

## Notes on the Peripatus of Dominica.

By

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With Plate 17.

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A NUMBER of specimens of *Peripatus* from Dominica, West Indies, have recently been handed over to me for description by Professor Ray Lankester, to whom I owe my best thanks for intrusting me with this material. The specimens were collected by Mr. Ramage in Dominica, and sent, some alive, some preserved in alcohol, to Professor Lankester.

I had, in all, eighty-six individuals, of which fourteen had been opened in salt solution before preserving, whilst the rest were preserved whole.

Size.—There are considerable differences in size; the length, measured without the antennæ, varying from a minimum of 17 mm. to a maximum of 50 mm.

The males are, as a rule, much smaller than the females, and they are also much less numerous. Out of thirty-nine specimens in which I determined the sex only eight are males, and of these the largest is only 25 mm. in length.

On the other hand, a good-sized female measures 42 mm.

There are one or two apparent exceptions to this generalisation, one of the females being only 17 mm. and another only 19 mm. long; but from the fact that I have not found any males longer than 25 mm., and also that the majority of the

females are considerably larger than this, I am inclined to regard the small females as not yet full-grown.

Colour.—My observations as to the colour of this *Peripatus* have been made entirely upon specimens preserved in spirit.

The general colour of the body is a reddish brown dorsally, with a diffuse longitudinal streak of a darker shade extending down the centre of the back. The median dorsal line is marked by a well-defined narrow band still darker in colour. Ventrally the colouring is much paler, being a light grey or greyish yellow. The colouring of the legs on their dorsal and ventral surfaces corresponds with the colours of the dorsal and ventral body surfaces.

The antennæ are of a dark red-brown shade, with their terminal enlargements much lighter, almost flesh-coloured.

This colouring obtains, with slight individual variations, for all the specimens with one exception. In this unique case the dorsal surface is piebald, with a pale straw-colour and a reddish brown. The brown is disposed as a broad collar, and as two lateral bands just dorsal to the legs; the band on the right side, however, is only present in the posterior region of the body. There is a white median line dorsally. The ventral surface and the legs are pale yellowish white. The antennæ are dark red-brown, with their knobbed terminations pale yellow or whitish.

This specimen is small, and appears to be a young form in which the pigment is as yet not completely developed, or it may possibly be an abnormality.

Ridges and Papillæ of the Skin.—As in the other neotropical species of *Peripatus*, the ridges of the skin are continued right across the dorsal median line.

The papillæ of the ridges are arranged in a single file of larger ones, or two or three smaller ones occur abreast.

As in *P. Edwardsii* (Blanchard), there are accessory ridges extending across the dorsal median line, but not reaching far on either side of it; and also, as in *P. Edwardsii*, the diagonal lines which occur in the Cape species, breaking the surface into lozenge-shaped areas, are absent.

Many of the papillæ, both on the legs and body, are divided into two main portions, a basal and a more distal part. Of these the basal portion is cylindrical in form, thus agreeing with the species from Caracas, and differing from the Demerara species, in which the basal portion of a papilla is conical (fig. 1).

The papillæ vary considerably in shade, some being much lighter than others, and to this is due the speckled appearance of the skin.

Jaws.—Fig. 2 shows that the jaws are very similar to those of *P. Edwardsii* (4, figs. 25, 26).

The outer blade is provided with a large main tooth, and a smaller but still well-marked secondary one. On the inner blade there is a large main tooth and seven or eight smaller ones, of which the first is closely approximated to the main one, and is considerably larger than the remaining six or seven, from which it is separated by a wide diastema.

Antennæ.—The papillæ on the rings of the antennæ are arranged in several rows.

Ambulatory Appendages.—Only one specimen of *Peripatus* from Dominica has been previously described, and the authorities differ as to the number of legs possessed by it. Professor Jeffrey Bell states that there are thirty pairs (1), whilst Mr. Sedgwick considers that there are only twenty-nine (4).

In my specimens the number of ambulatory appendages varies from twenty-five to thirty pairs, the great majority having twenty-nine.

The relationship between the number of appendages and the sex of the individual is interesting.

Out of thirty-nine specimens in which the sex was ascertained only eight are males, and each of these is possessed of twenty-five pairs of legs only.

Of the thirty-one females which I have examined, two are possessed of twenty-six pairs of ambulatory appendages, one of twenty-eight, twenty of twenty-nine, and six of thirty; whilst I am uncertain as to the number possessed by the two remaining specimens.

Of the remaining two, one at least possessed more than twenty-seven pairs, but the exact number in both cases is doubtful, since the specimens had been mutilated.

