NOTES ON THE GENUS DYSDERCUS (HEMIPTERA-HETEROPTERA) IN TRINIDAD, B. W. I.

BY E. O. PEARSON

The work on which this paper is based was carried out partly at the Imperial College of Tropical Agriculture, Trinidad, between February and June, 1930, and partly at the Museum of Comparative Zoölogy, Harvard University, during the present year. The author is indebted to these two institutions and also to the United States National Museum for access to their collections, and to Mr. W. E. China, of the British Museum, for assistance and advice with regard to the identification of the species.

The first record of the genus from Trinidad is contained in Ballou's (1906) paper on the West Indian Cotton Stainers, in which he describes a new species, *Dysdercus howardi,* and its variety, *D. howardi* var. *minor,* from material collected in the island.

D. howardi var. *minor* has recently been synonomized with *D. ruficollis* L. by Hussey (1929) and in the same paper *D. andreæ* L. is recorded from the island. The latter error is apparently based on a reference by Myers (1927) to this species in the Trinidad Mountains of Cuba. Apart from a number of papers dealing with the life history and bionomics of the genus from an economic point of view (Guppy and Thornton, 1911; Urich, 1916; Withycombe, 1924; Hewison and Symond, 1928) no further work has been done on the nature of the species occurring in the island.

There are, in point of fact, four well marked species in the island and in view of the fact that in certain cases these species have been inadequately described and that in every case an examination of the material in the collections mentioned above has shown the distribution of these spe-

cies to be considerably wider than that previously recorded, these have been re-described below.

Dysdercus howardi Ballou

Dysdercus howardi Ballou, West India Bull., VII, 69 (1906).[1]

The head, except the black eyes, antennæ, except the piceous terminal joint with a basal eburneous ring, rostrum, except the piceous terminal joint, anterior callus and lateral flanges of the pronotum, episterna, each margined anteriorly with a fine black line, legs, except the black distal joints of the tarsi, ferruginous (5'i-7'i-9'i) * the upper surface of a redder tone than the lower; the posterior disc of the pronotum pale luteous (21"d), margined anteriorly with a very fine impressed black line, posteriorly with a narrow black fascia which is itself narrowly albido-limbate; the scutellum fulvous (13'-13'i); the hemelytra luteous (19"), membrane black, the apex narrowly albidolimbate; the anterior collar of the pronotum, margined posteriorly by a fine impressed black line, the epimera and the acetabula, eburneous; the abdominal sternites pale luteous, frequently with a greenish tinge (21"d-23"d-25'"d), margined anteriorly on the second to sixth visible abdominal sternites with a narrow black line, broader on the posterior segments, the fifth and sixth sternites of the male with a fulvous band (13') covering all but the extreme posterior margin.

The anterior collar and posterior disc of the pronotum, the clavus and the corium, thickly punctate; the epimera and acetabula more sparsely punctate, the rest of the body impunctate.

The rostrum reaching in the female to the middle, in the male to the posterior margin of the second visible abdominal sternite.

The male parameres with two spurs projecting downwards toward the ventral surface; the distal one projecting

* In order to define these colors more exactly the specimens have been compared with the plates in Ridgeway's "Color Standards and Color Nomenclature" (1912), to which these numerals and letters refer. The words used to describe the colors, however, are those in common use and do not refer to Ridgeway's names.

nearly twice as far as the proximal one, narrow, cylindrical, acute, perpendicular to the axis of the paramere; the proximal one in the same plane, broad at the base, the apex forming a backwardly directed hook; the shaft of the paramere with a lateral flange arising from the outer ventral surface; the distance between the tips of the spurs roughly twice as great as that between the tip of the proximal spur and the apex of the lateral flange.

Length, from the apex of the clypeus to the tip of the membrane of the hemelytra: ♀ ♀ 12.5-15.0 mm. ♂ ♂ 11.5-12.5 mm.

