

6.

The Chalcid subfamily Eunotinae.

By

J. P. Kryger.

In his Classification (p. 312) Ashmead gives a key to the subfamilies of the family *Pteromalidae*. The new subfamily *Eunotinae* is characterised in the following way:

3. Head normal.....
— Head very wide, much wider than Thorax, lenticular;
antennae 6—10 jointed, inserted near the mouth border;
scutellum large, hind angles of metanotum acute.....
..... Subfamily III. *Eunotinae*.

Ashmead further writes (p. 325) about the *Eunotinae*:

“This small subfamily comprises a number of genera, all evidently of tropical origin, and all parasites of the rhynchotous family Coccidæ“.

According to the generic key (p. 326), Ashmead includes in the *Eunotinae* the genera *Enargopelte* Först. and *Eunotus* Walk. besides half a score of non-European genera, but he does not mention *Simopterus* Först. at all. This latter name occurs, however, in the index (p. 547), where reference is made to p. 388 (in Bibliography of the genera), on which we read:

Simopterus Förster, Verh. d. naturh. Ver. preuss. Rheinl. VIII, 1851, p. 22 (Type *S. venustus* Först.),

but the genus is not mentioned in any of the keys, and we cannot possibly guess where he would have placed it, if he had not quite forgotten it.

As Thomson has never seen any genus belonging to *Eunotinae*, we cannot, unfortunately, make use of his

"classificatory eye" if we are to form an opinion as to Ashmead's classification.

Further it may be mentioned here that the genus *Epicopterus* Westw., which, as pointed out below, is identical with *Simopterus* Först., was included by Ashmead (Classif. pp. 274 and 275) in the Miscogasteridan subfamily *Tridyminae*. As Ashmead has not collected chalcid flies in Europe, he had no other basis for this inclusion than Westwood's description.

It is beyond doubt that three genera occur in Denmark which may be placed in the *Eunotinae*, viz. *Epicopterus* Westw. (= *Simopterus* Först.), *Eunotus* Walk. (= *Megapelte* Först.), and *Enargopelte* Först.

But the questions now arise: Does there exist any relationship between these three genera, that is to say, do they form a well delimited subfamily within the European *Chalcidoidea*, and in which family is this subfamily to be placed?

I am inclined to admit the relationship, for the following reasons:

1. The antennae, though differing as to number of joints, are very much alike: the sense organs of the joints are quite identical; the surfaces of the scape and the pedicellus are reticulated in quite an identical way, which I have not seen in any other Danish Chalcidid group.

2. The head is lenticular in all the three genera.

3. The thorax and the abdomen are much alike in all the genera.

4. Middle tibiae with a rather stout spur, resembling that of the *Encyrtidae*.

5. Hind tibiae with two apical spurs (one small and one large).

6. The venation of the fore wing is in the main identical.

7. All the three genera are parasites of scale insects.

It is true that the shape of the wing of *Epicopterus* differs rather much from that of *Eunotus* and *Enargopelte*, but it is most probably influenced by the animal's living among the needles of small firs.

Moreover *Epicopterus* does not agree entirely with *Eunotinae* sensu Ashmead, for its antennae are not 6—10-jointed, but 12-jointed, but this, I think, is only a generic character within the *Eunotinae*.

As all the three genera possess two apical spurs on the hind tibiae, the subfamily *Eunotinae* belongs to the family *Miscogasteridae*, and not to the *Pteromalidae*.

Key to the genera.

- 1 (2) Antennae 12-jointed, with 2 annelli *Epicopterus* (*Simopterus*)
 2 (1) Antennae with less than 12 joints, without annelli..... 3
 3 (4) Club obliquely truncate at apex..... *Eunotus* (*Megapelte*)
 4 (3) Club rounded at apex..... *Enargopelte*

***Epicopterus* Westw. (*Simopterus* Förster).**

Westwood's original description of the genus *Epicopterus* and the sole species *choreiformis* (Mag. Nat. Hist. 1833 p. 418—19, fig. 55 b) is as follows:

Epicopterus Westw. *Pteromalo affinis*. Corpus brevissimum, latum; antennæ 12-articulatæ subclavatæ; alarum portio inter marginem anticum et nervum subcostalem antico (et præsertim ad nervi conjunctionem cum margine) dilatata, et ibi oblique truncata.

