

## The European Trichogramminae

by

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Taschenberg writes in his book „Die Hymenopteren Deutschlands“ (Leipzig 1866), that when reading through this work everyone will get the firm conviction that those who feel inclined to collect Ichneumon flies should not begin with the Chalcids or the Proctotrypids, and further, that he who offers these small insects any interest, must not be a beginner. This last remark must chiefly refer to the Proctotrypids, as Taschenberg himself does not treat this group but simply refers to four works which the collector can study. However, it may be that, if Taschenberg had written his book in 1918, he would perhaps have treated the Proctotrypids and only used his above remarks with regard to the Chalcids, as the Proctotrypids can now to a great extent be worked out with the help of the published literature now in view whilst it is certain that many years will pass before the Chalcids are classified, and especially the last group of this family, *Trichogramminæ*, as our knowledge here is quite in embryo and most probably more than a century will go before we have any idea of the number of species in the group.

The present work on the European Trichogramminae will show what an enormous material, for example, must be found in the tropics, as when a single collector who has also been engaged with other branches of Entomology, in so small a field as North Seeland has been able to

discover more than twenty species, it is a matter of course that more favourable zones than ours must be exceedingly rich in these species, as well as all others.

With regard to the literature of the present day, this is much more extensive than when Taschenberg wrote his little book, but nevertheless it is not at all easier, by means of the help it offers, to work out the boundless wealth of the *Chalcididae*.

Schmiedeknecht: *Chalcididae* (in *Genera Insectorum*: Bruxelles 1909) and Ashmead: *Classification of the chalcid Flies* (Washington 1904) only name the genera and even then in a very incomplete manner, as thus neither of these two authors refer to Aurivillius' Genus *Oophthora* with a single word. The reason is most probably that the paper on the *Oophthora* is published in the Swedish „Entomologisk Tidskrift“, a very discouraging result of publishing articles in scientific periodicals of the small Nationalities.

However, to start to write on all the *Chalcididae* in a single book or by a single author must be considered as quite hopeless at the present time. Otherwise than to follow Mayr's example in his work „Die Europäischen Encyrtiden“ is not possible. This work will in times to come be well worthy of being taken as a model by all future workers on the *Chalcididae*. When later on at some distant future time all the Genera of the *Chalcididae* are worked out as thoroughly as some of the European ones are, it will be time enough to make a systematic work on the *Chalcididae*. We who live now, may only hope to be able to assist by bringing stones to this great structure, and it this present addition to our knowledge of the group, will form one of these stones, I shall be more than repaid for the work I have had for years in collecting the present material.

After finding my first specimen of a trimerous Chalcid, *Trichogramma evanescens*, Juni 1902, in the act of depositing its eggs on the eggs of *Sialis lutaria*, I have felt the want

of a work that could give me some insight into the species I have found in numbers in the course of years. The first that gives a collected review of the Chalcididae is Förster, who in his „Hymenopterologische Studien“ part II. Aachen 1856 p. 87 gives a table of the genera of Trichogrammidæ; but he hardly mentions the species, and of those few he does mention, the description is so poor that it is hardly possible to recognize them. In Ashmead's above mentioned work as well as in that of Schmiedeknecht the genera found since Förster's time are recorded as far as Europe is concerned. Aurivillius gives in the Entom. Tidskrift Stockholm 1897 p. 251—53 a table of genera including his own new genus *Oophthora*, but neither he touches the species.

Finally in the Transactions of the American Entomological Society Vol. XXXVII 1911 p. 1—42 and p. 43—83, Girault gives information and descriptions of numerous new genera and species, but the work hardly touches the European species. Claude Morley, Catalogue of the British Hymenoptera London 1910 only mentions three genera with four species of the Family *Chalcididae* as found in England.

On the other hand Max Wolff, Eberswalde, in „Zeitschrift für Forst- und Jagdwesen, XLVII Jahrgang. Achtes Heft 1915. p. 474—497 and 543—568, gives a review of the European Trichogramminæ. This work contains really something of interest for collectors here in Europe, and although the war has evidently placed various obstacles in Prof. Wolff's way, it contains so much information, that it must be considered the best that has appeared since Förster 1856. This work has made it possible for me to recognize Förster's genus *Centrobia* and also made it possible to get some idea of what *Ophioneurus* looks like. It is only a great pity that the excellent work of this author has been published in such a strange place as the periodical mentioned, which is so badly got up, as there is no doubt that it will be greatly used in the future.

With regard to the systematic position of the *Trichogramminæ*, the original authors such as Walker or Westwood, did not put any importance in the fact that they only had three joints in the tarsi, and therefore placed them together with *Eulophus*. Förster is the first who proves the systematic importance of joints of the tarsi, and he is the first to acknowledge that the species with the three jointed tarsi form a well separated group, as well as the primary division of the group into two sections according to the pubescence on the wings, which is still maintained.

Ashmead writes (l. c. p. 359), that the *Oligositini* very much resemble certain species of the *Eulophinæ*, especially with regard to the hairs on the wings. When considering the thousands of the *Trichogramminæ* I have had in my collecting tubes in the course of the years, I find it difficult to follow this remark, as these insects are so characteristic in their appearance, that they cannot be confounded with others. It is nearly always possible to distinguish them with the naked eye, and a quite low power lens will at once disclose their identity. The only mistake I make now and then, with the naked eye, is to take an *Aphelinus* for a *Trichogramminæ*, but a lens will at once reveal the fact, and all the large quantity of specimens of which my collection consists, have been taken out of my net without the assistance of a lens.

Great difficulties are experienced in collecting most of the species of these small Chalcid-flies, it being naturally easiest to get those species whose host is known, but unfortunately so very few of the hosts are known. A systematical collecting of insect eggs would doubtless give a wonderful result, and especially those eggs laid on or in low plants. But how often are such eggs found? I have tried myself, by lying down in the grass at a spot where I was sure that many of these Chalcid flies occurred and for hours searched in such places, but always in vain.



Our knowledge as to how the other insects place their eggs, as well as to what cutting apparatus they have to place their eggs with etc. is too poor. That these eggs are well concealed is evident from the antennæ of the imagines, which are provided with quantities of sense organs, sense-hairs, sense spots and the like. And when considering that these insects are so amply furnished, it is not surprising that the human eye is unable to discover the eggs. The long ovipositor of many of the species also tends to the belief that the eggs are laid deep in the texture of the plants. But by degrees as the biology of these small Hymenoptera becomes better known it will be proved that they are not nearly as rare as was originally supposed.

Thus at the present time, certain species are only taken singly in very widespread localities, others only singly in localities of the size of a few square meters, and again some few in only a single specimen at quite accidental spots. One species, *Trichogramma evanescens*, on the other hand is to be found at all small ponds etc. when it is discovered that it preys on the eggs of *Sialis*, *Stratiomidae*, *Chrysops*, *Aterix* and *Tabanus* as well as *Nonagria* (?). That all the species attack eggs is not very probable, as it is well known that the *Encyrtidæ* chiefly attack *Coccus*, but at the same time certain species attack also Lepidopterous larvæ, and thus no doubt it will be proved to be the case with the *Trichogramminæ* that certain of these species deviate from the rule of attacking the eggs.

Most of the species, however, are only to be taken with the sweepnet; but at this work two great difficulties present themselves, the first being that the species are so extremely small that it requires a very trained eye to discover them and next that they live in the grass most probably at the very bottom, for which reason with a single sweeping very little results. The best means is to use a large sweep net; mine is 1 meter deep and 1,2 meter in

circumference, the bag being made of coarse linen, with the corners rounded and the seams carefully sewn so that the small insects cannot hide there. The locality should preferably be a sunny opening in a wood, the banks of a road through a wood, a highly lying meadow or some similar place. The vegetation must be somewhat low, a meadow in a forest with high grass gives nothing before the hay is made. I am of the opinion that it is due to the high grass that the best time for collecting is after the middle of July. Certainly the insects emerge late in the summer but as they have to lay their eggs at the same time as the greater part of other insects they ought to be able to be found in the early summer also if they were not hidden by the grass.

Both *Ophioneurus* and *Trichogramma* can be taken at their breeding places from the end of May, but the host of these two species lives above the grass too. When a suitable place is found where it can be expected to make a catch, the ground must be swept backwards and forwards, again and again on the same strip. I have often swept the same 200 meter bank four to five hours. After having swept for about five minutes you can sit down and without any fear leave the net open.

All the large insects will quickly run out, but the small species cannot release themselves from the coarse linen or the seed and sweepings that are in the net. In the beginning of August it can be very troublesome at times with the quantities of grass seeds. However, it must be gone through, the net and contents must be minutely examined, when now and then a *Trichogramminæ* can be seen labouriously working its way through the thick forest of leaves & dirt. Once the eye catches one, it is easy enough to take, it is only necessary to place a narrow glass tube over it. (I use a tube from a Laktoscope about 15 cm long). Having had so much work to get free of the dust etc. it comes as a great relief to get on to

the smooth surface of the glass, and it at once runs up. If a glass is used, as I have described, at least ten specimens can be taken in it before they attempt to find their way out, when taking a new specimen.

Great patience is required both with sweeping and examining the net. A hurried look gives nothing, a careful examination of 10 to 15 minutes gives one or two specimens. As the specimens are caught in glasses that cannot contain poison, they must always be brought home alive, which in itself can be an advantage if the living specimens should be examined. I preserve my specimens in small glass tubes ( $40 \times 10$  mm) in  $12^0$  (75%) spirit, which gives the advantage that they do not become stiff. These small tubes, which are closed with good corks, are then placed in a large glass bottle with ground glass stopper, making it easy to renew the spirit. The wings, antennæ etc. necessary for drawing, are prepared in canada balsam. To make a collection of such minute insects, set on card, is quite hopeless; they would in most cases be completely drowned in the gum, pubescence destroyed and the abdomen shrivelled so that an idea of what the originally looked like is impossible. To sketch the specimens would also be out of the question, as it is only possible to obtain absolute accuracy when for example the wings are laid quite flat. Even a superficial microscopical examination is only made with difficulty when only mounted specimens are at hand.

Some of the species are most probably bound to one special host, whilst others attack various hosts as previously mentioned with regard to *Trichogramma*, but unfortunately very little is known on this point. Similarly how many parasites can live in a single host is neither clear. I am of the opinion however, that with the case of *Trichogramma* on the eggs of *Sialis* only one is bred from each egg as is most probably the case with *Ophioneurus signatus* on the eggs of *Rhynchites betulæ*, but on the other hand

I have bred up to thirteen *Trichogramma* from one Lepidopterous egg. I have experimented by letting a *Trichogramma* female lay its eggs on the eggs of *Palomena prasina* L. The female was very willing to lay, but the result was that the *Palomena* eggs shrivelled in and died and only one single gave a large deformed *Trichogramma*, which died almost immediately after it emerged. I have also made the same experiment with a large number of the eggs of *Macrothylacia rubi*, with some female *Trichogramma*. They apparently had no difficulty whatever in cutting a hole in these eggs, which could be supposed to be of a very strong texture, but the result was negative, all the young *rubi* larvæ hatched and although they were kept in confinement a long time showed no sign of having been attacked. It may be, however, that the parasite laid its eggs too late as the *rubi* larva hatched a couple of days later. I am of the opinion, however, that if it could be managed to get a species to lay its eggs on another host than the usual and healthy specimens resulted, these would get their antennal reactions altered as to be able to attack this new host. This would have its importance in an economical respect.

When the specimens emerge they are often fully developed at once, no time being occupied after emerging for developing or drying the wings etc. I have sometimes seen as many as eight female *Trichogramma* on a bunch of *Sialis* eggs in the act of depositing their eggs, which confirms the fact that when breeding the specimens do not belong to one brood, thus accounting for the reason why they pair immediately after emerging, which never takes place with individuals of the same parents, a case I have often had opportunity to observe.

With regard to hibernation, nothing is known to me. Some species as already mentioned are to be found from early summer to far into the autumn in certain localities, but of where they then go and where they hide themself-

ves till the following spring I can only make suggestions having no evidence to go upon. Most probably a number of species pass the winter as larvæ or fully developed imagines of the last generation of a year, in the eggs of their host, but nevertheless the possibility that the imago hibernates in the cracks of bark or similar places is not excluded. To discover these minute insects in their winter quarters is by no means easy and if at any time this point is made clear it will no doubt be discovered by pure accident. Personally I am most inclined to believe that the winter is passed in the eggs of the host.

At present the life history is known only of *Poropoea* (Silvestri: Boll. Portici 1909), *Trichogramma* (Silvestri: Boll. Portici 1909; Gatenby: Quart. Journ. Micr. Sci. 1917) and *Prestwichia* (Henriksen: Ent. Medd. XII 1918).

Very little is published with regard to the anatomy of these insects. Aurivillius, l. c. p. 253, remarks that the muscles of the thorax in *Oophthora* reach far into the abdomen. They have, however, proportionally long wings and it is only natural that the muscles to move these large instruments if movement must be very powerful as well as the corresponding Postphragma being strong and inclined into the abdomen. This can also be observed with several other species when highly magnified and by the aid of falling light. Drawing No. 1 in Aurivillius gives a very good view of how these muscles appear. The exterior of these insects offers nothing unusual when compared with the other Chalcids. The mandibles are, as far as I have been able to see, always provided with three teeth, the outer and the median tooth are acute and distinctly chitinated and the inner one rather indistinct. Maxillary palpi always two jointed, with a long hair on the basal joint. Tarsal joints and feet generally speaking uniform in the whole group (see Figures).

Sometimes it is exceedingly difficult to distinguish the sexes, and very often the only means is by examining the

underside of the apex of the abdomen, becoming always necessary with those species where the female is not furnished with an extended ovipositor. A difference is to be found between the hairs etc. of the antennæ in some species, but they are so insignificant that they cannot be observed with the naked eye.

With regard to the division of the group into *Trichogrammini* and *Oligositini*, this was introduced by Förster, as previously mentioned, and has since been retained, but it is to be seen that several species of the genus *Oligosita*, which belong to the latter, and which should be distinguished by the uniformly distributed pubescence on the wings, have as a fact the pubescence arranged in rows, so that this character is no longer of importance as a means of separating the groups. It is to be supposed that in a near future, it will be necessary to revert to other characters than the pubescence on the wings to make a rational division of these groups.

#### Table of Genera.

##### A. Winged forms.

1. Surface of anterior wings from stigma to outer edge strongly haired, and the hairs or most of them arranged in regular rows. Fringe short or at all events not as long as half of wing at broadest. Antenna 5–9 jointed (*Trichogrammini*) . . . . . 2.  
Surface of anterior wings sparingly haired from stigma to outer edge, hairs not without a certain regularity. Fringe very long, longer than half of wing at broadest. Antenna 7-jointed. (*Oligositini*). . . . . 8.
2. Surface of wings from stigma to outer edge strongly haired with thick hairs, placed without any regularity (NB. *Asynacta*)  
Fringe short. Antenna 7–9 jointed (*Brachistini*) . . . . . 9.
2. Marginal vein not reaching costal margin . . . . . *Poropoea* Forst.  
Marginal vein reaching costal margin . . . . . 3.
3. Radius by being produced out on the surface of the wing forming a regular arch . . . . . *Trichogramma* Westw.  
Radius not forming a regular arch . . . . . 4.
4. Anterior wings with short fringe . . . . . 5.  
Anterior wings with longer fringe. . . . . 7.

5. Antenna 5 jointed (scape, pedicellus, 1 anellus, 1 funiculus, 1 jointed club) . . . . . *Chaetostrichella* Girault.  
Antenna more than 5 jointed, with 3–6 jointed club. . . . . 6.
6. Antenna 8 jointed (scape, pedicellus, 1 anellus, 2 funiculi, 3 jointed club) . . . . . *Centrobia* Först.  
Antenna 9 jointed (scape, pedicellus, 1 anellus, 6 jointed club) . . . . . *Ophioneurus* Ratz.
7. Antenna 7 jointed (scape, pedicellus, 1 anellus, 4 jointed club . . . . . *Lathromeris* Först.  
Antenna 7 jointed (scape, pedicellus, 1 anellus, 1 funiculus, 3 jointed club) . . . . . *Chaetostricha* Hal.
8. First joint of antenna half as long as the whole antenna . . . . . *Prestwichia* Lubb.  
First joint of antenna shorter than or as long as the club . . . . . *Oligosita* Hal.
9. Antenna 7 jointed (scape, pedicellus, 1 anellus 1 funiculus, 3 jointed club) . . . . . *Brachista* Hal  
Antenna 9 jointed (scape, pedicellus, 2 anelli, 2 funiculi, 3 jointed club. . . . . *Asynacta* Först.

#### B. Subapterous forms.

1. Scapus half the length of the whole antenna . . *Prestwichia* Lubb.  
Scapus as long as the club . . . . . *Chaetostricha* Hal.

#### C. Wingless forms.

1. Antenna with 3 jointed club . . . . . *Prestwichia* Lubb.  
Antenna with 1 jointed club . . . . . *Trichogramma* Westw.

## TRICHOGRAMMINI.

### *Poropoea* Förster.

- 1851 *Poropoea*. Förster, Verh. Nat. Ver. Preuss. Rheinl, VIII p. 28.  
Tab. 1. Fig. 10. a–e.
- 1852 *Ophioneurus*. Ratzeburg. Ichneumon d. Forst. III p. 196. \*
- 1858 *Trichogramma*, Reinhard. Berlin ent. Zeit. II 1858 p. 16. n. 44.
- 1878 *Ophioneurus* Thomson. Hym. scand. V. p. 299.
- 1897 *Poropoea*. Aurivillius. Ent. Tidsskrift p. 251.
- 1898 *Chaetostricha*. Dalla Torre Cat. Hym. Vol. v. p. 1.
- 1907 *Poropoea*. Schmiedeknecht. Hymenopt. Mitteleuropas p. 490.
- 1909 *Poropoea* Schmiedeknecht. Genera Insectorum. Fasc. 97, p. 550.
- 1915 *Poropoea*. Wolff. Zeit. Forst – u. Jagdwesen XLVII p. 489.
- 1916 *Poropoea*. Silvestri. Boll. Lab. Zool. Gen e Agr. Portici XI p. 124.

Förster states that he received this form from his friend Mr. Stollwerck, who had bred it from the eggs of *Attelabus curculionoides*. Förster is however, quite clear that this species is the same as the form bred by Ratzeburg from the same host.

Judging from the Present literature this form has not been found again since about 1860. Prof. Dr. Max Wolff gives a long discription of it in his previously mentioned work, pp. 489—497, but it is only an extract of Förster's and Stollwerck's works, and he admits that he has tried in vain to bred it from the host eggs. Thomson describes in his Hymenoptera Scand. V. p. 299 (1878) an insect which he calls *Ophioneurus grandis*. This species is, however, no other than *Poropoea stollwercki*, and not as Max Wolff believes, p. 555—556 a species which belonged to the genus *Chaetostricha* (Walker).

