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*Two fossil millipeds from the Dominican amber
(Diplopoda: Chytodesmidae, Siphonophoridae)*

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ABSTRACT

Two millipeds, *Docodesmus brodzynskyi*, n. sp. (Chytodesmidae, Polydesmida), and *Siphonocybe* sp. (Siphonophoridae, Polyzoziida), are described from Oligocene amber deposits in the Dominican Republic. Both closely resemble species now living in the same region.

INTRODUCTION

When Hoffman (1969) reviewed our knowledge of fossil millipeds, he drew attention to the interesting fact that none of the surviving orders of milliped is known from fossil material older than the Oligocene, though extinct orders are known from the Pennsylvanian and Cretaceous (see also Kraus, 1974). Of the available fossils, only a few are in amber, and these are largely from the famous and well-studied Baltic deposits. Representatives of the Polyxenida, Polyzoziida,

Chordeumatida, and Polydesmida have been recorded, but there are evidently numerous undescribed and unstudied fossil millipeds in the Baltic amber (Hoffman, in litt.). As the millipeds comprise an ancient, slowly evolving group of arthropods, it is not surprising that the Oligocene (and later) faunas that have been examined are quite similar to living forms. The two fossil millipeds reported in this paper, while they are the first fossil representatives of their respective families to be described, are assigned with ease to modern genera, both of which are to be found in the Dominican Republic today.

The Dominican amber has been characterized by Sanderson and Farr (1960). The age is uncertain, but Sanderson and Farr believed it to be Oligocene, perhaps 30-35 million years old. The strong piney odor they noted was present in the pieces studied by me; this suggests that the source might have been pines or even *Araucaria* trees. The pieces of amber I studied had passed through many hands and it is not possible to state with any exactitude the locale from which they came. Sanderson and Farr (1960) described two deposits, both in the Cordillera Septentrional, north of Santiago. The first of these deposits to be discovered is in the gorges of the Arroyo Capancho, and the second below Pico Diego de Ocampo. The amber occurs imbedded in gray sandstone, in a thin layer from which pieces easily may be dug. Erosion has removed a good deal of amber and carried it downslope. The color of the amber varies from crystal clear to deep red, and about a twentieth of the pieces seem to contain inclusions. Sanderson and Farr found insects of nine or ten orders, spiders, and a variety of plant remains. This report is the first of millipeds from these amber deposits.

I wish to express my gratitude to Mr. J. Brodzinsky, of Santo Domingo, D.R., for sending me the pieces of amber containing the millipeds described below. The specimens have been returned to his collection. My interest in fossil millipeds was brought to Mr. Brodzinsky's attention by Dr. Norman Platnick of the American Museum of Natural History, for which I thank him.

Family Chytodesmidae Cook

Docodesmus Cook

Docodesmus Cook 1896, *Brandtia*, p. 5, p. 20; Loomis, 1936, p. 161 et. seq.

The genus *Docodesmus* and the genera associated with it by Cook (1896) and Loomis (1936) belong in a very poorly understood complex of tropical milliped families sometimes called the "cryptodesmoid complex." The original grouping of this collection of small to medium-sized soil and litter-dwelling millipeds into families was carried out without much reference to gonopod anatomy, which we now know is the key to understanding milliped relationships. No real revisionary work has been done in this family or in any of the others. However, the amber specimen described below is clearly a member of *Docodesmus*, and perhaps even of a species still living, though this is impossible to tell from the female specimen.

The general appearance of *Docodesmus* species is as follows: The dorsum is quite flat, with very wide paranota, so that each diplosegment is up to six times broader than long. The collum covers the head, and like the paranota, is lobed around the margin. The paranota of each segment are drawn out somewhat at the posteriolateral corners and have four or five vaguely indicated paranotal lobes. The metazonites may be nearly flat, with four or six slightly raised areas, or, in some species, may have a series of tubercles present. The ozopores open on the dorsal paranotal surfaces, somewhat removed from the lateral margin. The entire

dorsum is covered with a velour-like coat of fine setae, which evidently serves to collect dirt and provide some degree of camouflage to the animals. The gonopods are simple and usually have one or two short terminal accessory branches.