Body very short, convex and contracted; antennæ short, subclavate, 12-jointed, the 3rd and 4th joints annular; wings with the humeral portion anteriorly dilated and obliquely truncate at the union of the subcostal nerve with the front margin of the wings; abdomen sessile.

Spec. 1. *Epic. choreiformis* Westw. Nigro-æneus haud nitidus; facie viridi; antennis piceis articulo basali rufo; abdomine nitido cyaneo-nigro; lateribus cupreo-nitentibus; pedibus testaceis; alis basi obscurioribus.

Longitudo corporis, lineæ dimidium. Expansio alarum, lineæ $\frac{7}{8}$. In museo nostro. Habitat in gramineis prope Cantabrigiam, Julio, 1833.

Brassy black, not shining; face greenish; antennæ pitchy, with the basal joint reddish; abdomen shining cyaneous black,

with the sides coppery; legs reddish; wings darkish towards the base.

I found several specimens of this curious little insect at Gog Magog Hills, near Cambridge, during the late meeting of the Brit. Ass. (June 24—28 1833) in company with *Choreia nigroaenea* W.; which it so much resembles that, until I had carefully examined it, I thought it was its male. I have seen no other insect in this very extensive family with wings similarly formed.

Förster's original description of the genus *Simopterus* and the sole species *venustus* (Verh. Nat. Ver. Rheinl. u. Westph. 1851 p. 22, tab. I fig. 8) runs as follows:

Simopterus nov. gen. Antennae fractae, fronti media insertae, articulis undecim. Thorax latus, pronoto lineari-transverso, mesonoto subintegro, scutello magno, antice et lateribus suturis profundis distincte separato, metanoto valde abbreviato. Alae margine antico fere angulatim flexo. Pedes tarsis pentameris. Abdomen thoracis latitudine et longitudine, depressum, sessile, primo segmento maximo.

Sim. venustus n. sp.

Subviolaceo- vel nigro-aeneus, capite virente, antennis pedibusque rufis, coxis fuscis; metathorace medio longitudinaliter acute carinato; alis fusco-umbratis; abdomine laevi, nitido, segmento primo basi media foveolato.

Lg. $\frac{1}{4}$ — $\frac{2}{5}$ lin.

It will be seen from Westwood's description that in 1833 he swept a minute hymenopteron with 12-jointed antennae, two annelli, a sessile abdomen and the fore wing obliquely truncate at the union of the subcostal and the marginal veins. Further he states, that the species was caught in company with *Choreia nigroaenea*, which it so much resembles that "I thought it was its male".

From Förster's description we learn that in 1851 he swept a small hymenopteron with 11-jointed antennae, two annelli (see Hym. Stud. II, p. 64—65), a sessile abdomen, and the fore wing "fere angulatim flexo".

In 1856, however, in his key to the *Pteromalidae* (Hym. Stud. II, p. 64—65), Förster places the genus

among the genera with 13-jointed antennae; but from a comparison with the original notes upon the genus from 1851, we understand that he regarded the basal socket as an antennal joint. In fact, the genus *Simo-pteris* must be regarded to have 12 antennal joints, the two annelli included.

