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TWO NEOTROPICAL DERBID GENERA
WITH OBSERVATIONS ON WING ROLLING
(FULGOROIDEA, HOMOPTERA)

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ABSTRACT

Dawnarioides hispaniolus n. sp. from the Dominican Republic, and a new genus, *Neodawnaria*, with 4 new species, *woldai* from Panama, *jamaicensis*, *ecuadorensis*, and *hondurensis*, are described.

Changes are made in Fennah's (1952) key to the genera of Cenchreini to adapt it to the New World only, with *Dawnarioides* placed differently, *Neodawnaria* added, and *Phrygia* (Achilidae) deleted. Also added is *Ipsnola*

Signoret, a monotypic genus from Chile, formerly placed in Achilidae or Cixiidae. A catalog of new world Cenchreini is included.

Longitudinal wing rolling is described and postulated to be a wing-strengthening device for adaptation to life in rain forests.

RESUMEN

Se describen *Dawnarioides hispaniolus* sp. n. de la República Dominicana y un género nuevo, *Neodawnaria*, con 4 especies nuevas: *woldai* (de Panama), *jamaicensis*, *ecuadorensis*, y *hondurensis*.

Se adapta la clave de Fennah de 1952 para los géneros de Cenchreini, para uso exclusivo en America, con *Dawnarioides* colocado en forma diferente; se agrega *Neodawnaria*, gen., n; y se elimina *Phrygia* (Achilidae). Se agrega también *Ipsnola* Signoret, un género monotípico de Chile colocado previamente en Achilidae o Cixiidae. Se incluye un catalogo de los Cenchreini americanos.

Se describe el enrollamiento longitudinal de las alas, que se postula como un mecanismo de refuerzo de las mismas para adaptación a la vida en los bodques tropicales humedos (rain forests).

During a collecting trip to Puerto Rico I observed the unusual longitudinal wing rolling of *Dawnarioides sordidulus* (Muir) discussed below. On a subsequent trip to Panama I discovered a new species of a new genus with the same habit. Searching through collections produced 4 more new species which are described here. In trying to place the genus I found it advantageous to modify Fennah's (1952) world key to the Cenchreini to cover the New World and to prepare a catalog of the 68 species (excepting *Cedusa*) known from Latin America and the West Indies (through The Zoological Record 1978).

In addition to including *Neodawnaria* in Fennah's (1952) key, several other modifications are necessary. These include recognizing that *Dawnarioides* does not possess a foliaceous subantennal process as stated by Fennah, but only a ridge. *Ipsnola* Signoret is included because the genitalia place it in the Derbidae. This genus, from Chile, was placed in Achilidae by Signoret, and in Cixiidae in Metcalf's (1936) catalog. Since it is not figured elsewhere, I have included an illustration of the frons and the very distinctive venation of the tegmen (Fig. 21, 22). *Phrygia* Stål is deleted because it is an achilid and *Patarella* Fennah (1952: 111) is not included because I consider it a nomen nudum.

The following is a modification of Fennah's (1952) key to include only New World genera. Because he contradicts the key characters in his discussion of the genus¹, in the following treatment I have grouped together those genera that I cannot separate using his key. However, for the convenience of the reader, I have included his couplets to New World genera as couplets 10-16. Couplets 8 and 9 have been prepared using illustrations and descriptions, not specimens.

¹For instance, *Cenchrea*, page 128, couplet 57, is keyed as "medioventral process present on pyrofer": on page 134, line 27 it says "no definite medioventral process is developed". *Cenanges* must key through couplet 56 of the key which says "no demarcated pronotal disc" and couplet 66 "pronotum with an elevated disc bounded by sinuate carinae".

KEY TO NEW WORLD GENERA OF CENCHREINI

1. Subantennal process of gena well developed *Cedusa* Fowler
- 1'. Subantennal process of gena absent or very small 2
- 2(1'). Lateral carinae of vertex pustulate; lateral pronotal carinae and ventral margins of pronotum usually foliate, forming an antennal fovea (except in *Persis* (*Eritalaena*) *fuscinervis* Muir) 7
- 2'. Lateral carinae of vertex not markedly pustulate; antennal fovea lacking 3
- 3(2'). Frons strongly laterally compressed, lateral carinae contiguous (Fig. 9); head broadly rounded anteriorly in lateral view (Fig. 10) 4
- 3'. Frons not laterally compressed, lateral carinae widely separated; vertex angulate with frons, head not rounded anteriorly in lateral view 6
- 4(3). Anterior claval veins markedly pustulate; male with antennae flattened and exceeding length of head *Patara* Westwood
- 4'. Anterior claval veins not pustulate; antennae shorter than head 5
- 5(4'). Cu_2 connected to apex of clavus by crossvein (Fig. 2); in frontal view pronotum 2 x or more wider than high (height measured dorsoventrally from ventral most part of pronotum) (Fig. 3, 5, 7, 9) *Neodawnaria* O'Brien, new genus
- 5'. Cu_2 not connected to apex of clavus by crossvein; in frontal view pronotum less than 2x as wide as high (Fig. 11, 13) *Dawnarioides* Dozier
- 6(3'). Frons subrectangular; vertex without median carina *Goneokarella* Fennah
- 6'. Frons subtriangular; vertex with median carina *Ipsnola* Signoret
- 7(2). Frons moderately broad, flat or slightly convex in dorsal view, not at all concave *Oropuna* Fennah or *Herpis* Stål 8
- 7'. Frons not as above *Cenchrea* Westwood, *Contigucephalus* Caldwell, *Cenanges* Fennah, *Neocenchrea* Metcalf, *Persis* Stål, *Omolicna* Fennah, *Anchimothon* Fennah, or *Phaciocephalus* Kirkaldy 9
- 8(7). Frons with median carina; medioventral lobe of pygofer rounded *Herpis* Stål
- 8'. Frons lacking median carina; medioventral lobe of pygofer subquadrate *Oropuna* Fennah
- 9(7'). Lateral pronotal carinae and ventral lateral margins of pronotum not foliately raised *Persis* Stål subgenus (*Eritalaena*) Fennah
- 9'. Lateral pronotal carinae and ventral lateral margins laminate, forming subantennal fovea 10
- 10(9'). Tegmina with subcostal cell short (not extending basad of claval apex); frons very narrow; a fine transverse carina between vertex and frons; pronotum with a distinct medial disc bounded by carinae 11
- 10'. Tegmina with subcostal cell long, no demarcated pronotal disc ... 12

