
An Onychophoran from the summit of Mt. Aripo, Trinidad, with notes on other animals from that locality.

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INTRODUCTION

Three species of onychophorans are known from Trinidad, *Macroperipatus torquatus* (Kennel), *Epiperipatus trinidadensis* (Stuhlmann) and *Epiperipatus imthurmi* (Sclater), (Peck 1975, personal observations). Arnett (1961) states that he has recently identified *Epiperipatus edwardsii* (Blanchard) from Trinidad, but as he gives no other details and does not refer to any specimens, this record must be considered as doubtful. Early records of *E. edwardsii* from Trinidad e.g. Kennel (1883) are misidentifications of *E. trinidadensis* (Bouvier 1905).

Recently, the author has found a peripatus on the summit of Mt. Aripo, Trinidad, which tentatively can be identified as *E. edwardsii*. This is the most widespread American onychophoran species, known from Brazil, Surinam, French Guiana, Venezuela, Colombia and Panama, (Bouvier 1905, 1906, Brues 1914, 1925, Clark and Zetek 1946, Froelich 1968, Peck 1975). For comparison *E. trinidadensis* and *M. torquatus* are not known outside Trinidad and *E. imthurmi* occurs in Surinam, French Guiana, Guyana and Colombia (Bouvier 1905, Brues 1914, 1925, Clark 1915, Froelich 1968).

COLLECTION DATA

An onychophoran was captured on 10th October 1982 on the summit of Mt. Aripo 940 m, the highest peak in Trinidad. It was found among the basal leaves of a bromeliad *Glomeropitcairnia erectiflora*, about 1 m from the ground on a fallen tree. This large bromeliad grows abundantly in the canopy on the summit, but does not grow terrestrially here though it is found near the ground on fallen trees. The climate is cool, probably in the region of 18-20 °C, and perpetually wet. Notes on other animals found at this locality are given in the appendix.

DESCRIPTION

The specimen was maintained alive for four months after which it was preserved. Its mean weight was 0.6124 g and did not increase over this period so it was assumed to be fully grown. The specimen was female and gave birth to four offspring, two of which are being reared in captivity (see Table 1).

Determination of Neotropical onychophorans is notoriously difficult and depends chiefly on external characters, the number and morphology of the feet, mandible structure, and in particular

the distribution of papillae on the dorsal body surface.

The first two characters agree well with *Epiperipatus edwardsii* (Blanchard). There are 32 pairs of feet in all five specimens. The nephridial tubercles of the fourth and fifth pair are connected to the third arc of the sole by a narrow isthmus. The mandible has one accessory tooth on both the inner and outer blade and seven denticles on the inner blade.

Examination of an ecdysed skin by transmitted light shows a distribution of papillae characteristic of *E. edwardsii*; the primary papillae of the dorsal surface are of more or less equal size, situated close together on the folds, not usually separated by accessory papillae which are relatively rare and occur on the edges of the folds.

Examination by scanning electron microscopy (fig. 1,2) however reveals that although the basal areas of the papillae are similar, they vary considerably in height. Some are predominant over the others with a cylindrical or subconical base and a well developed apical piece and sensory bristle, others are shorter with conical bases, the apical piece reduced or absent. Generally three of the smaller primary papillae occur between two large. This contradicts the description of *E. edwardsii* in Bouvier (1905) who states that there is little variation in the size of the primary papillae in adults. In small specimens there are one or two smaller primary papillae between two large.

In life some of the largest primary papillae are yellowish or white in colour and contrast strikingly with the brown body colouration, forming six more or less continuous rows which traverse the length of the animal on either side of the mid line. Yellow papillae are only present on alternate folds, although equally sized papillae are present on all folds.

The antennae and anterior part of the head are black and continuous with the dark brown mid line which is dilated segmentally into triangular shaped areas. The mid line is flanked by a lighter brown area, the remainder of the body being dark brown, (see fig 3). Though known only from preserved specimens whose colouration eventually fades, a similar pattern is present in *E. edwardsii*.

FIELD IDENTIFICATION OF TRINIDAD ONYCHOPHORANS

The Aripo species is similar in appearance to *E. trinidadensis* and may easily be mistaken for it. It may be distinguished in the field by the following criteria.

1. The greater number of feet. The 54 specimens of *E. trini-*

dadensis seen by the author had between 27 and 31 pairs of feet. None had 32 pairs and only three had 31.

2. The taller skin papillae. They give the body surface a rougher appearance than that of *E. trinidadensis*. *E. edwardsii* also has a rather more elongate body when in motion.
3. Differences in intensity of yellow papillae. Both species have a similar distribution of yellow papillae, but they are mostly not very distinct in *E. trinidadensis*. However two per segment, situated in rows three and five, over each leg are much brighter than the rest. In the Aripo species there is little variation in the intensity of these papillae, all of which are bright.