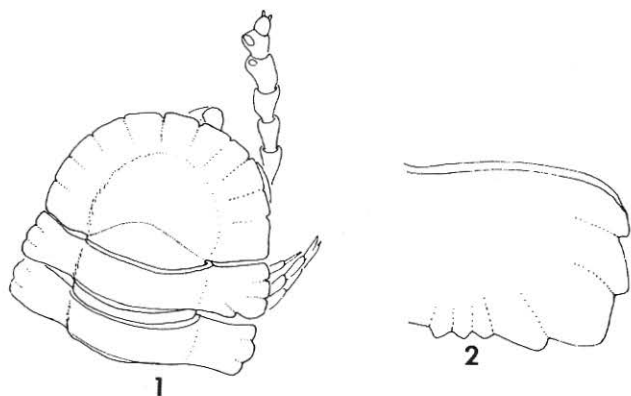


Fig. 1. *Docodesmus brodzinskyi*, collum; antenna, and first two segments.

Fig. 2. The same, right paranotum of segment 11.

***Docodesmus brodzinskyi*, n. sp. — Figs. 1, 2**

Holotype: a female specimen in amber, in the collection of J. Brodzinsky, Calle Z, No. 5, (NACO) Santo Domingo, D.R.

The specimen is less than a millimeter from the surface of a large piece of dark orange amber, of irregular outline, but about 5 cm square. The amber is badly fractured and contains numerous tiny gas bubbles near the surface. In addition to the milliped, the abundant inclusions in this piece of amber partake of the insect orders Collembola, Hymenoptera (Tiphiiidae), Orthoptera (Tettigonidae?), Diptera, Blattoidea, Isoptera (both alates and pseudergates) and Coleoptera (Staphylinidae and Pselaphidae). One mite, probably an oribatid, was also seen, and there are several fragmentary plant remains. The fact that all these forms are generally associated with the forest floor suggests that the resin which eventually formed the piece of amber seeped out near the base of a tree, trapping a sample of the ancient litter fauna.

The specimen is seen in largely dorsal view, with the anterior part of the body twisted slightly laterally, with the anterior legs of the right side partly visible. The posterior end of the animal is reflexed deeper into the piece of amber, but the last segment is clearly visible. The surface is covered with what appears to be fine silt, and this has in turn trapped air (or perhaps gas produced as the soft parts of the animal decayed) which partially obscures details of the dorsum. The distal five joints of the antenna extend from beneath the collum, but the head cannot be seen. The specimen is about 9.5 mm long, and 1.25 mm wide. The anterior end is depicted in fig. 1 and a typical midbody segment in fig. 2. There seems to be nothing novel or unique about this animal that has not already been remarked by Loomis (1936) in describing several species of *Docodesmus* from Hispaniola.

Family Siphonophoridae Newport

The millipeds of the order Siphonophorida are very much in need of a thorough revisionary study. The posthumous publication of Attems (1951) provides a starting point, but it certainly cannot be represented as a complete study, having been compiled from Attems' notes by his scientific executors.

Genus *Siphonocybe* Pocock

Siphonocybe Pocock 1903, p. 50; Loomis, 1936, p. 12-14.

Siphonocybe and *Siphonophora* have both been recorded from the island of Hispaniola; the former genus is distinguished by having the segments definitely constricted at the metazonites, and by having the ozopores on the margins of short, thick paranotal lobes. In both genera, the head is drawn out into a beak-like extension (as illustrated by Loomis, 1936, fig. 3c), and the antennae are strongly clubbed. Again, the specimen described below, as far as it can be studied shows no significant differences from living forms, and may indeed be a member of an extant species. Because so little detail is evident, I do not choose at this time to attach a name to the specimen, which is in the collection of Mr. J. Brodzinsky, Santo Domingo, D.R.

***Siphonocybe* sp.**

The specimen is embedded in a subspherical piece of amber about 3 cm in diameter, and of a dark orange-brown color. The amber is badly fractured and contains many gas bubbles; in addition to the *Siphonocybe* specimen, pieces of plant debris and soil are present, as are remains of a badly decomposed pholcid spider. The milliped is lying on its dorsal side and unfortunately is much obscured by gas bubbles which may have been produced by the decay of its soft parts. The maximum width of the specimen is about 1 mm, and its length can be estimated at about 15 mm. Because of its poor condition, no firm count of segments could be obtained, but I estimate there to be between 45 and 50 (*Siphonocybe alba* Loomis, a living species from Hispaniola, ranges to 14 mm in length and up to 61 segments). The head of the specimen is hidden by the typical clubbed antennae, so the characteristic beak is visible only with difficulty.

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