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Swedish species of the Poemeniinae (Hymenoptera: Ichneumonidae)

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1. Introduction

Poemeniinae belong to the hymenopteran family Ichneumonidae, the largest insect family in the world. Ichneumonidae has around 3000 known Swedish species today, but it is not uncommon to find new species. They are parasitoids on larvae or pupae of other insects, e.g. Coleoptera, Lepidoptera or Hymenoptera.

Over the years Poemeniinae has been classified differently; Perkins (1959) included them in the subfamily Pimplinae. Townes (1969) also placed them in the Pimplinae, which he referred to as Ephialtinae, but recognized them as a separate tribe, the tribe Poemeniini. It is only in recent years that the Poemeniinae has been recognized as a separate subfamily (Wahl & Gauld 1998).

The subfamily Xoridinae, which used to be classified with Poemeniinae, has a lot of the same characters, with one easily found difference. In Poemeniinae, the vein Cu-1 on the hind wing is closer to M than A (Fig. 1), while in Xoridinae it's in the middle (Fig. 2) (Fitton, Shaw & Gauld 1988). The Pimplinae also have some similar features, however; the petiole in Pimplinae is shorter and wider than in Poemeniinae. The Pimplinae have an epicnemal carina on the mesopleuron, which the Poemeniinae do not always have (see Appendix for morphological terminology).

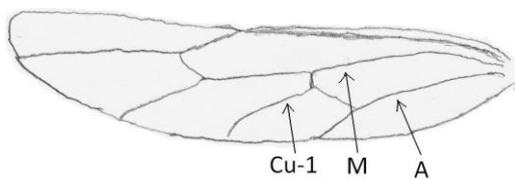


Fig. 1. Hind wing of *Poemeniinae*

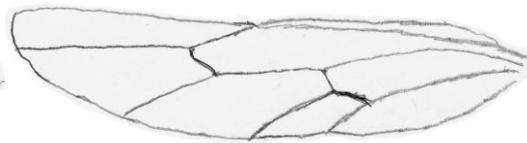


Fig. 2. Hind wing of *Xoridinae*

Currently, there are 11 Poemeniinae species recorded from Sweden, according to Fauna Europaea (Fauna Europaea Web Service 2004), divided into five genera, but there are most likely more species yet to discover. The aim of this study is to examine how accurate this information really is by examining museum specimens and recently collected material (from the Swedish Malaise Trap Project, see Karlsson et al 2005 Miller 2005) of the Poemeniinae. For instance, a previous species record can be the result of an error in identification made by the collector, which is not uncommon. Furthermore there is a possibility to find new Swedish species belonging to this subfamily, or even completely unknown Poemeniinae species.

2. Material and Methods

The specimens used for this study were gathered from the collections at the Swedish Museum of Natural History, Stockholm (NHRM), the Museum of Evolution, Uppsala University (ZMUU), the Museum of Zoology, Lund University (MZLU) and the material collected during the Swedish Malaise Trap Project. Materials from the museums were dry and mounted on pins, while the specimens from the Malaise Trap Project were contained in 96% ethanol.

All insects were examined with a dissection microscope with up to 40x magnification. All characters of all species were written down and then by determining the characters shared by genera and species the following key was constructed. For essential character names see Appendix.

3. Systematics

3.1 Common features

Sternaulus absent or very small. With or without glymma. Spiracle at or before mid length of petiole. Petiole straight or slightly bent. Propodeum with or without carina. Front tibia sometimes with small spines. Tarsal claws sometimes with apical tooth.

All species seems to be present in areas with wood-inhabiting hosts.

