

*THOMAS W. DONNELLY*

*The Odonata  
of Dominica  
British West Indies*

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*Thomas W. Donnelly* **The Odonata  
of Dominica  
British West Indies**

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## ABSTRACT

Donnelly, Thomas W., The Odonata of Dominica, British West Indies. Smithsonian Contributions to Zoology, 37: 1-20, 1970.—The Odonata fauna of Dominica is, for the first time, treated in detail. Twenty-one species of dragonflies and damselflies are recorded with detailed locality records and ecological notes, and a key is provided to 37 species known or expected to occur in the Lesser Antilles. *Scapanea archboldi*, new species, is described, and the nymphs of *Protoneura ailsa* Donnelly and *Argia concinna* Rambur are described for the first time. *Aeshna psilus* Calvert and *Telebasis sanguinalis* Calvert are recorded from the Lesser Antilles for the first time.

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Thomas W. Donnelly

## The Odonata of Dominica British West Indies

The Archbold-Bredin survey of the island of Dominica has provided an almost unparalleled opportunity for the close examination of the flora and fauna of a small, tropical island. The collection of dragonflies and damselflies (Odonata) amassed during this survey represents one of the most complete collections of Lesser Antillean Odonata ever assembled. The 20 species collected (plus an additional species reported by Dr. D. C. Geijskes) include 2 species reported from the Lesser Antilles for the first time, and an additional new species.

This report is based on the examination of 846 specimens collected by 16 individuals over a period of approximately 3 years, with collection dates falling on 89 days of the calendar year, and thoroughly representing all months of the year except for July, August, and December. In addition, a list of Odonata collected by D. C. Geijskes has been included. The author spent the first week of June 1964, collecting on the island in the company of Oliver S. Flint, Jr.

Although 40 specimen localities are included in this report, and although these localities occur in seven out of the ten parishes of Dominica, the areal coverage of the island is uneven. The principal collecting localities have been in the vicinity of Portsmouth, along the west-central coast (from the Layou River to Roseau and especially around Clarke Hall), along small streams in the central uplands of the island, and in the vicinity of Freshwater Lake. There are very few collections from the windward coast, and none from the southwestern coast.

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The locality near Portsmouth is the swampy area near East Cabrit. Here are found grassy, shallow ponds and tree-lined sloughs along a dirt road. All of these bodies of water have a temporary appearance but are probably permanent. Hodge (1954) records 113 inches of rain for the year 1948 at Portsmouth, with only one month (April) having less than 4 inches. Several species (*Micrathyria didyma*, *M. aequalis*, *Telebasis sanguinalis*) are far more common here than elsewhere, and *Lestes forficula* has been recorded on Dominica only from this locality.

The most important locality near the coast of west-central Dominica is in the vicinity of Clarke Hall, where a variety of habitats have been collected rather thoroughly. The small shaded stream at Café, across the Layou River from the estate house, has a sandy to rocky bottom, moderate flow, and abundant emergent vegetation. *Enallagma coecum* and *Protoneura ailsa* are particularly abundant here.

Several small streams in the central upland region, along the main road across the island, where collected repeatedly. These streams are almost entirely above 1,000 feet in elevation, and are characteristically rocky, more or less swift, and have only limited emergent vegetation. They have a limited Odonata fauna, consisting mainly of *Dythemis sterilis*, *Argia concinna*, and *Protoneura ailsa*.

Freshwater Lake is a high-elevation (2,365 feet), abundantly vegetated lake of moderate size (one-quarter mile across). It appears to be Dominica's only really salubrious Odonata locality which is appreciably away from the coast. Three species (*Anax concolor*, *Brachymesia furcata*, and *Scapanea archboldi*, new species) have been recorded only from this locality, and *Aeshna psilus* is known elsewhere only from one

collection of a nymph. There are two areas which are especially favorable for Odonata: the shallow water fringing the lake proper and the small outlet stream. In spite of the fact that clouds hang over this lake almost constantly during much of the year, and the rainfall is heavy, *Anax* can be seen flying at almost any time.

### Climate

Dominica is the wettest of the Antillean islands, with no really dry region of the island or part of the year. Hodge (1954) summarized the climate thoroughly, noting that for one year (1948) the mean rainfall of 22 stations was 137 inches. The windward part of the island had a mean of 126 inches, the leeward part 103 inches, and the central part of the island 186 inches. The minimum rainfall recorded by Hodge was 68 inches (leeward side) and the maximum 250 inches (center of island). Doubtless greater and lesser rainfalls occur. Rainfalls, especially in the wetter months, are generally torrential, interspersed with periods of misty rain referred to locally as "liquid sunshine." Figure 1 shows monthly rainfall histograms for 1948 from two localities: Riverdale (center of the island), with a 250-inch rainfall, and Roseau (on the leeward side), with a 79-inch rainfall (taken from Hodge, 1954). Temperatures are moderate (yearly average 79°F) and relative humidities, especially in the interior, are very high.

The leeward coast has a more arid appearance than the rainfall statistics indicate; not only are the records sparsely distributed and the rainfall highly variable from place to place, but also the evaporation rates are locally high. The vegetation varies from highly luxuriant to microphyllous.

The average year is divided into seasons, a "dry" season (actually rather wet) and a "wet" season (a very wet season). The dry season occurs from mid-January through mid-June, and the wet season from mid-June through mid-January. The wet season is generally divided by a drier period from mid-September through mid-November.

### Seasonal Distribution of Odonata

The extensive collections of Odonata made during this survey provide a unique opportunity to investigate the seasonal distribution patterns of Dominica Odonata. Figures 1-4 show the distribution of Odonata collections during the year, and, for comparison, monthly

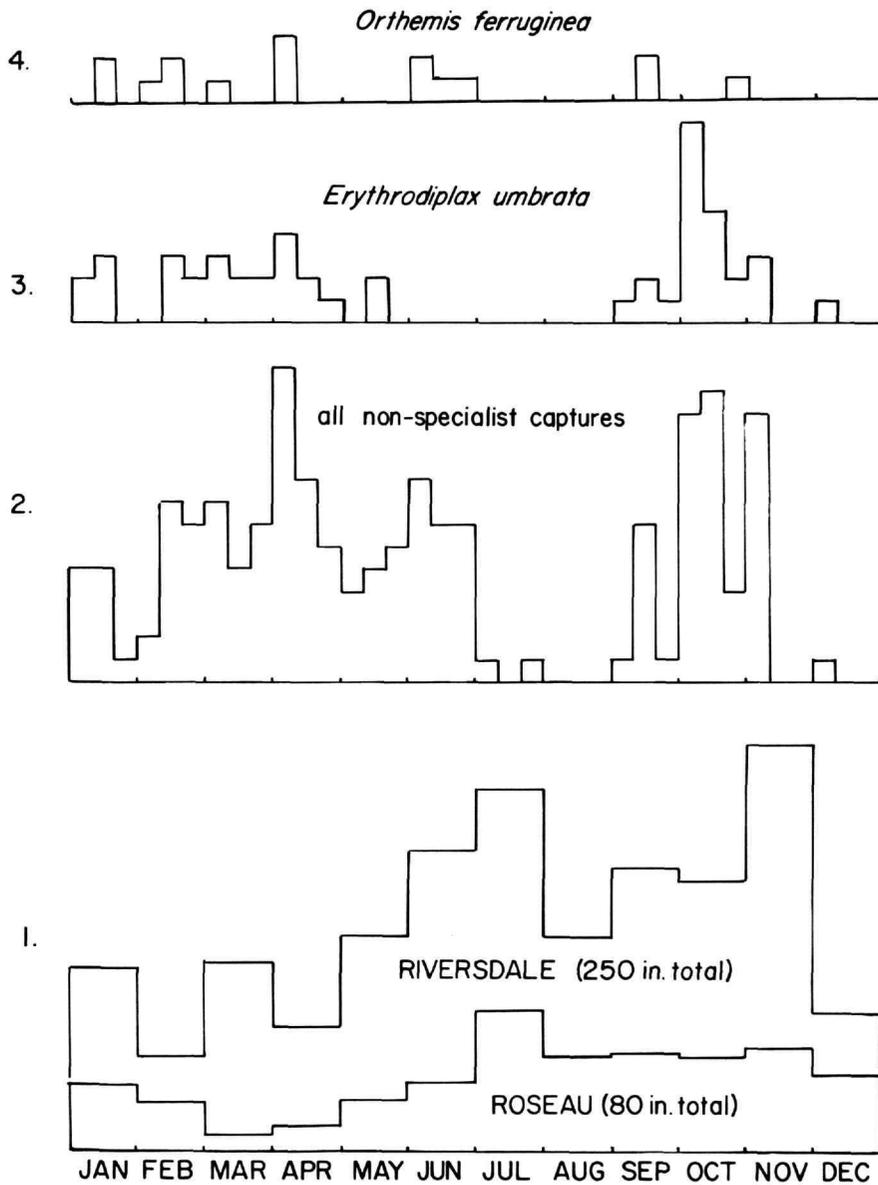
rainfall histograms for two localities, and collection histograms for two Odonata species. These figures have been constructed using only data from nonspecialists in order to minimize a possibly biased sample during the author's week of active collecting.

Most of the species that have been collected more than a few times do not have a conspicuous seasonal distribution pattern. A few species, however, deserve comment. *Erythrodiplax umbrata*, the most widespread Odonate on the island, occurs commonly during both the early and late months of the year. There are relatively few collections during the late part of the "dry" season. In addition to the records represented by the histogram (Figure 3), the author did not find this species conspicuous during his collections in the first week of June 1964. If the species is truly less common at this time, it might be suggested that there are either two semi-distinct univoltine populations of this species on Dominica—one flying during the dry season and one during the wet, or one bivoltine population. There is no clear geographical distinction between records of the two time groups. The flight period of the adults is probably a few weeks at the most, and, although the time required for nymphal development is not known, most smaller tropical libellulines require less than a year to complete the development from egg to adult.

The species *Orthemis ferruginea* (Figure 4) has a quite different pattern. There are relatively few records for this species during the later part of the wet season, suggesting that this species is univoltine with a preference for the less wet months. Two species typical of upland stream habitats (*Dythemis sterilis* and *Argia concinna*) show similar patterns, presumably because the torrential rains during the wet season make their streams uninhabitable at this season.

