

First report of three braconid species in Belgium (Hymenoptera: Braconidae)

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Abstract

Three distinctive braconids are reported for the first time in Belgium. Two of them, both belonging to Euphorinae, were caught with light traps. All three species could be expected to be present as they are known from most of our neighboring countries.

Keywords: *Bassus calculator*, *Chrysopophthorus hungaricus*, *Pygostolus otiorhynchi*, light traps, migration

Samenvatting

Drie goed herkenbare schildwespen worden voor het eerst in België gemeld. Twee ervan, beide behorend tot de Euphorinae, werden met lichtvallen gevangen. De drie soorten waren al bekend uit de meeste van onze naburige landen en konden dus verwacht worden.

Résumé

Trois espèces de Braconidea sont signalées pour la première fois de Belgique. Deux d'entre elles, appartenant aux Euphorinae, ont été capturées avec des pièges lumineux. La présence de ces espèces en Belgique pouvait être attendue vu qu'elles étaient déjà connues des pays voisins.

Introduction

Braconid wasps or Braconidae are parasitoid wasps belonging to the superfamily of Ichneumonoidea. In contrast to Ichneumonidae, their sister-family, braconids have received little attention in Belgium. An ongoing check-list establishes 528 species present in Belgium (LIBERT & VAN ACHTERBERG, *in prep.*). Nevertheless, many species remain to be discovered and reported. This is especially the case if we compare our knowledge with neighboring countries, such as The Netherlands, with a great tradition in braconid research. Citizen science portals and knowledge exchange through international collaboration offer many possibilities to close this gap. Here we introduce three distinctive species discovered in this line of thought.

Material and methods

BELGIUM

Bassus calculator (Fabricius, 1798): • 1 ♀; Somal; 50°19'N 5°19'E; 15 Jun. 2011, P.-N. Libert leg.; field observation; K. Van Achterberg det. • 1 ♀; Bonheiden, Mispeldonk (Den Berg); 51°00'52"N, 4°33'21"E; 21 Jun. 2016, M. Mergaerts leg.; field observation; F. Verheyde det.

Chrysopophthorus hungaricus (Zilahi-Kiss, 1927): • 1, Mechelen; 51°01'55"N 4°29'15"E; 3 Jun.

2017, J. Soors leg.; light trap; F. Verheyde det. • 1 ♀; Evergem, Ertevelde-Rieme-Hoge Averij; 51°10'16"N 3°45'30"E; 8 May 2018, B. Lutin-Smet leg.; light trap; F. Verheyde det. • 1 ♂; Erpe-Mere, Wachtbekken; 50°55'44"N 3°58'09"E; 26 Jul. 2018, G. Van Heghe leg.; light trap; F. Verheyde det. • 1 ♀; Rotselaar; 50°57'29"N 4°44'43"E; 5 Aug. 2019, R. Meeuwis leg.; light trap; F. Verheyde det.

Pygostolus otiorhynchi (Boudier, 1834): • 1 ♀, Edegem; 51°09'26"N, 4°25'58"E; 13 Jul. 2014, L. Janssen leg.; light trap; F. Verheyde det. • 1 ♂, Mol, Groesgoor en Koemoek; 51°16'07"N 5°10'29"E; 11 May 2019, M. Mangelschots leg.; light trap; F. Verheyde det.

The formatting follows the European guidances on taxonomy from CETAF (BÉNICHOU et al., 2018).

Results

Bassus calculator (Fabricius, 1798) Figs 1a-1b

Our first species belongs to the subfamily of Agathidinae Haliday, 1833. Agathidines are important examples of natural agents used in biological control programs. They mainly parasitize concealed larvae of lepidopterans (SHARKEY, 1992; SHARKEY and CHAPMAN, 2015; STEVENS, 2016). *Bassus* Hofmann, 1834 is placed within the tribe Agathidini which was redefined by SIMBOLOTTI and VAN ACHTERBERG (1992) and divided in four new genera by Sharkey (for recent conclusions see SHARKEY and CHAPMAN, 2017) based on phyletic analyses. Our species belongs to the monophyletic group restricted to the Old World, *Bassus s.s.*

