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First record of *Alloxysta brevis* (Thomson, 1862) (Hymenoptera: Figitidae: Charipinae) from The Netherlands

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Abstract

First record of Alloxysta brevis (Thomson, 1862) (Hymenoptera: Figitidae: Charipinae) from The Netherlands. *Alloxysta brevis* (Thomson, 1862) is here reported for the first time from The Netherlands. This species has a wide distribution pattern, being cited worldwide in all biogeographical regions. The species was collected in Netherlands–Gelderland (province)–Zevenaar (city)–Rijnstrangen–WGS84 (N51.914513; E6.035453). Information about this new record is given as well as images of the morphological features which characterize the species.

Key words: *Alloxysta brevis*, Charipinae, The Netherlands, Figitidae, aphid hyperparasitoids.

Resumen

Primer registro de Alloxysta brevis (Thomson, 1862) (Hymenoptera: Figitidae: Charipinae) en Los Países Bajos Alloxysta brevis (Thomson, 1862) se registra aquí por primera vez en los Paises Bajos. Esta especie presenta una amplia distribución, ha sido citada en todas las regiones biogeográficas. El especímen que hemos estudiado se ha colectado en Netherlands–Gelderland (provincia)–Zevenaar (ciudad)–Rijnstrangen–WGS84 (N51.914513; E6.035453). Presentamos información sobre esta nuevo registro, así como las características morfológicas que definen la especie.

Palabras clave: *Alloxysta brevis*, Charipinae, Los Países Bajos, Figitidae, hiperparasitoides de pulgones.

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Introduction

The Charipinae (Hymenoptera: Cynipoidea: Figitidae) are very small wasps, with shiny and smooth body, characterized by having very few diagnostic features which sometimes make very difficult separate between the species (Ferrer–Suay *et al*., 2012). The subfamily is subdivided into eight valid genera: *Alloxysta* Förster, 1869 (cosmopolitan), *Phaenoglyphis* Förster, 1869 (cosmopolitan), *Lytoxysta* Kieffer, 1909 (North America), *Lobopterocharips* Paretas–Martínez & Pujade–Villar, 2007 (Nepal), *Dilyta* Förster, 1869 (cosmopolitan except Australia), *Apocharips* Fergusson, 1986 (Eastern Palaearctic and Neotropics), *Dilapothor* Paretas–Martínez & Pujade–Villar, 2006 (Australia) and *Thoreauana* Girault, 1930 (Australia). Of these, *Alloxysta* is the most abundant and widespread genus, being cited in all the biogeographical regions (Ferrer–Suay *et al*., 2012).

Charipinae are related to aphids and act as hyperparasitoids, meaning that their presence disrupts the correct biological control performed by the primary parasitoids. They are biologically characterised as being hyperparasitoids of aphids via Aphidiinae (Hymenoptera: Ichneumonoidea: Braconidae) and Aphelininae (Hymenoptera: Chalcidoidea: Aphelinidae), and hyperparasitoids of psyllids via Encyrtidae (Hymenoptera: Chalcidoidea) (Menke & Evenhuis, 1991). According to van Veen *et al*. (2001), hyperparasitoids can reduce the efficiency of primary parasitoids on their hosts in at least three ways: (1) primary parasitoid mortality, (2) indirectly by the growth rate of the aphid population, and (3) the propensity for primary parasitoids to disperse.

Material and methods

Alloxysta brevis (Thomson, 1862) is mainly characterized by having a small closed radial cell being 2.1 times as long as wide (Fig. 2), pronotal carina absent (Fig. 4), propodeal carinae present forming a plate (Fig. 3), female and male antennae with the most proximal rhinaria in F4, F1 shorter than pedicel and F1-F3 subequal in length (Fig. 1). It is similar to *A. darci* they could be differentiated by the antennae length: shorter than body in *A. brevis* while longer in *A. darci*; forewing with marginal setae shorter in *A. brevis* while they are longer in *A. darci*. The brevis complex was deeply revised in Ferrer–Suay *et al.* (2013a).

This species has been recently collected from The Netherlands. This means the first record from this country. Here we give some information about the collection data and hosts, and we include images of the specimen as well.

The specimen was captured by Rudy Soethof on August 20, 2020 sweeping with a net on an extensively managed pasture, specially exploring the areas around cow flans.