It may easily be distinguished from the other Trinidad species which reach a larger size and lack a dorsal pattern. *E. imthurmi* is a uniform brown while *M. torquatus* has a greater number of legs, 36 to 42 pairs, is red-brown and has a distinct yellow collar separating the head from the body.

DISCUSSION

Onychophorans are usually terrestrial, living in leaf litter or holes in the soil. Until more data are available it is a matter for speculation as to whether peripatus actually live among the bromeliads and epiphytes in the canopy on Aripo, or whether the specimen had accidentally found its way from the ground into this bromeliad which was in a fallen tree.

Peripatus have nevertheless been recorded from bromeliads previously: *Macroperipatus ohausi* (Bouvier) near Rio de Janeiro, Brazil (Bouvier 1905); *Epiperipatus biolleyi* (Bouvier) at La Estrella, Costa Rica, altitude 2000 m, (Picado 1911). In the cloud forests of Rancho Grande, Venezuela, peripatus inhabit detritus in the lower leaves of bromeliads and hollows high in trees, (Beebe and Crane 1947).

The perpetual wetness, documented for at least two of these localities, Aripo and Rancho Grande, would allow these animals, which are very prone to desiccation, and thus normally restricted to the ground, to exploit the arboreal habitat. Onychophorans climb well; *M. torquatus* often lives on vertical banks and on occasion has been seen 0.5 m high in trees (personal observations). A further factor may be waterlogging or flooding of the ground, making this habitat less suitable not only for onychophorans but for lizard and frog ovoposition sites as well (see appendix).

Although it is close to *E. edwardsii* the distribution of skin papillae of the Aripo species somewhat resembles that of *E. trinidadensis*. However, in the latter species there is a much greater size difference between the small and the large primary papillae, the size of the former intergrading with the accessory papillae which are much more numerous. An affinity with *E. trinidadensis* is also shown by the nature of the apical piece (fig. 2) which is large in size. This feature is also shared by *E. edwardsii*. In probably most other *Epiperipatus* the apical piece is short and conical.

Present knowledge of *E. edwardsii*, and of the New World onychophora in general, is very fragmentary. As Froelich (1968) and Peck (1975) point out, this group is badly in need of review and revision. It is possible that in view of its wide distribution, *E. edwardsii* may prove to be more than one superficially similar species. Brues (1914) stated that it is possible that subspecific or varietal forms may be distinguished but was unable to find characters of sufficient constancy to warrant such a division. Neotropical onychophorans are notorious for their apparent

lack of good specific characters. Clark (1913) states that it is astonishingly easy to make mistakes in their determination.

This is not the first time a specimen has been referred to *E. edwardsii* with doubt. Froelich (1968) assigns a specimen from Rio Guama, Bravil, with uncertainty to *E. edwardsii* but says it might be a new species. He was also unable to classify a specimen from Esperito Santo, Brazil, which he thought was probably conspecific with the example from the same state determined by Bouvier (1906) as *E. edwardsii*. Bouvier (1905) also lists specimens from Caracas and Lake Valencia, Venezuela, and from Panama, which he assigns to *E. edwardsii* with doubt.

The author has examined, using scanning electron microscopy, the skin of an example from Haut Sarare, Venezuela, probably one of the examples determined as *E. edwardsii* by Bouvier (1905). Its primary papillae are regular in size with conical bases and it is certainly not conspecific with the Aripo species. A drawing of a primary papilla from the type specimen, collected in French Guiana, in Bouvier (1905) is however similar to those of the Aripo specimen.

This species is certainly near to *E. edwardsii* and *E. trinidadensis*, though is definitely distinct from the latter. It is possible that it should be regarded as a new species but a review of *E. edwardsii* is needed before a definite decision can be given.

TABLE 1

Reproduction record of Aripo specimen (A1) from 10. Oct. 82 to 15. Feb. 83.

