Studies on Psectra diptera Burm. (Neuroptera, Hemerobiidae).

By
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With one plate.

In 1932 I got an opportunity of studying some specimens of Psectra diptera Burm., kindly lent to me by Mr Wolter Hellen, Helsingfors. Though this very scarce and highly interesting species has been the object for several papers, dependent especially upon the interesting dimorphism in wing-development, my studies have given some results which I have found worthy of being placed on record.

While Hagen (3) and Mac Lachlan (7) considered the form with rudimentary hindwings (below dealt with as dipterous) to represent the ♂, Banks (2) maintained the opinion that this form represented the ♀. Later on Albarda (1) and Mac Lachlan (8) brought forward the question whether two distinct species were to be dealt with, a four-winged one and a dipterous one. Mjoberg (9), on the contrary, stated that dimorphism occurs in both sexes and that the four-winged and dipterous specimens belong to the same species. He gives a sketch of the ♀ abdominal end. Lackeschewitz (6) emphasizes that the proofs given by Mjoberg for his statements are less convincing, and gives sketches of the dried abdominal end of the single specimen known from East-Balticium, one dipterous ♂. None of these authors have tried to give full descriptions of the genitalia, and the sketches mentioned are drawn from dried material and without value.

More recently Killington and Kimmins (4) made the ♂-genitalia to the main object for a paper on the species. Their study was based on two dipterous British males. They have, however, not been quite successful, dependent upon the fact — as they have informed me — that their study could only be made from undissected material (though of course treated in KOH). It is very difficult, indeed, to get a sure apprehension of the details without dissecting out the different parts from one another.

The following specimens have been studied by me: 1 ♂, dipterous, from Finland, leg W. Hellen; 1 ♂, four-winged, from Finland, leg W. Hellen; 1 ♀, dipterous, from Karislojo, leg J. Sahlberg.

Mr Hellen has, upon my request, kindly examined the other specimens of the Helsingfors Museum and has informed me that they represent mere ♂♂.
I am greatly indebted to him for this information, for the valuable loan of the above specimens, and especially for the permission to dissect the abdomina.

In Swedish collections only the following specimens seem to exist: 1 ♂, four-winged, from Östergötland, leg. BOHEMAN, 1 ♂, four-winged, from Västergötland, leg. BOHEMAN, 1 ♀, dipterous, from Stockholm, leg. BOHEMAN, all in the Natural History Museum of Stockholm. (The specimen from Skåne, Färhult, recorded by WALLENGREN (10) does not exist in his collection and seems neither to have been there, for there is no pinhole behind the species label, and the example from Östergötland, Skedevi, recorded by KLEFBECK (5) and by him presented to the Swedish Station for Agricultural Research seems to have been lost).¹

After having studied the above-mentioned Finnish ♂♂ and having found the both forms to be in all genital details identical, I am able to verify MJÖBERG’s statement, that the four-winged and dipterous specimens belong to the same species. It rests, however, to be proved, if the ♀ also occurs in both conditions. The only ♀♀ seen by me are the above-mentioned two ones, both dipterous. By the way, it is no easy matter to separate the sexes from dried material, for in this genus the stature of the abdomen is in both sexes similar, thick and female-like, and the appendages of the ♂ are relatively small and little prominent. I think we have better not to take MJöberg’s statement of four-winged females for good without proof.

The reduced hindwing of the dipterous specimens shows an interesting shape, and has — as far as I know — never been satisfactorily figured. After treatment in KOH the mounted wing appears as shown in Fig. 1, Pl. I. Of special interest is a sharp and stiff bristle, which arises from the base of the fore-margin and which has some resemblance to the frenulum of the Lepidoptera. Its basal part appears as a thick vein. The veins are else very indistinct and impossible to homologize with certainty, until a study of the venation of the pupal stage has been done.

The abdominal structures show that the species is a very specialized one.

The tergits and sternits 1—7 are reduced in size and the pleural region is thus exceptionally large. In the ♀ the intersegmental membrane between the tergits 3—4 and 4—5 is very broad. The 1st segment is in both sexes reduced into narrow structures. The sternits 2—4 have each a transverse list in the middle-line.

