description Fabricius reported that the type is deposited in "Mus D. Lund", i.e. in the no longer available collection of the 18th century Norwegian scientist Niels Tønder Lund.

Therefore, a neotype is here designated because of the need to clarify the taxonomic status of this taxon. We decided to designate a specimen of *Orchestes testaceus* (MÜLLER) from Germany kindly provided for us by J. Rheinheimer as neotype of *Rhynchaenus scutellaris*. It is a perfectly preserved male with dissected genitalia, 3.30 mm long, corresponding to the original description of *Rhynchaenus scutellaris* Fabricius, 1801. The neotype is labelled as follows: "Bracht b. Marburg 24.8.1985 / *Rhynchaenus testaceus* / ex coll. Rheinheimer / NEOTYPUS *Rhynchaenus scutellaris* Fabricius M.Košťál & R.Caldara des. 2013 / *Orchestes testaceus* (Müller) Michael Košťál det. 2013". It is deposited in the collection of the Zoological Museum Copenhagen, Denmark.

***Salius calceatus* GERMAR, 1821**

Salius calceatus GERMAR 1821: 334.

In Germar's collection (Zoologische Sammlung, Martin-Luther-Universität Halle-Wittenberg, Halle), it was not possible to find syntypes of *Salius calceatus*. Therefore, a neotype is here designated because of the need to clarify the taxonomic status of this taxon. We decided to designate a typically black coloured specimen from Poland, as there is no patria reported in the original description. This is a perfectly preserved male with dissected genitalia, 2.93 mm long, corresponding to the original description of *Salius calceatus* GERMAR, 1821. The neotype is labelled as follows: "Polen: Krakau Smreczynski leg. / *calceatus* Germ. Dieckmann det. / coll. Dieckmann DEI Eberswalde / NEOTYPUS *Salius calceatus* Germar M.Košťál & R.Caldara des. 2013 / *Orchestes calceatus* (Germar) Michael Košťál det. 2013". It is deposited in the collection of the Deutsches Entomologisches Institut, Müncheberg, Germany.

Salius carnifex* GERMAR, 1821Salius carnifex* GERMAR 1821: 329.

In Germar's collection (Zoologische Sammlung, Martin-Luther-Universität Halle-Wittenberg, Halle, Germany), under the name "carnifex" there is one heavily damaged specimen with missing right anterior leg, left medial tibia, right medial and posterior tarsi and one antenna. We remounted this pinned specimen and revealed that it is a female of *Orchestes testaceus*. The specimen was designated in 1965 by Dieckmann as lectotype of "Rhynchaenus carnifex Germ.". As this designation was never published, we here designate this specimen as the lectotype of *Salius carnifex*. The specimen is about 3.0 mm long (due to damage no accurate measurement was possible), bears a small red square on its pin and is labelled as follows: "LECTOTYPUS Rhynchaenus carnifex Germ. Design. Dieckmann 1965 / R. alni L. a. carnifex Germ. Dieckmann det. 1965 / MLU Halle WB Zoologie S.-Nr. 9|2|14 / LECTOTYPUS Salius carnifex Germar M. Košťál des. 2013 / *Orchestes testaceus* (Müller) Michael Košťál det. 2013". It is deposited in the Zoologische Sammlung, Halle, Germany.

Orchestes semirufus* GYLLENHAL, 1827Orchestes semirufus* GYLLENHAL 1827: 597.