The specimen was studied using a stereo microscope (BMS 144 Trino Zoom 6.7–45x) and photos were taken using a Body=Sony A7RIII, lens=Canon 65mm MPE at 5x magnification and F2.8, ringflash=YONGNUO–YN14EX, photostacking software=Helicon Focus 7.

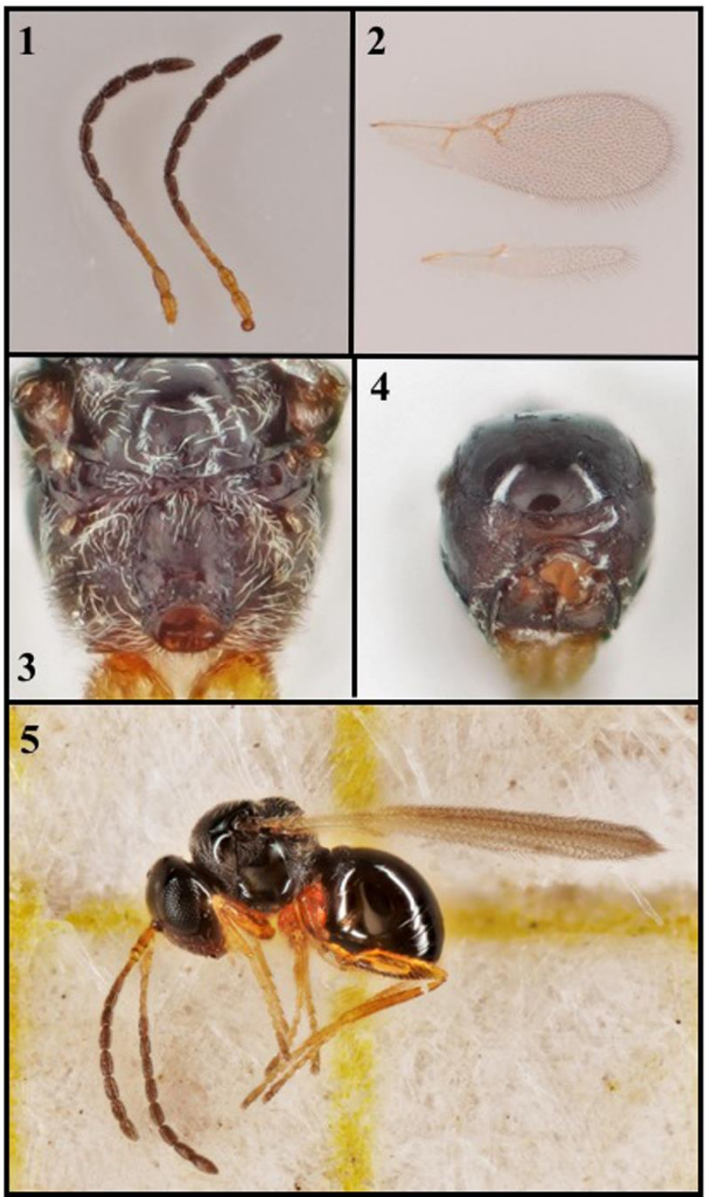
Morphological terms used are taken from Paretas–Martínez *et al*. (2007). Measurements and abbreviations include F1–F12, first and subsequent flagellomeres. The width of the forewing radial cell is measured from the margin of the wing to the beginning Rs vein. The transfacial line is measured as the distance between the inner margins of compound eyes, measured across the face through the antennal sockets divided by the height of the eye. The malar space is measured by the distance from the lower part of the gena from the mouthparts to the ventral margin of the compound eye, divided by the height of the eye.

Results

After the identification of the material collected, here we presented the new record of *Alloxysta brevis* in The Netherlands. Below we present the synonymy list of the species in order to collect all the taxonomic information of it, as well as the geographic distribution.

Allocysta brevis (Thomson, 1862)

Allotria brevis Thomson, 1862: 408. Type: MZLU (Ferrer–Suay *et al.* 2012d: 241).
Allotria megourae Ashmead, 1887: 19. Synonymized by Ferrer–Suay *et al.* 2013b: 605. Type: USNM (Ferrer–Suay *et al.* 2013b: 605).
Allotria (*Allotria*) *brevis* Thomson: Dalla Torre & Kieffer, 1902: 40.
Allotria (*Allotria*) *megourae* Ashmead: Dalla Torre & Kieffer, 1902: 41.
Charips (*Charips*) *brevis* (Thomson) Dalla Torre & Kieffer, 1910: 276.
Alloxysta rauchi Andrews, 1978: 67. Synonymized by Ferrer–Suay *et al*. (2013b: 605). Type: USNM (Ferrer–Suay *et al.* 2013b: 605).
Alloxysta brevis (Thomson) Andrews, 1978: 79.
Alloxysta megourae (Ashmead) Andrews, 1978: 86.