Morphologically this is a rather large braconid (6-7 mm). It is easy to identify within its genus. The mesoscutum and scutellum are entirely reddish(-brown), which is exceptional in combination with the black hind femur. Additionally the tarsal claws are missing a basal lobe and the scutellum is finely rugulose medio-posteriorly (SIMBOLOTTI and VAN ACHTERBERG, 1992). The degree of contrast in color is prominent. While the head (including antennae), propodeum, abdomen and hind legs (except for white bands near the knees) are completely black, front and mid tibiae/femora are orange (Fig. 1a). Our second specimen was observed in a rather wooded area on dead wood (Fig. 1a). This is usually the case since its hosts are lepidopterans, namely Tineidae, living in polypore fungi or dead wood. Known examples from Nixon (1986) are common in Belgium: *Morophaga choragella* (Denis & Schiffermüller, 1775) and *Triaxomera parasitella* (Hübner, 1796).



Fig. 1a. *Bassus calculator* ♀, leg. Michel Mergaerts; Bonheiden (Mispeldonk), 21.VI.2016 (© Michel Mergaerts).

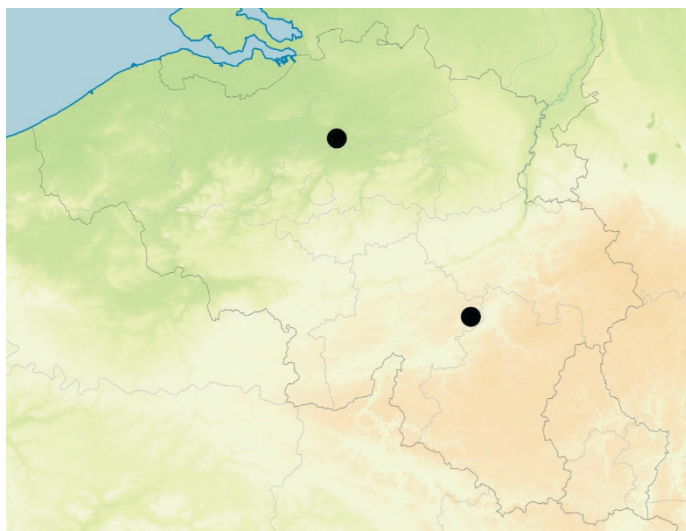


Fig. 1b Distribution of *Bassus calculator* in Belgium.

***Chrysopophthorus hungaricus* (Zilahi-Kiss, 1927) Figs 2a-2b**

Compared to Agathidinae, Euphorinae Förster, 1862 are even more diverse in host range (i.e. Coleoptera, Hemiptera, Hymenoptera, Neuroptera, Psocoptera, Orthoptera and Lepidoptera) although most hosts are attacked in their adult phase, which is rare among parasitic wasps. Based on molecular data *Chrysopophthorus* Goidanich, 1948 was recently transferred to Helorimorphini. While the host preference is quite exceptional within this tribe (see below), morphological features standing out are a long ovipositor, a long and slender petiole, and aberrant surface sculpture (STIGENBERG, BORING and RONQUIST, 2015; fig. 2a).

Three Palearctic species are known. One of them occurs in Azerbaijan and Moldova, and a second originates from France, but has an obscure taxonomical status. Therefore, we can assume *C. hungaricus* – the third species - appears to be the only one living in the Low Countries with certainty (VAN ACHTERBERG, 1994).

It is distinctive in appearance by having a long cylindrical first tergite and a short closed second cubital cell in the forewing (SHAW, 1996). Females reach approximately 3 to 4 mm. Furthermore, the species is very slender and has remarkable eyes, often glittering when exposed to lights. The first tergite and legs are very pale, sometimes close to being transparent, which contrasts with its red mesoscutum and other tergites.

There are interesting similarities between this species and the ichneumonid *Brachycyrtus ornatus* Kriechbaumer, 1880, which was reported for the first time in this journal last year (VERHEYDE & SOORS, 2018). Especially the host range is very similar, both preferring (green) lacewings from the genera *Chrysoperla* (BROOKS & BARNARD, 1990; WALKLEY, 1956) or *Mallada* (BROOKS & BARNARD, 1990; KABISSA et al., 1996). Both species can be seen as opportunistic species, with good colonizing abilities and they both appear to be at least bivoltine (flying from May to August). There are also differences. *B. ornatus* is thought to be an ectoparasitic idiobiont (QUICKE, 2015), while *C. hungaricus* is deemed to be an endoparasitic koinobiont. Lastly, *C. hungaricus* is often caught on light. In fact, all four specimens we mention here were caught with light traps, suggesting specific parasitic behavior having these morphological adaptations.