- 11(10). Medioventral process present on pygofer *Cenchrea* Westwood
 11'. Medioventral process reduced *Contiguicephalus* Caldwell
 12(10'). Tegmina with Sc + R fork distad of Cu₁ fork, latter about
 level with union of claval veins 13
 12'. Tegmina with Sc + R fork basad of Cu₁ fork, latter about
 level with claval apex 14
 13(12). Tegmina with papillate portion of anterior margin equal to
 smooth basal portion (node medial); pygofer with no medio-
 ventral process *Neocenchrea* Metcalf
 13'. Tegmina with papillate portion of anterior margin distinctly
 shorter than smooth basal portion (node distad of middle);
 pygofer with a medioventral process
 *Persis* Stål subgenus *Anapersis* Fennah
 14(12'). Apex of clavus distad of middle of tegmen 15
 14'. Apex of clavus at middle of tegmen; head compressed, but
 not linear; frons widest at distal border *Cenanges* Fennah
 15(14). Frons in middle line at least 3 times as long as broad at
 widest part; anal segment of male very long and narrow
 *Anchimothon* Fennah
 15'. Frons relatively shorter; anal segment of male not as above 16
 16(15'). Frons in middle line more than 2 times as long as broad at
 widest part, tegmina with first M fork basad of claval apex
 *Phaciocephalus* Kirkaldy
 16'. Frons in middle line less than 2 times as long as broad at
 widest part, tegmina with first M fork at level of claval apex
 *Omolicna* Fennah

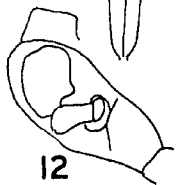
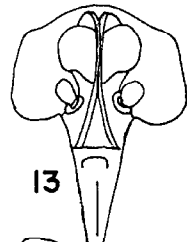
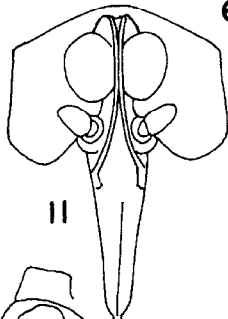
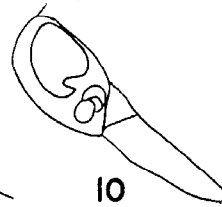
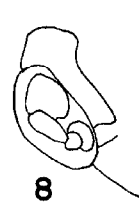
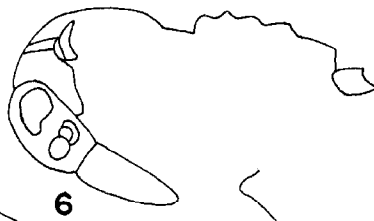
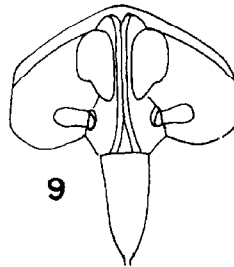
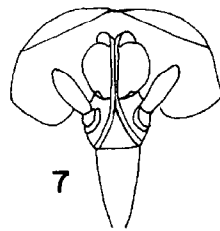
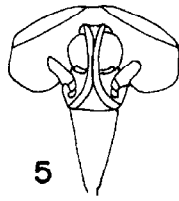
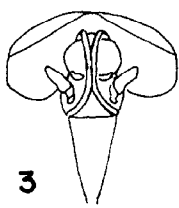
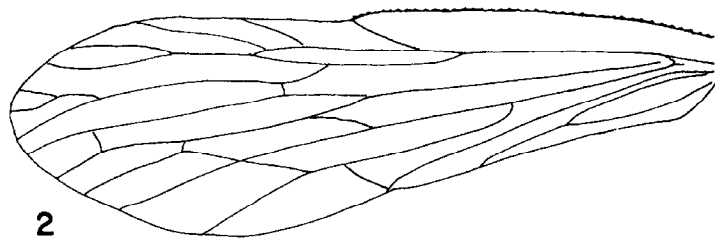
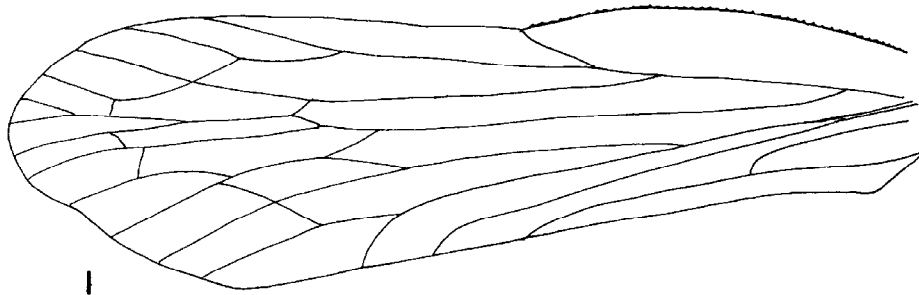
Dawnarioides Dozier

(Fig. 1, 11, 12, 13, 14, 15, 16)

Dawnarioides Dozier. 1929: 1. (Type-species: *sordidulus* (Muir) (*Cyclo-
 kara*), senior synonym of *musae* Dozier).

