

VERMES.¹

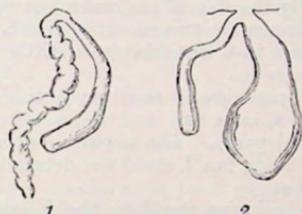
ON THE EARTHWORMS FROM CHRISTMAS ISLAND.

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1. *Pontodrilus ehippiger*, D. Rosa (1898). (Figs. 1, 2.)

D. Rosa: Ann. Mag. Nat. Hist. [7], vol. ii (1898), p. 281, pl. ix, figs. 4, 5.



Pontodrilus ehippiger, D. Rosa (1898).

FIG. 1. Prostate.
,, 2. Spermatheca.

Hab.—Christmas Island (near small stream on east coast).

The length of our specimens ranges from 43 to 47 mm., with a diameter of 3 mm.; the number of segments varies from 85 to 100; the colour (in spirit) is an intense yellow.

The prostomium is short, only slightly dovetailed in the peristomium, which is longer than the second segment.

The setæ are distant: behind the clitellum the ventral interval *aa* is twice that between setæ *ab*; the lateral intervals between setæ *ab*, *bc*, *cd* are about equal, though slightly increasing from below upwards; the dorsal middle space *dd* is about three times as wide as *cd*. These distances vary slightly in front of the clitellum; for instance, at the height of the spermatheca the setæ *bc* are slightly wider apart than setæ *ab* or *cd*, so that the setæ are here paired, though, of course, not very close together.

The clitellum extends over segments 13–17 = 5; it may be termed saddle-shaped, ceasing near the outer ventral seta (*b*): this clitellum is well developed dorsally, where its rings are completely fused together, while on the ventral area the setæ as well as the intersegmental furrows are tolerably visible.

There is a deep transverse fossa on segment 18; the transverse

¹ Reprinted, by permission, from Ann. Mag. Nat. Hist. [7], vol. ii (1898), p. 281, pl. ix, figs. 4–7.

margins of this fossa show a slight inward convexity, but are not specially swollen, whereas the longitudinal margins, which overhang the fossa, are in fact the ventral end of a pair of large glandular swellings which are also visible from the dorsal side, where they gradually disappear near the outermost setæ (*d*). The whole has much the appearance figured by Akira Jizuka for *P. matsushimensis*. The male openings are difficult to see, lying in the fovea at the base of the overhanging walls, approximately in a line with the outer ventral seta (*b*).

A deep slit-like sucker, with pale, somewhat raised margins, lies ventrally on the intersegmental furrow between segments 19 and 20, reaching laterally the line of the innermost ventral setæ.

The oviducal openings are two minute pores on the anterior part of segment 14, almost in a line (though a little ventrad) with the innermost ventral setæ (*a*).

The spermathecal pores are on small projecting tubercles between segments 7-8 and 8-9, on a line with the outer ventral setæ (*b*).

There are no dorsal pores. The nephridio-pores lie at the level of the outer ventral setæ, but I could not determine which segment bears the first of them.

Septa 5-6 to 8-9 inclusive are thin; the following, 9-10, 10-11, 11-12, and also, but to a less degree, 12-13, are thickened.

A gizzard is not recognizable, but septum 6-7 is more deeply infundibulate than its neighbours, and we may connect this with the earlier existence of a gizzard in the 6th segment. There are no calciferous glands; the intestine begins behind the 18th segment, perhaps in 16 or 17.

The hearts occupy segments 11, 12, 13, the last being the largest.

The two pairs of large spermathecæ belong to segments 8 and 9; each spermatheca consists of a pyriform pouch not distinctly marked off from its duct, and of a narrow tubular diverticula which is longer than the main pouch.

The broad grape-like ovaries are readily seen in segment 13, as well as the testes in segments 10 and 11, all these gonads being attached to the anterior septum on each side of the neurochord. In front of the gonads, that is, on the anterior face of septa 10-11, 11-12, and 13-14, the funnels of both pairs of vasa deferentia and of the oviduct are plainly visible.

The small sperm-sacs in segments 11 and 12 have a botryoidal appearance.

The prostates occupy segments 16, 17, and 18, and recall very nearly those of *P. insularis* (Rosa). Their glandular portion has the appearance of a large sausage-like body, formed by the apposition of the several parts of a slightly-coiled lesser duct. The muscular duct which arises from the front end of the glandular tube is moderately bent, with the convexity inwards, and gradually increases in diameter as it proceeds backwards, reaching at last the external openings on the 18th segment.