F. Silvestri, Contribuzione alla Conozcenza del Genere *Poropoea* Förster, published in Bollet. del. Laborat. di Zool. generale e agraria della R Scuola sup. d'Agric. in Portici Vol XI p. 120—135, maintains the right opinion of Thomsons species, as he places it as a synonym of *Poropoea stollwercki* Förster. My observations enable me to confirm Silvestri's opinion. Thomson's collection of Hymenoptera is at the Museum at Lund, and in the autumn of 1916 by the courteousness of Dr. Simon Bengtson. I had an opportunity to examine the specimen which Thomson called *Op. grandis*, and which proved to be a well preserved specimen of *P. Stollwercki*.

Description of the genus: Head slightly broader than thorax, and slightly broader than high; eyes large, provided with scanty short hairs. Antennæ 9 jointed, consisting of scapus, pedicellus, 2 anelli, and a 5 jointed club, which in the female represent 2 funiculi and a 3 jointed club. These 5 joints provided with sense organs of which the male has the greater quantity. Thorax almost as broad as high. Mesoscutum a little longer than Scutellum and



provided with two bristles at the sides, Scutellum with a sublateral bristle in front and a senseplate behind it, and provided with a similar bristle behind at the sides. Wings longer than abdomen, broad, all hairs on the anterior wings arranged in transverse rows, basal portion of wings only provided with one short row, which forms an arc from the club of the radius for a short distance inwardly towards the base of the wing. Posterior wings only provided with two rows of hairs, the marginal hairs shorter than wing's breadth. Anterior and intermediate tibiae provided with one apical spur, posterior tibiae with two, of which the inner is considerably longer than the outer. Abdomen sessile, showing 9 segments (besides segments mentioned). Ovipositor in female produced for some distance beyond apex of abdomen.

#### Summary of species.

1. Apical portion of anterior wings with 8 rows of hairs. Female clava longer than the two funiculi. Ovipositor long protruding . . . . . 1. *P. Stollwercki* Först.  
Apical portion of anterior wings with 9 rows of hairs. Female clava not longer than the two funiculi. Ovipositor shorter.  
. . . . . 2. *P. Defilippi* Rond.

#### **Poropoea Stollwercki** Först.

- 1851 *Poropoea Stollwercki* Förster. Verh. Nat. Ver. Preuss. Rheinl. VIII p. 28 Tf. I Fig. 10—a—e.  
1852 *Ophioneurus simplex* Ratzburg. Ichneum. d. Forstins III p. 196.  
1856 *Poropoea Stollwercki* Förster. Hym. Stud. II p. 88.  
1857—61 *Poropoea Stollwercki* Stollwerck Verk. Nat. Ver. Preuss Rheinl. XIV p. 113. XVIII p. 191.  
1858 *Trichogramma simplex* Reinhard. Berlin. Ent. Zeit. II p. 16.  
1878 *Ophioneurus grandis* Thomson. Hym Scand. V. p. 299.  
1898 *Chaetostricha*. Dalla Torre. Cat. Hymen V p. 1.  
1915 *Poropoea Stollwercki*. Wolff. Zeit. Forst.—u Jagdw. XLVII p. 489.  
1916 *Poropoea Stollwercki*. Silvestri. Boll. Lab. Zool. Gen. e. Agr. Portici XI p. 124.

The following description of the species is taken from Silvestri's work.

Female: Black, Antennæ with exception of scape and the apical portion of the pedicellus chestnut-brown; anterior legs brown with apex of femora, sides of tibiæ and the two first tarsal joints yellow, last joint of tarsus slightly darker; intermediate and posterior legs, with apex of tibia, and sometimes also knees, yellow, the two first tarsal joints yellow, apical joint brownish.

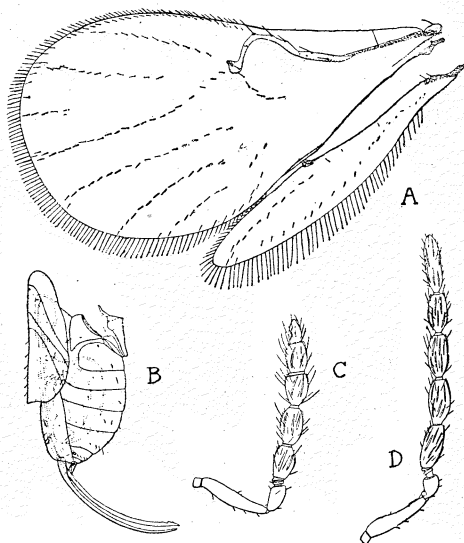


Fig. 1. *Poropoea Stollwercki* Först.

A Wings. B Apex of abdomen female. C Antenna female.  
D Antenna male. (From Silvestri).

Eyes are a little more than double as high as broad, ocelli forming a very obtuse angle, scape a little more than double as long as pedicellus, which is slightly shorter than first joint of funiculus, the two joints of funiculus little shorter than clavus.

Upper side of thorax finely reticulated, the meshes of the reticulation on the scutellum somewhat lengthened. Metanotum at sides with three or four longitudinal raised lines and two short hairs at the apical end of the inner raised line. Segment mediaire is smooth, provided with a large

round spiracle and two long hairs at sides. Outer edge of posterior tibiae with five — eight very short but acute teeth, apex of tibia provided with an inner transverse row of short strong bristles and a few similar bristles on outer edge.

Abdomen smooth, 1st segment without hairs, 2nd — 4th each with two hairs at sides, 5th — 7th each with four hairs at sides. Ovipositor curved upwards towards apex, with its base produced as far forward as to thorax up to anterior legs.

L. 1,2 mm. (together with ovipositor 2 mm).

Male: Antennae slightly longer than female, scape slightly thicker, with base and pedicellus a little shorter than in female; the five joints of scape all well separated, faintly thinner towards apex, and with more senseorgans than in female.

L. 1,1 mm.

For further notes as to the metamorphosis of the species see Silvestri.

Not found in Denmark.

**Poropoea Defilippii** (Rond nom. nud.) Silv.

1852 *Ophioneurus* sp. De Filippi. Ann. Sci. Nat. (3). XV. 294.

1916 *Poropoea Defilippii*. Silvestri. Boll. Lab. Zool. Gen. e Agric. Portici 11 p. 124.

The description of this species, which is only known from Italy, is like the foregoing taken after Silvestri's work.

Female: Black. Antennae with exception of scape and pedicellus chestnutbrown. Anterior legs with apex of femora, sides of tibiae and the two first tarsal joints yellow, third joint of tarsus brownish; intermediate and posterior legs brown with apex of tibiae and the first two joints of tarsi yellow, last joint brownish.

Sculpture and hairs as in the foregoing species.

Antennae stronger, the two funiculi at all events as long as clavus.

Ovipositor with the base only produced to hind legs, and considerably shorter than in the preceding species, apex only bent slightly upwards.

L. 1,1 mm. (together with ovipositor 1, 32 mm).

Male: Antennæ stronger than foregoing species. Size as in female. For further particulars as to this species see De Filippi and Silvestri.

Not found in Denmark.

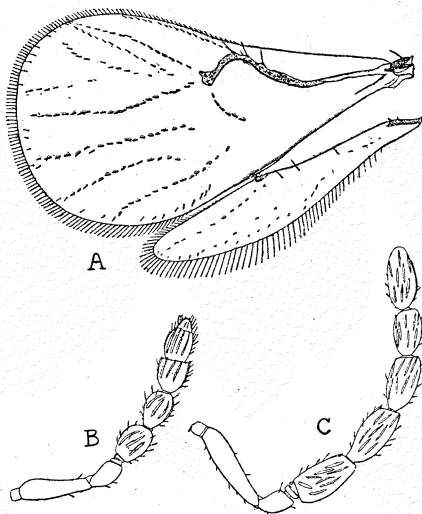


Fig. 2. *Poropoea Defilippii* Rond.  
A Wings. B Antenna female. C Antenna male.  
(From Silvestri).

**Trichogramma** Westwood.

- 1829 Microma. Curtis. Guide Br. Insects 1829. p. 137.  
1833 Trichogramma. Westwood. Phil. Mag. (3) II. 1833. p. 444 no. 21.  
1833 Calleptiles. Haliday. Ent. Mag. I. 1833. p. 340. no. 1.  
1834 Trichogramma. Nees. Hymen. Ichneum. affin. Monog. II. p. 410.  
no. 1.  
1839 Pterotrix. Walker. Monogr. Chalcid. I. 1839. p. 12.  
1840 Trichogramma. Westwood. Introd. mod. Classif. Synops p. 73.  
Insect. II.  
1841 Trichogramma. Walker. Entomologist. 1841. T. K.  
1843 Trichogramma. Haliday. Trans. Ent. Soc. London. III. R. 4 p. 298.  
1851 Trichogramma. Walker. Ann. & Mag. Nat. Hist. (2) VII. p. 212.  
1871 Pentarthrum. Riley. Record. Amer. Entom. 1871. p. 8.  
1871 Trichogramma. Greene. Entomologist. V. p. 358.  
1872 " Walker. Notes on Chalcid. P, 7 p. 114.  
1873 " Entomologist. p. 472.

- 1878 *Trichogramma*. Westwood. Trans. Linn. Soc. London. Zool. (2)  
I p. 593, tab. 73.
- 1878 *Aprobosca*. Westwood. Trans. Linn. Soc. London (2) I. p. 592.
- 1880 *Trichogramma*. Ashmead. Orange Insects p. 33.
- 1885 " Howard. Entom. Amer. I. p. 117.
- 1888 " Ashmead. Canad. Entomol. XX. p. 107. no. 21.
- 1897 " Aurivillius. Ent. Tidsskrift p. 251.
- 1897 *Oophthora*. Aurivillius. Ent. Tidsskrift. Stockholm. p. 249. tab. 5.
- 1898 *Trichogramma*. Dalle Torre. Cat. Hym. Vol. V p. 2.
- 1904 " Ashmead. Classification. p. 360.
- 1907 *Pentarthron*. Schreiner. Plodovodstvo 1907 p. 711.
- 1907 *Trichogramma*. Schmiedeknecht. Hymenopt. Mitteleuropas 490.
- 1909 " Schmiedeknecht. Genera Insectorum. Fasc. 97.  
Chalcididae.
- 1909 *Oophthora*. Silvestri. Boll. Lab. Zool. Gen. e. Agr. Portici. III.  
p. 72.
- 1910 " Masi. — — — — — IV p. 27.
- 1914 *Trichogramma*. Schmiedeknecht. Insekt. Mitteleuropas. B. II. p. 203.
- 1915 " Max Wolff. Zeit. f. Forst- u. Jagdw. XLVII.
- " Fitch.
- " Scudder & Howard.
- " Riley
- " Packard.

This genus was originally created by Westwood in Philos. Magaz. (3) II 1833 p. 444 n. 21. Förster states (Hym. Stud. II p. 88) that he has three species of this genus, but his specimens are so dried and collapsed that he does not dare to enter upon a description of them. Westwood describes and figures the species *evanescens* and gives as generic character, that the subcosta is connected to the edge of wing and the radius forms on extending from the edge into the surface of the wing a smooth curve. This character being so typical it should be imagined that confusion was quite excluded, nevertheless as can be seen from the synonyms above, various genera have been made out of this easily recognisable genus. Even as late as 1897 Aurivillius creates the genus *Oophthora*, separating it as he does in his table of characters from *Trichogramma* (Westwood) as follows: „*Trichogramma*:

— Abdomen transversum, thorace brevis. *Oophthora*: — Abdomen subcylindricum, thorace longius. This appears undoubtedly rather bold, when considering that Westwood, who naturally just as all the older collectors mounted their specimens on pins or card, only had dried specimens to description from, whilst Aurivillius had fresh, and even living specimens in numbers for his examinations. Max Wolff, who apparently is not aware of Aurivillius' work at all, states at once that the species bred by him is a *Trichogramma*, and places it in this genus. In Russia, where much work is done in practical Entomology, the genus is well known, and the name *Trichogramma semblidis* (not *Oophthora semblidis*) is used for the species. As far as I am able to judge from the literature I have seen, it is finally agreed now in 1917 to use the name *Trichogramma*, with *Trichogramma evanescens* Westwood, as type.

This genus has of late years won a renown that has gone out to all parts of the world, being used in economic entomological work in the fight against injurious Lepidoptera. This fight was first commenced in North America, and as regards the results that have been obtained I can refer to Howard and Fiske: Bulletin No. 91. U. S. Dep. of Agriculture. Washington. 1912.

In Russia also the genus is beneficially used, the numerous articles issued by the various entomological stations in that great empire bearing witness hereof. The following are a few examples: Herald of the Sugar Industry, Kiev 1913. 11 pp. Reports for 1912 from the Kiev Entomological station, Kiev 1913. Turkestan Ent. Station, Tashkent 1913. 28 pp. Report of the chief entomologist to the Semstvo Simferopol 1913. p. 1—23. Memoirs of the Bureau of Entomology, St. Petersburg 1913. X. Nr. 4. (An interesting article as to how it is possible to breed *Oophthora semblidis* in the winter by help of *Phalera bucephala* L.) — In France we have: P. Marchal: Rapport sur les Travaux



portions of the joints of the antennæ appear to be constant in all the specimens. Although should the result of my placing all the species at present known under one, give occasion to the question being taken up after the war for renewed examination and a final decision, I should be very glad.

I greatly doubt whether it is possible to decide if there is any difference between *evanescens* and *vitripenne* from the very short descriptions given by Walker and Westwood. My experience is that *Tr. evanescens* = *semblidis* Aur. = *piniperda* Wolff varies to such an extent, that it would be possible to describe numberless species, if only specimens taken in the field are examined. I have the species in thousands of specimens, partly bred, partly caught. There are large specimens and there are small. I have bred one single individual from the egg of a butterfly and I have bred thirteen specimens from another egg of the same brood. Of course the sculpture, size etc. are very different. I have light yellow, dark yellow, brown and dark brown specimens, and also some yellow with brown markings. At times I have believed it was possible to separate them into three groups, but I always find intermediates just when I have believed it so nicely arranged. The impression I now have is that this species attacks all manner of eggs and that they vary somewhat after the different host, in short the species is undergoing a change but no fast points have as yet appeared.

In the present times of war when all communications are stopped, it has been impossible for me to get any information from abroad, and the future must decide whether I am right in maintaining that at present we only have one species viz:

***Trichogramma evanescens* Westw.**

1833 *Trichogramma evanescens*. Westwood. Phil. Mag. (3) II. 1833.  
p. 444. no 21.



- 1829 *Microma latipennis*. Curtis. Guide Br. Ins. p. 137.  
1833 *Calleptiles latipennis*. Haliday. Ent. Mag. I. p. 340.  
1834 *Trichogramma evanescens*. Nees. Hym. Ich. aff. Mon. II, p. 410.  
1839 *Pterotrix evanescens*. Walker. Monogr. Chalcid. I, p. 12.  
1840 *Trichogramma evanescens*. Westwood. Introd. mod. Class. II.  
1841 " " Walker. Entomologist.  
1843 " " Haliday Trans. Ent. Soc. London III,  
R. 4. p. 298.  
1851 " *vitripenne*. Walker. Ann. Mag. nat. Hist. (2) VII.  
p. 212.  
1871 " *evanescens*. Greene. Entomologist V, p. 358.  
1872 " " Walker Notes on Chalc. P. 7, p. 114.  
1873 " " Walker Entomologist, p. 472.  
1897 *Oophthora simblidis*. Aurivillius. Ent. Tidskrift, p. 249.  
1898 *Trichogramma evanescens*. Dalla Torre. Cat. Hymen. V, p. 2.  
1904 " " Ashmead. Classific. p. 360.  
1907 *Pentarthron carpocapsae*. Schreiner. Plodovostvo. p. 711.  
1915 *Trichogramma piniperdae*. Wolff. Zeit. Forst- u. Jagdw. XLVII.

The description of the species given here is taken mainly from Aurivillius: — Antennæ six jointed, scape rather long, of the usual form, pedicellus triangulate, not half as long as scape, one anellus, two funiculus joints, which together are about three quarters of the length of the pedicellus, club almost oval, not jointed. Head short, triangulate, in female slightly, and in male clearly broader than thorax. Eyes normal size, red, egg-shaped, naked. Anterior wings longer than body, elongate egg shaped naked quite close to base. About fifteen more or less distinct rows of hairs from stigma, besides a number of spread upright hairs. Fringe short. Radius short. Posterior wings knife-shaped with two whole rows of hairs and a number of spread hairs on surface. Front margin with short fringe hind margin with long fringe. Abdomen with segments indistinct almost cylinder-shaped. Legs as usual normal. Intermediate and posterior tibiæ with one spur. Ovipositor almost invisible beyond apex of abdomen.

Female: Winged, pale yellow, yellow, dark-yellow,

brown, dark-brown. Antennæ and legs lighter, antennæ with short sensitive hairs, which are not protruding far beyond joints of antennæ. Wing-muscles produced far into the abdomen.

The male dimorphic, both winged specimens and apterous ones occurring.

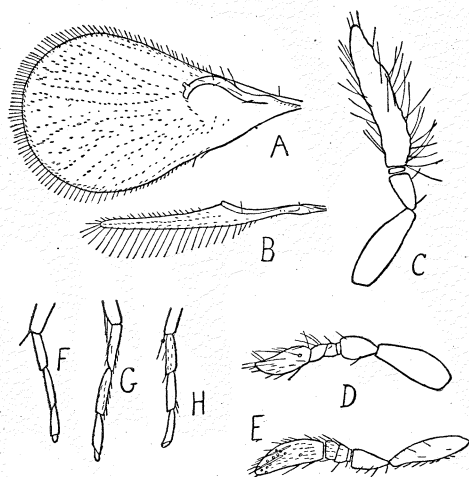


Fig. 3. *Trichogramma evanescens* Walk.

A Forewing. B Hindwing. C Antenna winged male. D Antenna subapterous male. E Antenna female. F Foreleg. G Middleleg. H Hindleg.

The winged form of male is distinguished from female by the longer and stronger antennæ, by the longer bristles, and by the joints of the funiculus being difficult to separate from the club, the whole resembling one great joint.

Apterous male: Head broader than thorax, legs shorter and thicker than female. Anterior wings reduced to a short lobe, posterior wings to an ovate lobe with one single bristle.

Length:  $\left\{ \begin{array}{l} \text{winged male } 0,36-0,75 \text{ mm.} \\ \text{wingless male } 0,42-0,75 \text{ mm.} \\ \text{winged female } 0,36-0,90 \text{ mm.} \end{array} \right.$

Localities: Ermelund, Fortunens Indelukke, Fuglesang-søen and other places in Dyrehaven; Vangede, Bøllemosen near Skodsborg, Rude Hegn, Præstevang, Ryget, Nyvang near Farum, Grib-Skov, Bidstrup Fen near Roskilde, Merrit Skov (Lolland), Varde Aa, Rold Skov, Madum Sø.

Dates  $27/5$ — $23/8$ .

Host. Eggs of *Sialis*, *Oxycera*, *Tabanus*, *Stratiomys*, *Chrysops*, various Lepidoptera, *Rhynchites betulæ* etc.

Hibernating unknown.

Specimens in the Zoological Museum Copenhagen.