HISTORY: In 1911 Distant erected the genus *Dawnaria* for a species from Burma. Muir erected *Cyclokara* for 2 species from Borneo in 1913, and added *C. sordidulum* from Puerto Rico in 1918. Metcalf (1938) synonymized *Cyclokara* with *Dawnaria*. Meanwhile, Dozier (1929) erected *Dawnarioides* for his new species *musae* from Puerto Rico. Caldwell (1951) synonymized *D. musae* with *Dawnaria sordidula* (Muir). I have seen both types from the American Museum of Natural History and confirm this synonymy. Fennah (1952) placed *sordidulus* in *Dawnarioides*. I agree with Fennah that the tegminal venation is distinct enough to retain Dozier's genus *Dawnarioides* based on illustrations of tegmina of the species of *Dawnaria*.

SALIENT FEATURES: Short bodied long winged cenchreine derbids, measuring from 2.4-3.3 mm in body length, 4.5-7.0 mm in tegminal length. Head scarcely visible in dorsal view. Vertex not pustulate, curving into frons. Frons laterally compressed, lateral carinae contiguous, diverging at apex. Gena lacking ocellus and subantennal fovea. Antennae small, not exceeding length of face. Pronotum scarcely visible in dorsal view, large when viewed frontally, not modified into antennal fovea. Mesonotum diamond shaped, a



little wider than long. Abdomen laterally compressed. Tegmina elongate, slightly curved (longitudinally rolled when alive), most veins meeting at acute angle. Anterior claval vein not pustulate. Clavus closed. Hind wing .35 length of tegmina.

The characters above apply to *Neodawnaria* as well as *Dawnarioides* except for size. The characters in which they differ are as follows. In *Dawnarioides* pronotum in frontal view less than 2 or more times as wide as high (Fig. 11, 13); gena elongate, about as long as clypeus, with angulate subantennal ridge (Fig. 12, 14); tegmen lacking cross vein between Cu_2 and claval suture, subcostal cell as broad as other cells (except costal), first M fork behind middle of tegmen; the styles with rounded ventral projection as well as dorsal projections; and aedeagus with many spines and spine shaped membranous projections.

KEY TO SPECIES OF *DAWNARIOIDES*

1. Tegmina with white and grayish transverse bands; length less than 7mm.; from Puerto Rico *sordidulus* (Muir)
Tegmina brown, with 5 pale incomplete transverse bands in female, very few in male; 7.5-8.5 mm.; from the Dominican Republic
..... *hispaniolus*, n.sp.

Dawnarioides sordidulus (Muir)
(Fig. 13, 14, 15)

Cyclokara sordidulum Muir 1918: 416

Dawnarioides musae Dozier 1929: 2

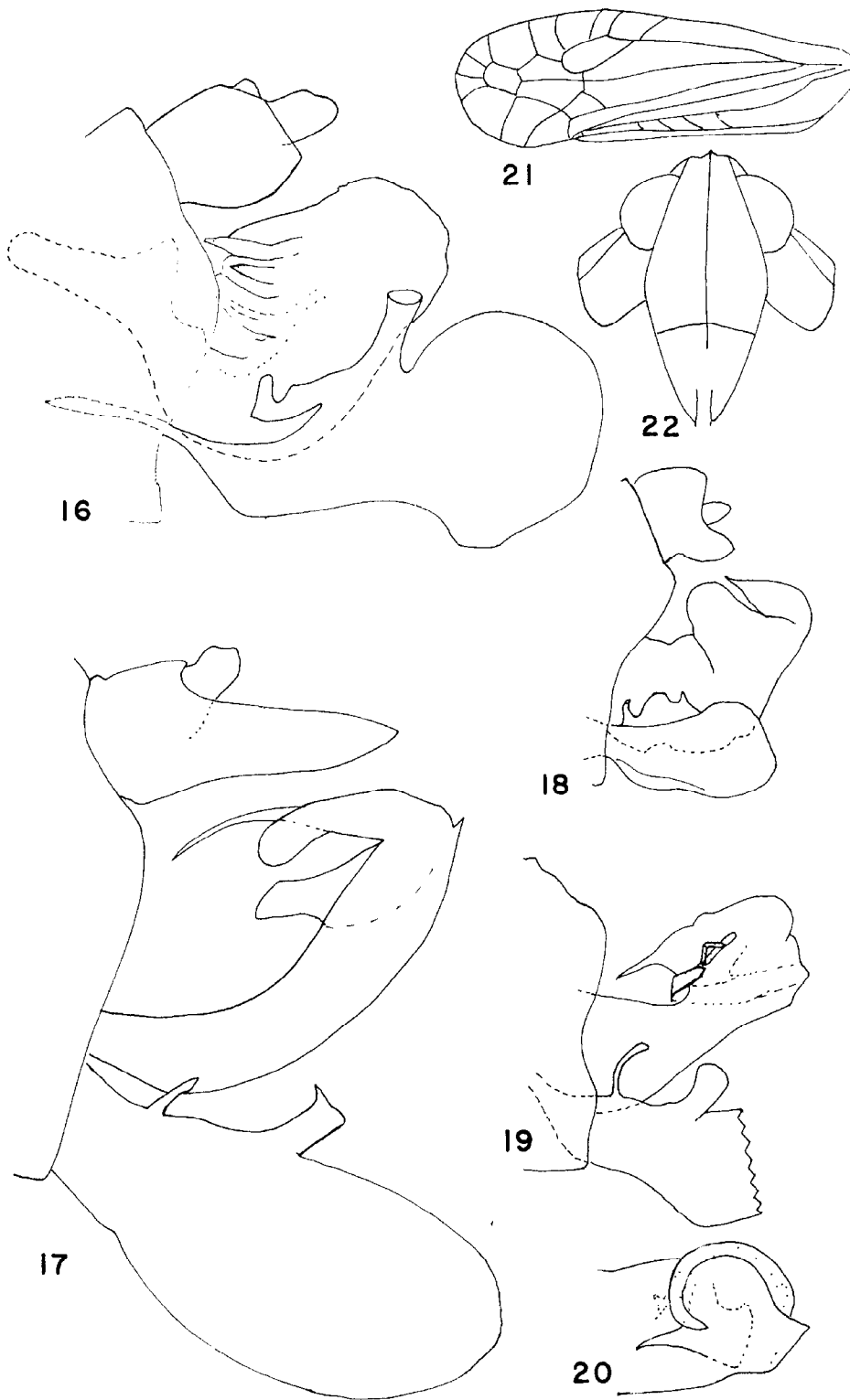
Dozier (1929) and Caldwell (Caldwell and Martorell 1951) each describe and illustrate the wing pattern of this species.