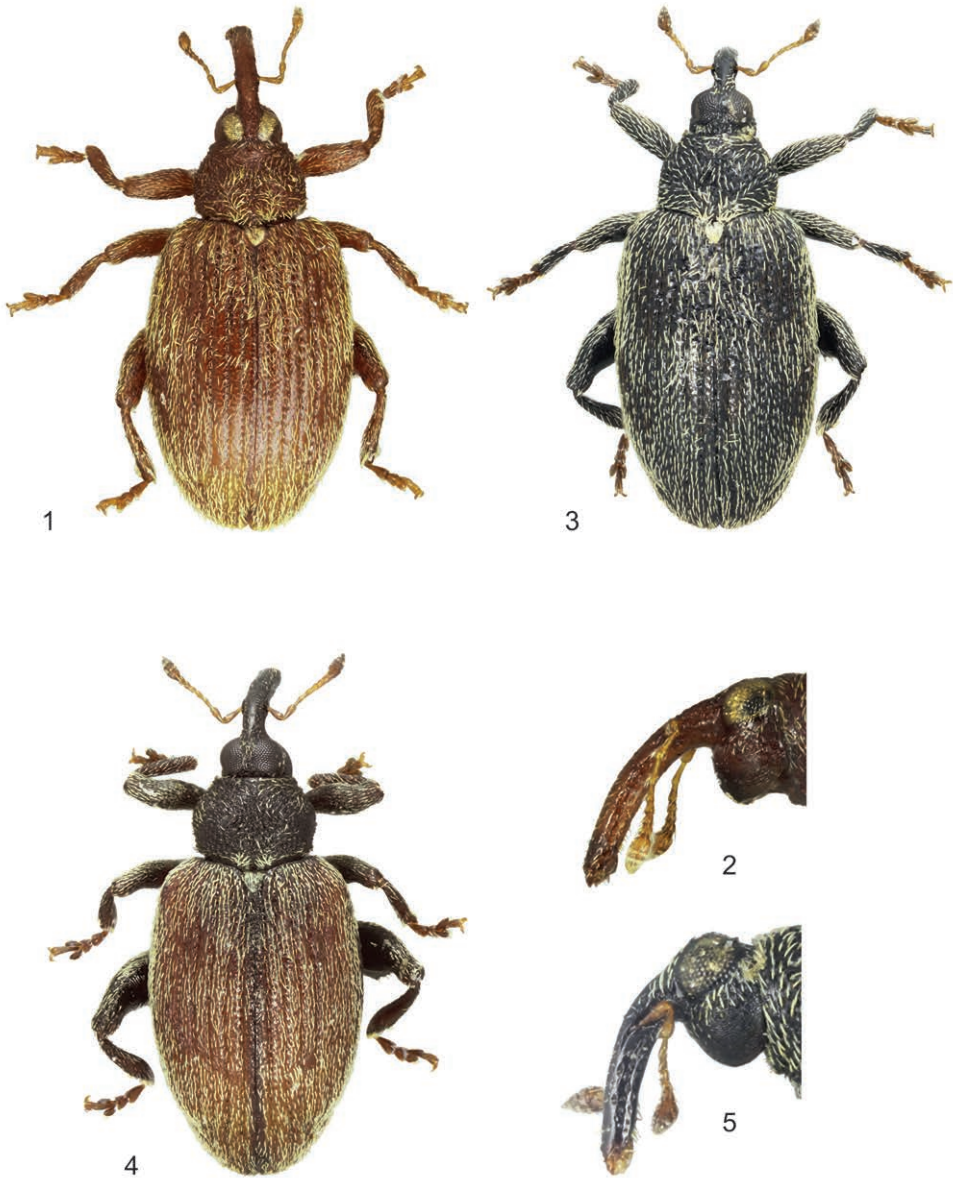
This species was described based on specimens collected in Sweden. In Schoenherr's collection (Naturhistoriska Riksmuseet Stockholm, Sweden), there is one well-preserved specimen, apparently a male, under the name "*Orchestes semirufus* Gyll." labelled "*Orchestes rufipennis*... / 99 68" which we here designate as lectotype. This specimen belongs to *O. calceatus*, is 3.12 mm long, and labelled as above plus "LECTOTYPUS *Orchestes semirufus* Gyllenhal M. Košťál des. 2012 / *Orchestes calceatus* (Germar) Michael Košťál det. 2012".

Orchestes pubescens* GYLLENHAL, 1835Orchestes pubescens* GYLLENHAL 1835: 495.