♂. 8th tergit normally developed. 9th tergit in its lower part drawn out into a relatively large backwards-inwards-upwards directed appendage, which ends acute and on its hindmargin before the apex bears two long hairs. 9th sternit small, distally rounded. Penis and parameres fused into an aedeagus

¹ When this paper was in the press I had an opportunity of examining another Swedish specimen, one dipterous ♂ from Skåne, Fjelkeståd, Råbelöv, 1. VII. 1935, leg. H. LOHMANDER (in Nat. Hist. Mus. Göteborg).
Explanation of plate.


Abbreviations:

ae = aedeagus
 cx = gonocoxites
gs = gonarcus
hy = internal hypandrium
mu = mediuncus
pa = parameres
sa = superior appendages
spm = spermatheca

1 — 9 = 1st — 9th tergits
I — IX = 1st — 9th sternits
of relatively large size. The shape of this structure is shown in fig. 6 and 7. Internal hypandrium large, cf. fig. 4, 13, 14. The gonarcus, fig. 10—12, forms a stout, dark pigmented arch, bearing a short mediuncus but no inferior appendages. In dorsal view there appears before the mediuncus a membranous area. In lateral view the mediuncus appears as a large blunt tooth. The superior appendages are formed as a pair of convex, rhomboidal plates, which in their lower margin are drawn out into a rounded appendage, which is dark pigmented and in its distal part bears a row of strong and relatively long, pale lamellae. Cercal callus small. Trichobothria relatively large and distinct. In the dipterous ♂ there are 6 on the right and 5 on the left callus; in the four-winged ♀ there are 5 on the right and 6 on the left callus. Spiracles 7 pairs, placed in the pleural regions of segment 2 to 8 respectively.

♀. The 8th tergit is prolonged downwards and reaches somewhat below the respective spiracle, which is placed in its hindmargin. The 9th tergit is very large, and on each side it is divided, so that it is composed by a dorsal part, the lower ends of which are acute, and two lateral parts, one on each side. These latter parts are relatively broad and overlap the lower part of the superior appendages. Of the gonapophyses -pairs only the lateral gonapophyses (gonocoxites) are present, and these form a pair of large and relatively broad blades, reaching from the under surface of the abdomen up to about the middle of the superior appendages. They carry no styles. A distinct spermatheca is present; its shape is shown in fig. 17. The superior appendages form two convex blades. These are rhomboidal with smoothly rounded lower margin and hindmargin. Their upper corner is very prominent. There are 7 trichobothria on the left, 6 on the right cercal callus.

The structures of as well the ♂ as of the ♀ seem to me to show, that the genus is a very specialized one. It forms, no doubt, the most caenogenetic representative of the palaearctic Hemerobiidae. Its nearest allied of the palaearctic genera seems to be the genus Micromus, but the affinity with this genus is very remote.

In Micromus a subgenital plate is present in the ♀ and the 9th tergit is not divided in such a manner as in Psectra. In the Micromus ♂ the 9th tergit is less specialized, not forming any backwards directed appendages, and the parameres are only partly togethergrown (proximally).

I am not aware of any genus of the family in which the 9th tergit of the ♂ is specialized in a similar manner as in Psectra. The development of the same tergit of the ♀ is doubtless a characteristic of great specialization, but, it is also found in the genus Sympherobius. This latter genus is else of a more primitive type; a subgenital plate is present in the ♀ and the gonocoxites carry small but distinct styles (a very primitive character, among the Hemerobiidae known to me else only present in the genus Neuronema).
The presence of only 7 pairs of abdominal spiracles seems also to be a matter of interest. I have recognized 8 pairs in all other Neuroptera, hitherto examined by me, but in Psectra I have in vain tried to find the pair of the reduced 1st segment. Evidently also a degree of specialization.

**Literature references:**


**Für die Fauna Finnlands neue Ichneumoniden (Hym.).**

*I. Ichneumoninae*

Von

Wolfert Hellén


Gleichzeitig sage ich Herrn Dr. A. ROMAN (Stockholm), der mir gültigst durch Literaturhinweise, Kontrolle einiger kritischen Arten und Angaben über finnländische Schlupfwespen aus seiner eigenen Sammlung geholfen hat, meinen besten Dank.

Zerstreute Mitteilungen über einheimische Schlupfwespen gibt es in bedeutender Menge besonders in den Zeitschriften Medd. Soc. F. Fl. Fenn. und
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