### Acknowledgments

The assistance of the following was most helpful and is gratefully acknowledged: the Smithsonian Institution for providing accommodations for me at Clarke Hall during my brief survey of the island; Dr. Oliver S. Flint, Jr. for many kindnesses and for accompanying me on numerous trips during that week; Dr. D. C. Geijskes for generously providing me with a list of the Odonata he collected on the island during 1965; and Professor Minter Westfall and Dr. Dennis Paulson for loaning me numerous specimens of *Micrathyrina didyma* for my study of that species. I am further grateful to



FIGURES 1-4.—1, histograms showing rainfall from wet (Riverdale) and relatively dry (Roseau) localities for 1945 (from Hodge, 1954). 2, histogram showing species collections for Smithsonian collectors during Archbold-Bredin survey (author's collections excluded). Smallest square is one collection. 3, histogram showing captures of *Erythrodiplax umbrata* by Smithsonian collectors. 4, histogram showing captures of *Orthemis ferruginea* by Smithsonian collectors.

Professor Westfall for information concerning the status of Kirby's (1894) record of *Argia insipida* from Saint Vincent and Grenada.

#### Collectors

DB	D. F. Bray
JC	J. F. G. Clarke
TC	T. M. Clarke
DD	D. R. Davis
TD	T. W. Donnelly
OF	O. S. Flint, Jr.
DG	D. C. Geijskes
AG	A. B. Gurney
HH	H. H. Hobbs, Jr.
HR	H. Robinson
PS	P. J. Spangler
TS	T. J. Spilman
GS	G. Steyskal
ET	E. L. Todd
WW	W. W. Wirth
RZ	R. Zusi

#### Localities<sup>1</sup>

(Elevations given for localities appreciably above sea level.)

Saint John Parish: East Cabrit (swamp); Portsmouth.

Saint Andrew Parish: Melville Hall (airport).

Saint Joseph Parish: Clarke Hall; Café (a small stream tributary to the Layou River across from Clarke Hall); Mannett Gutter (a small stream near Clarke Hall); mouth of Layou River; Hillsborough Estate (slough); Grande Savane; d'Leau Gommier (small stream at 1,400 ft. along road); Laurent R. at Bells Police Station. (600 ft.); d'Leau Morne Laurent (stream at 2,000 ft. along road); Central Forest Reservoir; Macoucheri Estate.

Saint Paul Parish: Vicinity of Pont Cassé (elevation 1,500–1,900 ft.) several small streams along roads, 0.4, 0.9, and 1.3 mi east, 1.0 mi west, and 0.5 mi south (Upper Belfast River) of road junction; also Brantridge Estate (just north of road junction); Springfield Estate (elevation 1,200 ft.); Sylvania Estate (elevation 1,800 ft.); Canefield Estate.

Saint David Parish: Fond Figue River (elevation 400 ft., along road); Castle Bruce junction (elevation 1,500 ft.); Salibia; Boeri Lake (elevation 2,900 ft.).

Saint David—St. Andrew Parish: Concord.

Saint George Parish: Freshwater Lake (elevation 2,300 ft.); Wotten Waven (elevation 1,300 ft.); Fond Colet; Trafal-

<sup>1</sup> Localities can be found on 1:50,000 map of Dominica (1963) (DOS 451) issued by Directorate of Overseas Surveys, Tolworth, Surrey, and obtainable from the Survey Department, Roseau, Dominica, British West Indies.

gar Falls (elevation 1,000 ft.); Trafalgar (elevation 800 ft.); Roseau River, 1¼ mi above Roseau; Copt Hall (elevation 500 ft.); Goodwill (part of Roseau); Laudat Creek (elevation 2,000 ft.); Roseau River at Goodwill Reservoir.

Saint Patrick Parish: Grand Bay; La Plaine.

#### Odonata recorded from Dominica

(Exclamation indicates new record from Lesser Antilles; x means endemic to Lesser Antilles.)

- Anax concolor* Brauer
- ! *Aeshna psilus* Calvert
- Triacanthagyna trifida* (Rambur)
- Orthemis ferruginea* (Fabricius)
- Micrathyria didyma* (Selys)
- Micrathyria aequalis* (Hagen)
- Erythrodiplax umbrata* (Linnaeus)
- Lepthemis vesiculosa* (Fabricius)
- Brachymesia furcata* (Hagen)
- Cannacia herbida* (Gundlach)
- Dythemis sterilis* (Hagen)
- x! *Scapanea archboldi*, new species
- Tramea abdominalis* (Rambur)
- Pantala flavescens* (Fabricius)
- Lestes forficula* Rambur
- x *Argia concinna* (Rambur)
- ! *Telebasis sanguinalis* Calvert
- Enallagma coecum* (Hagen)
- Ischnura ramburi* (Selys)
- Anomalagrion hastatum* (Say)
- x *Protoneura ailsa* Donnelly

The key to the Odonata is based in part on the keys of Klots (1932) and Needham and Westfall (1955). Terminology is that of Needham and Westfall, and also of Walker (1953). A more detailed key to the Libellulidae (using somewhat different terminology) is that of Borror (1945).

Species included in this key are: (1) those recorded in this survey, (2) additional species recorded by Klots from the islands from Grenada to Guadeloupe, (3) some unpublished records from the author's collections from Saint Lucia, and (4) some records from various monographs. *Macrothemis celeno* (Selys) has been included because of the possibility that it might occur. The species included under the second, third, and fourth categories above are: *Anax junius* (Drury) (Guadeloupe, Martinique), *A. amazili* (Burm.) (Barbados), *Gynacantha nervosa* Ramb. (Saint Lucia), *Triacanthagyna septima* (Selys) (Saint Lucia), *Erythemis credula* (Hagen) (Barbados, based on nymph supposition), *E. attala* (Selys) (Martin-

ique), *Brechmorhoga praecox grenadensis* Kirby (Grenada), *Erythrodiplax c. connata* (Burmeister) (Martinique, Saint Vincent), *E. c. fusca* (Rambur) (Grenada) *E. unimaculata* (DeGeer) (Martinique, Saint Vincent), *Dythemis multipunctata* Kirby (Saint Vincent, Grenada), *Tramea binotata* (Rambur) (Barbados), *T. onusta* Hagen (Guadeloupe), *Lestes spumarius* Selys (Barbados, Grenada), *L. tenuatus* Rambur (Martinique, Saint Lucia), and *Ceratura capreola* (Hagen) (Saint Lucia). The *Protoneura capillaris* (Rambur) recorded by Klots from Martinique has not been confirmed and is probably *P. ailsa* Donnelly. *Hetaerina luteola* (Rambur) (a variety of *cruentata* Selys) has been mentioned by Selys (1854) from Martinique; very probably the locality is an error, as the genus is quite unknown from the Antilles, with the sole possible exception of Jamaica. An addi-

tional species, *Argia insipida* Selys, was recorded by Kirby (1894) from Saint Vincent and Grenada but is here omitted because of the probability that the record represents either a misidentification (of *Argia concinna*) or misplaced specimens (M. Westfall, personal communication).

The key is not intended as a substitute to the standard taxonomic works, and these should be consulted before the specific diagnosis is completed. Female libelluline dragonflies of the *Macrothemis* group (including *Dythemis*, *Brechmorhoga*, and *Scapanea*) are not easily keyed out, and their diagnosis might require comparison with specimens. The male of *Scapanea archboldi* is not known, but the characters of the female indicate that the standard key characters for separating this genus from *Brechmorhoga* (as, for instance, in Borror, 1945) will have to be modified.

### Key to the Odonata of Dominica

(Species which might occur are in parentheses.)

1. Front and hind wings similar; male with paired ventral anal appendages; body slender (*Zygoptera*, or damselflies) ..... 2
- 1'. Hind wing considerably broader at base than forewing; male with single ventral anal appendage; body robust (*Anisoptera*, or dragonflies s. str.) ..... 11
- 2(1).  $M_2$  separating from  $M_{1+2}$  and base of  $R_s$  arising nearer arculus than nodus; stigma more than twice as long as wide (*Lestidae*; *Lestes*) ..... 3
- 2'.  $M_2$  separating from  $M_{1+2}$  and base of  $R_s$  arising nearer nodus than arculus; stigma less than twice as long as wide ..... 5
- 3(2). Inferior appendage of male more than twice as long as superior ..... 4
- 3'. Inferior appendage of male half as long as superior ..... (*L. tenuatus*)
- 4(3). Abdomen 30 mm; hind wing 21 mm; superior appendage of male singly curved in dorsal view; grayish marked with iridescent green ..... *L. forficula*
- 4'. Abdomen 39 mm; hind wing 24 mm; superior appendage of male doubly curved in dorsal view ..... (*L. spumarius*)
- 5(2').  $Cu_2$  reduced to a crossvein ending in the margin of the wing; quadrangle rectangular; very slender insects; abdomen 33 mm; male dominantly reddish (*Protoneuridae*) ..... *Protoneura ailsa*
- 5'.  $Cu_2$  at least several cells long (*Coenagrionidae*) ..... 6
- 6(5'). Tibial spines twice as long as intervening spaces; male black and blue; wings slightly infumated; abdomen 29 mm ..... *Argia concinna*
- 6'. Tibial spines twice as long as intervening spaces ..... 7
- 7(6'). Postocular pale spots absent; male dominantly red; abdomen 25 mm ..... *Telebasis sanguinalis*
- 7'. Postocular pale spots present ..... 8
- 8(7').  $M_2$  of hind wing arising at or near the 4th postnodal; male violet and black; female brown and black with conspicuous pale markings on segment 8; abdomen 26 mm ..... *Enallagma coecum*
- 8'.  $M_2$  of hind wing arising at or more proximal than 3rd postnodal ..... 9
- 9(8'). Arculus arising as far beyond 2nd antenodal as the upper section of the arculus is long; male green, blue, and black; female like male or yellow and black; very small, abdomen 19 mm ..... (*Ceratura capreola*)
- 9'. Arculus not arising so far beyond 2nd antenodal ..... 10
- 10(9'). Stigma of forewings of male touching costa; male green blue, and black; female like male or orange and black; abdomen 26 mm ..... *Ischnura ramburi*

