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RESEARCH ARTICLE

First record of the genus *Colopterus* (Coleoptera: Nitidulidae) from Estonia and the designation of a neotype of *C. truncatus*

Первая находка рода *Colopterus* (Coleoptera: Nitidulidae) в Эстонии и обозначение неотипа *C. truncatus*

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Abstract. A sap beetle of the genus *Colopterus*, collected in the Estonian village of Vinni near the border between Estonia and the Leningrad Province, was identified as *Colopterus* sp. For fixation of the taxonomic interpretation established in the PhD thesis by L.E. Watrous without complying with the requirements of the International Code of Zoological Nomenclature, and in order to avoid probable further mistakes, a neotype for *C. truncatus* (Randall, 1838) is designated.

Резюме. Блестянка из рода *Colopterus*, собранная в эстонском поселке Винни у границы Эстонии и Ленинградской области, определена как *Colopterus* sp. Для фиксации таксономической интерпретации, установленной в диссертации Уатроуса без соблюдения требований Международного кодекса зоологической номенклатуры, и во избежание возможных ошибок в дальнейшем, обозначен неотип для *C. truncatus* (Randall, 1838).

Key words: diagnostics of species, genital characters, distribution, new record, neotype designation, sap beetles, Coleoptera, Nitidulidae, *Colopterus*

Ключевые слова: диагностика видов, признаки гениталий, распространение, новая находка, обозначение неотипа, блестянки, Coleoptera, Nitidulidae, *Colopterus*

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Introduction

The genus *Colopterus* Erichson 1842 was transferred from the subfamily Carpophilinae Erichson, 1842 to Cillaeinae Kirejtshuk et Audisio, 1986 by Kirejtshuk (1986, 2008). This genus includes some common and similar to each other “species” with the rather wide range in the Western Hemisphere. Sharp (1899) synonymised the names *C. truncatus* (Randall, 1838) and *C. infimus* (Erichson, 1843). Later Horn (1879), Grouvelle (1913) and Parsons (1943) also

recognised these synonyms and added some more junior synonyms, *C. limbatus* (LeConte, 1858), *C. obliquus* (LeConte, 1858) and *C. triangularis* (Murray, 1864), and indicated the range of this species with the mentioned five synonyms, including Canada, USA, Central and South America south to Peru and Brazil. This general outline of distribution has not been increased, and later publications repeated this list of geographical regions and countries. In 1980, Watrous defended the PhD thesis "Morphology, reclassification and cladistics of the *Colopterus* genus group (Coleoptera: Nitidulidae)", in which he summarised his long-term revision of this genus with re-examination of most of the type series. Unfortunately, these data remained unpublished and almost unknown until recently, when the thesis became available on the Internet (Watrous, 1980). This manuscript is a nearly complete revision of all species of the genus *Colopterus*, including a revision of the taxonomic interpretation of *C. truncatus* with four junior synonyms. As a result of this revision, the junior synonyms were excluded from the synonymy of *C. truncatus*, and two of them treated as valid names (see below). The present article was prepared after the unexpected finding of one of latter species in natural conditions in Europe (Republic of Estonia).

Material and methods

One of the co-authors collected an unusual sap beetle, which was studied with the standard ways of preparation, dissection and mounting of insects. The photographs of habitus were taken with a Canon EOS 40D digital camera with Canon MP-E 65 mm objective, the photographs of the aedeagus were made with a Canon EOS 40D camera connected to a LOMO Biolam S11 microscope through an NDPL-2(2X) camera adapter. Images were produced using Zerene Stacker 1.04 and Adobe Photoshop software. The specimen examined is deposited in the collection of the Estonian Museum of Natural History.

Results

Order **Coleoptera**

Family **Nitidulidae**

Subfamily **Cillaeinae**

Genus ***Colopterus*** Erichson, 1842

Subgenus ***Colopterus*** Erichson, 1842

Type species: *Nitidula rupta* Fabricius, 1801.

