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## The Opiinae (Hymenoptera: Braconidae) collection of the Naturhistorisches Museum Basel, Switzerland

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The Opiinae (Hymenoptera: Braconidae) collection of the Naturhistorisches Museum Basel (Switzerland) is studied. In total, 10 species are deposited. Six species are recorded for the first time from Switzerland: *Biosteres (Chilotrechia) advectus* Papp, 1979; *Opius (Opiostomus) clausus* Fischer, 1958; *Opius (Opiothorax) minusculae* Fischer, 1967; *Opius (Misophthora) occuliscus* Telenga, 1950; *Utetes curtipectus* (Fischer, 1958) and *Utetes fulvicollis* (Thomson, 1895).

Keywords: parasitoids, faunistics, new records, entomological collections, Switzerland.

### INTRODUCTION

The Natural History Museum Basel (NMBA) was founded over 300 years ago and has many collections primarily focused on the fields of Anthropology, Entomology, Mineralogy, Osteology, Paleontology and Zoology. The Entomological Collection is rich in groups such as Coleoptera and Psylloidea. However, the Hymenoptera collection is not very rich and one of the largest families within it, Braconidae, is only represented by few dozens of specimens because no Braconidae specialist sampled and worked in Switzerland. With this aim, thanks to the Entomological staff, I am currently revising the Braconidae (Hymenoptera) material deposited in the NMBA.

Opiinae is one of the largest Braconidae subfamilies containing approximately 1,970 described species known in the world fauna (Yu *et al.* 2012). The species of Opiinae are an assemblage of small parasitic wasps, strictly koinobiont parasitoids of cyclorrhaphous Diptera (Wharton 1997), mainly of leaf miners and other larvae living in fruits. The hosts are known for only around 300 species, mostly within Agromyzidae, Anthomyiidae, Drosophilidae, Ephydriidae, Psilidae, Scatophagidae and Tephritidae (Fischer 1971a,b, 1972, 1977, 1987; Shaw & Huddleston 1991; Beyarslan & Fischer 2011; Peris-Felipo *et al.* 2014; Khajeh *et al.* 2014). The genera *Opius* Wesm., 1835 and *Phaedrotoma* Foerster, 1862 are the largest genera, and more than half of the recorded hosts belong to the Agromyzidae (Shaw & Huddleston 1991; Beyarslan & Fischer 2011; Khajeh *et al.* 2014), which are considered as pests of economic importance (Capinera 2001). Several species of the subfamily Opiinae are considered as important biocontrol agents of leaf mining Agromyzidae and fruit-infesting Tephritidae (Fischer 1971b; Greathead 1975; Wharton 1984, 1989, 1997; Schuster and Wharton 1993; Salvo and Valladares 1995). However, host-parasitoid relationships and worldwide distribution could be greater due to the lack of studies realized. On the other hand, Opiinae are closely related to Alysinae, based on the morphological data and the type of parasitism on cyclorrhaphous Di-

ptera (Wharton 1988; Quicke & van Achterberg 1990) and also molecular analyses (Dowton *et al.* 1998; Khajeh *et al.* 2014).

Many studies have been conducted on Opiinae from countries in Central Europe mainly carried out by Maximilian Fischer. However, no survey focused on Switzerland has been published and 84 recorded species from this country stem from sporadically collected samples.

The present work provides a faunistic list of the Opiinae collection deposited in the NMBA.

#### MATERIALS AND METHODS

The specimens are deposited in the collection of the Naturhistorisches Museum Basel, Switzerland (NMBA). They were identified using the keys of Tobias *et al.* (1986) and Wharton *et al.* (1998) for the genera and those of Tobias *et al.* (1986) for the species. Classification, nomenclature and the distributional data of Opiinae follows Yu *et al.* (2012).

#### TAXONOMIC PART

\* = new record for Switzerland

#### Hymenoptera: Braconidae: Opiinae

##### \**Biosteres (Chilotrechia) advectus* Papp, 1979 (Fig. 1A)

Material examined: 1 ♂, Switzerland, Bern, Kirchenfeld, 3.viii.1924 (Dr Th. Steck leg.).

