

ready to give others the benefit of his wide bibliographic knowledge, and his untimely demise is greatly to be deplored, not only as a severe loss to hemipterology, but his optimistic and kindly personality will be greatly missed by his friends and colleagues. He was a fellow of the Entomological Society, London, since 1895, a member of the American Association of Economic Entomologists, and several other entomological societies, and was for several years associated as a subeditor with the "London Entomologist," and was president for the ensuing year of the Hawaiian Entomological Society, a local society chiefly devoting its observations to the bionomics of the native insect fauna of the archipelago.

The deceased leaves a wife, a little daughter, and an aged mother to mourn his loss.

The following papers were accepted for publication:

NOTES ON THE FAMILY DALCERIDÆ.

[Lepidoptera; Dalceridæ.]

BY HARRISON G. DYAR.

I first gave a synopsis of the genera of this interesting little family in 1898 (Journ. N. Y. Ent. Soc., vi, 231), recognizing five genera. Later, Mr. Schaus published a table (Proc. U. S. Nat. Mus., xxix, 331, 1906), in which ten genera are distinguished. Not much has been added to our knowledge since that date, but I think an improvement can be effected by a change in the order of the characters used in the table, with the suppression of one genus. Two other genera are here recognized, bringing the number up to eleven. The family is allied to the Cochlidiidæ. I have never seen a larva of any species of the group, and know of but two descriptions. These are of the larvæ of *Acraga flava* Walker and *Acraga moorei* Dyar and are quoted below. The description implies a form like our cochlidian *Isochætes heutenmuelleri* H. Edw., without the hairs and with the processes even more easily detachable. If this interpretation of the description is correct it will furnish some interesting deductions as to the relationship of the Dalceridæ and also as to the antiquity of the *Phobetron* type of larva, to which *Isochætes* belongs.

SYNOPSIS OF GENERA OF THE DALCERIDÆ.

Fore wing without accessory cell:

Fore wing with vein 11 from the cell—

Veins 7-8, 9-10 on separate stalks ... *Dalcera* Herrich-Schaeffer

Veins 8 and 10 absent —

Veins 7-9 stalked; 8 of hind wing separate from subcostal *Paracraga* Dyar

Veins 7, 9 separate; 8 of hind wing broadly joined to subcostal..... .. *Minonoa* Dyar

Fore wing with vein 11 stalked with 9-10—

Veins 8 and 10 present—

Vein 6 arising below the discal vein *Dalcerina* Dyar

Vein 6 arising above the discal vein—

Veins 9-10 short-stalked; 11 well stalked

Minacraga Dyar

Veins 9-10 long-stalked; 11 shortly stalked

Zadalcera Dyar

Veins 8 and 10 wanting *Minacragides* Dyar

Fore wing with accessory cell:

Vein 8 of hind wing more or less broadly joined to subcostal—

Fore wing with the cell normal, the discal veins in line

Anacraga Dyar

Fore wing with the upper half of cell and accessory cell

retracted.....*Acragopsis* Dyar

Vein 8 of hind wing free, running close to subcostal—

Veins 9-10 long-stalked but distinct *Acraga* Walker

Veins 9-10 coincident *Dalcerides* Neumoegen & Dyar

In the following only the species with which I am acquainted are referred to. Several unknown to me have been described by Druce, and there are probably others concealed other under generic names. It is impossible to do anything with these until the opportunity arises of examining specimens. Many of the species of this group are similar in coloration, while unlike in venation, so that the descriptions are useless for placing the described species in their proper genera, since these deal only with the coloration.

DALCERA Herrich-Schaeffer.

Dalcera Herrich-Schaeffer, Ausserereurop. Schmett., i, 7, 1855.

***Dalcera abrasa* Herrich-Schaeffer.**

Dalcera abrasa Herrich-Schaeffer, Ausser. Schmett., f. 180, 1854.

Dalcera abrasa Walker, Cat. Brit. Mus., v. 1106, 1855.

Dalcera abrasa Möscher, Verh. zool.-bot. Ges. Wien., xxvii, 673, 1878.

Described from Colombia. I have specimens from Suapure, Venezuela (E. A. Klages); Merida, Venezuela (S. E. Bri-

ceno, P. Dognin); St. Jean, Maroni River, French Guiana (W. Schaus); Rockstone, Essequibo River, British Guiana (W. Schaus); and Omai, British Guiana (W. Schaus). Herich-Scheaffer figures a male without the black discal dot, but in my specimens it is more generally present than absent, varying in size when present from a mere rudiment to a distinct mark.

ZADALCERA, new genus.

With the structure of *Dalcera*, but vein 11 stalked with veins 9 and 10, shortly so, while veins 9 and 10 are long-stalked.

Type: Dalcera fumata Schaus.

Zadalcera fumata Schaus.

