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MILLIPEDS FROM DOMINICA, BRITISH WEST INDIES

By Richard L. Hoffman[1]

While a member of the Smithsonian-Bredin 1956 Caribbean Expedition, Dr. J. F. Gates Clarke of the Division of Insects, U.S. National Museum, collected arthropods on the faunistically little-known island of Dominica, in the West Indies. Although primarily concerned with insects, Dr. Clarke nonetheless obtained a sizeable collection of millipeds, which he kindly transmitted to me for identification and study.

Because of this island's geographic location at the midlength of the Lesser Antilles, its mountainous terrain with several rather high peaks, and especially its unspoiled condition (it is considered to be the island least disturbed by man of all the West Indies), one would suspect that the diplopod fauna of Dominica might contain species of considerable interest and utility in working out the problem of zoogeography in the Antillean region. That this belief is true is more implied than proven by collections made to date. The collections are notable in showing the presence of several endemic species, one of which has no relatives elsewhere in the islands, and in indicating the absence or extreme scarcity of several genera that are common and widespread in the Caribbean area. Obviously, more collecting is needed to confirm these preliminary impressions, particularly in the more remote mountains of the island and with special attention devoted to the search for the small humus-dwelling forms that normally escape the general collector.

[1] Department of Biology, Virginia Polytechnic Institute, Blacksburg, Virginia.

A study of Dr. Clarke's material, however, suggests that a brief survey of the millipeds that he obtained is quite desirable, particularly with respect to the known endemic species, most of which are very poorly described and illustrated, and whose systematic status has often been troublesome to workers treating particular groups of the Diplopoda.

A summary of the pertinent literature is not difficult to devise, as only Pocock (1888, 1894) and Loomis (1934) have contributed original information on the Dominican milliped fauna.

Pocock's first paper dealt with a small collection made on the island in 1886 by G. A. Ramage, and included the descriptions of two endemic species, which he named *Spirostreptus dominicanus* and *Strongylosoma semirugosum*. In his 1894 monograph, Pocock added another new species, *Rhinocricus leucostigma*, to the Dominican fauna.

H. F. Loomis, an experienced student of the group, spent some time collecting on Dominica in early 1933, obtaining additional specimens of *R. leucostigma* as well as many other forms that had not been taken by Ramage The species that he found, chiefly in the vicinity of Roseau, are: *Siphonotus purpureus* Pocock, *Rhinocricus leucostigma* Pocock, *Trigoniulus lumbricinus* (Gerstaecker), *Spirostrophus naresi* (Pocock), *Orthomorpha coarctata* (Saussure), and *Hexadesmus lateridens* Loomis.

Dr. Clarke's material includes all three of the species named by Pocock, two of the five added by Loomis, and two others previously not collected on the island The number of milliped species known from Dominica now stands at ten, of which six, however, are forms widely distributed by commerce and agriculture It is anticipated that collecting in the more remote interior mountains will at least double the presently known total.

Order Glomeridesmida

Family Glomeridesmidae

Glomeridesmus species

A single female belonging to this genus was taken by Dr. Clarke at Castle Bruce Junction, March 10, 1956, with the notation "under leaves and dead wood." Although this species is the first Dominican record for the genus, with the species almost certainly an undescribed one, a new name is not proposed at this time in the absence of males. Females of nearly all known glomeridesmids are quite similar, and cannot be distinguished on the basis of existing accounts in the literature. Several other forms of *Glomeridesmus* have been recorded from the Lesser Antilles: *marmoreus* Pocock from St. Vincent, and *grenadanus* Chamberlin from Grenada and Trinidad. Species are likewise

known from Puerto Rico, Hispaniola, Jamaica, and the South American mainland.

Order Polyzoniida

Family Polyzoniidae

Siphonotus purpureus Pocock

Siphonotus purpureus Pocock, 1894, p. 479.—Loomis, 1934, p. 9.
Siphonotus miamiensis Causey, 1953, p. 71.

A dozen specimens were taken at Antrim at 1,000 ft. on March 10, 1956. All are females, suggesting a very unequal sex ratio for the species.

This species has been reported from most of the islands of the Lesser Antilles, including Dominica, and presumably is a synanthropic form to some extent. It has also been collected in southern Florida, and specimens from Miami were recently described as a new species on the basis of having two transverse rows of setae on the tergites in contrast to their complete absence as attributed to *purpureus*. Pocock's original description contains no information on this character, and if he subsequently published on it, the reference has escaped me. H. F. Loomis found two rows of setae in all his material, which came from six of the Antillean islands and from French Guiana, indicating a very wide distribution for this character. The description of *S. miamiensis* contains nothing to indicate that Loomis's paper had been consulted.

It is possible that a restudy of all available material might show on the basis of male gonopods that several species have been confused under the name *purpureus*, but for the present it seems best to assume a single form, widespread by commerce.