Distribution. Western Palaearctic. Switzerland (new record).

##### *Biosteres carbonarius* (Nees, 1834)

Material examined: 4 ♀♀, Switzerland, Bern, 1.vi, 4.vi. & 2.vii.1899 and 9.vi.1907 (Dr Th. Steck leg.).

Distribution. Nearctic and Palaearctic.

##### *Biosteres (Chilotruchia) sylvaticus* (Haliday, 1837)

Material examined: 1 ♂, Switzerland, Bern, 2.vi.1899 (Dr Th. Steck leg.).

Distribution. Palaearctic.

##### \**Opius (Opiostomus) clausus* Fischer, 1958 (Fig. 1B)

Material examined: 1 ♂, Switzerland, Bern, 16.viii.1899 (Dr Th. Steck leg.).

Distribution. Palaearctic. Switzerland (new record).

##### *Opius (Nosopaeopus) lucidus* Szépligeti, 1896

Material examined: 2 ♀♀, Switzerland, Bern, 7.vi.1891 and 18.vi.1899 (Dr Th. Steck leg.).

Distribution. Western Palaearctic.

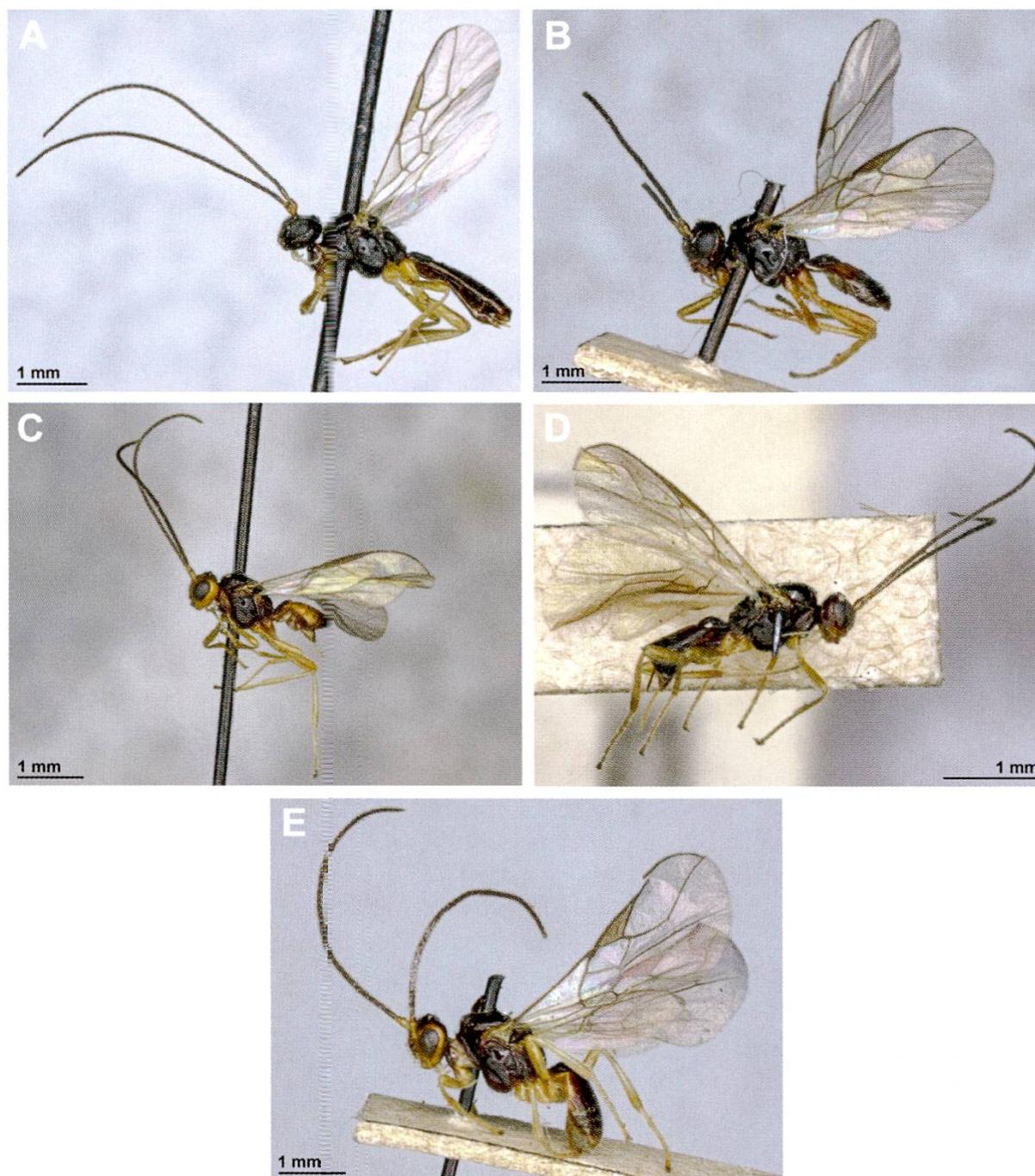


Fig. 1. Habitus lateral view of new Swiss Opiinae records. — A: *Biosteres (Chilotrechia) advectus* Papp, 1979. B: *Opius (Opiostomus) clausus* Fischer, 1958. C: *Opius (Opiothorax) minusculae* Fischer, 1967. D: *Opius (Misophthora) ocellus* Telenga, 1950. E: *Utetes curtipectus* (Fischer, 1958).

\**Opius (Opiothorax) minusculae* Fischer, 1967 (Fig. 1C)

Material examined: 1 ♀, Switzerland, Bern, Kirchenfeld, 19.ix.1925 (Dr Th. Steck leg.).

Distribution. Western Palaearctic. Switzerland (new record).

\**Opius (Misophthora) ocellus* Telenga, 1950 (Fig. 1D)

Material examined: 1 ♀, Switzerland, Bern (Dr Th. Steck leg.).

Distribution. Palaearctic. Switzerland (new record).

\**Utetes curtipectus* (Fischer, 1958) (Fig. 1E)

Material examined: 1 ♂, Switzerland, Bern, 1.viii.1900 (Dr Th. Steck leg.).  
Distribution. Western Palaearctic. Switzerland (new record).

\**Utetes fulvicollis* (Thomson, 1895)

