

The European Mymaridae
comprising
the genera known up to c. 1930.

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In the present paper a survey will be given of what was known up to c. 1930 about the European Mymarids. The plan was laid long before the war together with Dr. B. N. Blood, Bristol, and it was the plan, that we should work it out together. The war, however, cut off the connexion between us and in 1948 Dr. Blood died, so he never saw the manuscript in its final form. I am, therefore, forced to publish it under my own name alone, but I wish to point out the valuable assistance and kind interest always shown by Dr. Blood.

Historical survey.

The *Mymaridae* form a well-defined group of small Hymenoptera, which belongs to the *Chalcididae*. The first author to mention the group is Haliday (Ent. Mag. Vol. I 1833 p. 341—350), who, on the basis of careful examination of the thorax and the abdomen, places it as the

5th tribus of the Chalcididae. Later authors do not all of them agree with him. Westwood regards it as belonging to the *Proctotrypidae*. He writes as follows (Intr. mod. Class. Ins. London 1840. Vol. II p. 173):

“Regarding the Mymarides as belonging to the *Proctotrupidae* on account of the diversity of the antennæ in the opposite sexes and of the absence of veins of the wings (thus resembling *Diapria*)...”.

Förster, who first mentions the group in Linnaea entom. II 1847 p. 195—232, does not on that occasion take up a definite standpoint to the question. He writes that Curtis and Stephens refer it to the *Proctotrypidae*, and he himself thinks that *Ooctonus* and *Polyinema* are in many respects closely related to this family. In Hym. Stud. II 1856 p. 20 Förster recurs to the question, and now he has no doubt: in his key the *Mymaridae* are placed between *Platygaster* and *Diapria*, among the *Proctotrypidae*. Nees, whose work Förster rightly recognises, says (Hym. Ichn. Aff. Monog. Vol. II p. 7, the key):

“A. Terebra e ventre infra anum progrediens. *Chalcididae* [comprising also *Myina*, *Eutriche*, *Aneure*, and *Gonatocerus*].

B. Terebra analis seu ex ipso abdominis apice progrediens [all the genera which we now class among the *Proctotrypidae*].

In Förster’s key p. 11 we read:

Chalcididae. ♂ Fühler immer gebrochen, mit ein oder mehreren kleinen Ringeln (Zwischengliedern) zwischen Stielchen und Geissel.

♀ Der Legebohrer unterhalb (d. h. vor) der Spitze des Hinterleibs entspringend.

Proctotrupii. ♂ Fühler gebrochen oder ungebrochen, zwischen dem Stielchen und der Geissel keine Ringel (Zwischenglieder), selten ungebrochen mit einem kleinen Ringel.

♀ Der Legebohrer aus der Spitze des Hinterleibs entspringend.

Förster’s reasons for settling the matter in this way are impossible to guess. He cannot have been ignorant

of the fact that the ovipositor in *Eustochus* rises from the abdomen near the thorax, and accordingly he should have referred the *Mymaridae* to the *Chalcididae*. Recent investigators do no more agree about the question. Thomson (Scand. Hym. 1878) does not mention the group at all. Dalla Torre (Cat. Hym. V), Henriksen (Ent. Medd. 12 1918 p. 147. De europ. Vandsnyltehvepse), and Wahlgren & Tullgren (Sveriges Insekter 1920 p. 639) class it among the *Proctotrypes*, while Schmiedeknecht (Hym. Nord- und Mitteleur. 1930 p. 448) coordinates it with the *Chalcididae* and *Proctotrupidae* as XVIII Fam. *Mymaridae*. Ashmead (Classification 1904) classes the *Mymaridae* among the *Chalcididae*.

The *Mymaridae* no doubt form a true subfamily of the *Chalcididae* judging from the structure of the thorax and the rising of the ovipositor from the underside of the abdomen. The veins of the wings likewise suggest the relationship, for though the veins are more or less incomplete, it is easy to refer the different parts to the veins in the common chalcid wing, while they have not the least resemblance to the veins in the wings of the *Proctotrypes*.

In this paper the European genera known up to 1930 are dealt with. Before the description the most important historical facts concerning the family *Mymaridae* will be given. These facts are scattered over so many different periodicals and books that students will be relieved to find them all gathered in one place.

Haliday's key, Ent. Mag. I. 1833 p. 269, runs as follows:

**Ovivoræ, s. Mymares. Nervus subcostalis brevissimus: antennæ et pedes gracillimi.

I. Pentameri.

Ooctonus. Antennæ maris 13-articulatæ flagello filiformi, feminae 11-articulatæ capitulo exannulato.

Litus. Antennæ maris 13-articulatæ flagello filiformi, feminæ 9-articulatæ capitulo exannulato.

II. Tetrameri.

1. Antennæ feminæ 10-articulatæ capitulo biarticulato.

Eustochus.

2. Antennæ feminæ 9-articulatæ capitulo exannulato.

A. Abdomen petiolatum.

Mymar, (E. B.) Alæ anticæ capillares apice spathulatæ, posticæ setacæ.

Polynema. Alæ anticæ obovatæ, posticæ lineares.

B. Abdomen sessile.

Anaphes. Abdomen ovoideum: antennæ maris 12-articulatæ.

Anagrus. Abdomen conico-elongatum: antennæ maris 13-articulatæ.

Familiam hancce integram consulto transilui, generibus a me ipso olim vulgatis modo in ordinem revocatis, quippe quæ peritiori in manibus jam versatur optimo angurio.

Ibid. p. 341.

Trib. 5. Mymares.

Caput transversum areolatum. Antennæ supra mediam faciem insertæ, graciles elongatæ fractæ, feminis capitatæ. Os epalpatum. Alæ angustæ ciliatæ, nervo subcostali brevissimo, cubitali nullo.

Areolarum capitatis hæc est circumscriptio: vertex antice et utrinque lineolis elevatis terminatur lateralibus postice inflexis aut cum margine præciso occipitis coeuntibus: frons pari modo secernitur a regione oculorum lineolâ aliâ insuper sub antennas arcuatim ductâ. Quo vero crassius caput est et vertex planior eo magis emicat hæc structura: nonnullis quorum caput brevissimum est (e. g. Anagro) vertex antrorsum declivis fere in lineâ speciem contractus et antennæ inferius insertæ videntur: antenarum radícula sæpe exserta tenuis, capitulum feminarum plerunque exannulatum, rarius biarticulatum (Eustocho): mandibulæ trigonæ apice denticulis 3: maxillæ unâ cum labio ovato-circumscriptæ: palpi desunt*): thoracis forma variat: mesothoracis lobi humerales discreti; paraptera minuta valde remota; scutellum subtiliter transverse bipartitum, plerisque cum scuto metathoracis continuum: alæ valde angustæ lineares vel anticæ obovatæ

*) Species examined: *Ooctonus insignis*, *O. vulgatus*, *O. littoralis*, *Polynema ovulorum*. In living specimens of *Polynema ovulorum*, I have seen at the back of the maxilla in the ordinary place of the palpus, a minute shapeless tubercle, which becomes contracted, and disappears in dried specimens.

nunquam trigonæ, nervus subcostalis tenuis quadrantem alæ longitudinem vix attingit sæpius adhuc multo brevior, radio et cubito nullis, ulnâ lineari brevi, vel etiam in punctum contracta: alarum margo plerisque pulchre ciliatus s. plumatus: abdomen sæpius ad instar Cynipedum tereti-compressum, segmentorum dorsalium marginibus inflexis ventrem obtegentibus: venter carinatus arcuatim ascendens: aculeus gracilis crimæ ventrali repositus: pedes elongati graciles saltatorii, tarsis pentameris aut tetrameris.

This tribe comprises the very atoms of the order Hymenoptera. The females oviposit in eggs of other insects. The species occur from the earliest spring to late autumn.

With regard to their position in the system, both Stephens & Curtis refer them to the *Proctotrupidae*, and such high authority makes me very diffident in proposing for them a position nearer to the Chalcides: to which I have been determined principally by an examination of the parts of the thorax, and the position of the petiole, which, however, presents a marked peculiarity.

Thus in his first paper Haliday mentions the following genera: *Ooctonus* Hal., *Litus* Hal., *Eustochus* Hal., *Mymar* Hal., *Polynema* Hal., *Anaphes* Hal., *Anagrus* Hal.

Westwood (in *Introductio in Class. Insect. Vol. II.* 1840 p. 173) writes:

“Regarding the *Mymarides* as belonging to the *Proctotrupidae*, on account of the diversity of the antennæ in the opposite sexes and of the absence of veins of the wings (thus resembling *Diapria*) the family will comprise the six following subfamilies, corresponding with the divisions proposed by Mr. Haliday in the *Entom. Mag.* vol. I p. 269.

I. *Mymarides*: Head transverse areolate; antennæ inserted above the middle of the face, ♂ long, slender and elbowed, ♀ clavate; mouth destitute of palpi; wings narrowed, densely ciliated, with a very short subcostal nerve.”

In the same work (p. 78 of the *Synopsis*) Westwood gives the key to the *Mymaridae*:

“*Proctotrupidae*.

Subfamily 6. *Mymarides* Westw. (*Mymaridae* Hal.).

Mymar Hal. *Gonatocerus* Esenb. 4 sp. *M. pulchellus* Curt. 411.

Antennæ ♂ 13-jointed, ♀ 9-jointed; club inarticulate; scapus in both sexes elongate,

- linear; tarsi 4-jointed; abdomen peduncled.
(My fig. 78, 16 ♂).
- Ooctonus Hal. 5 sp. *M. insignis* Hal.
Antennae ♂ 13-jointed, ♀ 11-jointed, with an inarticulate club; tarsi 5-jointed.
- Anaphes Hal. 4 sp. *Ich. punctum* Shaw.
Antennae ♂ 12-jointed, ♀ 9-jointed; club inarticulate; tarsi tetramerous; abdomen sessile, ovoid. Linn. Trans. vol. XIV pl. 18. fig. 1.
- Polynema Hal. 7 sp. *Ichn. ovulorum* Linn.
Antennae ♂ 13-jointed, ♀ 9-jointed; club inarticulate; scapus in each sex dilated, sinuated, but slightly elongate; abdomen petiolated.
- Litus Hal. 5 sp. *Litus dimidiatus* Hal.
Antennae ♀ 9-jointed; club inarticulate; tarsi 5-jointed.
- Eustochus Hal. *Callitriche* Esenb. 1 sp. *M. atripennis* Hal.
Antennae ♀ 10-jointed; club biarticulate; tarsi tetramerous; abdomen petiolated.
- Anagrus Hal. 5 sp. *Ichn. atomus* Linn.
Antennae ♂ 13-jointed, ♀ 9-jointed; club inarticulate; tarsi 4-jointed; abdomen sessile, conic-acuminate.
- Alaptus Hal. 1 sp. *M. minimus* Walk.
"Tarsi pentamerous; antennae ♂ 10-jointed, filiform, 8-jointed ♀, last joint enlarged."
Haliday MSS.

Westwood supposes that *Ichn. ovulorum* Linn. is the type of the *Polynema*. As early as 1834, however, Nees ab Esenbeck (Hym. *Ichn. aff. Monogr. Pars II* p. 288—289) showed that this species belongs to the genus *Teleas*, so it cannot be the type of any Mymarid. — Westwood in his paper does not give us more than had already been given by Haliday, he only inserts the new genus *Alaptus* according to the manuscript by Haliday.

Fr. Walker (1846. *Ann. & Mag. Nat. Hist.* vol. XVIII p. 49—54. Descriptions of the Mymaridæ):

- Anaphes. Tarsi tetrameri: antennæ mari 12-, fem. 9-articulatæ: abdomen sessile ovatum.
- Patasson. Tarsi 4-meri. Antennæ ♀ 10-art. capitulo 2-art. ♂ 13-art. flagello compresso. Alæ anticæ vena clavata.
- Panthus. Tarsi tetrameri: antennæ mari 13-, fem. 9-articulatæ: abdomen subsessile.*)
- Caraphractus. Tarsi tetrameri: antennæ fem. 9-articulatæ scapo fusiformi: abdomen petiolatum segmento 2^o amplissimo: alæ anticæ ulna lineari.
- Polynema. Tarsi tetrameri: antennæ fem. 9-articulatæ, mari 13-articulatæ scapo dilatato compresso: abdomen petiolatum: alæ anticæ vena brevissima capitata.
- Mymar. Tarsi tetrameri: antennæ mari 13-, fem. 9-articulatæ scapo gracili caput exsuperante: abdomen petiolatum: alæ anticæ petiolatæ, posticæ setacæ abortivæ.
- Eustochus. Tarsi tetrameri: antennæ fem. 10-articulatæ capitulo biarticulato: abdomen petiolatum: alæ anticæ ulna lineari.

Sphecomicrus.

1. insignis. Fem. antennarum capitulo oblongo: $\frac{3}{4}$ lin.
2. vulgatus. Fem. antennarum capitulo ovato: alis completis, abdomine nigro: $\frac{1}{2}$ lin.
3. notatus. Fem. ut antea: abdomine rufo-piceo apice nigro: $\frac{1}{2}$ lin.
4. hemipterus. Fem. ut antea: alis abbreviatis: $\frac{1}{2}$ lin.

All these species are found in England and Ireland: *O. notatus* and *O. hemipterus* are perhaps only varieties of *O. vulgatus*.

Lymænon.

1. acuminatus (Walker MSS.). Niger: antennis basi et pedibus piceo-pallidis: fem. abdomine elongato conico, terebra exerta.
2. flavocinctus.
3. pictus. Sulphureus: antennarum flagello capitis thoracisque signaturis anoque nigricantibus.
4. litoralis. Piceus: antennis basi, abdomine anticæ pedibusque sulphureis, his proparte infuscatis.
5. fuscicornis. Nigro-piceus, antennis pedibusque piceis.

L. litoralis is very abundant in England and Ireland. It is darker than *L. flavocinctus* and paler than *L. fuscicornis*, but perhaps all three are varieties of one species.

*) Species sub hoc genus congestæ vix satis congruunt, caractere artificiali.

Arescon.

1. dimidiatus. Piceus ano concolore, antennis basi abdomine pedibusque luteis: fere $\frac{1}{2}$ lin.

Taken many years ago near Belfast; it has not since occurred.

Litus.

1. cynipseus. Niger capite thoraceque granulatis abdomine lævissimo alis infumatis pedibus ferruginosis: $\frac{1}{4}$ lin.

Var. Capite thoraceque piceis.

This species is common near London, and I have often found it on the windows of a greenhouse.

Alaptus.

1. minimus. Ferruginosus antennis et pedibus pallidis.
2. fuscus. Præcedente major colore obscurior antennis longioribus? vix revera species distincta.

These two seem to be only varieties of one species which is common on windows near London.

Anagrus.

Mr. Haliday has described three species (atomus, incarnatus, and ustulatus) of this genus, in which he has noticed three other species (atricapillus, concinnus and albiscapus), but I am unable to define them by good specific characters. Some of the species are very abundant.

Anaphes.

1. fuscipennis. Niger, alis fuscis antenarum basi pedibusque piceo-pallidis, fem. antenarum articulis 4^o et 5^o subæqualibus: $\frac{1}{3}$ lin.

Common near London and in Ireland.

2. collinus, Fem. Antenarum articulis a 4^o inde alternis minoribus.

Found by Mr. Haliday on heath on a mountain.

3. longicornis, Haliday MSS. A. fuscipenni affinis, antennis longioribus (Walker).
4. regulus, Haliday MSS. A. fuscipenni affinis, antennæ capitulo latiore (Walker).
5. auripes, Walker MSS. A. fuscipenni affinis, pedibus læte flavis.
6. brevis, Walker MSS. A. fuscipenni affinis, alis limpidis latioribus. July: forest of Fontainebleau.
7. latipennis, Walker MSS. A. fuscipenni longior, alis latioribus.

There may be more species of this genus, but I cannot distinguish them clearly. Mr. Haliday remarks that "the species are

difficult to characterize; their colours are much alike, but the length of the tarsal joints and of the antennæ may be compared".

Panthus.

1. *flavovarius*. Niger flavoque varius, scutelli axillis flavis puncto nigro. Mas antennarum flagello gracili. Fem. capitulo longofusiformi.

Patasson.

1. *crassicornis*. Niger antennarum basi pedum geniculis et tarsorum basi piceo-pallidis. Mas antennarum flagello piceo-pallido, compresso, striato.

Caraphractus.

1. *cinctus*. Fem. niger pedibus piceis, antennis basi metathoracis dorso coxis posticis et petiolo ferrugineis: metathorace bicarinato.

Found by Mr. Haliday on long grass in drains.

Polynema.

1. *flavipes*, Walker MSS. (ovulorum olim: nomen errore ortum). Piceo-niger, alis obscure hyalinis, antennis basi pedibus et petiolo flavis; metathoracis gibbere petiolari elevato: fem. antennarum articulis 2^o et 3^o subæqualibus: $\frac{3}{4}$ lin.

Eutriche gracilis Nees (Hym. Ich. aff. Mon. II 197) is a *Polynema* and apparently of this species.

2. *fumipennis*. Fem. piceo-niger alis fusco-hirtis, antennis basi pedibus et petiolo flavis.

3. *pusillus*. Nigro-piceus alis obscure hyalinis, antennis basi pedibus et petiolo flavis: petiolo coxarum altitudine: fem. antennarum articulo 3^o brevissimo: $\frac{1}{2}$ lin. fere.

4. *fuscipes*. Ater alis hyalinis, antennarum pedicello pedibus et petiolo ferruginosis.

5. *atratus*. Ater alis hyalinis, pedibus piceis, antennarum pedicello petiolo genubus et tarsorum basi pallidioribus: fem. abdomine ovato terebra subexerta.

6. *euchariformis*. Ater alis hyalinis, pedibus piceis, antennarum pedicello petiolo genubus et tarsorum basi pallidioribus; terebra abdominis lanceolati fere dimidio longitudine.

Mr. Haliday has remarked that the characters which he has assigned to the above species do not seem to him to be quite satisfactory, and that all excepting the 5th and 6th may be one species. There seems to me to be two forms of *P. flavipes*, which, however, can hardly be divided into two species, for there is a gradual transition from one of these forms to the other; the one has the legs all yellow, and it is more slender than the other, which has shorter and thicker antennæ, and brown hind

This table of errata has never been discovered by the students, which has given rise to many errors in the course of time.

It is first mentioned in a paper entitled: Synonymic Remarks on some Generic Names of Mymaridae (Hym.) by J. P. Kryger. Ent. Medd. XVIII. 1934. Copenhagen. — The table of errata is printed in Ann. Mag. Nat. Hist. XVIII 1846 immediately after the table of contents.

In this paper Walker (Haliday) mentions 13 genera, viz: *Sphecomicrus* (Hal.) Walker, *Lymænon* (Hal.) Walker, *Litus* Hal., *Arescon* (Hal.) Walker, *Alaptus* (Hal.) Westwood, *Anagrus* Hal., *Anaphes* Hal., *Panthus* (Hal.) Walker, *Caraphractus* (Hal.) Walker, *Polynema* Hal., *Mymar* Hal., *Eüstochus* Hal., *Patasson* (Hal.) Walker.

In the aforementioned paper by J. P. Kryger it is stated that Haliday cannot alter his own name *Ooctonus* to *Sphecomicrus*. Accordingly *Sphecomicrus* should be dropped and the first name, *Ooctonus*, be retained. Furthermore, the genus *Panthus* (Hal.) Walk. should be named *Arescon* (Hal.) Walk. And finally that *Anaphoidea* Girault and *Anaphoides* Enock should be named *Patasson* (Hal.) Walk.

The last of the great investigators to mention the *Mymaridae* is Förster. He recurs two times to the subject, viz. in 1847 and 1856.

Mymariden. Förster. Linnæa entom. II. 1847 p. 195—233.

Sect. I. Mit 5 Fussgliedern.

a. Mit gestieltem Hinterleibe.

Gen. I. *Ooctonus* Hal. (z. Th.). Die Fühler des ♂ sind 13gliedrig, des ♀ 11gliedrig, der Fühlerknopf einfach, der Hinterleib gestielt.
6 Species.

b. Der Hinterleib sitzend.

Gen. II. *Rachistus* m. Die Fühler des ♀ sind 11gliedrig, die Radicula sehr deutlich, der Knopf nicht geringelt; beim ♂ sind die Fühler 13gliedrig. Der Hinterleib ist sitzend, die Tarsen 5glied-

rig; die Flügel haben einen kurzen, die Mitte des Flügels nicht erreichenden Unterrandnerven.

5 Species.

Gen. III. *Litus* Hal. Die Fühler des ♀ 9gliedrig, der Knopf einfach, die Tarsen 5gliedrig.

2 Species.

Gen. IV. *Leimacis* m. Fühler des ♀ 8gliedrig, der Knopf einfach, des ♂ 13gliedrig, die Tarsen 5gliedrig; die Flügel haben einen fast die Mitte des Vorderrandes erreichenden Unterrandnerven. Der Hinterleib ist sitzend.

1 Species.

Gen. V. *Gonatocerus* Nees. Fühler des ♂ 13gliedrig, des ♀ 11gliedrig, der Fühlerknopf beim ♀ dreiringlig; der Hinterleib sitzend; der Legebohrer beim ♀ hervorragend; die Flügel mit kurzem Unterrandnerv.

1 Species.

Sect. II. Mit 4 Fussgliedern.

a. Der Hinterleib sitzend.

Gen. VI. *Anaphes* Hal. Die Fühler des ♂ 12gliedrig, des ♀ 9gliedrig, der Knopf einfach, die Tarsen 4gliedrig; der Hinterleib sitzend, eiförmig. Die Flügel haben einen deutlichen und ziemlich langen *nervus ulnaris*.

5 Species.

Gen. VII. *Anagrus* Hal. Die Fühler des ♂ sind 13gliedrig, des ♀ 9gliedrig, der Knopf einfach; die Tarsen 4gliedrig; der Hinterleib sitzend, kegelförmig zugespitzt. Die Flügel haben keinen oder nur einen punktförmigen *nervus ulnaris*.

7 Species.

b. Der Hinterleib gestielt.

Gen VIII. *Polynema* Hal. Fühler des ♂ 13gliedrig, des ♀ 9gliedrig, der Knopf einfach, der Schaft in beiden Geschlechtern erweitert, gebogen und ein wenig verlängert; die Tarsen 4gliedrig, der Hinterleib gestielt.

12 Species.

Gen. IX. *Mymar* Hal. Die Fühler des ♂ sind 13gliedrig, des ♀ 9gliedrig, der Knopf einfach; der Schaft in beiden Geschlechtern weit über die Stirne hinaus verlängert; die Tarsen 4gliedrig, der Hinterleib gestielt; die Flügel völlig linearisch, die vordern an der Spitze bloss erweitert.

1 Species.

Gen. X. Eustochus Hal. Die Fühler des ♀ 10gliedrig, der Knopf 2gliedrig; die Tarsen 4gliedrig, die 4 hintern Schienen sind länger als die Füße, der Hinterleib gestielt, beim ♀ mit sehr langem Bohrer; die Flügel haben einen stark verlängerten nervus ulnaris.
1 Species.

