

NOTES
ON
CHALCIDIÆ.

PART II.—EURYTOMIDÆ AND TORYMIDÆ.

BY
FRANCIS WALKER, F.L.S.

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PART II.

Fig. 1.

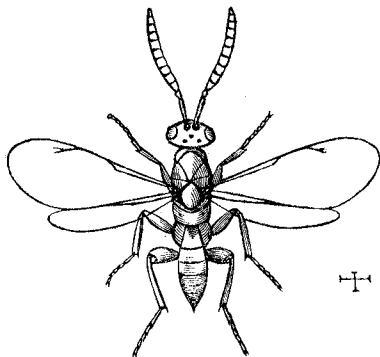
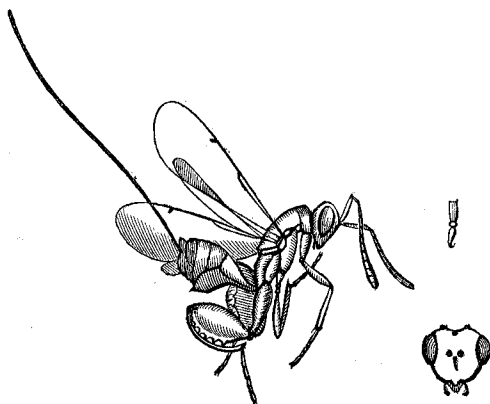


Fig. 2.



The two figures here inserted represent (1) *Torymus caliginosus* and (2) *Podagrion splendidum*.

EURYTOMIDÆ.

IN this concluding part of the sketch of the Eurytomidæ the following extract is another instance in which the genus *Eurytoma* is herbivorous, and not parasitic, on other insects.

In the 'Entomologist,' No. 88, p. 264 (March, 1871), Mr. Ritsema states that the galls found by Mr. Traill, near Aberdeen, on *Ammophila arundinacea* (*Psamma arenaria*, L.), were made by *Eurytoma longipennis*, and that they also occur near Landvoort in Noord-Holland, and that the economy of the fly is detailed in the 'Archives Néerlandaises des Sciences exactes,' vol. v. 1870; and is also noticed in the 'Nederlandsch Tydschrift voor Entomologie,' 2nd Ser. vol. vi. 1871.

The *Eurytomæ* and the *Decatomæ* are generally supposed to be parasitic; but it has not yet been ascertained whether their larvæ feed on the inhabitants of the galls or on the substance of the galls. Ratzeburg has published in his work, 'Die Ichneumonon,' a very large list of the insects which are the victims of the Hymenopterous parasites, and it will be seen that in many cases one kind is the prey of several parasites, and that one parasite (among others *Eurytoma*, as is also observed by Dr. Giraud) preys on several kinds. Others seem to be exclusively attached to one victim for the maintenance of their young by means of the insertion of their eggs, and to resort instinctively for that purpose to the same kind of object whence they emerged, and to succeed in finding it. It is not yet known whether a parasite, of which several species are victims, has a propensity to resort for oviposition to the same kind of habitation in which it passed its earlier life, or whether it takes the victim that is most convenient to it at once, or when it has failed to find the species whence it emerged; or, are there hereditary peculiarities in the families of the same species, and does one family live exclusively, generation after generation, in the larvæ of beetles, another in the larvæ of moths, another in *Cynips* larvæ, and another in Dipterous larvæ?

The species recorded as *E. Abrotani* in the Brit. Mus. List of Chalcidiæ, p. 8, may be identical with *E. tibialis*, *Zett. Boh. Kongl. Vet. Ak. Handb.* (1835), 232, and with *E. rubicola*, *Giraud*.

The species of *Eurytoma* described by Boheman have been all recorded in the above-mentioned list, with the following exceptions, of which the second and, perhaps, the third are species of *Isosoma*, — *E. maura*, *E. pilicornis*, *E. brevicornis*, *E. pubicornis*, *E. obscura*.

Isosoma flavimana is mentioned inadvertently as a *Eurytoma* in this list.

Zetterstedt, in his 'Insecta Lapponica,' describes *Eurytoma guttula* and *E. minuta*: the first may be identical with *Isosoma verticillata*; and the second with *I. minor*.

Eurytoma atra, *Nees*, is probably not one of the *Eurytomidæ*.

Among the species described by Foerster *Eurytoma gracilis*, *E. scabra*, *E. pumila*, *E. petiolata* and *E. punctulata* are *Eurytomæ*. *E. flavipes* and *E. humeralis* belong to *Isosoma*.

The two following species are described by Ratzeburg, in addition to those before mentioned :—*E. microneura*, *E. brunneiventris*.

Some of the European species of *Eurytoma* may be arranged in the following groups :—

Male. Antennæ setaceous, nodose, verticillate-pilose, as long as the thorax.

Group 1.—*plumata*, *Serratulæ*, *curta*, *Abrotani*, *apicalis*, *collaris*, *annulipes*, *atra*, *nodularis*.

Antennæ longer and more slender than those of the first group. *longipennis*.

Antennæ shorter and more compact than those of the first group. *platyptera*.

Antennæ less dilated than those of the three preceding groups, more compact than those of the first group. *tumida*, *rufipes*, *Scultenna*, *brevicollis*.

Antennæ of the *female* :—

Group 1.—*plumata*, *Serratulæ*, *curta*, *annulipes*, *rufipes*, *æthiops*, *nodularis*.

Group 2.—*tumida*, *Abrotani*.

Group 3.—*collaris*.