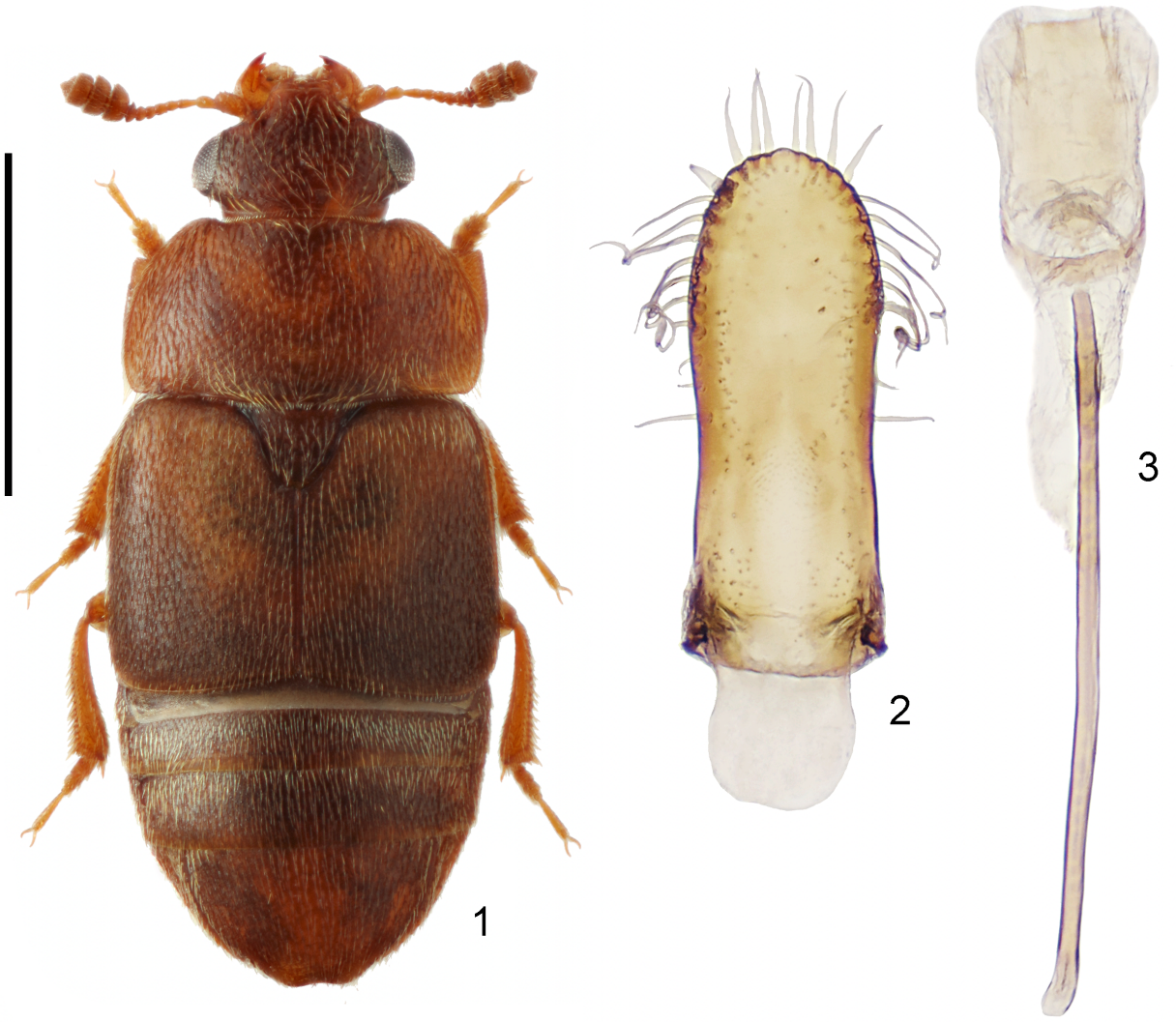
Notes. Murray (1864) divided this genus into two subgenera, based on the difference in the presence of strong sexual dimorphism in protibia (*Cyllopodes* Murray, 1864) and the absence of this dimorphism (*Colopterus* sensu stricto).

***Colopterus* sp.**
(Figs 1–3)

Material examined. 1 male, "ESTONIA, 08.05.2011, Vinni, 59°17′ / 26°25′, oakwood from grass and flowers (*Anemone nemorosa*)", U. Roosileht leg.

Notes on the specimen examined. Length 2.3, width 1.0 mm. Body light brownish, with lighter pronotum, subtriangular spot at base of elytra and appendages. Dorsal integument with fine and sparse shallow punctures, interspaces between them with fine cellular microreticulation. Pronotum about twice as wide as long, with gently sloping sides, posterior angles not projecting posteriorly and widely rounded. Penis trunk submembraneous and much shorter than weakly sclerotised tegmen.

Notes on identification. For a long time one "species" with five synonyms was regarded as *Colopterus truncatus* (see above). The very thorough examination after dissection of several thousands of specimens of this genus, including all accessible type series deposited in many collections all over the world, was fulfilled by Watrous (1980). His examination showed that it is reasonable to split this joint "species" *C. truncatus* into some species rather similar externally but with different male genital structures. In the key to species, Watrous distinguished one described species with the long sclerotised penis trunk as *C. truncatus*, while two other species ("*infimus* group") with the membraneous and short penis trunk were considered by him as (1) *C. infimus* (Erichson, 1843) [junior synonym *C. triangularis* (Murray, 1864)], charac-



Figs 1–3. *Colopterus* sp. **1**, body, dorsal view; **2**, tegmen, ventral view; **3**, penis trunk and apodeme, dorsal view. Scale bar: 1 mm (1), 0.25 mm (2 and 3).

terised by the strongly twisted proximal sclerites of the inner sac of penis, and elytra, if bicoloured, with outer apical angles dark; and (2) *C. limbatus* (LeConte, 1858) [junior synonym *C. obliquus* (LeConte, 1858)] with the flat proximal sclerites of the inner sac of penis, and elytra, if bicoloured, with a dark stripe parallel to the posterior margin. Besides, Watrous (loc. cit.) noted in the re-descriptions and showed in drawings of these species different arrangements of small setae on the ventral surface of the apical part of tegmen and some differences in the length of setae along its preapical and apical edges.