In the last-mentioned work (Hym. Stud. II 1856) the genus *Epicopterus* Westw. is completely lacking, and Förster does not mention it either in any of his other papers. In this paper (pag. 147) Förster says that he has treated 291 genera and their synonyms, arranged them in taxonomical keys, and given notes upon them. Further, that his own collection comprises 273 of these genera. Thus he has not seen eighteen of the genera, the names of which he enumerates. Among these eighteen names we also look in vain for *Epicopterus*. Förster cannot have been ignorant of Westwood's genus, for he records other of Westwood's genera from Mag. Nat. Hist. (e. g. *Lamprotatus*, *Agenioneurus*, *Hemiptarsenus*). He must have known this latter periodical, which is also evident from his note (l. c. pag. 82): "Siehe Mag. Nat. Hist. VI, 35, 418. *Smaragdites admirabilis* Westw. ". It seems incredible that he should have overlooked *Epicopterus* in Westwood's paper (pag. 418) and noticed *Smaragdites* on the same page. I am much more inclined to believe that the omission was made on purpose; he wanted to name the genus by his own name (*Simo-pteris*), as he begrudged Westwood the titbit.

Since 1856 no one seems to have seen *Epicopterus*. Thomson (Hym. Scand. IV 1878) does not mention it; he has not seen this nor any other genus of the Eunotid complex. As mentioned above, Ashmead (Classif. 1904) includes the genus *Epicopterus* in the *Tridymini*, and does not treat *Simo-pteris* at all. Schmiedeknecht (Hym. Mitteleur. 2. Ed. 1930), who follows, in all essentials, Ashmead's views, places *Epicopterus* in the *Misco-*

gasterinae (p. 426—27) and does not mention *Simopterus* at all, precisely as Ashmead. Kurdjumov (Notes on Pteromalidae, Revue Russe d'Ent. XIII 1913), it is true, mentions *Simopterus* (p. 9), but as he only deals with the *Pteromalinae*, and includes *Simopterus* in the *Eunotinae*, he does not enter further into the question and does not describe the genus. Gahan & Fagan (Type species 1923) record *Epicopterus* as well as *Simopterus* in their list, but have no idea that the two genera are identical.

The 3rd of July, 1930, was a very hot day. I was sweeping in Tibirke fen near Tisvilde. The heat was so oppressive that I was unable to work in the sun, and I therefore moved to a small grove of old birches with a couple of small scrubby firs growing in their shade. I swept the fir trees, and on examining the net, I discovered a small chalcid fly in it whose wings were pressed so closely against the body that it was difficult to observe them. At first I believed that I had caught the male of *Choreia inepta*, so long searched for; for this species may sometimes possess well developed wings. An examination at home revealed, however, a *Simopterus* female. A large number of Coccidae were found on the branches of the fir trees, many of which had been parasitised, but the parasites had unfortunately emerged. I assume that *Simopterus* is parasitic on the scales of the fir trees. Since this first finding of *Simopterus* I have swept the species several times, especially in Sønderkov fen near Lillerød, North Sealand, always on small shrubby firs beneath old birches and fir trees.

Förster's sketch of the wing makes it an easy matter to recognize the genus, and Westwood's statement, that his genus closely resembles *Choreia*, made it clear to me that the genus I swept was identical with

both *Simopterus* and *Epicopterus*. As Westwood's name is the older of the two, it has the priority, and the genus in question should therefore be named *Epicopterus* Westw. Similarly, on account of priority the sole species should be called *choreiformis* Westw.

Below I shall give some particulars about the species:

***Epicopterus choreiformis* Westw. (*venustus* Först.).**

Female: Antennae 12-jointed, consisting of scape, pedicellus, 2 small annelli, 5 funicular joints, and a 3-jointed club. Antennae very short; scape nearly as long as funicle and clavus together; antennae inserted at the lower edge of the eyes, not far from the mouth. Funicle and clavus with short hairs and strong sense organs.

Head broader than thorax, lenticular. Eyes large, ocelli in an almost straight line.

Thorax rectangular, nearly quadratic. Prothorax short; parapsidal furrows distinct; scutellum large; hind angles of thorax acute.

Abdomen sessile, rounded, 1st segment as long as all the succeeding ones together, and with an impression near its base.

Ovipositor hardly protruding.

Fore wing stout and broad, the outer edge convex. Subcosta long; marginal vein short; radius as long as the marginal vein, but shorter than the postmarginal vein. Subcostal cell wide. Wing obliquely truncate at the junction of the subcostal vein with the front margin. Marginal ciliae short; discal ciliae short; no discal hairs near the base of the wing.