Group 4.—*atra*.

Group 5.—*platyptera*.

Variations of the wing-veins :—

Group 1.—*Ulna* about one-fifth of the length of the humerus ; radius longer than the ulna. *plumata*, *Serratulæ*, *rufipes*.

Group 2.—*Ulna* about one-fourth of the length of the humerus ; radius a little shorter than the ulna. *Argele*, *fumipennis*, *tumida*, *platyptera*, *gracilis*, *brevicollis*.

Group 3.—*Ulna* nearly one-third of the length of the humerus ; radius as long as the ulna. *longipennis*.

Group 4.—*Ulna* about one-third of the length of the humerus ; radius as long as the ulna. *atra*.

Group 5.—*Ulna* about one-third of the length of the humerus ; radius a little shorter than the ulna. *curta*, *Abrotani*, *apicalis*, *collaris*, *Scultenna*, *annulipes*, *Micipsa*, *æthiops*.

With regard to the North-American *Eurytomæ*, *E. Hecale*, *Abatos*, *Cretheis*, *Iphis*, *Pythes* and *Teredon* agree with *E. longipennis* in the form of the prothorax. Tho form of the metathorax in all these species, except the first, is like that of the preceding first group of the European species ; in *E. Hecale* its longitudinal sutures

are all distinct, and each of them is alternate with a row of punctures. The petiole is longer than the metathorax in *E. Cretheis* and *Teredon*; but in *E. Hecale*, *Abatos*, *Iphis* and *Pythes* the metathorax is longer than the petiole.

The six preceding species were found in Florida, and appear to differ from the seven following species described by Dr. Walsh:—

1. *E. bicolor*. Reared from a fungoid swelling on the oak.
2. *E. prunicola*. Reared from a gall on *Quercus Prunus*. *Var. globulicola*. Reared from a gall on *Q. globulus*.
3. *E. auriceps*. Reared from oak-galls and from rose-galls. *Var. seminatrix*. Reared from oak-galls.
4. *E. punctiventris*. Reared from oak-galls.
5. *E. abnormicornis*.
6. *E. Diastrophii*. Reared from the above-mentioned fungus and from bramble-galls. *E. Bolteri*, *Riley*, reared from the gall of *Gelechia gallæsolidaginis*, is said, by Dr. Walsh, to be a variety of *E. Diastrophii*, but it may be another species.

7. *E. studiosa*, *Say*. This species is not exclusive in its selection of a habitation for its offspring, but proceeds indiscriminately to a *Cynips* gall, to a *Tenthredo* gall, to a *Cecidomyia* gall, to an *Aphis* gall, to a *Coccus* gall, or to a fungus with the likeness of a gall; or it may consist of families or castes, each of which keeps aloof from the rest, and has been brought up from time immemorial in one kind of gall.

Dr. Walsh was not able to identify *E. orbiculata*, *Say*.

Five Ceylonese species of *Eurytoma* have been described:—1. *E. contraria*, *Wlk.* (*albitarsis*, *Motsch.*). 2. *E. indefensa*, *Wlk.* 3. *E. maculipes*, *Motsch.* 4. *E. gracilis*, *Motsch.* 5. *E. angustula*, *Motsch.*

E. Capensis inhabits South Africa.

The British species of *Decatoma* may be placed in the three following groups according to the variations of length in the ulna:—

Group 1.—Ulna at least one-fifth of the length of the humerus. *Nicæa*, *aspilus*.

Group 2.—Ulna about one-sixth of the length of the humerus. *biguttata*, *obscura*, *immaculata*, *plana*, *flavicollis*, *variegata*, *minuta*, *unicolor*.

Group 3.—Ulna not more than one-tenth of the length of the humerus. *flavicornis*, *tenuicornis*, *mesomelas*.

D. flavovaria, *Ratz.*, may be the same as *D. concinna*; and *D. flavoscapularis*, *Ratz.*, may be identical with *D. biguttata*.

Dr. Walsh describes the five following American species of Decatoma, four of which inhabit oak-galls and one willow-galls also:—*varians*, *nigriceps*, *nubilistigma*, *hyalipennis*, *simplicistigma*. They have the same variation in the "colorational pattern" that is exhibited by the British species. *D. pigra*, *Motsch.*, a Ceylonese species, is probably not a Decatoma.

It seems that there is no definite line between *Eurytoma* and *Isosoma*, but it is advisable to retain the latter genus, *I. verticillata* being its type, and *E. plumata* the type of *Eurytoma*. The genus *Tetramesa* may be united to *Eurytoma*.

In passing away from the Eurytomidæ, I wish to recommend them to the attention of the public. They are especially interesting, as being partly exceptions to the rule that all the Chalcididæ are beneficial insects; and much investigation is required to ascertain whether some of them are wholly herbivorous and the rest wholly carnivorous, or whether the species have a capacity for either means of sustenance. There is a gradual transition from them to the Torymidæ, by means of the genera Decatoma and Megastigmus.

Genus EURYTOMA.

E. EXEMPTA. Mas.—*Nigra*, *gracilis*, *E. gracili longior*, *subtilissime punctata*; antennæ *graciles*, *verticillato-pilosæ*, *thorace paullo longiores*, *articulis petiolatis subdilatis*; *petiolus longus*; *abdomen brevi-lanceolatum*, *valde convexum*, *vix compressum*, *thoracis dimidio vix longius*; *pedes nigri*, *genubus tarsisque fulvis*; *alæ diaphanæ*, *fulvo venosæ*.