3.2 Key to the Swedish genera of Poemeniinae

- | | | |
|----|---|-----------------------|
| 1. | Clypeus without lobes or bi-lobed | 2 |
| - | Clypeus tri-lobed | Pseudorhyssa |
| 2. | Mandibles chisel shaped | 3 |
| - | Mandibles with two apical teeth | Poemenia |
| 3. | Upper half of temple coarsely scabrous (Fig. 3) | Neoxorides |
| - | Upper half of temple punctuated (Fig. 4) | Deuteroxorides |

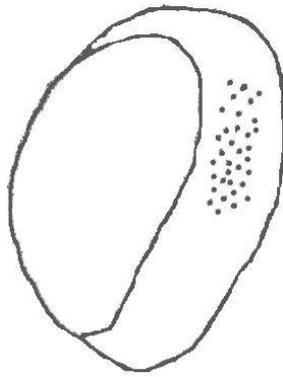


Fig. 3. Temple of Deuteroxorides

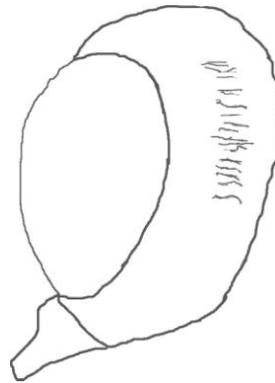


Fig. 4. Temple of Neoxorides

3.3 Genera

3.3.1 *Pseudorhyssa*

Key

- 1. Mandibles with two teeth
- Mandibles with one tooth

P. nigricornis

P. alpestris

***Pseudorhyssa nigricornis* (Ratzeburg, 1852)**

Specimens examined:

Museum collections: 1 female, coll. Marklin (ZMUU). *Swedish Malaise Trap Project:* none.

World distribution: Holarctic

Swedish distribution: Has, based on the specimens at Museum of Evolution, Uppsala University, probably been caught in Sweden before (most of Marklin's specimens are Swedish), location unknown.

Biology: Unknown

Description

Head: Mandibles with two teeth, equal size. Clypeus tri-lobed.

Mesosoma: Tarsal claws simple. Front tibia with one spur, the rest with two spurs.

Front wing: 3r-m present.

Hind wing: Cu1 closer to M than A.

Metasoma: Spiracle before mid length of petiole. Sternite ending at the same level as spiracle. Two carinae on top of petiole.

***Pseudorhyssa alpestri* (Holmgren, 1860)**

Specimens examined:

Museum collections: 1 female, no labels (MZLU). *Swedish Malaise Trap Project*: none.

World distribution: Holarctic

Swedish distribution: The specimen at Museum of Evolution, Uppsala University, is probably from Sweden.

Biology: The ovipositor is feeble and possibly unfit for drilling. The species has been observed to use oviposition drill holes made by *Rhyssella aproximator* to reach its host (Fitton, Shaw & Gauld 1988).

Description

Head: Mandibles with one tooth. Clypeus tri-lobed.

Mesosoma: Tarsal claws simple. Front tibia with one spur, the rest with two spurs.

Front wing: 3r-m present.

Areolet triangular.

Hind wing: Cu1 closer to M than A.

Metasoma: Spiracle before mid length of petiole. Sternite ending at the same level as spiracle. Ovipositor long. "V" shaped carina on second and third segment.

3.3.2 *Poemenia*

Key

- | | | |
|----|---|---------------------|
| 1. | 3r-m on fore wing present | 2 |
| - | 3r-m on fore wing absent | P. nonata |
| 2. | Clypeus weakly bi-lobed or not at all bi-lobed | 3 |
| - | Clypeus strongly bi-lobed | P. brachyura |
| 3. | Mesopleuron beneath fore wing insertion with obsolete rugose punctuate sculpture. Sternite covering 2/3 of petiole in females and 1/2 - 2/3 of petiole in males | P. hectica |
| - | Mesopleuron beneath fore wing insertion shiny and less punctuate. Sternite covering 1/2 of petiole | P. collaris |

***Poemenia nonata* (Holmgren, 1859)**

Specimens examined:

Museum collections:

Vstm:

Female, Kärrbo Solbacken 1969-06-26, coll M Idar (ZMUU);

Upl:

Female, Uppsala Stadsskogen 1976-06-28, caught on dead spruce, coll B.G. Svensson (ZMUU);

Swedish Malaise Trap Project: None.

World distribution: Holarctic

Swedish distribution: Has been caught in southern Sweden in areas with dead wood.

Biology: Has been caught probing the resin plugs made by *Passaloecus eremite* and *Passaloecus corniger* (Fitton, Shaw & Gauld 1988).