The numbers given above are perhaps better realised when arranged in a tabular form, thus :

8 specimens with 25 pairs of ambulatory appendages.	All males.
2 " " 26 " " "	Both females.
1 " " 28 " " "	Female.
6 " " 30 " " "	All females.
67 " " 29 " " "	Of these 20 were opened, and all found to be females.
2 " " , an uncertain number of legs.	Both females.

The male, therefore, seems to be always possessed of twenty-five pairs of ambulatory appendages; whilst the female, with one doubtful exception, has always more than twenty-five pairs.

There are four foot-pads ventrally on each of the ambulatory appendages (fig. 3), with the exception of those of the last pair, which are possessed of two pads only (fig. 4).

At the distal extremity of the foot, close to the claws, there are three primary papillæ, two on the anterior margin of the foot and one on the posterior; but the basal papillæ are absent.

The foot-groove, which in *P. capensis* extends on to the body surface as far as the median ventral line, is in the Dominican form continued only a very short distance on to the ventral surface.

There are no white papillæ on any of the ambulatory appendages.

In his description of specimens of *Peripatus* from Guiana and Dominica, Mr. Sclater (3) mentions the occurrence of a "bladder-shaped appendage" attached to the foot-grooves. Such a vesicle-like structure is very obvious on the legs of some of my specimens, but it appears to be due simply to an extroversion of the lining of the groove.

**Apertures.**—The anus is situated posteriorly between the legs of the last pair.

The generative aperture in both sexes is found ventrally between the legs of the penultimate pair.

The segmental organs of most of the appendages open into the foot-groove close to the junction of the leg with the body. On the fourth and fifth pairs, however, the aperture is situated on a papilla between the proximal and third foot-pads (fig. 5).

**INTERNAL ANATOMY.**—Male Generative Organs (fig. 6).—The vas deferens of each side is extremely short. Each passes under the nerve-cord of its own side, and the two then unite to form a very long coiled ductus ejaculatorius.

A pair of accessory glands are present, but these are much shorter than those of the other South American forms which have been described.

The accessory glands open out independently on either side of the anus, as in *P. Edwardsii*, not into the ductus ejaculatorius, as described for *P. capensis*.

In figs. 10 *a*—*c*, three sections through the testis are figured. Of these the most anterior (fig. 10 *a*) is through the prostate (*pr.* in fig. 6), and shows simply a mass of large nuclei surrounded by a single layer of flattened epithelial cells. The layer of epithelium round the nuclei of the prostate is a point to be noticed, since Gaffron (2), in his description of *P. Edwardsii*, states that there is in this region no epithelial covering to the cells, which are simply enclosed in a thin muscular sac. Gaffron, in fact, makes this a distinction between the prostate (Schlauchhoden) and the testis proper (Blasenhoden). This is well seen in his figure (Taf. xxiii, fig. 46), and is clearly described in his own words:—"Der bedeutendste Unterschied zwischen Schlauch und Blasenhoden ist jedoch das Vorhandensein eines charakteristischen Epithels im letzterem. Während der dünnhäutige Sack des Schlauchhodens gleichmässig und dicht angefüllt ist mit grossen Zellen, die sich nicht zu einem geschlossenen Wandungsepithel anordnen, liegt der eben beschriebenen Blasenhodensuscularis innen ein sehr regelmässiges polygonales Pflasterepithel."

It is possible, however, that in *P. Edwardsii* an epithelial covering to the prostate is also present, but the flattened cells lying close upon the large nuclei below as seen in fig. 10 *a* may have escaped notice.

The next figure (fig. 10 *b*) is from a section through the actual testis (*te.* in fig. 6). The contents of the testis in this region consist of numerous large nuclei and whips or bundles of spermatozoa. There is a considerable space between these and the epithelium, probably due to shrinkage. The epithelial wall is well seen, and is similar to that described and figured in *P. Edwardsii* by Gaffron. The cells are higher and the nuclei rounder than in the epithelium of the prostate.

More posteriorly still we get numerous cross-sections of the coiled duct of the testis (fig. 10 *c*). The walls of this duct are composed of cells with large round nuclei, and within its cavity are numerous spermatozoa. The whole coiled mass is surrounded by a layer of flat epithelium, and this is continued over the straight portion of the vas deferens, where we have accordingly two layers of epithelial cells,—an inner layer of fairly tall cells with round or oval nuclei, and an outer layer of flattened cells with rod-like nuclei.

In no region of the testis have I found a muscular covering external to the epithelium.

**Female Generative Organs (figs. 7—9).**—On each oviduct is situated a globular receptaculum seminis (*R. S.*) containing spermatozoa, and possessed of double ducts as in the other neotropical forms. Between the receptacula and the ovary are a pair of sac-like appendages (*R. Ov.*), the so-called receptacula ovarum of Kennel, but I have been unable to make out a vesicle at their distal ends.