Male.—Black, slender. Head and thorax finely punctured. Antennæ slender, verticillate-pilose a little longer than the thorax; joints slightly dilated on one side, with rather long petioles. Petiole long. Abdomen very convex, short-lanceolate, hardly more than half the length of the thorax, hardly compressed. Knees and tarsi tawny. Wings pellucid; veins dull tawny; ulna a little more than half the length of the humerus; radius very short; cubitus a little more than half the length of the ulna. Length of the body $1\frac{1}{2}$ line.

The body is longer than that of *E. gracilis*, which it most resembles.

England.

E. INTERMISSA. Fæm.—*Nigra*, *gracillima*, *subtiliter punctata*; antennæ *graciles*, *subclavatæ*, *thorace multo breviores*; *petiolus brevis*; *abdomen lanceolatum*, *glabrum*, *nitens*, *thorace paullo longius*; *pedes nigri*, *genubus tarsisque albidis*; *alæ diaphanæ*, *albido*

venosæ. *E. gracili* affinis; differt antennis gracilioribus, petiolo longiore, alarum venis pallidioribus.

Female.—Black, very slender. Head and thorax finely punctured. Head a little broader than the thorax. Antennæ slender, subclavate, much shorter than the thorax. Petiole short, distinct. Abdomen lanceolate, smooth, shining, a little longer than the thorax. Legs black; knees and tarsi whitish. Wings pellucid; veins dingy whitish; ulna about one-third of the length of the humerus; radius much shorter than the ulna; cubitus a little shorter than the radius. Length of the body $1\frac{1}{2}$ line.

Most allied to *E. gracilis*, from which the more slender antennæ, the longer petiole and the paler wing-veins distinguish it.
England.

Genus ISOSOMA.

I. JUNCEA. *Mas.*—Nigra, nitens, gracillima; antennæ graciles, filiformes, verticillato-pilosæ, thoraci æquilongæ, articulo 1o subincrassato; petiolus brevissimus; abdomen convexum, longi-fusiforme, thorace angustius et multo brevius; pedes graciles, tarsi quatuor posterioribus genibusque albido-testaceis, illis apice tarsisque anticis pallide fusciscentibus; alæ angustæ, diaphanæ, testaceo pallido venosæ.

Male.—Black, very slender. Head and thorax shining, extremely finely punctured. Head broader than the thorax. Antennæ slender, filiform, verticillate-pilose, as long as the thorax; scape slightly incrassated; intermediate joints linear. Petiole very short. Abdomen convex, smooth, elongate-fusiform, narrower and much shorter than the thorax. Legs slender; knees, four posterior tarsi and tips of tibiæ whitish testaceous; fore tarsi and tips of four posterior tarsi pale brownish. Wings narrow, pellucid; veins pale testaceous; ulna about one-third of the length of the humerus; radius about one-third of the length of the ulna, a little longer than the cubitus. Length of the body 1 line.

More slender than *I. minor* and than *I. linearis*. Antennæ stouter than those of *I. brevis*.

I have not been able to see any humeral spots on the prothorax of the single specimen of this species.
England.

I. ROBUSTA. *Mas.*—Nigra; antennæ sat validæ, verticillato-pilosæ, thoraci æquilongæ; prothoracis maculæ laterales picæ, parvæ; petiolus brevissimus; abdomen ellipticum, convexum, thorace multo

brevius; pedes sat validi, genubus tarsisque fulvis; alæ anticæ vix fuscæ, fusco venosæ.

Male.—Black. Head and thorax very finely punctured. Head a little broader than the thorax. Antennæ rather stout, verticillate-pilose, as long as the thorax; joints linear. Humeral spots piceous, small. Petiole very short. Abdomen elliptical, convex, smooth, very much shorter than the thorax. Legs rather stout; knees and tarsi tawny. Fore wings hardly brownish; veins brown; ulna about half the length of the humerus; cubitus about one-fourth of the length of the ulna, longer than the radius. Length of the body 1 line.

The stouter antennæ, and the shorter and broader abdomen distinguish this species from *I. brevis*.

England.

I. LATIVENTRIS. *Fœm.*—Nigra, gracilis, subtilissime punctata; antennæ subclavatæ, thorace multo breviores; prothoracis maculæ laterales albidæ, maximæ; petiolus brevissimus; abdomen ellipticum, glabrum, nitens, subdepressum, thorace paullo latius multo brevius; pedes nigri, tibiis piceis, femoribus tibiisque apice tibiis basi tarsisque testaceis; alæ anticæ pallidissime fuscæ, testaceo venosæ, basi diaphanæ.

Female.—Black, slender. Head and thorax very finely punctured. Head a little broader than the thorax. Antennæ subclavate, much shorter than the thorax; second joint livid at the tip. Humeral spots dingy whitish, transverse, each occupying about one-third of the breadth of the prothorax. Petiole very short. Abdomen elliptical, smooth, shining, rather flat, a little broader and much shorter than the thorax; first segment occupying most of the dorsum. Oviduct testaceous. Legs black; tibiæ piceous; tips of femora and of tibiæ, tibiæ at the basi and tarsi testaceous. Fore wings very pale brownish, pellucid towards the base; veins testaceous; ulna about one-fourth of the length of the humerus; radius and cubitus much shorter than the ulna. Length of the body $1\frac{1}{4}$ line.

Madeira.