Hind wing stout and broad.

Fore wing infuscated, but with a few hyaline patches evidently indicating the lines along which the wing is bent in order to lie close to the body.

Legs stout; middle tibiae rather stout; hind tibiae with two spurs, one long and one shorter.

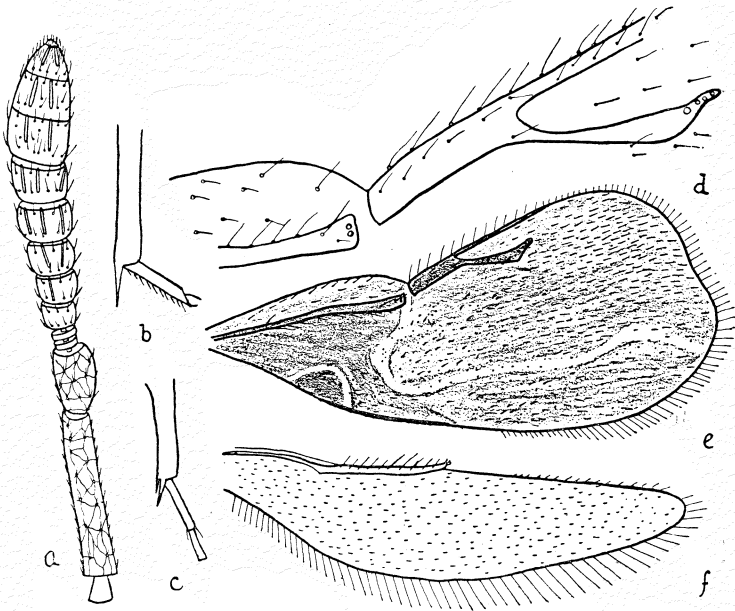
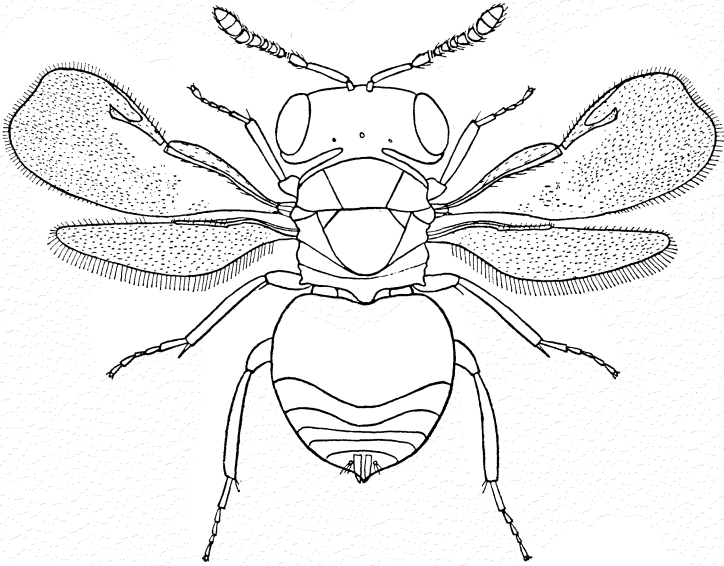


Fig. 1 (above): *Epicoproterus choreiformis* Westw. ♀.

Fig. 2 (below): a Antenna, b Middle leg, c Hind leg, d Stigma, e Fore wing, f Hind wing.

Antennae pale brown, pedicellus and clavus darker brown, head and thorax dark with a blue tint, abdomen black, shining, with a metallic lustre. Venation of wing dark brown. Legs more or less dark brown.

Length of animal: 1.25 mm.

Length of antenna: 0.50 mm.

Length of fore wing: 1.00 mm.

Length of hind wing: 0.75 mm.

Many females swept on shrubby firs, North-Sealand.

Dates of capture: first days of July.