Gen. XI. Dorielytus m. Die Fühler des ♀ 10gliedrig, der Knopf 2gliedrig, die Tarsen 4gliedrig, die 4 hintern Schienen sind etwas kürzer als die Füße; der Hinterleib kurz gestielt, der Bohrer länger als der Hinterleib, der nervus ulnaris der Flügel sehr kurz, fast unscheinbar.
1 Species.

Förster. Hym. Stud. II. H. 1856 p. 116—117.

- a. Die Tarsen fünfgliedrig.
- b. Der Hinterleib deutlich gestielt.
- c. Die Fühler beim ♂ zehn-, beim ♀ neungliedrig
Camptoptera m.
- cc. Die Fühler beim ♂ dreizehn-, beim ♀ eifigliedrig
Ooctonus Hal.
- bb. Der Hinterleib sitzend oder fast sitzend.
- d. Die ♂
- e. Der ramus marginalis erstreckt sich bis zur Mitte des Vorderrandes Limacis m. ♂
- ee. Der ramus marginalis erstreckt sich nicht bis zur Mitte des Vorderrandes.
- f. Fühler dreizehngliedrig. Gonatocerus Nees ♂
- ff. Fühler zehngliedrig Alaptus Walk. ♂
- dd. Die ♀
- g. Fühler eifigliedrig Gonatocerus Nees ♀
- gg. Fühler mit weniger als elf Gliedern.
- h. Fühler neungliedrig Litus Hal.
- hh. Fühler achtgliedrig
- i. Der ramus marginalis erstreckt sich bis zur Mitte des Vorderrandes Limacis m. ♀
- ii. Der ramus marginalis erstreckt sich nicht bis zur Mitte des Vorderrandes
Alaptus Walk. ♀
- aa. Die Tarsen viergliedrig.
- k. Der Fühlerknopf zweiringelig.
- l. Der ramus marginalis sehr lang; die vier Hintertarsen kürzer als ihre Schienen Eustochus Hal.
- ll. Der ramus marginalis sehr kurz; die vier Hintertarsen länger als ihre Schienen Dorielytus m.

- kk. Fühlerknopf nicht geringelt.
- m. Der Hinterleib deutlich gestielt.
- n. Die Vorderflügel bloß an der Spitze erweitert. .
Mymar Hal.
- nn. Die Vorderflügel nicht bloß an der Spitze er-
weitert.
- o. Der ramus marginalis punktförmig
Cosmocoma m.
- oo. Der ramus marginalis verlängert.
- p. Der Metathorax mit zwei Kielen; Fühler
beim ♀ neungliedrig (♂ unbekannt)
Caraphractus Walk.
- pp. Der Metathorax ungekielt; Fühler beim
♂ zehn-, beim ♀ neungliedrig
Stichothrix m.
- mm. Hinterleib sitzend oder fast sitzend.
- q. Fühler beim ♂ zwölfgliedrig (beim ♀ neunglied-
rig); der ramus marginalis verlängert, nach der
Spitze hin etwas verdickt Anaphes Hal.
- qq. Fühler beim ♂ dreizehngliedrig (beim ♀ neun-
gliedrig); der ramus marginalis linienartig, nach
der Spitze hin nicht verdickt Anagrus Hal.

In the first-mentioned paper Förster discusses the following genera: *Ooctonus* Hal., *Rachistus* m., *Litus* Hal., *Leimacis* m., *Gonatocerus* Nees, *Anaphes* Hal., *Anagrus* Hal., *Polynema* Hal., *Mymar* Hal., *Eustochus* Hal., *Doriclytus* m.

Three of these genera are new, viz.: *Rachistus*, *Leimacis*, and *Doriclytus*. But in his next paper Förster (p. 119) says:

“. wovon *Rachistus* mit *Gonatocerus* Nees (*Lymænon* Hal. Walk.) und *Leimacis* mit *Arescon* zusammenfällt.”

Gonatocerus Nees, however, is not at all a Mymarid (see Kryger: Synonymic Remarks), so the name *Lymænon* (Hal.) Walk. should be retained.

In his second paper Förster mentions the following genera: *Camptoptera* Först., *Ooctonus* Hal., *Limacis* Först., *Gonatocerus* Nees, *Alaptus* Walk., *Litus* Hal., *Eustochus* Hal., *Doriclytus* Först., *Mymar* Hal., *Cosmocoma* Först.,

Caraphractus Walk., *Stichothrix* Först., *Anaphes* Hal., *Anagrus* Hal.

In this paper the genus *Polynema* is without reason altered to *Cosmocoma*. One new genus is added, viz.: *Stichothrix* Först.

After the three great authors (Haliday, Westwood, Förster) had in the course of twenty years (1833—1856) published their works, no work of importance on the Mymaridae appeared. But in the first two decades of the present century two English scientists took up the study of these small flies, viz. Fred. Enoch and C. O. Waterhouse. It may be supposed that Enoch was the motive power in this cooperation. He has published several works, two of which are of systematic interest. The first is entitled "New Genera of British Mymaridae" (Trans. Ent. Soc. London 1909 p. 449—459). Enoch here describes the following new genera: *Stethynium*, *Cleruchus*, *Parallelaptera*, *Erythmelus*, *Dicopus*, *Enaesus*, *Stephanodes*, *Oophilus*.

The second paper has the title: "A new Mymarid from Hastings"; it is published in "Hastings and East Sussex Naturalist" vol. 2, 1915 p. 178—181.

The new genus is named *Neurotes*.

On the last page of his second paper Enoch enumerates the genera of the English Mymaridae, both the old well-known ones and his own new ones. The new ones are all marked with an asterisk. In this list he also mentions the genus **Anaphoides*. But apparently Enoch has nowhere published a description of a genus named *Anaphoides*, and moreover I cannot see that anyone else has described such a genus. From Enoch's own slides in the Manchester Museum we learn that the genus *Anaphoides* is the good old genus *Patasson* (Hal.) Walk. But as Enoch has never seen the "table of errata", he has had unneeded troubles in establishing a new name.

In Enock's list the following genera should be dropped: *Anaphoides* (= *Patasson*), *Stephanodes* (= *Polynema*), *Oophilus* (= *Lymænon*), and perhaps also *Enaesus* (= *Erythmelus*).

Since Enock published his paper on the *Neurotes*, only one new genus belonging to the Mymaridae has been discovered in Europe, viz. *Petiolaria* Bl. & Kr.

The European Mymaridae dealt with in this paper then comprise the following genera:

1. *Alaptus* (Hal.) Westwood.
2. *Anagrus* Haliday.
3. *Anaphes* Haliday.
4. *Arescon* (Hal.) Walker.
5. *Camptoptera* Förster.
6. *Caraphractus* (Hal.) Walker.
7. *Cleruchus* Enock.
8. *Dicopus* Enock.
9. *Doriclytus* Förster.
(*Enaesus* Enock.)
10. *Erythmelus* Enock.
11. *Eustochus* Haliday.
12. *Litus* Haliday.
13. *Lymænon* (Hal.) Walker.
(*Oophilus* Enock.)
14. *Mymar* (Hal.) Curtis.
15. *Neurotes* Enock.
16. *Ooctonus* Haliday.
17. *Parallelaptera* Enock.
18. *Patasson* (Hal.) Walker.
19. *Petiolaria* Blood & Kryger.
20. *Polynema* Haliday.
(*Stephanodes* Enock.)
21. *Stethynium* Enock.
22. *Stichothrix* Förster.

However, before finishing this historical survey I wish to say a few words about Ashmead and Schmiede-

knecht. Ashmead (Classification 1904 p. 361) refers the Mymaridae to the Chalcididae, stating that his studies in the course of years have confirmed him in this opinion, and he adds:

“Haliday was the ablest systematist of his days. He divided the family in Gonatocerinae (5-jointed tarsi) and Mymarinae (4-jointed tarsi). Gonatocerinae is divided into two parts: Ooctonini (abd. petiolate) and Gonatocerini (abd. sessile or subsessile). Ooctonini comprising Ooctonus Hal., Camptoptera Förster, Palæomymar Meunier. Gonatocerini comprising Leimacis Förster, Alaptus Hal., Litus Hal., Gonatocerus Nees.”

To this is to be urged: The abdomen of *Gonatocerus* Nees has a distinct petiole and hence a group with a sessile or a subsessile abdomen cannot be named after it. In the key he writes:

Abdomen petiolate Tribe I. Ooctonini.
 — — — — — II. Gonatocerini.

In the table of errata he corrects the latter “Abdomen petiolate” to “Abdomen sessile or subsessile”, but in line 16 he writes: “the distinctly petiolated abdomen distinguishes the tribe”. The four genera are *Leimacis*, *Alaptus*, *Litus*, and *Gonatocerus*. However, *Gonatocerus* and *Leimacis* have a distinct petiole, while *Alaptus* and *Litus* have no petiole at all.

Schmiedeknecht (Die Hymenopteren Nord- und Mitteleuropas. 2. Ausg. Jena 1930 p. 448—451) maintains, it is true, the generic name *Gonatocerus* Nees, but otherwise he is almost right in his statements. He is only guilty of four minor errors, viz.: The ♂ *Leimacis* has 13-jointed, not 11-jointed antennae, the ♂ *Litus* is unknown, the ♂ *Caraphractus* has 12-jointed, not 11-jointed antennae, and *Litus* has a short marginal nerve.

I do not consider it necessary to copy Ashmead's and Schmiedeknecht's keys; their books are new and easily available, any student may get them in the public libraries.

Collecting.

Great difficulties are experienced in collecting most species of these small flies, it being of course easiest to secure those species whose hosts are known, but unfortunately not many hosts are known. A systematic collecting of insect eggs would undoubtedly give a wonderful result, especially such eggs as are laid on or in low plants. That these eggs are well concealed, is evident from the antennae of the imagines, which are provided with numerous sense organs, sensual hairs, sense spots, and the like. And considering that these insects are so amply equipped, it is not surprising that the human eye will often try in vain to discover the eggs. The long ovipositor of several species also contributes to support the belief that the eggs are laid deep in the tissue of the plants. But gradually as the biology of these small Hymenoptera becomes better known, it will turn out that they are not nearly as rare as was originally supposed.

Most of the species, however, can only be taken with the sweeping-net; but this work presents three great difficulties. One is that some species are only taken singly in very widespread localities, others singly in localities of the size of a few square metres, and some few in only a single specimen quite accidentally. The second is that the species are so small that a very trained eye is required to discover them, and finally that most of them live in the grass, most probably at the very bottom, for which reason a single sweeping will yield very poor results. It will be best to use a large sweeping net; mine is 1 m. deep and 1.2 m. in circumference, the bag being made of coarse linen. The ring is made of iron-wire 4 mm. in diameter. I prefer a light ring, hoop-iron being too heavy. My stick is $1\frac{1}{2}$ m. long; with a long stick you can sweep in front of yourself, while a short stick only enables you to sweep at your sides, where the flies have already disappeared. Also the sweeping-

net from Richardson in Chicago U. S. A. is excellent; I have used one for many years. It is very easy to carry and it can be used almost instantly after being removed from the covering.

The best localities are sunny openings in woods, sides of roads through woods, high-lying meadows, outskirts of woods, open woods with birches or oaks, the soil beneath solitary oaks, shores of lakes, edges of ditches, heaths, fens, etc. Short grass is preferable to a tall vegetation. When the vegetation is moist (rain or dew) and if snails occur in the locality, the work will be impossible. Also seeds of grass or dried-up horse-dung (the commons in New Forest, England) may render sweeping impossible.

When a suitable place has been found in which a catch may be expected, the ground should be swept backwards and forwards, over and over again. After having swept for not more than 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 seeds and sweepings found in the net. Then go through the contents of the net, and now and then you will see a small fly working its way labouriously through the thick mass of leaves, dirt, etc. Then place the mouth of a narrow glass-tube over it. (I use a tube c. 15 cm. long, 1.2 cm. wide). Having had such great trouble to get free of the nap and dust, etc., the fly will be relieved to get on to the smooth surface of the glass and will at once enter the tube. The tube is closed with cotton wool. If a glass-tube as here described is used, at least 10 (20) specimens can be taken in it before they attempt to get out when you take a fresh specimen. Great patience is required for examining the net. A hasty look will give nothing, a careful examination for 10 minutes will yield one or two specimens.

In the northern hemisphere you can sweep from April to October. In Denmark the best time for sweeping is from the middle of May to the middle of June and August-September. The hours of the afternoon seem to me to be the best. Some living Mymaridae were, indeed, once taken in England in February, but perhaps they were hibernating specimens, or perhaps the winters in southern England are milder than on the continent. At any rate I do not think that Mymarid-hunting may be carried out with success till April.

At home I fill the tube half up with the solution mentioned later on in this paper. The wasps are killed by it, and then I sort the contents of the tube, which is emptied on to a small saucer. Rare specimens are mounted, the rest of them are kept for the winter in small tubes 40×10 mm.

Another way in which to remove the wasps from the bag is the following: Buy in a perfumer's shop some small bottles with a flattened stick in the stopper. They are quite cheap — may be had for a few pence. Fill three-fourths of the bottle with the solution, put the glass-stopper in, and it will be ready for the sweeping. If a small wasp is discovered in the net, take the bottle in your left hand and remove the glass-stopper with your right. The long tip of the stopper is wet; sweep it swiftly over the fly in such a way that the wings are just touched and the fly will adhere to the stopper. Put the stopper in the bottle and the fly will immediately sink to the bottom.

But rearing is just as necessary as sweeping. In the course of time we have learned that the hosts of the Mymaridae must be sought for among the eggs of bugs, cicades, Psocus, etc., not among butterflies or moths. Partly by accident and partly by systematic work scientists have succeeded in rearing several of the European genera. The Mymaridae are no doubt often destructive

to noxious insects, but our knowledge of this to-day is too scanty; we are not able to utilise what mother Nature has here given us. For rearing purposes almost any part of a plant may be used. Especially suitable are buds, twigs, leaves and stems of both herbs and shrubs. The laboratories have, indeed, a fair chance of succeeding, but also the amateur only equipped with some glass-tubes may attain successful results. Some species are most probably associated with one special host, while others attack various hosts, e. g. *Caraphractus*. As regards the hibernation, very little is known to me. Some species may be found from spring till late in the autumn, but as to where they then go and where they spend the winter, I can only form conjectures, as I have no evidence to go upon. Most probably the species pass the winter as larvae or fully developed imagines in the eggs of their host, but the possibility that some imagines hibernate in 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 this point should once be cleared up, it will, no doubt, be discovered by a mere accident. Personally I am most inclined to think that the winter is passed in the host-eggs.

I should like to call the attention of students to an excellent paper by O. Bakkendorf*) often mentioned in this paper. It contains an important account of the life of several genera of the Mymaridae, as well as plenty of original observations and a number of illustrative drawings (larvae—imagines).

According to this, the life history or the host is known in the following genera:

Alaptus: Eggs of Psocus.

Anagrus: Eggs of Cicades and Lestes.

Caraphractus: Eggs of water-insects.

*) Biological Investigations on some Danish Hymenopterous Egg-Parasites. Ent. Medd. XIX 1933 p. 1—134.

Cleruchus: Eggs of a beetle deposited in leaf-rolls of *Rhynchites betulae*.

Erythmelus: Eggs of bug in stems of *Urtica dioeca*.

Litus: Eggs of staphylinid beetles.

Lymænon: Eggs of Cicades in *Juncus*, *Baldingera*, *Populus tremula*, *Salix cinerea*.

Ooctonus: Eggs of a hemipterous insect in *Baldingera*.

Patasson: Eggs of chrysomelid beetles.

Polynema: Eggs of Cicades in *Populus tremula*, *Salix cinerea*, *Juncus*.

Stethynium: Eggs of Jassid(?) in *Salix pentandra*.

Life history and host are unknown in the genera: *Arescon*, *Anaphes*, *Camptoptera*, *Dicopus*, *Doriclytus*, *Enae-sius*, *Eustochus*, *Mymar*, *Neurotes*, *Oophilus*, *Parallelaptera*, *Petiolaria*, *Stephanodes*, *Stichothrix*.

At least one genus, viz. *Litus*, seems to have polyembryony. Nobody has ever seen the male and I have reared c. 70 specimens (all females) from one single egg of a staphylinid beetle (*Ocypus olens*). Parthenogenesis may also occur in certain localities (*Polynema euchari-formis* Hal.) see Bakkendorf, p. 71.

Mr. Bakkendorf has called my attention to the fact that many of the genera on the forewing (at the stigma) have a hook-formed hair pointing back towards the hind wing. This hook evidently serves as a support for the hindwing when the wings are in repose.

The sense organs of the antennæ were drawn in transmitted light. It is not always easy to explain what you see in the microscope at high magnification; the pictures, therefore, are perhaps not quite correct.

Some of the genera have, on the marginal cilia, a light area near the margin of the wings, which gives the wings the appearance of being provided with a halo. In the present paper this is indicated in some species, the cilia not being indicated in the area concerned.

The features concerning the veins of the forewing may easily be noticed in the figures in this paper. It is not impossible to distinguish the subcosta, the marginal vein, and a very short radius, but for the generic key these particulars are of little value. I have preferred only to mention the "marginal vein".

A fairly large number of students will, no doubt, have to work hard for many years before the life history of the Mymaridae will be fully cleared up so that the final monograph of this subfamily can be written.

Mounting.

Papers dealing with small Hymenoptera are frequently published with figures which are not sufficiently accurate, or are without illustrations. This is no doubt due to the fact that it has always been very difficult to mount these delicate insects in balsam. It is certainly very difficult for most Zoologists to acquire skill in the ways of preparing Mymarids and Trichogrammatids. However, there has been one man who knew the art perfectly, namely Fred. Enock, of London, who, being unfortunately a poor man, had to sell his slides in order to make a living and therefore did not disclose his method of mounting, taking the secret with him into the grave. His countryman, Dr. B. N. Blood, M. D., of Bristol, subsequently succeeded in discovering a method by which even the smallest Hymenoptera can be satisfactorily mounted. As I think I have been able to improve his method to some extent, I should like to place this improved method before you, and in doing so I express the hope that from now on the preparation of small Hymenoptera will be common knowledge and that further improvements will be found by the entomologists who will try the method I am going to describe.

The difficulty formerly encountered in mounting these insects was due to the way in which the insects were

preserved. They were usually preserved in alcohol, in which they became so rigid that it was scarcely possible to soften them again. Later on several solutions have been recommended in which the insects will remain soft for years. The composition of the solution published by Mercet, of Madrid, is almost the same as that of Dr. Blood's solution, which I use myself. Dr. Blood's liquid is composed as follows:

Acetic acid (33 %)	62.5 ccm
Hydrarg. perchlor. (liquid) ¹⁾	62.5 ccm
Glycerine	62.5 ccm
Alcohol (90 %)	500 ccm
Distilled water	312.5 ccm

The Hymenoptera are killed in this solution and kept in it until they are to be mounted. I use small tubes of 40 × 10 mm closed with a cork or cottonwool. Before mounting, the specimen is soaked in pure water for at least 24 hours. It is then placed in a drop of water on a cover-slip and this is put on a slide. Under the binocular microscope the specimen is turned on its back with the help of a small brush. I buy the smallest painting brush I can get and cut off most of the hairs, so that only about ten are left. The drop of water in which the insect is lying on its back is allowed partly to evaporate or is partly sucked away with the brush, the brush being dried again on a smooth piece of linen. Then I place the antennae, wings, and legs in their proper position. This is as a rule easy to do; but sometimes the forewings are behind the hindwings, or the wings are twisted, or the middle legs are in front of the wings, and so on. In this case I let all the water evaporate and then put one or two hairs of the brush under the part which requires arranging, lifting it from the cover-slip. The disarranged part will then assume its normal position. The brush is now again moistened with water,

¹⁾ United States pharmacopoeia: Hydrarg. Chlor. Corr.

and the antennae, wings, and legs are bent down on to the glass, where they will stick. After the head and abdomen have been arranged, the water is allowed to evaporate, everything being now in the right position. Occasionally there is too much or too little water, which renders it difficult to stretch out the legs, etc.; the defect can easily be remedied by adding some water from the little cup in which the insects are soaked, or by removing the superfluous water. One soon learns to estimate the amount of water necessary for the operation. The insect will now lie on the cover-slip with the legs, wings, and antennae nicely arranged; I take with the brush a small drop of clear glue, rather smaller than the head of an ordinary pin (Stephen's mucilage or gum arabic) and sweep the brush over the antennae, wings, and legs, so as to fix these organs on to the glass by a very thin layer of glue. A very little glue is also put under the head and abdomen. The entire insect being now fixed on to the cover-slip, an inverted tumbler or wine-glass is placed over it in order to prevent dust from falling upon it. After 24 hours the insect is examined under the binocular microscope, and if everything is found to be in order, a drop of xylol is put on to it. If there is any moisture in the specimen or in the glue, the xylol will at once drive it out. Then a drop of balsam is added, and the preparation again put under cover for 24 hours. If the preparation is then still satisfactory, I take hold of the coverslip with a pair of tweezers, turn it over, and place it on a slide, on which I have beforehand put some balsam.

I use a slide with a cavity (diameter of cavity 10 mm). The preparation is now ready, but must be left to dry for some days. If the specimen should get disarranged, the cover-glass is easily removed from the slide by means of xylol; I clean the cover-glass and the insect with xylol, and start afresh as before.

Some Hymenoptera, for instance Encyrtids, are sometimes so rigid that the process has to be slightly altered. In this case it is necessary first to fix the body to the cover-slip with glue and then proceed to arrange each antenna, wing, and leg and fix it in the right position. They can easily be loosened again with water. If the legs should be so rigid (middle legs of Encyrtids) that the brush cannot draw them into position, I use a piece of a hog's bristle fastened in a short handle, the bristle being stiff enough to enable one to arrange the refractory legs.

I always use a round coverslip with a diameter of 15 or 20 mm.

The method here described is suitable for all small insects, such as flies, newly hatched beetle-larvae, etc.

NB! Do not use a metallic forceps. The solution contains mercury, which will enter into a compound with the metal. Always use a brush.

Slide-mounted specimens are not suitable for photographic purposes, as the details will disappear (see Enoch: Trans. Ent. Soc. Lond. 1909, the tables). Drawings are much better, though it may sometimes be difficult e. g. to distinguish the fields of the thorax and to decide whether the abdomen is petiolate, subpetiolate, subsessile or sessile. Moreover the legs are shortened, so that it is very difficult to estimate the length of the tarsi in proportion to the tibiae. If a sufficient number of specimens for dissection are not available, it is much better to say nothing about the length of the tibiae and the tarsi, the difference being so insignificant that it is only observable on quite flat objects.

The British Museum (Nat. Hist.) and the Manchester Museum contain two large collections of Mymaridae including both slides and card-mounted specimens. The collection in the British Museum originates from the late

Mr. C. O. Waterhouse and that in the Manchester Museum from the late Mr. Fred. Enock. Mr. Enock has, no doubt, made the slides in both collections. I have had ample opportunity to go through the collection in the British Museum. It contains a very numerous representation of the genera *Anaphes*, *Lymænon*, *Ooctonus*, *Patasson*, and *Polynema* in addition to specimens of the other genera.