I. ÆQUALIS. *Fœm.*—Nigra, subtilissime punctata; antennæ graciles, subclavatæ, thorace valde breviores, clava fusiformi; prothoracis maculæ laterales testacæ, parvæ; petiolus brevissimus; abdomen fusiforme, convexum, glabrum, nitens, thorace multo brevius; pedes nigri, femoribus tibiisque apice tibiis basi tarsisque testaceis; alæ anticæ pallidissime fuscæ, testaceo venosæ, basi diaphanæ. *I. lineari* affinis; differt abdomine breviori minus acuminato.

Female.—Black. Head and thorax very finely punctured. Head

a little broader than the thorax. Antennæ slender, subclavate, very much shorter than the thorax; club fusiform, thrice the length of the preceding joint. Humeral spots testaceous, small. Petiole extremely short. Abdomen fusiform, convex, smooth, shining, much shorter than the thorax. Legs black; tips of femora and of tibiæ, tibiæ at the base and tarsi testaceous. Fore wings very pale brownish, pellucid towards the base; veins testaceous; ulna about one-fourth of the length of the humerus; radius and cubitus much shorter than the ulna. Length of the body $1\frac{1}{2}$ line.

The abdomen is shorter and less acuminate hindward than that of *I. linearis*. The longer and broader fore wings distinguish it from *I. angustata*.

Madeira.

I. ANTICA. *Fœm.*—Nigra, subtilissime punctata; antennæ subclavatæ, thorace multo breviores, clava lineari apice conica; prothoracis maculæ laterales testacæ, minimæ; petiolus brevissimus; abdomen fusiforme, glabrum, nitens, supra planum, thorace paullo brevius; pedes nigri, tibiis quatuor posterioribus piceis, femoribus tibiisque apice tibiis anticis tarsisque flavescens, tarsis apice piceis, alis anticis disco subtestaceo venis flavescens. *I. linearis* affinis; differt antennis longioribus crassioribus, thorace brevior, abdomine longiore.

Female.—Black. Head and thorax very finely punctured. Head a little broader than the thorax. Antennæ subclavate, very much shorter than the thorax; club linear, conical towards the tip, about thrice the length of the preceding joint. Humeral spots testaceous, very small. Petiole extremely short. Abdomen fusiform, smooth, shining, flat above, a little shorter than the thorax. Legs black; four posterior tibiæ piceous; tips of femora and of tibiæ, tarsi and fore tibiæ yellowish; tarsi with piceous tips. Fore wings with a slight testaceous tinge in the disk adjoining the ulna; veins yellowish; ulna about one-fourth of the length of the humerus; radius and cubitus much shorter than the ulna. Length of the body $1\frac{1}{2}$ line.

It much resembles *I. linearis*; the antennæ are longer and stouter; thorax is shorter and the abdomen is longer.

Madeira.

I. SUBFUMATA. *Mas.*—Nigra, gracillima, subtilissime punctata; antennæ verticillato-pilosæ, thorace longiores, articulis linearibus non petiolatis; thorax postice attenuatus; prothoracis maculæ laterales flavæ, sat magnæ; petiolus brevissimus; abdomen sublineare, glabrum, nitens, fere planum, thoracis dimidio paullo longius; pedes nigri, graciles, tibiis basi apiceque femoribus anticis apice

tarsisque pallide flavis; alæ anticæ vix fuscæcentes, venis pallide fuscæcentibus.

Male.—Black, very slender. Head and thorax very finely punctured, somewhat shining. Head rather broader than the thorax. Antennæ verticillate-pilose, longer than the thorax; intermediate joints long, nearly linear, not petiolated. Thorax long, attenuated hindward. Humeral spots pale yellow, transverse, each occupying a little more than one-fourth of the breadth of the prothorax. Petiole extremely short. Abdomen smooth, shining, nearly linear, rather flat above, a little more than half the length of the thorax. Legs black, long, slender, tibiæ at the base and at the tips, fore femora at the tips and tarsi pale yellow. Fore wings very slightly clouded with pale brownish; veins pale brownish; ulna about one-fourth of the length of the humerus; radius and cubitus much shorter than the ulna. Length of the body $1\frac{1}{2}$ — $1\frac{1}{4}$ line.

It much resembles *I. Nepe*; the antennæ are a little longer, the hind part of the thorax is more elongated and the wing-veins are paler. The darker fore wings, and more especially the darker wing-veins, distinguish it from *I. minor* and from *I. brevis*. It is more slender than *I. cornuta*, and has shorter antennæ than *I. longicornis*.

Madeira.

Fam. TORYMIDÆ.

The occupation of this family, like that of the Eurytomidæ, is, with a few exceptions, in galls, and they are especially adapted to destroy their predecessors in the galls, for nearly all the species are provided with a long projecting oviduct, which in some species is of sufficient length to reach the central inhabitant of the largest gall. The general colour of the family is golden green, of which hue there is no trace in the Eurytomidæ, but a gradation between the two families appears in *Megastigmus*: the yellow or luteous body of the latter genus is in *M. dorsalis* partly overspread with golden green, borrowed from the species of *Callimome*, with which it is associated in oak-apples. The European genera have been distinguished according to the following synopsis:—

- | | | | |
|---|---|---|-----------------|
| A. Hind femora with spines, and also serrated or notched. | | | |
| a. Hind tibiæ much curved. | - | - | PODAGRION. |
| b. Hind tibiæ not curved. | - | - | TORYMUS. |
| B. Hind femora with spines. | | | |
| a. Hind coxæ with spines. | - | - | MONODONTOMERUS. |
| b. Hind coxæ without spines. | - | - | DIOMORUS. |
| c. Hind femora serrated. | - | - | OLIGOSTHENUS. |

- C. Hind femora without spines and not serrated.
- a. Radius of the fore wings as long as, or longer than, the ulna; cubitus with a thick knob. - - - MEGASTIGMUS.
 - b. Radius much shorter than the ulna; cubitus with no thick knob.
 - * Scutellum near the tip with a strongly impressed transverse line. - - SYNTOMASPIS.
 - ** Scutellum with no strongly impressed transverse line.
 - † Sutures of the parapsides coming close to the scutellum. - - - LOCHITES.
 - †† Sutures of the parapsides at some distance from the scutellum. - - - CALLIMOME.