From abroad the following hosts are mentioned:

*Carpocapsa pomonella* (Schreiner); *Panolis griseovariegata* G. and *Bupalus piniarius* L. (both in Wolff); *Clysia ambiguella* Hb. (Cochylis) and *Polychrosis botrana* Schiff (Eudemis) (both in Marchal); from Russia: *Dendrolimus pini* L., *Malacosoma neustria* L., *Euproctis chrysorrhoea* L., *Lymantria monacha* L., *Stilpnotia salicis* L.; from Turkestan: *Sarothrips musculana* Ersch., *Cydia funebrana* L.; from Italy *Mamestria brassicae* L.; from Turkestan *Rhynchites auratus*, from Russia *Euxoa segetum* Schiff., *Pieris rapae*. *Agrotis segetum* and *Smerinthus populi*.

If at the end of May or beginning of June the observer walks along our Danish brooks and lakes (fens and ponds) where reeds, bullrushes or *Iris* grows along the edges and banks, the eggs of *Sialis* will not often be searched for in vain. *Sialis* lays its characteristic bunches of eggs on the leaves of these plants, each bunch containing numerous eggs placed on end close to each other; the colour is dark, sometimes with a little yellow in between so that the whole mass somewhat resembles the excrement of some bird. When examining one of these bunches, one or several female *Trichogramma* can be seen busily engaged in laying eggs. At the brook that runs through Bidstrup-Fen near Roskilde is one of the places where this can very frequently be seen. When the *Sialis* oviposition is past, there are other insect eggs laid

on the same plants, and many of these are like those of *Sialis*, arranged in bunches, containing hundreds of eggs. The *Trichogramma* which are at this time emerging in large numbers from their first host wander over to the next and continue so on through the summer.

The following are some dates etc. collected when breeding the species: — 5th and 8th Juni 1905. Vangede Fen near Gentofte. In this fen were collected about five hundred short stumps of the willow branches remaining on the main stems after the one year shoots had been cut off for basket-making, the pith in these stems having been eaten out by the larvæ of various insects. All the five hundred were put in a large glass jar and placed in a sunny window. The flies emerged about eleven o'clock in the forenoon and wandered up on the paper-lid.

Date	♂	♀	Date	♂	♀
25/6	1	0	4/7	0	1
27/6	1	1	5/7	0	4
29/6	1	0	6/7	3	4
30/6	1	0	7/7	0	5
1/7	1	0	8/7	1	3
2/7	0	1	9/7	0	1
3/7	1	0			

making a total of 11 males and 20 females, of which one apterous male, the remainder all winged. Also bred from the same locality and material in 1906, but not later from this place.

From the eggs of *L. camelina* (?) found on the leaf of an oak in Fortunens Indelukke in Dyrehaven near Copenhagen were bred as follows: — 1 egg found 5/7 bred 20/7 1909, 13 ♀♀; from 3 eggs found 28/7 1907, bred 16/8 1907 18 ♀♀; 12/7 1911 some eggs, bred 8 ♀♀. Further from same locality by sweeping in grass, very frequently, always females, dates from 24/6 to 26/8. Males have also been bred from unknown butterfly-eggs but only winged forms. Bred

from eggs of *Oxycera* Aug. 1902 found on an umbelliferous plant on the banks of Fuur Søen. Frequently bred from the rolled birch leaves containing eggs of *Rhynchites betulæ*. These eggs were collected for the sake of *Ophioneurus*, but *Trichogramma* was also bred from them; for instance  $16/6$  06 bred from rolled leaves collected at Præstevang  $4/6$  06, bred  $5/7$  03 from same locality. Also caught on birch and alder as for instance  $25/7$  05 Ermelund on alder. Bred  $5/7$  05 from eggs of *Chrysops*, collected on *Alisma* leaves in Fønstrup Dam, Grib Skov; from *Chrysops* eggs from Fuglsangsøen, Dyrehaven on *Typha latifolia*, from *Chrysops* eggs from Rude Hegn  $5/7$ —10. Bred from *Chrysops* eggs nearly always together with a Proctotrypid. From *Sialis* eggs from nearly all localities where looked for near water. The eggs of *Sialis* are found in this country most frequently in the beginning of June. On *Phragmites* growing in the brook which runs through Bidstrup Fen near Roskilde in the early part of June is to be found a very great quantity of *Sialis* eggs. On these egg bunches the female *Trichogramma* can be found laying their eggs, and I have found as many as eight females on the same leaf. It is especially from these eggs that the apterous form of the male is bred. The males emerge first and wait faithfully for the females that emerge from one to two days later, when pairing takes place at once. As the individuals are not from the same parents as a rule, no aversion to pairing apparently is present. The males are absolutely prevented from coming away from the *Phragmites* plants, which are growing in the middle of the running water. When bred from Lepidopterous eggs found on land the apterous form of the male is exceedingly rare, whilst the winged form is very common, thus the reverse to those which are parasites on the *Sialis* eggs in wet places. It is therefore necessary that the sexes can find each other on the land, whilst there is no actual searching necessary on waterplants.

The development from egg to imago is very fast, as a rule from two to four weeks.

The following are some dates:

$\frac{5}{6}$  11 *Sialis* eggs. Bidstrup fen. bred  $\frac{20}{6}$ — $\frac{22}{6}$  1911.

$\frac{5}{6}$  07 *Sialis* eggs. Bidstrup fen. bred  $\frac{24}{6}$  07.

$\frac{24}{6}$  07 *Sialis* eggs. Ermelund. bred  $\frac{10}{7}$  07.

*Stratiomys* eggs on *Typha latifolia*, in a small pond near Fuglsangsøen in Dyrehaven.  $\frac{2}{8}$  11 bred  $\frac{20-23}{8}$  1911. Merrit Skov Lolland  $\frac{20}{7}$  13 bred  $\frac{31}{7}$  and  $\frac{1}{8}$  1913.

*Aterix* eggs July 1915 on Linding Bridge at Varde Aa, Nørholm, Jutland bred July 1915.

Eggs of an unknown Lepidopterous insect laid on *Typha latifolia*, Fuglsangssø, Dyrehaven. From a very large portion of these Lepidopterous eggs which were laid amongst *Stratiomys* eggs on a plant in the water, collected  $\frac{20}{7}$  1908 were bred on  $\frac{30}{7}$  and following days 753 *Trichogramma*; amongst these were hardly any apterous forms, but on the other hand numerous winged males.

Two lots of eggs of an unknown insect, laid on *Typha latifolia*, Fuglsangssø, Dyrehaven, collected  $\frac{2}{8}$  1911. bred  $\frac{11}{8}$  1911 and  $\frac{6-7}{8}$  1911, one specimen from each egg, all males from the one lot and all females from the other.

From 1 lot eggs of *Sialis lutaria* bred

315 females

324 wingless males

0 winged males.

From 1 *Smerinthus ocellata*-egg bred

20 females

1 winged male.

Experiments: On  $\frac{9}{8}$  1909 were found a number of eggs of *Arctia caja* at Fønstrup Dam, Grib Skov, and on the same day a female *Trichogramma* was caught and confined together with these eggs. It was soon observed to be busily engaged in laying its eggs, but on  $\frac{15}{8}$  09 were bred larvæ of *Arctia caja* from all the eggs, no parasites appearing. Perhaps taken too late.

On  $23/7$  1909 a number of the eggs of *Phalera bucephala* were found on oak in Tokkekøb Hegn, and a female *Trichogramma* taken the same day was put to them, and immediately commenced to lay its eggs; on  $9/8-14/8$  1909 however a *Proctotrypid* was bred from all the eggs. The larvæ of the *Proctotrypid* having in all probability eaten the *Trichogramma* larvæ.

On  $9/8$  1908 a number of eggs of *Arctia caja* were found in Grib Skov, a female *Trichogramma* was placed with them, which laid its eggs. On the last ten days of August two *Trichogramma* emerged, one larva of *Arctia caja* having previously hatched; the remainder of the eggs gave no result.

On  $24/7$  1909 a bunch of eggs of a plant-bug, *Palomena prasina* Linn. were found on the eastern boundary of Bidstrup Hegn. A *Trichogramma* was allowed to attack the eggs which, however, all died.

$27/7$  1918. On this date a cluster of Geometra eggs were found on a branch of Chichory at Frederiksværk, quite far away from water.  $30/7$  1918 4 ♀♀ and 1 ♂ *Trichogramma evanescens* were found at Fuglesangsøen in Dyrehaven. These five living individuals were placed together in with the Geometra eggs, which the females as once attacked; about  $10/8$  some fur Geometra larvæ emerged, whilst from  $14/8-18/8$  were bred

211 ♀♀

29 winged males

7 apterous males

all dark coloured, but very large and strong *Tr. evanescens*.

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About *Trichogramma carina* Walker.

In the Ann. Mag. Nat. Hist. XII 1843 p. 104 Walker describes a species which he calls *Trichogramma carina*. The description which is in Latin is as follows: —

„Niger, antennae fuscae, pedes picei, alae limpidae. Corpus nigrum, breve, depressum, nitens, laeve, parce hir-

tum; caput transversum brevissimum, impressum, thoracis latitudine; vertex sat latus; frons abrupte declivis, oculi picei, mediocres, non extantes; antennae fuscae, hirtae, fusiformes, thorace longiores; articulus 1 us longus, gracilis, fusiformis; 2 us cyathiformis, 3 us et sequentes ad 7 um clavam fingentes fusiformem; thorax ovatus; prothorax transversus, supra non conspicuus; mesothoracis scutum longitudine latius; parapsidum suturae non bene determinatae; scutellum parvum; metathorax brevissimus; petiolus nullus; abdomen sublineare, thorace paullo longius vix angustius; pedes picei, simplices, subaequales; alae limpidae; proalae latissimae; squamulae piceae; nervi fusi, costae dimidii vix longitudine (Corp. long. lin.  $\frac{1}{4}$ ; alar lin  $\frac{1}{2}$ ).

To judge from the description it must absolutely have been a dried specimen mounted on card which he has had before him. When for example he states: abdomen depressed, head impressed, forehead sloping, abdomen almost lineate, this can only apply to a dried individual, and from the description it is quite impossible to form any opinion what insect Walker has had when not being oneself in possession of anything that fits with the characters given. That the specimen belongs to the *Trichogrammidae* is not at all clear from the description. Legs light brown, simple, almost alike, is stated but this gives no assistance, as the other species treated in the same work do not belong to the *Trichogrammidae*. With regards the wings he states: — Wings transparent, anterior pair very wide, which applies to almost all the Chalcids, although no mention is made with respect to the hairs. And as to the antennae — have they seven or eight joints? When Walker states that they are pubescent, it would appear that he had a very sharp eye or has used a very good lens, as the pubescence of the antennae of the *Trichogrammidae* is a point that cannot be observed by just everybody. But if the specimen has been a *Trichogrammidae* and Walker



could see the pubescence on the antennæ, the possibility that he has also seen the anellus is not excluded. If this is the case the matter becomes a simple one at once. The antennæ will thus consist of shaft (1st joint) pedicellus (2nd joint) anellus (3rd joint) and 4 jointed club (joint 4 to 7), the anellus being counted as belonging to the club (3rd to 7th joints). If this is right we would have a good and characteristic specimen of the genus *Lathromeris* Förster, the black colour also pointing in the same direction. If the species had 2 anelli, it would after the description belong to the genus *Poropoea* Förster (scapus, pedicellus, 2 anelli, 5 jointed club). If on the other hand Walker has not observed the anellus, the club must be five jointed and the species then belong to a genus quite different to all the other European genera (*Poropoea*).

From Mr. C. J. Gahan, Keeper of Entomology, British Museum (Natural History) with whom I have corresponded about the matter, I have received the following:

Septbr. 1918.

Dear Sir,

I have made a search for the type of *Trichogramma carina* Walk. (1843) in the collections here, but I regret to say that I have failed to find it, and I am inclined to believe that it had never been in possession of the British Museum. It was probably in the Entomological Club collection at the time it was described. Types of all the non-British species in that collection were presented to the British Museum in 1844; but as Walker in his List of Chalcidites in the British Museum (1846) omits all mention of *Trichogramma carina*, it appears that that species was not in the British Museum at that date. Other types described by Walker in the same paper (Ann. Mag. N. H. 1843) are in this Museum, having been presented by Walker himself or by the Entomological Club. The fact that the type of *carina* is not in British Museum collection, leads to the

opinion that it must have been destroyed soon after it was described. It is possible, however, that the type had been overlooked, and may still remain amongst the British Specimens in the Entomological Club.

I am, dear Sir, yours. etc.

If Walkers specimen is really a Trichogrammid the possibility not being excluded that it could belong to the genus *Lathromeris* (or *Poropoea*), and if this is not the case, it must belong to a new genus, as it cannot belong to the genus *Trichogramma*, from the description given.

### ***Chaetostrichella* Girault.**

1914 *Chaetostrichella* A. A. Girault. Mitt. a. d. Zool. Mus. in Berlin. VII B 2 H. p. 147.

Female: Antennæ 5-jointed with one ring joint which is distinct, the club solid, the pedicel elongate, nearly as long as the scape, twice the length of the single funicle joint. Fore wings rather broad, normally ciliate, the marginal cilia short (the longest not a sixth of the greatest wing width); venation not reaching to the middle of the wing, straight, the marginal vein longer than the submarginal, the stigmal sessile, nearly at right angles to the marginal. Abdomen conic-ovate, not long but longer than the rest of the body, the ovipositor (and valves) exerted for over a third of its length and the distal segment produced into a short stylus which is three fourths the length of the exerted portion of the ovipositor. Tibial spurs single, that of the cephalic legs minute and straight (absent, perhaps, since it is no longer than the clothing of the legs). Mandibles tridentate, the head triangular. Legs slender. Hind wings missing. Male: Not known.

### ***C. platoni* Girault.**

*C. platoni* Girault Mitt. a. d. Zool. Mus. in Berlin. VII. B. 2 H. p. 147.

Female: Length 0,80 mm, excluding the exerted portion of the ovipositor. Black, the appendages concolorous, the fore wings uniformly, lightly infumated and at its widest part bearing about 18 lines of discal cilia, stigmal vein with a distinct unculus which points distad. Tibiae hairy, the tarsal joints long. Antennae with a few long setae, the funicle joint distinctly wider than long.

Germany. Type in Zool. Mus. in Berlin. Kat. no. 31956.

### **Centrobia Förster.**

- 1851 Trichogramma Förster. Verh. d. nat. Ver. preuss. Rhein. u. Westphalens 8 Jahrg. p. 26.
- 1851 Calleptiles Förster. Verh. nat. Ver. Preuss. Rheinl. 8. p. 26.
- 1856 Centrobia Förster. Hym. stud. II 1856. p. 87.
- 1856 Calleptiles Förster. Hym. stud. II 1856. p. 89.
- 1897 Centrobia Aurivillius. Ent. Tidsskrift p. 257. 1856.
- 1898 Centrobia Dalla Torre. Cat. Hym. V. p. 4.
- 1904 Centrobia Ashmead. Class. of the Chalcid Flies. Washington. p. 360.
- 1907 Centrobia. Schmiedeknecht. Hymenopt. Mitteleuropas. p. 491.
- 1909 Centrobia. Schmiedeknecht. Genera Insectorum. Fasc. 97. p. 550.
- 1910 Centrobia. Kieffer. Deutsch. Zentr. Afr. Exp. p. 23.
- 1915 Centrobia. Wolff. Zeitsch. f. Forst- u. Jagdw. XLVII. p. 559.

This genus was originally described by Förster in his Hym. Stud. II H. and does not appear to have been found again later here in Europe, in any case nothing seems to be noticed anywhere in the literature, Schmiedeknecht however refers it in the Genera Insectorum and Aurivillius also in his work from 1897. In 1915 Wolff again mentions the genus. He complains first (p. 559) about Förster that he often creates new genera in his works without mentioning a single word of the species belonging to the various genera, and he next complains of Förster, and with very good reason according to my opinion, that he does not refer to his own works correctly. But when Wolff (p. 560) maintains in these works, how doubtful the base for our knowledge of *Centrobia* is, I am absolutely of the opinion that he is unjust towards Förster.

That Förster has been unable to see the anellus, he must be excused for, as it is often difficult enough now a days with our modern good microscopes to observe the various joints of the antenna of these very small Hymenoptera — so that we can easily imagin how much more difficult it has been in Försters time.

However, when looking at the figures of the wings (Förster 1851 Plate I fig. 9 a—b—c, reproduced by Wolff) and further reading (Wolff p.562).: „Der Bohrer soll nach Förster etwas aufwärtsgekrümmt sein. Das Männchen hat einen an der Spitze des Hinterleibes lang vorgestreckten Penis, dessen Länge wenigstens  $\frac{1}{3}$  von der Länge des Hinterleibes beträgt“, it is almost impossible not to be able to judge the appearance of *Centrobia*, of course when having a specimen of the genus to examin. The wings with the long ramus marginalis, and all the hairs in regular rows are so characteristic, as none of the European species known at present having such regular hairs on the wings. I must however criticize Förster when he finally states that it is his opinion that *Centrobia* on account of its long ovipositor is a parasite on the eggs — or larvæ — of bark-beetles, as although the species has a relatively long ovipositor, but exceedingly weak when considering the bark of trees, is in my opinion quite unable to penetrate such hard material as bark. I have also found all my specimens where there were no bark-beetles in the neighbourhood, and in reality why should *Centrobia* be provided with a long ovipositor for barkbeetles, it would be decidedly easier for it to make its way in the galleries. The chief characters of the genus are as follows: —

Antennæ eight jointed: scape, pedicellus, 1 anellus, 2 funiculus, and three-jointed clavus. Head triangulate, eyes round, large, red, ocelli placed close together, red. Antennæ placed near mouth, below eyes. Mandibles with three teeth. Head and thorax together as long as abdomen. Parapsid furrows distinct. Abdomen long narrow cylindrical.

Anterior wings broad, subcosta long, marginal vein long, as long as subcosta, radius quite short. All hairs on surface of wings in regular rows, fringe very short, only some long hairs at subcosta; posterior wings broad, knifeformed, hind fringe long, front fringe short; surface with several rows of fine hairs. Ovipositor and genitalia of male very long and powerful.

(The name *Centrobia* meaning the one with the powerful ovipositor).

Of this genus, two species are known in this country, which may be distinguished by the following characters:

Anterior wings with 17 rows of hairs, stigma present,

Antennæ shorter and thicker . . . . . *C. Walkeri* Förster.

Anterior wings with 24 rows of hairs, stigma absent,

Antennæ longer and thinner . . . . . *C. Försteri* n. sp.

### ***Centrobia Walkeri* Förster.**

1851 *Calleptiles Walkeri*. Förster Verh. nat. Verh. f. Preuss. Rhein. p. 257.

1856 *Centrobia Walkeri*. Förster Hym. Stud. II. 1856. p. 87.

1898 *Centrobia Walkeri*. Dalla Torre Cat. Hym. V. p. 4.

1904 *Centrobia Walkeri*. Ashmead Classification. p. 360.

1915 *Centrobia Walkeri*. Wolff Zeit. f. Forst- u. Jagdw. XLVII, p. 561.

♀ ♂ yellow brown. Underside slightly darker than upperside.