This species was described based on specimens from Sweden, Germany and England. In the collection of Schoenherr (Naturhistoriska Riksmuseet Stockholm, Sweden), under the label "13 Pubescens Schh. Gyll. pilosus. 11.", there are two males and one female. All three formerly pinned specimens were remounted and the males also dissected. All of them belong to *O. calceatus* colour form "semirufus". Only one specimen, a male, bears a locality label. We here designate this male as the lectotype of *Orchestes pubescens*. The lectotype is 3.10 mm long, heavily damaged with pin-perforated right elytron, missing left anterior leg and left antenna except scapus. It is labelled: "V: Gothia / LECTOTYPUS *Orchestes pubescens* Gyllenhal M. Košťál et R. Caldara des. 2013 / *Orchestes calceatus* (Germar) Michael Košťál det. 2013". The other two specimens were excluded from the syntype series as they are without labels and hence there is no indication that they belong to the type series.

Orchestes suturalis* ZETTERSTEDT, 1840Orchestes suturalis* ZETTERSTEDT 1840: 184.

Zetterstedt described this species from Swedish Lapponia. In Zetterstedt's collection (Museum Lund, Sweden), there is a single specimen under this name. It is a pinned female with a small black square on the pin. We here designate this specimen, which belongs to *Orchestes testaceus* (MÜLLER), as lectotype of *Orchestes suturalis* ZETTERSTEDT. The lectotype is 3.37 mm long, completely preserved and labelled "O. suturalis . ♀ . / 1970 37 / LECTOTYPUS *Orchestes suturalis* Zetterstedt M. Košťál et R. Caldara des. 2013 / *Orchestes testaceus* (Müller) Michael Košťál det. 2013".



Figs. 1–2: *Orchestes testaceus*, female, 1) body in dorsal view, 2) rostrum and head in lateral view. Not at the same scale.

Figs. 3–5: *Orchestes calceatus*, female, 3) body in dorsal view, 4) colour form “*semirufus*” in dorsal view, 5) rostrum and head in lateral view. Not at the same scale.

Rhynchaenus albopilosus* REICHE, 1864Rhynchaenus albopilosus* REICHE 1864: 248.

This taxon was described from the French department Hautes-Alpes. As the type material from Reiche's collection is known to be lost or destroyed (QUENTIN & VILLIERS 1983), a neotype is here designated because of the need to clarify the taxonomic status of this taxon. As there were no specimens of *O. testaceus* from Hautes-Alpes available to the authors, we decided, following Article 75.3.6 of ICZN (1999) to designate as neotype a completely preserved male from Wallis, which is only about 100 km from Haute-Alpes. Its genitalia were dissected. The neotype is 3.10 mm long, corresponding to the original description of *Rhynchaenus albopilosus* REICHE, 1864 and is labelled as follows: "Wallis / coll. Stierlin / NEOTYPUS *Rhynchaenus albopilosus* Reiche M.Košťál et R.Caldara des. 2013 / *Orchestes testaceus* (Müller) Michael Košťál det. 2013". It is deposited in the collection of the Deutsches Entomologisches Institut, Müncheberg, Germany.

Rhynchaenus oenipontanus* GREDLER, 1866Rhynchaenus oenipontanus* GREDLER 1866: 353.

This species was described from Tyrol. As a part of Gredler's collection (Franciscan Gymnasium, Bolzano) is known to be destroyed (M. Kahlen pers. comm.) and syntypes of this taxon are missing there (R. Caldara pers. obs.), a neotype is here designated because of the need to clarify the taxonomic status of this taxon. We selected a completely preserved male from South Tyrol, Italy, where Gredler operated, dissected its genitalia and designate it herewith as neotype. The neotype is 3.23 mm long, corresponding to the original description of *Rhynchaenus oenipontanus* and is labelled as follows: "Italien / Südtirol / Latsch / Vinschgau 20.6.87 Messutat / *R. testaceus atratulus* Prell. Dieckmann det. / coll. Dieckmann DEI Eberswalde / NEOTYPUS *Rhynchaenus oenipontanus* Gredler M.Košťál et R.Caldara des. 2013 / *Orchestes testaceus* (Müller) Michael Košťál det. 2013". It is deposited in the collection of the Deutsches Entomologisches Institut, Müncheberg, Germany.