Podagrion is found in most parts of the world, and is represented by a few species, which feed on the eggs of the Mantis tribe.

Palmon pachymerus is a synonym of Podagrion splendens; the latter genus and Bachyrischion, *Costa*, are identical.

Torymus (*Cryptopristus*, *Foerster*) includes the following species:—caliginosus, calcaratus, laticornis, macromerus, intermedius, fulvoscinctus and Syrphi. *T. calcaratus* is associated with *Megastigmus giganteus* in the single-chambered Mediterranean oak-gall.

Monodontomerus is represented by *M. dentipes*, *Anthophoræ*, *intermedius*, *militaris* and *vacillans*, and is a parasite of bees; it also includes *M. Phormio*, a South-American species.

Diomorus has two species, *nobilis* and *Kollari*; it can hardly include *Torymus tarsatus*, *Nees*, and *T. dubius*, *Nees*, which have a depressed abdomen.

Oligosthenus is founded on *O. stigma*, *O. ater* and *O. tibialis*. *O. stigma* is exclusively attached to the large pincushion-rose-gall, where, in conjunction with *Callimome bedeguaris* and a species of *Porizon*, it limits the increase of *Rhodites Rosæ*.

L. Papaveris is the only species known of *Lochites*.

Syntomaspis is closely allied to *Callimome*, and is represented by *chrysis*, *eurynotus*, *lazulinus*, *macrurus*.

Megastigmus contains a few European species, a few in Australia of small size, and two rather large Californian species, *M. Pinus* and *M. albifrons*.

Torymus erythrothorax, *Nees*, is perhaps a synonym of *M. collaris*, *Boh.*, and of *M. strobilobius*, *Ratz.* The oviduct of *M. Bohemanni Ratz.*, reaches to the scutellum, and that of *M. brevicaudis*, *Ratz.*, is hardly as long as the abdomen.

The species of *Callimome* are very numerous, and appear to be exclusively in attendance on galls. Their colour is golden green,

replaced in a few species by blue or by purple, or by reddish cupreous. When a reddish or yellowish hue appears it is only on the abdomen, where it forms a band or occupies the basal part.

C. nigricornis perhaps is brought up exclusively in oak-apples, and its long oviduct is exactly adapted to the probing of these from the outside to the middle, and when it (the next generation) has emerged thence in its perfect form, and is about to seek a suitable place for its eggs it resorts to a more recent oak-apple by instinct. When the oak-apple has attained its full size the grub in the middle of it is only accessible to *C. nigricornis*, but when the oak-apple is of small size this grub is liable to the attacks of other species of *Callimome*. Some species of this genus dwell both in oak-apples and in other oak-galls, and having comparatively short oviducts they limit their egg-laying to the more or less superficial inhabitants of the oak-apples. These have the choice of two means of bringing up the ensuing generation, and when they leave the old oak-apples and cannot find convenient fresh oak-apples they may resort to the oak-currants, and when they take wing from the oak-currants and can find none of that year's growth they may fly to the oak-apples. It will be said that when both ways of subsistence are equally attainable, the flies from oak-apples will select oak-apples, and those from oak-currants will prefer oak-currants by "the law of inheritance."

The European species of *Callimome*, with a few exceptions, are included in the following Synopsis:—

- | | | | |
|--|---|---------------------------|------------------------------|
| A. Oviduct more than twice the length of the body. | | | |
| a. Abdomen not blue-æneous. | - | - | <i>nigricornis, Fabr.</i> |
| b. Abdomen blue-æneous. | - | - | <i>cyaneus, Fons.</i> |
| B. Oviduct a little less than twice the length | | | |
| of the body. | - | - | <i>saphirinus, Boh.</i> |
| | | <i>crinicaudis, Ratz.</i> | <i>chalybæus, Ratz.</i> |
| C. Oviduct longer by half than the body. | | | |
| a. Abdomen pale at the base. | - | - | <i>cynipidis, Linn.</i> |
| b. Abdomen not pale at the base. | | | |
| * Body blue. | - | - | <i>azureus, Boh.</i> |
| ** Body green. | - | - | <i>quercinus, Boh.</i> |
| *** Body cupreous. | - | - | <i>speciosus, Boh.</i> |
| D. Oviduct longer than the body. | | | |
| | - | - | <i>Devoniensis, Parfitt.</i> |
| | | <i>annulatus, Spin.</i> | <i>macrocentrus, Ratz.</i> |
| E. Oviduct a little longer than the body. | | | |
| | - | - | <i>elegans, Boh.</i> |
| | | <i>Forsteri, Ratz.</i> | <i>Lasiopteræ, Gir.</i> |
| F. Oviduct hardly longer than the body. | - | - | <i>Druparum, Boh.</i> |
| G. Oviduct as long as the body. | | | |
| a. Abdomen pale at the base. | | | |