♀. Pedicellus about  $\frac{2}{3}$  of scape, two funiculus joints together  $\frac{2}{3}$  of pedicellus, first joint of funiculus quite small,  $\frac{1}{3}$ — $\frac{1}{4}$  of second joint, the three joints of clavus almost of equal length, the intermediate very slightly longer than the two others, the single joints of clavus about as long as both joints of funiculus together. Sensehairs apparently present in greater number than in male. Ovipositor of abnormal length for so small an insect, folded up under abdomen; saw bent upwards at apex with three, perhaps four teeth.

♂ all joints of clavus of equal length, funiculus somewhat longer than in female, second joint of funiculus as long as each of the joints of the clavus. Genitalia very long and produced far beyond the abdomen.

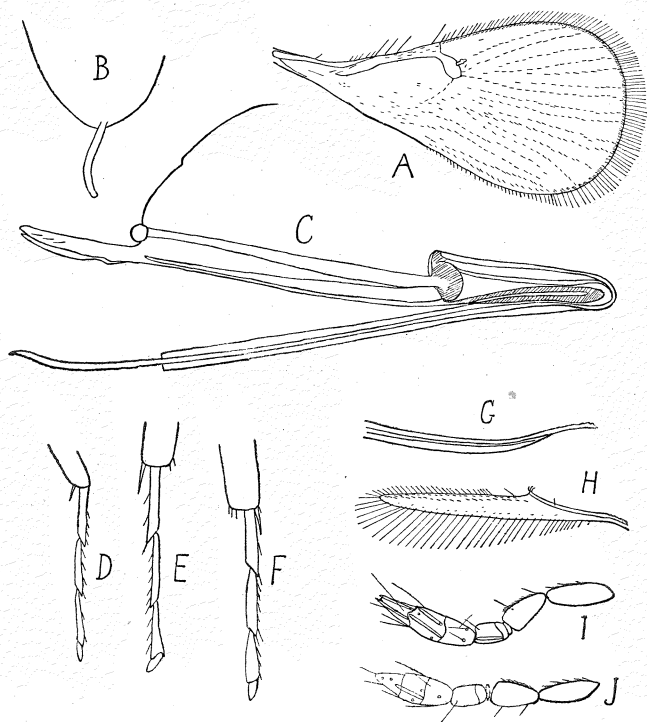


Fig. 4. *Centrobia Walkeri* Förster.

A Anterior wing. B Apex of abdomen ♂. C Apex of abdomen ♀. D Anterior Tarsus.  
E Intermediate Tarsus. F Posterior Tarsus. G Saw. H Posterior wing.  
I Antenna ♀. J Antenna ♂.

Spurs on intermediate tibiae in both sexes very strong. Muscles of wings reach beyond center line of abdomen.

Length: { male 0,75 — 0,80 mm.  
female 0,75 — 0,80 mm.  
ovipositor 0,90 mm.

Denmark: Ryget, Bøllemosen, Grib Skov. from  $1/7$  to  $27/7$ . one specimen  $11/8$ .

Taken singly by sweeping grass in high rather dry meadows.

Also found in Germany.

Neotype in Zoological Museum Copenhagen.

***Centrobia Försteri* nov. spec.**

♀. dark yellow-brown, legs somewhat lighter, as well as antennæ. Wings with 24 rows of hairs. Marginal vein much shorter than in *C. Walkeri*. Stigma absent, or in other words the radius is not visibly widened at that point where it ends. Antennæ somewhat longer and narrower than in *C. Walkeri*. Scape as long as pedicellus, anellus and first joint of funiculus together. Anellus very small. First joint of funiculus about one third of second joint: both joints of funiculus together a little more than one third of clavus. The joints of the clavus of equal length. Sensehairs strong.

♀ Length 0,84 mm.

Denmark: Fortunens Indelukke in Jægersborg Dyrehave  $5/8$  1905. Swept in short dry grass on the main road.

Type 1 ♀ Zoological Museum Copenhagen.

I have named this species in honour of the originator of the genus Arn. Förster.

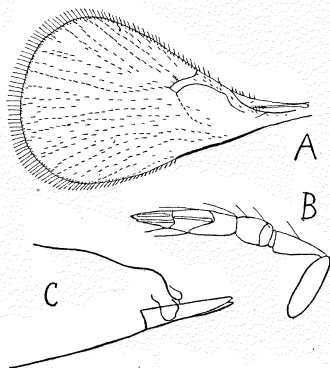


Fig. 5. *Centrobia Försteri*. Kryger.  
A Anterior Wing. B Antenna. ♀.  
C Apex of Abdomen ♀.

About *Centrobia odonatae* Ashmead, bred from eggs of *Lestes* sp., Lake Forest, Ill. U. S. A. by Professor James G. Needham I do not venture an opinion. If I am to judge from Ashmeads description in Ent. News Philad. XI. 1900 p. 616 it cannot be doubted that this species in no way can be reckoned to belong to the genus *Centrobia* Förster. The antennæ is said to have only 6 joints and not to be annulated and the long ovipositor is not mentioned. But Girault says in: Synonymic and descriptive notes on the Chalcidoid Family Trichogrammatidae Trans. Amer. Ent. Soc. Vol XXXVII, 1911 p. 75 that he has examined the type specimens in U. S. National Museum and he amplifies Ashmeads description calling attention — among others — to the long ovipositor. But he says furthermore: „The specimens were somewhat shrivelled“, and I must therefore suppose that he has been quite unable to form any opinion as to what the antennæ really looks like. He certainly says (p. 75): „. . . . . funicle 1. jointed, not able to see the other joints“. Now in my opinion it is one of the most difficult matters in any Trichogrammatoid antennæ to see just the two-jointed funicle by our European *Centrobia* and I therefore take it as by no means excluded that by a more thorough investigation f. inst., if the specimens, which are now tag-mounted, were put in xylol-balsam, *Centrobia odonatae* Ashmead would prove to belong to the genus *Centrobia* Förster.

### **Ophioneurus** Ratzeburg.

- 1852. Ophioneurus. Ratzeburg. Ichneum. d. Forstins. III. p. 197. n. 2.
- 1856. Poropoea. Förster: Hymen. Stud. II. 1856, p. 88.
- 1858. Chaetostricha. Reinhard. Berlin entom. Zeitschr. II. p. 16. n. 45.
- 1914. Lathromerella. Girault. Mitt. a. d. Zool. Mus. in Berlin VII. B. 2. H. p. 149.
- 1915. Chaetostricha. Wolff. Zeitschr. f. Forst- u. Jagdw. XLVII Jahrg. 8 H. p. 557.



This genus is originally described by Ratzeburg who also gave at the same time very fair figures of leg, wing and antennæ. However, thanks to Förster (Hym. Stud. II part p. 88) for bringing confusion with the name at once. Förster writes (with reference to *Poropoea*): — . . . . Es unterliegt keinem Zweifel, dass Ratzeburg in seiner Gattung *Ophioneurus* die er im Jahre 1852 aufstellte und nach seiner Aufgabe ebenfalls aus *Attelabus curculionoides* erzogen wurde, dasselbe Thierchen vor Augen gehabt hat. Sein *Ophioneurus simplex* wird deshalb als Synonym zu *Poropoea stollwerckii* gezogen werden müssen, dagegen hat er noch eine neue Art *Poropoea signata* (= *Ophioneurus signatus* Ratzb.) aus den Blattwickelungen von *Rhynchites betulæ* erhalten — In this manner Ratzeburg's genus is in a way killed and buried for ever, and for the future *O. simplex* is placed under *Poropoea*, and from 1858 *O. signata* under *Chaetostricha* and the later scientists have been unable to correct the error as Ratzeburg's species has not been found again later. Dalla Torre does not add the generic name *Ophioneurus* in his catalogue, just as little as Ashmead has it in his so often quoted work.

Wolff, p. 555. at last, is the first of the more recent authors who mentions *Ophioneurus* and he has even been so fortunate that he has had a specimen — although defective — for examination, but he nevertheless still regards the species as belonging to the genus *Chaetostricha* (Walker). Neither has Wolff been able to unravell the mystery by means of this defective gummed specimen from Ratzeburg's duplicates. However by following Ratzeburg's figures the question solves itself, the drawings showing an antenna with 9 joints, whilst *Chaetostricha dimidata*, according to Walker's description only has 6 joints, but as he has evidently overlooked the anellus, on which point I fully agree with Wolff, it should have 7 joints.

From Ratzeburg's description it can be further seen that

the radius is durch die Auflösung in einem dunkeln Wisch noch merkwürdiger.

This is so typical for *Ophioneurus signatus*, that when having a specimen for examination, a mistake cannot be made.

None of the European forms known to me have anything similar.

Girault finally describes a genus *Lathromerella*, Mem. Mus. Queensland I, II, which is evidently very closely related to *Ophioneurus*. I have not been able to obtain possession of the description, even by corresponding with Girault, but as in Mitt. a. d. Zool. Mus. in Berlin VII Bd. 2 II p. 149 he describes a European species *Lathromerella germanica*, and as this species to a very great extent agrees with the two Danish species, I am inclined to maintain that *Lathromerella* is only a synonym of *Ophioneurus*, although there may yet be reasons to place our one Danish species and *Lathromerella germanica* as a separate genus, but on this point at present I am not able to discuss further, until the international means of intercourse once more are established after the war so that it is possible to obtain foreign literature. One point, however, is certain: that Ratzeburgs genus *Ophioneurus* is a good and typical genus, which is hereby raised to rank and honour equal the other genera in the large kingdom of the Chalcidids.

The following is the description of the genus:

Antennæ 9 jointed, consisting of scape, pedicellus, annellus, and 6 jointed clavus. Head triangulate almost oval, mandibles with three teeth, antennæ inserted at mouth, eyes large round with a slight hollowing on the inner side, ocelli in a very wide triangle, abdomen as long, as head and thorax together.

Of this genus three species are known at present in Europe, two of which have been found in Denmark. They can be distinguished by the following characters:

1. Extreme apical point of antennæ provided with a large sense-organ (tap), marginal vein long, radius not dark-coloured . . . 2. Apical joint of antennæ without such sense-tap, first portion of the short marginal vein and radius deep black . . . *signatus* Ratzb.
2. Insect black, wings with about 15 rows of hairs *germanicus* Girault. Insect yellow, wings with about 10 rows of hairs besides various spread hairs . . . . . *danicus* n. sp.

### ***Ophioneurus signatus* Ratzb.**

1856 *Poropoea signata* Förster. Hym. Stud. II H. p. 88.

1858 *Chaetostricha signata* Reinhard. Berlin. Entom. Zeitschr. II 1858.  
p. 16 n. 45.

1915 *Chaetostricha signata*. Wolff. Zeit. f. Forst- u. Jagdw. XLVII.  
1914 p. 557.

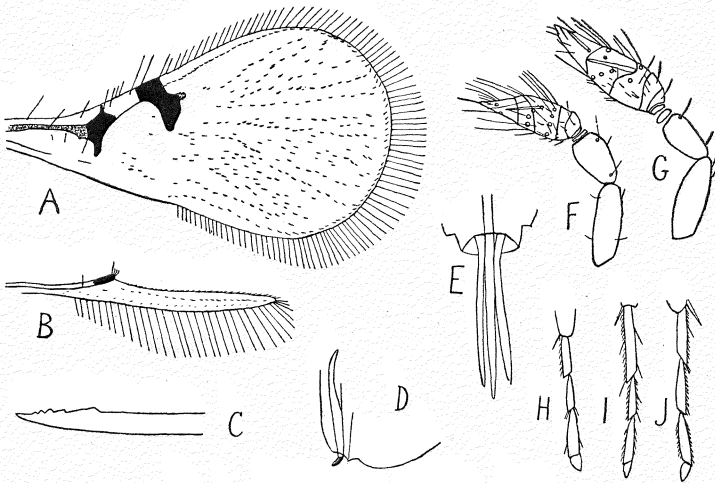


Fig. 6. *Ophioneurus signatus*. Ratzb.

A Anterior wing. B Posterior wing. C Saw. D Anal segment male.  
E Anal segment female. F Antenna male. G Antenna female. H Anterior leg.  
I Intermediate leg. J Posterior leg.

Head and body dark brown, segmental margins darker, tarsi and knees a little lighter. Abdomen eggformed, almost as long as head and thorax together, mesothorax and scutellum almost equal in size. Antennæ: — 1, 2 & 3 clavus joints short, 4, 5 & 6 larger. ♂ Antennæ: sixth clavus joint distinctly longer than fourth, which is

again longer than fifth. ♀ antennæ with fourth, fifth and sixth clavus joints almost of equal length, the sixth however a fraction longer than the two others; scape narrow, pedicellus broader pearlformed, annellus and first clavus joint very small, clavus strongly covered with long hairs, mostly in the male.

Anterior wings broad powerful, sub-costa and marginal vein short almost of equal length; radius short, stigma before the center line of wing. A part of marginal vein, radius and stigma deep black. These dark markings making so sharp an impression on the eye, that it can be well said to characterise the species; fringe short; surface of wing with about ten clear rows of hairs with single spread hairs between. Posterior wings long, swordshaped with two rows of hairs on surface, anterior fringe very small, posterior long, longer than fringe on anterior wings. Genitalia of male short, hardly produced beyond apex of abdomen. Ovipositor and sheaths produced far beyond apex of abdomen, to an extend of one third of length of abdomen, saw with five teeth.

Eyes dark red, ocelli red.

Length: Male 0.70 mm, female 0.78—0.96 mm.

Denmark. Generally distributed in North Sealand: Præstevang, Ryget, Ermelund, Nyvang etc. etc. Swept from birch, and bred from rolled leaves of *Rhynchites betulæ* on birch and alder.

Specimens in Zoological Museum Copenhagen.

If in the early days of June, small birches, where *Rhynchites betulæ* has commenced to make rolled leaves for its larvæ, are swept with a sweeping-net, it ist almost impossible to avoid finding this species, which is very common everywhere where birch and alder are found in North Sealand. I have bred this species many times besides having swept it in many other cases.

Below are given the results of a single breeding of 1200 rolled birch leaves with *Rhynchites betulæ* eggs, collected at Præstevangen <sup>5</sup>/<sub>6</sub>.

19/6	2 ♂♂	27/6	1 ♂ + 4 ♀♀
21/6	1 ♂	28/6	1 ♂ + 5 ♀♀
22/6	1 ♂ + 1 ♀	29/6	1 ♂ + 6 ♀♀
23/6	2 ♂♂ + 2 ♀♀	1/7	3 ♀♀
24/6	3 ♂♂ + 1 ♀	3/7	4 ♀♀
25/6	6 ♂♂ + 8 ♀♀		
26/6	6 ♂♂ + 10 ♀♀		

To the above result can be added that it is extremely difficult to keep such a large portion of green leaves free from mould, which naturally has the consequence that a number of the eggs are destroyed by the attacks of fungus. The larvæ of a bug and more especially a red mite, which races round the glass at a great speed, are great destroyers and devour many eggs.

(The little that is known as to the biology of the other Danish species of Trichogrammins is stated in the description of the respective species, which will prove how poor our knowledge is of the life history of these minute parasites, and it is to be hoped that this may give an impulse to other collectors to take the matter up and make trials by various breedings.)

### **Ophioneurus germanicus** Girault.

1914 *Lathromerella germanica*. Girault. Mitt. a. d. Zool. Mus. in Berlin VII Bd. 2 H. p. 149.

Female: Black, wings hyaline, vertex, meso- and metanotum deep orange yellow, antennæ lemon-yellow; knees, bases of femora, apex of tibia and proximal two tarsal joints whitish, remainder of legs black. Wings subhyaline; anterior pair with about fifteen irregular rows of hairs, fringe at it longest about one third of wing at broadest. Scutellum and postscutellum deep lemon yellow. Posterior tarsal joints rather long and almost subequal. Pedicellus stout, much longer than broad, the 3rd and 5th joint of clavus the longest; the strong apical-spur almost as long as the fifth joint. Posterior wings narrow, with two cephalad rows of hairs

on surface, and a fainter third row near caudal margin. Fringe at longest clearly longer than wing at broadest. 5th clavus joint the longest, much shorter than pedicellus. Posterior femur compressed. Mandibles apparently with three teeth, or at least with two acute outer teeth.

Male unknown.

♀: Length 0,85 mm. Slender.

Germany.

Type in Zoological Museum. Berlin.

The fact that Girault refers to the 5th joint of the clavus whilst I mention the 6th is due to either that he has not observed the extremely little 1st joint or perhaps that he does not reckon this little joint to clavus. I have sent him a drawing of *O. signatus* and he has stated that the antennæ agree exactly with his species.

***Ophioneurus danicus* nov. spec.**

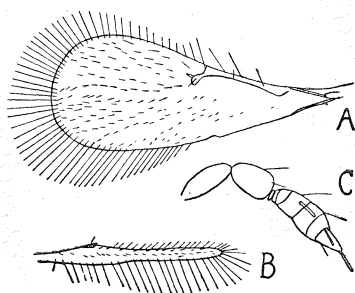


Fig. 7. *Ophioneurus danicus* Kryger.

A Anterior wing. B Posterior wing.

C ♀ Antennæ.

Female yellow, cheeks and entire underside smoke coloured as well as tarsi, femora and tibia yellow, middle part smoky. Eyes and ocelli red. Antennæ inserted at mouth on a level with lower point of eyes. Antennæ: scape a little

longer than pedicellus, first clavus joint of about the same size as anellus, second clavus joint small, half as long as third, third and fourth of same length, about half as long as pedicellus, fifth very slightly larger than second; sixth joint provided with long sense tap. Entire antennæ only scantily provided with hairs and sense-organs. Anterior wings with seven distinct rows of hairs, with many irregularly placed hairs between. Pubescence continued near towards base

of wing. Subcosta short, marginal vein long, stigma placed about at center line of wing; fringe not specially long, the longest at lower apical angle are about as long as breadth of wing at stigma. Faint dusky shadowing at base of wing. Posterior wings broad, provided with two rows of hairs on surface, costal margin with short hair, hind margin with long. Ovipositor and sheaths produced slightly beyond apex of abdomen, resembling to a great extent ovipositor of *O. signatus*.

♀ Length 0.60–0.65 mm.

Male unknown.

Denmark.

On an open spot near the northern fence at Fortunens Indelukke, where gravel had been dug. Swept the specimens from the edge of the gravel pit which was sparingly covered with low dry grass.

Altogether 32 ♀♀.  $^{20}/_7$ – $^5/_8$  from 1906–1914.

Types in Zoological Museum Copenhagen.

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Ganin states in Zeitschr. für wiss. Zool. XIX. 1869. p. 427. (Tab. XXXIII fig. 7–19) that he has examined the development of the larvæ of the *Ophioneurus* which lays its eggs on the eggs of *Pieris brassicae* (vide p. 382. Anm.) The *Ophioneurus* (*Poropoea*) the larva of which De Filippi examined, Ganin has looked for in vain at Giessen. Whether on the whole it was the larvæ of an *Ophioneurus* which Ganin examined, is not easy to decide at the present time.