The two gentlemen intended to write a monograph of the Mymaridae; this appears from their letters and from the fact that they have named a number of the species. The work was not finished, not even commenced, because of the authors' early death. But I do not believe that they would have been able to come to any final result as regards the 5 said genera. They classed the specimens on the basis of the shape of their wings, their colours, the length of the antennae, etc. Actually, they had very few facts to go by, thus for instance no rearings. To what extremity they have carried the division can be seen from a slide found in the British Museum. On the label is written

"Gonatocerus
left side
socialis?
right side
ovalis?"

It is not impossible that a very critical investigation of Waterhouse's collection may give valuable hints concerning the species, but a definite result will not be obtained before a sufficient number of rearings are at hand.

If someone, animated by this brief paper, should take up the studies of the Mymaridae, I should feel more than repaid for my own work in collecting these "fairy-flies".

The collections of the Zoological Museum in Copenhagen include a collection of Mymaridae comprising specimens of the different genera with the exception of *Doriclytus*, *Stephanodes*, and *Stichothrrix*.

Table of genera.

Winged.

1. Tarsi 5-jointed (Ooctoninae).....	2.
— " 4- " (Mymarinae).....	18.
2. ♂♂	3.
— ♀♀	10.
3. Antennae 13-jointed	4.
— " less than 13-jointed	8.
4. Forewings battledore-shaped, hindwings rudimentary ...	
..... <i>Petiolaria</i> Bl. & Kr.	
— Forewings not battledore-shaped, hindwings normal	5.
5. Marginal vein short (not $\frac{1}{4}$ the wing's length).....	6.
— " " long ($\frac{1}{2}$ - $\frac{2}{3}$ " " ").....	7.
6. Abdomen petiolate.....	<i>Ooctonus</i> Hal.
— " subpetiolate. (<i>Oophilus</i> Enoch) <i>Lymænon</i> (Hal.) Walk.	
7. Marginal vein $\frac{1}{2}$ the wings length....	<i>Arescon</i> (Hal.) Walk.
— " " $\frac{2}{3}$ " " "	<i>Neurotes</i> Enoch.
8. Antennae 12-jointed	<i>Dicopus</i> Enoch.
— " 10- "	9.
9. Forewing with an angular excision at base. <i>Alaptus</i> (Hal.) Walk.	
— " without " " " " <i>Camptoptera</i> Först.	
Male unknown	<i>Litus</i> Hal.
10. Antennae 11-jointed	11.
— " less than 11-jointed.....	12.
11. Abdomen petiolate.....	<i>Ooctonus</i> Hal.
— " subpetiolate. (<i>Oophilus</i> Enoch) <i>Lymænon</i> (Hal.) Walk.	
12. Antennae 10-jointed.....	13.
— " less than 10-jointed.....	15.
13. Forewings battledore-shaped, hindwings rudimentary ...	
..... <i>Petiolaria</i> Bl. & Kr.	
— Wings normal.....	14.
14. Scape with 3 angular projections.....	<i>Dicopus</i> Enoch.
— " without projections.....	<i>Camptoptera</i> Först.
15. Antennae 9-jointed	16.
— " 8- "	17.

16. Club 2-jointed, abdomen petiolate *Arescon* (Hal.) Walk.
 — " 1- " " sessile *Litus* Hal.
17. Marginal vein insignificant..... *Alaptus* (Hal.) Walk.
 — " " long ($\frac{2}{3}$ the wing's length) .. *Neurotes* Enock.
18. ♂♂ 19.
 — ♀♀ 29.
19. Antennae 13-jointed 20.
 — " less than 13-jointed..... 26.
20. Forewings battledore-shaped, hindwings rudimentary ...
 *Mymar* (Hal.) Curt.
 — Wings normal..... 21.
21. Abdomen petiolate..... 22.
 — " sessile (or subsessile) 24.
22. Petiole long 23.
 — " very short; also with antenna 12-jointed.....
 *Cleruchus* Enock.
23. Marginal vein long *Eustochus* Hal.
 — " " punctiform. (*Stephanodes* Enock) *Polynema* Hal.
24. Last antennal joint sessile *Stethynium* Enock.
 — " " " moveable 25.
25. 1st funicle joint more than twice as long as pedicellus..
 *Erythmelus* Enock. *Enaesius* Enock.
 — 1st funicle joint a little longer than pedicellus.....
 *Anagrus* Hal.
26. Antennae 12-jointed (cf. *Cleruchus*)..... 27.
 — " 10- " *Stichothrix* Först.
27. 2nd funicle joint very short..... *Paralleleptera* Enock.
 — 2nd " " of normal length 28.
28. Petiole long *Caraphractus* (Hal.) Walk.
 — " very short (subpetiolate).....
 *Anaphes* Hal. *Patasson* (Hal.) Walk.
 Male unknown *Doriclytus* Först.
29. Forewings battledore-shaped, hindwings rudimentary....
 *Mymar* (Hal.) Curt.
 — Wings normal..... 30.
30. Antennae 11-jointed (3-jointed club) *Stethynium* Enock.
 — " less than 11-jointed..... 31.
31. Antennae 10-jointed (2-jointed club) 32.
 — " less than 10-jointed 34.
32. Petiole long 33.
 — Abdomen subpetiolate *Patasson* (Hal.) Walk.
33. Stigma long *Eustochus* Hal.
 — " short *Doriclytus* Först.

34. Antennae 9-jointed 35.
 — " 8-jointed *Paralleleptera* Enock.
 35. Abdomen petiolate 36.
 — " sessile or subpetiolate 38.
 36. Petiole long 37.
 — " very short *Cleruchus* Enock.
 37. Marginal vein long *Caraphractus* (Hal.) Walk.
 — " " punctiform. (*Stephanodes* Enock) *Polynema* Hal.
 38. Forewings narrow, marginal cilia very long *Anagrus*.
 — " broader 39.
 39. Ovipositor short, but visible
 *Erythmelus* Enock. *Enaesus* Enock.
 — Ovipositor hidden *Anaphes* Hal.
 ?*Stichothrix* Först. (ant. 9-jointed).

Apterous or Subapterous.

1. Tarsi 5-jointed 2.
 — " 4- " Ant. ♂ 13-jointed, ♀ 9-jointed.. *Polynema* Hal.
 2. Abdomen petiolate, Ant. ♂ 13-jointed, ♀ 11-jointed
 *Ooctonus* Hal.
 — Abdomen sessile, Ant. ♀ 9-jointed *Litus* Hal.

Alaptus (Hal.) Westw.

1840. *Alaptus* (Hal.) Westw. Introd. mod. Class. Ins. II. Syn. p. 79.
 1846. *Alaptus* Walk. Ann. & Mag. Nat. Hist. XVIII p. 51.
 1856. *Alaptus* Förster. Hym. Stud. II H. p. 120.
 1898. *Alaptus* Dalla Torre. Cat. Hym. V.
 1904. *Alaptus* Ashmead. Classif. p. 362.
 1923. *Alaptus* Gahan & Fagan. Type Spec. p. 9.
 1930. *Alaptus* Schmiedeknecht. Hym. Mitteleur. p. 449—450.
 1933. *Alaptus* Bakkendorf. Ent. Medd. XIX p. 17.

Original description:

ALAPTUS Hal. — 1 sp. *M. minimus* Wlk. Tarsi pentamerous; antennae ♂ 10-jointed, filiform, 8-jointed ♀, last joint enlarged. Haliday MSS.

Tarsi 5-jointed. Antenna of ♂ 10-jointed, of female 8-jointed. Abdomen sessile. Head quadrangular with a pronounced ridge between the eyes, as wide as thorax. Eyes large, ocelli forming an obtuse-angled triangle.

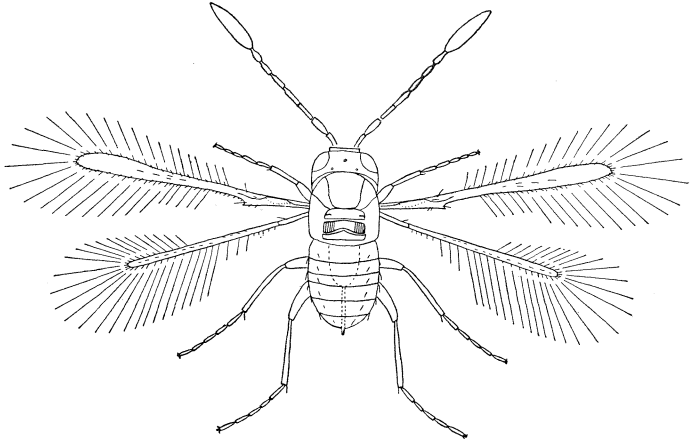


Fig. 1. *Alaptus* (Hal.) Westwood.

Thorax short and broad, three times as long as the head. Abdomen short and stout, longer than the head and thorax together. Ovipositor protruding. Forewings long and slender, longer than the whole insect, curved on the anterior border near the apex, posterior margin nearly straight. Fore-wing with a pronounced angular excision on the posterior margin just beyond the jugum. In some specimens the frenulum is produced into a spine. Only few and small traces of veins. Marginal cilia long but not numerous. Hind-wings long, narrow and slightly widened towards the apex, marginal cilia long and stout. The cilia of both wings have at their base a pale area, forming a hyaline area along the border of the wings.

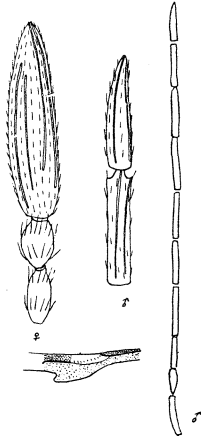


Fig. 2. *Alaptus* (Hal.) Westw. Tip of female and male antenna, male antenna, and stigma.

Distinguished by the excised hind margin of the forewing and the sessile abdomen. May only be confused with *Litus* and *Dicopus*, but neither of these have the notch in the front wing.

The following species are either insufficiently characterized or the description is not published, or published in periodicals which I am unable to get access to at present. I am inclined to think that

A. fuscus Walker

A. minimus (Hal.) Westw.

and *A. terebrans* Förster

are good species.

***Alaptus antennatus* Enoch.**

(Waterhouse's collection, British Museum).

Wings 0.525 mm. \times 0.05 mm. Angular basal dilatation slightly acute.

♀ Ant. 0.525 mm.; as long as the wing, the 3rd and 4th antennal joints subequal in size and distinctly longer than the 2nd. Club narrower than the preceding joint.

***Alaptus crassus* Enoch.**

(Waterhouse's collection. Brit. Mus.).

Brown. Wings 0.451 mm. \times 0.05 mm., angular basal dilatation an acute angle, surface hairs arranged as in *fuscus*. ♀ Ant. 0.375, shorter than the wing.

Length 0.4 mm.

July 15—18.

Richmond Park (Enock), Goring, Sussex (Waterh.).

***Alaptus fuscus* Förster.**

1861. *A. fuscus* Förster. Progr. Realsch. Aachen. p. XLIII n. 123.

1885. *A. fuscus* Dalla Torre. Jahresber. naturf. Ges. Graubünden XXVIII p. 80.

Alaptus fuscus (Hal.) Walker.

1846. *Alaptus fuscus* Walker. Ann. & Mag. Nat. Hist. XVIII
p. 51.

1898. *Alaptus fuscus* Dalla Torre. Cat. Hym. V.

♀. Dark brown, second joint of antennae and legs a lighter brown. Fore-wing with an irregular row of discal hairs. Antennae: scape a trifle longer than pedicellus, 3rd and 5th joints of equal size, 4th joint longer than 3rd and 5th, 6th joint as long as the 5th, 7th a little shorter, the club twice as long as the 4th joint. The club with long sense-organs. (From a slide in Waterhouse's coll. in the Brit. Mus.). Size 0.4 mm. Fore-wings 0.575 mm. × 0.075 mm. Angular basal dilatation an acute angle. Surface hairs arranged in a single line from near base to apex in anterior half of wing. ♂ Ant. 0.575 mm. ♀ Ant. 0.4 mm.

Length 0.45—0.6 mm.

July 22.

Goring, England.

Extracted from Waterhouse's papers. Brit. Mus.

Enock says about *fuscus* (Knowledge. Septbr. 1st 1897 p. 204):

"*Alaptus fuscus* is one of the first to appear in the spring, its particular jerky gait will at once reveal its identity. Of this species I have bred hundreds from the eggs of a Psocid (*Stenopsocus cruciatus*) an insect much like a common aphid, but very active and shy.... In Septbr. & Octbr. *Alaptus fuscus* found at Chester ovipositing in loosely covered eggs of Psocus from which *Alaptus* emerged in end of March and in April completing the cycle."

The eggs of the *Stenopsocus* are found on the stems and leaves of various trees: Lime, oak, etc.

Brockenhurst, Herne Horsley (W.).

May 24, July 8—31.

Alaptus minimus (Hal.) Westw.

1840. *Alaptus minimus* (Hal.) Westw. Introd. mod. Class. Ins.
II. Syn. p. 79.
1856. *Alaptus minimus* Förster. Hym. Stud. II. p. 120.
1879. *Alaptus excisus* Westw. Trans. Linn. Soc. Lond. Zool.(2)
1 p. 586 tab. 73, fig. 10—11.
1898. *Alaptus minimus* Dalla Torre. Cat. Hym. V.

♀. Yellow. Head, thorax, basal half of the abdomen dorsally, and the antennae, except the two first joints, lighter. Eyes black, ocelli black. Phragma reaching half way down into the abdomen. Antennae: scape longer than pedicellus, 4th joint longer than 3rd, 5th, 6th, and 7th, which are of about equal length. The 8th joint forms a stout and solid club, which is longer than the scape and pedicellus together. Common sense organs present.

♀ Length 0.33 mm. Fore-wing 0.47 mm × 0.03 mm.

♂ Antennal joints long and slender, pedicellus and club the shortest. ♂ antennae longer (0.475 mm.) than ♀ ant. (0.4 mm.).

♂ Length 0.3 mm.

May—September.

Very common: England, Germany, Denmark.

Parasitic in eggs of Psocidæ. Easily reared. May 24, July 20—August 17.

Alaptus pallidicornis Förster.

1856. *Alaptus pallidicornis* Förster. Hym. Stud. II p. 120.

Förster writes (translated from the German): "I have discovered a new species of this genus near Aachen, *Alaptus pallidicornis* m. It is scarcely half as long as *A. minimus*; it has yellowish white antennae."

Alaptus parvulinus Mercet.

1912. *Alaptus parvulinus* Ricardo Mercet. Bull. de Real. Soc. Española de Historia natural. Junio.
p. 331 et seq.

***Alaptus terebrans* Enock.**

(Waterhouse's collection. Brit. Mus.).

Wings 0.675×0.075 ; surface hairs arranged in a line near front margin following the curve, angular dilatation a right angle.

♀ Ant. 0.536 mm., shorter than the wing. 3rd joint as long as pedicellus, 4th a trifle longer. Club elongate; ovipositor very long, protruding.

Length 0.55 mm.

July 25.

St. Neots (England) (Waterh.).

My friend O. Bakken dorf on March 28, 1926 found a lump of Psocid eggs deposited as dark crusts on *Alnus glutinosa*, from which eggs he reared an *Alaptus* with a long ovipositor.

***Alaptus uncinatus* Enock.**

(Waterhouse's collection. Brit. Mus.).

♀ Dirty yellow. Antennae light brown. Legs light brown. Scape, pedicellus, 4th, 5th, 6th and 7th antennal joints of equal size, 3rd shorter. Club two and a half times as long as scapus.

September 18.

Richmond (England).

Anagrus Hal.1833. *Anagrus* Hal. Ent. Mag. I. p. 346.1840. *Anagrus* Westwood. Intr. mod. Class. Ins. II. Syn. p. 78.1847. *Anagrus* Förster. Linnaea entom. II p. 215.1856. *Anagrus* Förster. Hym. Stud. II p. 117.1898. *Anagrus* Dalla Torre. Cat. Hym. V.1904. *Anagrus* Ashmead. Classif. p. 363.1923. *Anagrus* Gahan & Fagan. Type Spec. p. 11.1930. *Anagrus* Schmiedeknecht. Hym. Mitteleur. p. 451.**Original description:**

Antennæ maris 13-articulatæ, feminae 9-articulatæ capitulo exannulato. Tarsi tetrameri. Abdomen sessile conico-acuminatum.

Caput valde oblatum vertice lineari, fronte depressa: antennæ feminæ articulo 3tio, brevissimo, sequentibus subequalibus ultimo majore oblongo; maris compressæ crassiusculæ articulis flagelli interioribus paulo brevioribus: thorax oblongus depressus, collari parvo attenuato, scutello brevi semiorbiculato; metathorace fere disjuncto, subito depresso et dorso excavato: abdomen sessile metathoracis dorso incumbens, conicum elongatum, dorso deplanatum aut canaliculatum, ventre compressum carinatum, aculeo breviter exerto: pedes graciles: alæ lineares plumato-ciliatæ, anticæ apice nonnihil dilatatæ rotundatæ: cilia haud ex ipso margine oriuntur sed interius unde margo alæ pulcherrime duplicatus s. striatus extat: nervus subcostalis tenuissimus.

Tarsi 4-jointed. Abdomen sessile. Antennae in male 13-jointed, in female 9-jointed. Head rectangular, broader than thorax. Eyes rather large, ocelli near together at the posterior border of the head, forming an obtuse-angled triangle. Thorax long and narrow, almost parallel-sided, twice as long as the head. Abdomen as long as the thorax. Ovipositor stout, more or less protruding.

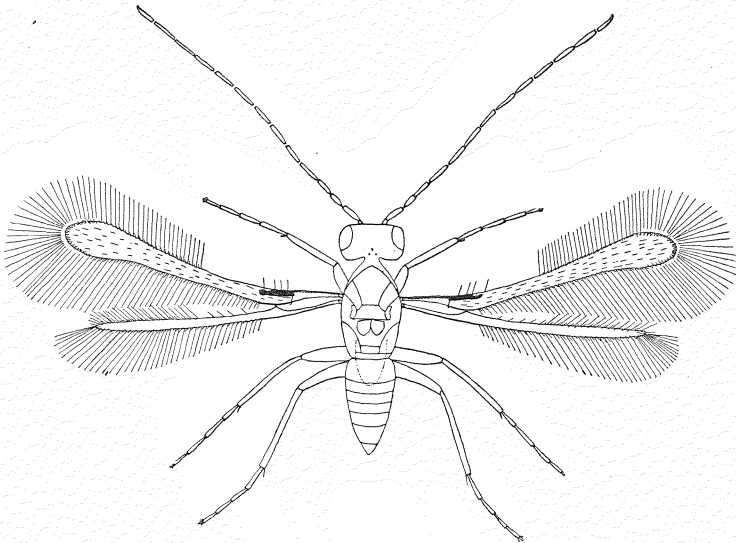


Fig. 3. *Anagrus* Hal.

Legs long and slender. Wings short, narrow, of about equal length. Fore-wings widening towards apex. Both fore- and hind-wings with long and stout marginal cilia. Marginal venation short.

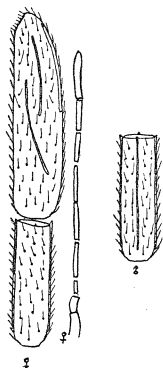


Fig. 4.

Anagrus Hal.

Antenna and tip of same, of female; funicle joint of male.

The genus can hardly be confused with any other genus than *Stethynium*, which has a much broader wing.

The species may be swept in low herbage in different localities from May to October. It has been reared from eggs of *Agrion* (leaves of *Nymphaea*), eggs of *Cicada* (stems of *Juncus*), eggs of *Typhlocyba*(?) (*Alnus glutinosa*), eggs of a Hemipteron (stems of *Cynosurus cristatus*), eggs of *Cicada* (leaves of *Typha* and *Phragmites*), see Bakkendorf p. 51.

All over Europe.

Haliday says (p. 347 n. 1) that the type species for the genus *Anagrus* must be *Ichneumon atomus* L. (1st spec. page 941 System. Nat.). Linné's description is as follows:

atomus. 76. I. pallido fuscoque varius. Habitat Upsaliæ.

Minor Acaro Sirene, & adea parvus ut vix oculis manifestus, nisi motu, adeoque inter minima insecta alata numerandus.

Translated into English it runs as follows: pale and brown marked. Smaller than *Acarus Sirene*, and so small that it is scarcely visible to the eye unless it is moving, so that it must be regarded as one of the smallest winged insects.

Haliday supposes that this description corresponds with his *Anagrus atomus* — *Ich. atomus* be synonymous with his own species. But as Förster says in *Linnaea entom.* II p. 215: No man is able to tell us which animal Linné has described when he named a species *I. atomus*. His words may fit numerous small Hymenoptera.

Moreover nobody can tell which species of *Anagrus* Haliday has named *atomus*. His collection in Dublin (see this paper: *Lymænon*) is no doubt now without any scientific value; we have only Enoch's numerous labels to go by, viz. the labels marked *Anagrus atomus* attached to numerous slides sold by him to microscopists.

Possibly there is only one European species of *Anagrus*, and if so, the name *Anagrus incarnatus* Hal. will fit this species. At any rate it is impossible that there should be c. 25 species of the genus in Europe as supposed by Enoch and Waterhouse (Waterhouse's collection in Brit. Mus.).

Anaphes Hal.

1833. *Anaphes* Hal. Ent. Mag. I p. 269, 346.
 1840. *Anaphes* Westw. Intr. mod. Class. Vol. II Syn. p. 78.
 1847. *Anaphes* Förster. Linnaea entom. II p. 210.
 1856. *Anaphes* Förster. Hym. Stud. II p. 117.
 1898. *Anaphes* Dalla Torre. Cat. Hym. V.
 1904. *Anaphes* Ashmead. Classif. p. 363.
 1923. (*Anaphes*). Gahan & Fagan. Type Spec. p. 12.
 1930. *Anaphes* Schmiedeknecht. Hym. Mitteleur. p. 451.

Original description.

Abdomen ovoideum: antennæ maris 12-articulatæ. Abdomen sessile. Antennæ feminae 9-articulatæ capitulo exannulato. Tarsi tetrameri.

Antennæ maris 12-articulatæ, feminae 9-articulatæ capitulo exannulato. Tarsi tetrameri. Abdomen subsessile ovoideum.

Caput oblatum vertice fere lineari: frons subimpressa: antennæ feminae scapo compresso utrinque attenuato, pedicello lato compresso, articulo 3tio brevissimo, reliquis subæqualibus latitudine crescentibus, ultimo magno oblongo; — maris flagello filiformi articulis subequalibus: thorax breviter ovatus convexus collari brevissimo, scutello ovato, metathorace rotundato: abdomen breve ovoideum subsessile aculeo viz exerto; alæ anticæ latiores, posticæ lineares longius ciliatæ.

Tarsi 4-jointed. Abdomen subpetiolate. Antennæ of male 12-jointed, of female 9-jointed. Head rectangular,

as broad as thorax. Eyes small, ocelli forming a very obtuse-angled triangle. Thorax oval, more than twice as long as the head, finely reticulated. Abdomen oval, shorter than thorax. Legs stout. Wings of almost equal length, longer than the body. Fore-wings rather broad, with powerful marginal cilia. Marginal venation short.