- | | | | | | |
|-----|---|---|---|---|--|
| † | Body green. | - | - | - | euchlorus, <i>Boh.</i> |
| | | | | | appropinquens, <i>Ratz.</i> |
| †† | Body blue. | - | - | - | cyaneus, <i>Fabr.</i> |
| ** | Wings nearly hyaline. | - | - | - | fastuosus, <i>Boh.</i> |
| *** | Wings brownish | - | - | - | parellinus, <i>Boh.</i> |
| b. | Abdomen pale at the base. | | | | |
| * | Wings brown. | - | - | - | chrysocephalus, <i>Boh.</i> |
| ** | Wings pellucid. | - | - | - | Angelicæ, <i>Wlk.</i> |
| L. | Oviduct as long as the abdomen and thorax, excepting the prothorax. | - | - | - | splendidus, <i>Foerst.</i>
chlorinus, <i>Foerst.</i> |
| M. | Oviduct as long as three-eighths of the body. | - | - | - | Nordlinger, <i>Ratz.</i> |
| N. | Oviduct as long as two-fifths of the body. | - | - | - | cultriventris, <i>Ratz.</i>
pumilus, <i>Ratz.</i> |
| O. | Oviduct rather longer the abdomen. | - | - | - | strenuus, <i>Wlk.</i> |
| P. | Oviduct a little longer than the abdomen. | - | - | - | |
| a. | Body much contracted. | - | - | - | contractus, <i>Ratz.</i>
robustus, <i>Ratz.</i> |
| b. | Body not much contracted. | | | | |
| * | Body blue. | - | - | - | amethystinus, <i>Boh.</i> |
| ** | Body green. | | | | |
| † | Antennæ slender. | | | | |
| † | Fore wings yellowish. | - | - | - | Hederæ, <i>Wlk.</i> |
| †† | Wings pellucid. | - | - | - | leptocerus, <i>Wlk.</i> |
| †† | Antennæ stout. | | | | |
| † | Antennæ black. | | | | |
| § | Wings nearly pellucid. | - | - | - | flavipes, <i>Wlk.</i> |
| §§ | Wings pellucid. | | | | |
| + | Body stout. | | | | |
| o | Fore wings with a small stigma. | - | - | - | autumnalis, <i>Wlk.</i> |
| oo | Fore wings with a very small stigma. | - | - | - | microstigma, <i>Wlk.</i> |
| + + | Body slender. | - | - | - | Galii, <i>Boh.</i> |
| †† | Antennæ brown. | - | - | - | exilis, <i>Wlk.</i> |
| ††† | Antennæ ——— ? | - | - | - | propinquus, <i>Foerst.</i>
viridis, <i>Foerst.</i> dubius, <i>Ratz.</i> |
| Q. | Oviduct as long as the abdomen. | | | | |
| a. | Abdomen pale at the base. | - | - | - | quadricolor, <i>Wlk.</i> |
| b. | Abdomen not pale at the base. | | | | |
| * | Antennæ black. | | | | |
| † | Fore wings spotted. | - | - | - | spilopterus, <i>Boh.</i> |
| †† | Fore wings not spotted. | | | | |
| † | Wings pellucid. | | | | |
| § | Legs wholly yellow. | - | - | - | auratus, <i>Enc. Méth.</i> |
| §§ | Legs partly dark. | | | | |

+	Legs reddish.	-	-	-	-	confinis, <i>Wlk.</i>
++	Legs yellow.	-	-	-	-	
o	Abdomen green.	-	-	-	-	
+	Antennæ clavate.	-	-	-	-	curtus, <i>Wlk.</i>
		-	-	-	-	inconspicuous, <i>Wlk.</i>
++	Antennæ subclavate.	-	-	-	-	mutabilis, <i>Wlk.</i>
		-	-	-	-	bicolor, <i>Wlk.</i> minutus, <i>Wlk.</i>
oo	Abdomen purple.	-	-	-	-	purpurascens, <i>Fabr.</i>
††	Wings brownish.	-	-	-	-	
§	Body slender.	-	-	-	-	basalis, <i>Wlk.</i>
§§	Body broad.	-	-	-	-	latus, <i>Wlk.</i>
**	Antennæ brown.	-	-	-	-	fuscicornis, <i>Wlk.</i>
R.	Oviduct hardly as long as the abdomen.	-	-	-	-	cupratus, <i>Boh.</i>
S.	Oviduct shorter than the abdomen.	-	-	-	-	
a.	Wings pellucid.	-	-	-	-	
*	Body narrow.	-	-	-	-	chlorinus, <i>Wlk.</i>
		-	-	-	-	Resinane, <i>Ratz.</i>
**	Body rather broad.	-	-	-	-	Capree, <i>De Lap.</i>
b.	Wings brownish.	-	-	-	-	
*	Legs tawny.	-	-	-	-	viridiæneus, <i>Wlk.</i>
**	Legs green.	-	-	-	-	Arvernicus, <i>Wlk.</i>
T.	Oviduct less than half the length of the abdomen.	-	-	-	-	brachyurus, <i>Boh.</i>
V.	Oviduct hardly extending beyond the abdomen.	-	-	-	-	
a.	Wings brownish.	-	-	-	-	
*	Legs straw-colour.	-	-	-	-	nitens, <i>Wlk.</i>
**	Legs pale red.	-	-	-	-	brevicauda, <i>Wlk.</i>
b.	Wings pellucid.	-	-	-	-	abdominalis, <i>Wlk.</i>

Male.

