

Zeitschrift: Alpine entomology : the journal of the Swiss Entomological Society
Herausgeber: Swiss Entomological Society
Band: 5 (2021)

Artikel: First report of Cooka incisa (Beekey, 1937) from Europe (Diptera, Scatopsidae)
Autor: Haenni, Jean-Paul / Pollini Paltrinieri, Lucia
DOI: <https://doi.org/10.5169/seals-966035>

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First report of *Cooka incisa* (Beekey, 1937) from Europe (Diptera, Scatopsidae)

Jean-Paul Haenni¹, Lucia Pollini Paltrinieri²

¹ Muséum d'histoire naturelle, Rue des Terreaux, 14, CH-2000 Neuchâtel, Switzerland

² Museo cantonale di Storia naturale, Viale Carlo Cattaneo 4, CP5487, CH-6901 Lugano, Switzerland

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Corresponding author: Jean-Paul Haenni (jean-paul.haenni@unine.ch)

Academic editor: Patrick Rohner ♦ Received 20 November 2020 ♦ Accepted 17 January 2021 ♦ Published 10 February 2021

Abstract

Cooka incisa (Cook, 1956) is recorded from several wooded localities in southern Switzerland (canton of Ticino). This is the first European record of this species, as well as the first record of the otherwise Nearctic genus *Cooka* Amorim, 2007 in the Palaearctic region as a whole. The possibility of an accidental introduction of *C. incisa* in Europe is discussed.

Key Words

Scatopsidae, faunistics, Palaearctic, Nearctic, Switzerland

Introduction

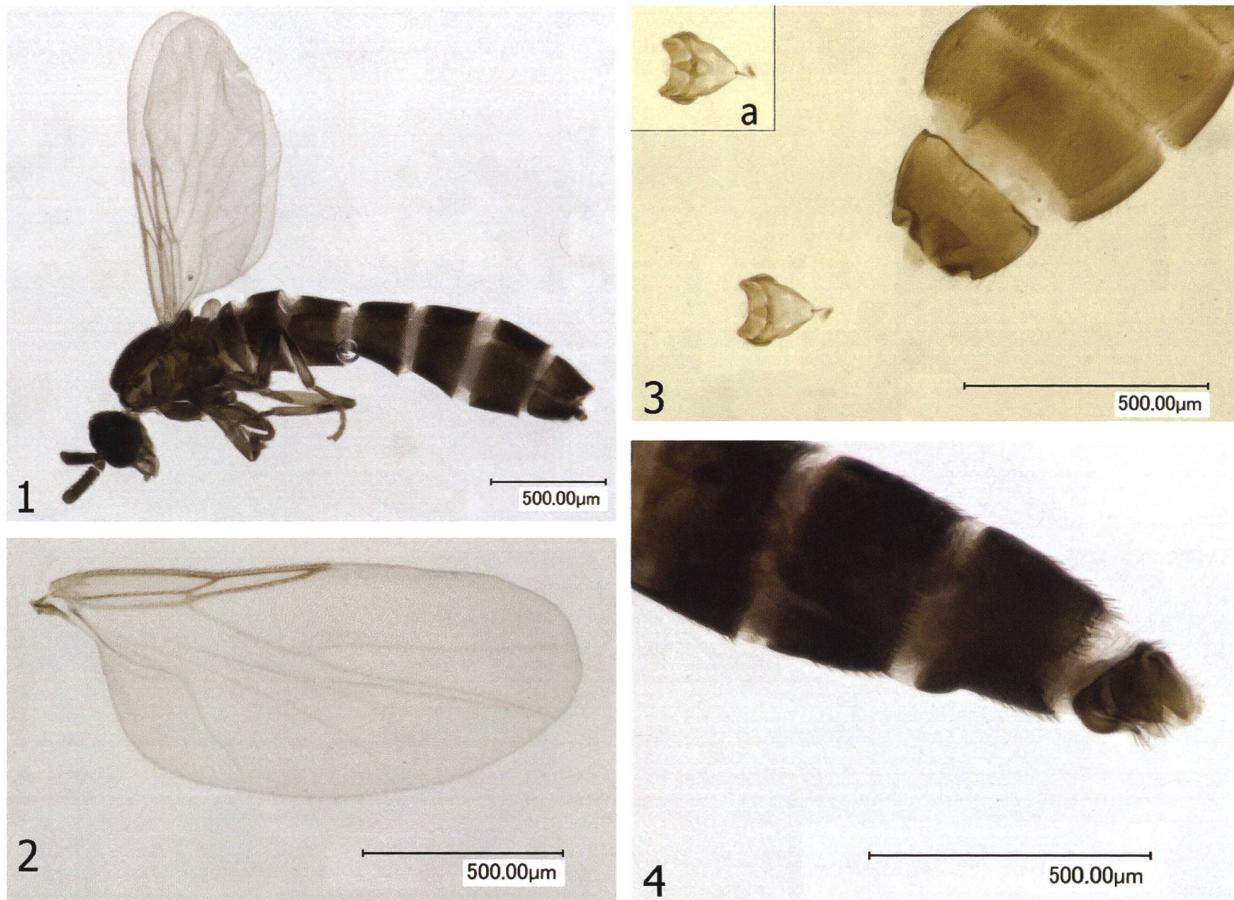
In 2015–16 an extensive faunistic survey employing different trapping methods was conducted in the area initially proposed for the Swiss National Park of Locarnese, near Locarno (Ticino, southern Switzerland). Among the many Diptera found, midges of the family Scatopsidae were caught in significant numbers, revealing the presence of several interesting species, some of them still under study (Haenni and Pollini in prep.). The unexpected discovery among this material of a Nearctic species never before recorded in Europe is presented here.

