

**Stephanus serrator (Fabricius, 1798) in Romania  
(Hymenoptera: Stephanidae)**

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**Abstract** – New and earlier unpublished faunistic records of *Stephanus serrator* (Fabricius, 1798) are presented for Romania. Notes on collecting sites, phenology and morphology are given. With 4 figures and 1 table.

**Key words** – Stephanidae, suburban habitats, Carpathian Basin

INTRODUCTION

The superfamily Stephanoidea contains a single cosmopolitan family: Stephanidae Leach, 1815. Stephanidae is most probably the oldest group of parasitoid Hymenoptera, with 332 extant species belonging to 11 genera (ACHTERBERG & YANG 2004, AGUIAR 2004). The species mostly occur in tropical and subtropical forests, but several species inhabit arid and semiarid areas too. The Oriental region is where species of Stephanidae are the most abundant (AGUIAR 2004).

The history of the taxonomic position of stephanids began with their placement in Ichneumonidae (ZSCHACH 1788). Later FABRICIUS (1804) placed them in Braconidae, which was followed by their inclusion in the Evanioidea by JURINE (1807). Their assignment to the superfamily Stephanoidea was done in the 20th century. BENOIT (1949) suggested what RASNITSYN (1969) finally did, so in consequence the Stephanoidea contained only Stephanidae (AGUIAR 2004). At present Stephanidae has two extant (Schlettereriinae Orfila, 1949 and Stephaninae Enderlein, 1905) and one extinct (Electrostephaninae Engel, 2005) subfamilies, from which only one, the Stephaninae is present in Europe.

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In the last few decades many works on Stephanoidea were published, including revisions of the majority of the genera and descriptions of new species. While the family is diverse in the tropical and subtropical areas, the temperate regions have few representatives. In Europe, only two species were described and reported, *Megischus anomalipes* (Förster, 1855) and *Stephanus serrator* (Fabricius, 1798). They are keyed in GYÖRFI & BAJÁRI (1962). There are two additional species, *Foenatopus turcomanorum* Semenov, 1891 and *Afromegischus gigas* (Schletterer, 1889) from the Middle East, which were collected also in the south-east of Europe (HILSZCZAŃSKI 2011).

The adults seem to be diurnal, but sometimes are attracted by light traps (NAUMANN 1991), which may suggest the nocturnal flight of some species. Their collecting with traditional methods (sweeping, Malaise-traps, light traps, yellow pan traps) is not efficient. The majority of the species descriptions were based on specimens collected by hand (AGUIAR 2004). Use of blue pan traps also seems to be a fairly efficient method for collecting stephanids (AGUIAR & SHARKOV 1997).

Stephanids are named crown wasps because adults bear five distinct tubercles on the top of their heads (Fig. 2). Other distinctive morphological characteristics of the stephanids include a very long petiole articulated to the dorsal part of the propodeum, more or less lengthened pronotum and teeth on the ventral side of hind femur. Their ovipositor is usually long with or without an ivory band on the apex of its sheath (ACHTERBERG 2002).

Stephanids usually occur around dead trees infested with xylophagous beetles (ACHTERBERG 2004). Their larvae are ectoparasitoids of Cerambycidae, Buprestidae (Coleoptera), Siricidae and Apoidea (Hymenoptera) (AGUIAR 2001). Data on polyphagy are available only for *Schlettererius cinctipes* (Cresson, 1889) and *Stephanus serrator* (Fabricius, 1798), even though host specificity is considered low for stephanids (AGUIAR 2004).

In this paper we present the earlier and new unpublished Romanian records of *Stephanus serrator* and the Romanian data of *Megischus anomalipes*. In addition, we provide information on the association of the species with a new habitat type: the suburban environment. As a by-product of urbanisation, human activity created a new habitat type and it is used by several insect species (FRANKIE & EHLER 1978). Suburban habitat represents an intermediate stage between urban and rural environments with a mix of natural (land cover) and built environmental elements (BENNETT & GRATTON 2011, HINNERS *et al.* 2012). As a result of this combination, the suburban habitat can have a higher diversity of hymenopterans (HINNERS *et al.* 2012, SZCZEPKO *et al.* 2013).

*Abbreviations* – HNHM = Hungarian Natural History Museum, Budapest. MZBBU = Museum of Zoology, Babeş-Bolyai University, Cluj-Napoca.

## STEPHANIDAE IN ROMANIA

*Megischus anomalipes* (Förster, 1855)

*Stephanus anomalipes* FÖRSTER, 1855: 228; SCHLETTERER 1889: 93; MOCSÁRY 1897: 57; KIEFFER 1904: 487; ELLIOTT 1922: 731–732; GYÖRFI & BAJÁRI 1962: 37.