Maximum breadth of the pronotum: ♀ ♀ 3.4-3.8 mm. ♂ ♂ 3.0-3.4 mm.

These measurements were made on only seven specimens; from measurements made in Trinidad on a longer series it appears that the limits of size are greater than those indicated above.

Localities: Trinidad, B. W. I.[1]
British Guiana (Georgetown).
Brazil (Bonito, Prov. Pernambuco; Natal).

The color is subject to some variation. In some specimens from Trinidad the head, disc of the pronotum, scutellum and hemelytra, except the extreme costal margin, are more or less infuscate, the antennæ, rostrum and legs being castaneous, verging at their apices to black. Occasionally a faint fuscous spot is developed towards the inner angle of the corium and the infuscation on the head and pronotum may take the form of irregular patches. Specimens from British Guiana follow the same course of variation. Those from Brazil are somewhat smaller than the above, more deeply infuscate and sometimes have the head completely black. The shape of the parameres, however, is a sure guide to the identity of the specimen.

Specimens of *D. discolor* Walker from the Lesser Antilles have parameres which differ only very slightly from those of *D. howardi* and whilst in general the coloration of this species is distinct, it is of interest to find that specimens, particularly from those islands closest to Trinidad, (Grenada, Bequia, St. Vincent and St. Lucia), occasionally are found in which the usual sanguineous suffusion is lack-

ing, these specimens in color approaching very closely to Ballou's species. *D. discolor* Walk. and *D. howardi* Ballou are thus evidently very closely related species, derived from a common South American continental stock and exhibiting progressive differentiation as they are followed up the line of the Lesser Antilles.

In Trinidad this species has been found feeding and breeding on the seeds and unopened bolls of all varieties of cultivated cotton, on the local "wild" cottons *(Gossypium purpurascens* and *G. peruvianus),* on the seeds of the ripe pods of the silk cotton tree, *Eriodendron anfractuosum,* on the capsules of *Hibiscus cannabinus* and *Hibiscus sabdariffa,* and on the fruits of *Malachra capitata* and *Thespesia populnea.*

Dysdercus maurus Distant

Dysdercus maurus Distant, Trans. Ent. Soc. Lond., 590 (1901).[1]

Dysdercus howardi var. *minor* Ballou, West India Bull. VII, 70 (1906).[2]

Dysdercus howardi var. *minor* Ballou=*Dysdercus ruficollis* L., Hussey, Gen. Cat. Hem., Fasc. III, 101 (1929).

The head above, antennæ, except the basal eburneous ring of the terminal joint, rostrum, except the castaneous base, and legs, black; the anterior callus and lateral flanges of the pronotum ferruginous (5'i); the posterior disc of the pronotum pale luteous (21"d), margined anteriorly by a very fine impressed black line and posteriorly by a broader black line, which is itself posteriorly narrowly albido-limbate; the abdominal sternites pale luteous, sometimes with a greenish tinge (21"d-23"d-25'"d), the second to sixth visible sternites with a very narrow black anterior margin, finer on the discal region and broader as a whole on the posterior sternites; the head below, the episterna, each margined anteriorly by a fine black line, coxæ and trochanters, lateral flanged margin of the abdomen, the whole of the fifth and the anterior half of the sixth visible abdominal sternite in the male, fulvous (13'-13'i); the anterior collar of the pronotum, margined posteriorly by a fine impressed black line, the epimera and the acetabula, eburneous; the hemelytra, except the extreme costal mar-

gins, which are luteous, deeply infuscate, with a small spot towards the inner angle of the corium, accompanied by a streak following the course of the radial vein, black; the membrane black, the apex narrowly albido-limbate.

The anterior collar and posterior disc of the pronotum, the epimera and acetabula, sparsely punctate; the clavus and the corium thickly punctate; the rest of the body impunctate.

The rostrum reaching to the posterior margin of the second visible abdominal sternite.