MALE GENITALIA: Pygofer in ventral view medially angulate but lacking medioventral lobe, with triangular dorsolateral projection; anal flap in lateral view 1-1/2 times as long as wide, in dorsal view apex bilobed; styles connected to each other ventrally by strap shown posterad of pygofer (Fig. 15); dorsal projection bipartite, anterior extension thin and curved, posterior avicephaliform at apex; aedeagus with triangular lightly keratinized brace and attached spine on dorsal surface of shaft (stippled in Fig. 15), keel on left margin of shaft; 1 faintly sclerotized spine on each side posterad of keel, flagellum with twisted sclerotized spatulate projection.

Caldwell and Martorell (1951) state that this species was found at 1500-2950 feet in Puerto Rico. We collected many specimens in the high elevations



Fig. 1-15. 1) Tegmen of *Dawnarioides hispaniolus* O'Brien; 2) tegmen of *Neodawnaria jamaicensis* O'Brien; 3) frontal view of *N. woldai* O'Brien; 4) lateral view of head *N. woldai* O'Brien; 5) frontal view of *N. jamaicensis* O'Brien; 6) lateral view of head *N. jamaicensis* O'Brien; 7) frontal view of *N. hondurensis* O'Brien; 8) lateral view of head *N. hondurensis* O'Brien; 9) frontal view of *N. ecuadorensis* O'Brien; 10) lateral view of head *N. ecuadorensis* O'Brien; 11) frontal view of *D. hispaniolus* O'Brien; 12) lateral view of head *D. hispaniolus* O'Brien; 13) frontal view of *D. sordidulus* (Muir); 14) lateral view of head *D. sordidulus*; 15) lateral view of genitalia of *D. sordidulus* (Muir).



of the Caribbean National Forest, both El Yunque and El Toro Negro Divisions, but some specimens also were collected near Mayaquez and in Carite, Guilarte, Maricao, and Rio Abajo Forest Reserves between 19-26 July 1979.

TYPE REPOSITORY: AMNH (both *sordidulus* and *musae*).

Dawnarioides hispaniolus O'Brien, NEW SPECIES
(Fig. 1, 11, 12, 16)

SALIENT FEATURES: Length: 7.5-8.5 mm. Body brown, margins of pronotum, apical margin of mesonotum, apex of mesonotum, legs, and posterior margins of abdominal sternites pale. Clypeus and frons, dorsal carinae of pronotum and area of pronotum surrounding head usually suffused with red. Tegmina medium brown with costal cell pale with brown median streak, areas along middle of claval suture, a partial transverse band behind apex of clavus, a circular area between the 2 rows of transverse veins, and stigmal cell pale. Apices of M and Cu veins in males red, edged with white areas; in females veins may be reddish throughout with white areas larger than in males. Male styles and anal segments red.

MALE GENITALIA: Medioventral lobe of pygofer roundly produced; anal flap as long as broad in lateral view, not emarginate medially in dorsal view; style with dorsal projection bipartite, posterior extension with truncate apex, anterior sharply bent dorsad; aedeagal shaft and flagellum contiguous, globose when combined, flagellum with pigmented spine on each side, several unpigmented pointed membranous projections parallel to spines.

COMPARATIVE NOTES: This species may be separated from *sordidulus* by its color, size, geographic distribution, and male genitalia.

TYPE DESIGNATION: *Holotype* ♂: DOM[INICAN] REP.[UBLIC]: La Vega, 23 km. SE. Jarabacoa, "May 25, 1978", C. W. and L. B. O'Brien and G. B. Marshall. *Allotype* ♀: DOM[INICAN] REP.[UBLIC]: La Vega, 24 km. SE. Constanza, "August 4, 1978", G. B. Marshall. *Paratypes* (3): DOM[INICAN] REP.[UBLIC], La Vega; 1 ♂, same data as holotype; 1 ♂, 18 km. E. El Rio, 10-VIII-1979, crest, cloud forest, C. W. O'Brien; 1 ♀, 19 km. E. El Rio, cloud forest, 3-VIII-1979, G. B. Marshall. The first specimens collected were found sweeping low shrubs in a cutover pasture in the mountainous resort area between Jarabacoa and Constanza. The others were collected in small patches of cloud forest left in horseshoe bends in high areas of the road between Constanza and Santo Domingo.

TYPE REPOSITORY: LOB.

Neodawnaria O'Brien, NEW GENUS
(Fig. 2-10, 17-20)

(Type-species: *Neodawnaria woldai* O'Brien, n. sp., present designation)

Short bodied long winged cenchreine derbids, measuring from 1.4-3.0 mm



Fig. 16-22. 16) Lateral view of genitalia of *Dawnarioides hispaniolus* O'Brien; 17) lateral view of genitalia of *Neodawnaria ecuadorensis* O'Brien; 18) lateral view of genitalia of *N. woldai* O'Brien; 19) lateral view of genitalia of *N. jamaicensis* O'Brien; 20) dorsal view of aedeagus of *N. jamaicensis*; 21) tegmen of *Ipsnola sextuberculata* Signoret; 22) frontal view of head of *I. sextuberculata*.

in body length, 3.8-6.6 mm in tegminal length. Head scarcely visible in dorsal view. Vertex not pustulate, curving into frons. Frons laterally compressed, lateral carinae contiguous, diverging at apex. Gena lacking ocellus and subantennal fovea. Antennae small, not exceeding length of face. Pronotum scarcely visible in dorsal view, large when viewed in frontal view, not modified into antennal fovea. Mesonotum diamond shaped, a little wider than long. Abdomen compressed laterally. Tegmina elongate, slightly curved (longitudinally rolled when alive), most veins meeting at acute angle. Anterior claval vein not pustulate. Clavus closed. Hind wing 0.35 length of tegmina.