Rhynchaenus atratus* PRELLER, 1867Rhynchaenus atratus* PRELLER 1867: 211.

Since in 1943 Preller's collection was completely destroyed (WEIDNER 1976), there is no type material of this taxon available. Therefore, a neotype is here designated because of the need to clarify the taxonomic status of this taxon. We selected a nearly completely preserved historical dark brown male of *O. testaceus* with missing left median last tarsal segment, collected in Hamburg (Germany), dissected its genitalia and designate it herewith as neotype of *Rhynchaenus atratus*. The neotype is 3.17 mm long, corresponding as closely as possible to the original description of *R. atratus* and is labelled as follows: "Hamburg / coll. Letzner / v. *atratus* Preller / Dtsch. Ent. Inst. Eberswalde / NEOTYPUS *Rhynchaenus atratus* Preller M.Košťál et R.Caldara des. 2013 / *Orchestes testaceus* (Müller) Michael Košťál det. 2013". It is deposited in the collection of the Deutsches Entomologisches Institut, Müncheberg, Germany.

Orchestes quinquemaculatus* CHEVROLAT, 1867Orchestes quinquemaculatus* CHEVROLAT 1867: lxvi.

This taxon was described based on specimens collected on birch leaves in France (Mayenne). In the same box as *O. montanus*, above the label "*Orchestes quinquemaculatus* [Chvr.]", there are 6 specimens, each pair of specimens on one pin. One pair is without any label, the second pair with the label "semirufus Gyll." and the last pair bears the labels "21" "Typus" and "O.5punctatus...". We decided to consider only the two last specimens as syntypes and therefore here designate the female from this pair (because it is relatively well preserved) as lectotype of *Orchestes quinquemaculatus* CHEVROLAT. It is 3.07 mm long, resting in glue, and labelled as above plus "LECTOTYPUS *Orchestes quinquemaculatus* Chevrolat M.Košťál des. 2012 / *Orchestes*

calceatus (Germar) Michael Košťál det. 2012". The male bears the label "PARALECTOTYPUS". All six specimens belong to *Orchestes calceatus*, specifically to the colour form identical with the *Orchestes semirufus* phenotype.

***Orchestes montanus* CHEVROLAT, 1874**

Orchestes montanus CHEVROLAT 1874: xxx.

Chevrolat described this taxon based on specimens from Monte Rosa (Piedmont, Northern Italy). In the Naturhistoriska Riksmuseet Stockholm, in Chevrolat's collection above the label "Orchestes montanus Chvr", there are two specimens: a male which is resting in glue and bears the label "Typus" and a female bearing the label "Paratypus". We here designate the male as lectotype and the female as paralectotype of *Orchestes montanus*. The lectotype is 3.30 mm long, sufficiently preserved and now also labelled "LECTOTYPUS *Orchestes montanus* Chevrolat M.Košťál des. 2012 / *Orchestes testaceus* (Müller) Michael Košťál det. 2012". The female is labelled the same as the lectotype except for "PARALECTOTYPUS". Both specimens belong to *Orchestes testaceus*.

***Orchestes canus* HORN, 1878**

Orchestes canus HORN 1878: 620.

The type locality of this species is Isle Royale (Michigan, USA) based on the lectotype designated by ANDERSON (1989), who synonymized it with *O. testaceus*.

***Orchestes pallicornis pallidior* LENG, 1916**

Orchestes pallicornis pallidior LENG 1916: 281.

Orchestes pallidior LENG; BROWN 1930: 245.

This taxon was described from the Avalon Peninsula (Canada) and considered as a separate species by BROWN (1930). Subsequently it was synonymized with *O. testaceus* by ANDERSON (1989).