Material and methods

The samples were collected by Lucia Pollini (LP) and †Michele Abderhalden during a 2015–16 faunistic survey in the area of the planned Swiss National Park of Locarnese, using Malaise traps, aerial Malaise traps (SLAM traps) and three slightly different beer/wine traps. This material, sorted by LP, is preserved in 70%

alcohol in the collection of the Museo cantonale di storia naturale in Lugano (MSNL) and was identified by Jean-Paul Haenni (JPH).

Additional specimens of *C. incisa* were discovered in material sent for identification to JPH by Gerhard Bächli (Dietikon) and preserved in his collection (CGB) (now partly in the collection of the Muséum d'histoire naturelle de Neuchâtel (MHNN)). This material originates from two biodiversity programs, namely a general faunistic survey of Switzerland conducted by Peter Duelli (WSL, Birmensdorf) from 1999 to 2006, using “Kombifallen” (window traps combined with yellow pans), and the national research program BiodiverCity conducted by Thomas Sattler (WSL, Birmensdorf) using “Kombifallen” and pitfall traps in 2006 in urban landscapes of three Swiss cities (Lugano, Luzern, Zürich). The dipteran material, originally preserved in 70% alcohol, was later sorted and partly dry-mounted by G. Bächli. Some specimens were cleared in KOH, dissected and slide-mounted for description and production of figures. Morphological nomenclature follows Haenni (1997), nomenclature and faunistics Haenni (2013).



Figures 1–4. *Cooka incisa* (Cook): **1.** Habitus, male, lateral view. **2.** Wing, male. **3.** Tip of abdomen and genital capsule, male, ventral view; inset a. Genital capsule, dorsal view (true ventral, as genitalia rotated through 180°). **4.** Tip of abdomen, female, lateral view.