Description

Head: Mandibles with two apical teeth, the upper tooth smaller. Clypeus hairy, about twice as wide as long.

Mesosoma: Extensively red-marked. Front tibia with one spur, the rest with two spurs.

Tarsal claws simple.

Front wing: 3r-m absent.

2m-cu with two bullae.

Hind wing: Cu1 closer to M than A.

Metasoma: Spiracle before middle of petiole. Sternite ending at the same level as spiracle. Female: Small apical teeth ventrally on the apex of the ovipositor.

***Poemenia brachyuran* (Holdgren, 1860)**

Specimens examined:

Museum collections:

Vstm:

Female, Kärrbo Solbacken, 1980-07-14, coll M Idar (ZMUU);

Upl:

Female, Uppsala stadsskogen 1976-06-26, caught on dead spruce, coll B.G. Svensson (ZMUU);

Swedish Malaise Trap Project:

Sm:

Female, Trap 1000, Caught 2005-09-12, Nybro kommun, Bäckebo, Grytsjöns naturreservat, Old moisty haymaking meadow in forest edge.

World distribution: Holarctic

Swedish distribution: Has been caught in southern Sweden, one confirmed in areas with dead wood.

Biology: Unknown

Description

Head: Mandibles with two apical teeth, the upper tooth smaller. Clypeus hairy with two lobes, about twice as wide as long.

Mesosoma: Front tibia with one spur, the rest with two spurs. Tarsal claws simple.

Front wing: 3r-m present.

Hind wing: Cu1 closer to M than A.

Metasoma: Spiracle before middle of petiole. Sternite covering ½ of petiole. Female: ovipositor of median length.

***Poemenia hectica* (Gravenhorst, 1829)**

Specimens examined:

Museum collections:

Sm:

Female, Gårdsby s:n Gasslanda by, 1927-07-18, coll J.A.Z. Brundin (ZMUU);

Vstm:

Malec Vstm Kärrobo Solbacken 1969-06-?, coll M Idar (ZMUU);

Upl:

Male, Rosbokil, 1971-07-06, coll M Idar (ZMUU);

Male, Uppsala Näset 1971-06-21, coll M Idar (ZMUU);

Female, Uppsala Prediktstolen 1969-06-29, coll M Idar (ZMUU);

Female, Stavby Väsby 1978-06-24, coll M Idar (ZMUU);

Swedish Malaise Trap Project:

Boh:

Female. Trap 31, Caught 2004-08-11, O - Västra Götalands län, Stenungsunds kommun, Kolhättan (Ödsmål), Hällsberget, Stenungsund. Trapping, broad-leaved deciduous forest.

World distribution: Holarctic

Swedish distribution: Has been caught in the areas around Uppsala and few other localities in the southern Sweden.

Biology: Has been caught in areas with dead Angiosperm trees.

Description

Head: Mandibles with two apical teeth, the upper tooth smaller. Clypeus hairy, about twice as wide as long.
Mesosoma: Black. Reds redish or yellowish (Dry, pinned). Front tibia with one spur, the rest with two spurs. Tarsal claws simple. Mesopleuron beneath fore wing insertion punctuated sculpture.
Front wing: 3r-m present, areolet closed
2m-cu with two bullae
Hind wing: Cu2 closer to M than A
Metasoma: Spiracle before mid length of petiole. Female: Sternite covering 2/3 of petiole. Male: Sternite covering 1/2 - 2/3 of petiole. Female: Ovipositor long with ventral apical teeth

***Poemenia collaris* (Haupt, 1917)**

Specimens examined:

Museum collections: Female, coll. Marklin (ZMUU).

Swedish Malaise Trap Project:

Sm:

Female. Trap 1008, Caught 2006-07-10, Nybro kommun, Alsterbro/Alsterån, Mixed forest.

World distribution: Holarctic

Swedish distribution: Has been caught in Småland.

Biology: Has been found on dead tree containing nests of *Passaloecus eremite* (Fitton, Shaw & Gauld 1988).