## Key to the Odonata of Dominica—Continued

- 10'. Stigma of forewing of male not touching costa; male green, yellow and black; female orange and black; small, abdomen 17 mm. . . . . *Anomalagrion hastatum*
- 11(1'). Triangle equally distant from arculus in fore and hind wing; antenodal crossveins not matched across Sc except for two thickened veins (Aeshnidae) . . . . . 12
- 11'. Triangle nearer arculus in hind wing than forewing; antenodal crossveins matched across Sc (Libellulidae) . . . . . 18
- 12(11). Male hind wing rounded at base; sectors of arculus arising from upper end of arculus (*Anax*) . . . . . 13
- 12'. Male hind wing excavated at base; sectors of arculus arising from middle of arculus. . . 15
- 13(12). Frons without dark markings; occiput black, thorax green, abdomen brown; abdomen 55 mm. . . . . *A. concolor*
- 13'. Frons with dark markings; occiput yellowish . . . . . 14
- 14(13'). Frons above with a more or less triangular central spot of black or dark brown; normally with a triangular spot of blue on each side; thorax and base of abdomen green, end of abdomen brown; abdomen 51 mm. . . . . (*A. amazili*)
- 14'. Frons above with a circular central spot surrounded anteriorly at a short distance by a semicircle of blue; male thorax green, abdomen blue; abdomen 52 mm. . . . . (*A. junius*)
- 15(12').  $R_s$  forked; dark with pale thoracic stripes; abdomen 39 mm. . . . . *Aeshna psilus*
- 15'.  $R_s$  not forked. . . . . 16
- 16(15'). Two rows of cells between  $M_1$  and  $M_2$  beginning at or before stigma in hind wing, and usually in forewing; ventral process of segment 10 of female two pronged; abdomen 56 mm. . . . . (*Gynacantha nervosa*)
- 16'. Two rows of cells between  $M_1$  and  $M_2$  beginning under stigma; ventral process of segment 10 of female three pronged (*Triacanthagyna*) . . . . . 17
- 17(16'). Legs entirely pale; thorax without definite markings; abdomen pale; anterior edge of frons seen from above convex; abdomen of male not constricted at segment 3; abdomen 45 mm. . . . . (*T. septima*)
- 17'. Legs more or less dark; thorax with definite dark markings; anterior edge of frons seen from above more or less angled; abdomen of male constricted at segment 3; abdomen 43 mm. . . . . *T. trifida*
- 18(11'). Stigma with ends parallel. . . . . 19
- 18'. Stigma trapezoidal. . . . . 34
- 19(18). Last antenodal crossvein in forewing complete; male violaceous; wings clear; abdomen 32 mm. . . . . *Orthemis ferruginea*
- 19'. Last antenodal crossvein in forewing incomplete. . . . . 20
- 20(19'). Two bridge crossveins (*Micrathyria*) . . . . . 21
- 20'. One bridge crossvein. . . . . 22
- 21(20). One cell between hind angle of triangle and midrib of anal loop; discoidal field of hind wing one cell wide; male thorax pruinose; abdomen 18 mm. . . . . *M. aequalis*
- 21'. Two cells between hind angle of triangle and midrib of anal loop; discoidal field of hind wing two cells wide; male thorax dark with yellow stripes; abdomen 24 mm. . . . . *M. didyma*
- 22(20'). Midrib of anal loop bent at an angle of 30–50°;  $M_2$  not undulate; nodus of forewing commonly near center of wing . . . . . 23
- 22'. Midrib of anal loop bent at an angle of 50–60°;  $M_2$  commonly somewhat undulate; nodus of forewing commonly distinctly beyond center of wing . . . . . 29
- 23(22). Femora with both conspicuously long and small spines; hind wing  $Cu_1$  arising at outer side of triangle . . . . . 24
- 23'. Femora without conspicuously long spines; hind wing  $Cu_1$  arising from hind angle of triangle . . . . . 26
- 24(23).  $R_{PL}$  subtends two cell rows; green color; abdomen 41 mm. . . . . *Leptthemis vesiculosa*
- 24'.  $R_{PL}$  subtends one cell row (*Erythemis*) . . . . . 25
- 25(24'). Discoidal field of forewing with 2 cell rows; discoidal field of hind wing with at least one cell running through from  $M_4$  to  $Cu_1$ ; slender insect with small brown basal spots on hind wing; abdomen 23 mm. . . . . (*E. credula*)

## Key to the Odonata of Dominica—Continued

- 25'. Discoidal field of forewing with 3 cell rows; of hind wing with no cells running through from  $M_1$  to  $Cu_1$ ; stout insect with black basal spots on hind wing; abdomen 28 mm. .... (*E. attala*)
- 26(23'). Anal crossing before the origin of  $A_2$ ; (*Erythrodiplax*) ..... 27
- 26'. Anal crossing opposite, not before,  $A_2$  ..... 33
- 27(26). Two cell rows between  $R_S$  and  $R_{PL}$ ; adult male with black band on wing; vulvar lamina of female small, much less than half length of segment 9; abdomen 27 mm. .... *E. umbrata*
- 27'. Usually only one cell row between  $R_S$  and  $R_{PL}$ ; if two cell rows, then adult male without dark band on wings; vulvar lamina of female about half as long as segment 9 ..... 28
- 28(27'). Hind wing of male with conspicuous basal spot (black in mature specimens) extending to  $A_2$ ; genital lobe of male usually upright and not overlying posteriorly; vulvar lamina of female not more than half as long as segment 9; abdomen 21 mm. .... (*E. unimaculata*)
- 28'. Hind wing of male clear or with very slight basal infuscation; genital lobe of male strongly overlying posteriorly; vulvar lamina of female more than half as long as segment 9; frons bluish black; abdomen 20 mm. .... (*E. c. connata*)
- 28''. Hind wing of male with conspicuous basal spot (dark red or reddish brown in mature specimens) extending at least to base of  $A_2$ ; genital lobe of male strongly overlying posteriorly; vulvar lamina of female more than half as long as segment 9; frons red; abdomen 20 mm. .... (*E. c. fusca*)
- 29(22').  $M_2$  undulate;  $M_S$  in all wings clearly defined ..... 30
- 29'.  $M_2$  not conspicuously undulate;  $M_S$  absent in hind wing; tooth of tarsal claw long, protruding beyond end of claw; male dark, slender, with rounded pale spots on side of thorax; abdomen 31 mm. .... (*Macrothemis celeno*)
- 30(29). Forewing discoidal field with 2 cell rows ..... 32
- 30'. Forewing discoidal field with 3 cell rows (*Dythemis*) ..... 31
- 31(30'). Frons reddish, ground color of thorax chocolate brown; abdomen 29 mm. .... *D. sterilis*
- 31'. Frons and ground color of thorax dark, iridescent blue-green; abdomen 26 mm. .... (*D. multipunctata*)
- 32(30). Arculus of hind wing very close of 2nd antenodal; spines of hind femur of female tapering in length; male unknown; abdomen 32 mm. .... *Scapanea archboldi*
- 32'. Arculus of hind wing distinctly distal to 2nd antenodal; spines of hind femur of female subequal in length, except for ultimate spine; abdomen 35 mm. .... (*Brechmorhoga praecox grenadensis*)
- 33(26'). Hind wing with 6 antenodal crossveins;  $M_{PL}$  subtends a single cell row; male reddish brown; abdominal segments 8–9 black; abdomen 28 mm. .... *Brachymesia furcata*
- 33'. Hind wing with 7–8 antenodal crossveins;  $M_{PL}$  subtends 2 cell rows; male brownish; abdominal segments 4–9 black; abdomen 33 mm. .... *Cannacria herbida*
- 34(18'). Hind wing with 2 cubital-anal crossveins; yellowish insect with clear wings; abdomen 30 mm. .... *Pantala flavescens*
- 34'. Hind wing with 1 cubital-anal crossvein; dark brown to red brown patches at base of hind wing (*Tramea*) ..... 35
- 35(34'). Basal spot of hind wing reach to or beyond triangle; abdomen 31 mm. .... (*T. onusta*)
- 35'. Basal spot of hind wing not reaching triangle ..... 36
- 36(35'). Frons of adult male metallic; of female with a broad basal black band; abdomen 32 mm. .... (*T. binotata*)
- 36'. Frons of adult male and female red; abdomen 30 mm. .... *T. abdominalis*

***Anax concolor* Brauer**

*Anax longipes* Hagen, 1861, p. 118.—Calvert, 1905, p. 176.—Needham & Westfall, 1955, p. 272.

*Anax concolor* Brauer, 1865, p. 508.—Geijskes, 1968, p. 73.

*Anax longipes concolor* Brauer.—Martin, 1908, p. 13.—Paulson, 1966, p. 100.

**MATERIAL EXAMINED.**—Dominica: Freshwater Lake, 5 June 1964, 5 ♂ (TD), 4 ♂ (OF), 25 Oct. 1964, 1 ♂ (PS), 28 May–2 June 1965 (DG), 9 June 1965, 2 ♂ (DD).

This species, recorded only recently from the Lesser Antilles (Dominica and Guadeloupe), is well known from the Bahamas and in tropical South America. It is a large, conspicuous dragonfly at Freshwater Lake, and males may be seen patrolling the lake margins almost constantly, except during rain showers. Cast skins can be found clinging to floating vegetation on the lake.

***Aeshna psilus* Calvert**

*Aeshna cornigera*, nec Brauer.—Klots, 1932, p. 18.

*Aeshna psilus* Calvert, 1947, p. 4.—Calvert, 1956, p. 150.

**MATERIAL EXAMINED.**—Dominica: Brantridge, 9 May 1964, 1 nymph(OF); Freshwater Lake, 5 June 1964, 1 ♂, 1 ♀(TD), 7 June 1964, 1 ♂(TD), 15 Oct. 1966, 1 ♂(ET).

This species is recorded from the Lesser Antilles for the first time, having previously been known from the Greater Antilles, Mexico, Central America, and northwestern South America. It is less conspicuous than the previous species, and prefers to patrol paths and wet spots around the lake, rather than the open water.

***Triacanthagyna trifida* (Rambur)**

*Gynacantha trifida* Rambur, 1842, p. 210.—Calvert, 1905, p. 191.—Klots, 1932, p. 24.

*Triacanthagyna trifida* (Rambur).—Martin, 1909, p. 148.—Williamson, 1923, p. 24.—Needham & Westfall, 1955, p. 325.

**MATERIAL EXAMINED.**—Dominica: Melville Hall, 7 Jan. 1965, 1 ♂ (JC, TC); Clarke Hall, 23 Mar. 1964, 1 ♀ (DB), 9 Oct. 1964, 1 ♀ (PS), 8 Jan. 1965, 1 ♀ (JC, TC).

The seasonal distribution of this crepuscular dragonfly and its close relatives, on Dominica and on other Antillean islands, is not known. *Gynacantha* and *Triacanthagyna* species generally tend to fly

together where they occur. I have found various species common in Saint Lucia in September, in Puerto Rico in January (though scarce in July), in Trinidad in March and April, and in Guatemala in August and September. Although we searched for this insect on Dominica intensively during the first week of June, we found no evidence of it. The life history and ethology of this and related species remains somewhat mysterious.

