Spathicopis van Achterberg, 1977 (Braconidae, Euphorinae) a new wasp genus for Sweden, with a spoon shaped ovipositor

JULIA STIGENBERG

Stigenberg, J.: *Spathicopis* van Achterberg, 1977 (Braconidae, Euphorinae) a new wasp genus for Sweden, with a spoon shaped ovipositor. **[*Spathicopis* van Achterberg, 1977 (Braconidae, Euphorinae) ett nytt stekelsläkte för Sverige, med en skedformad ovipositor.]** – Entomologisk Tidskrift 133(4): xxx-xxx. Uppsala, Sweden 2012. ISSN 0013-886x.

In Sweden, the parasitic wasp family Braconidae belongs to the top-three species-richest insect families, together with Ichneumonidae (Hymenoptera) and Staphylinidae (Coleoptera). Currently 1089 species are reported from Sweden. The world species of Braconidae are divided into 31 subfamilies and 172 genera. Several new species has been discovered in Sweden within the subfamily Euphoriane (Stigenberg & Ronquist 2011) and there is material enough to increase the Braconidae records up to at least 1500 species in Sweden. Here I present a new genus to Sweden with a distribution covering Sweden from the North to the South. So far 52 specimens of the species *Spathicopis flavocephala* have been found in Sweden.

Julia Stigenberg, Department of Entomology, Swedish Museum of Natural History, P.O. Box 50007, SE-104 05 Stockholm, Sweden. E-mail: julia.stigenberg@nrm.se

Introduction

The wasps of the subfamily Euphorinae, belong to the parasitic family Braconidae. They are small to medium sized (2-10 mm) and are known as solitary parasitoids mostly attacking adult insects. Parasitism on fully-grown individuals, adults, is rather unusual amongst parasitic wasps. However, in the family Braconidae there are two subfamilies specialized on such hosts: Euphorinae and Aphidiinae. The Euphorinae, mainly attack beetles but also Hymenoptera, Lepidoptera, Orthoptera, Hemiptera, Psocoptera and Neuroptera (Tobias 1966, Wharton et al. 1997, Shaw 1985). The Aphidiinae attack aphids. Although most Euphorinae are idiobionts (preventing further host development), the subfamily also includes some koinobiont (the host continues its development) endoparasitic forms attacking larvae. For a great part of the Euphorinae species, the biology is still unknown. This includes the Holarctic genus *Spathicopis* (Fig. 1) which was described in 1977, including one single species: *Spathicopis flavocephala* van Achterberg, 1977. He named it after one of the more peculiar characters that have only been found once before among the Braconidae (van Achterberg & Quicke 1991). The name refers to the latin words “spatha” and “copis” which means “broad blade cleaver”, describing the unique shape of the apically depressed “spoon-like” ovipositor. van Achterberg (1977) included this genus in the tribe Centistini based on morphological characters such as the shape of the laterope, the ovipositor, notauli and the propodeum. It was formerly mostly included in *Neoblacus* Ashmead, 1900, a subgenus of *Blacus* Nees, 1818, but was subsequently transferred to a monotypic genus by van Achterberg in 1977.

Material and methods

Most of the specimens studied for this work were collected within the Swedish Malaise Trap Project (SMTP), in which insects were collected in

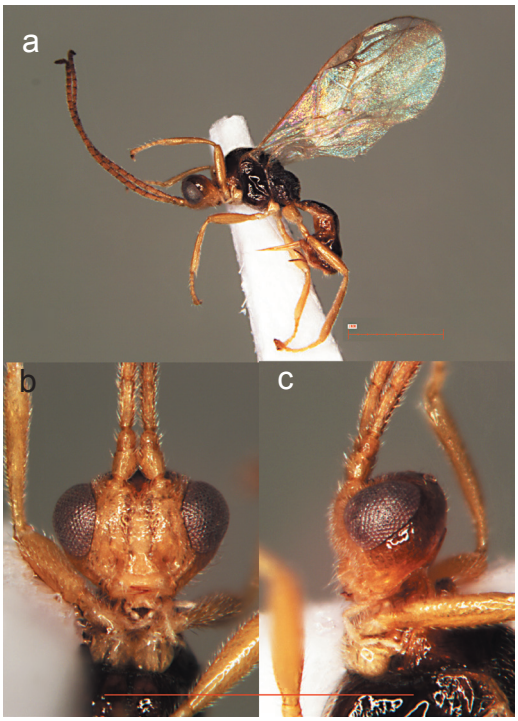

Figure 1. Habitus and close up images of *Spathicopis flavocephala*. a) Habitus image, b) anterior part of head, c) lateral part of head. Scale bar: 1 mm.