A.	Abdomen pale at the base.	-	-	-	-	
a.	Fore wings spotted.	-	-	-	-	regalis, <i>Wlk.</i>
b.	Fore wings not spotted.	-	-	-	-	pretiosus, <i>Wlk.</i>
B.	Abdomen not pale at the base.	-	-	-	-	
a.	Antennæ brown, black at the base.	-	-	-	-	microcerus, <i>Wlk.</i>
b.	Antennæ black.	-	-	-	-	
*	Body not black.	-	-	-	-	
†	Wings pellucid, or nearly so.	-	-	-	-	moestus, <i>Wlk.</i> straminei-
	tarsus, <i>Wlk.</i> versicolor, <i>Wlk.</i> modestus, <i>Foerst.</i> asso-	-	-	-	-	
	catus, <i>Foerst.</i> distinctus, <i>Foerst.</i> congener, <i>Foerst.</i>	-	-	-	-	
††	Wings yellowish.	-	-	-	-	rufipes, <i>Foerst.</i>
†††	Wings brownish.	-	-	-	-	apicalis, <i>Wlk.</i>
		-	-	-	-	antennatus, <i>Wlk.</i> purpurascens, <i>Boh.</i>
†††	Wings brown.	-	-	-	-	fuscipennis, <i>Wlk.</i>
**	Body black.	-	-	-	-	ater, <i>Wlk.</i>

The species of *Callimome* described by Boheman are all recorded in the list of Chalcididæ for the British Museum, with the following exceptions:—*C. azureus*, *speciosus*, *contubernalis*, *fuscipes*, *abdominalis*, *chlorocopes*, *cyaneus*, *amethystinus*, *purpurascens*, *cupratus*, *brachycerus*. These are inserted in the preceding Synopsis of the species.

The abdomen of *C. fuliginosus*, *Spin.*, and of *C. annulatus*, *Spin.*, is short and depressed, and they differ thereby from the rest of the European species of this family, and perhaps do not belong to it. *C. longicauda* and *C. crinicaudis*, *Ratz.*, are perhaps identical with *C. nigricornis*.

Torymus fasciatus, *Nees* (*Cynips fasciata*, *Fons. Ann. Sci. Nat.* 1832, 288), appears to be a species of *Decatoma*.

Callimome viridissimus, *Zett.*, includes four species of that genus. *C. caudatus*, *Nees*, is perhaps *C. saphirinus*. *C. difficilis*, *Nees*, may be *C. flavipes*. *C. globiceps*, *Nees* (*Ichn. globiceps*, *Ratz.*), is perhaps not a *Callimome*. *C. nitidulus*, *Nees*, may be a small variety of *C. nobilis*. *C. quercicola*, *Nees*, is the same as *C. cingulatus*. *C. minor*, *Ratz.*, may be a *Monodontomerus*. *C. Dresdensis*, *metallicus* and *anephelus* may be *Diomori*. *C. cultriventris*, *Nordlinger* and *confluens*, *Ratz.*, have been reared from the conical galls formed on beech-leaves by *Cecidomyia Fagi*: these galls have been lately observed in England. I have seen abundance of them in Belgium, in Switzerland, and in some parts of France, and have reared one species of *Callimome* from them. In the description of *C. obscuripes*, *Foerst.*, the length of the oviduct is not stated. *C. igneiventris*, *Costa*, is an inhabitant of South Italy.

The North-American species of *Callimome* are as yet little known; only seven have been described, two of which were found at St. Martin's Falls, in Hudson's Bay, and two in Florida: they much resemble the European species. *C. pavidus* and *C. ocreatus* inhabit Indiana, and are described by Say. The South-American and Australian examples of *Callimome* are smaller than most of those in Europe, and the species described as *C. sulcus* is probably a *Megastigmus*. *C. Ceylonica*, *Motsch.*, is the only Asiatic species yet described.

The exotic genera of *Torymidæ* are not numerous. I have not seen *Pelecinnella*, *Westw.*, nor *Pachytomus*, *Westw.*, which are said to belong to this family. *Pachytomus* may be one of the *Aganidæ*. *Ecdamua* is remarkable on account of its excessively long oviduct, and the indications of the genus *Metamorphia* to a remote affinity with *Leucospis* have been before mentioned.

Platyscapa, *Motsch.*, and *Platyneura*, *Motsch.*, do not belong to the *Torymidæ*.

Genus CALLIMOME.

C. STRENUUS. *Fœm.*—Aureo-viridis, cupreo varius; antennæ nigrae, robustæ, subclavatæ, thorace paullo breviores, scapo luteo; abdomen basi cupreum, thorace paullo longius; oviductus abdomine longior; pedes flavi, femoribus tibiisque posticis nigricantibus basi apiceque flavis, tarsis pallidissime flavis; alæ anticæ disco pallidissime fuscæ. *C. macroptero* affinis; alæ anticæ paullo angustiores.

Female.—Golden green. Head and thorax finely squamous, partly cupreous. Head a little broader than the thorax. Antennæ black, stout, subclavate, a little shorter than the thorax; first joint luteous. Abdomen cupreous at the base, a little longer than the thorax. Sheath of the oviduct rather longer than the abdomen. Legs yellow; hind femora and hind tibiæ blackish, except at the base and at the tips; tarsi very pale yellow. Wings pellucid; veins tawny; ulna much shorter than the humerus; radius about one-fourth of the length of the ulna; cubitus very short. Length of the body $1\frac{1}{2}$ line.