### **Lathromeris Förster.**

1856 Lathromeris. Förster. Hym. Stud. II. 1856 p. 87 & 89.

1858 Ophioneurus. Reinhard. Berlin Entom. Zeitschr. II 1858 p. 323.

1897 Chaetostricha. Aurivillius. Ent. Tidsskrift. p. 257.

1898 Chaetostricha. Dalla Torre. Cat. Hym. V. p. 3.

1904 Lathromeris. Ashmead. Classification. 1904 p. 360.

1907 Lathromeris. Schmiedeknecht. Hymenopt. Mitteleuropas. p. 491.

1909 *Lathromeris*. Schmiedeknecht. Genera Insectorum. fasc. 97. p. 550

1915 *Chaetostricha*. Wolff. Zeitschr. f. Forst- und Jagdw. XLVII Jahrg.  
8 H. p. 555 & 557.

Förster describes the genus *Lathromeris*\*) in Hym. Stud II part. In the table of genera (p. 87) he states absolutely correctly: —

„e. Fühler siebengliederig mit einem Ringel und viergliedrigem  
Endglied . . . . . *Lathromeris*.“

and in the description p. 89 he goes more freely into this point without, however, giving any more detailed description of the species. Although this character in the antennæ would appear sufficient to characterise the genus, it is already dropped in 1858, in which year Reinhardt refers it to *Ophioneurus*. Dalla Torre refers it in his catalogue to *Chaetostricha*. Förster states that *Lathromeris* has a four jointed clavi; Ratzeburg figures the antennæ of his *Ophioneurus* with a six (perhaps seven) jointed club, which does not appear very clear what could have given Reinhardt the courage to let the genus be dropped. Just as difficult to explain is the reason why Dalla Torre has referred *Lathromeris* to *Chaetostricha*, as Walker points out that *Chaetostricha* has a six-jointed antenna, and a three-jointed clavi. Only a single exception, however, Schmiedeknecht, in Genera Insectorum, admits the genus and characterises it correctly with the seven jointed antennæ and four jointed clavi. This however does not appear to have had any effect on the subsequent authors, for example Wolff.

It does not thus appear that the genus has ever been found again here in Europe since Förster described it. However, on having a specimen to examine, there is not the slightest doubt that Förster is right, the four jointed clavi characterising it from all the other European ge-

\*) from *lathros* = hidden and *meris* = part; the name referring to the joints of the clavi which are so closely connected that the joints appear almost hidden.



nera, and therefore just as well as *Ophioneurus* it is perfectly entitled to a position among the genera of the Chalcidids.

The description of the genus is given below: —

Head triangular, eyes large round, ocelli placed close together almost in a straight line, antennæ placed just above the mouth on a level with the lower edge of the eyes; thorax of the same length as abdomen; parapsid grooves distinct; abdomen short cylindrical; antennæ 7-jointed, scape, pedicellus, 1 anellus, 4 jointed clavus.

Anterior wings broad, powerful, subcosta rather short, marginal vein very long, stigma nearer towards outeredge than the center-line of the wing is, fringe long, longest at the posterior angle.

Posterior wings broad knifeformed, hindermost fringe long.

**Lathromeris scutellaris** Förster.

- 1856 *Lathromeris scutellaris* Förster Hym. stud. II, p. 89.  
1858 *Ophioneurus scutellaris* Reinhard Berl. Ent. Zeit. II, p. 323.  
1898 *Chaetostricha scutellaris* Dalla Torre Cat. Hymen. V p. 3.  
1904 *Lathromeris scutellaris* Ashmead Classific. p. 360.  
1909 " " Schmiedeknecht Genera Insect. fasc. 97,  
d. 550.  
1915 *Chaetostricha scutellaris*. Wolff. Zeit. f. Forst- u. Jagdw. XLVII,  
p. 557.

Male black, thorax, especially the posterior half yellow; a yellow irregular spot on the anterior half of the sides of the abdomen. Muscular system of the wings visible almost to apex of abdomen; legs black, joint connections somewhat lighter. Eyes and ocelli red. Male genitalia produced somewhat beyond apex of abdomen.

Anterior wings: nearly all the hairs in regular rows, about 18 shorter or longer rows of hairs, with quite single spread hairs between.

The basal and larger half of wings with deep black shading, giving it the appearance of being nearly as black as body. Fringe rather long, about half as long as the

breadth of wing at stigma. Posterior wings with two rows of short hairs on surface, anterior fringe short, posterior long.

Antennæ: scape long and narrow, nearly double as long as pedicellus, anellus very small, clavus slightly

longer than scape, 2nd joint of clavus the shortest, joints 1, 3 & 4 almost of equal length; clavus provided with long sense-hairs and sense-organs; last joint of clavus provided with several hairs at the extreme apex, which under a low-power microscope can very well give the appearance of the clavus having an extremely faint 5th joint, which quite explains what Förster writes (p. 89) . . . .

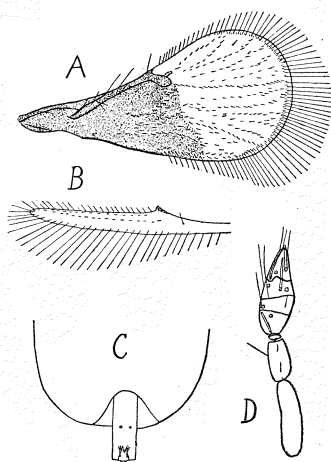


Fig. 8. *Lathromeris scutellaris*  
Förster ♂

A Anterior wing. B Posterior wing.  
C Apex of Abdomen. D Antenna.

„Keule, welche an der Spitze noch ein kleines griffelförmiges Endglied zu haben scheint . . . .“

Antennæ black, though somewhat lighter than body.  
Length 0.5 mm.

I have succeeded in taking two males, which are all I have been able to obtain for examination.

Denmark: Skovrøddam, (wet meadow) in Rudehegn.  
2 ♂♂  $7/8$  &  $8/8$  1910.

Also found in Germany.

Neotype in Zool. Mus. Copenhagen.

With regard to the American species of the genus *Lathromeris* I would make the following remark:

It might from what Girault writes in: Synonymic and descriptive on the Chalcidoid Family Trichogrammatidæ

... in Trans. Amer. Ent. Soc. Vol XXXVII 1911 p. 43—83, appear that the genus is identic with *Lathromeris* Förster so that both of the two American species *fidiae* Ashmead (Journ. Cin. Soc. Nat. Hist. XVII 1894 Ashmead and do. do. Webster) and *cicadae* Howard (Canad. Ent. London, Ontario XXX, 1898 p. 102) rightly are referred to the genus *Lathromeris* Förster.

Ashmead certainly says in his first description that *Lathromeris cicadae* has 3-jointed club, but Girault expressly corrects this saying (p. 7): „club 4-jointed“ and the description of the wings of the American species is certainly not quite identical with that of our European species but I do not believe that so much stress should be laid on these differences in the wings that this should be taken as an opportunity to found a new genus. I may perhaps be justified in hoping that my present paper may enable the American hymenopterologists to decide whether the American species *Lathromeris fidiae* Ashmead and *L. cicadae* Howard in the future can be rightly referred to Förster's genus or whether it will be necessary to found a new genus for them.

### **Chaetostricha** Walker.

- 1851 Chaetostricha Walker Ann. Mag. Nat. Hist. (2) VII, p. 210, Nr. 2.
- 1852 Ophioneurus Ratzeburg Ichn. d. Forstins. III, p. 196, Nr. 18.
- 1856 Chaetosticha Förster Hym. Stud. II, p. 89.
- 1856 Lathromeris Förster Hym. Stud. II, p. 87.
- 1856 Poropoea Förster Hym. Stud. II, p. 88.
- 1858 Chaetostricha Reinhard Berl. Entom. Zeit. II, p. 16, Nr. 45.
- 1879 Trichogramma Riley Canad. Entomol. XI, p. 161.
- 1880       "       Packard Proc. Boston Soc. Nat. Hist. XXI, p. 37.
- 1893 Chaetosticha Dyar Canad. Entomol. XXV, p. 256.
- 1897 Chaetostricha Aurivillius Ent. Tidsskrift, p. 251.
- 1898       "       Dalla Torre Cat. Hymen V. p. 4 (3).
- 1904       "       Ashmead Classification, p. 360.
- 1907       "       Schmiedeknecht Hymenopt. Mitteleuropas, p. 490.
- 1909       "       Schmiedeknecht Genera Insectorum fasc. 97, p. 550.
- 1915       "       Wolff Zeit. f. Forst- u. Jagdw. XLVII, p. 555.

The description of this genus by Walker is so short, that it should almost appear impossible to form any opinion of the species. The various authors who, in the course of time, have gone to great trouble to finally settle the synonymis, have worked without success.

Dalla Torre in Cat. Hym. Vol. 5, has believed that *Chaetostricha* Walker is the same as *Chaetostricha* Förster, *Lathromeris* Förster, *Ophioneurus* Ratzebg. and *Trichogramma* Riley, Packard. However, Schmiedeknecht would not regard *Ophioneurus* as a synonym of *Chaetostricha* although Reinhard on the other hand does so. Wolff (1915) again revives Dalla Torres list of synonyms, without bringing forward anything new. Thus he considers *Chaetostricha dimidiata* (Walker 1851), *Ophioneurus grandis* (Thomson 1878), *Lathromeris scutellaris* (Förster 1856) and *Ophioneurus signatus* as belonging to one genus. From the preceding pages it can be seen however, that Thomsons *Ophioneurus grandis* is identical with *Poropoea Stollwerckii* Förster, that *Lathromeris scutellaris* is a good genus and species and that Ratzeburgs *Ophioneurus signatus* also is an easily distinguishable genus and species, and that all these three last mentioned species are quite distinct from Walkers *Chaetostricha*. The genus *Chaetostricha* will therefore remain with only one species *Chaetostricha dimidiata* Walker, and it now remains to find out how this species appears and whether the genus is really a good one.

Walkers description of both genus and species are certainly very short, but when taking two main points:—wings with hairs in rows, the seven jointed antennæ, of which the three joints form the clavus, there is really nothing to confound it amongst the European genera; at the same time no regard must be paid to the fact that Walker describes the antenna without annellus, he only mentioning scape, pedicellus, funiculus and the three

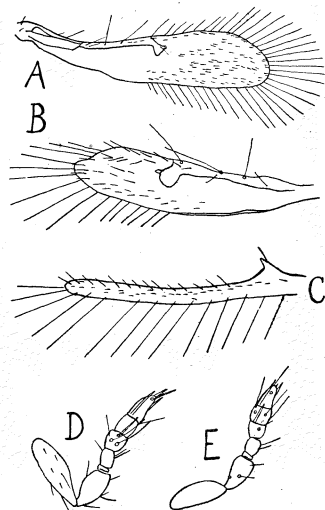
jointed clavus. The anellus is very small in all these minute Chalcids, and can often be very difficult to see when the specimens are prepared in canada-balsam, still more so if the specimens are mounted on card. As a matter of fact, amongst the Danish species there are at any rate three, which correspond to Walkers description of the genus, and there is no doubt whatever that the genus should be retained, and that it should be retained just as Walker has described it.

The description of the genus is as follows:

Head short, almost quadrate, broader than thorax. Eyes small. Thorax short, half the length of the abdomen. Abdomen stout, conic. The segments of the abdomen each showing a basal, dark chitinised band from which emerges numerous dark chitinised longitudinal lines backwards through the whole distal hyaline part of the segment. Antennæ 7 jointed: scapus, pedicellus, anellus, 1 funiculus, 3 jointed clavus. Scapus as long as pedicellus + anellus + funiculus and as long as clavus. Fore-wings stout and broad, longer than the abdomen, with long fringe. Discal ciliæ mostly arranged in regular rows. Marginal vein very long, radius short, stigma at the middle of the wing. Hind wings knifeshaped with a single row of discal ciliæ. Hind fringe very long. Ovipositor half as long as the whole body, very powerful, almost not protruding behind the apex of abdomen. Penis short, not to be seen from above.

#### Summary of species.

1. Subapterous ..... *C. Werner* n. sp.  
    Winged ..... 2
2. Abdomen black ..... 3  
    Abdomen yellow ..... *C. Schlicki* n. sp.
3. Fore wing with a very little faint shadow below stigma *C. pulchra* n.sp.  
    Fore wing brown from the base to beyond the middle *C. dimidiata* Hal.

**Chaetostricha Werner** nov. spec.

Figur 11. *Oligosita Werner* n. sp.

A ♀ Anterior wing. B ♂ Anterior wing.  
C ♀ Posterior wing. D ♀ Antenna.  
E ♂ Antenna.

Head almost quadrate, eyes small, black, lens-shaped, Forehead broad, ocelli close to each other, black. Antennæ placed almost in middle of face. Thorax small, slightly longer than half the length of abdomen, abdomen short, conical.

♂ yellow (light-dark) with third apical abdominal segment brown. Antennæ light yellow. Legs and margin of segments of abdomen tinged with brown.

♀ yellow-brown (light-dark), underside somewhat darker than upper-side. Antennæ light yellow. Femora

and tibiae tinged with brown.

Antennæ: Scape very little longer than clavus, pedicellus more than half as long as scape, funiculus and the two first joints of clavus of equal length, the apical joint of antennæ longest. Sense-organs of ♀ produced far beyond apex of antennæ, in the male only short.

Anterior wings of ♀ very small, but normal. Marginal vein very long, radius short, stigma placed before center line of wing. Surface of wings with one row of hairs from stigma along costal margin, outer and lower half of surface with spread hairs. Below stigma, a very slight shading. Fringe long, the longest being of the same length as broadest part of wing. Fringe of posterior wings scanty but very long; surface with one row of hairs, towards apex with two rows.

Anterior wings of ♂ more or less rudimentary with very strong fringe. In the figure is represented a somewhat normal anterior wing. Posterior wings rudimentary or absent. Apparently unable to fly. The specimens vary both in size and particularly in colour. The colour varies from bright yellow to dark yellow brown.

Sexual characters similar to the other species of genus.

Length: male 0,36 mm, female 0,60 mm.

Taken by sweeping grass in dry open places in woods.

Dyrehaven in the open place at Fortunen. Ermelunden (Ridepladsen), Rudehegn (Skovrøddam).

A total of 98 specimens taken in the years 1905--1918.

Dates:  $25/7 - 27/8$ .

Type specimens in Zoological Museum Copenhagen.

Named in honour of Mr. Sigvart Werner, the merchant of Copenhagen, who with great love has watched the welfare of Dyrehaven.

### ***Chaetostricha Schlicki* nov. spec.**

Head triangulate, almost round, eyes small, widely separated, forehead broad, ocelli close to each other, antennæ inserted almost in center of face. Thorax little, half the length of abdomen. Abdomen egg-shaped, ovipositor slightly produced beyond apex of abdomen. Penis similarly produced.

Antennæ: scape and pedicellus powerful, and long, of equal length, pedicellus oblong, narrowed towards base, anellus small, joint of funiculus about three fourths of the length of pedicellus, narrow, much narrower than both pedicellus and clavus. Club broader than the first joint, spindle-shaped. First joint of clavus the shortest, smaller than funiculus joint, the two extreme joints of clavus of equal length, as long as funiculus. Antennæ not strongly provided with sense organs and hairs. Eyes black, egg formed, ocelli black.

♀ yellow, underside of abdomen in region of ovipositor dark-brown, legs, especially femora and coxa, darker yellow, similar to lower part of face and underside of thorax. Antennæ light yellow. Apical joint of tarsi darker than the other joints.

♂ light yellow, the entire underside (face and underside of thorax and abdomen) of a darker yellow-brown colour, femora and coxæ of same colour.

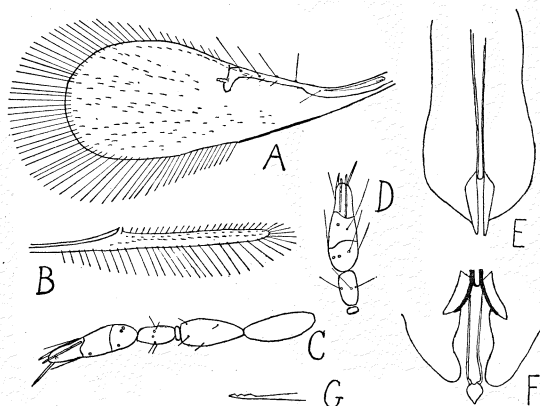


Fig. 9. *Chaetostricha schlickii* Kryger.

A Anterior wing. B Posterior wing. C Antennæ female. D Antennæ male. E Apex of abdomen, female. F Apex of abdomen, male. G Saw, female.

Anterior wings with about ten to twelve longer or shorter rows of hairs with spread hairs between the rows. Subcosta and marginal vein long, radius short, a little brown shading below stigma, fringe long. Posterior wings knife-shaped, fringe on anterior edge short, on posterior edge long, surface with two rows of hairs.

Length: male 0,75–0,85 mm, female 0,75–0,90 mm.

Dania: Dyrehaven, at the spot in Fortunens Indelukke, where gravel has been dug, on a little gravel slope covered with dry grassy vegetation.



Dates:  $^{30}/_7 - ^3/_8$ . From 1906–1913 found in all 26 ♀♀ and 2 ♂♂.

Types in Zoological Museum Copenhagen.

Named in honour of the late Konservator R. W. T. Schlick at the Zool. Museum in Copenhagen.

***Chaetostricha pulchra* nov. spec.**

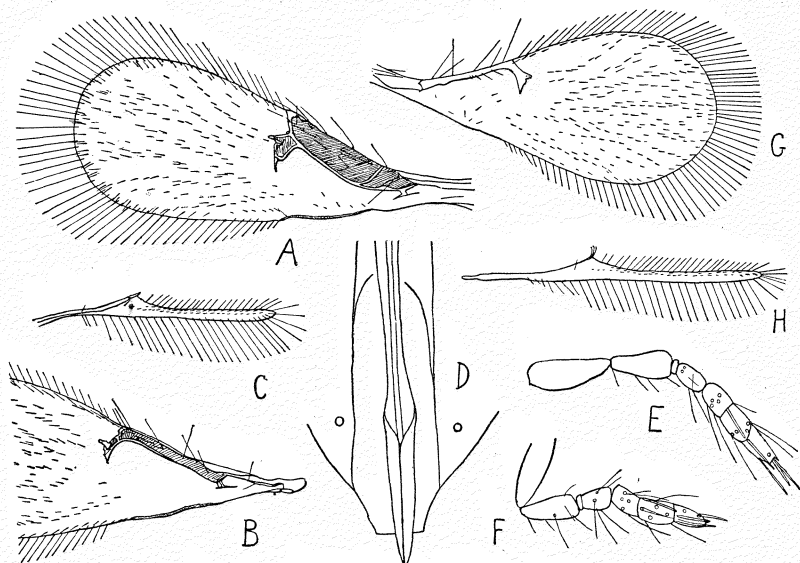


Fig. 16. *Chaetostricha pulchra* Kryger.

A Forewing, abnormal, Female. B Forewing abnormal, Male. C Hindwing, abnormal Female. D Apex of abdomen female. E Antenna male. F Antenna female. G Forewing, normale. Forewing normal.