Dalcera fumata Schaus, Proc. Zool. Soc. London, 238, 1894.

Five males before me, all from Castro, Parana, Brazil. The species is superficially very close to *Dalcera abrasa*, distinguished by the smoky shadings along submedian area and the curved inner half-band.

Zadalcera arhathodota, new species.

Fore wing carneous yellow, the costa and fringe without the pink tint. Hind wing orange yellow. Expanse, 50 mm.

One female, Rio Janeiro, Brazil (Geo. Franck collection).

Type No. 13056, U. S. National Museum.

Coloration very much as in *Dalcera abrasa*, but the wings less oval and drawn out toward the apex, being of a more normal shape. The coloration is less intense.

DALCERINA Dyar.

Dalcerina Dyar, Journ. N. Y. Ent. Soc., vi, 232, 1898.

Dalcerina tijucana Schaus.

Dalcera tijucana Schaus, Proc. Zool. Soc. Lond., 322, 1892.

Dalcerina tijucana Dyar, Journ. N. Y. Ent. Soc., vi, 232, 1898.

Only the single male type is known, on which I have commented previously.

ACRAGA Walker.

Acraga Walker, Cat. Brit. Mus., iv, 807, 1855.

Pinconia Moore, Proc. Lit. Phil. Soc. Liverpool, xxxvi, 365, 1882.

Epipinconia Dyar, Journ. N. Y. Ent. Soc., vi, 232, 1898.

Acraga moorei Dyar.

Pinconia ochracea Moore (not Walker), Proc. Lit. Phil. Soc. Liverpool, xxxvi, 364, 1882.

Acraga moorei Dyar, Journ. N. Y. Ent. Soc., vi, 232, 1898.

A male from São Paulo, Brazil (Von Ihering), and a female from the same place (Schaus collection) are before me. The species is easily known by the dark-lined veins. Jones says of the larva: "It is quite white and translucent, looking just as if made of Venetian glass. The abdominal legs are wanting, their place being indicated merely by slight swelling of the skin. The motion of the caterpillar . . . is that of a slug."

Acraga coa Schaus.

Pinconia coa Schaus, Proc. Zool. Soc. Lond., 322, 1892.

Acraga coa Dyar, Journ. N. Y. Ent. Soc., vi, 232, 1898.

Not uncommon in the coast region of Mexico. I have specimens from Cordoba, Jalapa, and Coatepec. Easily recognized by the pale-lined veins.

Acraga ochracea Walker.

Dalcera ochracea Walker, Cat. Brit. Mus., v, 1107, 1855.

Dalcera ochracea Kirby, Cat. Lep. Het., 542, 1892.

Acraga ochracea Dyar, Journ. N. Y. Ent. Soc., vi, 232, 1898.

Described from Rio Janeiro. I identify with this four males from Castro, Parana, Brazil. I have also a series from the Guianas which differ in the somewhat more diversified ground, the orange seeming to be overspread upon a yellow ground and more intense on the inner margin. I leave the form, however, as a race of *ochracea*, under the new varietal name *conda*.

Acraga infusa Schaus.

Acraga infusa Schaus, Proc. U. S. Nat. Mus., xxix, 332, 1906.

In this the diversification of the shading on the wing is more marked than in the form of *ochracea* referred to above. Otherwise similar to *ochracea*.

Acraga ciliata Walker.

Acraga ciliata Walker, Cat. Brit. Mus., iv, 807, 1855.

Dalcera ciliata Kirby, Cat. Lep. Het., 542, 1892.

Acraga ciliata Dyar, Journ. N. Y. Ent. Soc., vi, 232, 1898.

Described from Jamaica. I have a specimen from there. The modification of the *ochracea* type indicated by the Guiana specimens and by *infusa* Schaus is here carried further.

the inner margin and the end of cell being distinctly marked with brown.

***Acraga meridensis* Dognin.**

Acraga meridensis Dognin, Ann. Ent. Soc. Belg., li, 23, 1907.

I have three specimens from Merida, Venezuela, the type locality. The color is a uniform orange-brown, considerably darker than in *ochracea* and allies.

***Acraga obscura* Schaus.**

Dalcera obscura Schaus, Journ. N. Y. Ent. Soc., iv, 57, 1896.

The single type is before me from São Paulo, Brazil. I did not have this species for examination in 1898. It is still darker than *meridensis*, similarly brown and unicolorous.

***Acraga angulifera* Schaus.**

Acraga angulifera Schaus, Proc. U. S. Nat. Mus., xxix, 332, 1906.

From French Guiana. A delicate, prettily marked species, unlike any other in the genus.

***Acraga leberna* Druce.**

Dalcera leberna Druce, Proc. Zool. Soc. Lond., 505, 1890.

Dalcera leberna Kirby, Cat. Lep. Het., 542, 1802.