Thus, the examined specimen is definitely not *C. truncatus*, as it has a short, submembraneous penis trunk. Unfortunately, the anal sclerite with ventral plate and the apex of the inner sac of penis of the specimen from Estonia were lost during the dissection and, therefore, the features of these structures cannot be compared with the Watrous' drawings. However, because of the long setae along the preapical and apical edges of tegmen and the submembraneous short penis trunk, this specimen should be assigned to the "*infimus* group". The arrangement of the long hairs and short setae along edge in the apex of tegmen of the examined specimen does not completely fit those in the Watrous' drawings of both *C. infimus* and *C. limbatus*. Taking into consideration rather common variability in the genital structures of Cillaeinae,

it could be supposed that the genital characters used by Watrous for discrimination of these species (*C. infimus* and *C. limbatus*) need further confirmation. Thus, at the moment it is impossible to provide the specimen from Estonia with a precise species identification.

Designation of a neotype for the name *Colopterus truncatus*

The designation of a neotype for the name *Colopterus truncatus* (Randall, 1838) is necessary for the fixation of the taxonomic interpretation of this species after the revision of the genus *Colopterus* by Watrous (1980).

Nitidula truncata Randall, 1838: 18 (type locality: the state of Maine, USA). Neotype, male with dissected genitalia, proposed to designation in the PhD thesis by Watrous, 1980: 103 – "[USA] Paris Maine, 13.vi.1925, C. A. Frost". The neotype is deposited in the collection of the Field Museum of Natural History in Chicago. Watrous proposed to designate a neotype for this species because, as he reports (op. cit.), the type series of this species has been lost. The characters that distinguish *C. truncatus* from other species of the genus are listed by Watrous (1980) and briefly mentioned here above. The description of *C. truncatus* and characters given in the key to *Colopterus* species by Watrous (1980), based, among them, on the specimen designated as a neotype, correspond to the original description of *N. truncata*; respectively, the neotype corresponds to the lost type series of the species.

Conclusions and discussion

The conclusions by Watrous (1980) on the reason to split "*Colopterus truncatus*" into three separate species should be recognised as reasonable. They are *C. infimus*, *C. limbatus* and *C. truncatus*, although distinctness of the first two species needs to be confirmed. For fixation of this conclusion, the authors of this paper propose to recognise the designation of a neotype for *C. truncatus* by Watrous. Thus, all records of these three species are required confirmation in accordance with their diagnoses, particularly taking into consideration that, according to Watrous, the specimens of *C. infimus* and *C. limbatus* are markedly more numerous in the collections than those of *C. truncatus*. Therefore, it concerns also most references on the occurrence of *C. infimus* (Cline et al., 2005; Fernandes et al., 2012; Peck et al., 2014; etc) and *C. truncatus* (Ambourn et al., 2005; Cline et al., 2005; Price & Young, 2006; Hayslett & Moltzan, 2008; Peck et al., 2014; etc).

The capture of a living specimen in Estonia (near the border between Estonia and the Leningrad Province), the first finding of the subgenus *Colopterus* sensu stricto in Europe, is important because this species can be a factor of distribution of quarantine objects, pests in fruits, and can also inhabit different decaying products of plant origin. Ambourn et al. (2005), Hayslett & Moltzan (2008) and others mentioned "*Colopterus truncatus*" as participant in the transmission of fungal infections, in particular as probable vectors of the oak wilt fungus *Bretziella fagacearum* [*Ceratocystis*]. However, in fact, *C. truncatus*, *C. infimus* or *C. limbatus* may hide under this name. The specimen from Estonia was collected in the "oakwood from grass and flowers (*Anemone nemorosa*)" and it certainly belong to the "*infimus*-group" but not to *C. truncatus*. The specimens of "*C. truncatus*" (or other two *Colopterus* species under consideration) are known as regular pollinators of *Calycanthus floridus* and *C. occidentalis* (Williams et al, 2008; Gottsberger & Silberbauer-Gottsberger, 2014; etc). Adults of other congeners, according to museum labels under specimens, are rather frequent visitors of flowers. Another congener, belonging to the subgenus *Cyllopodes* and originating from the Western Hemisphere, *C. abdominalis* (Erichson, 1843), is regularly collected in Sicily since 2004 (Baviera & Audisio, 2014; Jelínek et al., 2016).

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