The male parameres with two spurs projecting downward toward the ventral surface, both short, of approximately equal length, obtuse, cylindrical, the distal one perpendicular to, the proximal one forming an acute angle with the axis of the paramere, the shaft of the paramere with a strongly dorsally reflected flange arising from the outer ventral surface, the distance between the tips of the spurs roughly equal to that between the tip of the proximal spur and the apex of the lateral flange.

Length, from the apex of the clypeus to the tip of the membrane of the hemelytra: ♀♀ 9.5-12.5 mm. ♂♂ 7.5-11.5 mm.

Maximum breadth of the pronotum: ♀♀ 2.5-3.1 mm. ♂♂ 2.0-3.0 mm.

Based on measurements of a series of thirty-five specimens from Trinidad.

Localities: Trinidad, B. W. I.[2]
Brazil (Quipapa, Pernambuco;[1] Joazino, Queimada and Portello, Bahia; Paô d'Assucon; Campinas; Ceara Mirim; Independencia; Natal).
Colombia (Cali; Santa Marta).
Argentine (Tucuman).

The color of this species is exceedingly variable. In the pallid forms the head, rostrum, antennæ, legs, posterior disc of the pronotum, scutellum, clavus and corium are identical in color with the same parts of the body of *D. howardi* Ballou, which they also approach in size. They may be distinguished from the latter species by the relatively narrower anterior black margins to the abdominal

sternites and very readily by the male parameres. These pallid forms appear to be characteristic of the species as it occurs in Trinidad, but every grade of color exists between such forms and the extreme melanic type, which differ from the description given above in that the entire posterior disc of the pronotum and the hemelytra are black. The specimens from Brazil correspond more closely than those from Trinidad with the description given by Distant, the abdomen below being uniformly of a pale luteous color with no trace of a greenish tinge, while the episterna, coxæ and maculæ of the two posterior abdominal sternites in the male are pale ochraceous (15'b) and not fulvous.

D. maurus has some affinities with *D. howardi* in the shape of the parameres as well as in the color of the more pallid forms and the two species are also related in the same manner to two distinct but undescribed species occuring in Brazil, Paraguay, Bolivia and the Argentine Republic. The four species form a complex which, judging from the synonomy and from a number of incorrectly determined specimens, has long been confused with *D. ruficollis* L. I have not had the opportunity to examine any type material of Linné's species, but there can be little doubt that Fabricius' species *Lygæus annulus* (1803) is a color form of Linné's species. This fact is placed beyond reasonable doubt by Stäl's statement (1866) that *L. annulus* Fabr. is a variety of *D. ruficollis* L. with the hemelytra distinguished by a black hinderpart or a black fascia.

I have examined Linnaeus' type in the Museum of Upsala. The identity of *L. annulus* Fabr. is clear from the figure given by Hahn (1834) for *Pyrrhocoris annulus*=*L. annulus* Fabr., which is distinguished by the shape of the pronotum and by the fact that the transverse impressed line between the anterior callus and the posterior disc of the pronotum is not straight, as in most species, but has an anteriorly directed nick on the mid-dorsal line.

D. ruficollis L. would be intermediate between Hahn's vars. *b* and *c*, having the black head of the former and the immaculate hemelytra of the latter. I have examined a number of specimens, some of them already determined as *D. annulus* Fabr. by Uhler, and I am satisfied that these

represent the true *D. ruficollis* L. and its synonyms, *D. annulus* Fabr. and *D. fulvo-niger* DeGeer. These all possess characteristic and identical genitalia, distinct from those of other New World species. All these specimens have a basal eburneous ring to the terminal joint of the antennæ, as in the original descriptions and since this character appears to be of first class taxonomic value in the genus it is impossible to accept the statements of Burmeister (1835), Stäl (1870) and Distant (1883) to the effect that specimens of *D. ruficollis* L. sometimes occur in which the terminal joint of the antenna is unicolorous. Distant, in particular, appears to have been very much in doubt as to the identity of the species, for in Biologia Centrali Americana, Hemiptera-Heteroptera, Vol. I, Tab. XXI, he figures as *D. ruficollis* L. a specimen of *D. mimus* Say (fig. 20) and a pallid color form of *D. flavolimbatus* Stäl (fig. 19), while nineteen years later (Distant, 1902) he describes as a new species, *D. clarki,* what is apparently none other than a somewhat melanic specimen of the true Linnean species *D. ruficollis.*