Order Cambalida

Family Epinannolenidae

Genus *Epinannolene* Brolemann

Epinannolene Brolemann, 1903, p. 135.

On the basis of existing knowledge, we have every reason to think that this genus may be of the greatest utility in studying faunal distribution, at least of diplopods, in the Caribbean region. Species of *Epinannolene* occur very abundantly in the northern Andean region of Peru, Ecuador, Colombia, and Panama; others have been recorded from Cuba, Hispaniola, Puerto Rico, Dominica, Grenada, and Trinidad. The apparent absence of species from Jamaica is remarkable. So far none of the species has been studied carefully enough to give any idea about phylogeny and evolution; consequently, we are ignorant of what might be primitive and what might be specialized

characters, and are thus unable to deduce anything about lines of descent and affinity. Nonetheless, each island has its own native species not shared with any other, and so far none of these species can be identified with any species known from South America. If introduction has occurred by natural or artificial means, subsequent speciation has covered up the trail.

So far only one species of *Epinannolene* has been taken on Dominica. The species was first discovered by G. A. Ramage and described by Pocock, in 1888, but was not seen again until Dr. Clarke obtained a nice series of specimens from several localities.

***Epinannolene dominicana* (Pocock)**

FIGURE 1

Spirostreptus (*Nodopyge*) *dominicanus* Pocock, 1888, p. 478.
Epinannolene dominicana Chamberlin, 1918, p. 179.

Males and females of this endemic species were obtained at Castle Bruce Junction on March 20 and 24, 1956, and at the Fresh Water

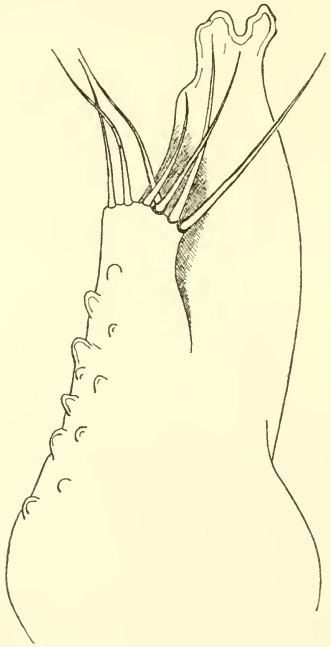

FIGURE 1.—*Epinannolene dominicana* (Pocock). Caudal aspect of telopodite of left gonopod.

Lake on March 26, 1956. A field note with one lot indicates the specimens were taken from decaying bromeliads.

The original description of this form was not explicit with respect to the gonopod structure, so that it seems desirable to provide an illustration for future comparison with other Antillean species.

That *E. dominicana* is not an introduced synanthropic form seems indicated by the fact that Dr. Clarke's material came from inland high-elevation localities, whereas the species was not taken around Roseau by such an experienced collector as H. F. Loomis.

Order Spirobolida

Family Trigoniulidae

Spirostrophus naresi Pocock

Spirobolus naresi Pocock, 1893, p. 252.
Spirostrophus naresi Loomis and Hoffman, 1948, p. 51 (this paper contains a fairly complete synonymy for the species).

Two large collections of this widespread commerce species were made at Antrim at 1,000 ft. on March 10, 1956, and at West Cubrits at 500 ft. on March 28, 1956. Notes made at the latter locality state: "Soil, leaf mold, and dry leaves on dry lightly wooded hillside."

Ramage did not obtain *naresi* on Dominica, but Loomis found it to be abundant around Roseau in 1932. He also secured specimens of the related *Trigoniulus lumbricinus*, another synanthropic species, which, however, is not quite as widespread in the Antilles as *naresi*, and seems to be more restricted to areas disturbed by the activities of man.

Family Spirobollelidae

Pseudospirobolellus bulbiferus (Attems)

Spirobolus bulbiferus Attems, 1903, p. 71.
Pseudospirobolellus bulbiferus Carl, 1912, p. 93.
Azygobolus tumidus Loomis, 1934, p. 27.
Pseudospirobolellus tumidus Loomis, 1950, p. 165.

Two females of this genus, tentatively referred to the type species, were obtained at Antrim on March 11, 1956. The vial carried the label "night beating," which suggests that the specimens may have been swept from low vegetation while they were making a nocturnal ascent. Numerous other species of spiroboloids are known to climb at night.

Our previous knowledge of this animal in the Western Hemisphere is due entirely to the work of H. F. Loomis, who took the first recorded specimens on St. Martins and Guadeloupe in 1932, and who subsequently found the species on the southern peninsula of Haiti. It is

widespread in the East Indies, and has certainly been introduced into the Antilles by shipping.

Family Rhinocricidae

Rhinocricus leucostigma Pocock

Rhinocricus leucostigma Pocock, 1894, p. 500; Loomis, 1934, p. 16.