Material examined: Switzerland, Bern, Kirchenfeld, 9.viii.1925 (Dr Th. Steck leg.).  
Distribution. Nearctic and Palaearctic. Switzerland (new record).

*Utetes rotundiventris* (Thomson, 1895)

Material examined: 1 ♂, Switzerland, Bern, Dählhölzli, 14.viii.1913 (Dr Th. Steck leg.).  
Distribution. Palaearctic.

## DISCUSSION

Based on the revision of the Opiinae material in the Naturhistorisches Museum Basel, the existence of only 14 deposited specimens reflects the poor collection of Braconidae. Information is also comparable with the recent publication about the Alysiinae subfamily (Peris-Felipo 2016), where only 20 species (61 specimens) from 168 recorded for Switzerland were catalogued.

Despite the small number of specimens, six species are recorded here for the first time from Switzerland: *Biosteres (Chilotrechia) advectus* Papp, 1979, *Opius (Opiostomus) clausus* Fischer, 1958, *Opius (Opiothorax) minusculae* Fischer, 1967, *Opius (Misophthora) occulusus* Telenga, 1950, *Utetes curtipectus* (Fischer, 1958) and *Utetes fulvicollis* (Thomson, 1895). By this contribution, the number of Opiinae species known from Switzerland (Yu *et al.* 2012) increased to 90 species. This number is lower than for surrounding countries such as Austria and Germany with 155 species, Italy (125) and France (101), suggesting that the Swiss Opiinae fauna is still insufficiently known.

The limited number of the known Opiinae from Switzerland also reflects the paucity of research on this group. Further investigations both on the fauna and host associations of the Swiss Opiinae are necessary to provide a solid basis for biological control of the dipterous pests in agricultural and urban landscapes.

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