PERIPATUS NUMBER	DATE OF BIRTH	WEIGHT AT BIRTH (GRAMS)	WEIGHT ON 5. NOV. 83
A2	9-17. Nov. 82	----	0.2993
A3	27. Dec. 82	0.0400	----
A4	13. Jan. 83.	0.0407	0.2413
A5	15. Feb. 83	----	----

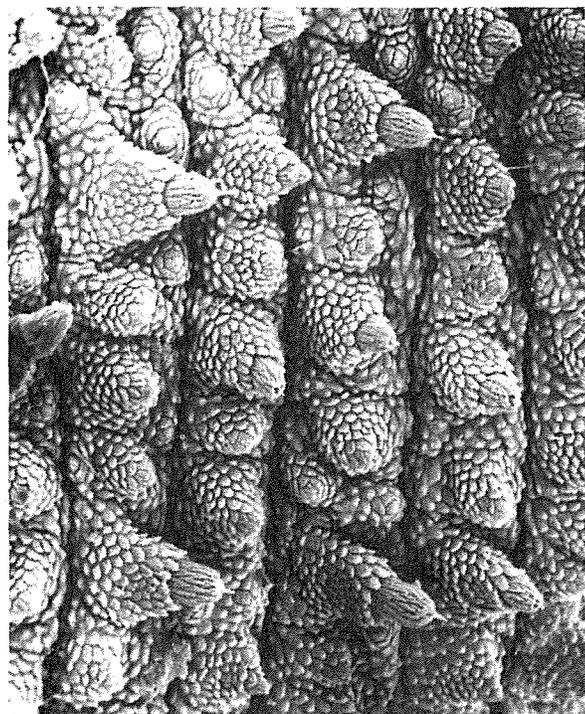


Fig. 1

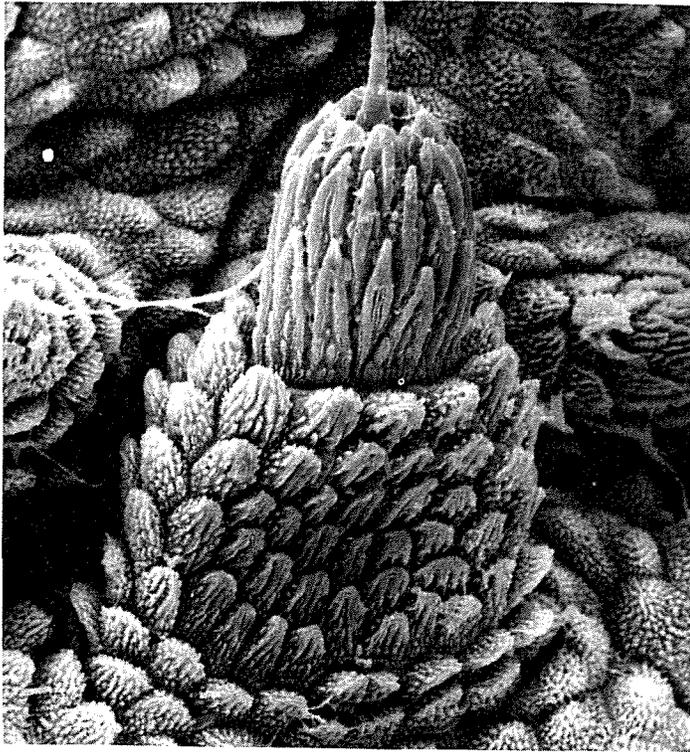


Fig. 2

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Fig. 1. (Previous pg.) Scanning electron micrograph of a sample of epidermis from mid-body. Note mid line at top of picture. Scale 200 μ m.

Fig. 2. Scanning electron micrograph. Large primary papilla from near mid line. scale 43 μ m.

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APPENDIX.

NOTES ON SOME OTHER ANIMALS FOUND ON THE SUMMIT OF MT. ARIPO

In addition to the peripatus, the bromeliad-dwelling fauna included large cockroaches, *Dryadoblatta sp.*, chactid scorpions and the frog *Phyllodytes auratus*. The latter species, which was previously know only from the type locality, the summit of Mt. El Tucuche, has already been reported by Read (1983). The scorpions, which include several specimens from the summit and one from a small bromeliad *Vresia sp.* on the ridge about two km west of the summit, were also known only from El Tucuche. These have been sent to Julius Boos for determination.

Two specimens of the montane lizard *Proctoporus shrevei* were observed at night, one swimming in a pool of water trapped in the petiole of a fallen palm leaf, the other retreating into a burrow under a fallen tree fern trunk. Fourteen eggs of this species were found in a moss-covered bunch of aerial roots about 1 m from the ground. Ten of these adhered in pairs indicating the usual clutch size is two. Four other pairs were found, three under moss on branches, and one in a bromeliad.

Eleutherodactylus eggs, almost certainly *E. urichi*, were found in similar situations in the moss layer covering branches between one and two metres from the ground. At night males of *E. urichi* were seen calling on the ground but not in the branches. This frog presumably lays on the ground at lower elevations.

A Bushmaster, *Lachesis muta*, approx. length 1.5 m, was caught on the ridge about 1.5 km east from where the Lalaja-Paria road crosses it. It is now in the possession of Hans Boos at Emperor Valley Zoo, Trinidad.