***Orthemis ferruginea* (Fabricius)**

*Libellula ferruginea* Fabricius, 1775, p. 423.

*Orthemis ferruginea* (Fabricius).—Kirby, 1894, p. 264.—Calvert, 1906, p. 234.—Ris, 1910, p. 282.—Klots, 1932, p. 28.—Needham & Westfall, 1955, p. 471.

**MATERIAL EXAMINED.**—Dominica: East Cabrit (swamp), 10 Apr. 1954, 3 ♂ (OF), 4 June 1964, 1 ♂, 1 ♀ (TD), 18 June 1964, 1 ♂ (OF), 29 June 1964, 1 ♂ (OF), 28 May–2 June 1965 (DG); Melville Hall, 9 June 1965, 1 ♀(DD); Clarke Hall, 16 Feb. 1964, 1 ♂ (DB), 4 Apr. 1964, 1 ♂ (OF), 28 Oct. 1964, 1 ♀ (PS), 16 Jan. 1965, 1 ♂ (WW), 18 Jan. 1965, 1 ♂ (WW), 9 Feb. 1965, 1 ♂ (JC, TC), 13 Feb. 1965, 1 ♂ (JC, TC), 10 Mar. 1965, 1 ♂ (JC, TC); Café, 3 June 1964, 4 ♂ (TD), 1 ♂ (OF); Pont Casse (.9 mi east), 17 Sept. 1964, 1 ♂ (TS). Springfield Estate, 28 May–2 June 1965 (DG); Sylvania Estate, 28 May–2 June 1965 (DG); Grande Savane, 8 Apr. 1964, 1 ♂ (OF); Freshwater Lake, 17 Sept. 1964, 1 ♂ (TS), 9 June 1965, 1 ♀ (DD); Laudat, 28 May–2 June 1965 (DG); Roseau River at Goodwill Reservoir, 28 May–2 June 1965 (DG).

This handsome, plum-colored dragonfly is one of the most widespread Odonata species in the circum-Caribbean region, and is conspicuous in nearly all aquatic habitats, including stock ponds and muddy creeks inhabited by few other Odonates. Its seasonal distribution on Dominica (see above) is unusual in that it appears in few collections in the autumnal months, toward the end of the rainy season.

***Micrathyria didyma* (Selys)**

FIGURES 5–14

*Libellula didyma* Selys, 1857, p. 453.

*Micrathyria*(?) *pruinosa*, new species.—Kirby, 1894, p. 267.

*Micrathyria didyma* (Selys).—Calvert, 1906, p. 221.—Ris, 1911, p. 430.—Klots, 1932, p. 38.—Needham, 1943, p. 189.—Santos, 1954, p. 493.—Needham & Westfall, 1955, p. 507.

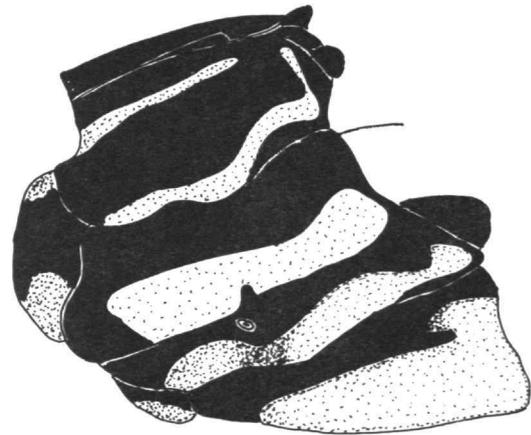
**MATERIAL EXAMINED.**—Dominica: East Cabrit (swamp), 10 Apr. 1964, 1 ♂ (OF), 4 June 1964, 5 ♂ (TD), 1 ♂, 1 ♀ (OF), 18 June 1964, 2 ♂ (OF), 29 June 1964, 4 ♂, 5 ♀ (OF), 2 Nov. 1964, 1 ♂ (PS), 5 Nov. 1964, 1 ♂, 1 ♀ (PS), 28 May–2 June 1965 (DG); Roseau River, 1¼ mi above Roseau, 23 July 1963, 2 ♂ (OF); Canefield Estate, 28 May–2 June 1965 (DG).

This species is widely distributed in the Caribbean region. A long series of specimens from Cuba, Jamaica, Haiti, Dominican Republic, Puerto Rico,

the Bahamas, Dominica, and Saint Lucia, as well as a series from Guatemala and southern Mexico which had been included in this species, were compared during this study. The species *didyma* varies little through the Antillean regions, though there are some minor peculiarities in the thoracic color pattern (Figures 5–8) that are identifiable with particular islands. Though these patterns vary, even at one locality, the “Cuban” pattern is found also in the Dominican Republic, the Bahamas (Cat Island), Puerto Rico, Saint Lucia, and near Roseau, Domin-



5. DOMINICA



6. JAMAICA

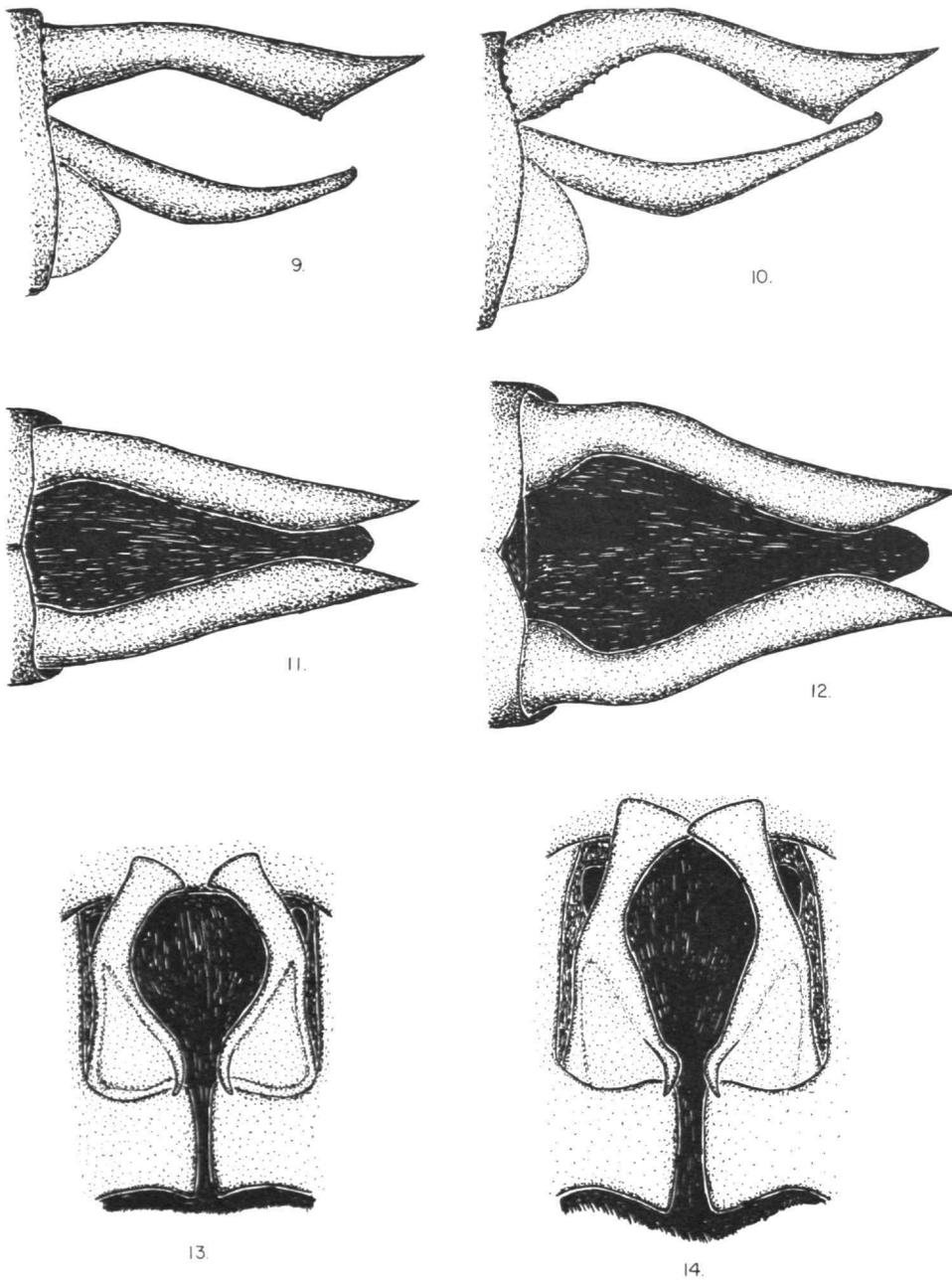


7. CUBA



8. GUATEMALA

**FIGURES 5–8.**—Thoracic patterns of *Micrathyria didyma* sensu lato: 5, Dominica; 6, Jamaica (collected by M. J. Westfall); 7, Cuba (collected by M. J. Westfall); 8, Morales, Guatemala (collected by T. W. Doanally).



FIGURES 9-14.—*Micrathyria didyma* sensu lato: 9, 11, 13, Cuba (collected by M. J. Westfall); 10, 12, 14, Morales, Guatemala (collected by T. W. Donnelly); 9, 10, male appendages, lateral view; 11, 12, male appendages, dorsal view; 13, 14, male genitalia of second segment, ventral view.

ica. The "Jamaican" pattern is found also in the Bahamas (San Salvador). The "Dominican" pattern, with its tendency toward pale color restriction, is restricted to the East Cabrit occurrence.

Structurally there are no conspicuous differences among the Antillean specimens. The Guatemalan and Mexican specimens examined, however, have conspicuously heavier posterior laminae, and more arched and curved anal appendages, as shown in Figures 9-14. Because Ris described in detail a Guatemalan, rather than a Cuban, specimen of this species in his monograph, the former is the better-known representative of this species. It now appears, however, that the mainland form may have to be referred to under another name, and the name *didyma* reserved for the Antillean form.

The specimens of this species which I have collected have rather different habits than the Guatemalan and Mexican forms. The Antillean insect is a retiring, inconspicuous insect found generally in shaded brush around small ponds. The mainland form, on the other hand, commonly perches in more conspicuous, exposed places around the margins of ponds.

### *Micrathyrta aequalis* (Hagen)

*Dythemis aequalis* Hagen, 1861, p. 167.

*Micrathyrta aequalis* (Hagen).—Kirby, 1894, p. 267.—Calvert, 1906, p. 229.—Needham, 1943, p. 187.—Needham & Westfall, 1955, p. 505.