Fig. 2a. *Chrysopophthorus hungaricus*, leg. Jan Soors; Mechelen, 3.VI.2017 (© Jan Soors).

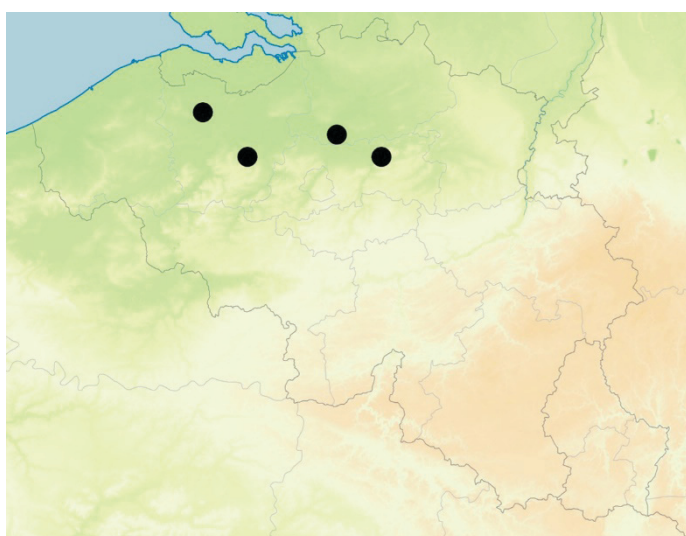


Fig. 2b. Distribution of *Chrysopophthorus hungaricus* in Belgium.

***Pygostolus otiorhynchi* (Boudier, 1834) Figs 3a-3b**

Also belonging to Euphorinae is *Pygostolus* Haliday, 1833. In the same study from STIGENBERG et al. 2015 it was placed into a new tribe, Pygostolini, removing it from Centistini. Species from this new tribe parasitize Coleoptera in the family Curculionidae.

Within *Pygostolus* four European species can be found: *P. falcatus* (Nees, 1834), *P. multiarticulatus* (Ratzburg, 1852), *P. otiorhynchi* (Boudier, 1834) and *P. sticticus* (Fabricius, 1798). All four species are now confirmed to be present in Belgium, *P. otiorhynchi* was the last one to be reported for the genus.

Species (especially the males) are more difficult to identify but can be recognized by their wing venation: marginal cell of the forewing almost reaching apex of wing, vein 3RSb straight, vein m-cu slightly shorter than vein 2RS. *P. otiorhynchi*, measuring 4 to 5 mm, has a distinctly bent ovipositor. Furthermore, the pterostigma is yellow (esp. in females) and paler than vein 1R1. Lastly, females are more or less yellowish, especially on its frons (medially), mesosternum, propodeum and metasoma (VAN ACHTERBERG, 1992; STIGENBERG et al., 2015; Fig. 3a).



Fig. 3a. *Pygostolus otiorhynchi* ♀, leg. Leo Janssen; Edegem, 13.VII.2014 (© Leo Janssen).

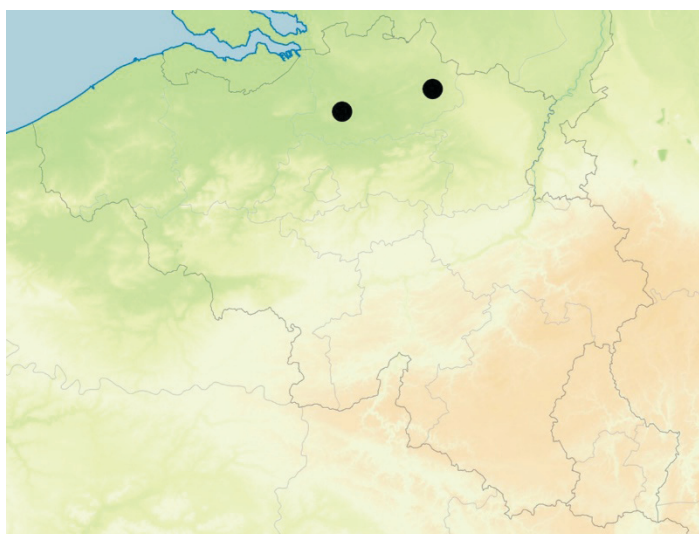


Fig. 3b. Distribution of *Pygostolus otiorhynchi* in Belgium.

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