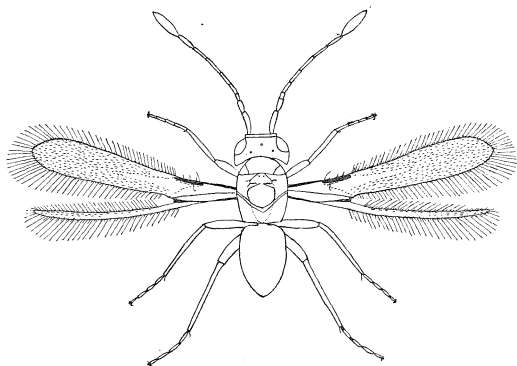


Fig. 5. *Anaphes* Hal.



Fig. 6.
Anaphes Hal.
Tip of female
antenna.

Hind-wings knife-shaped, cilia at anterior margin short, at posterior longer.

The genus cannot be distinctly separated from *Patasson* in the male sex.

The species may be swept in all sorts of localities from spring to autumn.

All over Europe.

Ichneumon punctum Shaw.

In Trans. Linn. Soc. London 4 p. 189 (1798) Shaw writes that he has got an insect on a pane, which he supposes may be *Ichneumon punctum* L. The description runs as follows:

Ichneumon punctum.

Ichneumon niger nitidus, alis iricoloribus margine pilis longissimis nigris. (In the English text: uniform polished black).

From the figure tab. 18 the following particulars will

appear: The right hind-leg has 5-jointed tarsi; the other 5 tarsi are not distinctly drawn. Abdomen subsessile. All the wings have marginal cilia of equal length. Antennae apparently 7-jointed, they have a distinct club. The club is slightly curved, which fits very well with *Anagrus*. The abdomen also reminds one of *Anaphes*, and the wings resemble *Anaphes*, *Alaptus*, *Camptoptera*, and *Litus* wings. The species may very well have been an *Anaphes*. But which species, it is now quite impossible to guess. All the species of *Anaphes* agree with Shaw's description.

Haliday enumerates 6 species, Förster 4 more, and Waterhouse's collection in Brit. Mus. comprises c. 15 new species named by Enoch, 6 by Waterhouse (and 4 by Walker). The 21 species named by Enoch and Waterhouse have never been described. It is impossible that there should be 35 species of this genus.

Arescon (Hal.) Walker.

- 1846. *Arescon* (Hal.) Walker. Ann. & Mag. Nat. Hist. XVIII p. 50.
- 1847. *Leimacis* Förster. Linnaea entom. II p. 208.
- 1856. *Limacis* Förster. Hym. Stud. II p. 116 & 119.
- 1873. *Limacis* Marshall. Cat. Brit. Hym. Oxyura.
- 1898. *Limacis* Dalla Torre. Cat. Hym. V.
- 1904. *Leimacis* Ashmead. Classif. p. 362.
- 1923. *Leimacis* Gahan & Fagan. Type Spec. p. 79 (also p. 80).
- 1930. *Limacis* Schmiedeknecht. Hym. Mitteleur. p. 449—50.

Original description:

Tarsi pentameri; antennæ mari 13-, fem. 8-articulatæ, abdomen subpetiolatum; alæ anticæ vena tenuissima dimidiante.

1. dimidiatus. Piceus ano concolore, antennis basi abdomine pedibusque luteis: fere $\frac{1}{2}$ lin.

Taken many years ago near Belfast; it has not since occurred.

Tarsi 5-jointed. Antennae of male 13-jointed, of female 9-jointed with 2-jointed club. Abdomen petiolate. Head rectangular, broader than thorax. Eyes rather

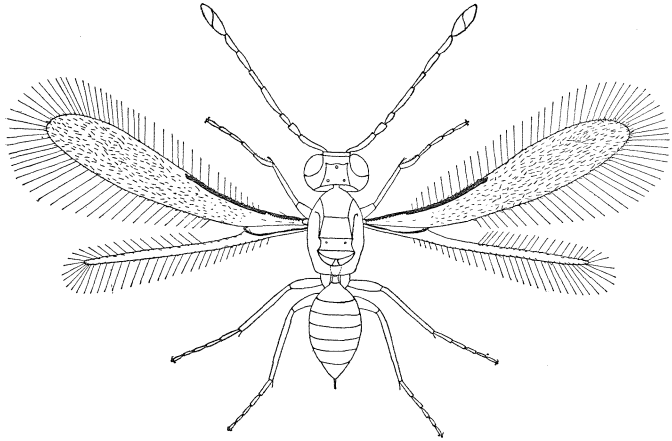


Fig. 7. *Arescon* (Hal.) Walker.

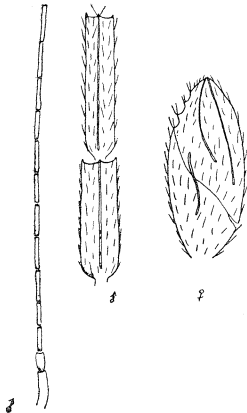


Fig. 8. *Arescon* (Hal.) Walk.

Male antenna, funicle joints of same, and club of female antenna.

large, ocelli forming an acute-angled triangle. Thorax long, elliptical, not three times as long as head. Petiole short. Abdomen egg-shaped, as long as thorax. Wings very long and rather narrow. Fore-wings slightly curved on posterior margin near jugum; marginal cilia long, marginal vein nearly half as long as the length of the wings. Hind-wings shorter than fore-wings, marginal cilia short. Ovipositor slightly protruding.

The genus cannot be confused with any other genus.

***Arescon dimidiatus* (Hal.) Walker.**

1833. *Litus dimidiatus* Hal. Ent. Mag. I p. 345.

1846. *Arescon dimidiatus* (Hal.) Walk. Ann. Mag. Nat. Hist. XVIII p. 49.

1847. *Leimacis rufula* Förster. Linnaea entom. II p. 208.

1898. *Limacis rufula* Dalla Torre. Cat. Hym. V.

1923. *Leimacis rufula* Gahan & Fagan. Type Spec. p. 49.

♀. Dark brown, two first joints of antennae, base of abdomen, and legs lighter brown, the tip of each leg a little darker. Scape long and rather narrow, pedicel short and broad, about $\frac{1}{3}$ of scape, 3rd joint as long as pedicel but narrow, the three following joints of about equal length, shorter than the 4th, the 8th and 9th forming a solid 2-jointed club longer than the pedicel. Forewing with rather short hairs uniformly distributed over the whole surface. Hind-wings with some few discal hairs.

Length 0.65 mm.

♂. Colours like those of the female; base of abdomen not lighter. Scape long and slender, pedicel half as long as scape, the following joints of almost equal size. Tip of last antennal joint cut abruptly off.

Length 0.68 mm.

Swept in open grassy places in woods.

Dates: May—June, Aug.—Septbr.

Denmark, England, Germany.

In Trans. Ent. Soc. London 1909 (p. 450) Enoch writes as follows:

“... In 1895, at last, I heard that Haliday's Type Collection of Mymaridae was in possession of the Dublin Museum, and which, by the great kindness of Dr. Scharf, I was permitted to examine at my leisure, “all that was left of them”, less than one hundred.

It was a most disappointing examination, for of the special type wanted not one was to be found — only the very commonest species remained, and they were so encrusted with dirt and crystals of sorts that it was utterly impossible to identify species. Before returning the collection, I made most careful drawings under the microscope of the wings of every specimen which had wings left, as I consider they will prove to be the best guide to classifying the species. I must not dismiss Haliday's Collection without mention of one specimen, which Haliday has named *Panthus*, showing a peculiarity of the marginal branch. Dr. Scharf gave me permission to remove this specimen from the card, and mount it in Canada balsam, and when under the microscope I was enabled to identify it with Walker's description of the genus *Limacis*, the balsam bringing out the number of joints in antennae and tarsi in its own peculiar way.”

Förster proposes to drop the name *Arescon*, because a beetle has been named *Arescus* (1830); he therefore gives the genus a new name, viz. *Limacis*. However, Förster has no reason at all to drop the name *Arescon*, which must be the valid name for the genus.

Camptoptera Förster.

1856. Camptoptera Förster. Hym. Stud. II p. 119.

1856. Pteroclisus Förster. Hym. Stud. II p. 144.

1898. Camptoptera Dalla Torre. Cat. Hym. V.

1904. Camptoptera Ashmead. Classif. p. 362.

1923. Camptoptera Gahan & Fagan. Type Spec. p. 27.

1930. Camptoptera Schmiedeknecht. Hym. Mitteleur. p. 449.

Camptoptera: Greek: camp = curve, pteros = wing.

Pteroclisus: Greek: pteros = wing, clisis = curve.

Förster says (Hym. Stud. 1856 II. H. p.144) that he wants to alter his name *Camptoptera* to *Pteroclisus*, because Presl has used the name *Camptopteris* in fossil botany. But there is no reason whatever for this; the name *Camptoptera* should be maintained.

Original description:

Tarsen fünfgliedrig; Fühler beim ♂ zehn-, beim ♀ neungliedrig; Hinterleib kurz gestielt; Flügel schmal, mit einem breiteren Absatz nahe an der Basis und hinter demselben gebogen.

Bräunlich, der Schaft mit dem Stielchen, der Hinterleibsstiel und die Beine gelb; die Füße fast unmerklich dunkler als die übrigen Theile der Beine. Das ♂ hat die Geißelglieder alle ungefähr gleich lang, jedoch so, dass die vier bis fünf ersten Glieder fast unmerklich länger erscheinen, als die folgenden; das letzte ist mit einer sehr feinen pfriemenförmigen Spitze versehen. Die Fühler stehen hart am innern Augenrande. Beim ♀ ist das erste Geißelglied etwas länger als das Stielchen, das zweite viel länger als das erste, das dritte etwas kürzer als das erste und das vierte sogar kürzer als das dritte. Die beiden folgenden unter sich genau von gleicher Länge, einzeln genommen wenig, aber doch merklich kürzer als das dritte. Das letzte Glied bildet eine ziemlich stark verlängerte, fast elliptische Keule von der Länge der drei vorangehenden Glieder. Die beiden der Keule vorhergehenden Glieder sind auch ein wenig dicker als die übrigen Geißelglieder.

Camptoptera Papaveris m. ♂♀, die einzige Art dieser Gattung, erzog ich vom 12. bis 18. August 1851 aus Mohnkapseln von *Papaver Rhoeas* und *dubium*.

Tarsi 5-jointed, antennae of male 10-jointed, of female also 10-jointed*). Abdomen petiolate. Head almost

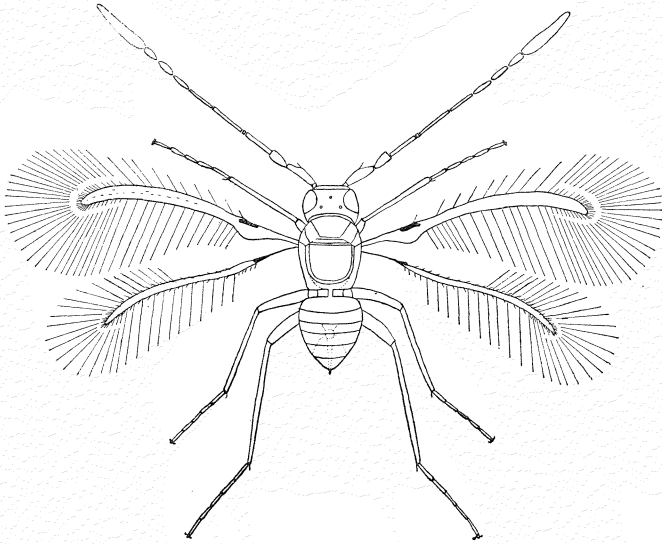


Fig. 9. *Camptoptera* Förster.

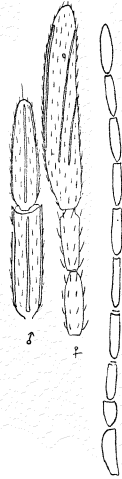


Fig. 10.
Camptoptera Först.
Tip of male and
female antenna,
and male antenna.

rectangular, as wide as thorax, eyes rather large, ocelli placed in an obtuse-angled triangle. Thorax oval, much longer than the head. Petiole rather short. Abdomen oval, shorter than thorax. Ovipositor slightly protruding. Legs long and slender. Wings of almost equal length, long, narrow, arched. Marginal

*) The 2nd, very small funicle joint in the female antenna seems not to have been observed until now. Girault (Mem. Queensl. Mus. Vol. V p. 207) says indeed that *Camptoptera gregi* from Australia has the same, small 2nd funicle joint. Also in the male a still smaller inter-segmental sclerite may be seen between 1st and 2nd, and between 2nd and 3rd, funicle joints. If these were counted, the male antennae may be said to be 12-jointed.

vein short; posterior margin at jugum with a pronounced, rounded dilatation. Marginal cilia long and stout.

May be confused with *Dicopus* and *Alaptus*, but is easily recognised by the petiolated abdomen and the arched wings.

Camptoptera papaveris Förster.

1856. *C. papaveris* Förster. Hym. Stud. II p. 119.

1898. *C. papaveris* Dalla Torre. Cat. Hym. V.

1923. *C. papaveris* Gahan & Fagan. Type Spec. p. 27.

♀. Dark brown. Eyes red. Ocelli black (dark red?). Antennae brown, first two joints lighter, petiole yellow, legs light yellow. Head, thorax, and abdomen smooth. Wings with only few discal cilia.

Length 0.4 mm.

♂. Colours as in the female. Antennae and legs light yellowish brown.

Length 0.35 mm.

Reared from capsules of *Papaver rhoeas* containing galls of *Aulax rhoeadis* and *Cecidomyia papaveris*. Enock says that on the 6th of Septbr. he found more than 300 females on a window facing east, at Woking.

Swept in open grassy places in woods. Also swept on flowers of *Daucus*.

Dates: June, July, Aug., Septbr.

Denmark, England, Germany.

Waterhouse's collection in the Brit. Mus. includes two more species, viz.:

Camptoptera elongatula Enock.

Differs from *C. papaveris* in being much larger, the wings are much longer, but scarcely perceptibly wider, so that they are much more gradually acuminate at the apex and the discal hairs are more numerous. Club as long as the preceding 3 joints.

Length 0.475 mm. — and

Camptoptera tarsalis Enoch.

♀. Dark metallic brown, antennae light brown, pedicellus testaceous. Club as long as 5th, 6th, and half of the 7th funicle joints together.

Length 0.625 mm.

Differs from both the preceding species in the proportions of the antennal joints, and in having the tarsi relatively much longer.

Mr. C. I. Povl reared some specimens from a *Boletus* infested with *Cis micans* obtained at Godalming, July 1913. They appear to be referable to this species. They are somewhat smaller than the type, but have the same long tarsi. Unfortunately all the specimens are males.

Until rearings have been performed there is no reason to suppose that there is more than one species of *Camptoptera*, viz. *C. papaveris* Förster.

Caraphractus (Hal.) Walker.

1846. *Caraphractus* (Hal.) Walk. Ann. Mag. Nat. Hist. XVIII p. 50.
 1856. *Caraphractus* Förster. Hym. Stud. II p. 117.
 1863. *Polynema* Lubbock. Trans. Linn. Soc. London. XXIV p. 138.
 1873. *Cosmocoma* Marshall. Cat. Brit. Hym. Oxyura p. 24.
 1879. *Anaphes* (Walkerella) Westwood. Trans. Linn. Soc. London.
 (2) 1 p. 584.
 1896. *Polynema* Vosseler. Jahresb. Ver. vaterl. Naturk. Württemberg LII p. LXXXVI.
 1898. *Polynema* Dalla Torre. Cat. Hym. V p. 426.
 1898. *Caraphractus* Dalla Torre. Cat. Hym. V p. 424.
 1904. *Caraphractus* Ashmead. Classif. p. 364.
 1907. *Anaphes* Rousseau. Ann. Biol. Lac. II. 3.
 1909. *Anaphes* Heymons Brauer. Süßwasserf. Deutsch. VII p. 33.
 1912. *Caraphractus* Matheson & Crosby. Ann. Ent. Soc. America.
 V. 68.
 1920. *Caraphractus* Rimsky-Korsakov. Revue Russe d'Entomologie.
 1923. *Caraphractus* Gahan & Fagan. Type Spec. p. 26.
 1930. *Caraphractus* Schmiedeknecht. Hym. Mitteleur. p. 450.

Original description:

Tarsi tetrameri; antennæ fem 9 articulatae scapo fusiformi; abdomen petiolatum segmento 2^o amplissimo; alæ anticæ ulna lineari.

1. cinctus. Fem. niger pedibus piceis, antennis basi metathoracis dorso coxis posticis et petiolo ferrugineis; metathorace bicarinato.

Tarsi 4-jointed, abdomen petiolate, antennae of ♂ 13-jointed, of ♀ 9-jointed. Head rectangular, slightly

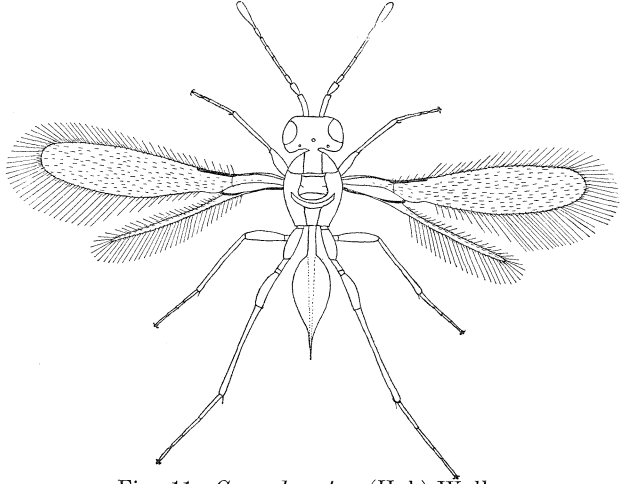


Fig. 11. *Caraphractus* (Hal.) Walker.

broader than the thorax. Eyes rather large, ocelli forming an obtuse-angled triangle. Thorax long, more than twice as long as the head. Petiole nearly as long as the head. Abdomen egg-shaped, as long as the petiole and thorax together. Ovipositor slightly protruding. Legs long and slender. Forewings long, rather narrow, marginal cilia long and stout, discal hairs long but not numerous, marginal vein long. Hindwings knife-shaped, cilia of anterior margin short, those of posterior margin long. Head, thorax, coxa, and femora finely reticulated.

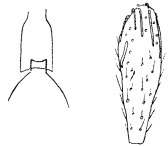


Fig. 12.
Caraphractus
(Hal.) Walker.
Petiole and club
of fem. antenna.

The genus may only be confused with *Polynema*, from which it can easily be distinguished by its much longer marginal vein and reticulated surface. From *Eustochus* it may be distinguished by possessing narrower wings, shorter hind tibiae, and shorter petiole and marginal vein.

Caraphractus cinctus (Hal.) Walk.

1846. *C. cinctus* (Hal.) Walker. Ann. Mag. Nat. Hist. XVIII p. 52.
 1863. *Polynema natans* Lubbock. Trans. Linn. Soc. London. XXIV p. 138.
 1879. *Anaphes natans* Westwood. Trans. Linn. Soc. London. (2) 1 p. 584.
 1895. *Polynema natans* Enoch. Scien. Gossip. II p. 89.
 1896. *Caraphractus cinctus* Enoch. Nature LIV p. 28.
 1898. *Polynema natans* Dalla Torre. Cat. Hym. V p. 426.
 1898. *Caraphractus cinctus* Dalla Torre. Cat. Hym. V p. 424.
 1907. *Anaphes cinctus* Rousseau. Ann. Biol. Lac. II. 3.
 1917. *Anaphes cinctus* Rimsky-Korsakov. Revue Russe d'Entomologie XVI p. 220, 225.
 1923. *Caraphractus cinctus* Gahan & Fagan. Type Spec. p. 26.

♀. Head dark brown, eyes and ocelli black. Antennae dark brown, 1st and 2nd joints lighter. Thorax dark brown. Petiole light brown. Abdomen blackish-brown, tip a little lighter. All legs brown, tarsi lighter brown. Head, petiole, and coxæ covered with fine reticulations, thorax with larger reticulations, Fore-wings slightly infusate; discal hairs evenly distributed over the wing.

Length 1.1 mm.

♂. Colours as in the female only a little darker. Reticulation as in the female.

Length 1 mm.

The species is parasitic in eggs of aquatic insects and has been reared from eggs of *Dytiscus marginalis*, *Notonecta*, and other insect eggs from water. It swims under water with jerky movements of its wings. Matheson and Crosby say that they mate under water, and Enoch has seen them mate immediately on emerging

from the host-eggs and even before. Rimsky-Korsakov has kept them alive for four days without access to the air; they have both tracheal respiration and respiration through the skin. In the air the flight is good, and they descend easily from the air into the water.

Date: June.

Belgium, Denmark, England, Germany and Russia.

Cleruchus Enock.

1909. *Cleruchus Enock*. Trans. Ent. Soc. London. p. 453.

1923. *Cleruchus Gahan & Fagan*. Type Spec. p. 36.

1933. *Cleruchus Bakkendorf*. Ent. Medd. XIX p. 58.

Original description:

Tarsi 4-jointed. The abdomen subsessile. The antennae of the male 13 joints; of the female 9 joints. The scape is very long. The apical joint forming an elongated elliptical club.

The scape, springing from a very decided ridge, projecting from between the eyes; giving the head a somewhat flattened appearance. The wings are almost destitute of surface hair, with the exception of a central row running from the base to the tip. The cilia are very long and slender. The anterior wings are narrow, parallel from near the base to just before the apex, where they gently curve down. The posterior wings a very little shorter than the anterior, and about half the width and parallel.

The ovipositor projecting beyond, and the tip rising above the abdomen.

Cleruchus pluteus Enock.

Original description:

General colour, smoky brown; the head and front part of the thorax darker.

The antennae of the male, 13-jointed, are dark brown, the joints slightly increasing in length to the apex: those of the female, nine in number, are brown, paler at the base. The scape very long and compressed, curved and tapering to the base, which springs from a projecting ridge between the eyes. The pedicel is short and broad, the 3rd joint very short, the 4th almost twice as long as the 3rd, the 4th, 5th, and 6th equal in length, the 7th and 8th a trifle shorter and broader.

The club the same length as the scape. The wings smoky

brown, 0.6 mm. in length by 0.075 mm. in width, the longest cilia 0.2 mm. The legs somewhat short, the femora compressed.

Length 0.6 mm.