Spathicopis flavocephala. a) Habitusbild, b) huvudet framifrån, c) huvudet från sidan. Skala: 1mm.

Malaise traps placed all over Sweden (Karlsson et al. 2005). Some additional material was collected by Bo W. Svensson and others in the abandoned Limhamn limestone quarry, near Malmö in Scania (Molander & Hellqvist 2011, Svensson et al. in prep). They also used Malaise traps and the material is deposited in the Lund Zoological Museum (MZLU).

The material from the SMTP was originally preserved in 80% ethanol. For exact measurements, illustrations and for additions to the reference material at the Swedish Museum of Natural History (NHRS), all *Spathicopis* specimens were dry-pinned. One hind leg of 14 specimens was removed for DNA extraction, and the extractions are kept for future use at the Molecular Systematics Laboratory at NHRS. Most images were captured using an Olympus SZX-12 with an Infinity x32 camera and DeltaPix software. The close up image of the ovipositor was taken with a Dino-Eye Microscope Eye-Piece Camera model AM423U with DinoCapture software. The terminology used for descriptions of morphological characters follows Wharton et al. (1997) and Yoder et al. (2010). For illustrating the WIPs (Wing Interference Patterns) (Fig. 2c), in the otherwise transparent wings of the wasp, a black background was used when images were taken, as described by Shevtsova et al. (2011).

For verifying the determination of the Swedish specimens two specimens were loaned from the National Museum of Natural History, Leiden. They were from Bulgaria and The Netherlands.

Results

So far 50% of the total SMTP material has yielded about 2500 euphorines sorted and determined to species level. There are still about a hundred euphorines only sorted to genera, but from that, a total of 44 specimens of *Spathicopis flavocephala* were found in the SMTP material. *Spathicopis flavocephala* could be found all over Sweden, from Pajala in the North to Limhamn in the far South. Most specimens were found in the counties Södermanland and Småland but also the west coast was represented with one specimen from Halland (Table 1). In total 54 specimens were studied, 52 specimens from Sweden, all of which were females.

Table 1. Number of findings of *Spathicopis flavocephala* in different faunaprovinces in Sweden.

Antalet fynd av *Spathicopis flavocephala* i olika svenska landskap, räknat först som antalet individer totalt och sedan som antal fällor med fångst av arten.

Province/Landskap	No of individuals	No of traps	Collecting months	Collector
Skåne	8	5	July-Nov,	MZLU
Halland	1	1	Sept.	SMTP
Småland	11	7	June-Aug.	SMTP
Öland	1	1	Sept.	SMTP
Södermanland	15	10	July-Nov.	SMTP
Uppland	8	5	July-Nov.	SMTP
Västerbotten	1	1	Sept.	SMTP
Norrbotten & Lule lappm.	5	3	Aug-Oct.	SMTP