D. maurus Dist. differs little in its bionomics in Trinidad from *D. howardi* Ballou. It occurs on the same food plants, usually in smaller numbers than the larger species, although at times it is more numerous.

It would appear, from Withycombe's reference (1924) to a small, dark or otherwise aberrant form of *D. howardi* and also from a number of specimens identified by him in the Coll. Imperial College of Tropical Agriculture, that he considered *D. maurus* to be merely a seasonal or diet-produced phase of *D. howardi.* The characteristic genitalia, however, show that this is not the case.

Dysdercus mimus Say

Capsus mimus (excl. vars.) Say, Heter. N. Harm. 20 (1832).[1]

Dysdercus albidiventris Stäl, O. V. A. F. XI, 236 (1854).[1]

Dysdercus lunulatus Uhler, Proc. Ent. Soc. Phila. I, 24 (1861).[1]

Dysdercus albidiventris Uhler, Bull. U. S. Geol. Geogr. Surv. I, 314 (1876).[2]

Dysdercus albidiventris Distant, B. C. A. Het., I, 229 (1883).[3]

Dysdercus ruficollis (excl. syn.) Distant, B. C. A. Het., I, 233; Tab. XXI, fig. 20 (1883)

Dysdercus albidiventris Hussey, Bull. Brookl. Ent. Soc., XXII, 235 (1927).

Dysdercus mimus Hussey, Gen. Cat. Hem. Fasc. III, 95 (1929).[4]

The head, except the black eyes, and the anterior callus of the pronotum, ferruginous (8'h), the latter with a slightly yellower tinge than the former; the episterna, coxæ, femora, proximal joints of the rostrum and the maculæ covering, in the male, the anterior part of the disc of the fourth, the greater part of the fifth and the anterior half of the sixth visible abdominal sternites, and in the female the anterior half of the fourth, fifth and sixth visible abdominal sternites, orange-ferruginous (11'i); the posterior disc and lateral flanges of the pronotum, the clavus and the corium, luteous (17"); the abdominal sternites pale luteous (21"d); the anterior collar of the pronotum, margined posteriorly by a fine impressed black line, the epimera and acetabula, eburneous; the antennæ, scutellum, distal joints of the legs and rostrum, the very narrow anterior margins to the second to sixth visible abdominal sternites, and the membrane, black, the last named narrowly albido-limbate at the apex.

The clavus and corium thickly punctate, the anterior collar and posterior disc of the pronotum, the epimera and the acetabula, more sparsely punctate, the rest of the body impunctate.

The rostrum reaching the posterior margin of the second visible abdominal sternite.

The male parameres with two spurs projecting downward toward the ventral surface; the distal one perpendicular to the axis of the paramere, dorso-ventrally flattened, tapering to a point; the proximal one in the same plane as and with its distal edge parallel to the distal one, but broader, laterally flattened and with the apex forming an

acute, sharply recurved hook, and with a tooth on the proximal edge which is transverse and chisel-like; the shaft of the paramere with a dorsal longitudinal ridge and a lateral flange arising ventrally on either side, the inner one prominently projecting; the axis of the proximal spur roughly midway between that of the distal spur and the anterior margin of the inner lateral flange of the shaft.

Length, from the apex of the clypeus to the tip of the membrane of the hemelytra: ♀ ♀ 10.5-13.0 mm. ♂ ♂ 8.0-10.5 mm.