Head dark brown with yellow-brown forehead. Thorax yellow, abdomen black with a broad yellow stripe on the four first segments, apex of abdomen quite black, the yellow on the four first segments being continued also on underside; the part round ovipositor black. Legs and antennæ light yellow. Thorax very short, not half the length of abdomen, abdomen broad, broader than thorax, powerful, all segments with coarsely, chitinated vertical striae. Eyes large, black, ocelli placed very close together,

black. Mandibles provided with three teeth, the two extremes, powerful, long, pointed and strongly chitinised. Palpi as in the other genera.

Antennæ placed close to mouth. Scape long, powerful, pedicellus almost of equal size to the scape, anellus little, club only a little longer than scape, all three joints of club almost of equal length each about as long as funiculus. Males club provided with stronger sense-organs than females. Anterior wings: subcosta long, costal vein very long, radius short, stigma before the center line of wing, with a very little faint shading below stigma, surface with about twelve rows of hairs and a number of spread hairs outside the rows, fringe rather short; posterior wings sword-shaped, long, one row of hairs on surface, anterior margin with short, hind margin with long hairs.

Length: male 0,75 mm, female 0,9 — 1,00 mm.

At Ryget and Skovrøddam the species is very common, other places only taken singly. It appears to prefer wet meadows (Ryget and Skovrøddam), although it has also been found on high dry grass land.

Figures A and B are representing wings of some specimens, quite resembling the ordinary form, but which have abnormal veins, with a very strongly chitinised central part. Som few specimens amongst many of the type form from Rude Hegn.

Dania: Dyrehaven, Ermelunden, Fortunens Indelukke, Rude Hegn, Ryget, Frerslev Hegn.

Dates:  $\frac{12}{5}$  —  $\frac{7}{8}$ , 1916—1918. A single specimen  $\frac{11}{9}$ .

Types in Zoological Museum Copenhagen.

### ***Chaetostricha dimidiata* (Haliday).**

1851. *Chaetostricha dimidiata* (Haliday) Walker. Ann. Mag. Nat. Hist. (2) VII. p. 211.

1898. *Chaetostricha dimidiata*. Dalla Torre. Cat. Hym. V. p. 3.

1904. *Chaetostricha dimidiata*. Ashmead. Classification p. 360.

1914. *Chaetostricha dimidiata*. Wolff. Zeit. f. Forst- u. Jagdw. XLVII p. 556.

Ferruginea, abdomine nigro, antennis pedibusque flavis, his fusco variis, alis basi fuscis.

Ferruginous: head transverse, short depressed in front: chest short an forechest extremely short; shield of the middle chest broad, scutellum small, abdomen black, smooth, shining, obconic, sessile, hollow above, keeled beneath, a little broader and longer than chest, legs yellow, fore-thighs and middle shanks brown at the base, middle thighs, hind thighs and hind shanks brown, the latter yellow beneath and the tips; feelers nearly spindle-shaped, yellow, about half the length of the body, first joint long, second joint cupshaped, brown at the base, third broad, fourth, fifth and sixth forming a spindle-shaped club, sixth joint dart shaped; fore-wings broad, brown from the base to beyond the middle, veins brown, not reaching beyond the middle of the wing, humerus long, ulna short, radius very short, cubitus rather short, stigma large.

Length of body  $\frac{1}{4}$  line, of wings  $\frac{1}{2}$  line.

Britannia: Holywood. Not found in Denmark.

## OLIGOSITINI.

### **Prestwichia** Lubbock.

- 1863. *Prestwichia*. Lubbock. Trans. Linn. Soc. London. XXIV p. 140.
- 1879. — Westwood. Zool. (2) I. p. 587.
- 1896—00. — Enoch. Various periodicals.
- 1897. — Willem. Bull. Scient. Fr. Vol. 30. p. 265.
- 1898. — Dalla Torre. Cat. Hym. V. p. 431.
- 1904. — Ashmead. Classification p. 359.
- 1907. — Schmiedeknecht. Die Hym. Mitteleuropas.
- 1908. — Heymons. Deut. Entom. Zeit. Berlin. p. 138.
- 1909. — Schmiedeknecht. Genera Insectorum. fasc. 97. Chalcididae.
- 1915. — Wolff. Zeit. f. Forst- und Jagdw. XLVII. p. 566.

This genus was originally described by Lubbock in 1863. It has been found time after time in many Euro-

pean countries and no doubt has ever arisen as to its identity.

The following is the description of the genus:

Antennæ proportionally short, inserted on a level with a line through the lower third of eye, seven jointed, scape, pedicellus, 1 anellus, 1 funiculus, and three jointed club. Head short and broad, cordiform, almost round, eyes rather small, produced, ocelli placed in an obtuse angled triangle. Thorax of winged female half the length of abdomen, but not broader than abdomen, in the apterous forms the thorax is less powerfully built. Abdomen sessile, pointed, conical, ovipositor strong, produced beyond apex of abdomen to a length equal to about two thirds of the entire abdomen. Penis quite short, hardly produced beyond apex of abdomen. Legs of winged female long and slender, in the apterous forms the legs are hardly as long; taken as a whole the apterous forms appears to be more powerfully and thicker built than the winged females.

Most probably only one species is found, which appears in winged, sub-apterous and apterous females and apterous males.

### ***Prestwichia aquatica* Lubbock.**

- 1863. *P. aquatica*. Lubbock. Trans. Linn. Soc. Lond. (2) Zool. vol. XXIV.
- 1879. — Westwood. Zool. (2) I. p. 587.
- 1898. — Dalla Torre. Cat. Hym. V. p. 431.
- 1904. — Ashmead. Classification 1904. p. 359.
- 1907. — Schmiedeknecht. Die Hymenopteren Mitteleuropas.
- 1909. — Schmiedeknecht. Genera Insectorum. fasc. 97. Chalcid.
- 1910. — Ussing. Internat. Rev. ges. Hybrob. u. Hydrol. III.  
120.
- 1915. — Wolff. Zeits. f. Forst- und Jagdw. XLVII. p. 566.

Winged female: Antennæ light brown, scape long and narrow, almost rectangular, pedicellus long, slightly broader than, and half as long as scape, anellus small, funiculus hardly half as long as pedicellus, clavus + funicu-

lus = scape. Each of the three joints of clavus almost of equal length, slightly longer than funiculus, sparingly provided with sense-organs.

Head dark brown, as well as front of thorax. Thorax light yellow, abdomen dark brown. Ovipositor lighter with dark apex, legs dark, femora light. Entire upper

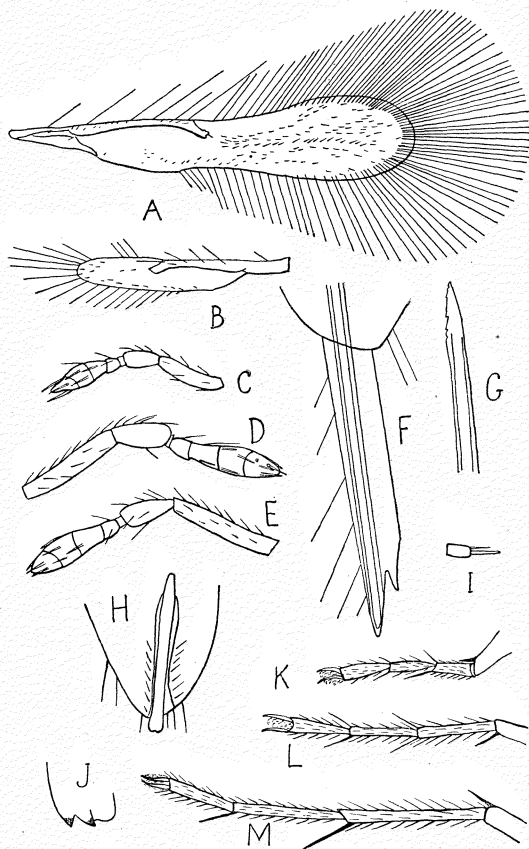


Fig. 11. *Prestwichia aquatica*.

A Forewing female. B Forewing female subapterous. C Antenna male. D Antenna winged female. E Antenna subapterous female. F Apex of abdomen female. G Saw. H Apex of abdomen male. I Maxillary palp. J Mandible. K Foreleg. L Middleleg. M Hindleg, subapterous female.

surface strongly reticulated, especially on thorax resembling scales.

Anterior wings very long and narrow, provided with very strong fringe, which at longest is longer than wing at broadest. Subcosta short, almost half as long as marginal vein, which is hardly one third of the wing-length. Radius short, stigma insignificant. Surface of wing provided with short hairs, which have a tendency to regularity, 3 or 4 regular rows are seen. Basal portion of wing to stigma smoky, as well as along costal margin; the wings being as a whole somewhat opaque. Posterior wings lineshaped without hairs on surface. Fringe at posterior margin long, at anterior margin short. Both pair of wings with reticulated surface. Legs similar to *Brachista* thickly furnished with long strong hairs and also similar to *Brachista* provided with very large claws.

Wingless and subapterous female as a whole darker, almost black on the dark parts. Sense-organs on antennæ more strongly developed.

Male apterous: much lighter than females. Antennæ appear to be much more strongly provided with sense-organs than in the winged females. Penis short, light at apex. Entire surface being strongly reticulated as in the females.

Each segment of abdomen of all forms as well as ovipositor provided with scanty but strong hairs.

Doubt has been expressed by several authors as to how far the winged females are able to fly. The only occasion on which I have found *Prestwichia aquatica* was  $27/7$  1905 at Donse. I swept the specimen from an Umbelliferous plant that grew on the banks of Donse Dam. The locality was such that the specimen must absolutely have flown to have reached this plant which stood away from the water.

This species, which lives in water, in which it swims by help of its legs has been found and bred often in

this country, as well as in our neighbouring countries, also in Belgium, France, England and Russia. It is a parasite on the eggs of water insects which are laid on or in waterplants or on stones; it occurs both in still and running water. As hosts can be named: eggs of *Aphelocheirus* (Hj. Ussing), eggs of *Ranatra*, *Dytiscus*, *Pelobius*, *Agabus*, *Dragon flies*, *Notonecta*, and *Erythromma najas* (Kaj L. Henriksen). It can be caught in the water, but the easiest manner is to bring the water plants home on which the host eggs are laid, and breed it.

The wingless and subapterous females appear to be the most common while males and winged females are rare.

Length: 0.5—1.3 mm.

Europe, also in Denmark.

Specimens in Zoological Museum, Copenhagen.

For further information as to the biology of this species, the reader is referred to a preceding article in this volume upon Aquatic Hymenoptera by Kaj L. Henriksen (p. p. 168—178).

### **Oligosita** Haliday.

1851. *Oligosita*. Haliday (Walker) Ann. & Mag. Nat. Hist. (2) VII  
p. 212 ♀.
1879. — Westwood. Trans. Linn. Soc. London. Zool. (2) I. p.  
591.
1897. — Aurivillius. Ent. Tidsskrift. p. 251.
1898. — Dalla Torre. Cat. Hym. V. p. 5.
1904. — Ashmead. Classification. p. 360.
1904. Westwoodella. Ashmead Classification. p. 559—360.
1907. *Oligosita*. Schmiedeknecht. Hymenopt. Mitteleuropas p. 491.
1909. Westwoodella. Schmiedeknecht. Gen. Insect Fasc. 97 p. 550.
1909. *Oligosita*. Schmiedeknecht. Genera Insectorum. Fasc. 97. p. 550.
1914. — Girault. Mitt. a. d. Zool. Mus. Berlin. VII B. 2 H. p.  
148.
1915. — Wolff. Zeitschr. f. Forst- u. Jagdw. XLVII p. 563.

This genus was originated by Haliday, and Walker reproduces the description of the first species from Haliday's manuscript in the work quoted above. Strangely

enough no disputes seem to have arisen as to this genus, it has easily been recognised by all the authors who have had the species for description, and neither does it cause the slightest difficulty to come to the correct result by help of Försters, Schmiedeknechts, Ashmeads and Wolffs tables.

However, although it may thus cause no difficulty to determine the genus *Oligosita*, I am of the opinion that there can be difficulty enough to get all the species I have found to agree with the diagnosis of the genus if it is to be taken quite literally. Taking as an example, Förster states: Hairs on wings not placed in rows, so that it will easily be understood by looking at my figure of *Oligosita pallida* that if it is to be followed as it stands the *Oligosita pallida* comes under the first group: Hairs on wings in rows (*Trichogram.*). Nevertheless there can be no question of doubt, that all the species I have referred to this genus really belong to *Oligosita* as they resemble each other so considerably, and therefore I have endeavoured in my table of the genera to avoid too much regard being placed to the fact that a species with the hairs on wings in rows absolutely must belong to group I.

#### Description of genus:

The species are on an average long and slender insects most often of yellow or brown colours. Antennæ 7 jointed: scape, pedicellus, 1 anellus, 1 funiculus and 3 jointed club. In the females the ultimate joint is provided with very marked sense-organs, more marked than in the male. Eyes and ocelli black. Wings on an average long and narrow, the surface provided with hairs on the external half only and only sparingly; the hairs on the disc of the wings not without a certain degree of regularity. Ciliae very long and robust. The wing muscles extend far into the abdomen. Sexual organs as a rule not visible from above. The sexes can best be determined by examination of the underside of the abdomen or of the antennæ.



## Table of the species\*):

1. Surface of wing with 0-4 single hairs . . . *O. nudipennis* n. sp.  
    Surface of wing with regular rows of hairs . . . *O. pallida* n. sp.  
    Surface of wing with irregular rows of hairs . . . . . 2
2. Clavus short and broad . . . . . 3  
    Clavus long and slender . . . . . 4
3. Clavus shorter than scapus . . . . . *O. incrassata* n. sp.  
    Clavus a little longer than scapus . . . . . *O. subfasciata*. Westw.
4. Forewing without any substigmatal spot . . . . . 5  
    Forewing with a little substigmatal spot . . . . . 6  
    Forewing with a larger triangulate substigmatal spot *O. impudica* n. sp.
5. Legs yellow, hind femora black . . . . . *O. germanica* Girault  
    Legs yellow, four hinder feet with brown tips . . . *O. collina* Hal.  
    Legs distinctly black . . . . . *O. nigripes*. Girault.
6. Fringe longer than the greatest width of the wing *O. Engelharti* n. sp.  
    Fringe four fifths the greatest width of the wing *O. Försteri*. Girault

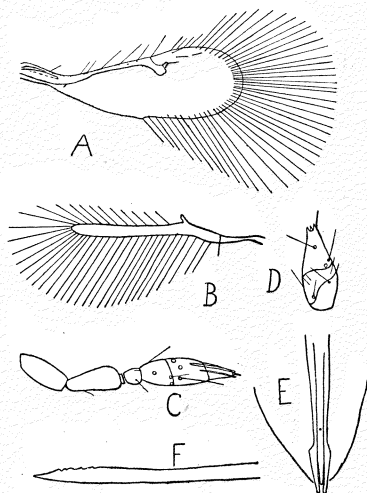
***Oligosita nudipennis* nov. spec.**

Elongate, narrow. Head broad, oval, forehead broad. Head broader than thorax slightly more than half the length of abdomen. Muscles of wings reaching down half way in the abdomen.

Colour almost whitish-yellow, underside and legs light yellow-brown, apical joints of tarsi and extreme apex of antennæ slightly darker.

Eyes and ocelli small, black, ocelli placed in a distinct triangle, antennæ inserted at mouth.

♀: scape a little shorter than pedicellus, funiculus

Fig. 12. *Oligosita nudipennis*.

Kryger.

A Forewing. B hindwing. C Antenna female. D Club of antenna male. E Apex of abdomen female. F Saw.

\*) with exception of *Oligosita sanguinea* Girault.

conspicuously small; joints of club of about equal length, the middle joint however being a fraction longer than the other two. Sense-organs short, sense hairs long.

♂ apical joint of club the longest, the middle distinctly shorter than the other two.

Anterior wings proportionally short and broad. Marginal vein long, radius short, stigma in apical half of wing. Surface of wing with 0–4 long, strong hairs near anterior margin and near stigma, also long hairs on marginal vein. Fringe extremely long and powerful, the longest at posterior angle, half as long as length of wing. A rather strong shading on the inner third of wing, and a slightly lighter shading below stigma.

Posterior wings without hairs on surface but with very long fringe both on anterior and posterior margin.

Penis and ovipositor short.

Saw provided with six teeth.

Length: male 0,45 mm, female 0,60 mm.

Dania: Ryget, Fortunens Indelukke, Dyrehaven at Forne, Ermelunden. The localities are open sunny dry grounds with short grass.

At total of nine specimens (6 ♀♀ + 3 ♂♂) 1905–1916.

Dates:  $25/7 - 16/8$ .

Type specimens in Zoological Museum, Copenhagen.

### ***Oligosita pallida* nov. spec.**

♀. Head cord-shaped, thorax long and narrow, abdomen long and narrow, the whole giving an elongate appearance. Thorax of about the same length as abdomen. Eyes small, black, ocelli black, forehead broad. Entire insect pale yellow. Antennæ placed almost in center of face. Antennæ elongate narrow, scape as long as pedicellus, anellus and funiculus together, pedicellus about two thirds of scape, club almost half of the length of whole antennæ. First joint of club a little longer than funiculus, second joint shorter than pedicellus and third

joint a little shorter than scape. The third joint of club as long as first and second together. Club only sparingly provided with short hairs and short sense-organs.

Wings quite transparent, marginal vein long, radius short, stigma about at centerline of wing. Surface at apex provided with four regular but short rows of hairs and one short row of hairs close to anterior margin, the four rows nearest margin are almost parallel, besides some single hardly perceptible hairs between stigma and base of wing. Fringe on anterior wings very long, the longest almost half the length of entire wing. Below the stigma is a quite little faint brown shading. Posterior wings long knife-shaped, apical half provided with one, hardly visible, row of hairs. Ovipositor hardly produced beyond apex of abdomen, saw provided with four teeth.

Length: female 0,84 mm.

2 ♀♀ taken  $10/10$  1906 in the short dry grass on the fence at the west side of the park at Bernstorff Palace, Gentofte.

Dania: Gentofte.

Types in Zoological Museum, Copenhagen.

***Oligosita incrassata* nov. spec.**

Elongate, narrow. Head broad, almost oval, broader than thorax. Thorax and abdomen of equal length and breadth. Abdomen cylindrical. Yellow, underside slightly darker, the apical half of abdomen dark yellow brown.

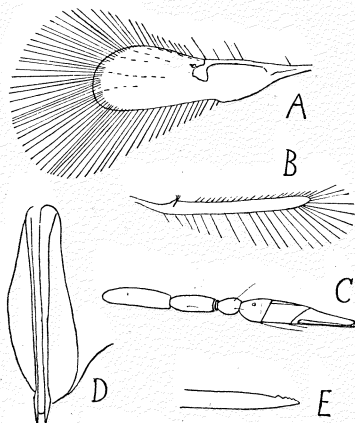


Fig. 13. *Oligosita pallida*. Kryger.

A Anterior wing. B Posterior wing.  
C ♀ Antenna. D ♀ Apex of abdomen  
E Saw.

Eyes black, egg-shaped, ocelli black, placed almost in a straight line.

Antennæ placed in center of face, short and very powerful. Scape long and narrow, pedicellus short and thick, about two thirds of the length of scape, funiculus short, narrower than pedicellus, and half as long as same.