Described from Ecuador. Two specimens are before me from French Guiana, one of which was determined as *leberna* by Mr. Druce. In the original description the color is said to be creamy white, whereas the present specimens are distinctly yellow. I have no specimens from Ecuador, though I suspect that the two forms are not the same. The manuscript name *arcifera*, which is attached to one of the specimens, may be used for the Guiana specimens, at least as a racial designation.

***Acraga umbrifera* Schaus.**

Epipinconia umbrifera Schaus, Proc. U. S. Nat. Mus. xxix, 333, 1906.

Also from French Guiana and allied to the preceding. The color of this is really creamy white, but the brown markings are broadened and shaded, which will distinguish it from *leberna*. The occurrence of these two allied species in French Guiana inclines me the more to consider that the form called *arcifera* above is not the same species as the true *leberna*.

***Acraga caretta* Dyar.**

Acraga caretta Dyar, Proc. U. S. Nat. Mus., xxxviii, 268, 1910.

This species is white, without a trace of the yellow color. The dark markings have become nearly marginal. This is apparently allied to *Dalcera ampela* Druce and *D. alba* Druce, but both these species are unknown to me in nature and may not even be congeneric with the present form.

***Acraga flava* Walker.**

Dalcera flava Walker, Cat. Brit. Mus., v, 1107, 1855.

Caviria sulphurea Burmeister, Desc. Rep. Arg., v, 517, 1878.

Dalcera flava, Burmeister, Desc. Rep. Arg., Atlas, 53, pl. xxiv., fig. 3, 1879.

Caviria sulphurea Kirby, Cat. Lep. Het., 434, 1892.

Dalcera flava Kirby, Cat. Lep. Het., 542, 1892.

Epipinconia flava Dyar, Journ. N. Y. Ent. Soc., vi, 233, 1898.

Described from Rio Janeiro. My specimens are from Petropolis and from Castro, in the State of Parana, Brazil. The species is bright sulphur-yellow, but is peculiar in having numerous transverse shining bands, due to the scales being set at different angles on the wing. No other dalcerid known to me has any such appearance, though it occurs in the megalopygid genus *Carama* and in the liparid genus *Caviria*. Burmeister gives the following notes upon the larva:

Mon fils Henri l'a obtenu de la chenille et m'écrit que la chenille a presque un pouce le long, qu'elle est plane en dessous, légèrement convexe en dessus et couverte de plusieurs séries de verrues coniques gélatineuses qui tombent quand on les touche, même avec la plus grande précaution. Le corps de la chenille est vert. Les verrues ont la transparence du verre, elles sont incolores, et formées par une exudation de la surface du corps, sans avoir avec lui un contact parfait.

The statement that the appendages are formed by an exudation from the surface of the body appears to me to be probably a wrong interpretation of the structures. More probably we have to do with a further development of the peculiar modification of the subdorsal horns seen in the cochlidian genera *Phobetron*, *Alarodia*, and *Isochaetes*. I have shown how these appendages, which are only modifications of the subdorsal warts, become in these genera successively more and more detachable, culminating in *Isochaetes*. This larva is already green and the horns transparent, like glass, so that it only needs a little further modification, by the loss of the hairs, to produce the larva above described. It is unfortunate that no larvæ are available to test the above hypothesis.

DALCERIDES Neumogen & Dyar.

Dalcerides Neumoegen & Dyar, Can. Ent., xxv, 121, 1893.

Dalcerides Dyar, Journ. N. Y. Ent. Soc., vi, 232, 1898.

Dalcerides Dyar, Bull. 52, U. S. Nat. Mus., 359, 1903.

Dalcerides ingenita Hy. Edwards.

Artaxa ingenita Hy. Edwards, Papilio, ii, 12, 1882.

Dalcerides ingenita Neumoegen & Dyar, Journ. N. Y. Ent. Soc., ii, 111, 1894.

Dalcerides ingenita Dyar, Bull. 52, U. S. Nat. Mus., No. 4113, 1903.

I have a nice series from Baleas, Guerrero, Mexico, 1,500 feet, August, 1906 (W. Schaus), and a single little male from Guadalajara, Mexico. Both sexes are in the series, the females being a little larger and paler than the males and with the antennal pectinations not so long. I have also a specimen from Palmerly, Cochise County, Arizona, August (C. Schaeffer), and crippled specimens with pupæ, food-plant, and flimsy yellow cocoons from Payson, Arizona (C. Reedy), but unfortunately no larvæ.

ANACRAGA Dyar.

Anacraga Dyar, Proc. U. S. Nat. Mus., xxix, 176, 1906.

Anacraga citrina Schaus.

Dalcera citrina Schaus, Journ. N. Y. Ent. Soc., iv, 57, 1896.

The type is a male from Trinidad. There are seven other males and a female in the collection from the Guianas. The entire insect is of a very pale yellow.