Specimens on slides in Canada-balsam, Zoological Museum, Copenhagen.

Eunotus Walker (*Megapelte* Förster).

Walker (Ent. Mag. vol. II 1834, p. 297) described the genus *Eunotus* and the sole species *cretaceus* as new to science. Förster (Hym. Stud. II 1856 p. 63 & 66) changed the name to *Megapelte*, since in 1833 the name *Eunotus* had been given by Dejean to a beetle genus; the latter name proved, however, to be a synonym and the old name should therefore be retained.

Förster (l. c.) places the genus at the very top of the *Pteromalidae*, stating that the antennae have but eleven joints, viz. a scape, a pedicellus, two annelli, a 4-jointed funicle, and a 3-jointed club. Ashmead (Classif. p. 326) describes it as having 10-jointed antennae, and includes it in family LXIX *Pteromalidae*, subfamily III *Eunotinae*. Schmiedeknecht agrees with this and states (Hym. Mitteleurop. p. 430): 10-jointed antennae, and the genus belonging to *Pteromalinae*. It is not clear whence Ashmead got his different view. Thomson never caught the genus in Scandinavia, and accordingly it is not recorded in his book (Hym. Scand. IV).

Last year (1930) I happened to rear the sole species of this genus, *cretaceus* Walk., and as there seem to be

divergent views as to its characters, I shall describe it below.

***Eunotus cretaceus* Walk.**

Female: Antenna 9-jointed, consisting of scape, pedicellus, 5-jointed funicle and a 2-jointed club. Scape long, pedicellus one-third the length of the scape, 1st joint of funicle small, not half as long as pedicellus, 2nd and 3rd twice as long as the 1st; 4th and 5th shorter than the 2nd and 3rd, but a little longer than the 1st; club two-thirds the length of the scape, 1st club joint half as long as the 2nd. No annelli present; what earlier authors described as two annelli, is actually an undivided joint, which I regard as the 1st funicular joint, as I think it is too large to be called an annellus. It is true that a very careful preparation of an antenna in a convenient (curved) position on a slide mounted in Canada-balsam and at a 700 times magnification, seems to reveal a slight streak-like indication of a real annellus, but I have been unable to refind it in any of the antennae which I have examined; I therefore venture to say that it cannot represent (one of) Förster's annelli; Förster would hardly have been able to discover this minute streak.

Head rather thin, eyes small, occiput excavated, with a sharp border towards the front; the two hindmost ocelli placed near this sharp border. Mandibles bidentate. Antennae inserted near the mouth.

Thorax rectangular; pronotum small, looking like a collar; mesonotum rectangular, parapsidal furrows distinct, scutellum two-thirds of the whole length of the mesonotum, that is to say, twice as long as the preceding part of the mesonotum, stout, reaching the abdomen.

Head and thorax finely reticulated.

Six segments may be counted on the abdomen of specimens soaked in water, the 1st very long, the last

five very small. On dried or mounted specimens only the 1st segment can be seen, the five posterior ones having been retracted within this.

Ovipositor not protruding, apparently — on account of the sheath — arising directly from the apex of the abdomen.

Head and thorax dark green, dull, abdomen dark green, shining.

Fore wing stout and wide, densely covered with short hairs. Marginal vein not very short, subcosta long and straight, twice as long as marginal vein, radius and postmarginal vein of equal lengths, half as long as marginal vein. The four sense organs in the stigma rather widely separated. Subcosta with a transparent spot near the junction with the marginal vein. Colour of venation brown. Subcosta with about 15 strong setae, costal cell covered with fine hairs near the margin, naked near subcosta; a naked spot near hind margin.

Hind wing fairly long and wide, densely and evenly covered with discal hairs. Marginal ciliae short. Venation long.

Legs rather short and stout. Five tarsal joints. Middle tibia with a strong spur, and 1st tarsal joint of middle leg long and with strong and short setae — features reminding one of the *Encyrtidae* and *Eupelmidae*. Hind tibia with two apical spurs. Femur, tibia, and last tarsal joint dark brown, the four proximal tarsal joints pale brown.