MATERIAL EXAMINED.—Dominica: East Cabrit (swamp), 4 June 1964, 1 ♂ (TD), 1 ♂ (OF); 28 May-2 June 1965 (DG); Hillsborough Estate (slough), 17 Apr. 1964, 2 ♂ (OF); Canefield Estate (pool), 28 May-2 June 1965 (DG).

This dark libelluline is the smallest dragonfly species recorded from Dominica. It is widespread in the circum-Caribbean region, and is commonly found perched on bare twigs around the edges of small ponds.

### *Erythrodiplax umbrata* (Lumaeus)

*Libellula umbrata* Linnaeus, 1758, p. 545.

*Trithemis umbrata* (Linnaeus)—Kirby, 1894, p. 263.

*Erythrodiplax umbrata* (Linnaeus).—Ris, 1911, p. 484.—Calvert, 1928, p. 25.—Klots, 1932, p. 43.—Borror, 1942, p. 105.—Needham & Westfall, 1955, p. 528.

MATERIAL EXAMINED.—Dominica: East Cabrit (swamp), 10 Apr. 1964, 6 ♂, 7 ♀ (OF), 15 Oct. 1964, 1 ♀ (PS), 2 Nov. 1964, 4 ♂, 2 ♀ (PS), 3 Nov. 1964,

2 ♀ (PS), 5 Nov. 1964, 2 ♂, 9 ♀ (PS), 23 Feb. 1965, 2 ♂ (TC, JC), 22-25 Mar. 1965, 2 ♂, 1 ♀ (WW), 28 May-2 June 1965 (DG), 18 Oct. 1966, 1 ♂ (ET); Melville Hall, 10 Apr. 1964, 1 ♀ (OF), 14 May 1966, 1 ♂, 1 ♀ (GS); Clarke Hall, 16 Feb. 1964, 2 ♀ (DB), 17 Oct. 1964, 1 ♀ (PS), 31 Oct. 1964, 1 ♀ (PS), 10 Jan. 1965, 1 ♂ (JC, TC), 16 Jan. 1965, 3 ♂, 1 ♀ (WW), 18 Jan. 1965, 1 ♂ (WW), 13 Feb. 1965, 2 ♂, 4 ♀ (JC, TC), 16 Feb. 1965, 2 ♂ (JC, TC), 2 Mar. 1965, 1 ♀ (JC, TC), 10 Mar. 1965, 1 ♂, 1 ♀ (JC, TC), 11 Mar. 1965, 1 ♀ (JC, TC), 21-31 Mar. 1965, 1 ♀ (WW), 4 Oct. 1966, 1 ♂ (ET), 9 Oct. 1966, 1 ♂ (AG), 11 Oct. 1966, 1 ♀ (AG), no date, 1 ♂ (JC, TC); Café, 3 June 1964, 1 ♂, 1 ♀ (OF), 3 ♂, 1 ♀ (TD); Pont Cassé, 1 June 1964 (1.6 mi west), 1 ♀ (TD), 18 Sept. 1964 (1 mi west), 3 ♂, 1 ♀ (TS), 8 Oct. 1966, 2 ♂ (ET), 14 Oct. 1966, 1 ♀ (AG), 1 ♀ (ET); d'Leau Gommier, 27 Apr. 1964, 1 ♀ (OF); Salibia, 25 Sept. 1964, 1 ♀ (TS); Concord, 4 Dec. 1964, 1 ♀ (PS); Castle Bruce, 8 Oct. 1966, 1 ♂ (AG), 2 ♂ (ET); mouth of Layou River, 9 Jan. 1965, 1 ♀ (JC, TC), 20 Jan. 1965, 1 ♀ (WW), 10 Oct. 1966, 1 ♂ (ET); Grande Savane, 8 Apr. 1964, 3 ♂ (OF), 2 Sept. 1964, 1 ♂ (TS), 15 Sept. 1964, 1 ♂ (TS), 7 Oct. 1966, 1 ♀ (AG); Fond Figs, 6 Apr. 1964, 1 ♂, 1 ♀ (OF); Hillsborough Est. (slough), 17 Apr. 1964, 1 ♂, 1 ♀ (OF); Mannett Gutter, 17 May 1966, 1 ♀ (GS); Goodwill, 7 Oct. 1966, 1 ♂ (ET); Laudat (creek), 28 May-2 June 1965 (DG); Cane-field Est. (pool), 28 May-2 June 1965 (DG); Roseau R. at Goodwill Reservoir, 28 May-2 June 1965 (DG); Springfield Est., 28 May-2 June 1965 (DG); Wotten Waven, 7 Oct. 1964, 1 ♀ (PS); Fond Colet, 9 Oct. 1964, 1 ♂ (PS); Freshwater Lake, 25 Oct. 1964, 1 ♀ (PS); Trafalgar Falls, 15 Mar. 1964, 1 ♀ (DB); Grand Bay, 13 Apr. 1964, 1 ♂ (OF).

This handsome species is one of the most common and widespread of all Neotropical Odonata, occurring around nearly every body of relatively quiet water at lower elevations in the American tropics. A remarkably small proportion of females collected (1 out of 55) had any dark marking on the wings.

### *Leptemis vesiculosa* (Fabricius)

*Libellula vesiculosa* Fabricius, 1775, p. 421.

*Leptemis vesiculosa* (Fabricius)—Kirby, 1894, p. 268.—Calvert, 1907, p. 339.—Ris, 1911, p. 607.—Klots, 1932, p. 56.—Needham & Westfall, 1955, p. 555.

MATERIAL EXAMINED.—Dominica: East Cabrit (swamp), 4 June 1964, 1 ♂ (TD), 27 June 1964,

1 ♂ (OF), 2 Nov. 1964, 3 ♂ ("Culucoides feeding on wings and thorax") (PS), 5 Nov. 1964, 2 ♂ (PS), 28 May–2 June 1965 (DG); 18 Oct. 1966, 2 ♀ (ET); Portsmouth, 19 Oct. 1966, 1 ♂ (AG); Clarke Hall, 10 Mar. 1965, 1 ♂ (JC, TC); Canefield Estate, 28 May–2 June 1965 (DG); Grand Bay, 13 Mar. 1964, 1 ♂ (DB).

This is another widespread Neotropical pond species, occurring especially commonly in rather stagnant pools where relatively few other species are present. A disproportionate number of specimens were taken toward the end of the rainy season.

### *Brachymesia furcata* (Hagen)

*Erythemis furcata* Hagen, 1861, p. 169.

*Cannacria smithii*, new species.—Kirby, 1894, p. 266.

*Cannacria furcata* (Hagen).—Calvert, 1907, p. 325.

*Brachymesia furcata* (Hagen).—Ris, 1911, p. 737.—Klots, 1932, p. 51.—Garcia Diaz, 1938, p. 58, 72, 74.—Needham & Westfall, 1955, p. 559.

**MATERIAL EXAMINED.**—Dominica: Freshwater Lake, 5 June 1964, 1 ♂ (TD).

This dragonfly ranges widely, but rarely occurs in numbers. It prefers lacustrine habitats, generally away from the seashore. Other dragonflies of this species were seen at Freshwater Lake on the date of the lone collection.

### *Cannacria herbida* (Gundlach)

*Libellula herbida* Gundlach, 1889, p. 261.

*Cannacria batesii* Kirby, 1889, p. 341.—Calvert, 1907, p. 326.—Ris, 1912, p. 736.

*Cannacria herbida* (Gundlach).—Klots, 1932, p. 61.—Needham & Westfall, 1955, p. 563.

**MATERIAL EXAMINED.**—Dominica: Canefield Estate (pool), 28 May–2 June 1965 (DG).

A widespread Antillean species, occurring sparingly on the mainland.

### *Dythemis sterilis* Hagen

*Dythemis sterilis* Hagen, 1861, p. 317.—Ris, 1916, p. 1205.—Geijskes, 1946, p. 232.

*Dythemis velox sterilis* Hagen.—Calvert, 1898, p. 309; 1906, p. 273.—Ris, 1913, p. 841.

**MATERIAL EXAMINED.**—Dominica: d'Leau Gommier, 21 Feb. 1965, 1♂(JC, TC); Brantridge, 9 May 1964, 1 ♂ (OF); Pont Cassé, 7 May 1964 (0.5 mi

east), 1 ♂ (OF), 6 June 1964 (0.5 mi east), 2 ♂ (TD), 22 May 1964 (0.4 mi east), 1 ♂ (OF), 1 June 1964 (1.3 mi east), 2 ♂ (TD), 15 June 1964 (1.3 mi east), 3 ♂ (OF); Clarke Hall, 1 Mar. 1965, 1 ♂ (JC, TC); Mannett Gutter, 11 Apr. 1964, 2 ♂ (OF), 1 May 1964, 1 ♂ (OF), 3 June 1964, 2 ♂ (TD); Café, 3 June 1964, 1 ♂ (TD), 6 June 1964, 3 ♂ (OF); Macoucheri, 14 Feb. 1965, 1 ♂ (WW); Grande Savane, 20 May 1964, 1 ♀ (OF); Laudat (creek), 28 May–2 June 1965 (DG); Roseau River at Goodwill Reservoir, 28 May–2 June 1965 (DG); Freshwater Lake, 5 June 1964, 1 ♂, 1 ♀ (OF), 1 ♂ (TD), 7 June 1964, 1 ♂ (OF), 28 May–2 June 1965 (DG), 15 Oct. 1966, 1 ♀ (ET); Boeri Lake, 22 Feb. 1964, 1 ♂ (emerging)(RZ).

This species is common in Mexico, Central America, and northern South America, and its West Indian occurrences are limited to the Lesser Antilles. Streams and rivers, frequently shaded, are the favored habitat.