Faunistics

Cooka incisa (Cook, 1956)

Figs 1–5

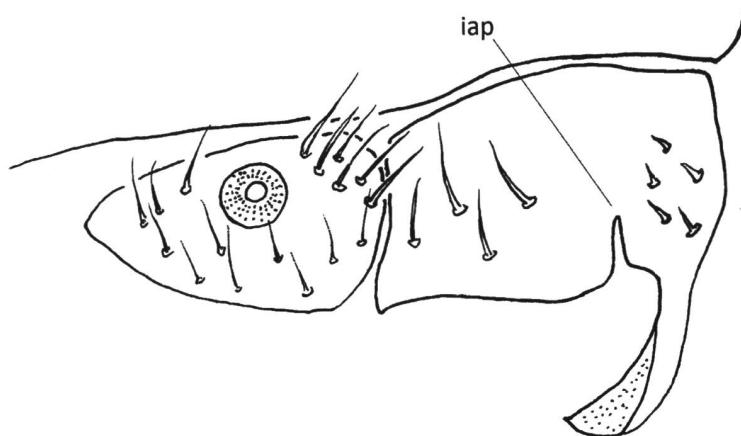
Rhexoza incisa Cook, 1956: Ann. Ent. Soc. Am. 49: 6, figs 2A, 2G, 3B. Cook in Stone & al., 1965: Cat. Dipt. N. Amer.: 240. Cook, 1975: Pan-Pac. Entomol. 51: 66, figs 13, 24–25. Cook, 1981: Manual of Nearctic Diptera 1: 315, figs 20–22. *Cooka incisa* (Cook, 1956): Amorim 2007: Zootaxa 1640: 48.

Material studied (12♂♂, 4♀♀). SWITZERLAND, TI: Bolle di Magadino, [Gordola, Reviscài], 199 m, 710.121/114.037 [46°10'07.685"N, 8°51'52.248"E], forest, mid June-end July 2000, 1♂; same locality but mid June-end July 2001, 3♂♂ 1♀; same locality but mid June-end July 2004, 2♂♂; same locality but mid June-end July 2005, 2♂♂, all P. Duelli leg., CGB, MHNN; Lugano, 24.VI–5.VIII.2006, 1♂, Th. Sattler leg., MHNN; Losone, Arcegno, Collina di Maia, 420 m, 701.151/113.376 [46°09'51.337"N, 8°44'53.687"E], ARC1, 21–28.VII.2015, birra bianca, 2♀♀; same, but 7–18.VIII.2015, 1♂ 1♀; same, but 411 m, 701.013/113.741 [46°10'03.240"N, 8°44'47.535"E], ARC2, 28.VII–7.VIII.2015, vino, gialla,

1♀; same, but, 366 m, 701.307/113.196 [46°09'45.434"N, 8°45'00.812"E], ARC3, 7–26.VII.2016, birra bianca, 1♂, all L. Pollini & M. Abderhalden leg., MSNL.

Diagnosis. Body, elongate (Fig. 1), dull in general appearance, except for contrasting, shining tergite 7 and basally sub-shining sternite 7 in male. Wing venation (Fig. 2) very similar to that of *Rhexoza* species and of the cosmopolitan *Coboldia fuscipes*. Tergite 7 (Fig. 3) with median posterior projection broad, sternite 7 deeply incised medially, genital capsule (Fig. 3) with elongate, pointed, posteriorly directed lateral projections, aedeagus short. Female (Fig. 4) with tergite 8 deeply incised medially, sternite 8 broadly divided in two basally broad, apically pointed lateral lobes.

The Swiss material perfectly agrees with the description and figures of North American specimens of this species, especially regarding the very characteristic shape of the male genital capsule (Cook, 1981: fig. 20.22, and present paper, Fig. 3). *Cooka incisa* will run to *Rhexoza* in the key to the Palaearctic genera of Scatopsidae (Haenni 1997), but can be differentiated from the four known European species of *Rhexoza* by the features given in the diagnosis. Furthermore, the pregenital segment of *C. incisa* is shiny, strongly contrasting with the other abdominal tergites in



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Figure 5. *Cooka incisa* (Cook), male, antepronotum and anterior spiracular sclerite (iap: indentation of antepronotum).

the male, which are dull (pregenital segment only partly shining in female). All tergites are dull in *Rhexoza*.