Length of animal: 2 mm.
 Length of antenna: 1 mm.
 Length of fore wing: 1.5 mm.
 Length of hind wing: 1 mm.

Bred from *Coccus* on *Salix repens* on the heathery common near Sandkroen at Tisvilde, North Sealand. A number of twigs of *Salix repens* with numerous big, brown coccids were collected on June 5th, 1929; during the summer many specimens of *Aphycus* were bred,

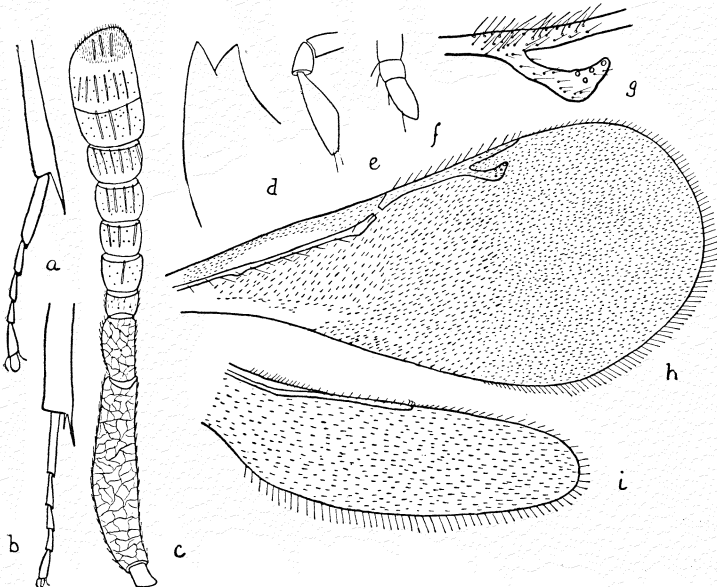
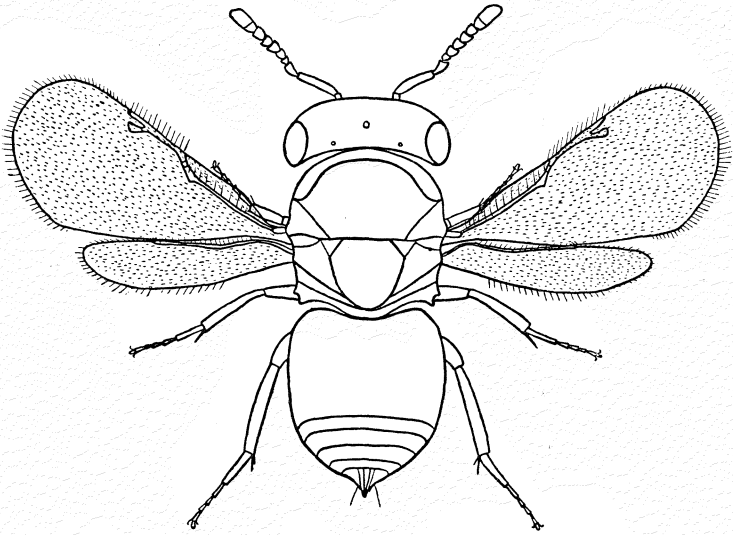


Fig. 3 (above): *Eunotus cretaceus* Walk. ♀.

Fig. 4 (below): *a* Middle leg, *b* Hind leg, *c* Antenna, *d* Mandible, *e* Maxillary palp, *f* Labial palp, *g* Stigma, *h* Fore wing, *i* Hind wing.

and in April, 1930, about 35 specimens of *Eunotus* appeared, all females. According to this, *Eunotus* seems to develop very slowly, especially when it is borne in mind that in the open no specimens would have been bred until May or June.

Further, one female swept in the heathery moor Sorte Mose near Lillerød, North Sealand, on May 29th, 1930.

I have never seen the male, but Förster states that it is like the female, except for the slender antennae, which lack a distinct club.

