

although incapable of motion after being thus stung, the Trogo-derma larva could still void its excrement.

— Mr. Ashmead read the following paper :

ON THE GENERA OF THE EUCHARIDÆ.

By WILLIAM H. ASHMEAD.

In my paper entitled "Notes on the Eucharids found in the United States," read October, 1892, I wrote: "Since becoming better acquainted with that great complex of the Hymenoptera at present known to us under the family name *Chalcididæ*, I have gradually come to the conclusion that instead of a single family to deal with we have several distinct families. Indeed, in many cases, these families are even more distinct and sharply defined than many others of the so-called families in this order, and until these are properly separated and defined, I believe but little real progress can be made in our systematic knowledge of the Chalcidoidea."

Since this was written, I have diligently and laboriously prosecuted my studies on these insects, and have now in MSS. a new classification of them, which I hope to publish this winter, in which I have recognized fourteen distinct families.

Inasmuch, therefore, as I have entitled this paper "On the Genera of the Eucharidæ," I desire briefly to put on record the names of these families and the new arrangement proposed in this work.

The families recognized and their arrangement are as follows :

SUPERFAMILY VII.—CHALCIDOIDEA.

Family LX. Agaonidæ.

LXI. Torymidæ.

Subfamily I. Idarninæ.

II. Toryminæ.

III. Monodontomerinæ.

IV. Megastigminæ.

V. Ormyrinæ.

LXII. Chalcididæ.

Subfamily I. Leucospidinæ.

II. Chalcidinæ.

LXIII. Eurytomidæ.

LXIV. Perilampidæ.

LXV. Eucharidæ.

LXVI. Mischogasteridæ.

Subfamily I. Pireninæ.

II. Tridyminæ.

III. Mischogasterinæ.

IV. Lelapinæ.

- LXVII. Cleonymidæ.
 Subfamily I. Chalcedectinæ.
 II. Cleonyminæ.
 III. Pelecínellinæ.
 IV. Colotrechninæ.
- LXVIII. Encyrtidæ.
 Subfamily I. Eupelminæ.
 II. Encyrtinæ.
 III. Signiphorinæ.
- LXIX. Pteromalidæ.
 Subfamily I. Merisinæ.
 II. Pteromalinæ.
 III. Sphegigasterinæ.
 IV. Spalangiinæ.
 V. Diparinæ.
- LXX. Elasmidæ.
- LXXI. Eulophidæ.
 Subfamily I. Entedoninæ.
 II. Aphelininæ.
 III. Tetrastichinæ.
 IV. Eulophinæ.
- LXXII. Trichogrammidæ.
 Subfamily I. Oligositinæ.
 II. Trichogramminæ.
- LXXIII. Mymaridæ.
 Subfamily I. Gonatocerinæ.
 II. Mymarinaæ.

The family *Eucharidæ* takes its name from the genus *Eucharis*¹ Latreille, erected in 1805, for *Cynips adscendens* Fabricius, a species widely distributed over Europe, and described under the latter name as early as 1787, or a little over a century ago.

In 1811 Spinola described his genus *Stibula*² to contain *Ichneumon cyniformis* Rossi, evidently a misprint for *cynipiformis*, a species found in South Europe.

Latreille's definition of the genus was a broad one, and from this time down to the year 1829 all other species of Eucharids discovered in various parts of the world, showing any affinities, were described and placed in it. In this year, however, Latreille erected another genus, *Thoracantha*,³ for a singular looking species discovered in Brazil.

In 1840 Blanchard described his genus *Psilogaster*,⁴ while six

¹ Latreille, Hist. Nat. Crus. et Ins., t. xiii, p. 210.

² Spinola, Ann. Mus., xvii, p. 150.

³ Cuvier's Règne Anim., ed. 2, v, p. 297.

⁴ Blanchard, Hist. Anim. Art., iii, p. 260.

years later Francis Walker, in his "List of the Chalcididæ in the British Museum," brings the genera together and gives to the group the family name *Eucharidæ*, wrongly associating with them the genera *Perilampus* and *Caratomus*, neither of which belong here, although the former exhibits some affinities.

Subsequent to this publication new species and genera continued to be discovered. Westwood, who had announced his intention of monographing the group, in 1835 erected his genus *Schizaspidia*,¹ for a form discovered in India, while in 1868 he described his genus *Eucharissa*,² from the Cape of Good Hope.

In 1856 Förster recognized the group as a distinct family under the name *Eucharoidæ*.