The description above applies to *Dawnarioides* except for size. *Neodawnaria* differs from *Dawnarioides* in the following: in *Neodawnaria*, pronotum more than 2x as wide as high (height measured dorsoventrally from ventral-most point of pronotum); genae oval; subantennal ridge usually lacking, but straight if present (Fig. 10); tegmen with a crossvein from Cu_2 to apex of claval suture; first M fork at middle of tegmen, subcostal cell narrower than most other cells, sometimes shorter than in *Dawnarioides*; pygofer lacking medioventral lobe, genital styles smooth ventrally without a projection; aedeagus comparatively simple, having little more than a single spine and a flagellum directed anterad.

The species of *Neodawnaria* may be separated by their present distributions, sizes, and color patterns, and by the shape of projections on the styles and the shapes and spines of the aedeagi.

KEY TO SPECIES OF NEODAWNARIA

1. Larger than 5 mm; from South America or the West Indies 2
- 1'. Smaller than 5 mm; from Central America 3
- 2(1). Tegmina yellow with transverse brown bands; 5.5-7.5 mm; from the upper Amazon basin (1850 feet) of Ecuador
..... *ecuadorensis*, n. sp.
- 2'. Tegmina pale brown; from Jamaica *jamaicensis*, n. sp.
- 3(1'). Apex of tegmen, including veins, white; apex of scutellum pale brown *woldai*, n. sp.
- 3'. Apex of tegmen, including veins, brown or red; apex of scutellum white *hondurensis*, n. sp.

Neodawnaria woldai O'Brien, NEW SPECIES

(Fig. 3, 4, 18)

SALIENT FEATURES: Length 3.1-4.4 mm. Body pale brown, abdomen darker. Tegmina milky with 3 indistinct transverse smoky bands; anterior costal margin red.

This species is named after Henk Wolda, the tropical ecologist, on whose property the wing rolling of this species was observed.

MALE GENITALIA: Styles in lateral view with dorsal projection tripartite, median lobe broadly rounded, others narrow; anal flap in lateral view as wide as long, in posterior view apical margin emarginate; aedeagus globose, with rotund flagellum, single lobate spine arising near base of flagellum on left side.

COMPARATIVE NOTES: This is the smallest species in the genus to date and

also the palest. It can be separated from *ecuadorensis* by its size, from *jamaicensis* by its color, and from *hondurensis* by its transversely banded tegmina.

TYPE DESIGNATION: *Holotype* ♂ and *Allotype* ♀: PANAMA: Las Cumbres, "26-VI-1974," at light, C. W. and L. B. O'Brien & [G. B.] Marshall. *Paratypes* (31): 3 ♀, same as holotype, 1 ♀, 27-VI-1974, L. B. O'Brien, UV trap; 1 ♀, 21-XI-1973, 1 ♂, 1 ♀, 22-XI-1973, 1 ♀, 23-XI-1973, 1 ♀, 29-XI-1973, 2 ♀, 9-XII-1973, 1 ♀, 11-XII-1973, 1 ♀, 24-I-1974, 1 ♂, 28-III-1974, 1 ♀, 15-IV-1974, 1 ♀, 27-VI-1974, 1 (abdomen missing), 1-10-VIII-1976, all H. Wolda, at lights. 6 mi. N. Panama City, 27-VI-1974, C. W. and L. O'Brien and Marshall. CANAL ZONE: Fort Clayton, 2 ♂, 7 ♀, 8-15-IX-1978, N[ew] J[ersey] light trap, H. J. Harlan. Fort Kobbe, 1 ♂, 3 ♀, 28-VIII-1971, N. J. Lee. Specimens other than types: CANAL ZONE: Fort Gulick, 1 ♀, IX-1978, 1 ♀, X-1979, 2 ♀, III-1980, at light, H. J. Harlan; Fort Clayton, 1 ♀, 8-5-IX-1978, N.J. light trap, H. J. Harlan. These latter were collected in alcohol and their wings are twisted or torn and thus would make poor paratypes. *N. woldai* has been collected on both sides of the continental divide in the Canal Zone and in adjacent regions of Panama in cutover areas.

TYPE REPOSITORY: LOB. Paratypes in BMNH, CAS, and FSCA.

Neodawnaria jamaicensis O'Brien, NEW SPECIES
(Fig. 2, 5, 6, 19, 20)

SALIENT FEATURES: Length: 5.1-5.7 mm. Body pale brown. Tegmina pale brown with darker brown veins; paler areas at wing tip (including veins), near junction of claval veins, at apex of clavus, and apex of costa. Costal margin, especially anteriorly, red.

MALE GENITALIA: Styles in lateral view with dorsal projection bipartite, apex of distal extension rounded, proximal extension narrower than distal; aedeagus longer than broad, partially surrounded by semicircular keratinized band, flagellum narrowed into spinelike apex.

COMPARATIVE NOTES: This species is larger than *N. woldai* and *N. hondurensis*. It lacks the transverse banding of *woldai* and *N. ecuadorensis*. It differs from *hondurensis* in color and pattern; *hondurensis* has a pale area in the brown suffusion in the subcostal cell which is lacking in *jamaicensis*. *N. jamaicensis* is more golden brown and has a paler border along the anterior and posterior margins of the pronotum and along the median carina just behind the head. The single specimen of *hondurensis* is concolorous on the pronotum.

