

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

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I present findings of a new genus of Braconidae (Euphorinae) to Sweden. In total 52 specimens of the species *Spathicopsis flavocephala* van Achterberg, 1977 have been found, all caught in Malaise traps. All of them are also females. The records are distributed from the southernmost part of the country to the northernmost. The habitat on the sites are in most cases different kinds of forests, but some are more open land. Currently 1089 species of Braconidae are reported from Sweden.

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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 is true for the Holarctic genus *Spathicopsis* (Fig. 1) which was described in 1977, including one single species: *Spathicopsis*

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 Malaise traps placed all over Sweden (Karlsson et al. 2005). Some additional material was

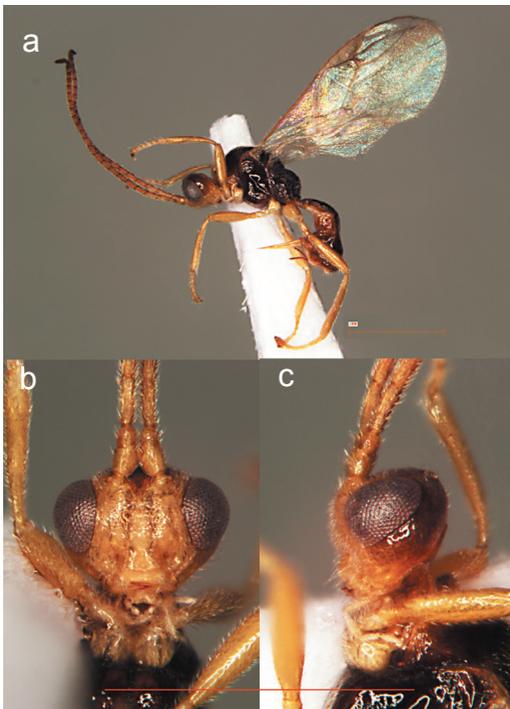


Figure 1. Habitus and close up images of *Spathicopsis flavocephala*. a) Habitus image, b) anterior part of head, c) lateral part of head. Scale bar: 1 mm.

Spathicopsis flavocephala. a) Habitusbild, b) huvudet frami-från, c) huvudet från sidan. Skala: 1mm.

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 *Spathicopsis* 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 *Spathicopsis flavocephala* were found in the SMTP material. Eight additional specimens were found in Limhamn limestone quarry. The records were distributed 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). All 52 specimens from Sweden were females.

Special features

Here I present some special features that characterize this genus, although a detailed but ‘hard-

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

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

Province/Landskap	No of individualstraps	No of	Collecting	Collector
		months		
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
Norrbottn & Lule lappm.	5	3	Aug-Oct.	SMTP

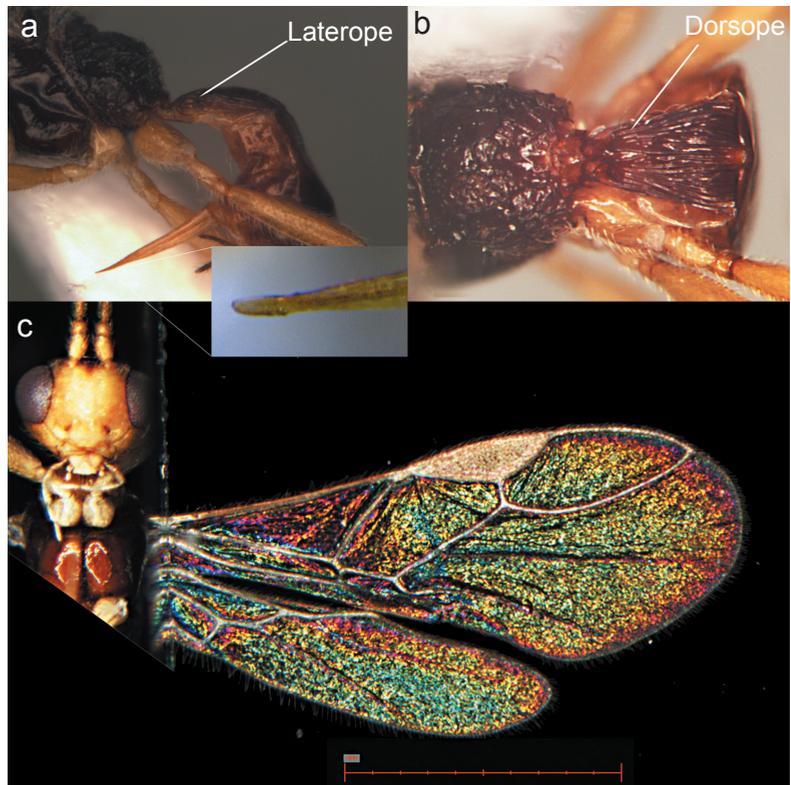


Figure 2. Detailed images of *Spathicopsis flavocephala*. a) Lateral image of abdomen illustrating the ovipositor (with a close up, dorso-lateral view) and the laterope of the petiole, b) dorsal image of 1st and 2nd abdominal tergites (propodeum and petiole), illustrating the dorsope of the petiole,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

Detaljerade bilder av *Spathicopsis flavocephala*. a) bak-kroppen visad från sidan som illustrerar ägglägningsröret (med en förstoring, sett snett uppiifrån) och laterope på petiole, b) första och andra abdominaltergterna (propodeum och petiole) sedda ovanifrån som illustrerar dorsope på petiole, c) fram- och bakvinge med färggranna WIPs. Skala: 1mm.

core' 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 *Spathicopsis* 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 coniferous 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 show that we still have a limited knowledge about the species surrounding us. Presently 1089 species of Braconidae are known in Sweden (Forshage et al. 2009), but there are many more to find, as suggested by the record presented in this paper and studies of the tribus Meteorini belonging to the same subfamily (Stigenberg & Ronquist 2011). Large-scale inventories such as SMTP are therefore highly valuable.

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Svensk sammanfattning:

Stekelfamiljen Braconidae (bracksteklar) 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, *Spathicopsis 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 Kanada. *Spathicopsis* kännetecknas av ett lite egendomligt utformat äggläggningssrör. 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 (adult) insekter, främst skalbaggar men också andra ordningar. Just för *Spathicopsis 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 hittats (Stigenberg & Ronquist 2011) och det finns garanterat många fler att hitta.