### *Scapanea archboldi*, new species

FIGURES 15, 17, 18

**DESCRIPTION OF FEMALE.**—Holotype.

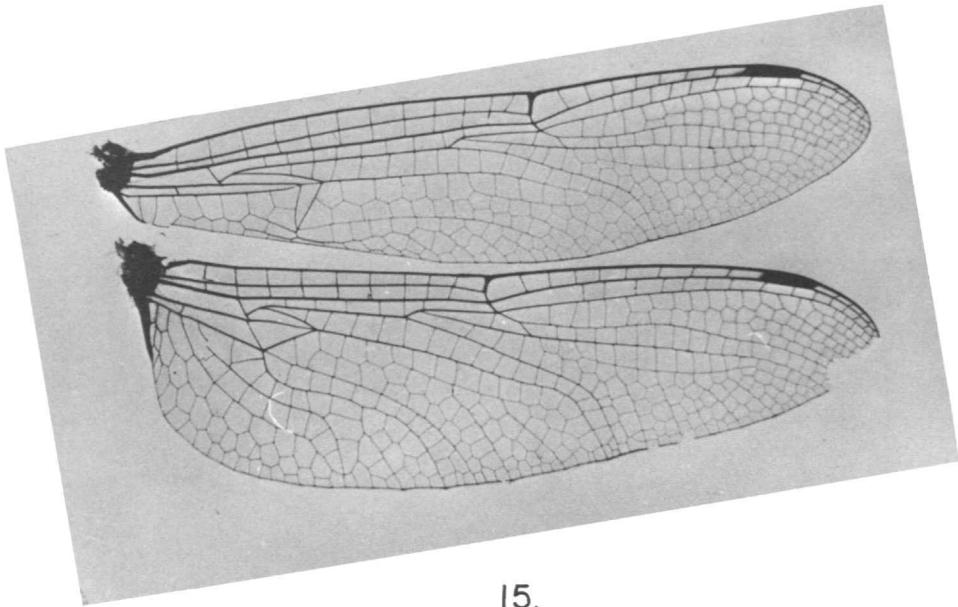
**Head** (Figure 17): Labrum deep glossy purple; anteclypeus gray-brown; postclypeus shining, very pale bluish, dark centrally; frons glossy purple, pale ventrally; vertex glossy purple, apparently erect with conical projections as is typical for genus (specimen flattened).

**Prothorax:** Brown, with three small dark spots at base of forelobe, two lateral dark dashes on midlobe. Hind lobe suberect, rounded, with very shallow, rounded, median emargination.

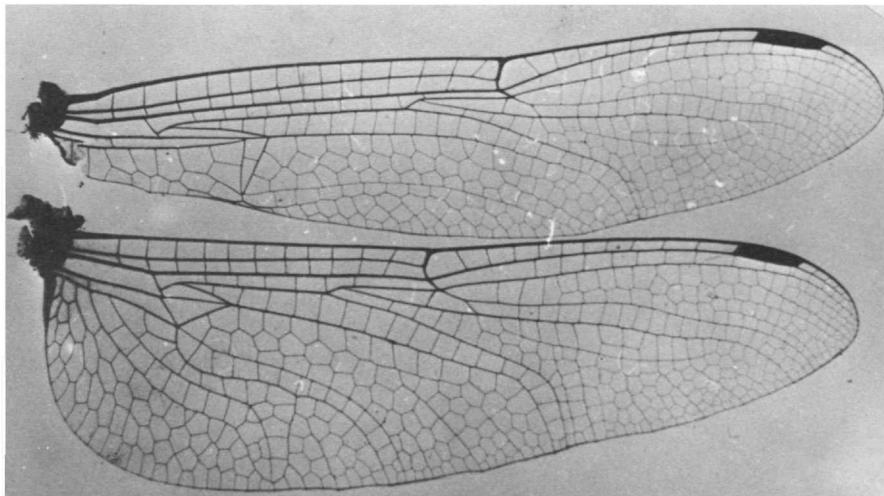
**Pterothorax:** Obscure dark brown, with conspicuous covering of fine, dark setae, pale as follows: thin stripe on mesepisternum, expanded dorsally into distinct "L"; broad stripe, rounded below, occupying approximately rear half of mesepimeron; thin stripe, wider and rounded below, on metepisternum; broad, parallel-sided stripe, rounded below, on metepimeron.

**Legs:** Dark, femoral spines tapering in length, last spine (last two spines on fore femur) conspicuously longer (Figure 18). Six spines on forefemur, seven on midfemur, nine on hind femur.

**Abdomen:** Obscure dark brown, paler ventrally on basal segments, pale discontinuous dashes parallel to middorsal carina on sides of 3–5, extending caudally about two-thirds of 3 and 4 and less than one-third of 5. Anal appendages dark, slightly longer than 10. Vulvar lamina short, inconspicuous, rounded, with round-

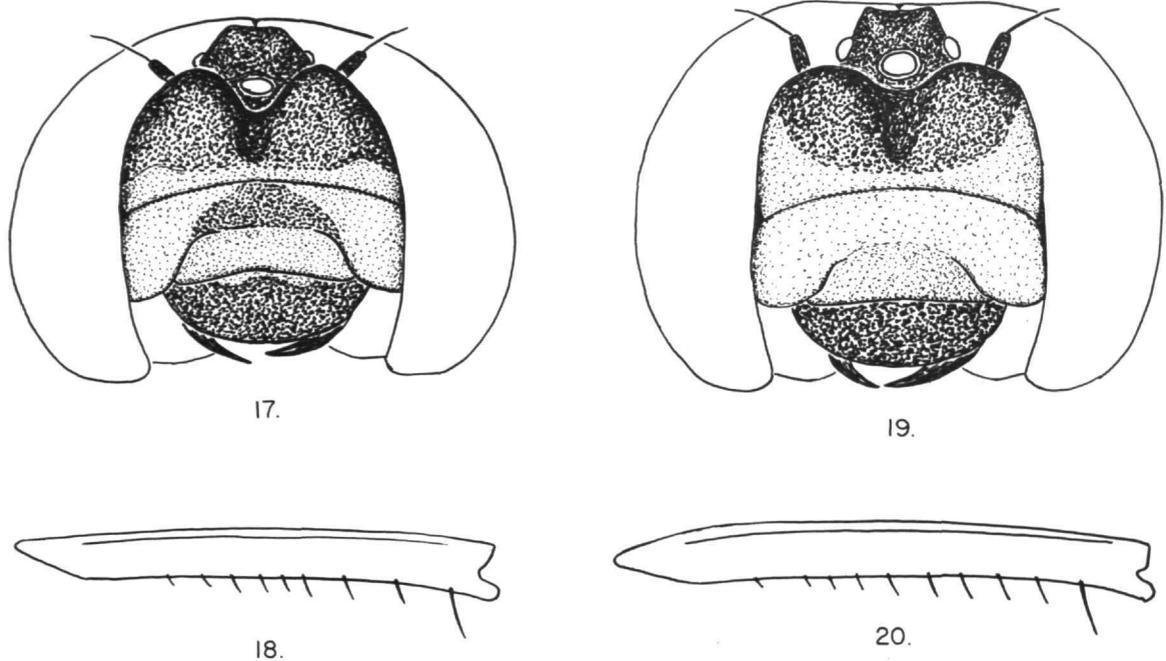


15.



16.

FIGURES 15-16.—*Scapanea* wings: 15, *S. archboldi*, new species, female; 16, *S. frontalis* (Burmeister), female (Puerto Rico, collected by T. W. Donnelly).



FIGURES 17-20.—*S. archboldi*, new species, female: 17, female facial pattern (frontal horns somewhat restored from crushed condition); 18, female hind femur. *S. frontalis* (Burmeister), female (Puerto Rico, collected by T. W. Donnelly); 19, facial pattern; 20, hind femur.

ed central excavation. Abdomen of specimen flattened, but evidently broad, with breadth of terga of 8 and 9 suggesting slight expandability.

Venation (Figure 15): Antenodals  $11\frac{1}{2}$  (forewing), 8, 9 (hind wing); postnodals 7 (forewing), 8, 9 (hind wing). Forewing arculus rises one-sixth space proximal to 2nd antenodal.  $R_{PL}$  and  $M_{PL}$  conspicuous, one cell between these and  $R_S$  and  $M_4$  respectively. Forewing triangle and supertriangle one celled, subtriangle with three cells, discoidal field two cells wide; hind wing, triangle and supertriangle one celled. Three cell rows between  $A_2$  of hind wing and wing margin.

Measurements: Abdomen 32 mm; hind wing 31 mm.

Locality: Dominica, Freshwater Lake, 16 September 1964, collected by T. J. Spilman.

This species is evidently closely related to *Scapanea frontalis* (Burmeister) of the Greater Antilles, although the generic diagnosis is somewhat doubtful for females. The closest genus to *Scapanea* is *Brechmorhoga*, which is represented in Grenada by one species (*B. praecox grenadensis* Kirby) and in Trinidad additionally by *B.*

*nubecula* (Rambur). The wing venation of the new species (Figure 15) is superficially like that of *Brechmorhoga* in the reduction of number of cells in the triangles and cell rows between  $A_2$  and the wing margin, and number of cell rows between the  $R_{PL}$ ,  $M_{PL}$ , and their respective principal veins. These characters do not indicate a relationship with *Brechmorhoga*, however, but rather a reduction of venation, largely in conjunction with reduction in size. The position of the arculus in the hind wing, which is coincident with or very close to the 2nd antenodal in *Scapanea* and generally more distal in *Brechmorhoga*, is a clue to the correct relationship. The strongest indication of affinity of the new species with the Greater Antillean genus, however, is the breadth of the abdomen, which is conspicuously greater in the new species than in either *Brechmorhoga* from Trinidad, or even the broader Middle American species *B. rapax* Calvert. Further, the femoral armature of the new species is very close in general form to that of the female of *Scapanea frontalis*, in which the femoral spines taper

rather gradually in length proximally. In *Brechmorhoga* females the preultimate spines are subequal in length.

The new species differs from *frontalis* by: (1) its smaller size and relatively shorter wings (two Puerto Rican females have abdomens 33 and 32 mm, and hind wings 37 and 34½ mm); (2) its narrower antehumeral stripes and coarser, darker, pterothoracic setae; (3) its conspicuously different facial color pattern with the more restricted pale color on the frons, the central dark color on the postclypeus, and the pale basal spots on the labrum; and (4) its reduced venation (the Puerto Rican females of *frontalis* (Figure 16) have two-celled triangles in the forewing and the discoidal field three cells wide; there are four cell rows between  $A_2$  and the wing margin of the hind wing; there are two cell rows for a distance of three or four cells between  $R_{sp1}$  and  $R_8$ ; there are 14½ or 15½ antenodals in the forewing and 10 or 11 antenodals in the hind wing).

Whether the male, when it is finally taken, will have the conspicuously clubbed abdomen of *frontalis* is, of course, not known. The female of *frontalis*, however, has somewhat widened terga on 8 and 9 which are shared with those of the new species, and I believe it is probable that the new species will be equally clubbed.

The exact habitat of the new species is not known. Again by analogy with *frontalis*, however, its most likely habitat is a mountain stream such as the outlet stream of Freshwater Lake.

It is with great pleasure that I name the new species for John D. Archbold, whose interests in Dominica and in natural history have combined in the patronage of a most important series of biological studies of this truly fascinating tropical island.

### *Tramea abdominalis* (Rambur)

*Libellula abdominalis* Rambur, 1842, p. 37.