Taxonomy

The study of the various type specimens as detailed above allows the following main conclusions:

1. *Orchestes calceatus* is a valid species different from *O. testaceus*.
2. *Orchestes semirufus* is synonymous with *O. calceatus*.

***Orchestes testaceus* (MÜLLER, 1776)**

= *Orchestes rufus* (MÜLLER, 1776)

= *Orchestes scutellaris* (FABRICIUS, 1801)

= *Orchestes carnifex* (GERMAR, 1821)

= *Orchestes suturalis* ZETTERSTEDT, 1840

= *Orchestes albopilosus* (REICHE, 1864)

= *Orchestes oenipontanus* (GREDLER, 1866)

= *Orchestes atratus* (PRELLER, 1867)

= *Orchestes montanus* CHEVROLAT, 1874

Diagnosis: Habitus as in Fig. 1. Whitish densely setose scutellum, incrassated hind femora, 6-articulated antennal funicle, frons between eyes markedly wider than end of antennal scapus, prothorax reddish brown to brown-black, rostrum in lateral view (Fig. 2) gradually curved, in dorsal view in its basal part (between frons and antennal insertion) only feebly narrowed, at antennal insertion with only slightly prominent lower margin of antennal furrow.

Remarks: *O. testaceus* is on average slightly larger (2.7–3.6 mm) than *O. calceatus*. The integument varies from reddish brown to dark brown or brown-black, but the mesoventrite, metaventrite, epimera and major parts of abdomen are always black. The darker colour appears more frequently on elytra, which are covered by pale setae longer on interspaces than in striae. Sometimes the setae on the dark parts of elytra are black and are often arranged with unequal density forming feebly visible, oblique convergent bands or more or less dense patches. The sexual dimorphism of the rostrum is markedly variable, in most cases the antennal insertion in males is at the end of the proximal 1/3 and in females at the end of the proximal 1/4 of the rostrum. The median lobe of the penis is lance-like, moderately tipped at the apex.

Distribution: Whole Europe, Transcaucasus, northern and north-eastern Asia and North America. The record from Algeria (VIRAMO 1970b) requires confirmation.

Biological notes: This species is oligophagous on alder. The first author collected many specimens in Germany and Slovakia on *Alnus glutinosa* (L.) GAERTNER. SCHERF (1964) and SMRECZYŃSKI (1976) reported also *A. incana* (L.) MOENCH as a host plant. The detailed morphology of larval instars as well as of egg and pupa was given by VIRAMO (1975).

***Orchestes calceatus* (GERMAR, 1821)**

= *Orchestes semirufus* GYLLENHAL, 1827 **syn.n.**

= *Orchestes pubescens* GYLLENHAL, 1835 **syn.n.**

= *Orchestes quinquemaculatus* CHEVROLAT, 1867 **syn.n.**

Diagnosis: Habitus as in Figs. 3–4. Whitish densely setose scutellum, incrassated hind femora, 6-articulated antennal funicle, frons between eyes markedly wider than end of antennal scapus, prothorax always black, rostrum in lateral view (Fig. 5) abruptly curved at antennal insertion, in dorsal view in its basal part (between frons and antennal insertion) markedly narrowed, at antennal insertion with clearly prominent lower margin of antennal furrow.

Remarks: *Orchestes calceatus* is a little bit smaller (2.3–3.3 mm) on average than *O. testaceus*. The integument of the whole body is dark brown to black except for a colour form described as *O. semirufus*, which is characterized by brown to reddish-brown elytra. Based on specimens collected in Ireland, MORRIS (1997) reported a wide variation of elytral coloration from entirely red to completely black. The elytra are covered with pale setae longer on interspaces than in striae. The setae on elytra are regularly arranged, but often with two areas in the proximal elytral half and one perisutural area in the distal half more sparsely setose. The setae in these areas, especially in the black form, are often brown to reddish. The penis and the sexual dimorphism of the rostrum are similar to *O. testaceus*.