Between this time and 1884 there was a long period of rest, so far as the establishment of genera, although new species continued to be described, especially by Francis Walker. In this year, however, Mr. Peter Cameron,³ in working up the Mexican and Central American *Chalcididæ*, found it necessary to characterize four new genera, viz., *Orasema*, *Lophyrocera*, *Lirata*, and *Kapala*. He gave a good table for recognizing the new genera, and they were incorporated by Dr. Howard in his table of the *Eucharinæ*, prepared for Cresson's Synopsis of the North American Hymenoptera.

Two years later, however, or in 1886, the group received an excellent generic revision at the hands of Mr. W. F. Kirby,⁴ Assistant in the Zoölogical Department in the British Museum.

This revision was based upon types and the extensive material in the British Museum, and is entitled "A Synopsis of the Genera of the Chalcididæ, Subfamily *Eucharinæ*, with Descriptions of Several New Genera and Species."

Brief but fairly good diagnoses of all the known genera are given, and in every case the type of the genus is mentioned. The following new genera were characterized: *Tricoryna*, *Metagea*, *Chalcura*, *Rhipipallus*, *Tetramelia*, *Uromelia*, and *Saccharissa*.

Mr. Kirby terminates his paper with a table of the genera, in which 12 genera are tabulated. He has, however, not included *Eucharissa* and *Saccharissa*; these he considers represent a new subfamily, which he calls *Eucharissinæ*, but does not define. In this separation I cannot follow him.

Mr. Kirby settled definitely the types of the various genera, and since the publication of his Synopsis it has been possible for the student to pursue intelligently further studies in the group. His

¹ Westwood, Proc. Zöol. Soc. Lond., 1835, p. 69.

² *Id.*, Trans. Ent. Soc. Lond., 1868, p. 36.

³ Cameron, Biol. Centr.-Am. Hym., i, p. 101 *et seq.*

⁴ Kirby, Journ. Linn. Soc. Zoöl., xx, pp. 28-37.

table, slightly altered, was reproduced by me in *Entomologica Americana*, vol. iii, 1887, p. 186.

In 1894, Mr. John W. Shipp,* gave a short revision of the genus *Thoracantha* Latreille, based upon material in the Hope Museum, Oxford, in which five supposed new genera are characterized, viz.: *Lasionychus*, *Dilocantha*, *Lætotantha*, *Acrostola*, and *Isomeralia*.

Lasionycha Shipp equals *Uromelia* Kirby, while *Acrostola* Shipp is apparently based upon the male of *Thoracantha* Latr. At least, that is my opinion, since all the *Acrostola* I possess are males, and I had them placed as the opposite sex of *T. latreillei* before Mr. Shipp's paper appeared, and I see no reason for believing them other than the opposite sex of this common Brazilian species.

Of the habits of this group, comparatively little is known. Mons. L. Bedel, Bull. Soc. Ent. de France, 1895, p. xxxv, records the rearing of *Chalcura bedeli* Cameron from the cocoons of *Formica rufa* Linn.; while Mr. Cameron, in Mem. and Proc. Manchester Lit. and Phil. Soc., 1891, p. 5, records the interesting fact that Prof. Forel, of Zurich, obtained two specimens of *Eucharis myrmiciæ* Cam. from the cocoons of the Bull-dog Ant, *Myrmica forficata* Fabr., sent him from South Australia.

Before giving a table of the genera now recognized, it may be well to give some of the structural peculiarities of the group which I believe entitle it to family rank.

The head is comparatively smaller than other Chalcidids, triangular, and much thinner antero-posteriorly; the mandibles are rather long, falcate, without or with one or two teeth within in one or the other mandible, both mandibles rarely being exactly alike.

The shape and characteristics of the mandibles alone will enable the careful student to separate at once a Eucharid from all others in the Chalcidoidea. But there are several other distinguishing characters: The thorax is most frequently very gibbous, the scutellum very large, abnormally developed, elevated, and usually produced posteriorly, the axillæ being connate, not distinctly separated from the surrounding surface, and broadly united along their inner margin, so as to separate widely the scutellum proper (middle lobe) from the base of the mesonotum.

The legs also are quite characteristic of the group, being unusually slender, with all the coxæ of very nearly an equal size.

The wings, too, offer some slight differences from other Chalcidids; they are almost entirely bare or devoid of pubescence, the front pair being somewhat broadly rounded at apex, with a moderately long marginal vein and a very short sessile or at most subsessile stigmal vein, the postmarginal vein being absent, very

* The Entomologist, 1894, June No., p. 184.

short or only slightly developed. The hind wings are proportionately larger and wider at base than in the generality of the other families, the costal cell being distinct.