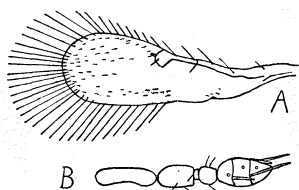


Fig. 14. *Oligosita incrassata*  
Kryger.

A Forewing. B Antenna female.

Club short and thick hardly as long as scape, all three joints of about equal length. Sense-organs long and powerful, produced far beyond apex of antennæ.

Anterior wings with very long marginal vein, radius hardly visible; about five short rows of hairs on the apical half of surface, two irregular rows at posterior margin below stigma. A dark shading below stigma. The shading which is strongest immediately below stigma becomes fainter towards posterior margin. Fringe long.

Posterior wings with one row of hairs on surface. Anterior margin with short hairs, posterior margin with long fringe.

Length: female 0,60 mm.

$\frac{9}{7}$  1906. One female taken amongst short grass on Amager common.

Dania: Amager.

Type in Zoological Museum, Copenhagen.

### ***Oligosita subfasciata* Westwood.**

1879. *Oligosita subfasciata*. Westwood. Trans. Linn. Soc. London. Zool. (2) I. p. 591.

1904. *Westwoodella subfasciata*. Ashmead. Classification p. 359.

1909. — — — Schmiedeknecht. Gen. Insect. Fasc. 97, p. 550.

1915. *Oligosita subfasciata*. Zeitschr. f. Forst- u. Jagdw. XLVII. Wolff. p. 563.

Head and thorax yellow. Legs and antennæ fuscus. Anterior half of abdomen yellow. Apical half of abdomen and lower part of face dark brown. Femora and tibiæ rather dark brown. Eyes and ocelli black. The yellow parts of male somewhat lighter than of female. Penis and ovipositor brown.

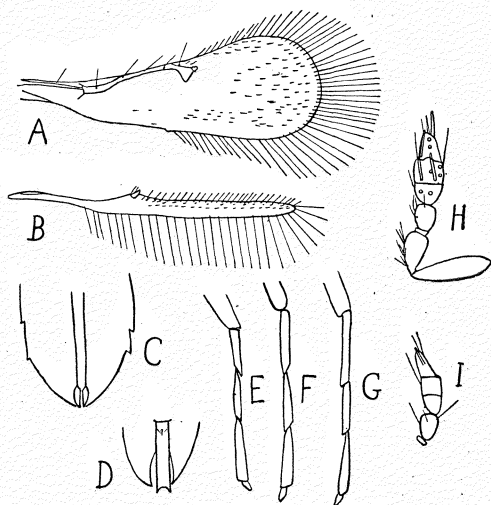


Fig. 16. *Oligosita subfasciata* Westwood.

A Anterior wing. B Posterior wing. C ♀ Abdomen. D ♂ Apex of abdomen.  
E. Anterior leg F. Intermediate leg G Posterior leg. H Antenna, female.  
I Antenna, male.

Antennæ at mouth on a level with lower point of eyes. Female: joints long, narrow, conical, pedicellus half as long as scape, funiculus one third of scape, club as long as scape, first clubjoint slightly shorter than funiculus, second and third joints of equal length, as long as funiculus. Male: The first and second club joints of equal length, slightly shorter than funiculus, last joint of club equal to funiculus. Male antennæ thinner than those of female. Joints of club in female provided with long sense-organs, which are produced on the last joint beyond the apex of antenna to an extent equal to the length of the third

joint. The sense-organs in the male are only short, and are hardly produced beyond the apex of antennæ. This appears to be a somewhat constant character in *Oligosita* and is most probably in conjunction with the fact that the female has the difficult work of finding the host-eggs in the grass, for which reason these organs must naturally be more developed than is the case with the male.

Anterior wings long and narrow. Marginal vein long, radius short, stigma triangulate, placed nearer the outer edge of wing than centerline of wing, with fuscus shading below stigma reaching to posterior margin of wing, subcosta with a similar shading along the innerside. Marginal vein provided with five strong setæ. Apical third of wing surface provided with hairs, not forming regular rows; below stigma two or three irregular rows of hairs. Fringe long, longest at outer-margin, shorter at costal and inner-margin, the longest slightly shorter than breadth of wing at stigma.

Posterior wings long, knifeshaped, costal margin with short hairs, hind margin with long hairs. Surface with a central row of short hairs, near costal margin a similar but somewhat thinner row of hairs.

Thorax as broad as but slightly shorter than abdomen. Segments of abdomen almost of equal length. Abdomen of female conical, of male cylindrical.

Ovipositor, sheaths etc. clearly visible on underside of female, which, however, are not produced beyond apex of abdomen.\*)

Male long and slender, female a little shorter and thicker.

Length: male 0,75 mm, female 0,75 mm.

The species is exceedingly common in open grassy spots in woods. I have taken it in Dyrehaven (many

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\*) A short penis can be seen in male which is produced slightly beyond apex of abdomen.

places, especially near „den slesvigske Sten“), Ermelunden (Ridepladsen), Fortunens Indelukke, Sorte Mose near Lillerød, Sandbjerg, Ørholm.

Altogether in the course of years I have collected 103 males and 167 females from the various localities where I have worked.

Dates:  $1/7 - 11/9$ , one single specimen  $27/6$ . 1905—1918.  
Dania. England.

Specimens in Zoological Museum Copenhagen.

I have no doubt that the species here described is identic with *subfasciata* Westwood. The colours, certainly, do not correspond quite, but as Westwood probably only had a single card-mounted specimen for examination whereas I have had ample fresh specimens partly in alcohol partly in Xylol-balsam for examination under strong light in the microscope, I have not considered this small divergences as of any weight. Westwood facies drawing of *O. subfasciata* I think is excellent and it gives an exceedingly good picture of our Danish species. Westwood's drawing of the mandible, however is surely wrong. Such a mandible is not to be found in any of the Trichogrammini examined by me. None of the species possesses more than two distinct external and one indistinct internal tooth on the mandible (vide my drawing of *Prestwichia*).

#### ***Oligosita impudica* nov. spec.**

Head heart-shaped, Thorax more than half as long as abdomen; abdomen of male slender, cylindrical, of female broader, conical. Head and thorax yellowish, lower part of face, abdomen and all legs darker yellow red-brown.

Antennæ placed near mouth at lower point of eyes, in male shorter and more slender than in female. Antennæ of female abundantly provided with sense-organs on club; these organs on last clubjoint produced far

beyond apex of antennæ. In male these organs are much shorter and are hardly produced beyond apex. Scape longer than pedicellus in the male, almost double as long as pedicellus in the female. Anellus and funiculus together as long as pedicellus. In male the middle joint of club shorter than first and third joints, in female the

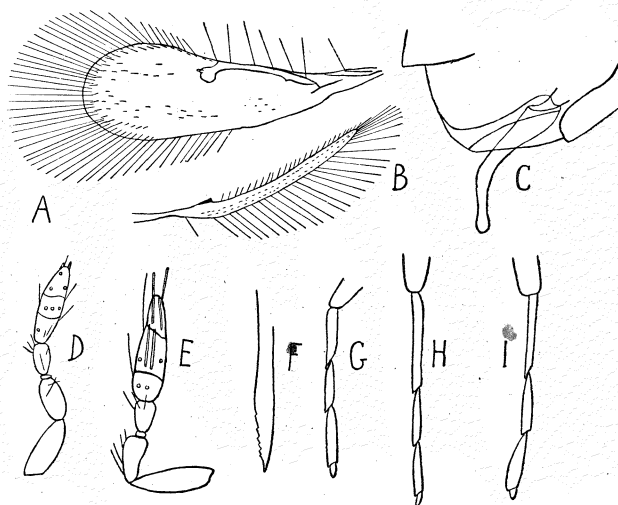


Fig. 17. *Oligosita impudica* Kryger.

A Anterior wing. B Posterior wing. C Male apex of abdomen. D Male antenna. E Female antenna. F Saw. G Anterior leg. H Intermediate leg. I Posterior leg.

middle joint is the longest. Club about as long as scape and pedicellus together.

Eyes black, ocelli forming a distinct triangle.

Anterior wings rather broad, strong. Marginal vein long, radius short, stigma placed before centerline of wing. One row of hairs on surface from radius along edge of wing to a little beyond subapical angle. One single row of hairs across surface on a level with stigma. Between stigma and suture two irregular rows of hairs and about seven single hairs on basal half of wing. From stigma a brownish shading spreads in a triangulate form towards suture, most marked just below stigma. Fringe about as



long as breadth of wing at stigma. Hairs and marginal vein conspicuously long and strong.

Surface of posterior wings with two rows of hairs, fringe very long. Posterior wings sword shaped.

Penis produced beyond apex of abdomen, ovipositor hardly visible beyond apex of abdomen, saw with seven teeth.

Length: male 0,75 mm, female 0,78 mm.

From a willow-bed in Vangede Fen, where the young branches are cut each winter for basket-making; the old stumps of the branches in which the pith has dried up form a hiding place for several larvae. In order if possible to breed some of these larvae, about 1100 of these old stumps were collected in April 1904, which were placed in glasses. From the shoots were bred six specimens of this species  $^{11}/_7$ — $^{18}/_7$ , and from shoots collected in June 1905 one specimen was reared  $^5/_7$ . Host quite unknown.

Bred  $^{11}/_7$ — $^{18}/_7$  1904 . . . 3 ♂♂ + 3 ♀♀.  
—  $^5/_7$ . 1905 . . . 1 ♂.

Dania: Vangede Fen.

Type specimens in Zoological Museum. Copenhagen.

### ***Oligosita germanica*. Girault.**

1914. *O. germanica*. Girault. Mitt. a. d. Zool. Mus. Berlin. VII B. 2 H. p. 148.

Male: Deep orange yellow, the distal two thirds of abdomen black, the proximal third pallid; legs yellow, the hind femora black. Fore and hind wings as in *subfasciatipennis* Girault which this species closely resembles excepting in coloration. It cannot be distinguished from that species otherwise.

Funicle joint obconic, longer than wide at apex by a little, intermediate club joint wider than long, shorter than the pedicel.

Length: 0,72 mm.

Germany. Not found in Denmark.

Type in Zool. Mus. Berlin. (Kat. Nr. 31958.)

**Oligosita collina** Walk.

1851. *O. collina*. (Haliday) Walker. Ann. & Mag. Nat. Hist. (2) VII  
1851. p. 212. ♀.

1898. — Dalla Torre. Cat. Hym. V p. 5.

1907. — Schmiedeknecht. Hymenopt. Mitteleuropas, p. 491.

1915. — Wolff. Zeit. f. Forst- u. Jagdwesen p. 563.

*Oligosita collina* (Haliday MSS), fem. Lutea, antennis pedibusque flavis, alis limpidis.

Body rather narrow, bright pale luteous, head hardly broader than the chest: eyes and eyelets piceous, the former very large: feelers pale yellow, subclavate, brown towards the tips, much more than half the length of the body, first joint very long, second cup-shaped, third and following forming a spindle-shaped club, chest short, nearly flat, sutures of the segments indistinct, abdomen spindle-shaped, depressy above, hardly keeled beneath, nearly twice the length of the chest to which it is closely applied, legs yellow, slender, four hinder feet pale yellow with brown tips, wings colourless, very narrow, deeply fringed; veins yellow, reaching a little beyond the middle of the fore wing, ulna rather longer than the humerus; cubitus a little longer than the radius, with which it forms a very acute angle, wing brand small, pale brown.

Length of the body  $\frac{1}{6}$  line of the wings  $\frac{1}{4}$  line.

Eur. Hibernia.

Mountain heath near Belfast (Ireland).

**Oligosita nigripes** Girault.

1914. *O. nigripes*. Girault. Mitt. a. d. Zool. Mus. Berlin VII. B. 2  
H. p. 148.

Female: Deep orange yellow, the wings slightly, uniformly infuscated, sides of thorax and abdomen, tip of the latter and about four transverse stripes evenly distri-

buted, dusky black. Legs dusky black, except knees and tips of tibiae. Antennae blackish, the funicle joint pale, one and a half times longer than wide, shorter than the pedicel, longer than the first club joint, the second club joint wider than long, the third longer than wide, subequal to the funicle. Fore wings broad, the discal ciliation distinct (about 13 lines across widest portion, the lines not regular), the longest marginal cilia a little over half the greatest wing width; a distinct substigmatal spot which is crescentic and from the direct apex of the stigmatal vein. Hind wings narrow, normal, their caudal marginal cilia a little longer than the longest marginal cilia of the fore wing.

Length: 0,73 mm.

Male: A little stouter and lighter in colour, the abdominal cross stripes more distinct. Tarsal joints and last two pair of legs longer, the first longest, over a third the length of the hind tarsus.

Patria: Germany (Spandau).

Type: Zool. Mus. Berlin. (Kat. No. 31959).

### ***Oligosita Engelharti* nov. spec.**

Head triangulate short, Thorax long, more than half as long as abdomen. Abdomen long, pointed, conical.

Dark fuscus, lower part of femora, especially on posterior legs dark clouded, the two apical joints of antenna darker shaded, eyes and ocelli black.

Antennae: scape as long as the two apical joints of clavus together, pedicellus half as long as scape, funiculus and first joint of clavus of equal length, together slightly longer than pedicellus. The two apical joints of antennae each as long as pedicellus. Sense-organs produced well beyond apex of antennae, all joints with strong and long hairs.

Anterior wings long and narrow, marginal vein long, radius short, stigma nearer costal margin than centerline

of wing. One row of hairs from stigma round the margin and one row on surface of wing. Besides on surface of wing is one irregular row of hairs below stigma and six spread hairs on basal half of wing. Very little shading below stigma. Longest portion of fringe about one third of length of wing. Posterior wings with

one row of hairs on surface, hind fringe long.

Ovipositor similar to the other species of the genus.

Length: female 0,66 mm.

Dania: Copenhagen.

Chr. Engelhart C. E. has found the only known specimen of this species on a window in Vestergade, Copenhagen. Date  $24/8$ . 1909.

The biology of this species is quite unknown, and its appearance in this locality in the center of a large

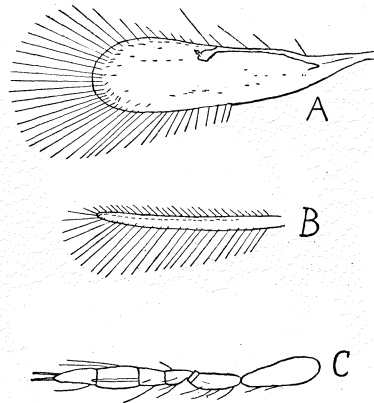


Fig. 18. *Oligosita Engelharti* Kryger.

A Anterior wing. B Posterior wing.  
C Antenna ♀.

city is quite a mystery. The only possible explanation being perhaps that it was brought there with earth or plants for a balcony-box or perhaps that the host lives on one of the limetrees on the neighbouring boulevard.

Named in honour of Mr. C. Engelhart C. E., President of the Entomological Club.

Type in Zoological Museum Copenhagen.

### ***Oligosita Foersteri* Girault.**

1914. *O. foersteri*. Girault. Mitt. a. d. Zool. Mus. Berlin VII B. 2 H. p. 148.

Male: Light golden yellow, the abdomen above, the hind coxa and sides of pronotum suffused with dusky. Fore wings hyaline, the substigmal spot pointing caudo-proximad, the discal cilia absent excepting for a more

or less distinct line from a little distad of knob of stigmal vein, out from the margin, distad to and around the apex and a short line of three or four near caudal margin opposite the stigmal vein and a longer one along cephalic edge; longest marginal cilia (at apex) four fifths the greatest wing width. Proximal joint of hind tarsus long and slender, somewhat longer than the other two which are subequal. Funicle joint one and a half times longer than wide, shorter than the pedicel, distinctly longer than the proximal joint of the club which is a little longer than wide and somewhat shorter than the following two joints, terminal setae not conspicuous.

Length: 0,65 mm.

Female: The same but darker yellow (deep orange yellow); antennae not seen.

Patria: Germany (Salzburg).

Types: Zool. Mus. Berlin. (Kat. No. 31957).

### ***Oligosita sanguinea* Girault.**

Girault relates (Entom. News. Philad. XXVI No. 1. Januar 1915 p. 32) that *Oligosita sanguinea* has been reared from cold storage material, mostly leaves and stems of lucerne collected at Portici, Italy. It has probably been introduced into Europe in connection with the importation of grasses.

I am not able to give the description of *Oligosita sanguinea* because nothing of the literature concerning the species is found here in Copenhagen.

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I have not overlooked the fact that it might perhaps have been reasonable to split the genus *Oligosita* in several genera. As I mean, however, that we are in present time too inclined to splitting of genera and as the species described by me are so characteristic in their appearance that the genus *Oligosita* can immediately be

recognized when a certain amount of material is at hand, I have at the present state of things been unwilling to go to a splitting of the genus *Oligosita*. Neither have I, on account of the war, been able to get the drawings of the species in the Berlin Museum, which should be required in order to make a just decision in this question.

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About the genus *Westwoodella* Ashm.

About *Westwoodella* Ashmead (1904. Mem. Carnegie Museum. Vol I. p. 359—360) is to say:

The genus *Westwoodella* does not exist at all. Ashmead who creates the genus on Westwood's *Oligosita subfasciata*, is of the belief that the species is a native of Ceylon. He apparently quite overlooks the remarks in Trans. Linn. Soc. London. Vol I p. 591, fifth line from top which runs as follows: Habitat Richmond Park, comit Surrey, mense Augusto capta.

However it is quite easy to see how Ashmead's error has occurred. If when reading further where quoted, the description of *Oligosita subfasciata* follows on lines 6—22. Then without hyphen or other clear point of separation from this description is continued on line 23 and further: Amongst the numerous minute Hymenoptera collected at or near Colombo by Mr. Staniforth Green.....

These lines form the introduction to the description of *Oligosita staniforthii*, *Oligosita nodicornis* etc. which can be easily overlooked as the whole page appears as one complete article all referring to *Oligosita subfasciata*.

The fact that Ashmead makes use of the shading on the wings, so common amongst the European species, as an additional character for the genus, does not in any way improve the matter.

## BRACHISTINI.

**Brachista** Haliday.

1851. *Brachista*. Haliday (Walker.) Ann. & Mag. Nat. Hist. (2) VII p. 211. no. 3.
1856. *Brachysticha*. Förster. Hym. Stud. II. p. 88.
1888. *Trichogramma*. Ashmead. Canad. Entom. XX p. 107 no. 19.
1894. *Brachysticha*. Ashmead. Journ. Cin. Soc. Nat. Hist. XVII p. 172.
1897. *Brachista*. Aurivillius. Ent. Tidsskrift p. 251.
1878. — Dalla Torre. Cat. Hym. V. 5.
1904. *Brachystira*. Mayr. Verh. Zool. Bot. Gesell. Wien. 54 B. p. 590.
1904. *Brachista*. Ashmead. Classification p. 359.
1909. — Schmiedeknecht. Genera Insectorum. Fasc. 97. p. 550.

With regards this genus, great diversity of opinion appears to be found amongst the various authors.