Distribution. *Cooka incisa* was described by Cook (1956) (as *Rhexoza incisa*) from the Great Lakes region (USA: Iowa, Illinois, Minnesota; Canada: SE Ontario). It is recorded here for the first time from Europe and the Palaearctic region as a whole. In Europe it is presently known only from the Swiss canton of Ticino in the localities cited above.

Biology. “The larvae of this species have been collected from beneath the bark of dead American elm [*Ulmus americana*], box elder [*Acer negundo*] and cottonwood [*Populus* spp.] trees” in the USA (Cook 1956: 8), where this species is bound to wet areas. One of the Swiss localities, namely Bolle di Magadino, is a riverine forest which presents similar characteristics (main tree species are *Alnus glutinosa*, *Fraxinus excelsior*, *Quercus robur*, *Ulmus* spp., *Salix alba* and *Populus* spp., while *Acer negundo* is also present in the region). In Arcegno, on the other hand, *C. incisa* was caught in a forest consisting of chestnut (*Castanea sativa*) together with oak (*Quercus petraea*, *Q. pubescens*, *Q. robur* and *Q. rubra*) [“castagneto con querce”].

Discussion

The genus *Cooka* Amorim, 2007 (with *Scatopse similis* Beekey, 1938 as type-species) is one of the most derived genera of the Swammerdamellini, as well as of the subfamily Scatopsinae as a whole. It was erected by Amorim (2007) for six species previously placed within *Rhexoza* Enderlein, 1936 *sensu lato* (Cook 1956, 1975). *Cooka* can be distinguished from *Rhexoza* mainly by the structure of male genitalia, the unsclerotized abdominal sternites 1–4 (only 1–3 unsclerotized in *Rhexoza*) and the shape of antepronotum, which is deeply indented ventrally in *Cooka* (Fig. 5). Until now, the distribution of *Cooka* was considered purely Nearctic (Amorim 2007), thus the discovery of one species in Europe could be of special interest from zoogeographical and phylogenetic points of view. However, the indigenous status of *C. incisa* in Europe cannot

be ascertained at present. Indeed, there are some cases of scatopsid species with Holarctic distribution: these include *Arthria analis* Kirby, 1837, *Pharsoreichertella simplicinervis* (Duda, 1928), *Scatopse lapponica* Duda, 1928 and *Thripomorpha borealis* (Cook, 1955), but all these species, however, exhibit more or less marked boreal affinities, with a circumpolar distribution. *Ectaetia clavipes* (Meigen, 1846), on the other hand, has a wide distribution both in Europe and in North America. The case seems different for *Cooka incisa*, whose only European records are those presented here from the canton of Ticino, in a region characterized by comparatively mild, warm Insubrian climatic conditions. Its absence from older faunistic surveys in Ticino is puzzling (first known capture in the year 2000), while its recent discovery in various forested environments within a relatively limited area (all five localities lie within a radius of only about 20 km) could indicate an alien origin for this species. The possibility of an accidental introduction of *C. incisa* from North America cannot be immediately discarded. Hopefully, future observations of this species from other parts of Europe or the discovery of additional material in collections may bring an answer to this question.

Conclusion

Although one of the richest in Europe, the fauna of Scatopsidae of Switzerland still remains incompletely known, as shown by the discovery of *Cooka incisa* presented here, regardless of an indigenous or alien origin of this species. This demonstrates the importance of including poorly documented taxonomic groups in regional or national faunistic surveys of biodiversity.

Acknowledgements

The first author thanks very gratefully Gerhard Bächli, Dietikon (Switzerland), for sending for study the rich material of Scatopsidae of his collection. Many thanks to Jessica Litman for kindly checking the English language.

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