Description

Head: Mandibles with two apical teeth, the upper tooth smaller. Clypeus hairy, about twice as wide as long.
Mesosoma: Front tibia with one spur, the rest with two spurs. Tarsal claws simple. Mesopleuron beneath fore wing insertion shiny and less punctuated than in *P. hectic*.
Front wing: 3r-m present.
2m-cu with two bullae
Hind wing: Cu1 closer to M than A
Metasoma: Spiracle before mid length of petiole. Sternite covering about half of petiole. Female: ovipositor long.

3.3.3 *Neoxorides*

Key

1. Propodeum: Area between the spiracle and

- the end with a distinct carina
- Propodeum: Area between the spiracle and the end without or weak carina

N. Varpies

N. Collaris

***Neoxorides varpies* (Holmgren, 1860)**

Specimens examined:

Museum collections: Male, collector unknown, location unknown (ZMUU).

Swedish Malaise Trap Project: None.

World distribution: Holarctic

Swedish distribution: Has, based on the specimens at Museum of Evolution, Uppsala University, probably been caught in Sweden before, location unknown.

Description

Head: Mandibles chisel shaped without teeth. Upper half of temple coarsely scabrous. Clypeus small, about 1.5 as wide as long.

Mesosoma: Front tibia with 1 spur, the rest with 2 spurs. Tarsal claws simple.

Mesocutum strongly trilobed.

Fore wing: 3r-m absent

2m-cu with two bullae

Hind wing: Cu1 closer to M than A

Metasoma: Spiracle at 1/3 of petiole. Sternite covering 1/3 of petiole.

***Neoxorides collaris* (Gravenhorst, 1829)**

Specimens examined:

Museum collections:

12 females and 10 males collector unknown, location unknown.

Swedish Malaise Trap Project:

Sm:

Female, Trap 1008, Caught 2006-07-22, Nybro kommun, Alsterbro/Alsterån, Mixed forest.

World distribution: Holarctic

Swedish distribution: Has been caught in Sweden before, location unknown.

Description

Head: Upper half of temple coarsely scabrous. Mandibles short, chisel shaped without teeth. Clypeus small, about 1.5 as wide as long.

Mesosoma: Front tibia with one spur. The rest with two spurs. Tarsal claws simple.
Mesocutum strongly trilobed.
Front wing: 3r-m absent,
2m-cu with two bullae.
Hind wing: Cu1 closer to m than a, often do not reach edge of the wing.
Metasoma: Spiracle at 1/3 of petiole. Sternite covering 1/3 of petiole.

***Neoxorides nitens* (Gravenhorst, 1829)**

I was not able to find any specimens of this species caught in Sweden. The following description is based on a specimens from the Swedish Museum of Natural History, Stockholm. However, according to Fauna Europaea, it has been caught in Sweden before.

Specimens examined:

Museum collections: Female, collector unknown, location unknown (NHRS).
Swedish Malaise Trap Project: None.

World distribution: Holarctic

Swedish distribution: Unknown

Head: Upper half of temple coarsely scabrous. Mandibles chisel shaped without teeth.
Yellow edges between eyes and forehead.
Mesosoma: Front tibia with one spur, the rest with two spurs. Tarsal claws simple.
Mesocutum strongly trilobed.
Fore wing: 3r-m absent
Hind wing: Cu1 closer to M than A.
Metasoma: Spiracle at 1/3 of petiole. Sternite covering 1/3 of petiole.

3.3.4 *Deuteroxorides*

***Deuteroxorides elevator* (Panzer, 1799)**

Specimens examined:

Museum collections:

Vstm:

Female, Kärrobo Solbacken, 1980-07-14, Collector unknown.

Swedish Malaise Trap Project:

Öl:

Female, Trap 22, Caught 2006-06-28, Hö – Öland, Mörbylånga kommun, Gamla Skogsby (Kalkstad), "diversitetsängen", Gamla Skogsby, diversitetsängen trapping, meadow w. bushes;

Sm:

Male, Trap 1001, Caught 2005-07-12, Sm, Nybro kommun, Bäckebo, Grytsjöns naturreservat, Old aspen forest in boulder terrain;

Female, Trap 1008, Caught 2006-06-28, Sm, Nybro kommun, Alsterbro/Alsterån, Mixed forest.