*Megischus anomalipes*: SICHEL 1866: 485; MADL 1991: 122–123; AGUILAR 2004: 48.

*Bothriocerus europaeus* SICHEL, 1861: 759; MADL 1991: 122 (synonymy).

*Megischus europaeus*: SICHEL 1866: 484, 487 (as darker variety of *M. anomalipes* (Förster)).

*Stephanus europaeus*: SCHLETTERER 1889: 95; KIEFFER 1904: 486; ELLIOTT 1922: 730.

*Stephanus athesinus* BIEGELLESEN 1929: 211; MADL 1991: 122 (synonymy).

**Remarks** – As for distribution of *M. anomalipes*, AGUILAR (2004) lists Czech Republic, France, Hungary, Italy and Spain. In Transylvania, Romania this species was collected in Németbogsán (= Bocșa), Caraș-Severin county (1 female, GYÖRFI & BAJÁRI 1962, MADL 1991). The female is deposited in the HNHM. The species is mentioned in the checklist of Romanian fauna (MOLDOVAN 2007).

*Stephanus serrator* (Fabricius, 1798)  
(Figs 1–4)

*Ichneumon* no. 193: ZSCHACH 1788: 60, fig. 193.



**Figs 1–3.** *Stephanus serrator* (Fabricius, 1798): 1 = female, 2 = head of female, 3 = male (photo B. Holinka)

*Ichneumon serrator* FABRICIUS, 1798: 224.

*Stephanus serrator*: MOCSÁRY 1897: 57; ELLIOTT 1922: 718–719 (for additional references);

BLÜTHGEN 1953: 229–234; GYÖRFI & BAJÁRI 1962: 37; PAGLIANO 1986: 13–14; MADL 1991: 121, figs 6, 9; VÖLLGER 1994: 276; AGUILAR 2004: 76.

*Stephanus coronatus* JURINE in PANZER 1800: fig. 13.

*Material examined* – The data of the specimens from Transylvania, Romania collected at the end of the 19th and at the beginning of the 20th century and deposited in the HNHM are the following: Arad county, Honctő (= Gurahonț), 10–13.V.1913, collector unknown, probably L. Diószeghy, 1 female; Arad county, Honctő (= Gurahonț), date unknown, probably 10–13.V.1913, leg. L. Diószeghy, 1 female; Arad county, Borosjenő (= Ineu), 9.VI.1927, collector unknown, probably L. Diószeghy, 1 female; Arad county, Borosjenő (= Ineu), 28.V.1927, leg. L. Diószeghy, 3 females; Arad county, Borosjenő (= Ineu), 20.V.1912[?], leg. L. Diószeghy, 1 female; Arad county, Borosjenő (= Ineu), 14.VI.1927, collector unknown, probably L. Diószeghy, 1 female; Arad county, Borosjenő (= Ineu), 31.V.1927, leg. L. Diószeghy, 1 female; Caraș-Severin county, Mehádia (= Mehadia), date unknown, leg. J. Pável, 2 females; Caraș-Severin county, Németbogsán (= Bocșa), date unknown, collector unknown, probably E. Merkl, 1 male; Satu Mare county, Hadad (= Hodod), date unknown, leg. E. Zilahi-Kiss, 2 females; Sălaj county, Szilágycseh (= Cehu Silvaniei), 7.VIII., year unknown, leg. E. Zilahi-Kiss, 1 female; Sălaj county, Zilah (= Zalău), 11.VI.1887, collector unknown, 1 female; Sălaj county, Zilah (= Zalău), date unknown, collector unknown, 1 female.

Freshly collected material from Transylvania, Romania: Satu Mare county, Satu Mare, 6–9.VI.2009, leg. Z. László, 2 females; Satu Mare county, Satu Mare, 15.V.2010, leg. Z. László, 3 males. The specimens are deposited in the MZBBU.

*Remarks* – *Stephanus serrator* (Figs 1–4) is known from Austria, Bulgaria, Croatia, Czech Republic, France, Germany, Hungary, Italy, Netherlands, Serbia and Montenegro, Spain and Switzerland (AGUILAR 2004). Neither AGUILAR (2004) nor MOLDOVAN (2007) mentioned the species from Romania. However, MOCSÁRY (1897) listed the localities Mehádia (= Mehadia), Orsova (= Orșova), Peér (= Szilágypér, Pir) and Zilah (= Zalău), and GYÖRFI & BAJÁRI (1962) mentioned it from Transylvania and Mehadia. These references most probably escaped the attention of AGUILAR (2004) and MOLDOVAN (2007) or they did not distinguish the localities that now belong to present-day Romania from those in present-day Hungary. The above-mentioned localities belonged to the Kingdom of Hungary before 1918.