TYPE DESIGNATION: *Holotype* ♂ and *Allotype* ♀: JAMAICA, Portland P[arish], Somerset Falls, "Dec. 8, 1975," C. W. and L. O'Brien and [G. B.] Marshall. *Paratypes* (8): 1 ♂, 4 ♀, same data; 1 ♂, 2 ♀, JAMAICA, Fair Prospect, "17 April 1975," N. L. Woodiel (FSCA). The specimens from Somerset Falls were collected on the north coast of Jamaica at an elevation of a few hundred feet in luxuriant 2nd growth which was replacing a coconut grove that had been destroyed.

TYPE REPOSITORY: LOB. Paratypes: BMNH, CAS, FSCA.

Neodawnaria ecuadorensis O'Brien, NEW SPECIES
(Fig. 9, 10, 17)

SALIENT FEATURES: Length: 6.4-7.4 mm. Pale yellow tegmina with white anterior costal margin and 4 indistinct transverse brown bands, veins brown

or milky yellow, concolorous with background. Male with dark brown abdomen, genitalia and anal flap pale. Female with pale abdomen with a median dorsal dark brown stripe. Gena with ridge under antenna that curves smoothly into the fronto-clypeal suture (Fig. 10), ridge not angled and set far away from the fronto-clypeal suture as in *Dawnarioides* (Fig. 12, 14).

MALE GENITALIA: Styles in lateral view with apical projection bipartite, proximal extension narrower than distal, apex of distal with each lateral margin angularly produced; anal flap in lateral view 2 x as long as wide, in dorsal view deeply emarginate for half its length; shaft of aedeagus elongate, with dorsal projection just below flagellum; 2 spines at apex of shaft of aedeagus, one very small, the other attached to right side of flagellum, extending anterad beyond it.

COMPARATIVE NOTES: This species is the largest *Neodawnaria* known to date and the most clearly patterned. The males have dark brown abdomens and the females have a dorsal dark brown median stripe. No other species is as contrastingly colored.

TYPE DESIGNATION: *Holotype* ♂ and *Allotype* ♀: ECUADOR: Naranjapata, 1850 F[ee]t. "Dec. 1922". F. X. Williams, Collector. Brit. Mus.[accession number] 1970-521. *Paratypes* (4): ECUADOR 2 ♂ and 2 ♀, same date as holotype.

TYPE REPOSITORY: BMNH. *Paratypes*: BMNH, LOB.

Neodawnaria hondurensis O'Brien, NEW SPECIES
(Fig. 7, 8)

SALIENT FEATURES: Length: 5 mm. Head and thorax medium brown, abdomen darker. Tegmina medium brown, darker suffusion in subcostal cell, interrupted medially with paler area; darker suffusions also in 2nd R₁ cell and between Y veins of clavus. Three paler oval areas at each side of and preceding 2nd R₁ cell. Veins of costal margin strongly red, some of apical veins lightly red.

COMPARATIVE NOTES: This species most closely resembles *jamaicensis* (See *jamaicensis* comparative notes). *Neodawnaria woldai* is smaller and its tegmina are transversely banded.

TYPE DESIGNATION: *Holotype* ♀: HONDURAS, Atl.[lantida], Lancetillo, "Aug. 7, 1977," C. W. and L. B. O'Brien and [G. B.] Marshall. Lancetillo is a botanical garden with both imported and native plants. It is at sea level on the Caribbean coast of Honduras.

TYPE REPOSITORY: LOB.

WING-ROLLING OBSERVATIONS

Wing rolling was observed in *Dawnarioides sordidulus* in Puerto Rico, *D. hispaniolus* in the Dominican Republic, and *N. woldai* in Panama. The other species of *Neodawnaria* described here were not observed alive.

While these unusual derbids are resting, the tegmina are raised and spread apart in a V above the body. Each tegmen is rolled into a longitudinal cylinder with the costal and commissural margins nearly touching each other, each tegmen encircling its hind wing which is similarly rolled. When the insect dies, the wings slowly uncurl and remain nearly flat.

The tegminal venation in these derbids (Fig. 1, 2) differs markedly from

other derbids in that the majority of cross veins form an acute angle rather than a right angle with the longitudinal veins.

These species differ from other derbids in resting behavior as well as venation. They are more often seen sitting on the tops of leaves or on exposed vertical surfaces. Derbids of the tribe Derbini (*Derbe*, *Mysidia*, *Symidia*, etc.) hold their wings out laterally, parallel to the leaf surface, and commonly rest on the underside of the leaves of broad leaved plants such as bananas and palms. Genera of the tribes Otiocerini (*Anotia*, *Sayiana*, *Apache*, *Shellenius*, *Otiocerus*, etc.) and Cenchreini (*Cedusa*, *Herpis*, etc.) hold their wings over their backs in a tectate position and I have seen them sitting vertically on grass stems and corn stalks, head up. I postulate that these are all adaptations to keep raindrops (or drops of condensing fog in cloud forests) from sticking the derbid's fragile wings to the substrate. Specimens of *Persis* sp., sitting with their heads up on grass stems, were not disturbed during a heavy tropical rain and could fly immediately after the shower when I brushed the grass. However, when swept up in a net, they were immobilized by the wings sticking to the wet cloth or to wet leaves. *Apache*, *Shellenius*, and *Cedusa* frequently drowned in the laboratory when their wings became stuck to condensation on the walls of mason jars (S. W. Wilson, pers. comm.). I have no proof that this would be a mortality factor in the derbids under natural conditions, but D. L. Deonier rated heavy rainfall as the most important mortality factor in *Hydrellia* (Diptera: Ephydriidae). This was determined by the number of dying and dead insects stuck to the leaves by their wings after a rain and by the fluctuations in trap count which were correlated with heavy rain but not other factors examined (Deonier, pers. comm.). In paper models of wings, a wing with the *Dawnarioides-Neodawnaria* Y-junction venation has more rigidity when curled than a right-angled junction type. I postulate this may be rigid enough to prevent water from sticking the wings to a substrate.