*Tramea abdominalis* (Rambur).—Cabot, 1890, p. 45.—Kirby, 1894, p. 262.—Calvert, 1906, p. 304.—Ris, 1913, p. 994.—Klots, 1932, p. 69.—Needham & Westfall, 1955, p. 595.

MATERIAL EXAMINED.—Dominica: East Cabrit (swamp), 4 June 1964, 1 ♂ (OF), 27 June 1964, 1 ♂ (OF); Hillsborough Estate (slough), 17 Apr. 1964, 3 ♂ (OF); Clarke Hall, 10 Mar. 1965, 1 ♂ (JC, TC); Trafalgar, 13 Apr. 1964, 1 ♂ (OF); Freshwater Lake, 5 June 1964, 1 ♂, 1 ♀ (OF), 1 ♂ (TD), 7 June 1964, 1 ♂ (OF), 16 Sept. 1964, 1 ♂ (TS), 9 June 1965, 1 ♂ (DD).

This is a widespread tropical lacustrine species occurring dominantly in the West Indies. On Dominica most records were during the first months of the rainy season.

### *Pantala flavescens* (Fabricius)

*Libellula flavescens* Fabricius, 1798, p. 285.

*Pantala flavescens* (Fabricius).—Cabot, 1890, p. 44.—Kirby, 1894, p. 262.—Calvert, 1906, p. 307.—Ris, 1913, p. 917.—Klots, 1932, p. 73.—Needham & Westfall, 1955, p. 602.

MATERIAL EXAMINED.—Dominica: East Cabrit (swamp), 18 Oct. 1966, 1 ♀ (ET<sup>†</sup>); Melville Hall, 9 June 1964, 1 ♂ (OF).

This conspicuous yellow dragonfly is the most widely ranging of all Odonata species, being found throughout the tropic and subtropical regions of the entire world. The small number of captures on Dominica is surprising; there are several additional sightings.

### *Lestes forficula* Rambur

*Lestes forficula* Rambur, 1842, p. 247.—Calvert, 1901, p. 50.—Klots, 1932, p. 77.

MATERIAL EXAMINED.—Dominica: East Cabrit (swamp), 4 June 1964, 4 ♂ (OF), 4 ♂ (TD), 18 June 1964, 1 ♂ 1 ♀ (OF), 5 Nov., 1964, 1 ♂ 1 ♀ (PS).

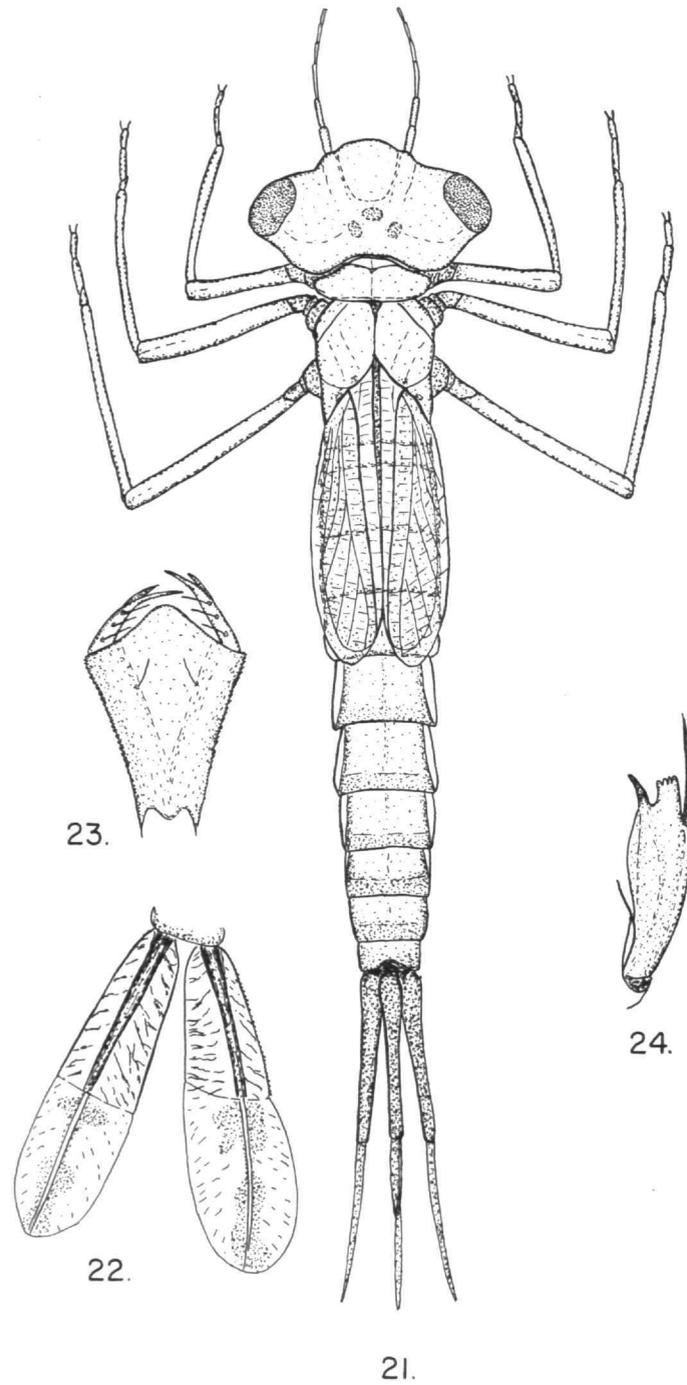
This damselfly occurs widely in Middle America and the West Indies. Its preferred habitat is shallow, often temporary, ponds, commonly in cleared areas.

### *Protoneura ailsa* Donnelly

FIGURES 21-24

*Protoneura ailsa* Donnelly, 1961, p. 119.

MATERIAL EXAMINED.—Dominica: d'Leau Morne Laurent, 1 Mar. 1964, 1 ♂ (HH); Central Forest Reserve (small creek in forest), 28 May-2 June 1965 (DG); Pont Cassé, 22 May 1964 (1.3 mi east), 6 ♂ (OF), 1 June 1964 (1.3 mi east) 2 ♂ (TD), 3 June (0.3 mi east) 1 ♂ (TD); Clarke Hall, 21-31 Mar. 1965, 2 ♀ (WW), 31 May 1965, 1 ♂ (GS); 4 Apr. 1964 (wooded trail), 1 ♀ (OF); Mannett Gutter, 5 Apr. 1964, 1 ♂ (OF), 11 Apr. 1964, 6 ♂ (OF), 1 May 1964, 11 ♂ (OF), 3 June 1964, 3 ♂, 1 ♀ (TD); Café, 3 June 1964, 17 ♂, 2 ♀ (TD), 6 June 1964, 29 ♂, 5 ♀ (TD), 17 ♂, 1 ♀ (OF), 8 June 1964, 8 ♂, 2 ♀ (OF), 27 June 1964, 4 ♂ (OF).



FIGURES 21-24.—*Protoneura ailsa* Donnelly, nymph: 21, dorsal view; 22, lateral view of caudal lamellae; 23, dorsal view of labium; 24, lateral view of lateral lobe of labium.

This very beautiful damselfly is locally common in shaded, heavily vegetated, small streams.

**NYMPH.**—A pale-colored nymph with lightly pigmented caudal lamellae and subtransparent wing cases, through which the segmentation of the abdomen is visible. Antennae 6-segmented, 3rd segment longest,  $1\frac{1}{2}$  times the 2nd segment. Three lateral and 1 mental seta. Mentum abruptly rounded; postocular lobes setose. Lateral lobe beyond movable hook bifid, the mesal branch a strong hooklike tooth, the distal branch with a short hook and a square-tipped, dentate, wide tooth. Wing cases reach beyond the base of the 5th segment. Lateral keels present on 1–7. Pale color relieved only by dark markings on lamellae, and by the black eyes. Lamellae flat, rounded, thinner beyond nodus. Length 15 mm; gills 4 mm.

The nymph was found clinging to aquatic vegetation in a small stream tributary to the Layou River at Clarke Hall.

Locality: Café, 8 June 1964, collected by Flint and Donnelly.

### *Argia concinna* (Rambur)

FIGURES 25–27

*Agrion concinnum* Rambur, 1842, p. 254.

*Argia concinna* (Rambur).—Hagen & Calvert, 1902, p. 107.—Gloyd, 1941, p. 130.

**MATERIAL EXAMINED.**—Dominica: d'Leau Gommier, 27 Apr. 1964, 5 ♂1♀(OF), 3 June 1964, 18 ♂ (TD), 21 Feb. 1965, 1♀ (JC, TC); Central Forest Reserve (small creek in forest), 28 May–2 June 1965 (DG); Laurent River north of Bells Police Station, 28 May–2 June 1965 (DG); Pont Casse, 22 May 1964 (1.3 mi east), 5 ♂ (OF), 24 May 1964 (0.4 mi east), 2 ♂ (OF), 1 June 1964 (1.3 mi east) 3 ♂ (TD), 6 June 1964 (1.3 mi east), 3 ♂, 3 ♀ (TD), 15 June 1964, 1 ♂ (OF), 28 May–2 June 1965 (0.5 mi south), (DG); La Plaine, 16 Feb. 1964, 1 ♂ (HR); Fond Figue River, 16 Mar. 1964, 4 ♂ (DB), 17 Mar. 1964, 2 ♀ (DB), 6 Apr. 1964, 12 ♂, 10 ♀ (OF), 6 June 1964, 7 ♂, 14 ♀ (TD); Laudat (creek), 28 May–2 June 1965 (DG); Springfield Estate (river), 28 May–2 June 1965 (DG); Roseau River north of Goodwill Reservoir, 28 May–2 June 1965 (DG); Castle Bruce junction, 27 Apr. 1964, 1 ♂ (OF); Clarke Hall, 21–31 Mar. 1965, 1 ♂ (WW).

This damselfly is one of the few species of Odonata endemic to the Lesser Antilles. Its identity was a mystery for several years; the type locality ("Du Cap") was taken to mean the Cape of Good Hope, and its supposed occurrence in Africa was unique for the genus. Gloyd (1941) showed that the true locality of this species was the Lesser Antilles, mentioning that specimens from Dominica, Grenada, and Guadeloupe had been determined by her (making this species, incidentally, the only one heretofore recorded from Dominica (except from the very recently recorded *Anax concolor*). The mystery of the label locality has not, however, been satisfactorily solved. The possible type locality could be on Saint Lucia, where the northernmost part of the island belongs to the large Cape (or Cap) Estate, and where several small localities bear this name.