Anacraga ria, new species.

Entirely ocher yellow. Expanse, 18 mm.

One male, Rio Janeiro, Brazil (Schaus collection).

Type: No. 13058, U. S. National Museum.

If this should prove to be the true *Dalcera ochracea* of Walker (*Acraga ochracea*) the present name would be a synonym thereof, while the name *Pinconia ochracea* Moore would be resurrected from the synonymy as *Acraga ochracea* Moore.

Anacraga mesoa Druce.

Dalcera mesoa Druce, Biol. Cent.-Am. Lep. Het., i, 213, 1887.

Dalcera mesoa Kirby, Cat. Lep. Het., 542, 1892.

Dalcerides mesoa Dyar, Journ. N. Y. Ent. Soc., vi, 232, 1898.

I have specimens from Orizaba and Jalapa, Mexico. The fore wing is nearly occupied by a large purplish-brown patch.

Anacraga sofia Dyar.

Anacraga sofia Dyar, Proc. U. S. Nat. Mus., xxxviii, 268, 1910.

I have only the female type from Cuernavaca, Mexico. It is a small, pale, cream-colored species with discal and submarginal faint brown bands and a darker discal dot.

ACRAGOPSIS Dyar.

Acragopsis Dyar, Proc. U. S. Nat. Mus., xxix, 176, 1906.

Acragopsis flavetta Schaus.

Acragopsis flavetta Schaus, Proc. U. S. Nat. Mus. xxix, 332, 1906.

Four males, all from French Guiana. The species is uniformly rather dark yellow.

MINONOA Dyar.

Minonoa Dyar, Proc. U. S. Nat. Mus., xxix, 176, 1906.

Minonoa perbella Schaus.

Minonoa perbella Schaus, Proc. U. S. Nat. Mus., xxix, 332, 1906.

A distinctly marked and pretty species. I have only the type from Petropolis, Brazil.

MINACRAGIDES Dyar.

Minacragides Dyar, Zoologica, i, 137, 1910.

Minacragides arnaxis Dyar.

Minacragides arnaxis Dyar, Zoologica, i, 137, 1910.

The single type before me is from British Guiana.

MINACRAGA Dyar.

Minacraga Dyar, Proc. U. S. Nat. Mus., xxix, 176, 1906.

Minacraga disconitens Schaus.

Minacraga disconitens Schaus, Proc. U. S. Nat. Mus., xxix, 331, 1906.

Six males and a female from French Guiana. The disk of the fore wing is shining silvery. The antennæ are creamy white with a black tuft at the tip. The wings are marked with a distinct pattern.

Minacraga indiscata, new species.

Similar to *M. disconitens*. The wing has none of the silvery scaling on the disk, but is overspread with pale brown, while the marginal markings are faint. Discal dot present. Hind wing pale brownish with a faint darker shading below the middle of the outer margin. Expanse, 27 mm.

One male, St. Jean, Maroni River, French Guiana, July, 1904 (W. Schaus). Another male is in the collection of Mr. Paul Dognin from Nouveau Chantier, French Guiana, December (Le Mout).

Type: No. 13060, U. S. National Museum.

PARACRAGA Dyar.

Paracraga Dyar, Proc. U. S. Nat. Mus., xxix, 176, 1906.

Paracraga innocens Schaus.

Paracraga innocens Schaus, Proc. U. S. Nat. Mus., xxix, 331, 1906.

Four males and a female from French Guiana. A delicately marked and frail species.

Paracraga amianta Dyar.

Paracraga amianta Dyar, Zoologica, i, 137, 1910.

The single type is from British Guiana. The species is more strongly marked and less frail-looking than the preceding.

Paracraga canalicula Dognin.

Paracraga canalicula Dognin, Het. nouv. de l'Amer. du sud, i, 42, 1910.

I have examined Dognin's unique type. The species is a distinct one, with the two parallel lines not wavy.

THE STRIDULATIONS OF SOME CONE-HEADED GRASSHOPPERS (CONOCEPHALUS).*

[Orthoptera; Locustidæ.]

BY H. A. ALLARD.

(Plate VI.)

The number of species of *Conocephalus* in any particular locality is never large. In their occurrence the individuals of any species are usually widely scattered, and not more or less grouped into colonies as are the orchelimums. These interesting locusts prefer the tall grasses and reeds of meadows, although some species occur in grass, briers, etc. As is characteristic of nearly all our Locustidæ, green or brown is the usual coloration of the cone-headed grasshoppers. It is highly probable that these colors are largely of a protective nature to these insects, since everywhere their natural habitat is among

*All the locusts listed in this paper were identified by Mr. A. N. Caudell, of the U. S. National Museum, except *Conocephalus ensiger*.



1910. "Notes on the family Dalceridae." *Proceedings of the Entomological Society of Washington* 12, 113–121.

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