Förster states (l. c. p. 80) that the genus is *Brachista* Walker, but his reasons for ascribing it to Walker are not given. Further he changes the name to *Brachysticha*, because Wesmael has formed another similar name *Brachistes*. Further according to Förster's opinion, the genus is very easy to recognize. Schmiedeknecht does not at all mention it, however, in his book of 1907; Ashmead mentions the genus, but this is most probably because he knows the genus from America; under all circumstances he states in his table of genera: . . . . . *Brachista*. Haliday. (Type unknown.)

Wolff writes at last p. 563: Försters Angaben über die (rein amerikanische) Gattung *Brachysticha* . . . . ., thus does neither he regard it as belonging to Europe.

No remarks can be made about Ashmead, but both Wolff and Schmiedeknecht should have known otherwise, because in 1904 Gustav Mayr published in Verh. Zool. bot. Gesell. Wien 54 B. p. 584 a description of the genus from Försters own specimens.

Mayr states here, that in 1856 Förster created several new genera, without mentioning anything about the species, for which reason Mayr, who is now in possession

of Försters collections, describes amongst others the genus *Brachista*, which is found in the collection in well preserved specimens. Mayr, however, changes the name into *Brachystira*, as, according in his opinion, it is impossible to distinguish the two genera *Asynacta*, and *Brachysticha* in Försters collection by means of Walker's description.

As Förster, however, distinctly states that he has called the genus which has the long ovipositor *Brachysticha* and the other without ovipositor produced *Asynacta*, and even Mayr himself in his description states exactly the same, it would appear that the point was for once definitely settled, and thus there was no reasons whatever for Mayr to make any alteration, since he quite agrees with Förster as to which is which.

In my opinion there has been no cause whatever either for Förster or Mayr to make any alteration, and therefore I have taken the liberty to bring the name again in its original form, *Brachista*.

According to Mayr's description and my own observations I can describe the genus as follows.

Head short, width hardly visible if seen from above. Head wider than thorax, body short compressed, strong, with spread strong hairs, one and a half times as long as thorax and head together. Legs long, abundantly provided with hairs on tarsi, very large claws, spurs on intermediate and posterior tibiæ very strong.

Anterior wings long and broad longer than body, closely covered with long strong hairs almost over the whole surface, subcosta short, marginal vein long, radius short, stigma on basal half of wing, fringe short, longest at apical margin. The hairs on the surface of the wings distributed over the whole without any sign of regularity.

Antennæ seven jointed: scape, pedicellus, one anellus, one funiculus and three jointed club.



We have three species of this genus here in Denmark which can be separated by means of the following characters:

1. Club as long as scapus . . . . . 2  
Club distinctly longer than scapus . . . . . *B. similis* n. sp.
2. Protruded part of ovipositor as long as abdomen, species dark red-brown . . . . . *B. pungens* Mayr  
Protruded part of ovipositor one third of the abdomen, species black . . . . . *B. nigra* n. sp.

***Brachista pungens* Mayr.**

1904. *B. pungens*. Mayr. Verh. Zool. bot. Gesell. Wien. 54 B. p. 590-92.

Head oval almost as broad as long, broader than thorax. Eyes oval, black, not large, ocelli dark-brown placed in a very oblong triangle. Temples and forehead with few but long and strong hairs, cheeks with fine hairs in a single row. Antennæ inserted below the lower edge of eye, near mouth.

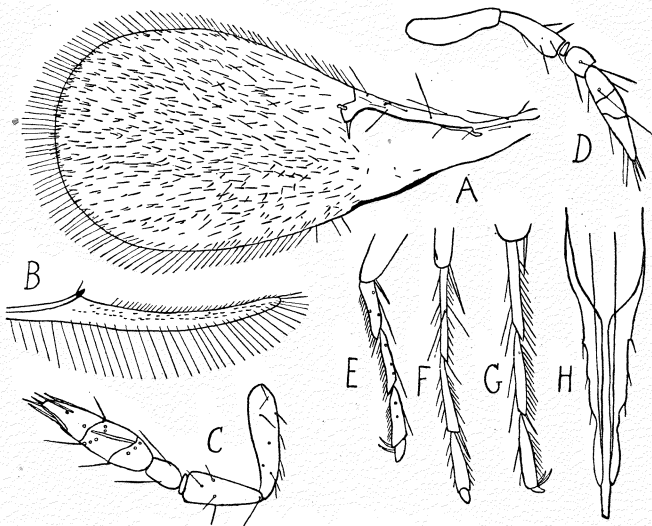


Fig. 19. *Brachista pungens* Mayr.

A Anterior wing. B Posterior wing. C Antenna ♀, D Antenna male. E Anterior leg.  
F Intermediate leg. G Posterior leg. H Apex of abdomen, female.

Antennæ: 7 jointed in both sexes, and *not* as stated by Mayr 8 jointed, it being his belief that there are two annellus joints. Specimens placed fresh in Xylol-balsam show quite distinctly *one* anellus, so that most probably Mayr's mistake originates from his having old tag-mounted specimens for examination. Scape long and narrow, longer than pedicellus, funiculus about one third of scape, middle joint of club of female as long as funiculus, first joint of club, a little shorter and third slightly longer than middle joint. In the male the middle joint the shortest, slightly shorter than the first and much shorter than the third. Sensitive hairs long and powerful, longest in male. Club as long as scapus.

Mandibles with two strong outer teeth, similar to the other species.

Mesothorax double as broad as long with well perceptive parapside furrows. Two very strong hairs on Mesothorax, scutellum distinctly shorter than mesothorax.

Abdomen with few spread strong hairs. Chitinising strongest on front margin of segments of abdomen, segments with chitinised vertical stria, however only visible under high magnifying power. Ovipositor stout and thick produced almost as far beyond apex of abdomen as the length of abdomen, sheaths with strong hairs pointed backwards.

Anterior wings faintly coloured with brown, posterior wings brownish with two rows of hairs on surface, sword-scaped, fringe on hind margin long, double as long as the longest on anterior wings, fringe on front margin insignificant.

Entirely red-brown, in the male the apex of abdomen darker, antennæ, legs and especially tarsi somewhat lighter, middle portion of ovipositor darker than abdomen.

Length: male 0,60 mm, female 0,60 mm.

On the shores of Furesø on a little slope below Frederikslund Garden, where all manner of insects, which

habit damp places were walking, one male and one female were taken with a few minutes interval on the ground amongst the low plants. From the locality where these two specimens were taken, there is no reason why the host in this case should not also be a dragon-fly similar to the American species later on mentioned.

Denmark. Germany. England.

Date: 27/6 1903.

Specimens ♂ ♀ in Zoological Museum, Copenhagen.

***Brachista nigra*. nov. spec.**

Female. Black. Head with single black and strong hairs. Face with one row of fine black hairs at the inner edge of each eye. Club of equal length to the scapus, apical club joint longer than 1st and 2nd. Funiculus as long as first or second club joint. Joints of abdomen with coarse chitinised vertical striae (as in *Chaetostricha pulchra*) and with single spread stout hairs. Ovipositor uncommon stout and thick; the inner two thirds curved to fit the rounding of the abdomen, the outer third straight. Saw with four teeth. Ovipositor with reticulated surface.

Length of thorax one third of the length of abdomen. Abdomen stout and broad.

Length: female 1,05 mm.

Denmark. Dyrehaven.

Dates 26/8—27/8 1918.

Types, two females, in Zoological Museum, Copenhagen.

I succeeded at last this summer after several years anxious search for more species of *Brachista*, to find this species, *Brachista nigra*, 2 females, at the little pond West of Fuglesangssøen in Dyrehaven by sweeping over a swampy ditch. I brought the specimens home alive and thus had an opportunity to make some observations as to their behaviour to the water.

The insects were reluctant to get under water, but once there, they behaved so that I could well presume that water was no strange element to them. They walked with ease both up and down a stick resting in the water and likewise they walked, underside up, under the leaves of ducks weed floating on the surface of the water. They could, however not keep at the bottom of the water without holding on to some object. There appeared to be some air adhering to them and this evidently gave them some buoyancy. They were able to rub their legs, wings and antennae while sitting on a stick in the water. If they lost their hold of the bottom or of the object they walked on they would rise slowly to the surface. At such opportunities as also when they left the ducks weed they used only their legs for swimming purposes and absolutely not the wings. These were always folded flat along their back.

These observations certainly seem to indicate that the European species of the genus also are aquatic forms but whether they should exactly frequent on the eggs of Odonata alone appears to me rather doubtful. The specimens of this species appears to me to be too big and powerfully built for that and I could rather fancy them frequenting eggs of Dytiscs or of aquatic bugs.

***Brachista similis* nov. sp.**

Female. Similar to *B. pungens* but longer and more slender built. Ovipositor is only produced beyond apex for about half the length of abdomen. Entire insect light brown. Striation much stronger than in *B. pungens*. Wings more narrow and not so powerful as in *pungens*.

Antennæ: Club longer than scapus, pedicellus 2 thirds of scapus; funiculus half as long as pedicellus and of equal size with 1st and 2d club joint. 3 club joint the longest.

Length: female 0,72 mm.

Denmark.

One female taken near the little pond West of Fuglesangsøen in Dyrehaven.

Date: 6/8 1906.

Type in Zoological Museum, København.

I take it for granted that *Brachista pallida* Ashmead (Some Hym. Parasites from Dragon fly Eggs. (Entomol. News. Philad. XI. 1900. p. 616) reared from eggs of *Lestes* sp., Lake Forest, Ill. U. S. A. by

Professor James G. Needham) can in no ways belong to the genus *Brachista* Haliday if one is to judge from Ashmead's description only. But these lines might perhaps cause a closer comparison to be undertaken between Ashmead's types and the description of the European species, so that it could be decided whether it is necessary to found a new genus for the non-European species.

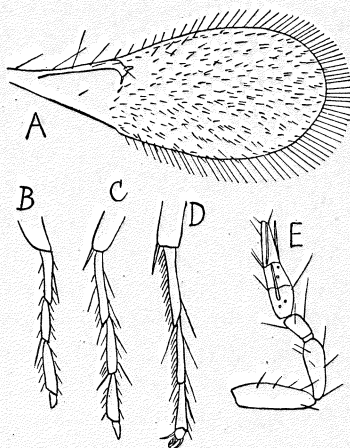


Fig. 20. *Brachista similis* Kryger.

A Forewing. B Foreleg. C. Middleleg.  
D Hindleg. E Antenna.

### **Asynacta** Förster.

- 1834. Eulophus. Nees. Hym. Ichn. aff. Mon. II. p. 183.
- 1856. Asynacta Förster. Hym. Stud. II. p. 87.
- 1897. — Aurivillius. Ent. Tidsskrift. p. 251.
- 1898. — Dalla Torre. Cat. Hym. V. p. 4.
- 1904. — Ashmead. Classification p. 359.
- 1904. — Mayr. Verh. Zool. bot. Gesell. Wien. 54 B. p. 589—92.
- 1909. — Schmiedeknecht. Gen. Insect. fasc. 97.

Nor seems this genus to have been found again after its having been described. At any rate none of the later authors are mentioning the species more closely. They

confine themselves to refer to Förster. Nor in the literature of the other continents is anything published indicating that such a genus has been found.

However, fortunately those specimens which Nees as the discoverer and those which Förster have possessed, are still in existence so that it is possible to get knowledge about genus and species.

On the supposition that Mayr's collection after his decease had found its way to the museum at Vienna I have written to this museum to get, if possible, a drawing of *Asynacta*. Professor Franz Fr. Kohl has in consequence hereof written me two letters of which transpires that Mayr's collection as I expected is in the museum and that *Asynacta exigua* Nees still is in the collection. The species is certainly established under the name of *Asynacta nigra* Förster, and Professor Kohl has not been able to find out what has become of two of the specimens which Mayr has used for his description (Euloph. exiguus „Original-exempl.“) but he thinks that after all the two specimens are still to be found in the collection.

Professor Kohl has compared the specimens labelled *Asynacta nigra* Förster in Mayr's collection with Mayr's description of *A. exigua* Nees and he says that the description fits *nigra* completely. There cannot be any doubt, that the problem *Asynacta* has found its final solution by the here mentioned description by Mayr.

Unfortunately it appears that out of the five specimens at hand only a single one is in such condition that it could be used to make a drawing from. Professor Kohl has shown me the extreme kindness to draw for me what could be drawn from the said specimen. The hind wings unfortunately are covered by the front wings and it has been impossible to get a proper view of the antennæ of the badly prepared specimen. Professor Kohl's drawing is reproduced beneath.

Professor Kohl further gives me some supplementary notes to Mayr's description. When Mayr says: „Der Hinterrand des Scheitels scheint so wie bei *Braschista* schneidig zu sein“, then this is quite correct, the hinder part of the head is „fast wie ausgeschnitten“ (Kohl) and quite alike in all the five specimens. Various minor discrepancies between Kohl's drawing and Mayr's description of the wing are naturally explained by Mayr having overlooked these trifles on account of the bad state of preparation of the specimens. Kohl especially points out that the basal part of the front wing is without discal ciliation.

Description of genus:

Antennæ 9 jointed: scape, pedicellus, 2 anelli (? Kryger) 2 funiculi, 3 jointed clavus, eyes hairy; head triangulate, almost broader than thorax. Mesonotum broader than long, parapsid furrows distinct. Abdomen short almost round, not longer than thorax. Ovipositor not produced.

Anterior wings broad, costal vein similar to that in *Poropoea*. Fringe very short. Apical half of wing covered with short brown hairs, 3 distinct rows is seen. (see drawing.)

### ***Asynacta exigua* Nees.**

1834. *Eulophus exiguus* Nees. Hym. Ich. aff. Mon. II, p. 183.

1904. *Asynacta exigua* Mayr. Verh. Zool. bot. Gesell. Wien. 54 Bd. p. 589—92.

Gustav Mayr states in Verh. Zool. bot. Gesell. Wien 54 B. 1904 p. 584, that he is the possessor of Förster's collection of Chalcids and Proctotryps. Förster, Hym. Stud. II., having created several new genera without describing the species belonging to them, and Mayr therefore describes the species belonging to the genus *Asynacta* in the above mentioned work p. 589—598.

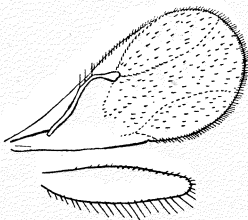


Fig. 21. *Asynacta exigua* Nees.

Fore- and hind wings.  
(Drawing by Kohl.)

Mayr's description is given here below:

„Syn. *Eulophus exiguus* Nees.

♀ length 0,5 mm. Not or hardly shining, underside faintly shining, dark brown, temples, mesonotum and scutellum black or brown-black, knees narrow, yellowish white. Very sparingly pubescent with protruding hairs. Eyes covered with short perpendicular protruding hairs, funiculus and clavus covered with scanty rather long diagonally placed hairs. Legs thinly covered with short recumbent hairs. Head and thorax finely wrinkled, abdomen above smooth or almost smooth.

Head seen from front rounded triangular, almost broader than thorax, posterior edge of temples appear as in *Brachystira* to be sharp, although I am not quite sure of this point as the head is very much shrivelled, and this edge may have been produced by the shrivelling in of the head.

Antennæ 9 jointed and not as stated by Förster 7 jointed, he not having paid regard to the two small anelli, scape is not flat and does not reach to the front ocellus, the moderately large pedicellus is almost one and a half times as long as it is broad at its extreme end, the two next following ring-joints are extremely small and can only be observed under a microscope; funiculus two jointed, as thick as pedicellus, both of the two joints somewhat longer than thick; clavus consisting of three joints and not quite three times so long as thick, each of the two first joints hardly shorter than thick and evidently broader than the joints of the funiculus, apical joint conical.

Mesonotum broader than long as usually in the *Trichogrammatinae*, with two sharply impressed parapsid furrows. Scutellum not strongly rounded behind.

Abdomen short almost circleround, not longer than thorax. Ovipositor and sheaths not produced. Legs rather thin and not short.



The evenly broad anterior wings with a costal vein, almost similar, to that in *Poropoea*, being situated almost nearer to the costal margin, than in that genus, although not confluent with margin, which is plainly seen under the microscope. From this point the vein bends as a ramus stigmaticus of average length downwards towards the middle of the wing and ends with a insignificant little knob. Marginal hairs rather short towards the apex of wings. The hyaline surface of anterior wings evenly covered with short brown hairs, only from the knob of the ramus stigmaticus is to be seen a clearly defined row of hairs towards the apex of the wing and another more indistinct diagonally towards the lower quarter of the anterior margin of the wing.

Together with Försters types which originate from Germany are two other specimens of the same species marked «*exiguus* Nees (*Eulophus exiguus* Nees) Original-exempl.», which must be regarded as Nees' types."

The species has not been found since from any locality.

---

As at present known the European Trichogrammidae comprise at least

11 genera and 30 species

of which

8 genera and 19 species are found in Denmark.

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All the original figures in this work have been drawn by help of Leitz's camera Nr. 2. Zeis's microscope having been used; tube length 160 mm. The following oculars and objectives have been used with all the figures:

Anterior wing .....	2 × C.
Posterior — .....	2 × C.
Leg .....	2 × D.
Penis .....	2 × D.
Ovipositor .....	2 × D.
Antenna .....	2 × D.
Saw .....	2 × F.

All figures reproduced one third of original drawings.

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All the material which has been used in this present work has been collected and bred (in the cases where breeding has been possible) by myself.

The types and the abundant material of earlier known species have been presented by me to the Zoological Museum 3rd Dpt. in Copenhagen after the work was finished.

With regard *Prestwichia aquatica* Lubb. however, I have only found the species on one occasion (1 winged female); Magister Kaj L. Henriksen and Hj. Ussing having kindly placed their bred material at my disposal. To these gentlemen I beg to tender my best thanks.

---

I express my thanks to the „Carlsbergfondet“ for having presented me with my microscope thus enabling me to study these small insects, and for the support rendered me for travelling so that I have been able to undertake the collecting of material all over the country.

Further I beg to thank „Det Steenstrupske Legat“ for having on several occasions granted me funds to undertake journeys in Denmark.

I further have to thank Messrs. Aug. West and Chr. Engelhart for their assistance in the translation.

Lastly I beg to tender my best thanks to Mr. Gahan, Keeper of Entomology, British Museum, Nat. Hist, for his

excellent assistance in clearing up the question of *Trichogramma carina* Walker, and further to Professor Franz Fr. Kohl, Vienna, partly for his undertaking a comprehensive examination of what the museum at Vienna possesses of *Asynacta*, partly for his extreme kindness in getting me a drawing of *Asynacta*, which thanks I feel so much the more compelled to tender as these two gentlemen, in spite of war and censors have rendered me assistance both quickly and satisfactorily.

Gentofte  $24/6$  1918.

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## LITERATURE.

The following list of literature by no means claims to be complete, and the greater part of the works mentioned I have not seen, it being quite impossible at the present time to obtain the works that have been published recently abroad; especially all the Russian works mentioned are quite unknown to me. A number of the works quoted here treat the North American or tropic species and therefore do not directly touch the present article; although I am of the opinion that it should be of interest to see the quantity of articles that have appeared on such a small portion of the chalcid flies as the group on which I have worked, as well as it could be of some importance to have a list of the main part of the literature which treat this group.

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