Maximum breadth of the pronotum: ♀ ♀ 2.7-3.5 mm. ♂ ♂ 2.1-2.8 mm.

Redescribed from material collected in Trinidad, 1930.

Localities: U. S. A. (Arizona,[4] California,[2,4] Texas[2,4]).
British Guiana (Georgetown).
Mexico[1,4] (Tampico, Vera Cruz).
Guatemala[3,4] (Alta V. Paz, Ayutla, Los Amates).
Honduras[4] (La Ceiba, Tegucigalpa).
Salvador.
Nicaragua.[3,4]
Costa Rica.[3,4]
Panama[2,3,4] (Ancon and Mt. Hope, C. Z.).
Colombia[4] (Aracataca, Santa Marta).
Ecuador[4] (Chimbo).
Bolivia (Prov. Sara).
Brazil (Igaripe and Manaos, Amazonas; Para).
British Guiana (Georgetown).
Venezuela (Cumaragua).
Trinidad, B. W. I.
Cuba (Santiago de las Vegas).

The variation amongst Trinidad specimens is not striking, running usually towards the production of smaller, more sordid forms, in which the color of all parts of the body is infuscate, this infuscation on the posterior disc of the pronotum occasionally taking the form of an irregular patch. The specimens examined from Cuba, Colombia, Venezuela, British Guiana, Bolivia and Brazil are similar

to those from Trinidad. Specimens from Panama are usually larger in size, with a more pallid coloration, little infuscation, the membrane brownish and the scutellum frequently yellowish and not black. Possibly they represent a distinct geographic race. I have been fortunate in being able to examine a long series from the same locality in Guatemala (23 ♀ ♀ and 34 ♂ ♂), in which every shade of variation occurs between specimens which are identical with those from Trinidad, with the hemelytra immaculate, and specimens which agree with the descriptions given by Say (1832) and Stäl (1854), having the whole posterior disc of the pronotum infuscate and a large, inwardly directed, black fascia on the corium.

Specimens from Mexico, Honduras, Salvador and Costa Rica follow the same course of variation, while in a number of specimens from Ecuador the fascia on the corium covers the whole of the apex.

All these different color varieties share the characteristic parameres described above and may be recognized on superficial examination by the unicolorous antennæ, the fact that the lateral flanges of the pronotum are luteous and not, as is usually the case, the same color as the anterior callus, by the infuscation of the discs of the posterior abdominal sternites in the female and usually by the black scutellum. It may be remarked that forms of *D. mimus* Say with the hemelytra immaculate may be difficult to distinguish from similarly pallid forms of *D. mimulus* Hussey, but it is possible to do so from the fact that *D. mimulus* rarely has the disc of the pronotum immaculate, there being usually a sharply defined posterior black margin, whereas in *D. mimus* the black fascia, where it occurs, merges indefinably into the paler color. Moreover, in *D. mimulus* the black anterior margins to the abdominal sternites are relatively broader and more sharply defined than in *D. mimus*.

An examination of the male parameres, of course, reveals the nature of a doubtful specimen immediately.

In Trinidad this species is found feeding and breeding on the same plants as support the two preceding species, but it is distinguished by its penchant for the low-lying

weeds of the genus Sida (Malvaceæ), which are common along the sides of roads and traces and in other rather exposed and dusty situations. With the exception of one occasion on which a number of migrants of *D. maurus* Dist. were found, *D. mimus* was the only species ever taken on Sida and indeed it was unusual to find an association of these plants which did not support a small colony of the species.

D. mimus is a much rarer species in Trinidad than either *D. howardi* or *D. maurus*.

Dysdercus fernaldi Ballou

Dysdercus fernaldi Ballou, West India Bull., VII, 68 (1906).[1]

The head, antennæ, except the basal eburneous ring of the ultimate joint, rostrum, legs, anterior callus and lateral flanges of the pronotum, rufous (9'); the color of the lateral flanges encroaching onto the sides of the posterior disc of the pronotum, which is pale luteous (21"d), with a sub-basal fuscous margin, itself posteriorly narrowly albido-limbate; hemelytra buff-yellow (19"d): abdominal sternites, epimera, acetabula and the pronotal collar, eburneous; scutellum, episterna, the lateral flanged margins, the incisures, very narrowly, the whole of the fifth and the anterior half of the sixth visible sternites of the abdomen, orange-rufous (11'); the membrane fuscous, narrowly albido-limbate.