This is a conspicuous lotic species, occurring well above sea level in rushing streams.

**NYMPH.**—A moderately pigmented, stout nymph with heavy caudal lamellae, as is typical of the genus. Antennae 7 segmented, 3rd and 4th segments longest,  $1\frac{1}{3}$  times the length of the 2nd. No mental and 1 lateral seta. Lateral lobe beyond movable hook bifid, mesal hook longer than lateral. Postocular lobes rounded, setose. Legs with brown, subapical femoral stripes. Infolded lateral keels on 1–5. Wing cases reaching base of 5th segment. Lamellae triangular in section, inflated, with elongate tips. Color dark, with stripes on femora and on lamellae. Length 15 mm; gills 5 mm.

The nymph was collected in a small stream.

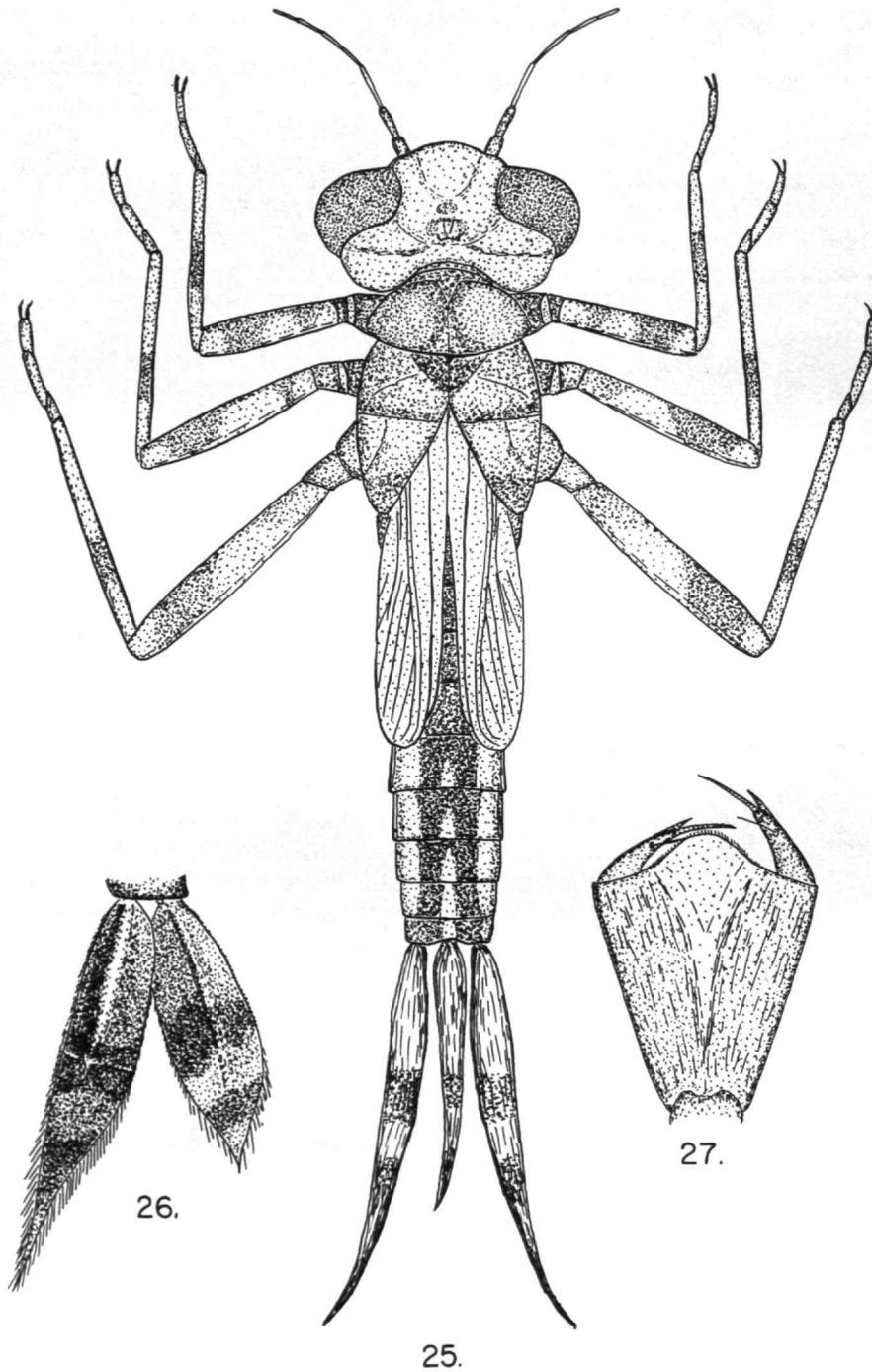
Locality: d'Leau Gommier, 27 April 1964, collected by Flint.

### *Telebasis sanguinalis* Calvert

*Telebasis sanguinalis* Calvert, 1909, p. 192.

**MATERIAL EXAMINED.**—Dominica: East Cabrit (swamp), 10 Apr. 1964, 3 ♂ 3 ♀ (OF), 25 Apr. 1964, 1 ♂ (OF), 4 June 1964, 10 ♂, 2 ♀ (TD), 18 June 1964, 3 ♂, 2 ♀ (OF), 29 June 1964, 3 ♂ (OF), 3 Nov. 1964, 1 ♂ (PS); north of Springfield Estate (swampy grassland), 28 May–2 June 1965 (DG).

This bright red, small damselfly occurs around small, grassy ponds. It occurs in South America and Trinidad, as well as the Lesser Antilles.



FIGURES 25-27.—*Argia concinna* (Rambur), nymph: 25, dorsal view; 26, lateral view of caudal lamellae; 27, dorsal view of labium.

*Enallagma coecum* (Hagen)

*Agrion coecum* Hagen, 1861, p. 84.

*Enallagma coecum* (Hagen).—Calvert, 1902, p. 112.—Klots, 1932, p. 96.

MATERIAL EXAMINED.—Dominica: Melville Hall, 14 May 1966, 2 ♀ (GS); Clarke Hall, 13 May 1966, 1 ♂ (GS); Café, 3 June 1964, 2 ♂ (TD), 6 June 1964, 3 ♂, 1 ♀ (OF), 5 ♂, 1 ♀ (TD), 27 June 1964, 1 ♂, 2 ♀ (OF), 8 July 1964, 2 ♂ (OF); Fond Figs River, 6 June 1964, 1 ♀ (TD); Springfield Estate, 28 May–2 June 1965 (DG); Roseau River at Goodwill Reservoir, 28 May–2 June 1965 (DG); Copt Hall, 11 Oct. 1966, 1 ♂ (ET).

Tiny streams, preferably heavily vegetated, are the habitat of this small violet damselfly. It ranges throughout the West Indies, but is replaced by a closely related species on Cuba (*E. cardenium* Hagen), an undescribed related species on Jamaica, and *E. novaehispaniae* Calvert on the mainland from Trinidad to Texas.

*Ischnura ramburi* (Selys)

*Agrion ramburii* Selys, 1857, p. 189.

*Micronympha senegalensis* (Rambur).—Kirby, 1894, p. 269.

*Ischnura ramburii* (Selys).—Calvert, 1902, p. 124, 388; 1928, p. 10.—Klots, 1932, p. 92.

MATERIAL EXAMINED.—Dominica: East Cabrit (swamp), 10 Apr. 1964, 4 ♂, 1 ♀ (OF), 25 Apr. 1964, 3 ♂ (OF), 4 June 1964, 1 ♂, 2 ♀ (TD), 18 June 1964, 1 ♀, 2 ♀ (OF), 2 Nov. 1964, 1 ♂ (PS), 3 Nov. 1964, 2 ♀ (PS), 28 May–2 June 1965 (DG); Melville Hall, 4 June 1964, 2 ♂, 1 ♀ (TD), 9 June 1964, 6 ♂, 5 ♀ (OF); Hillsborough Estate (slough), 17 Apr. 1964, 2 ♂ (OF), 1 June 1964, 1 ♂, 1 ♀ (TD); Canefield Estate (pool near beach), 28 May–2 June 1965 (DG); mouth of Layou River, 9 Jan. 1965, 1 ♂ (JC, TC), 6 Feb. 1965, 2 ♂, 2 ♀ (JC, TC), 18–24 Mar. 1965, 1 ♂ (WW); Fond Colet, 9 Oct. 1964, 1 ♂ 3 ♀ (PS); Roseau River near Goodwill Reservoir, 28 May–2 June 1965 (DG); Laudat (creek), 28 May–2 June 1965 (DG); Freshwater Lake, 21 Feb. 1964, 4 ♀ (DB), 14 Apr. 1964, 3 ♀ (OF), 5 June 1964, 3 ♀ (OF), 1 ♂, 1 ♀ (TD), 16 Sept. 1964, 2 ♂, 3 ♀ (TS), 21 Jan. 1965, 1 ♀ (TC), 16 Feb. 1965, 1 ♀ (JC, TC), 23 May 1965, 1 ♂, 2 ♀ (GS), 28 May–2 June 1965 (DG), 9 June 1965, 2 ♂ (DD), 15 Oct. 1966, 2 ♂ (ET).

This species is abundant around small, grassy ponds throughout the Middle American and West Indian

region. All of the specimens captured on Dominica belong to what is sometimes called the variety *credula*.

*Anomalagrion hastatum* (Say)

*Agrion hastatum* Say, 1839, p. 38.

*Anomalagrion hastatum* (Say).—Calvert, 1903, p. 110.—Klots, 1932, p. 99.

MATERIAL EXAMINED.—Dominica: East Cabrit (swamp), 10 Apr. 1964, 14 ♂ 8 ♀ (OF), 25 Apr. 1964, 45 ♂, 28 ♀ (OF), 4 June 1964, 1 ♂ (TD), 3 Nov. 1964, 136 assorted ♂ and ♀ (PS), 27 Feb. 1965, 5 ♂ (WW), 22–25 Mar. 1965, 2 ♂, 2 ♀ (WW); Portsmouth 20 Oct. 1966, 1 ♀ (AG); Melville Hall, 9 June 1964, 2 ♂, 1 ♀ (OF); Fond Colet, 9 Oct. 1964, 1 ♂ (PS); Springfield Estate (swampy grassland), 28 May–2 June 1965 (DG); Laudat (creek), 28 May–2 June 1965 (DG); Wotten Waven, 7 Oct. 1964, 13 assorted ♂ and ♀ (PS).

This is another widespread New World species, and it is by no means restricted to the tropics. It inhabits tiny ponds, around which it is commonly found in high grass.

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