To my knowledge, the only other insects that roll wings longitudinally are some African moths, photographed but not named in a National Geographic movie on the Baobab tree. Three families of insects roll wing tips only. An orthopteran, *Schizodactylus* Brulle, rolls both fore and hind wing tips transversely (Khattar 1972) and cupedid and sphaeriid beetles (Britton 1970) roll hind wings only. These 3 have their wings folded at rest and when dead, indicating a different mechanism than in the derbids.

CATALOG OF NEW WORLD CENCHREINI

NOTA BENE: The genus *Cedusa* is not included as it is currently being revised (Flynn and Kramer, pers. comm.).

The figures in the last column refer to the volume and page of Metcalf's catalogue (1936) where the genus may be found. The letters there indicate where the author of the species said the type was deposited. There are 6 personal collections: Ball, EDB; Caldwell, JSC; Fennah, RGF; Osborn, HO; O'Brien, LOB; and Van Duzee, EPVD. Ball's and Caldwell's collections have gone to the U. S. National Museum (USNM); Osborn's has gone to Ohio State University (OSU); Fennah and O'Brien retain theirs; and part of Van Duzee's was sold to Iowa State College in 1897, and the rest given to the California Academy of Sciences (CAS). Other repositories listed are

The American Museum of Natural History (AMNH), British Museum (Natural History) (BMNH), The Museum of Comparative Zoology, Harvard (MCZ), and the New York Zoological Society (NYZS). Abbreviations are not used for museums in Copenhagen, Paris, Stockholm, or Rio Piedras, Puerto Rico.

Species found in the U.S. are preceded by an asterisk.

<i>Patara</i> Westwood (type-species: <i>guttata</i>)		4: 96
<i>albida</i> Westwood	St. Vincent	BMNH
<i>cyanea</i> Fennah 1952: 147	Dominica	RGF
<i>fumipennis</i> Fennah 1952: 148	St. Lucia	RGF
<i>gausapata</i> Fennah 1952: 149	St. Vincent	RGF
<i>guttata</i> Westwood	St. Vincent	BMNH
<i>inermis</i> Fennah 1952: 149	St. Lucia	RGF
<i>marmorata</i> Fowler	Guatemala	BMNH
<i>mimula</i> Fennah 1952: 148		
.....	Dominica, St. Kitts, Nevis, Montserrat	RGF
<i>unicornis</i> Fennah 1952: 148	St. Lucia	RGF
<i>pakaraima</i> Fennah 1952: 150	British Guiana	BMNH
<i>poeciloptera</i> Fennah 1945: 448	Trinidad	USNM
<i>trigona</i> Fennah 1945: 447	Trinidad	USNM
* <i>vanduzei</i> Ball	U.S. (NY)	EPVD
<i>vittatipennis</i> Fennah 1945: 448	Trinidad	USNM
<i>Neodawnaria</i> O'Brien (type-species: <i>woldai</i>)		
<i>ecuadorensis</i> O'Brien	Ecuador	BMNH
<i>hondurensis</i> O'Brien	Honduras	LOB
<i>jamaicensis</i> O'Brien	Jamaica	LOB
<i>woldai</i> O'Brien	Panama	LOB
<i>Dawnarioides</i> Dozier (type-species: <i>sordidulus</i>)		4:94
<i>sordidulus</i> Muir	Puerto Rico	AMNH
= <i>musae</i> Dozier (teste Caldwell 1951: 198)		AMNH
<i>hispaniolus</i> O'Brien	Dominican Republic	LOB
<i>Goneokarella</i> Fennah 1952: 142 (type-species: <i>maculivenis</i>)		
<i>maculivenis</i> Fennah 1952: 142	Argentina, Chile	BMNH
<i>Ipsnola</i> Signoret (type-species: <i>sextuberculata</i>)		2:244
<i>sextuberculata</i> Signoret	Chile	Paris?
<i>Herpis</i> Stål (type-species: <i>fuscovittata</i>)		4:117
= <i>Syntames</i> Fowler (teste Caldwell 1944: 99)		4:101
<i>albida</i> (Metcalf) [<i>Syntames</i>] (teste Caldwell 1944: 100)		
.....	Panama	MCZ
<i>chiriquensis</i> (Fowler) [<i>Syntames</i>] (teste Caldwell 1944: 100)		
.....	Panama	BMNH
<i>delicata</i> (Fowler) [<i>Syntames</i>] (teste Caldwell 1944: 100)		
.....	Panama, Guatemala	BMNH
<i>fusca</i> (Metcalf) [<i>Syntames</i>] (test "?" Caldwell 1944: 100)		
.....	Panama	MCZ
<i>fuscovittata</i> Stål	Brazil	Stockholm
<i>serrata</i> (Metcalf) 1945: 129 [<i>Syntames</i>]	British Guiana	NYZS