Clavus and corium thickly punctate, anterior collar and posterior disc of the pronotum, epimera and acetabula, more sparsely punctate, rest of the body impunctate.

Rostrum reaching to the middle, if not to the posterior margin of the third visible abdominal sternite.

The male parameres with the shaft in the form of a prism, of which the ventral surface is hollowed out and the dorsal ridge is extended distally to form a long, downward curving, cowl-shaped structure, of which the outer edge is toothed like a saw and bears at the proximal end a long, curved spine.

Length, from the apex of the clypeus to the tip of the membrane of the hemelytra X Maximum breadth of the pronotum:

Grenada	♂ ♂	10.5-11.5 mm. X 2.8-2.9 mm.
	♀	12.5 mm. X 3.0 mm.
Trinidad	♂	11.8 mm. X 2.9 mm.
Brazil	♂	11.8 mm. X 2.8 mm.
	♀ ♀	10.0 - 12.0 mm. X 2.6 - 3.0 mm.
Colombia	♂	14.0 mm. X 3.7 mm.
Bolivia	♂ ♂	12.2 - 14.0 mm. X 2.8 - 3.7 mm.
	♀ ♀	13.0 - 14.0 mm. X 3.3 - 3.7 mm.

I have been able to examine so small a number of specimens that I have not felt justified in giving an average figure for the above measurements.

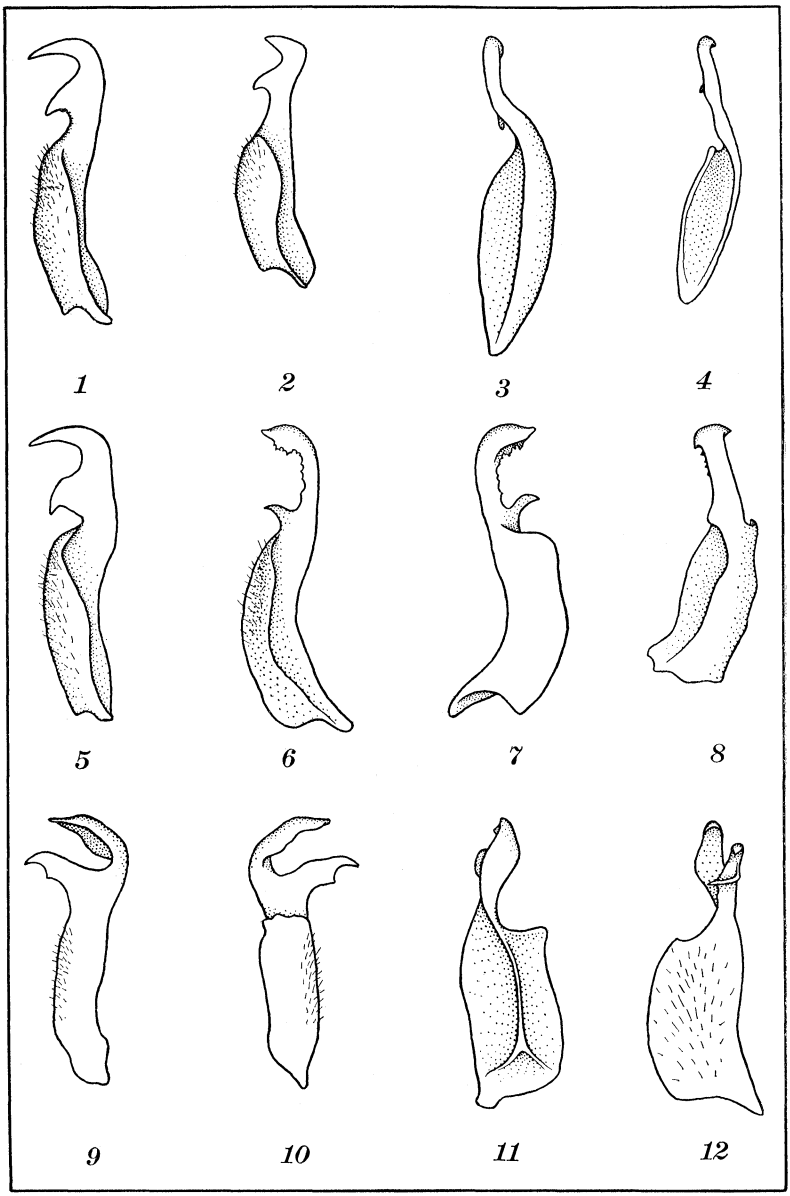
Localities: Grenada, B. W. I.[1]
Trinidad, B. W. I.
Colombia (Cali).
Peru (Chanchamayo, Lucma).
Brazil (Manaos; Para; Porto Velho, Matto Grosso; Rio de Janeiro).
Bolivia (Prov. Sara).
Argentine (Tucuman).