Woking: July 1885; Loughton: July 1897 (Fred. Enoch); Burnham Beeches: 1908 (C. O. Waterhouse) England. In Denmark rather common: Grib Skov (Alnus), Sandbjerg, Dyrehaven, Præstevang (Betula, Alnus), Bøllemose, Farum (Corylus). Many specimens reared from rolled

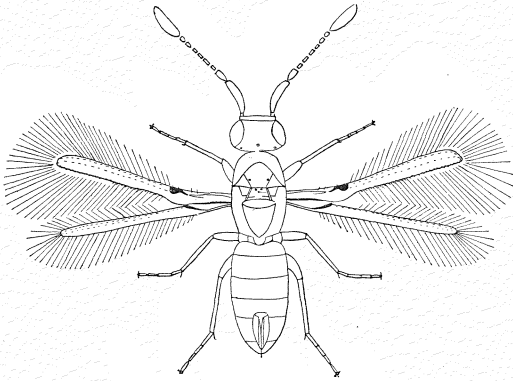


Fig. 13. *Cleruchus* Enoch.

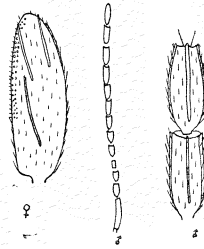


Fig. 14. *Cleruchus* Enoch. Club of female antenna, male antenna, and tip of same.

leaves (*Rhynchites betulae*) of Alnus and Betula, May, June, July. Also from Hazel (*Rhynchites alni*) by Emil Nielsen. Bakkendorf says that it is not a parasite in *Rhynchites* eggs, but in some other beetle-eggs deposited in the rolls.

There seems to be a seasonal dimorphism in the females. Females from the spring have 13-jointed antennae, from the summer 12-jointed.

Nothing is to be added to Enoch's description. The attention of students should only be directed to the truncate tip of the male antennae. I should prefer to say: abdomen subpetiolate, because there is a very short petiole.

Dicopus Enock.

1909. *Dicopus Enock*. Trans. Ent. Soc. London p. 455.

Original description:

The tarsi 5-jointed; the abdomen sessile. The antennae of the female 10 joints. The scape compressed, with three angular projections on the upper edge, the space between the first and second gently sinuate, the basal projection not so prominent as the others. The wings 0.4 mm. in length and 0.05 mm. in width.

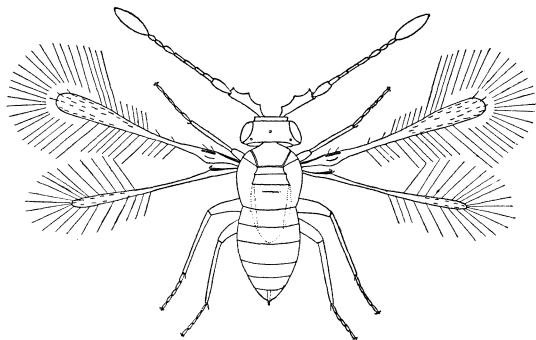


Fig. 15. *Dicopus Enock*.

The cilia very long, the longest 0.23 mm. The ovipositor very minute and short, just level with tip of abdomen.

The male is at present unknown.

***Dicopus minutissima* Enock.**

Original description:

General colour, testaceous; the head slightly broader than the thorax; the antennae of the female pale testaceous, the scape compressed with three angular projections on the upper edge, the space between the first and second gently sinuate, the basal projection not so prominent as the other. The pedicel half as long as the scape, as broad as the scape across the prominences — the 3rd and 4th joints are about equal length. The 5th and 6th equal length, the 7th, 8th, and 9th shorter, but broader. The club equal in length to the 6th, 7th, 8th, and 9th combined. The wings are very delicate and oar-shaped; the

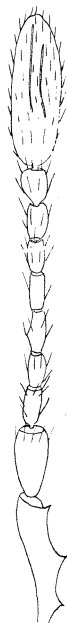


Fig. 16.
Dicopus Enock.
Female antenna.

anterior 0.4 mm. long by 0.05 mm. broad; the cilia of great length; the longest 0.23 mm. The legs light testaceous, the tibiae longer than the tarsi, the tarsal joints minute and of equal length. The ovipositor just level with the tip of abdomen.

Length 0.4 mm.

Hab. Woking: September 1885 (Fred. Enock).

♂. Brown, abdomen dark brown, legs and antennae lighter. Antennae 12-jointed, scape and pedicel just as in the female. 1st funicle joint as long as pedicel, 2nd joint small, not half as long as 1st. 3rd, 4th and 5th longer than 1st. 1st to 5th joint cylindrical, 6th to 9th widening against apex just as 5th, 6th, and 7th in the female. 9th joint the longest, 10th funicle joint rather small, shorter and not as wide as 8th and 9th.

♂ description from a slide in Zool. Mus. Copenhagen (Blood).

1 ♂ in Brit. Mus. (Waterhouse's collection) has 13-jointed antennae, but the specimen cannot be confused with any other genus (scape).

Goring, Broadstairs (Waterhouse). 2 ♂♂, England (Blood), 1 ♂, Woking (Enock).

Date $\frac{4}{8}$, $\frac{7}{8}$.

The genus is only known from England.

May only be confused with *Alaptus*, from which genus it is easily distinguished by the shape of the wings.

Doriclytus Först.

1847. Doriclytus Förster. Linnaea entom. II p. 226.

1856. Doriclytus Förster. Hym. Stud. II p. 117 & 121.

1898. Doriclytus Dalla Torre. Cat. Hym. V p. 428.

1904. Doriclytus Ashmead. Classif. p. 363.

1923. Doriclytus Gahan & Fagan. Type Spec. p. 48.

1930. Doryclytus Schmiedeknecht. Hym. Mitteleur. p. 450.

Original description:

“Die Fühler des ♀ 10gliedrig, der Knopf 2gliedrig, die Tarsen 4gliedrig, die 4 hintern Schienen sind etwas kürzer als die Füße; der Hinterleib kurz gestielt, der Bohrer länger als der

Hinterleib, der nervus ulnaris der Flügel sehr kurz, fast unscheinbar."

Further Förster writes (p. 227):

Diese Gattung hat mit der vorhergehenden [Eustochus] eine gewisse Uebereinstimmung in der Körperform und könnte bei oberflächlicher Betrachtung leicht damit zusammengeworfen werden; die unterscheidenden Merkmale namentlich die von der Flügelbildung hergenommenen sind aber in dieser kleinen Familie von solcher Wichtigkeit, dass selbst die kleinsten Differenzen in dem Geäder auf verschiedene Gattungen zuversichtlich hindeuten. Auch in der Fühlerbildung zeigt sich eine Abweichung von Eustochus in Bezug auf die relative Grösse der einzelnen Glieder der Geissel, doch ist diese wie wir in der Gattung Polynema sahen mehr zur Unterscheidung der Arten geeignet; wichtiger aber ist das Verhältniss der Länge der Schienen zu den Füßen in dieser und der vorhergehenden Gattung, und dieses Verhältniss trug ich kein Bedenken in den Gattungscharakter mit aufzunehmen.

Ich besitze von dieser Gattung nur eine Art: *Dor. vitripennis*. Schwarzbraun, die Fühler an der Basis, der Stiel des Hinterleibes und die Beine roth; der Bohrer etwas länger als der Hinterleib, die Flügel glashell mit kurzen Wimpern. ♀. Lg. $\frac{1}{2}$ Lin.

An den Fühlern ist das erste Glied der Geissel so lang wie das Stielchen, aber viel kürzer als das 2te, die Glieder 2 bis 6 der Geissel sind walzenförmig, viel länger als breit und nehmen nach der Spitze des Fühlers hin wie an Länge ab, so an Dicke zu, der Knopf ist 2gliedrig und nur so lang wie die 2 vorhergehenden Glieder zusammengenommen. Der Hinterleibsstiel ist kürzer als die hintersten Hüften.

Wenn wir die Fühler dieser zierlichen Art mit denen des Eustochus atripennis vergleichen, so finden wir die 3 dem Knopf vorhergehenden Glieder der Geissel hier länger, stark walzlich und weniger dick, die Fühler zeigen dadurch an der Spitze weniger das Ansehen einer Keule.

Das einzige ♀ meiner Sammlung ist aus der Gegend von Aachen.

1856. Hym. Stud. II p. 117 (the key):

aa. Die Tarsen viergliedrig.

k. Der Fühlerknopf zweiringelig.

1. Der ramus marginalis sehr lang; die vier

Hintertarsen kürzer als ihre Schienen. *Eustochus* Hal.

11. Der ramus marginalis sehr kurz; die vier

Hintertarsen länger als ihre Schienen. . . *Doriclytus* m.

This genus does not seem to have been found again after having been described. At any rate none of the later authors mention the species more closely. If it is a Mymarid it cannot be confounded with any other European genus.

It is true that Enock (in Trans. Ent. Soc. London 1909 p. 458—459) states that he has caught ♀ + ♂ of *Doriclytus vitripennis* Förster. But his description proves that, when he wrote his paper, he had only a ♀ + ♂ of *Polynema*. And moreover, it is quite evident that later on he was fully aware that he was wrong in his first supposition. I have in my possession a copy of the paper and on the cover of it is written in Enock's own handwriting: With Fred. Enock's love. F. E.'s copy. It is his private reference copy. Next to the description of *Doriclytus* he has written a large interrogation mark.

There is no reason whatever for believing that Förster's *Doriclytus* has any connection with Enock's species. The long ovipositor in Förster's specimen "longer than the abdomen" and "the slightly projecting ovipositor" in Enock's specimen clearly establish the difference.

Enaesus Enock.

1909. *Enaesus Enock*. Trans. Ent. Soc. London p. 456.

1923. *Enaesus Gahan & Fagan*. Type Spec. p. 50.

1933. *Enaesus Bakkendorf*. Ent. Medd. XIX p. 51.

Original description:

The tarsi are 4-jointed, the abdomen sessile; the antennae of the male are 13-jointed; of the female 9-jointed. The scape long, narrow and hairy. The wings 0.85 mm. in length, by 0.175 mm. wide; the basal quarter of the anterior wings devoid of surface hairs. The ovipositor level with apex of abdomen.

Enaesus agilis Enock.

Original description:

General colour, almost black or dark brown; the antennae of the male 13-jointed, brown throughout; of the female 9-jointed,

the scape very long; the pedicel about the same length as the 3rd, 4th, 5th and 7th joints the same length, the 6th and 8th a little longer, the club increasing in width from the base, the tip rounded. In the male the 3rd to the 12th joints inclusive, are of the same length — the 13th slightly shorter — all of one width. The head is about the same width as the thorax, the eyes rounded; the wings 0.85 mm. long by 0.175 mm. broad; straight on the costa and much swollen on the inner margin; the longest

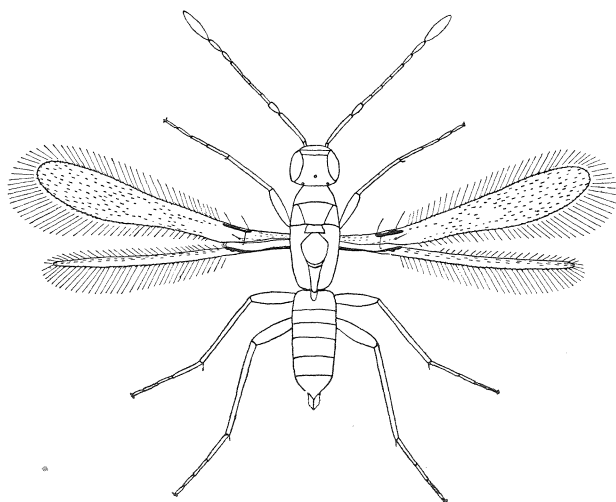


Fig. 17. *Enaesus* Enock.

cilia 0.175 mm.; the apical half covered with coarse surface hairs. The legs of the male have dark brown femora in the centre, the front tibiae testaceous, the trochanters very long and cylindrical. The femora of the front legs of the female are brown changing to testaceous at the base and tips; the middle legs with the basal half of the tibiae testaceous, brown at the tips, the tarsi testaceous to brown. The hind femora brown, testaceous at the tips and trochanters; the tibiae testaceous, brown at the base, the tarsi brown. The abdomen of the female testaceous at the base; the rest dark brown; the ovipositor level with the tip.

Length 1 mm.

Hab. Woking: September 1885 (Fred. Enock); Broadstairs: 1908 (C. O. Waterhouse); Richmond Park: August (Fred. Enock); 1909, I. of Wight (C. O. Waterhouse).

Tarsi 4-jointed. Abdomen subsessile. Antennae of male 13-jointed, of female 9-jointed. Head quadratic, as wide as thorax. Eyes large, ocelli placed in a very obtuse-angled triangle. Thorax long and elliptic, three times as long as the head. Petiole very short. Abdomen egg-shaped, as long as thorax. Ovipositor protruding; base of it concealed by a sheath (see Bakken-dorf l. c. p. 42—43).

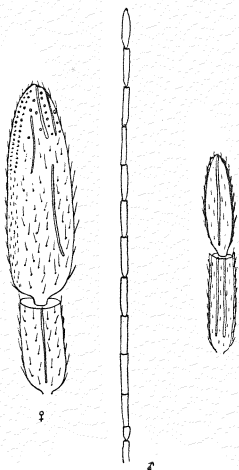


Fig. 18. *Enaesus* Enock.

Male antenna, and tip of female and male antenna.

Legs stout, fore-tibiae shorter than their tarsi, middle- and hind-tibiae of same length as their tarsi. Wings rather narrow, marginal vein short, marginal cilia rather short. Hind wings knife-shaped, ciliation short.

The genus cannot easily be confused with any other genus except *Erythmelus*, see below.

Enock describes two species: *agilis* and *laticeps*, but the descriptions are given with almost the same words for both species. There seems only to be a slight difference in the head.

agilis: head about the same width as thorax.

laticeps: head very wide.

There seems to be no reason at all to separate these into two species.

But there seems hardly to be any reason to refer *Enaesus* to a separate genus different from *Erythmelus* Enock. Both of them have the above-mentioned sheath and are only distinguished from each other by minute characteristics, e. g. the different lengths of the tarsi. Both genera, however, are separately dealt with here, future investigations may then decide the question.

Enaesius agilis Enoch.

1909. *Enaesius agilis* Enoch. Trans. Ent. Soc. London p. 456,
tab. XIV fig. 1—5.

1909. *Enaesius laticeps* Enoch. Trans. Ent. Soc. London p. 456.

♀: Black-brown; two first antennal joints and abdomen at the base testaceous, femora of front legs brown changing to testaceous at the base and tip, middle legs with the basal half of the tibiae testaceous, hind femora brown, testaceous at the tips and trochanters, tibiae testaceous, brown at base, tarsi brown. Antennae: scape very long and slender, more than $\frac{1}{4}$ of the rest of the whole antenna, 2nd joint small, 3rd, 4th, 5th, and 7th about equal in length, 8th a little longer, club shorter than scape. Fore-wings with short discal hairs from the stigma to the middle of the wing with a few irregular lines, the apical half evenly covered. Hind-wings with two rows of discal cilia.

Length 0.85 mm.

♂. Dark brown. All funicle joints of equal length, long and slender, club slightly shorter.

Length 0.8 mm.

Nothing is known about the life history of the genus. Specimens have been caught in England (Blood, Enoch) and Denmark (Bakkendorf, Kryger). Swept in open places in woods; seems to prefer moist ground. Swept together with *Erythmelus* (Bakkendorf).

Dates: July—August ($\frac{2}{7}$ — $\frac{6}{8}$).

Erythmelus Enoch.

1909. *Erythmelus* Enoch. Trans. Ent. Soc. London p. 454.

1923. *Erythmelus* Gahan & Fagan. Type Spec. p. 57.

1933. *Erythmelus* Bakkendorf. Ent. Medd. XIX p. 42.

Original description:

The tarsi are 4-jointed; the abdomen sessile; the antennae of the male 13 joints, of the female 9 joints. The scape is long, the same length as the club, which is pointed. The wings are

straight on the costa, and very much swollen on the inner margin. The anterior wing is 0.65 mm. in length by 0.16 mm. in width; the longest cilia 0.16 mm. The ovipositor projecting just beyond the apex of the abdomen.

Tarsi 4-jointed. Antennae in male 13-jointed, in fe-

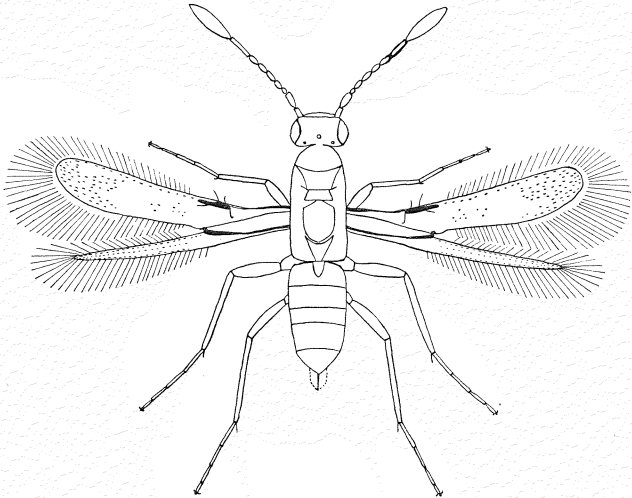


Fig. 19. *Erythmelus* Enoch.

male 9-jointed. Abdomen sessile. Eyes large. Ocelli forming a nearly right-angled triangle. Head quadratic, as broad as thorax. Thorax long and oval, more than three times as long as head. Abdomen oval, as long as thorax. Ovipositor protruding, covered by a sheath outside the common one (see Bakken-dorf l. c. p. 42—43). Wings short and rather narrow; marginal vein short. Legs long and stout, all tarsi longer than their tibiae.

The genus can only be confused with *Enaesius*.

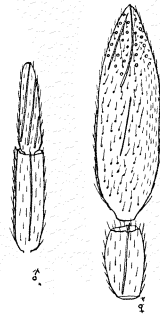


Fig. 20. *Erythmelus* Enoch.

Tip of male and female antenna.

Erythmelus goochi Enock.

1909. *Erythmelus goochi* Enock. Trans. Ent. Soc. Lond. p. 454.
 1933. *Erythmelus goochi* Bakkendorf. Ent. Medd. XIX p. 42.

Original description:

The head and thorax black; the sides yellowish. The legs and basal half of abdomen yellowish; the apical half black. The antennae of the male are 13-jointed and of one length and width throughout, with 4 longitudinal ridges. The thorax very long. The antennae of the female are 9-jointed; the scape is very long; the pedicel much broader than the scape; the 3rd and 4th joints the same length; the 5th a very little broader and longer; the 6th and 7th broader but same length; the 8th equal to the 5th and 6th together. The club long and pointed, only slightly broader than the 8th and equal in length to the 2nd to 6th combined. The thorax is long, but shorter than the abdomen. The tarsi of the front legs are much longer than the tibiae, the middle tarsi and tibiae about the same length; the hind tibiae and tarsi are longer than the others. The wings are 0.65 mm. long by 0.16 mm.; from the widest point to the apex the surface is slightly hairy; the longest cilia 0.16 mm., the ovipositor projecting a little beyond the apex.

Length 0.8 mm.

Hab. Somerset (Dr. Gooch); Holloway, London, N.: August 1908 (F. Enock).

♀. Brown, parts of thorax and base of abdomen lighter, antennae and legs light brown. Antennae: scape long and slender, pedicel long, half as long as scape, funicle joints increasing in length and widening towards the club, club long and stout.

Length 0.8 mm.

♂. Colours as in the female. Antennae: scape and pedicel the shortest antennal joints, funicle joints subequal in length, slightly increasing towards the club, which is shorter than the funicle joints.

Length 0.7 mm.

Highgate, Goring, Effingham (England), Dyrehaven (Denmark).

Reared from Heteropterous eggs, deposited in stems of *Urtica dioeca* (Bakkendorf).

Dates: Swept in July and August. Reared in April and May.

***Erythmelus maculatus* Enoch.**

Waterhouse's collection in Brit. Mus. contains a slide with an *Erythmelus* mounted in balsam. The slide has a label on which is written: *E. maculatus*. But Waterhouse has scratched the name out. A picture of the thorax of *maculatus* is also found in the collection but no difference can be seen between the drawing and the thorax of *goochi*.

As far as I know, Enoch has not published any description of *maculatus*.

Eustochus Hal.

1829. Mymar Curtis. Guide to Br. Insects.
 1833. Eustochus Hal. Ent. Mag. I p. 349.
 1840. Eustochus Westw. Introd. mod. Class. Vol. II.
 1846. Eustochus (Hal.) Walk. Ann. & Mag. Nat. Hist. XVIII p. 50.
 1847. Eustochus Förster. Linnaea entom. II p. 195—233.
 1856. Eustochus Förster. Hym. Stud. II p. 116—117.
 1898. Eustochus Dalla Torre. Cat. Hym. V.
 1904. Eustochus Ashmead. Classif. p. 363.
 1923. Eustochus Gahan & Fagan. Type Spec. p. 65.
 1930. Eustochus Schmiedeknecht. Hym. Mitteleur. p. 450.

Original description:

Antennæ feminæ 10-articulatæ capitulo bi-articulato. Tarsi tetrameri. Abdomen petiolatum.

Caput transversum, occiput truncatum; vertex latus planus undique definitus transverso quadratus angulis anticis mucronatis; frons truncata: antennæ margini summo frontis insertæ, scapo longiusculo fusiformi, pedicello clavato, articulis sequentibus linearibus, 3tio, 4to subequalibus, 6o, 7o, 8o brevioribus incrassatis, 9no et 10mo capitulum magnum lenticulari-ovatum efformantibus: thorax breviter ovatus valde convexus, collari inconspicuo; mesothoracis scutello et metathoracis scuto continuis, per dorsum longitudinaliter elevatis, lateribus præcis: abdomen petiolatum ascendens semicordatum teres apice acuminatum, aculeo elongato ascendente: alæ anticæ obovatæ longius

ciliatæ, ulna quam in reliquis generibus magis elongata; posticæ lineares ciliatæ: (plura videas sub species unica).

Sp. 1. *E. atripennis*. Niger capite thoraceque opacis, alis fuliginosis, antennis basi pedibus et petiolo ferrugineis. ♀. (Long. corp. et acul. 0,07; alar. 0,11).

Mymar atripennis Curtis, E. B.

Caput thorax et coxæ posticæ granulatæ: abdomen lævissimum nitidum: aculeus abdomine longior: alæ pilosæ lineola

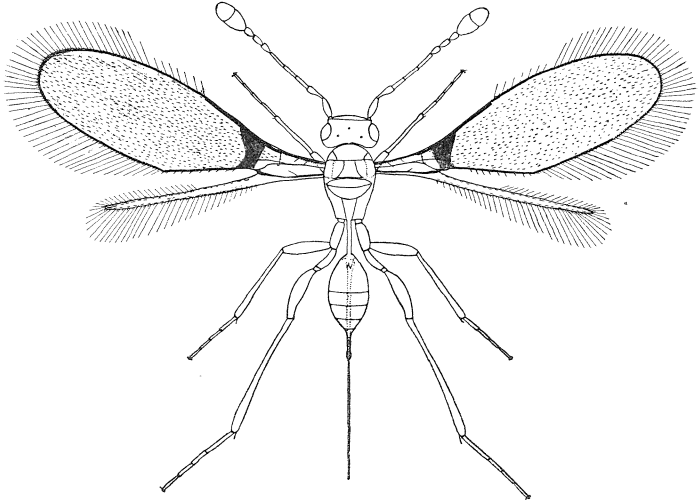


Fig. 21. *Eustochus* Hal.

ambiente crassiuscula: lunula seu fascia ferruginea interne hyalino limbata sita est transverse prope basin alarum anticarum fere sub medio ulnæ, lineola tenuis subimpressa (s. nervus spurius) ibidem orta usque in marginem anteriorem pone apicem alæ excurrit, leni flexu a costa descendens.