Distribution: North, West, Central and East Europe. Records from Sardinia, continental Greece (VIRAMO 1970b) as well as from northern Iran (LEGALOV et al. 2010) require confirmation. It is noteworthy that the completely black specimens are more common in the north-eastern area of its distribution, while specimens with reddish elytra tend to occur in Central and north-western Europe, although exceptions exist as reported by MORRIS (1997).

Biological notes: This species is apparently closely associated with *Betula pubescens* EHRHART (MORRIS 1997, RHEINHEIMER & HASSLER 2010). SMRECZYŃSKI (1976) also reported it from *B. pendula* ROTH and *B. nana* L. *Orchestes calceatus* particularly inhabits moors and bogs, which support its association with *B. pubescens*, which is also characteristic of such habitats. However, the species is also rarely found in drier habitats. This suggests the possibility that it can use other birch species as its host plants. DEDYUKHIN (2010) collected two specimens of *O. calceatus* on *B. pendula* in Udmurtia in late April and early July.

Orchestes testaceus and *O. calceatus* can be separated as follows:

- Rostrum in lateral view gradually curved (Fig. 2), in dorsal view not or very slightly narrowed in its basal part between frons and antennal insertion (Fig. 1). Lower margin of antennal furrow at antennal insertion only slightly projecting from the rostrum outline. Whole body mostly brown to reddish, sometimes darker, very rarely dark brown *testaceus*
- Rostrum in lateral view abruptly curved at antennal insertion (Fig. 5), in dorsal view markedly narrowed in its basal part between frons and antennal insertion (Figs. 3–4). Lower margin of antennal furrow at antennal insertion projecting considerably (lobe-like) from the rostrum outline. Body, femora and tibiae mostly black to brown-black, elytra sometimes brown to reddish brown *calceatus*

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Dr. Michael KOŠTÁL
Kotlanova 1A, CZ – 628 00 Brno, Czech Republic (michael.kostal@iol.cz)

Dr. Roberto CALDARA
Via Lorenteggio 37, I – 20146 Milano, Italy (roberto.caldara@gmail.com)

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Buchbesprechung

RÖSSNER, E. 2012: Die Hirschkäfer und Blatthornkäfer Ostdeutschlands (Coleoptera: Scarabaeoidea). – Erfurt: Verein der Freunde & Förderer des Naturkundemuseums Erfurt e.V., 508 pp.

Das umfangreiche Werk lässt einfach nichts vermissen. Alles Wissen, das in irgendeinem Zusammenhang mit der ostdeutschen Scarabaeoidea-Fauna steht wurde in mühevoller Kleinarbeit zusammengetragen und wohlgeordnet zu Papier gebracht.

Der allgemeine Teil widmet sich ausführlich den geophysikalischen Gegebenheiten des betreffenden Gebietes sowie der Erforschungsgeschichte. Im systematischen Teil wird jede Art ausführlich besprochen und zwar hinsichtlich Verbreitung, Ökologie und Gefährdung. Der Umfang der aufgelisteten Funddaten lässt vermuten, dass jede verfügbare Quelle (Sammlungen, Literatur) zur Datenerhebung berücksichtigt wurde. Zusätzlich ist jedes einzelne Art-Kapitel mit hervorragendem Habitusfoto, Verbreitungskarte, grafischer Darstellung der Phänologie und zuweilen sogar des Entwicklungszyklus vervollständigt. Im Anhang wird noch der Versuch unternommen, das Ergebnis dieser faunistischen Zusammenfassung statistisch auszuwerten.

Die Veröffentlichung von „Prachtbänden“, auch für die Behandlung kleinerer geografischer Einheiten, ist in den vergangenen 10–15 Jahren offensichtlich Mode geworden. Was manchmal als „über das Ziel geschossen“ anmutet, trifft bei vorliegendem Buch keineswegs zu. Der immense Arbeitsaufwand der hinter solch einem Werk steht, um es in diese makellose Form zu bringen, verdient und rechtfertigt eine würdige Präsentation und das ist mit diesem Buch zweifelsohne gelungen.

H. SCHILLHAMMER