Figures 1–5. *Alloxysta brevis* (Thomson, 1862): 1) antennae; 2) forewing; 3) propodeum; 4) pronotum; 5) habitus.
Figuras 1–5. Alloxysta brevis *(Thomson, 1862): 1) antenas; 2) alas; 3) propodeo; 4) pronoto; 5) cuerpo.*

DISTRIBUTION: Andorra (Ferrer–Suay *et al.* 2011: 350); Argentina (Díaz *et al.* 2011: 134); Asia (India and Thailand) (Ferrer–Suay *et al*. 2013b: 5); Austria (Ferrer–Suay *et al*., 2018b: 79); Canada (Andrews, 1978: 68); China (Ferrer–Suay *et al.* 2016: 1069); Corsica (Ferrer–Suay *et al.* 2013d: 5); Czech Republic (Ferrer–Suay *et al.* 2018a: 30); England (Müller *et al.* 1999: 346); Finland (Hellén, 1963: 22); France (Kieffer, 1904a: 602; De Gaulle, 1908: 26; Ferrer–Suay *et al.* 2015: 122); Germany (Hübner *et al.* 2002: 507); Greece (Ferrer–Suay *et al.* 2018a: 30); Hawaii (Beardsley, 1985: 50); Hungary (Fülöp *et al.* 2010: 54); Iran (Ferrer–Suay *et al.* 2013e: 36); Ireland (O'Connor & Nash, 1997); Italy (Ferrer–Suay *et al.* 2014b: 5); Japan (Takada & Nakamura, 2010: 269); Madeira (Borges *et al.* 2008); Mexico (Ferrer–Suay *et al*. 2013f: 32); Moravia (Ferrer–Suay *et al*. 2018a: 30); Morocco (Ferrer–Suay *et al*. 2013g: 262; 2018a: 30); Poland (Barczak, 1991: 87); Romania (Ionescu, 1969: 245–246; Prelipcean *et al.* 2004: 60); Russia (Ferrer–Suay *et al.* 2018a: 30); Spain (Ceballos, 1941: 226; Tizado & Nuñez–Perez, 1993: 97; Bertolaccini *et al.* 2004: 42); Sweden (Thomson, 1862: 408); Switzerland (Ferrer–Suay *et al.* 2018a: 24); USA (California) (Oatman *et al.* 1983: 1714; Zuparko & Dahlsten, 1995: 730); USA (Florida) (Ashmead, 1887: 19; Evans & Stange, 1997: 1); USA (Idaho) (Weld, 1920: 15); Zimbabwe (Ferrer–Suay *et al.* 2013g: 262); USA (California, Colorado, Georgia, Iowa, Maryland, Utah) and Canada (Vancouver) (Ferrer–Suay *et al.* 2014a: 56).

HOST: Data available in Charipinae Catalogue (Ferrer–Suay *et al*., 2012)

Discussion

Netherlands–Gelderland(province)–Zevenaar(city)–Rijnstrangen–WGS84 (N51.914513; E6.035453). Rijnstrangen is a small nature reserve along an old course of the Rhine, subject to Natura 2000 regulations. It used to be a very wet area with a small running stream. Now, due to climate change, it is getting increasingly drier and water is running only for a short time every year. Due to agricultural interests adjustments to increase water levels have only been moderate.

Alloxysta brevis has a very wide distribution, until now it is present in Palaearctic, Oriental and Neotropical regions (Ferrer–Suay *et al*., 2018). As it has been established before, many *Alloxysta* species have wide distribution patterns and the gap on them could be mainly explained by the lack of information due to the scarce material captured in these areas. Thus, it is very important continuing with the field work who give us a new point of view of Charipinae species distribution.

As for the fauna from The Netherlands, a revision is being preparing in this moment. The complete list of this subfamily has been updated with the new information, mainly taking into account the synonymies established in last works of Ferrer–Suay research team.

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