Six males and females were taken from Antrim at 1,000 ft. on March 10, 1956. Although the material at hand is badly faded from preservation, I suspect that actually two species are now masquerading under the name *leucostigma*. There is considerable variation in size of adults, and the smaller specimens are not so definitely marked as the larger. Typically the species is black with a middorsal white spot on each segment and one such spot on each side surrounding the ozopore. The small male examined has gonopods of a slightly different form, but whether this condition reflects more than an individual variation cannot be determined at this time. The situation needs further attention, particularly with respect to living colors and the examination of numerous male specimens of both forms.

Loomis found specimens ranging in length from less than 30 mm. to 45 mm. in the vicinity of Roseau. The species is endemic to Dominica, but it has a very similar counterpart in *R. martiniquensis* Chamberlin of the nearby island of Martinique.

Order Polydesmida

Family Strongylosomidae

Genus *Mestosoma* Silvestri

Mestosoma Silvestri, 1897, p. 3.—Kraus, 1956, p. 412.
Habrodesmus Attems, 1937, p. 174.

A considerable number of generic names were proposed for South American strongylosomids by Silvestri near the end of the last century, most of them unfortunately poorly characterized and based upon equally unrecognizable species. Attems reduced the number to two in his 1937 monograph, recognizing only *Catharodesmus* as an endemic American genus and extending the African genus *Habrodesmus* to include many of the Neotropical species.

Recently, however, Dr. Kraus reviewed the matter and revived most of Silvestri's names for various groups of species that now seem to constitute well-marked genera. He likewise restricted *Habrodesmus* to African species, thereby disposing of a zoogeographic anomaly. Although Kraus defined and listed all species of some genera, he gave no diagnosis of *Mestosoma*, and listed only a few of the species that seem to be referable to it, so that a good treatment of the genus is still high on the list of desirable projects.

For the present, the shape of the gonopod telopodite, as shown in the drawings in the cited work by Dr. Kraus and those included with this paper, is more meaningful as a generic diagnosis than any tentative verbal characterization might be.

***Mestosoma semirugosum* (Pocock), new combination**

FIGURE 2

Strongylosoma semirugosum Pocock, 1888, p. 477, pl. 16, fig. d.—Chamberlin, 1918, p. 246.
Habrodesmus semirugosus Attems, 1937, p. 194.

Males and females were taken from the Fresh Water Lake at 2,000 ft. on March 26, 1956, and from Castle Bruce Junction, March 10, 24, and 30, 1956. Field notes state: "between boards," "under leaves," and "from decaying bromeliads."

The original gonopod drawings published by Pocock are small and very diagrammatic, showing nothing in the way of characters that

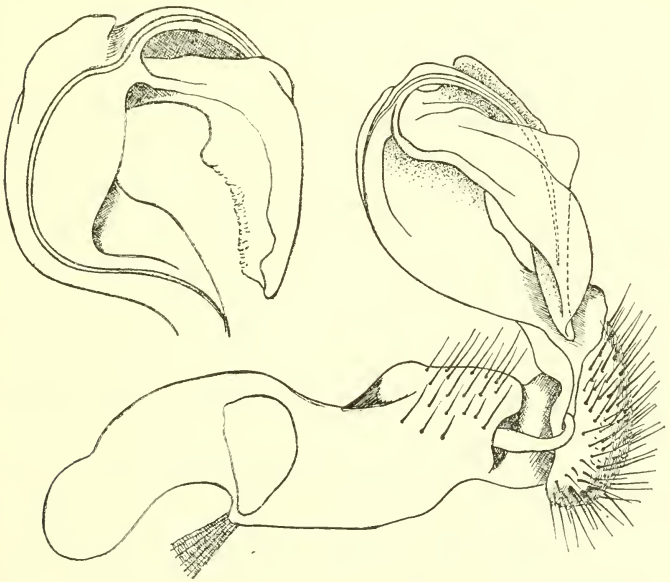

FIGURE 2.—*Mestosoma semirugosum* (Pocock). Left gonopod of male. Mesial aspect lower right; ventral aspect of telopodite upper left, to show the finely laciniate inner margin of the postfemur.

are now necessary for the recognition of species in *Mestosoma* and related genera; therefore, this opportunity is taken to provide more adequate illustrations. It will be noticed that the gonopods in *Mestosoma*, as well as in some related genera of the Andean region, are quite similar to those found in oriental genera such as *Orthomorphella*. The telopodite is bent into nearly a complete circle, with the postfemoral region set off by a distinct cingulum, and modified into laminae medialis and lateralis that sheath the long slender solenomerite.

The South American diplopod fauna is still very poorly known, and it is thus entirely possible that *semirugosum* was introduced into Dominica from a mainland population. But this species does not seem to be identical with any species known from the more civilized parts of the continent, whence one would logically expect the species to have been transported. So far no other species of this genus have been found elsewhere in the West Indies or on the fairly well explored island of Trinidad, and it may be that *semirugosum* is the result of introduction by rafting or some other natural means from a remote interior species.

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