Tarsi 4-jointed, abdomen petiolate, antennae of male 13-jointed, of female 10-jointed with a 2-jointed club. Head rectangular with a pronounced ridge between the eyes and the posterior aspect concave, as wide as thorax. Eyes small, ocelli forming a right-angled triangle. Thorax short and wide, twice as long as the head. Abdomen egg-shaped, longer than thorax. Ovipositor protruding, the

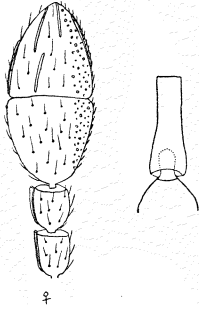


Fig. 22. *Eustochus*
Hal. Tip of female
antenna, and petiole.

visible part as long as abdomen and petiole together. Petiole a little longer than head. Legs stout, hind tibiae very long. Head finely reticulated, thorax with larger reticulations, petiole, trochanters, and femora finely reticulated.

Fore-wings wide and ample, longer than the whole insect, marginal cilia stout and of moderate length, discal hairs stout, subcosta short, marginal vein long, twice as long as subcosta. Hind-wings knife-shaped, much shorter than the fore-wings, cilia short, those on posterior margin rather long (longer than those of the fore-wings), 3 rows of discal hairs.

E. atripennis Curtis.

1829. *Mymar atripennis* Curtis. E. B.
 1833. *Eustochus atripennis* Hal. Ent. Mag. I p. 349.
 1846. *Eustochus atripennis* (Hal.) Walker. Ann. & Mag. Nat. Hist. XVIII p. 54.
 1847. *Eustochus atripennis* Förster. Linnaea entom. II p. 226.
 1856. *Eustochus atripennis* Först. Hym. Stud. II p. 117.
 1898. *Eustochus atripennis* Dalla Torre. Cat. Hym. V.
 1904. *Eustochus atripennis* Ashmead. Classif. p. 363.
 1923. *Eustochus atripennis* Gahan & Fagan. Type Spec. p. 65.
 1930. *Eustochus atripennis* Schmiedeknecht. Hym. Mitteleur. p. 450.

♀. Head black, eyes and ocelli black, antennae dark brown, 2nd and 3rd joints lighter brown, thorax dark brown, petiole light brown, legs brown, femora and tibiae darker than the tarsi. Ovipositor light brown. Fore-tibiae as long as their tarsi, middle-tibiae one and a half times as long as their tarsi, hind-tibiae nearly twice as long as their tarsi.

Fore-wings infuscate, with a darker shade across the disc near the base. [Hind-wings infuscate.

♂. I have never seen the male, but it is, no doubt, in all essentials like the female.

The species is swept under old trees (beech, oak, elm) but it seems to be very rare. Nothing is known about its life-history.

Dates: $4/6-8/6$; $4/8-25/9$.

England (Richmond, Bristol, Hallen Wood (Bristol)), Denmark (Dyrehaven), Germany (Aachen?).

The genus may only be confused with *Doriclytus*, from which it may easily be distinguished by its long marginal vein.

Only this one species is known from Europe.

The wings of *Eustochus* present a remarkable feature which I have not observed in any other Chalcid fly. At high magnification it looks as if the base of the discal cilia penetrates the wing, leaning upon the opposite side of the wing. It is a fact, however, that after the wing has been fully developed, a large cell remains at the base of each cilium, extending partly into the cilium partly towards the middle lamella of the wing. This cell can not generally be observed, no doubt because it is diminutive and situated vertically beneath the cilium, thus being concealed by the papilla of the cilium. This is not the case in *Eustochus*, in which the cell is very large and situated obliquely down on the middle lamella, for which reason it is seen very distinctly. Dr. Henning Lemche has seen a mounted specimen of *Eustochus* and has given me the aforesaid explanation. He has moreover compared the wing of *Eustochus* with the wing of some other Chalcid flies, and from this investigation he considers himself justified to conclude that the feature is characteristic of *Eustochus*.

Litus Hal.

1833. *Litus* Hal. Ent. Mag. I p. 269, 345.

1847. *Litus* Förster. Linnaea entom. II p. 207.

1856. *Litus* Förster. Hym. Stud. II p. 116.

1898. *Litus* Dalla Torre. Cat. Hym. V.
 1904. *Litus* Ashmead. Classif. p. 362.
 1923. *Litus* Gahan & Fagan. Type Spec. p. 81.
 1930. *Litus* Schmiedeknecht. Hym. Mitteleur. p. 449.

Original description:

Antennæ maris 13-articulatæ flagello-filiformi, feminae 9-articulatæ capitulo exannulato. Tarsi pentameri.

1. *Litus cynipseus*. Niger capite thoraceque opacis, alis fuscis

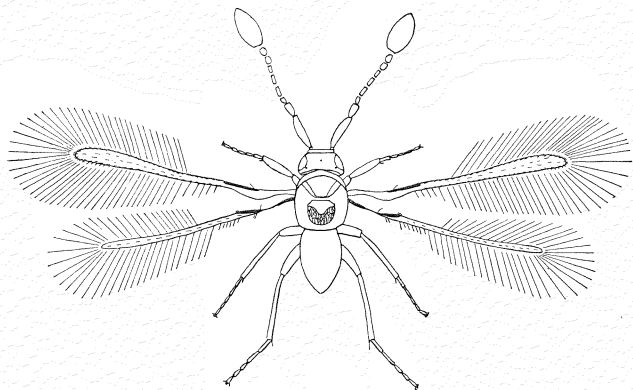


Fig. 23. *Litus* Hal.

longe ciliatis, pedibus ferrugineis. ♀ (Long. 0,02 — alar. 0,08).

Caput et thorax granulato-opaca; frons lata truncata: vertex planus: occiput excavatum: antennæ feminae radícula brevissima, scapo longiusculo arcuato untrinque attenuato, pedicello lato compresso, articulis flagelli 6 minutis, 3tio brevior, exterioribus sensim incrassatis subglobosis, ultimo 3 præcedentibus simul sumtis longiore, ovato acuminato: thorax brevis gibbus: collari brevissimo arcuato; metathorace truncato: abdomen breve sessile metathoraci adpressum, tereti-compressum, ventre carinatum, aculei apice subexerto, (forma fere ut in genere Cynipide): alæ lineares anticæ paulo latiores undique longe ciliatæ; pedes approximati solito crassiores, tibiis anticis clavatis.



Fig. 24.
Litus Hal.
 Tip of female antenna.

♀. Tarsi 5-jointed, abdomen sessile, antennae in female 9-jointed.

Head rectangular, broad but short, as wide as thorax. Front with a distinct pronounced edge between the eyes. Eyes small, ocelli forming a very obtuse-angled triangle, the two posterior ocelli situated at the lateral margin of the head, widely separated. Thorax stout, almost rectangular, twice as long as the head. Head and thorax reticulated. Abdomen short and stout, a little longer than thorax, as broad as thorax, cup-shaped. Ovipositor slightly protruding. Wings much longer than the whole insect. Fore- and hind-wing of almost equal length, very narrow, almost linear, with very long marginal cilia at both margins. Subcosta stout, marginal vein longer and stouter. Legs stout, especially fore- and middle legs, hind legs longer and more slender. Femora and coxæ reticulated. Scape very long, club powerful, with large sense organs.

Colour of animal: Black.

♂ unknown.

The genus may be confounded with the genera *Camptoptera*, which has a petiolated abdomen, *Dicopus*, which has 10-jointed antennae in the female sex, and *Alaptus*, which has 8-jointed antennae in the female sex.

The 9-jointed antennae, sessile abdomen, 5-jointed tarsi, and powerful antennal club characterize, however, the genus *Litus* very well.

Wingless specimens are sometimes met with.

Dates: $6/5-4/6$, $7/7-11/9$.

Europe.

Litus is a parasite in eggs of different species of the *Staphylinidae*. On 29. 7. 1907 70 specimen (♀♀) of *Litus* were reared from an egg of *Ocypus olens*.

At the celebration of the one hundredth anniversary of the Entomological Society of London 1934 a collection of ants and their guests was exhibited, among which

were some specimens of ♀ *Litus*. As many Staphylinid beetles live in ant-hills, it is likely that their parasites may also be found there.

It may be supposed that the ♂ *Litus* has never been found. It is possible that the genus multiplies by parthenogenesis and ♂♂ are only met with under particular circumstances. The ♀ *Litus* is by no means rare. I have once swept 12 ♀♀ in Dyrehaven, Denmark, during one afternoon, and it is not uncommon to get 2-3 specimens on one excursion. It might be anticipated that a collector of small Hymenoptera would occasionally secure a ♂ *Litus*, but that is not the case. All the descriptions published of the *Litus* ♂ plainly indicate that the authors are mistaken because they do not know the *Litus* ♀. Haliday may be excused when he writes (Ent. Mag. 1833 vol. I p. 268) that the ♂ *Litus* has 13-jointed antennae. No doubt he examined an *Alaptus*, but as his apparatuses were very poor, he could easily make mistakes. Brocher (Ann. Biol. Lac. IV p. 180) published 1910 a paper about a parasitic wasp reared from eggs of *Limnobates*. This wasp was described by Schultz as *Litus cynipseus* Hal. It has been impossible to get access to Brocher's material; but in the summer of 1923 my friend O. Bakkendorf succeeded in rearing the species from eggs of *Gerris*, and he was able to ascertain that it was a Proctotryp *Typhodytes gerriphagus* Mar. In 1914 Smitz van Burgst in Ent. Blätt. IV p. 125 published a paper on *Litus nigripes* Smitz van Burgst ♀ + ♂, reared from insect eggs (*Homoptera?*) laid in stems of oat (*Avena*). However, this was no *Litus* either. To judge from the drawing it must be *Anagrus incarnatus* Hal. But the best proof of our ignorance as to the ♂ *Litus* is that Girault (Austral. Hym. Chalc.) does not mention any males from Australia.

In Europe we have only got one species, viz. ***Litus cynipseus*** Hal. Kieffer has indeed described *Litus Krygeri* (in Ent. Medd. 2. R. 4. B. 1913 p. 378) reared from

eggs of a Stapylinid (*Ocypus olens*), but he was in error, the species was *L. cynipseus* Hal.

Lymænon (Hal.) Walk.

1846. *Lymænon* (Hal.) Walk. Ann. Mag. Nat. Hist. p. 49—50.
List of Errata and Addenda (just after the list of contents).
1847. *Gonatocerus* Förster. Linnaea entom. II p. 203 nr. 2.
1856. *Gonatocerus* Förster. Hym. Stud. II p. 121.
1898. *Gonatocerus* Dalla Torre. Cat. Hym. V.
1904. *Gonatocerus* Ashmead. Classif. p. 362.
1923. *Gonatocerus* Gahan & Fagan. Type Spec. p. 66.
1930. *Gonatocerus* Schmiedeknecht. Hym. Mitteleur. p. 449.
1934. *Lymænon* Kryger. Ent. Medd. XVIII p. 503—505.

Original description:

Tarsi pentameri : antennæ mari 13-, fem. 11-articulatæ : abdomen sessile : alæ anticæ vena trientali.

Tarsi 5-jointed, abdomen subpetiolate, antennae of male 13-jointed, of female 11-jointed. Head rectangular, as broad as thorax. Eyes small. Ocelli forming a nearly right-angled triangle. Thorax oval. Petiole very short.

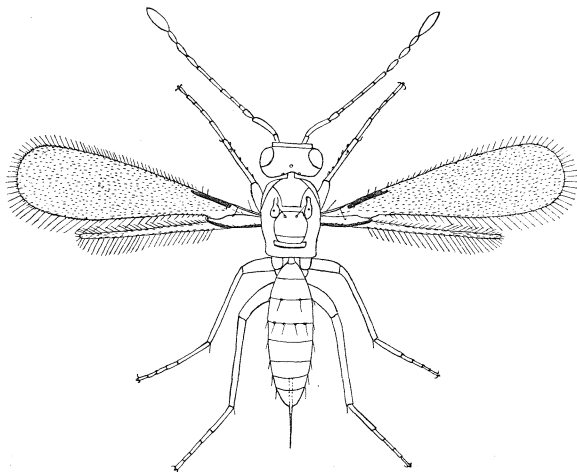


Fig. 25. *Lymænon* Hal.

Abdomen oval, as long as thorax and head together. Ovipositor more or less protruding. Legs stout. Fore-wings broad and stout, widest near apex. Venation rather short, marginal cilia short, the whole surface of the wing uniformly covered with short hairs. Hind-wings shorter than fore-wings, knife-shaped, with rather long cilia on the posterior margin.

General colour brown, dark brown, yellow, or pale yellow.

The genus can only be confused with the genus *Ooctonus*, from which it may be distinguished by its very short petiole.

A number of species have been erected by Enoch and Waterhouse. Including the species of Haliday, Förster and other authors there seem to be more than 50 European species. But Enoch's and

Waterhouse's species have never been described. Their slides are in Brit. Mus. and in the Manchester Museum.

I will revert to this question in a later paper.

The species are commonly swept in low herbage in all sorts of localities, May to October. The species figured in this paper was swept in marshy land, where *Scirpus*, *Juncus*, *Atriplex*, *Chenopodium*, and *Aster* were found.

The species are parasitic in eggs of cicadas deposited in stems of *Juncus*, *Baldingera*, branches of *Populus tremula* and *Salix pentandra*. The eggs were collected in the autumn and winter, *Lymænon* reared in spring (O. Bakkendorf).

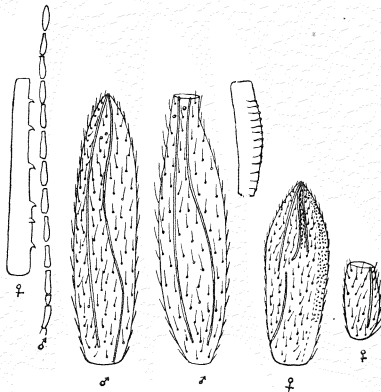


Fig. 26. *Lymænon* Hal.

Female fore tibia; male antenna; clavus and funicle joint of male and female antennae; scape of female antenna.

In 1834 the genus *Gonatocerus* was erected by Nees in Hym. Ichn. aff. Monogr. vol. II p. 192 for the species *G. longicornis* and placed among genera which are now partly ranged in the family *Chalcididae*.

1. Förster in 1841 (Beitr. z. Monogr. d. Pterom. I p. 45) mentions the genus, describing the species *ater* and *flavus*, and places it among the Chalcidids. Later he reverts to the genus several times, constantly changing his standpoint.

2. In Linnaea entom. II p. 205 he says that *Rachistus littoralis* = *Ooctonus littoralis* Hal. and refers *Gonatocerus flavus* and *ater* to *Rachistus*.

3. In Linnaea entom. II p. 209 he says that *Gonatocerus* Nees is neither *Ooctonus* nor *Rachistus* and abandons his view that *Rachistus littoralis* is the same as Nees's species.

4. He maintains (Linnaea entom. II p. 210) that in Beitr. z. Monog. d. Pteromal. he has stated that *Rachistus littoralis* is the same as Nees's species, but it is impossible to find a single word about this in the said paper.

5. In Hym. Stud. II. H. pag. 7 he writes: "It is difficult to explain what *Gonatocerus* Nees really is. It seems to be in accordance with *Ooctonus* Hal. among the *Myrmaridae*".

6. In Hym. Stud. II p. 118 he writes: "*Gonatocerus* Nees = *Lymænon* Walk."

7. In Hym. Stud. II p. 118 he further writes: "Though it was not an easy matter (1841), I have nevertheless correctly recognised Nees' genus *Gonatocerus* and pictured a female."

8. In Hym. Stud. II p. 119 he finally writes: "*Rachistus* Förster = *Gonatocerus* Nees."

In my paper (Syn. Rem. on some Gen. Names of Myrmaridae. Ent. Medd. XVIII p. 503) I have shown that Nees's *Gonatocerus* should be placed somewhere among the Chalcidids with 5-jointed tarsi, not among the My-

marids, and that the fly which Förster incorrectly called *Gonatocerus* (as did all later authors also) should be called *Lymænon* (Hal.) Walk.

Ashmead (Class. p. 362) divides the subfamily with 5-jointed tarsi into two tribes:

- Abdomen petiolate..... Tribe I. *Ooctonini*.
 Abdomen petiolate (a printer's error for sub-
 sessile)..... Tribe II. *Gonatocerini*.

To the *Gonatocerini* Ashmead reckons *Gonatocerus*, *Litus*, *Alaptus*, and *Limacis*. *Gonatocerus* and *Limacis* have a short but distinct petiole, *Alaptus* and *Litus* no petiole at all, thus making the confusion complete. In "Bibl. of Genera" Class. pp. 365—393 he writes (p. 380): *Lymmaenon* (Hal.) Walk. (= *Gonatocerus* Nees)....". In Errata and Addenda he corrects *Lymnaenon* to *Lymnaeon*.

Mymar (Hal.) Curtis.

1832. Mymar (Hal.) Curtis. Brit. Ent. vol. 9 p. 411.
 1833. Mymar Hal. Ent. Mag. I p. 269, 349.
 1847. Mymar Förster. Linnaea entom. II p. 224.
 1856. Mymar Förster. Hym. Stud. II p. 117.
 1898. Mymar Dalla Torre. Cat. Hym. V.
 1904. Mymar Ashmead. Classif. p. 364.
 1923. Mymar Gahan & Fagan. Type Spec. p. 92.
 1930. Mymar Schmiedeknecht. Hym. Mitteleur. p. 450.

Original description:

Alæ anticæ capillares apice spathulatæ, posticæ setacææ. Tarsi tetrameri. Abdomen petiolatum.

Antennæ maris 13-articulatæ; feminae 9-articulatæ capitulo exannulato, scapo utriusque elongato lineari. Tarsi tetrameri. Abdomen petiolatum.

Caput oblato-globosum, vertice late planiusculo subquadrato, fronte producta oblique truncata: antennæ elongatæ, feminae scapo longissimo lineari, pedicello lato compresso, articulis 3o, 5o, 6o, 7o et 8o brevibus, his sensim crassioribus, 4o lineari vix brevioribus, ultimo magno elliptico: maris adhuc multo longiores scapo lineari arcuato, flagelli articulis exterioribus parum brevioribus: thorax fere ut in *Polynema*, collari adhuc majore: abdomen petiolatum semicordatum ascendens aculeo

brevi: pedes gracillimi eximie elongati: alæ anticæ valde elongatæ capillares, apice summo explanatæ, margine longius plu-

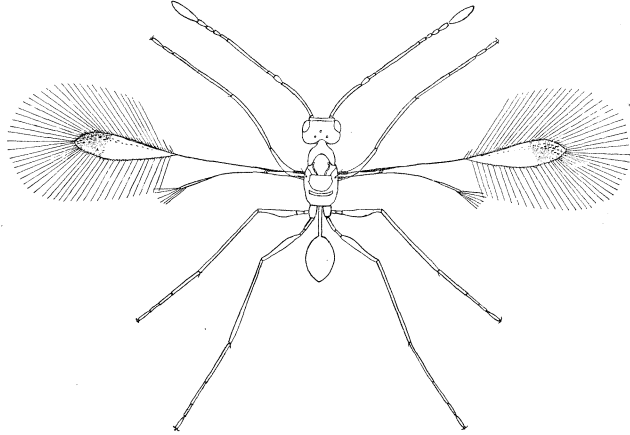


Fig. 27. *Mymar* (Hal.) Curtis.

mato ciliatæ, lineola disci setigera longitudinali unica: posticæ brevissimæ setaceæ nudæ.

Tarsi 4-jointed. Antennæ of male 13-jointed, of female 9-jointed. Abdomen petiolate. Marginal vein very long, extending as a very narrow, almost linear band half-way along the anterior border of the expanded part of the wing. Fore-wing battle-dore-shaped, stem very long and slender, few and short discal cilia, the expanded part of the wing with very long and strong marginal cilia. Hind-wings either rudimentary (*pulchellus*) or linear (*regalis*), in which case the expanded part is nearly absent. Head quadrangular. Thorax oval. Petiole long. Abdomen egg-shaped. Legs long and slender. The whole insect very slender and graceful.

Cannot be confused with any other insect.



Fig. 28.
Mymar (Hal.)
Curtis.
Male antenna,
and male and
female clavus.

Two European species are known, which may be distinguished by the following characters:

Fore-wings with 30—35 marginal cilia, hind-wings rudimentary, extending only to the jugum. *pulchellus* (Hal.) Curt.
Fore-wings with 50—60 marginal cilia, hind-wings prolonged and linear, with a few marginal cilia. . *regalis* Enoch.

M. pulchellus (Hal.) Curt.

1832. *M. pulchellus* (Hal.) Curt. Brit. Entom. IX p. 411.
1833. *M. pulchellus* Hal. Ent. Mag. p. 349.
1840. *M. pulchellus* Westwood. Introd. II. Syn. 167, tab. 78, fig. 16.
1856. *M. pulchellus* Förster. Hym. Stud. II p. 120.
1879. *M. pulchellus* Westwood. Trans. Linn. Soc. Lond. Zool.
(2) I p. 584 tab. 73 fig. 3.
1897. *M. pulchellus* Enoch. Knowledge p. 202.

Original description:

Sp. I. *Mymar pulchellus*. Ochreus antennis apice oculisque fuscis, alis hyalinis apice nigris. ♂♀. Long. 0.06, alar. 0.12.

♀. Light smoky-brown, antennae from pedicel darker. Eyes and ocelli black. Antennae: scape very long, pedicel short, 1st funicle joint shorter than pedicel, 2nd funicle joint as long as scape and pedicel together, the last four funicle joints increasing in length but all shorter than pedicel. Club half as long as scape. Fore-wings with apical half of the membranous part dark smoky-brown. Ovipositor slightly protruding. Length 0.8 mm.

♂. Colours as in the female. Antennae: scape very long, pedicel small, all the following joints slightly spindle-shaped and of equal length.

Length 0.33 mm.

The species is found in open spaces in woods where *Festuca*-grass grows. Rondani is said to have reared it from *Aphis lactucae*, but this needs further confirmation. It is quite improbable that a Mymarid should be a parasite of grown-up insects or their larvae.

Not uncommon — all over Europe.

May—October.

Mymar regalis Enock.

1911. *Mymar regalis* Enock. Knowledge XXXIV p. 271.