The abdomen is always distinctly petiolated, the second segment abnormally enlarged and usually enclosing the following segments, or the greater part of them, while the female possesses a very broad saw-like ovipositor, the blade of which is very similar to that of a small saw-fly.

TABLE OF GENERA.

Females.

- Antennæ 13-jointed or less..... 2
 Antennæ 14-jointed or more.
 Scutellum simple; antennæ 16-18-jointed.
 1. *Eucharissa* Westwood.
 Scutellum produced into a single long process at apex, and longitudinally striated; antennæ 14-jointed.... 2. *Saccharissa* Kirby.
2. Scutellum bidentate, or greatly produced into long processes over the abdomen 4
 Scutellum simple, neither bidentate nor produced into long processes.
 Antennæ not moniliform..... 3
 Antennæ moniliform.
 Abdomen compressed, ascending.... 3. *Eucharis* Latreille.
 Abdomen neither compressed nor ascending.
 First joint of hind tarsi much thickened; antennæ 11-jointed..... 4. *Tricoryna* Kirby.
 First joint of hind tarsi very long, but not thicker than the others..... 5. *Metagea* Kirby.
3. Joints of antennæ long; antennæ 11-jointed.
 Thorax smooth, polished; petiole of abdomen abruptly enlarged at apex.... 6. *Pseudometagea* Ashmead.
 Thorax rugose; petiole of abdomen normal, long, cylindrical.
 7. *Psilogaster* Blanchard.
- Joints of antennæ short; antennæ 13-jointed.
 Thorax not greatly elevated, punctate, with complete parapsidal furrows; mandibles long, acute at tip, the right with two teeth within, the left with one tooth within.... 8. *Orasema* Cameron.
- Joints of antennæ serrate.
 Antennæ 13-jointed..... 9. *Rhipipallus* Kirby.
 Antennæ 11-jointed..... 10. *Chalcura* Kirby.
4. Scutellum with the processes usually as long as the abdomen and sometimes very broad and covering the abdomen..... 5
 Scutellum bidentate, the processes never very long.
 Metathorax unarmed.
 Metanotum with hump-like elevations above the pleura.
 11. *Stilbula* Spinola.
 Metanotum simple, without such elevations.
 12. *Schizaspidia* Westwood.

Metathorax armed with strong lateral projections or teeth.

Metathoracic processes curving downwards.

13. *Lophyrocera* Cameron.

Metathoracic processes consisting of two diverging horizontal teeth.....14. *Tetramelia* Kirby.

5. Scutellar processes long and slender, generally curving inwards toward tips..... 6

Scutellar processes broad and covering the entire abdomen.

Thorax not pubescent, the apex of the scutellar projections simple, cleft, or notched.

Scutellar processes very broad, triangular.

15. *Thoracantha* Latreille.

Scutellar processes long, contiguous, and acutely pointed at extremity16. *Uromelia* Kirby.

(= *Lasionychus* Shipp.)

Scutellar processes long, contiguous, but very flat, the extremities rounded or subtruncate; mesonotum and scutellum medially impressed; head almost as wide as the thorax; antennæ 10-jointed, the third joint as long as the scape, the following much wider than long.

17. *Dicælothorax* Ashmead, n. g.

Thorax pubescent; apex of the scutellar processes rounded and not sharply cleft, the notch extending two-thirds of the entire length.....18. *Dilocantha* Shipp.

Scutellar projections with the basal portion as wide as thorax, shortly compressed in centre, then dilated, and at the apex furnished with two rounded short spines.....19. *Lætocantha* Shipp.

Scutellar projections with the basal portion as wide as thorax, produced and with the sides parallel, the apex furnished with a small semi-circular excavation, the apices of the spines being very sharp.

15. *Acrostela* Shipp.

(? = ♂ *Thoracantha* Latr.)

6. Head and eyes tuberculate; antennæ 12-jointed...20. *Isomeralia* Shipp.

(Type *Thoracantha coronata* Westwood.)

Head and eyes normal.

Antennæ 10-jointed, the third joint as long as all the rest united.

21. *Lirata* Cameron.

Antennæ 11-jointed, the third joint not much longer than the fourth.

Thorax not pubescent, the scutellum always longitudinally striated..... 22. *Kapala* Cameron.