Specimens on slides in Canada-balsam, Zoological Museum, Copenhagen.

Enargopelte Förster.

Förster described the genus *Enargopelte*, and the sole species *obscurus* in 1878 (Verh. naturh. Ver. preuss. Rheinl. Jhg. 35 1878 p. 62). Ashmead records it in his Classification (1904); in the key (p. 326) he spells the name *Euargopelte*, while in the Bibliography (p. 372) he correctly writes *Enargopelte*. Schulz (Spolia Hym. 1906 p. 143) also mentions it, but he has seen it no more than Ashmead. Nor have Thomson or Schmiedeknecht seen it, so most likely it has not been caught since the time of Förster.

I caught a male and a female in 1931, and on the basis of these I shall describe here the genus and its sole species, *obscurus* Förster.

Enargopelte Förster.

Antennae of both sexes 9-jointed, in the male filiform without clavus or annellus, in the female consisting of scape, pedicellus, one small and four large funicular joints, and a 2-jointed clavus; no annellus present. Antennae inserted near the mouth.

Head rather thin but wide. Eyes large, ocelli forming a right-angled triangle.

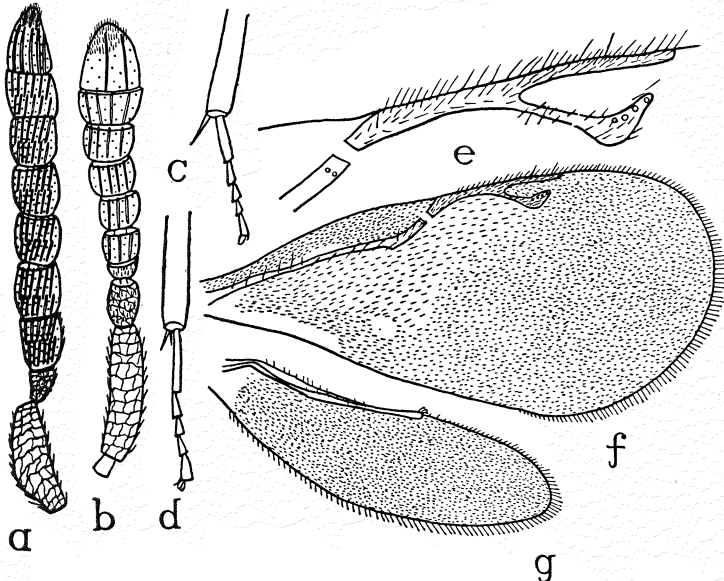
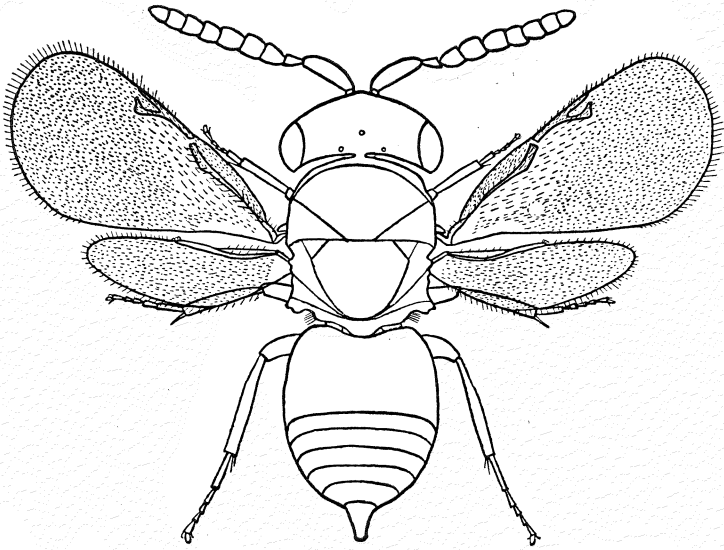


Fig. 5 (above): *Enargopelte obscurus* Först. ♂.