The freshly collected *S. serrator* specimens were found on the walls of a shed, where old stakes were present (Fig. 4). All specimens were caught in the late afternoon hours as singletons while they were searching or resting on the stakes

or outer beams of the shed. Blue pan traps were placed around the shed but no individuals have fallen into them. Three male and two female specimens were measured using a binocular microscope. The morphometric measurements of the freshly collected specimens are included in Table 1.

As the data of the old collected specimens suggest, *S. serrator* was detected in the Partium and Transylvania regions in the late 19th and the early 20th centuries, but mostly by Hungarian entomologists. As a consequence of historical events, these data became unheeded for the Romanian entomologists, so the species is missing from the checklist of Romanian fauna (MOLDOVAN 2007).

All fresh specimens were collected in a suburban area, searching on timber of old buildings. It is well known that urbanisation decreases biodiversity and induces habitat loss of species. Despite the disturbed nature of man-made environments, several insect species inhabit urban environments (FRANKIE & EHLER 1978). Being in transition between urban and rural environments, suburban environment represent a more natural habitat, with less disturbance and more exposure to abiotic and biotic factors (BENNETT & GRATTON 2011, HINNERS *et al.* 2012).

For the occurrence of *S. serrator*, presence of their wood boring insect preys is imperative. Urbanisation in most cases is associated with deforestation, which

**Table 1.** Measurements (in mm) of the freshly collected *Stephanus serrator* (Fabricius, 1798) specimens (three males, two females). \* = without ovipositor

Character	Male (mean, SD)	Female (mean, SD)
Body length	9.53 (1.21)	13.10 (1.91)*
Head width in anterior view	1.33 (0.23)	1.73 (0.25)
Head width in dorsal view	1.28 (0.24)	1.63 (0.32)
Ocell-ocular length	0.14 (0.07)	0.09 (0.00)
Post-ocellar length	0.60 (0.10)	0.76 (0.08)
Head length	1.17 (0.29)	1.58 (0.11)
Scape length	0.25 (0.05)	0.30 (0.00)
Pedicel length	0.13 (0.02)	0.16 (0.01)
1st funicular segment length	0.21 (0.04)	0.26 (0.02)
2nd funicular segment length	0.28 (0.05)	0.35 (0.04)
3rd funicular segment length	0.30 (0.06)	0.38 (0.07)
4th funicular segment length	0.32 (0.06)	0.40 (0.05)
Length of mesosoma	2.70 (0.38)	3.83 (0.46)
Length of metasoma	5.66 (0.80)	7.70 (1.34)*
Length of ovipositor	–	11.38 (1.94)



means habitat loss of wood boring insects. In these changed conditions, timber of old buildings can provide food source and suitable habitat for xylophagous insects and their parasitoids in urbanised areas (SZCZEPKO *et al.* 2013). Moreover, SZCZEPKO *et al.* (2013) found that several species of cuckoo wasps (Chrysididae) and their hosts favoured old abandoned wooden buildings as habitat, because these provided greater number of holes made by wood boring insect than in forests with less dead wood.

In the literature there are a few mentions about the occurrence of *S. serrator* in urban-suburban environment, as individuals sit on fence posts, boards,



**Fig. 4.** Male *Stephanus serrator* (Fabricius, 1798) on a wood stave behind an old shed (photo Z. László)

firewood and timber (JANSEN *et al.* 1988), on telegraph poles (WALL 1994), or on larch and conifer fences (HAUSL-HOFSTATTER 2003). Specimens collected on cultivated trees (det. B. B. Sípó, Foktő, Hungary): 1 male specimen from hazelnut (8.VII.1998) and 1 female from bark of a peach tree (27.V.2000) (SÍPOS & MÓCZÁR 2007).

Like other habitat specialists, *S. serrator* is sensitive to urbanisation (BENNETT & GRATTON 2011). The latter authors collected stephanids in rural areas using yellow sticky traps, but none was trapped in urban areas. However, the key factor could be the availability of a suitable habitat for the prey species of stephanids. There are known instances of polyphagous parasitoids searching at first for a known type of habitat of several prey species and then searching for a particular prey (HETZ & JOHNSON 1988).

As SZCZEPKO *et al.* (2013) stated, keeping old buildings in areas with a considerable amount of dead wood can facilitate presence of wood boring insects and the often rare parasitoid species associated with them, thereby positively influencing the insect diversity of the area.

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