Near *C. macropterus*: the fore wings are a little narrower, and have a faint brownish tinge in the disk.

England. In Dr. Chapman's collection.

C. DIVISUS. *Fœm.*—Cyaneo-viridis; frons aureo-viridis; antennæ nigrae, subclavatæ, thorace paullo breviores; scapo fulvo; abdomen cupreum, basi cyaneo-viride; oviductus corpore perpaullo brevior; pedes lutei, tarsis quatuor posterioribus pallide flavis; alæ anticæ cinereæ, fulvo venosæ. *C. elegati* affinis; oviductus brevior.

Female.—Very bright bluish green, slender. Head and thorax finely squamous. Head as broad as the thorax; front bright golden green. Antennæ black, subclavate; a little shorter than the thorax; first joint tawny. Prothorax short. Sutures of the parapsides strongly marked; scutellum elliptical, with a few short whitish bristles. Abdomen smooth cupreous, brilliant, bright bluish green at the base, with a few short bristles towards the tip, as long as the thorax. Sheath of the oviduct nearly as long as the body. Legs luteous; four posterior tarsi pale yellow. Wings cinereous; veins tawny; ulna about half the length of the humerus; radius much shorter than the ulna; cubitus and stigma black, the former extremely short. Length of the body $1\frac{1}{2}$ line.

Nearly allied to *C. elegans*, but the oviduct is shorter.

Torla, Spain. In the collection of the Rev. T. A. Marshall.

Genus MEGASTIGMUS.

M. PISTACIÆ, *Haliday MS.* *Fœm.*—Pallide testaceus; frons albidæ; antennæ fulvæ, fere filiformes, thorace multo breviores, scapo pallide testaceo; thorax fulvo univittatus, abdomen subfusiforme, thorace brevius, segmentis fusciscentis fasciatis; oviductus niger, abdomini æquilongus; pedes albidæ; alæ diaphanæ, testaceo venosæ, stigmate nigro.

Female.—Pale testaceous. Head a little broader than the thorax; front whitish. Eyes red. Antennæ tawny, nearly filiform, much shorter than the thorax; first pale testaceous; club lanceolate. Thorax with a tawny stripe, in structure like that of *M. dorsalis*. Petiole extremely short. Abdomen subfusiform, shorter than the thorax, with a brownish band on each segment. Sheath of the oviduct black, slightly curved, as long as the abdomen. Legs whitish. Wings pellucid; veins testaceous; ulna about one-fourth of the length of the humerus; radius and cubitus very short; stigma black. Length of the body $1\frac{3}{4}$ line.

On *Pistacia lentiscus* and on *P. terebinthus* in S. France and in Tuscany.

Genus ECDAMUA.

E. INDICA. *Fœm.*—Aureo-viridis, gracillima; caput thorace latius; antennæ nigræ; petiolus pallide flavus, gracillimus, metathoraci æquilongus; abdomen thorace multo brevius, basi pallide flavus; oviductus corpore plus duplo longior; pedes flavi; alæ diaphanæ, testaceo pallido venosæ.

Female.—Bright golden green, very slender. Head and thorax very finely squamous. Head large, broader than the thorax. Eyes piceous. Antennæ black. Thorax long. Prothorax elongate-conical, much developed. Scutum long; sutures of the parapside strongly marked. Metathorax slanting, tapering hindward. Petiole pale yellow, very slender, as long as the metathorax. Abdomen smooth, much compressed, much shorter than the thorax. Sheath of the oviduct black, very slender, more than twice the length of the body. Legs yellow, slender. Wings pellucid; veins pale testaceous. Length of the body $2\frac{1}{4}$ lines.

The pale base of the abdomen and the nearly entirely pale legs distinguish it from *E. macrotelus*.

Bombay. In the collection of Dr. Leith.

Genus ODOPOIA, n.

Fœm.—Corpus robustum, breve, convexum. Caput et thorax æquilata, subtilissime punctata. Antennæ robustæ, clavatæ, thorace paullo breviores. Prothorax transversus, subquadratus. Mesothorax brevis; parapsidum suturæ vix determinatæ. Metathorax brevis, abrupte declivis. Petiolus gracilis, metathoraci æquilongus. Abdomen glabrum, brevi-ellipticum, subcompressum, valde convexum, thorace brevius. Oviductus abdomine paullo longior. Pedes breviusculi, sat robusti.

Female.—Body stout, short, convex. Head and thorax very finely punctured. Head as broad as the thorax. Antennæ stout, clavate, a little shorter than the thorax. Prothorax subquadrate, well developed, a little narrower than the mesothorax. Mesothorax short; sutures of the parapsides indistinct. Metathorax short, abruptly slanting. Petiole slender, as long as the metathorax. Abdomen smooth, short-elliptical, much arched, slightly compressed, shorter than the thorax. Sheath of the oviduct a little longer than the abdomen exclusive of the petiole. Legs rather short and stout. Wings moderately long and broad.

This genus shows a way to the Eurytomidæ on the one hand, and on the other hand to the Torymidæ, as it partakes of the characters of both families: it differs very widely from Megastigmus.

O. ATRA. *Fœm.*—Atra; pedes nigri, tibiis anticis genubus tarsisque fulvis, femoribus anticis piceis apice fulvis, alis anticis fusco unifasciatis.

Female.—Deep black. Eyes red. Knees, tarsi and fore tibiæ tawny; fore femora piceous, their tips tawny. Wings pellucid. Fore wings with a brown middle band; veins blackish. Length of the body 1 line.

Ceylon.