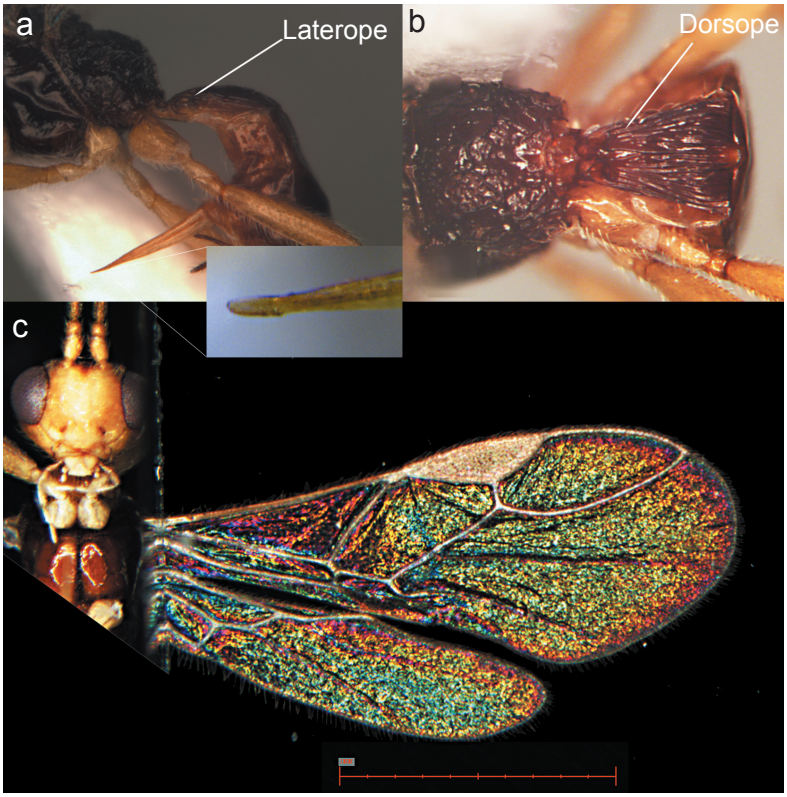

Figure 2. Detailed images of *Spathicopis flavocephala*. a) Lateral image of abdomen illustrating the ovipositor (with a close up, dorso-lateral view) and the laterope of the petiole, b) dorsal image of 1st and 2nd abdominal tergites (propodeum and petiole), illustrating the dorsope of the petiole, c) fore and hind wing veins and colorful WIPs. Scale bar: 1 mm.

Detaljerade bilder av *Spathicopis flavocephala*. a) bakkroppen visad från sidan som illustrerar äggläggningsröret (med en förstoring, sett snett uppifrån) och laterope på petiole, b) första och andra abdominaltergiterna (propodeum och petiole) sedda ovanifrån som illustrerar dorsope på petiole, c) fram- och bakvinge med färgranna WIPs. Skala: 1mm.

Special features

Here I present some special features that characterize this genus, although a detailed but 'hardcore' scientific description is published by van Achterberg (1977). The head of this genus has a rather peculiar shape seen from the anterior view. The protruding large eyes are placed far apart and the deep malar sulcus enhances the impression of a triangular face (Fig. 1 a, b). Antennal segments vary between 25 and 27. The mesopleuron is glabrous and the propodeum carinate. The petiole (2nd abdominal tergum) is characteristic with two deep dorsope and deep laterope (Fig. 2 a, b). The fore wing lacks the veins RS+M and r-m, and the vein RS is bent upwards, a character shared with several other Euphorinae genera (Fig. 2c). The ovipositor is short, equal to or slightly longer than the length of the petiole, and the apical part of the ovipositor is shaped as a spoon (Fig. 2a).

Discussion

Recently the SMTP had a 50% anniversary; meaning that 50% of the material estimated to withhold 80 million specimens has been sorted. Depending on the group of interest the material has been sorted into order, family, subfamily etc. As this species has been found in The Netherlands, Belarus, Czechoslovakia, Britain, Bulgaria, Russia, China, USA and Canada (Wharton et al. 1997, van Achterberg 2009, Yu et al. 2011), as well as all over Sweden, it certainly has a wider distribution than currently known. They are probably present in several other museum collections in Europe, but perhaps dwelling in the periphery as unseen, unsorted and undetermined material. Their biology is unknown since no rearing of a *Spathicopis* has ever been reported. The Swedish specimens were caught in Malaise traps that were put up in a variety of biotopes such as deciduous-, coniferous and mixed forests, on a bog surrounded by conifer-

ous forest but also on a *Calluna* heath and in a limestone quarry. The only conclusion regarding biotope is that they like forests. Otherwise, they seem to be very generalized with no special preference to biotope.

The finding of this new genus gives indications that large-scale inventories such as SMTP are highly valuable and necessary, and helps us increase the knowledge about the species surrounding us.

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Svensk sammanfattning:
Stekelfamiljen Braconidae (brackesteklar) hör till toppskiktet gällande artrikedomen i Sverige bland insekter med 1089 arter rapporterade (Forshage et al. 2009). I denna artikel presenteras en ny art för Sverige, som också tillhör ett släkte som inte hittats tidigare, *Spathicopis*. *flavocephala*. Den hittades i 52 exemplar, från Pajala i norr till Limhamn i söder. Arten är även funnen i Storbritannien, Nederländerna, Tjeckoslovakien, Vitryssland, Ryssland, Kina, USA och i Canada. *Spathicopis* kännetecknas av ett lite egendomligt utformat äggläggningsrör. Det är nämligen i spetsen utformat som en liten sked. Arten tillhör underfamiljen Euphorinae som till skillnad från de flesta andra parasitsteklar ägglägger i fullvuxna (adulta) insekter, främst skalbaggar men också andra ordningar. Just för *Spathicopis*. *flavocephala* är biologin okänd och fynden som rapporteras här är gjorda i diverse olika biotoper, möjligen med en dominans för skog av olika slag. I underfamiljen har ett flertal nya arter har hittats (Stigenberg & Ronquist 2011) och det finns garanterat många fler att hitta.