Ög:

Female, Trap 15, Caught 2005-07-05, Ög, E – Östergötlands län, Ödeshögs kommun, Omberg, Storpissan, Storpissan trapping, old Norway spruce wood;

Sö:

Male, Trap 3, Caught 2004-08-11, Sö, AB – Stockholms län, Haninge kommun, Tyresta, Urskogsslingan, hållmark, Urskogsslingan, hållmark trapping, flat-rock pine forest;

Dr:

Female, Trap 10, Caught 2003-07-21, Dr, W – Dalarnas län, Sätters kommun, Säterdalen, Näsåkerspussen, Säterdalen trapping, alder wood ravine;

World distribution: Palearctic

Swedish distribution: Forrest areas in the southern and middle parts, based on the specimens caught in the Swedish Malaise Trap Project

Description

Head: Mandibles chisel shaped without teeth. Upper half of temple punctuated. Clypeus concave and bi-lobed

Mesosoma: Female: Tarsal claws with apical tooth on front and middle legs, hind leg without tooth. Male: Tarsal claws simple. Front tibia with one spur, the rest with two spurs.

Front wing: 3r-m absent,

Hind wing: Cu1 closer to M than A.

Metasoma: Spiracle before mid length of petiole. Sternite covering 2/3 of petiole.

3.3.5 *Podoschistus*

***Podoschistus scutellaris* (Desvignes, 1856)**

Specimens examined:

Museum collections: None. *Swedish Malaise Trap Project:* None.

World distribution: Holarctic

Swedish distribution: Unknown

Description (based on Fitton et al. 1988)

Fore wing length 5.4-12.5 mm. Main sculpture of dorsal half of temple consisting of large, uneven, scale-like ridges. Ovipositor-hind tibia index 2.0-2.3. Mainly black with scutellum and postscutellum yellow marked, legs reddish to yellowish, hind tibia and tarsus infuscate; male face yellow.

Comments

This is supposed to be a Swedish species according to Fauna Europaea. It has not been examined by me, since I was unable to find specimens of it. The description was published in Fitton *et al.* (1988).

4. Discussion

Before I started my study, 11 species of Poemeniinae had been recorded from Sweden. However, based on the collections I examined, I could only confirm the presence of six of these in the country. For two species, I could not find any specimens at all. Three other species were represented solely by old specimens, which could possibly be Swedish but might also come from other geographical regions.

The specimens from the Swedish Malaise Trap Project belonged to five species representing four of the species that were definitely known previously to be Swedish, and one species (*Poemenia collaris*), which was previously represented only by doubtfully Swedish specimens in existing museum collections.

Among the specimens I studied, I also found two females, caught in Tyresta (Swedish Malaise Trap Project, Trap nr. 3), which I were not able to identify. They had all the common *Neoxorides* characters except the coarsely scabrous temple, which is one of the characters that all *Neoxorides* species are supposed to share. The temple was not punctuated either, like in *Deuteroxorides*, it was smooth. There is no description of this species in the various English and Swedish handbooks I have read. This can very well be a new species for Sweden and maybe even an undescribed species. In order to confirm this, more literature and museum collections from similar habitats must be studied, e.g. from Russia, Japan and USA.

My results show that for a poorly studied group like the Poemeniinae, previous records from Sweden cannot necessarily be trusted and even a relatively small material, such as the one I examined from the Swedish Malaise Trap Project, is likely to contain species that have not been found in the country before.

Judging by the location of the traps used in the Swedish Malaise Trap Project where Poemeniinae have been caught, it seems like they are more common in the southern and middle parts of Sweden than in the northern part. Also, as mentioned earlier, they seem to be more common in wooded areas. This was also stated by Fitton, Shaw & Gauld (1988). I was unable to acquire information about the amount of dead timber in the trap areas, however since the traps are located in wooded areas there should be enough dead wood for the host species to breed.

Swedish Poemeniinae seem to be more common in summer and early fall, since all specimens I studied were collected between June and September. This also seems likely due to the fact that it is the same time period in which many wood-inhabiting insects are active.

The material I examined came from a small number of catches from the Swedish Malaise Trap Project. It would be interesting to study a larger sample to see if even more specimens representing potentially new species could be found. Also, there is a need for more studies of the ecology of the Swedish poemeniines.