**Comparison with other Neotropical Species.**—The *Peripatus* of Dominica, *P. Dominicæ*, resembles the other neotropical species in—

- i. The possession of four spinous foot-pads.
- ii. The position of the generative aperture between the legs of the penultimate pair.

- iii. The division of the primary papillæ into two portions.
- iv. The absence of the dorsal white line.
- v. The arrangement of the teeth on the inner blade of the jaw, there being a considerable gap between the first minor tooth and the rest.
- vi. The presence of the receptacula ovarum and seminis on the oviducts.
- vii. The unpaired portion of the vas deferens is of great length and much coiled.
- viii. The number of legs is not constant.

**Compared with *P. Edwardsii***, to which the Dominican species is most nearly allied, we find the following special points of agreement :

- i. There are two foot-pads only on the legs of the last pair.
- ii. The male has a smaller number of legs than the female.
- iii. The basal part of the primary papillæ is cylindrical in both.
- iv. The jaws and arrangement of the teeth are similar in the two.
- v. There is in each a pair of accessory glands opening on each side of the anus.

The chief differences between the two are—

- i. The number of ambulatory appendages ; of these there are 29 to 34 pairs in *P. Edwardsii*, and 25 to 30 in *P. Dominicæ*.
- ii. The white tubercles which are present on some of the legs in *P. Edwardsii* are not found in the species now described.

**Compared with *P. Trinidadensis***.—The Dominican species differs much more from *P. Trinidadensis*. Besides the difference in the number of ambulatory appendages (*P. Trinidadensis* having 28—31 pairs), the two forms differ in the number of teeth on the inner blade of the jaw, the Trinidad species having a much larger number than the Dominican. Moreover in the Trinidad *Peripatus* the basal portion of the primary papillæ is conical, whilst in the Dominican form it is cylindrical.

Compared with *P. torquatus*.—*P. torquatus* is possessed of a much larger number of legs than the Dominican form, having 41 or 42. The colouring is also strikingly different, *P. torquatus* being characterised by a bright yellow band behind the head on the dorsal surface.

#### BIBLIOGRAPHY.

Complete lists of the literature referring to *Peripatus* have already been published by Mr. Sclater and Mr. Sedgwick, and therefore the following list includes only the papers to which special reference is made in the above description.

1. BELL, F. J.—“Note on a *Peripatus* from the Island of Dominica, West Indies,” ‘Ann. Mag. Nat. Hist.’ 5th ser., xi, 1883.
2. GAFFRON, E.—“Beiträge zur Anatomie und Histologie von *Peripatus*,” ‘Zool. Beiträge’ (Schneider), Bd. i, 1885.
3. SCLATER, W. L.—“Notes on the *Peripatus* of British Guiana,” ‘Proc. Zool. Soc. London,’ 1887.
4. SEDGWICK, A.—“A Monograph on the Species and Distribution of the Genus *Peripatus* (GUILDING),” ‘Quart. Journ. Micr. Sci.,’ New Ser., xxviii, 1888.

## EXPLANATION OF PLATE 17,

Illustrating Miss E. C. Pollard's paper, "Notes on the  
Peripatus of Dominica."

FIG. 1.—Primary papilla from skin of *Peripatus*.

FIG. 2.—Inner and outer blades of jaw.

FIG. 3.—Leg of *Peripatus*, showing four foot-pads.

FIG. 4.—Last leg of specimen with twenty-nine pairs, possessed of two foot-pads only.

FIG. 5.—Fourth leg, showing aperture of nephridium between the third and proximal pads.

FIG. 6.—Male generative organs. *Ac. gl.* Accessory gland. *D. Ejac.* Ductus ejaculatorius. *N. C.* Nerve-cord. *Pr.* Prostate. *Te.* Testis.

FIG. 7.—Female generative organs. *Lig.* Ligament of attachment. *N. C.* Nerve-cord. *Ov.* Ovary. *R. S.* Receptaculum seminis. *R. Ov.* Receptaculum ovarum. *Ut.* Uterus.

FIG. 8.—Enlarged view of ovary and receptacula. Reference letters as in Fig. 7.

FIG. 9.—Diagram of the same.

FIG. 10.—Transverse sections through the testis.

10*a.*—Through the prostate.

10*b.*—Through the testis proper.

10*c.*—Through the coiled duct of the testis. *Ep.* Epithelium.

Outlines drawn with Zeiss, oc. 4, obj. B; and details filled in with Zeiss, oc. 2, obj. D.

FIG. 11.—Transverse section through vas deferens.