Fig. 6 (below): *a* Male antenna, *b* Female antenna, *c* Middle leg, *d* Hind leg, *e* Stigma, *f* Fore wing, *g* Hind wing.

Thorax large, wide, nearly rectangular, pronotum rather large. Parapsidal furrows distinct. Scutellum large, oblong. Metanotum with acute hind angles.

Abdomen oval, longer than thorax, almost as long as head and thorax together, 1st abdominal segment much longer than the rest of the abdomen.

Fore wing long and stout. Subcosta long, marginal vein short, radius more than half the length of marginal vein, postmarginal vein longer than radius, but shorter than marginal vein. Costal cell wide. Surface of wing evenly covered with short hairs, beneath the venation the hairs are larger and more scattered. Subcosta with about 20 setae. Two long setae on postmarginal vein. Marginal fringe short.

Hind wing wide and stout, but short. Surface of wing evenly covered with short hairs. Marginal fringe short.

Legs of usual shape, stout. Middle tibiae with a long spur, resembling to some extent the *Encyrtidae*. Hind tibiae with two spurs, one long and one stout.

Green, metallic. Head and thorax finely reticulated with many very small shining points resembling those of *Phaenodiscus*. Abdomen bright. Legs and antennae brown; eyes and ocelli red.

Enargopelte obscurus Förster.

Male: Antennae short and stout; scape long and wide, pedicellus very small, the seven funicle joints subequal in length, terminal joint the longest, longer than 1st and 2nd funicle joints together; all funicle joints as wide as long. No sensory hairs, but stout sense organs on all funicle joints.

Legs and antennae dark brown. Tarsi and pedicellus dark brown.

Female: Antennae short and stout; scape long and slender, pedicellus longer than in the male, nearly half as long as scape; 1st funicle joint very small, the last four subequal in length, shorter than wide, widening

towards the tip. Clavus stout, egg-shaped, 1st claval joint half as long as the terminal joint. Funicle and club joints with stout sense organs, no sensory hairs.

Antennae brown, scape and pedicellus pale brown.

Legs dark brown, tarsal joints pale brown, last tarsal joint darker.

Venation in both sexes brown.

Male: Length of animal: 2.2 mm.
Length of antenna: 1.00 mm.
Length of fore wing: 1.4 mm.

Female: Length of animal: 1.7 mm.
Length of antenna: 0.7 mm.
Length of fore wing: 1.00 mm.

One large male and a small female swept on *Salix repens* infested with scale insects, May 26th, 1931, on the common near Sandkroen, Tisvilde, North Sealand.

Male and female on two slides in Canada-balsam, Zoological Museum, Copenhagen.

Dansk Oversigt.

I dette Arbejde behandles en lille Underfamilie af de pentamere Chalcidier. Den rummer en halv Snes Slægter væsentligt hjemmehørende i de varmere Dele af Jorden, men dog med nogle europæiske Repræsentanter. Underfamiliens Plads i Systemet har været omstridt, men den maa henføres under *Miscogasteridae*, da alle Slægter har to Sporer paa Enden af Mellemskinnebenene. Tre Slægter, som alle er meget sjældne, idet de ikke synes at være fundet nogetsteds i Verden siden 50'erne i forrige Aarhundrede, er fundet her i Landet; de afbildes og beskrives. *Epicopterus* (*Stimopterus*) *choreiformis* Westw. er fundet paa Fyrretræer under gamle Birke i Tibirke Mose, 3. Juli 1930, i Sønderskov Mose ved Lillerød o. a. Steder; antagelig snylter den paa Coccider. *Eunotus cretaceus* Walk. er fundet ved Sandkroen, Asserbo, 5. Juni 1929, paa Grene af *Salix repens*, og 29. Maj 1930 i Sorte Mose ved Lillerød; antagelig ligeledes som Snylter i Coccider. Og endelig er *Enargopelte obscurus* Först. fundet ved Sandkroen, Asserbo, 26. Maj 1931, ogsaa paa *Salix repens*, paa hvilken der var talrige Skjoldlus.