♀. Colour yellowish-brown, slightly darker on the dorsal surface. Antennae: 1st and 2nd joints light yellowish, 3rd and 4th dark brown, 5th lighter, 6th and 7th nearly yellow, 8th and club dark brown. Eyes and ocelli dark brown. Scape very long, pedicel short, 1st funicle joint longer than pedicel, 2nd very long, $\frac{1}{3}$ the length of the whole antenna, the four following joints subequal, widening a little, club short and narrow with long and fine sense organs. Membranous part of forewing shorter than half the length of the whole wing, the outer one-third deeply pigmented with brown; marginal cilia long. Hind-wings long, arching strongly backwards, at the apex is a very narrow membrane with a couple of long cilia at the apex and a few ones at the posterior margin. Head subquadrate, not half as long as thorax but broader. Thorax long and oval, petiole long. Abdomen oval, a little shorter than thorax.

Length 0.92 mm.

♂. Colours as in the female, but the first two joints of the antennae are yellowish brown and all the rest dark brown. Apex of abdomen darker. Scape long, pedicel short, following antennal joints subequal. Hind-wings as in the female.

Length 0.83 mm.

Date: $^{30}/_5$ — $^{24}/_7$, $^{12}/_9$ — $^{17}/_9$.

Denmark, England.

Swept in grassy places and outskirts of woods with grasses and *Juncus*.

Neurotes Enock.

1915. *Neurotes* Enock. Hastings and East Sussex Nat. Vol. 2 p. 178.

1923. *Neurotes* Gahan & Fagan. Type Spec. p. 97.

Original description:

The tarsi five-jointed. The abdomen sub-sessile. The antennae of the male 13-jointed, those of the female 8-jointed. The wings broad and elliptical. .75 mm long \times .208 broad. The costal nerve very long. The ovipositor level with the tip of the abdomen.

Neurotes iridescens Enock.

Original description:

The general colour dark brown; the head broader than the

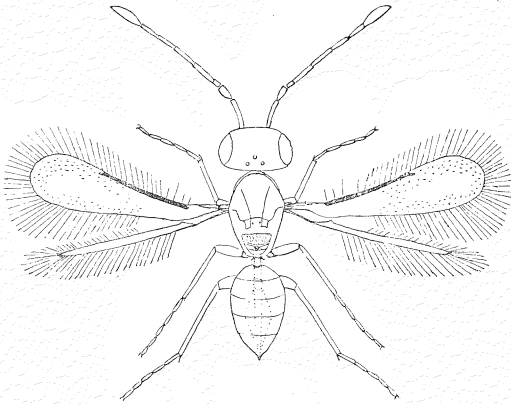


Fig. 29. *Neurotes* Enock.

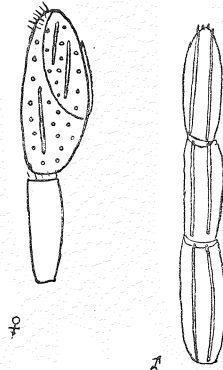


Fig. 30.

Neurotes Enock.
Club of female and tip of male antenna.

thorax. The antennae of the male 13-jointed, dark brown, 1 mm. in length, the scape twice as long as the funicular joint, the third to the twelfth joint of equal length; the thirteenth a little short. The antennae of the female 8-jointed .57 mm. long. The scape and pedicel testaceous, the latter a little longer than the first funicular joint, the others gradually diminishing in length to the club, which is the longest joint and rounded at the tip.

The ovipositor level with the tip of the abdomen. The wings narrower and shorter than those of the male. The costal nerve very long, reaching to beyond the middle of the wing, the tip slightly enlarged. The cilia long. The surface hairs most numerous at the base and margins of the wing, leaving an almost clear oval area in the centre. The cilia long on the lower wings. The legs lighter brown than the body — and darkest in the centre. Length 1 mm.

Hab. Hollington Wood, Hastings. August 1913. Male and female captured.

As the genus has a short petiole, the description must be corrected to: Abdomen subpetiolate.

♀. Dark brown. Scape and pedicel testaceous. Legs lighter brown than the body, a shade darker in the middle. 2nd funicular joint the longest funicular joint, club a little longer. Ovipositor protruding.

♂. Colours as in the female. Wings a little longer and broader than in the female. Pedicel the shortest antennal joint, scape and club a little shorter than the funicle joints, which are of equal length. Tip of abdomen with 3 small appendages resembling 3 fingers.

Dates: July and August.

England (Hollington Wood, Hastings. Bristol).

The genus cannot be confused with any other fly.

Found in England, Denmark, Finland.

Ooctonus Hal.

1833. *Ooctonus* Hal. Entom. Mag. I p. 269, 343.
 1834. *Eutriche* Nees. Hym. Ich. aff. Monogr. II p. 156.
 1840. *Ooctonus* Westwood. Introd. mod. Class. Insects II p. 293.
 1846. *Ooctonus* (Hal.) Walker. Ann. & Mag. Nat. Hist. XVIII p. 50.
 cf. List of Errata immediately after "Contents".
 1856. *Ooctonus* Förster. Hym. Stud. II p. 116, 120.
 1898. *Ooctonus* Dalla Torre. Cat. Hym. V.
 1904. *Ooctonus* Ashmead. Classif. p. 362.
 1923. *Ooctonus* Gahan & Fagan. Type Spec. p. 100.
 1930. *Ooctonus* Schmiedeknecht. Hym. Mitteleur. p. 449.

Original description:

Antennæ maris 13-articulatæ flagello filiformi, feminae 11-articulatæ capitulo exannulato. Tarsi pentameri.

A. Abdomine petiolato.

His statura *Polynemæ* fere, sed brevior abdomine magis rotundato, pedibus brevioribus, alis breviter ciliatis, ulna brevi lineari: quoad reliqua, caput thorax abdomen aëque satis conveniunt: antennæ feminae scapo elongato utrinque attenuato, pedicello lato compresso, articulis flagelli longitudine subæqualibus aut intermediis longioribus, exterioribus sensim incrassatis; undeci-

mus major ovatus s. oblongus; maris articulis flagelli linearibus subequalibus.

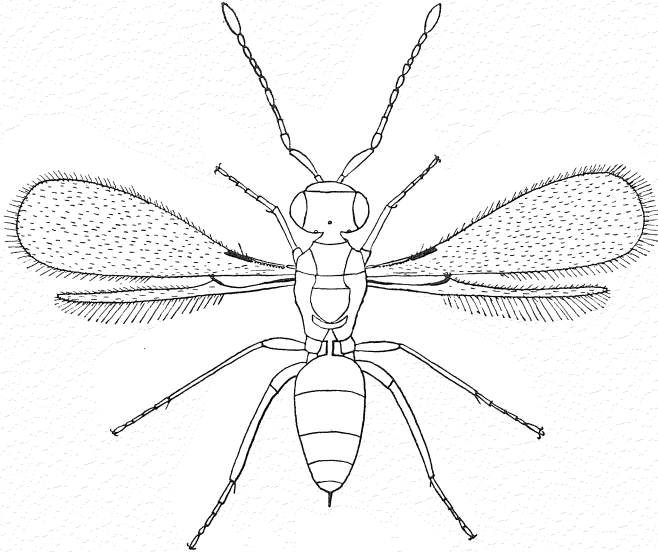


Fig. 31. *Ooctonus* Hal.

B. Abdomine subsessili.

Discrepant hi ab *Ooctonus* sectionis 1mæ. capite oblatiore, vertice fere lineari; collari brevior; abdomine haud petiolato, infra præsertim basi valde compresso: antennis maris brevioribus crassiusculis, feminae capitulo angustiore.

Tarsi 5-jointed. Abdomen petiolate. Antennae of male 13-jointed, of female 11-jointed. Head rectangular, broader than thorax, with a distinct ridge between the eyes. Eyes rather large, ocelli rather large, situated in a small obtuse-angled triangle near posterior margin of the head. Thorax oval, faintly reticulated, more than twice as long as the head. Petiole rather long. Ab-

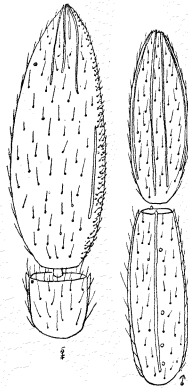


Fig. 32.
Ooctonus Hal.
Tip of female and male antenna.

domen egg-shaped as long as thorax. Ovipositor slightly protruding. Legs long and slender. Fore-wings long and ample, uniformly covered with short discal hairs, marginal cilia short. Venation short. Hind-wings knife-shaped, posterior marginal cilia rather long.

General colours: Head, thorax, and abdomen black. Antenna, petiole, and legs yellow, brown, or both.

The genus may be confused with *Lymænon*, from which it can be distinguished by its long petiole, and with *Polynema* from which it is distinguishable by its tarsi, which are 4-jointed in *Polynema*.

Haliday erected the genus *Ooctonus* in 1833 with 2 divisions, A: Abdomen petiolate, B: Abdomen sessile, saying that the last-mentioned one probably ought to form an independent genus. In 1846 he entirely dropped the name *Ooctonus*, dividing the genus into two new genera, viz. A = *Sphecomicrus*, B = *Lymænon*. However, the first name is only found in the list of Errata and Addenda, but as no one seems to have discovered this list, the name *Sphecomicrus* has never been transferred to the literature, fortunately enough, for (Hal.) Walker has no right to drop his own name. The genus with petiolate abdomen should still be named *Ooctonus*, while that with the sessile abdomen is *Lymænon* — and the name *Sphecomicrus* should be dropped. The 5 species belonging to the original genus *Ooctonus* is then to be divided into two groups:

A:	<i>insignis</i>	}	<i>Ooctonus</i> (<i>Sphecomicrus</i>)
	<i>vulgatus</i>		
	<i>hemipterus</i>		
B:	<i>littoralis</i>	}	<i>Lymænon</i> .
	<i>pictus</i>		

The species is frequently swept in low herbage in all sorts of localities in April—October (a single specimen in November).

Mr. Bakkendorf has reared *O. heterotomus* Förster from hemipterous(?) eggs in a stem of *Baldingera arundinacea*. Eggs collected on December 26, imagines reared in April.

In addition to Haliday's and Förster's species, Waterhouse's collection in Brit. Mus. includes six species named by Enoch or Waterhouse, but the descriptions have never been published.

Oophilus Enoch.

1909. *Oophilus Enoch*. Trans. Ent. Soc. London p. 458.

Original description:

The tarsi 4-jointed; the abdomen sub-sessile. The antennae of the male 13-jointed, those of the female 11 joints. The wings large and ample, 1.35 mm. long \times 0.5 mm. broad; the cilia very short, the longest 0.1 mm. The ovipositor very long, projecting 0.25 mm. beyond the tip of the abdomen.

Oophilus longicauda Enoch.

Original description:

The general colour black.

The head slightly narrower than the thorax; the antennae of the male 13-jointed, black and 1.65 mm. long. The scape very long and compressed, centre is black, the base and tip yellowish; the 4th to 11th joints of equal length and thickness, the 12th and 13th a little shorter; the pedicel yellowish in the female; the club longer than the scape; the joints 3 to 11 gradually increasing in length and breadth; the club 0.2 mm. long, the lower edge serrated. The thorax slightly broader than the head. The wings broad, 1.35 mm. long \times 0.5 broad, of a milky colour, the outer margin very slightly flattened. The cilia very short, the longest 0.1 mm., the inner margin straight, the surface covered with short hairs; the femora of the female compressed, with yellow tips and bases, black in the middle. Front tibiae shorter than tarsi. The abdomen long and tapering to tip; the ovipositor very long, powerful, projecting 0.25 mm. beyond the apex.

Length 1.6 mm.

Hab. Richmond Park, Surrey: July (Fred. Enoch and C. O. Waterhouse) 1908.

Denmark: Dyrehaven (1 specimen).

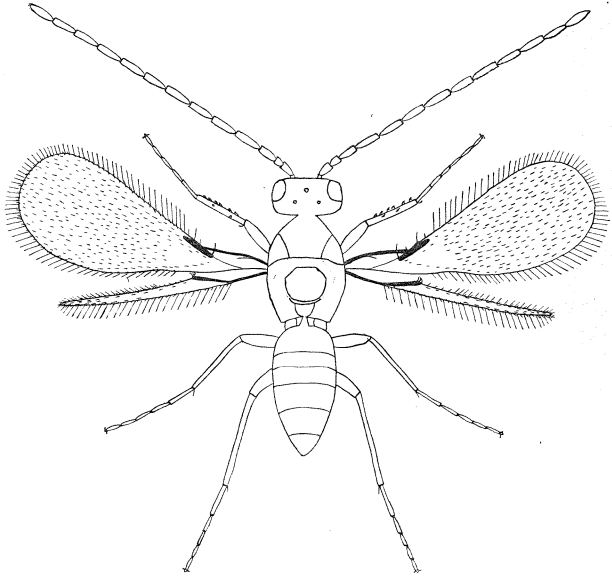


Fig. 33. *Oophilus* Enock.

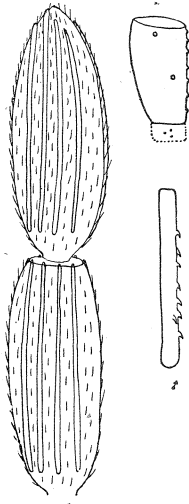


Fig. 34.
Oophilus Enock.
Tip of male antenna,
scape (above) and
fore-tibia (below).

There seems to be no reason whatever to maintain *Oophilus* as a genus different from *Lymænon*. Enock's description begins with a misprint: tarsi 4-jointed, should be 5-jointed. The photograph pl. XV fig. 1, the male, shows that both hind-legs have 5-jointed tarsi. And an examination of a specimen mounted by Enock himself shows that all the tarsi are 5-jointed. There seems to be a slight difference between the fore-wing of the two genera relative to the subcosta. But both genera have the same spinous fore-tibia, such as are not met with in any other genus among the Mymarids. Also the scape are very much alike in the two genera.

Enock says that *Oophilus* has a long ovipositor, but some species of *Lymænon* have the same, e. g. the species drawn in this paper, caught at the seashore. Future investigations and rearings must ascertain the difference between *Lymænon* and *Oophilus* if there is any. For the present both genera are figured here.

Panthus (Hal.) Walk.

1846. *Panthus* (Hal.) Walker. Ann. Mag. Nat. Hist. p. 50.

The genus *Panthus* was originally erected upon the species:

Panthus flavovarius,

Panthus crassicornis.

As (Hal.) Walker in the table of errata says that his new genus *Patasson* is to be established upon *Panthus crassicornis*, the genus *Panthus* only comprises one species, viz. *flavovarius*.

But Enock states that the single specimen of *Panthus* left in Haliday's collection at Dublin is a specimen of the genus *Limacis* Förster (= *Arescon* Hal.); thus also *P. flavovarius* disappears.

If we try to determine the genus *Panthus**) by means of the key in the present paper, we shall arrive at the result that the ♂ is *Erythmelus—Enaesi* while the female fits nowhere, no doubt because it was impossible for Haliday to find common criteria for the two heterogeneous species *flavovarius* and *crassicornis*.

The name *Panthus* must then be discarded for ever. (See also: J. P. Kryger. Synon. Remarks on some Generic Names of Mymaridae (Hym.) Ent. Medd. XVIII 1934 p. 505—506).

Parallelaptera Enock.

1909. *Parallelaptera* Enock. Trans. Ent. Soc. London p. 454.

1923. *Parallelaptera* Gahan & Fagan. Type Spec. p. 106.

*) Tarsi tetrameri: antennæ mari 13-, fem. 9-articulatæ: abdomen sub-sessile.

Original description:

Tarsi are 4-jointed. The abdomen sessile. The antennae of the male 11 joints, of the female 8 joints.

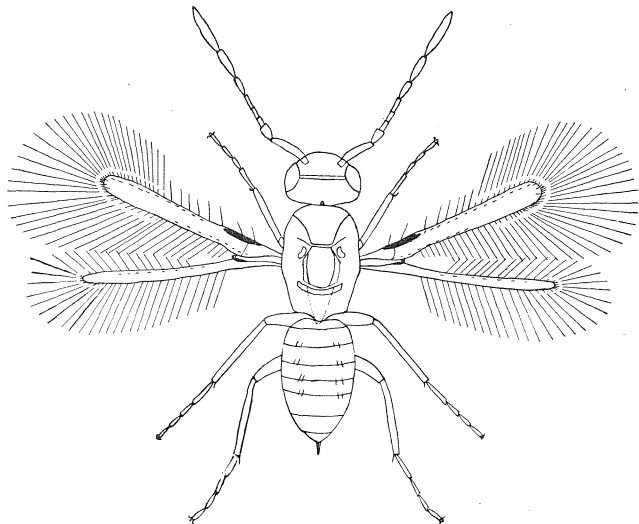


Fig. 35. *Paralleleptera* Enock.

The wings are without any surface hairs and almost parallel; the posterior wings are the same length as the anterior.

The ovipositor projecting beyond the apex of the abdomen.

Tarsi 4-jointed. Antennae of male 12-jointed, of female 8-jointed. Abdomen subpetiolate. (Enock says: antennae of male 11-jointed, but he has quite overlooked the very small 4th joint. He likewise says: abdomen sessile, but there is a very short petiole). Head subquadrangular; eyer large; ocelli forming an obtuse-angled triangle. Thorax

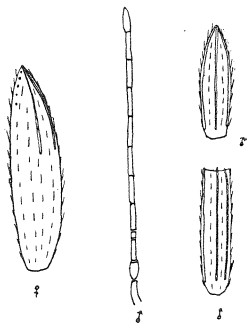


Fig. 36. *Paralleleptera* Enock.

Male clavus, antenna, funicle joint, and female clavus.

wider than head, about three times as long. Petiole very short. Abdomen as long as thorax; ovipositor slightly protruding. Fore-wings short, narrow, and almost parallel-sided; marginal vein short; marginal cilia long and stout, but not numerous; surface nearly without discal hairs. Hind-wings knife-shaped, with a few surface hairs; marginal cilia long and stout.

The genus may only be confused with *Cleruchus*, from which it can be distinguished by having one antennal joint less in both sexes.

Of this genus hitherto only one species is known:

Parallelaptera panis Enock.

1909. *Parallelaptera panis* Enock. Trans. Ent. Soc. London.
p. 454, tab. XIII fig. 1—5.

1923. *Parallelaptera panis* Gahan & Fagan. Type Spec. p. 106.

Original description:

Head dark brown; the thorax and abdomen lighter. The antennae of the male 11 joints, of the female 8 joints — testaceous. The scape somewhat slender; the pedicel the same width as the scape in the centre, the 3rd and 4th joints the same length, cylindric, the 5th joint much longer, the 6th longer than the 5th and the 7th equal to the 3rd, 4th and 5th combined. The club equal to the 6th and 7th combined and having two ridges running down half its length, and twice as broad as the funicular joints. The base and tip slightly pointed; the sides parallel; the eyes dark. The thorax longer than the abdomen. The wings quite clear of all surface hair, rounded on the outer margin, the anterior wing is 0.45 mm. long by 0.33 mm. broad, the sides almost parallel. The cilia long, the longest 0.2 mm. The tarsi much longer than tibiae. Length 0.6 mm.

Hab. Woking: September 1885 (Fred. Enock).

♀. Brown, middle-part of thorax and fore-part of abdomen, two first joints of antennae and legs lighter brown. Eyes brown, ocelli black. Thorax with numerous fine longitudinal striæ on the dorsal surface. Fore-wings slightly infumate, a little darker at base, one row of discal cilia along the anterior margin and a few at the posterior margin at jugum. Antennae: scape much longer

than pedicel, the 3 first funicle joints rather short, club as long as 6th and 7th together.

Length 0.7 mm.

♂. Colours as in the female. Striation and wings as in the female. Antennae: scape long and slender, longer than pedicel, 3rd joint longer than pedicel, 4th very small, the following joints slightly increasing in length, club shorter than the preceding joint.

Length 0.6 mm.

Date: June and September.

England, Denmark. Kryger has reared ♀+♂ from flood-refuse, seashore, Denmark, June. Swept at Woking (Enock), Combe Dingle (near Bristol) (Dr. Blood) and in different places in Denmark (Dyrehaven, Boserup near the sea).

Patasson (Hal.) Walk.

1846. Patasson (Hal.) Walk. Ann. Mag. Nat. Hist. p. 50, 52. Table of Errata and Addenda in the earlier part of the volume just after the list of contents.
 1909. Anaphoidea Girault. Journ. N. Y. Ent. Soc. vol. 17 p. 167.
 1915. Anaphoides Enock. Hastings and East Sussex Naturalist Vol. 2 p. 178.
 1923. Panthus Gahan & Fagan. Type Spec. p. 103.

Original description:

[Tarsi tetrameri. Abdomen subsessile.] Tarsi 4-meri. Antennæ ♀ 10-art. capitulo 2-art. — ♂ 13-art. flagello compresso. Alæ anticae vena clavata.

Patasson. 1. crassicornis. Niger antennarum basi pedum geniculis et tarsorum basi piceo-pallidis. Mas antennarum flagello piceo-pallido, compresso, striato.

In the table of Errata (Hal.) Walker says that after the generic description of *Anaphes* is to be introduced the generic description of *Patasson* (see above) and the new genus *Patasson* is to be established upon *Panthus crassicornis*.

In Class. 1904 p. 384 (Bibliography of the genera) Ashmead mentions *Panthus* in the following way:

Panthus Walker (= *Gonatocerus* Nees), Ann. & Mag. Nat. Hist. XVIII, 1846 p. 52.

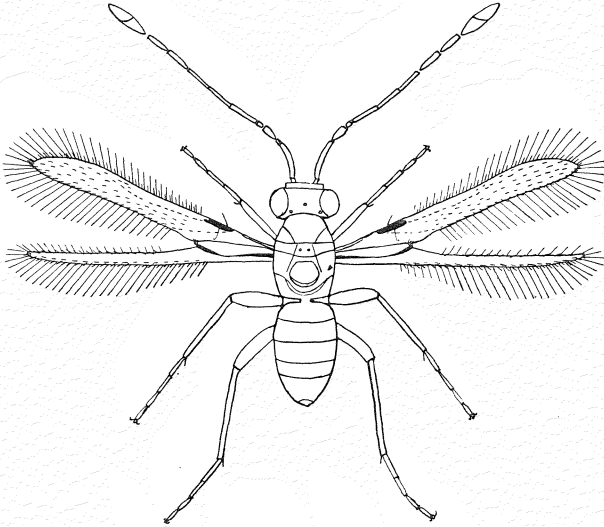


Fig. 37. *Patasson* (Hal.) Walker.

On the other hand he does not at all mention *Patasson*. Neither *Panthus* nor *Patasson* are mentioned in the key on pp. 362—364.

Förster (Hym. Stud. II p. 121) mentions *Panthus*, which he believes is the same genus as *Anagrus*. He says that Walker has sent him specimens of *crassicornis* ♂ and *flavovarius* ♂♀. The former, however, is only *Gonatocerus* and the latter *Anagrus*. Walker was a man with many irons in the fire, we must forgive him that he has forgotten his paper in Ann. & Mag. Nat. Hist. XVIII, and also that he was unable to determine the *Mymaridae*.

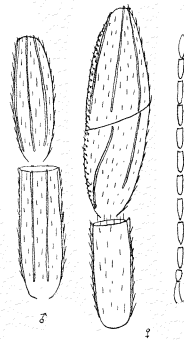


Fig. 38.
Patasson (Hal.)
Walker.
Tip of male and
female antenna,
and male an-
tenna.