(Type *Thoracantha fuscata* Fabr.)

Thorax clothed with a fine pubescence, the scutellum smooth, not longitudinally striated, the processes smooth to apices, where they are transversely serrated.

23. *Lasiokapala* Ashmead, n. g.

Males.

- Scutellum bidentate, or produced into long processes over the abdomen 4
- Scutellum normal or simple..... 2
- Scutellum produced into a simple long process.
- Antennæ 18-jointed.....1. *Saccharissa* Kirby.
2. Antennæ 22-jointed.....2. *Eucharissa* Westwood.
- Antennæ 10 to 13-jointed.
- Antennæ ramose 3
- Antennæ simple.
- Flagellar joints moniliform.
- Abdomen compressed, ascending.
3. *Eucharis* Latreille.
- Abdomen neither compressed nor ascending.
- First joint of tarsi much thickened.
4. *Tricoryna* Kirby.
- First joint of tarsi very long, but not thicker than the others..... 5. *Metagea* Kirby.
- Flagellar joints cylindrical, not moniliform.
- Joints of antennæ long; antennæ 10-11-jointed.
- Petiole of abdomen abnormally and abruptly enlarged at apex; thorax smooth.
6. *Pseudometagea* Ashmead, n. g.
- Petiole of abdomen normal, long, cylindrical; thorax rugose..... 7. *Psilogaster* Blanchard.
- Joints of antennæ rather short; antennæ 13-jointed.
- Thorax closely punctate; right mandible with two teeth within, the left with one tooth within.....8. *Orasema* Cameron.
3. Antennæ 11-jointed, biramose.....9. *Rhipipallus* Kirby.
- Antennæ 11-jointed, ramose.
- Thorax coarsely rugose; face longitudinally striated.
10. *Chalcura* Kirby.
4. Scutellum with the processes very long, usually as long as the abdomen, and often very broad..... 5
- Scutellum bidentate, the teeth never very long.
- Antennæ simple.
- Metanotum with hump-like elevations above the pleura.
11. *Stilbula* Spinola.
- Antennæ ramose.
- Metathorax unarmed..... 12. *Schizaspida* Westwood.
- Metathorax with strong lateral projections or teeth.
- Metathoracic processes curving downwards.
13. *Lophyrocera* Cameron.
- Metathoracic processes consisting of two diverging horizontal teeth.....14. *Tetramelia* Kirby.

5. Scutellar processes long and slender, generally curving inwards towards the tips 6
 Scutellar processes very broad, deeply, broadly, semicircularly emarginated at apex.....15. *Thoracantha* Latreille.
 (= ? *Acrostela* Shipp.)
 Scutellar processes long continuous and acuminate at apex; antennæ with 8 long branches....16. *Uromelia* Kirby.
 (= *Lasionycha* Shipp.)
 Scutellar processes long continuous but rounded not acuminate at apex; antennæ with no long branches, serrated.
 17. *Dicælothorax* Ashmead, n. g.
6. Eyes tuberculate..... 20. *Isomeralia* Shipp.
 Eyes normal.
 Mesonotum, scutellum and the scutellar processes longitudinally furrowed or striated.
 Third joint of antennæ very long; funicle with 7 branches which are scarcely longer than the third antennal joint.
 21. *Lirata* Cameron.
 Third joint of antennæ very short; funicle with 9 long branches.....22. *Kapala* Cameron.
 Mesonotum with the middle lobe coarsely transversely furrowed, the lateral lobes with the scutellum and scutellar processes smooth, not striated.....23. *Lasiokapala* Ashmead.

This paper was followed by a brief discussion of the probable habits of the insects of this group, participated in by Messrs. Ashmead, Howard, and Schwarz. Nothing is known of their host relations, except two records of Australian species having been reared from the pupa of ants. Mr. Howard stated that he had seen a specimen of *Kapala furcata* in Mr. H. H. Smith's collection from St. Vincent, which carried an ant in its jaws. He thought this might possibly be significant, although, of course, the Eucharid might have clasped the ant in its death struggles in the cyanide bottle. Mr. Ashmead and Mr. Schwarz stated that Florida species occur commonly in localities where ants are abundant.

—Mr. Ashmead submitted for publication the following paper :

CLASSIFICATION OF THE OLD FAMILY CHALCIDIDÆ.

By WILLIAM H. ASHMEAD.

At the meeting of the Entomological Society of Washington held December 2, 1897, I suggested the segregation of the old family Chalcididæ into 14 distinct families, and gave a tentative