The specimens from Grenada, all of which correspond very closely with the type specimen in the U. S. N. M., are of a richer color than that described above, which is based on a single male specimen from Trinidad in the M. C. Z., Harvard University. In Grenadan specimens the head is a clearer red (7), the hemelytra orangeochraceous (14'), the posterior disc of the pronotum more or less suffused with black, the legs and antennæ verging castaneous distally, the apical angle of the corium suffused with black and the incisures of the abdomen frequently narrowly black.

The Brazilian specimens are identical with the one from Trinidad.

The specimens from other parts of South America are larger than the preceding and show some distinctions in the color, being generally of a duller shade and having, in some cases, broader black fasciæ where in the specimens described above such fasciæ are very pale and narrow. They possess, however, the very characteristic parameres in an unmodified form and share with specimens from the type locality the peculiarity that the reddish color of the anterior callus and lateral flanges of the pronotum en-

Psyche, 1932 VOL. 39, PLATE 4.



Pearson—Dysdercus

croaches onto the sides of the posterior disc. They have therefore been regarded as belonging to Ballou's species, the range of which is thus considerably amplified.

I did not, to my knowledge, take this species in Trinidad and can therefore give no information as to its food plants. There is, however, a single male in the Coll. M. C. Z. from Port of Spain, Trinidad and no doubt the similarity in coloration to *D. howardi* and pallid specimens of *D. maurus* has caused it to be overlooked by collectors. I understand, nevertheless, that even in Grenada it is rare.

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EXPLANATION OF PLATE 4.

1. *D. howardi* Ballou (Trinidad). Right paramere, right side.
2. *D. maurus* Distant (Trinidad). Right paramere, right side.
3. *D. discolor* Walker (Grenada). Right paramere, dorsal surface.
4. *D. maurus* Distant (Mirim Ceara, Brazil). Right paramere, dorsal surface.
5. *D. discolor* Walker (Grenada). Right paramere, right side.
6. *D. fernaldi* Ballou (Trinidad). Right paramere, right side.
7. *D. fernaldi* Ballou (Trinidad). Right paramere, left side.
8. *D. fernaldi* Ballou (Grenada). Right paramere, dorsal surface.
9. *D. mimus* Say (Trinidad). Right paramere, right side.
10. *D. mimus* Say (Trinidad). Right paramere, left side.
11. *D. mimus* Say (Guatemala). Right paramere, dorsal surface.
12. *D. mimus* Say (Honduras). Right paramere, ventral surface.

All approximately 40 times natural size, drawn with camera lucida under low power of microscope.