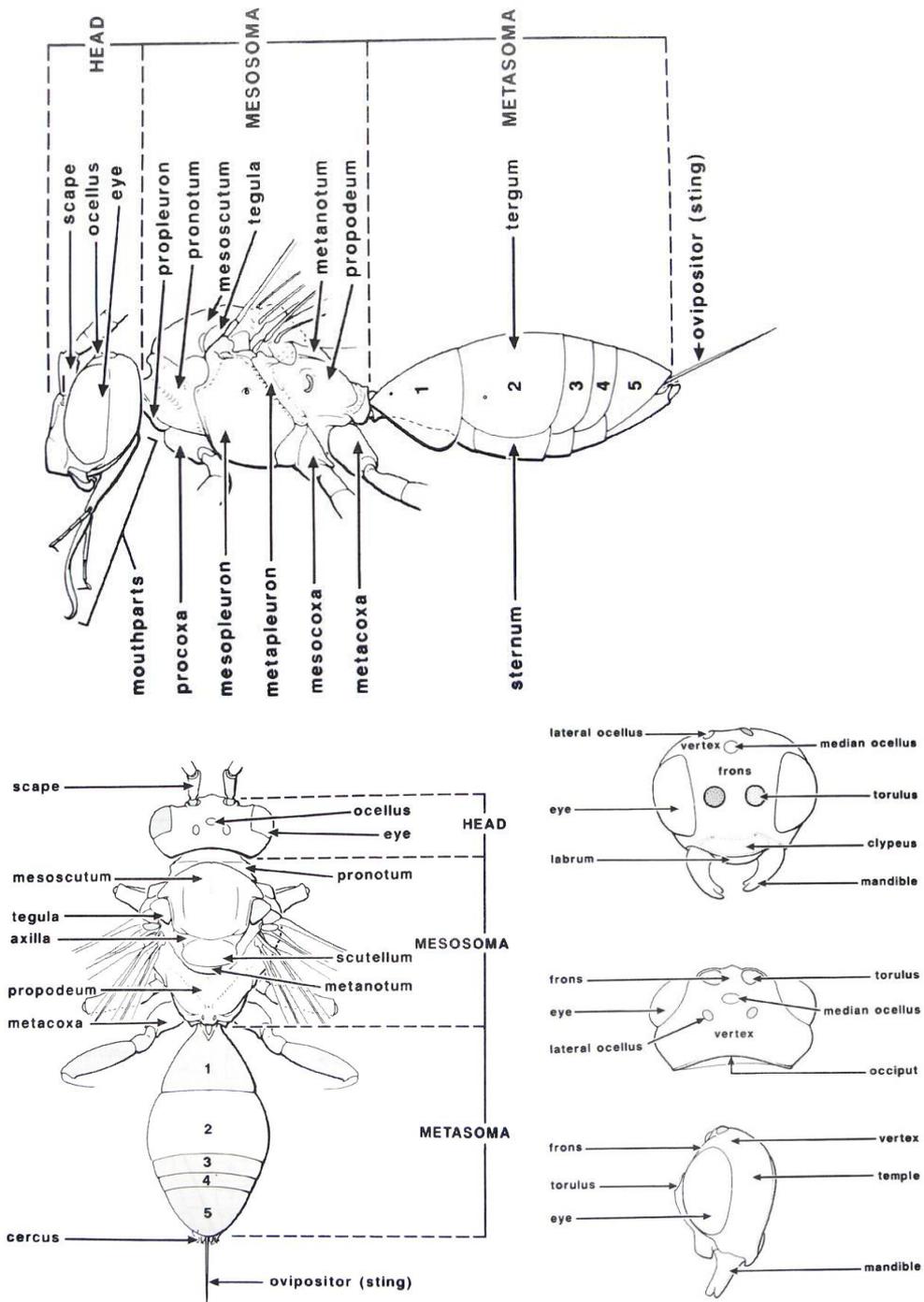
5. Acknowledgements

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7. Appendix. Morphological Terminology



Pictures published in Hymenoptera of the World: An Identification Guide to Families (Goulet & Huber 1993)