<i>sufflava</i> (Muir) [<i>Syntames</i>] (teste Caldwell 1944: 100)	British Guiana	HO
<i>vittata</i> Fabricius [<i>Flata</i>]	S. America	Copenhagen
<i>Oropuna</i> Fennah 1952: 136 (type-species: <i>minutianus</i>)		
<i>minutiana</i> (Caldwell) 1944: 102 [<i>Phaciocephalus</i>]	Guatemala, Mexico	JSC
<i>Cenchrea</i> Westwood (type-species: <i>dorsalis</i>)		4:104
<i>bipunctata</i> (Muir) [<i>Phaciocephalus</i>] (teste Fennah 1952: 132)	British Guiana	HO
<i>dorsalis</i> Westwood	St. Vincent	BMNH
<i>exquisita</i> Uhler	St. Vincent	BMNH?
<i>sororia</i> Fennah 1952: 131	Trinidad, Venezuela	BMNH
<i>sexguttata</i> Fennah 1952: 132	British Guiana	BMNH
<i>Cenanges</i> Fennah 1952: 132 (type-species: <i>spectralis</i>)		
<i>spectralis</i> Fennah 1952: 133	Dominica	RGF
<i>Contigucephalus</i> Caldwell 1944: 101 (type-species: <i>rubra-venosus</i>)		
<i>rubra-venosus</i> Caldwell 1944: 101	Costa Rica	OSU
<i>Neocenchrea</i> Metcalf (type-species: <i>heidemanni</i>)		4:103
<i>bakeri</i> (McAtee) [<i>Cenchrea</i>]	Mexico	USNM
* <i>heidemanni</i> (Ball) [<i>Cenchrea</i>]	U.S. (KS, DC)	?
<i>mero</i> Fennah 1952: 137	Trinidad	RGF
<i>ochracea</i> Metcalf 1945: 128	British Guiana	NYZS
<i>pallida</i> Metcalf	Panama	?
<i>Persis</i> Stål (type-species: <i>pugnax</i> Stål)		4: 90
(<i>Persis</i>)		
<i>fabriciana</i> Metcal (n.n. for <i>Cicada lineata</i> Fabr.)	South America	Copenhagen
<i>foveatis</i> Caldwell 1944: 106	Mexico	JSC
<i>novacula</i> Fennah 1952: 140	Trinidad	RGF
<i>pugnax</i> Stål	Rio de Janeiro	Stockholm
<i>stali</i> Muir	British Guiana, Dutch Guiana	HO
(<i>Anapersis</i>) Fennah 1952: 140 (type-species: <i>gregaria</i>)		E
<i>gregaria</i> Fennah 1945: 443 [<i>Neocenchrea</i>]	Trinidad, St. Vincent, Grenada, St. Lucia	USNM
<i>pallescens</i> (Metcalf) [<i>Neocenchrea</i>] (teste Fennah 1952: 141)	Panama	MCZ
<i>spretata</i> (Fowler) [<i>Mysidia</i> (?)]	Mexico	BMNH
(<i>Eritalaena</i>) Fennah 1952: 142 (type-species: <i>fuscinerervis</i>)		
<i>fuscinerervis</i> Muir	British Guiana	HO
<i>Omolicna</i> Fennah 1945: 440 (type-species: <i>proxima</i>)		
<i>anastomosis</i> Caldwell 1944: 104 (teste Caldwell 1951: 201)	Guatemala	JSC
<i>brunnea</i> (McAtee) [<i>Cenchrea</i>] (teste Caldwell 1951: 201)	Mexico, Panama, Guatemala	USNM
<i>cubana</i> (Myers) [<i>Phaciocephalus</i>] (teste Fennah 1952: 136)		

.....	Cuba	?
<i>dominicana</i> Fennah 1952: 135	Dominica	RGF
<i>dubia</i> Caldwell 1944: 105 (teste Caldwell 1951: 201)	.....
.....	Mexico	JSC
* <i>fulva</i> (Van Duzee) [<i>Cenchræa</i>] (teste Fennah 1952: 136)	.....
.....	U.S. (FL)	CAS
<i>latens</i> Fennah 1952: 136	Trinidad	RGF
* <i>mcateeii</i> (Dozier) [<i>Cenchræa</i>] (teste Caldwell 1951: 201)	.....
.....	U.S. (MS)	?
<i>nero</i> Fennah 1971: 327	Grand Cayman	BMNH
<i>nigripennis</i> Caldwell 1944: 103 (teste Caldwell 1951: 201)	.....
.....	Mexico	JSC
var. <i>flavipennis</i> Caldwell 1944: 104	Mexico	JSC
<i>proxima</i> Fennah 1945: 441	Trinidad, Venezuela	USNM
<i>puertana</i> Caldwell 1951: 201	.....
.....	Puerto Rico, Vieques Is., St. Thomas	JSC
<i>puncta</i> Caldwell 1944: 104 (teste Caldwell 1951: 201)	.....
.....	Mexico	JSC
<i>quadrispinosa</i> Caldwell 1944: 103 (teste Caldwell 1951: 201)	Guatemala, Mexico	JSC
<i>rubrimarginata</i> Fennah 1945: 442	Trinidad	USNM
<i>tarco</i> Fennah 1971: 325	Cayman Brac	BMNH
* <i>texana</i> Caldwell 1944: 103 (teste Caldwell 1951: 201)	.....
.....	U.S. (TX)	OSU
<i>triata</i> Caldwell 1944: 103 (teste Caldwell 1951: 201)	.....
.....	Br. Honduras	JSC
* <i>uhleri</i> (Ball) [<i>Cenchræa</i>] (teste Caldwell 1951: 201)	.....
.....	U.S. (DC, MD, KS)	EDB
<i>Anchimototho</i> Fennah 1952: 137 (type-species: <i>parishi</i>)	.....
<i>parishi</i> (Muir) [<i>Phaciocephalus</i>]	British Guiana	HO
<i>Phaciocephalus</i> Kirkaldy (type-species: <i>vitiensis</i> , Fiji Islands)	4:107	
<i>fimbriolatus</i> (Stål) [<i>Herpis</i>]	Brazil	Stockholm
<i>orbis</i> (Stål) [<i>Herpis</i>]	Brazil	Stockholm
<i>pallidovenosus</i> (Stål) [<i>Herpis</i>]	Brazil	Stockholm

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SMINTHURUS FISCHERI, NEW SPECIES
FROM GEORGIA (COLLEMBOLA: SMINTHURIDAE)

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ABSTRACT

A new species, *Sminthurus (Sminthurus) fisheri* Snider, is described from Georgia. This species is closely allied to *Sminthurus banksi* Christian and Bellinger, and *Sminthurus butcheri* Snider, but can be separated on the basis of color pattern, presence of 2 corner teeth on the meta-unguiculus, absence of apical bulb on ANT. IV, number of antennal subsegments, and setal lengths related to the unguis. The type locality is Hart County, Georgia. Specimens were taken from leaf litter.

RESUMEN

Se describe una nueva especie de Georgia, *Sminthurus (Sminthurus) fisheri* Snider. Esta especie está intimamente relacionada con *Sminthurus banksi* Christian y Bellinger, y con *Sminthurus butcheri* Snider, pero puede

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