I feel convinced that Enock's *Anaphoides* is the same as (Haliday) Walker's *Patasson*. I have seen a great many of his slides with mounted *Anaphoides*. He publishes indeed on p. 181 (Hastings and East Sussex Nat. Vol. 2. 1915) a list of the known genera of Mymarids — his own genera marked with an asterisk. In this list *Anaphoides* is indicated, but it cannot be seen that he has published the description anywhere. Maybe he has quoted the name from Girault (*Anaphoidea*).

Tarsi 4-jointed. Abdomen subpetiolate. Antennae in male 13-jointed, in female 10-jointed (club 2-jointed). Head wider than thorax, rectangular. Eyes large, ocelli placed in an obtuse-angled triangle. Thorax oval, more than twice as long as the head. Abdomen egg-shaped, a little longer than thorax. Ovipositor hidden. Legs short. Wings of almost equal length. Fore-wings rather narrow, marginal cilia rather short, discal ciliation evenly scattered over the surface of the wings from the stigma to the apex. Venation short. Hind-wings knife-shaped, nearly without discal cilia, marginal cilia on posterior border rather short, on anterior border very short. ♂: All antennal joints subequal in length, ♀: 1st funicle joint the shortest of all the antennal joints.

Colour: Brown to black.

Only distinguishable from *Anaphes* by the 2-jointed club in the females. There seems to be no difference between the males of the two genera.

The species are very common in all sorts of localities from early spring to late autumn. They seem to be parasitic in eggs of Chrysomelid beetles (*Chrysomela* sp., *Chrysomela staphylea* L.) and also in other beetle eggs. Mr. Bakkendorf has reared specimens from *Chrysomela* sp. eggs swept in grasses in wood, from *C. staphylea* eggs swept in immense numbers in meadows at the sea-

shore. He has also reared specimens from *Agabus* eggs in stems of *Juncus effusus*.

Bred June 4—7; February 5—26 (*Agabus* eggs taken on October 17th). American investigators state that the development takes about 10 days.

All over Europe.

Waterhouse's collection in Brit. Mus. includes c. 40 different species on slides mounted in Canada balsam. Descriptions of them have never been published.

Petiolaria Bl. & Kr.

1922. *Petiolaria* ♀. Blood & Kryger. Ent. Mo. Mag. 3 Ser. vol. VIII p. 229.

1936. *Petiolaria* ♂. Blood & Kryger. Journ. Soc. Brit. Entom. p.116.

Original description (combined):

Tarsi 5-jointed, abdomen petiolate, antennae of male 13-jointed (of female 10-jointed). Head quadrangular, excavated behind, broader than the thorax. Eyes small, no visible ocelli. Thorax ovate, a little more than twice as long as the head, the prothorax wider, and semicircular in outline. Front-wings battledore-shaped convex (seen from above), "stem" about a quarter of the total length of the wing. The surface of the wing with a few rows of strong hairs; the outer half of the wing with very long and power-

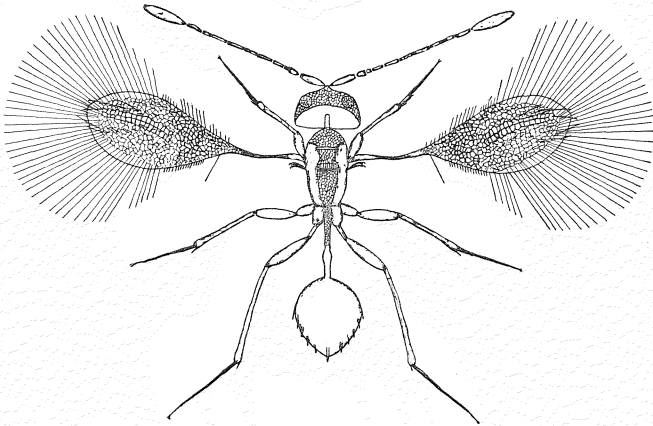


Fig. 39. *Petiolaria* Bl. & Kr.

ful marginal cilia. Hind-wings short and almost rudimentary, about half as long as the stem of the anterior wings. Petiole nearly as long as the thorax, consisting of two distinct joints. Abdomen a little longer than the thorax.

Petiolaria anomala Bl. & Kr.

♀. Head and thorax light brown, eyes black, abdomen darker brown, petiole and legs light yellow, at each tarsal articulation a narrow dark ring, last tarsal segment lighter than the preceding four. Antennae brown. Tegulae black.

Head, thorax, surface and underside of forewings and first segment of petiole reticulated; in the wings the reticulation reminds one of crocodile-skin and does not correspond with any lines of neuration.

Antennae long and slender, 10-segmented; scape, pedicellus, 7 funicle segments and an entire club. Scape long, pedicellus pear-shaped, a little more than one-third the length of scape, segments of funicle narrow, slender, increasing in length towards apex, but the seventh a trifle shorter than the sixth and slightly curved. Club long, oval, without any trace of articulation. The whole antenna very sparingly provided with hairs and sense organs.

Fore-wings as in the male. Slight traces of a short venation are to be seen near the wing-root. It is rather difficult to make a correct drawing of the forewing, because it is strongly curved and concave. Some parts of the reticulation seem to be more conspicuous than the rest. Hind-wings short and rudimentary, without venation and surface hairs; at apex with two hooks and the anterior margin with two rather long and strong bristles. Legs as in the male.

It is difficult to tell anything about the relative posi-



Fig. 40.
Petiolaria
Bl. & Kr.
Tip of female antenna,
and male antenna.

tion or size of the abdominal segments. The specimens mounted in balsam have all the segments of the abdomen drawn into the first one. Six segments may be seen. Ovipositor short and inconsiderable, slightly protruding.

♂. Head brown, the eyes black; antennae brown; thorax brown, with dark brown tegulae; abdomen brown; petiole and legs light yellow, at each tarsal articulation is a narrow darker ring, and the last tarsal joint is lighter in colour than the other four.

The head, thorax, and surface of the wings reticulated; in the wings the reticulations are large, like crocodile-skin, and do not follow any lines of neurulation. Antennae: scape long and slender; pedicel turbinate, one-third as long as the scape; third joint very small, shorter than the pedicel or any other joint; last joint of antenna pointed.

Wings: anterior border, from the end of the stem to the first long cilium, with very short cilia; posterior border, from the end of the stem to the first long cilium, with shorter cilia than those of the anterior border. On the posterior border, about half-way between the thorax and the first long cilium, springs a solitary long spine. The rest of the wing-border with cilia which are nearly all longer than the greatest width of the wing. The surface of the wing has four rows of discal hairs above and two rows underneath.

Legs: fore-legs shorter, middle and hind-legs longer and slender.

Fore and middle tarsi longer than their tibiae; hind tarsi shorter than their tibiae; the tarsi taper towards the apex.

Length 0.63 mm.

Date: August.

England, Denmark.

1 ♂ New Forest (England), 3 ♀♀ (Holmegaards Mose, Salpetermosen and Lyngby Mose) Denmark.

The genus cannot be confused with any other fly.

Petiolaria much resembles *Mymar* in its behaviour. Its gait is very stiff and the insect walks with the wings raised about 30 degrees over the body, the concave sides towards each other. *Mymar* also walks with its wings raised in a similar manner.

Polynema Hal.

1758. Ichneumon Linné. Syst. Nat. Ed. 10 I p. 568.
 1764. Ichneumon O. F. Müller. Fauna Insect. Fried. p. 71.
 1781. Ichneumon Fabricius. Spec. Insect. I p. 440.
 1833. Polynema Haliday. Ent. Mag. I p. 269, 347.
 1834. Eutriche Nees. Hym. Ich. aff. Monogr. II p. 196.
 1856. Cosmocomma Förster. Hym. Stud. II p. 117, 120.
 1898. Polynema Dalla Torre. Cat. Hym. V.
 1904. Polynema Ashmead. Classif. p. 364.
 1923. Polynema Gahan & Fagan. Type Spec. p. 118.
 1930. Polynema Schmiedeknecht. Hym. Mitteleur. p. 450.

Original description:

Alæ anticæ obovatæ, posticæ lineares. Tarsi tetrameri. Antennæ feminæ 9-articulatæ capitulo exannulato. Abdomen petiolatum.

Antennæ maris 13-articulatæ, feminæ 9-articulatæ capitulo exannulato, utriusque scapo dilatato sinuato parum elongato. Tarsi tetrameri. Abdomen petiolatum. Caput crassiusculum subrotundatum, vertex late planiusculus: frons subtruncata: antennarum scapus capite vix longior dilatatus sinuatus, pedicellus latus compressus, flagellum maris lineare articulis exterioribus longitudine decrescentibus; feminæ articulo 3tio brevioribus quam 4to exterioribus sensim brevioribus et crassioribus, ultimo magno ovato: thorax ovatus convexus lævis collari conspicuo, scutello ovato, metathorace rotundato: abdomen petiolatum semicordatum aut fere lanceolatum ascendens, feminæ apice deplanatum aculeo brevi vel elongato: petiolus ut etiam sequentibus filiformis descendens: pedes longi graciles: alæ anticæ anguste obovatæ ciliatæ, nervo subcostali brevissimo clavato (sc. ulna fere in punctum contracta); posticæ lineares longius ciliatæ.

Tarsi 4-jointed. Antennæ of male 13-jointed, of female 9-jointed. Abdomen petiolate. Head rectangular, broader than the thorax. Eyes rather large, ocelli forming a right-angled triangle. Thorax long and oval, about

three times as long as the head. Abdomen oval, a trifle shorter than thorax. Petiole long. Ovipositor more or

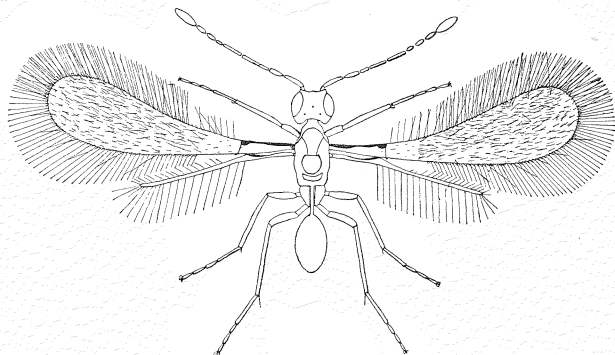


Fig. 41. *Polynema* Hal.

less protruding. Legs long and slender. Fore-wings large and ample with a fringe of long and stout cilia, discal ciliation more or less long and stout. Venation short ending in a semicircular, black spot. Hind-wings rather, narrow, knife-shaped, posterior margin with long cilia. General colour: Shining black, antennae, petiole, and legs yellow, brown, or yellow with brown parts.

The genus cannot be confused with any other Mymarid.

Haliday published his name *Polynema* in 1833, Nees his name *Eutriche* in 1834. It must then be taken for granted that *Eutriche* should be dropped. Truly Förster says in 1856 that the name *Polynemus*

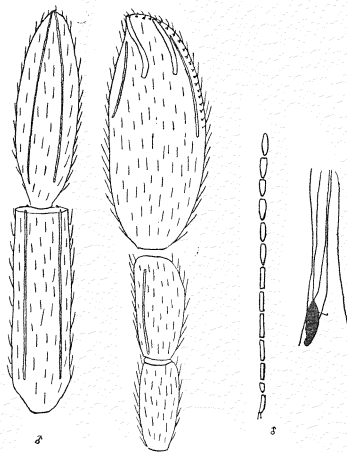


Fig. 42. *Polynema* Hal.

Tip of male and female antenna, male antenna, and female wing venation.

has been given to a genus among the fishes and therefore he alters *Polynema* Hal. to *Cosmocoma* Förster. But Förster has no reason to make any alteration, so the genus should be called *Polynema* Hal.

The species are easily swept in all sorts of localities from spring to autumn. Mr. Bakkendorf has reared six different species from heteropterous eggs in stems of *Juncus*, and in twigs of *Salix pentandra*, *Populus tremula* and *Salix cinerea*.

Haliday (1834) enumerates 6 species, Förster (1847) 12 species. Waterhouse's collection in Brit. Mus. contains c. 30 species named by Enock or Waterhouse, but no descriptions have been published. In a later paper I will try to find out how many species live here in Europe. That we should have 50 species, is no doubt out of the question.

The species drawn for this paper is *Polynema fumipennis* (Hal.) Walk. 1846 p. 52 (= *hirtipennis* Enock).

Stephanodes Enock.

1909. *Stephanodes* Enock. Trans. Ent. Soc. London p. 457.

Original description:

The tarsi 4-jointed; the abdomen petiolate. The antennae of the male 13-jointed, of the female 9-jointed; the scape in both sexes asperate. The wings 1.3 mm. long and 0.31 wide; cilia short, the longest 0.11 mm. Inner margins of eyes bounded by carinae which run three-quarters round the eyes, and smoothing down level at the lower margin. The ovipositor level with the tip of the abdomen.

Stephanodes elegans Enock.

Original description:

General colour, intense black.

The tarsi 4-jointed. The abdomen petiolate. The head, thorax and abdomen smooth and shining; intense black. The head almost square with well-rounded corners, slightly depressed between the antennae; the margins of the eyes, except on the outside, surrounded by a small carina, running out level above and below the eyes, which are rounded the same curve as the

cheeks. The antennae of the male 13 joints. Scape asperate in both sexes. The pedicel half the length of the scape; light testaceous; the 3rd joint about the same colour as scape — brown; the 4th to 13th very dark brown and joints of equal length. The scape and pedicel of the female similar to the male; the 3rd joint a little longer than the 2nd, the 4th darker and longer; the 5th and 6th shorter and darker, the 7th and 8th short, dark

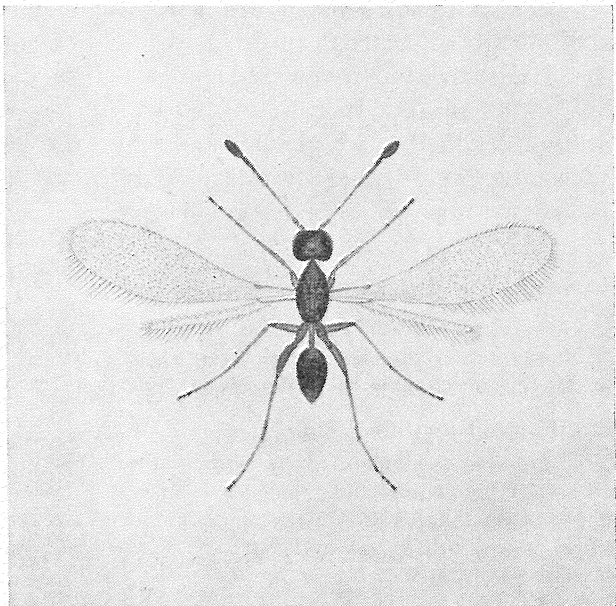


Fig. 43. *Stephanodes* Enock.

and thicker, the club darker, and twice as broad as the 8th and longer than the 7th and 8th combined. The thorax oval; the petiole testaceous. The wings 1.3 mm. long by 0.31 mm. broad. The cilia very short; the longest cilia 0.11 mm. The outer margin almost semicircular. The surface evenly covered with short hairs. The front tarsi longer than tibiae; the 4th joint brown; the 1st joint equal to 2nd, 3rd and 4th combined, the middle and hind tibiae a little longer than the tarsi. The ovipositor just level with the tip of the abdomen.

Length 1.15 mm.

Hab. Woking: July 1885 (Fred. Enock); Somerset (Dr. Gooch); Burnham Beaches: 1907 (C. O. Waterhouse).

This species at first sight resembles a *Cosmocoma*, but the totally different "gait" from the insect of that genus gave us the first impression that it was something new, which the peculiar asperate scape and carina confirmed. This beautiful species is one of the most elegant and fairylike in its movements.

There seems to be no reason at all for maintaining *Stephanodes* as a genus different from *Polynema*. The photographs in Enock's paper are very bad and shows nothing, but the photograph in this paper, after a picture of Blood, drawn after a specimen mounted by Enock himself shows plainly that the veins of the fore-wings are quite alike in the two genera, and since the genera also resemble each other in all essentials the "gait" mentioned by Enock is of no generic value.

Stethynium Enock.

1909. *Stethynium* Enock. Trans. Ent. Soc. London. p. 452.

1923. *Stethynium* Gahan & Fagan. Type Spec. p. 137.

1933. *Stethynium* Bakkendorf. Ent. Medd. XIX p. 42.

Original description:

Tarsi 4-jointed; abdomen sessile. Antennae of male 13 joints, the female 11 joints, including the club, composed of three joints. Scape twice as long as broad, having a number of circular concavities. Wings broad and symmetrically curved on costa and inner margin. Cilia very long.

***Stethynium triclavatum* Enock.**

Original description:

General colour, light testaceous. Antennae of the male, 13-jointed. The scape much swollen on the outer side, twice as long as broad, with a number of circular concavities. The pedicel cupshaped, as broad as long. The 3rd as long as the 2nd. The 4th to the 13th of about equal length. The 12th and 13th joints forming a narrow club. The whole of the antennae testaceous. Antennae of the female 11 joints in all, including the club of 3 joints. The scape testaceous, becoming darker. The outer side much swollen, the surface pitted with a number of circular concavities. The pedicel equal in length and breadth, the 3rd and 5th joints the same length and cylindrical, the 4th slightly

longer, the 6th, 7th and 8th a little shorter and broader. The club equal in length to the 2nd, 3rd and 4th combined, is composed of 3 joints, the second articulation commencing at right angles from the upper side to the centre, then turning off in

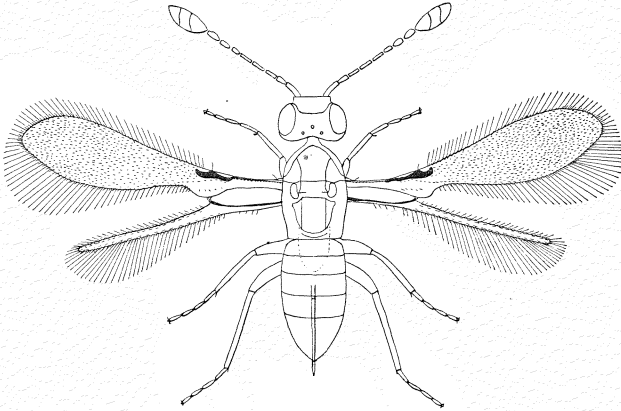


Fig. 44. *Stethynium* Enock.

a curve towards the tip, emerging at the lower side about three-quarters the length of the club. The 2nd articulation emerging just before the tip, giving the three joints somewhat of a flabellate appearance.

The head is broader than the thorax, which is longer than the abdomen.

The wings of the male are 0.8 mm. long by 0.23 mm. broad. The longest cilia 0.23 mm. Those of the female are 0.7 mm. long by 0.2 mm. broad. The curves of both male and female wings are symmetrical, uniting in an obtuse angle.

The ovipositor projecting just beyond the tip of the abdomen.

Length 0.7 mm.

Hab. Woking: September 1885 (Fred. Enock); Somerset (Dr. Gooch).

Mr. Enock adds the following footnote (p. 453):

Mr. Waterhouse has furnished me with the following note on the colour of a fresh male

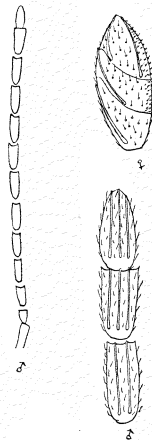


Fig. 45.
Stethynium
Enock.
Male antenna,
tip of same,
and female
clavus.

specimen of this genus, apparently referable to the same species, taken by him in Richmond Park on Oct. 23rd on *Juncus glaucus* —

Head pale dirty yellow, the ridge between the eyes nearly black; the three large ocelli are also nearly black. Thorax light smoky brown, with a pale dirty yellow dorsal line. The metanotum has the appearance of being slightly excavated, with a pale yellow membrane across it. Abdomen rather darker brown than the thorax. Legs pale yellow, the apical joint of the tarsi pale fuscous. Antennae pale dirty yellow, the basal joint clear yellow. Length 0.75 mm.

This genus may only be confused with *Anagrus*, from which it can be distinguished by its stouter, less arched and wider wings and the 3-jointed club in the female.

♂ + ♀ reared from twigs of *Salix pentandra* taken in Ryget Forest on January 2nd, 1927. Host eggs not found, but the host is possibly a Jassid. ♂ reared $11/4$, ♀ $16/4$ (Bakkendorf).

Swept in a dried up pond surrounded by willows (Nailsea ponds near Bristol) ♂♂ + ♀♀ Blood, Kryger 15. 8. 1923.

Stichothrix Förster.

1856. *Stichothrix* Förster. Hym. Stud. II. 1856 p. 117 & 121.
 1898. *Doriclytus* Dalla Torre. Cat. Hym. V p. 428.
 1904. *Stichothrix* Ashmead. Classif. p. 364.
 1923. *Stichothrix* Gahan & Fagan. Type Spec. p. 137.
 1930. *Stichothrix* Schmiedeknecht. Hym. Mitteleur. p. 450.

In the key Förster writes (p. 117):

Die Tarsen viergliedrig

Fühlerknopf nicht geringelt

Der ramus marginalis verlängert

Der Methathorax mit zwei Kielen;

Fühler beim ♀ neungliedrig (♂ unbekannt)..... Caraphractus Walk.

Der Metathorax ungekielt; Fühler beim ♂ zehn-, beim ♀ neungliedrig. *Stichothrix* m.

(von *Stichos*, die Reihe und *thrix*, das Haar.)

On p. 121 he writes:

Die von Haliday auf hohem Grasse an Abzugskanälen entdeckte Gattung *Caraphractus* ist die einzige in dieser Familie,

welche ich in der Gegend von Aachen noch nicht auffinden konnte, aber sehr nahe verwandt damit wird wohl meine neue Gattung *Stichothrix* sein, welche in der Zahl der Fühlerglieder beim ♀ übereinstimmt, aber der Metathorax entbehrt der beiden Kiele, welche Walker bei der Gattung *Caraphractus* anführt. Das ♂ dieser letzteren Gattung ist nicht bekannt, dagegen habe ich von der Gattung *Stichothrix* beide Geschlechter aus Distelköpfen erzogen, worin die Larven von *Trypeta Cardui* lebten. Das ♂ hat zehngliedrige Fühler. Nach ihrem Wohnort nenne ich die einzige mir bekannte Art *Stichothrix Cardui*.

Thus Förster only says about this genus that it has 4-jointed tarsi and that the male has 10-jointed and the female 9-jointed antennae. No one has seen the genus since Förster's time and it is impossible to tell anything about the appearance of it, and as he has not given any picture of the animal, nobody can tell what *Stichothrix* is. But as Förster is a reliable man, his genus cannot really be any of the genera dealt with in this paper.

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Postscript:

It is very difficult to decide whether *Limacis* ♀ and *Neurotes* ♀ have a 2-jointed club. In the present paper it is represented as 2-jointed in both species, but it is quite possible that if sufficient material can be procured for examination, it will prove to be varying, either 1- or 2-jointed.

As to the petiole of *Camptoptera* I believe it to be 2-jointed, but it is not distinctly visible in the few specimens (2) I possess.