I could not see exactly where the vas deferens joins the prostate, but I have little doubt that the connection between both structures will be found to be the same as that which has been described by Akira Jizuka for *P. matsushimensis*.

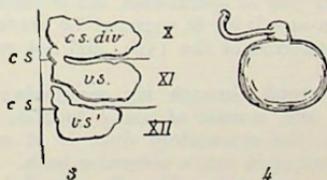
Our species seems to be closely allied to *P. insularis* (Rosa), which I first described from specimens obtained in the Aru Islands,¹ and which has been more recently found also at Ceylon (Michaelsen).² Still, a marked difference between the two species exists, as in the spermathecae of *P. insularis* both Michaelsen and I failed to find any diverticulum. Our specimens were not fully mature, but on the hypothesis of an identity between these two species it seems highly improbable that even in a series of sections no traces could be found of an organ which in the adult reaches so great a development. Moreover, in the descriptions of *P. insularis* no mention is made of a ventral sucker.

Another allied species is undoubtedly *P. matsushimensis*, for a clear description of which we are indebted to Akira Jizuka.³ However, this Japanese *Pontodrilus* seems to be really different from our species.

First, it is a larger species than ours, as its length ranges from 90 to 110 mm., with a diameter of 3-3.5 mm.; while our specimens, with a diameter, too, of 3 mm., have only a length of 43-47 mm. Besides, it may be noted that the clitellum of *P. matsushimensis* is described as being well developed all round the body (and the same is shown by the figures), whilst in our species the clitellum is distinctly saddle-shaped. Finally, the appearance of the prostate is (so far as one can judge from the figures) somewhat different.

2. *Perichæta brevis*, D. Rosa (1898). (Figs. 3, 4.)

D. Rosa: Ann. Mag. Nat. Hist. [7], vol. ii (1898), p. 283, pl. ix, figs. 6, 7.



Perichæta brevis, D. Rosa (1898).

FIG. 3. Sperm-sacs (*vs.*), sperm-reservoirs (*cs.*), and diverticulum (*cs. div.*).
 ,, 4. Spermatheca.

¹ Ann. d. naturh. Hofmuseum, Wien, Bd. vi, 1895.

² Mitth. aus. d. naturhistor. Museum, xiv (Hamburg, 1897).

³ Annotationes Zoologicae Japonenses, vol. ii, pars 1 (Tokyo, 1898).

Hab.—Christmas Island (near small stream on east coast).

A very small species, measuring only 15–20 mm. in length by a diameter of 2–2.5 mm.; it consists of about 70–80 segments; the colour (in spirit) is a deep yellow.

The setæ on segment 25 are approximately 50.

The clitellum occupies somites 14, 15, 16.

The male pores are on high conical and almost lateral porophores, which are partially visible from behind. The boundaries of these porophores are laterally indistinct; in front and behind they are marked by the intersegmental furrows 17–18 and 18–19, which are here deflected. Fourteen setæ are visible between the male pores.

The oviducal pore is single and lies in a whitish spot on the 14th segment.

There are three pairs of spermathecal pores between somites 5–6, 6–7, and 7–8, close to the lateral line.

I have not been able to determine the position of the first dorsal pore. There are no copulatory papillæ.

None of the septa are noticeably thick and none are wanting.

The gizzard is between conical and tun-shaped; it is as long as two somites, but is nevertheless comprised between septa 7–8 and 8–9; this last septum is pushed backwards and comes nearly in contact with septum 9–10.

The last heart lies in segment 13.

The spermathecæ lie in segments 6, 7, 8; each consists of a nearly globular sac with a short narrow duct, which is connected at the inner side with a narrow tubular diverticulum; this diverticulum is straight, not enlarged at the end, and extends a little over the middle of the large sac.

The sperm-sacs in segments 11 and 12 are each connected with a minute sperm-reservoir; the sperm-reservoirs of the 10th segment are laterally produced into a large lobe, which looks exactly like another pair of sperm-sacs, but it should be mentioned that the true sperm-sacs lying in segment 10 prove to be connected with the sperm-reservoirs of the 11th, and not with those of the 10th segment.

The prostates extend through six segments; they are very irregular in shape and consist of many lobules, which are only loosely connected; the ejaculatory duct is of moderate length, sigmoid, and does not open into a muscular bulb.

This species somewhat recalls *P. acrophyla*, Rosa,¹ from Sumatra.

¹ Ann. Mus. Civ. Genova, vol. xvi, 1896.

3. *Perichæta posthuma*, Vaill.

Vnillant: Ann. Sci. Nat., 1868, p. 228.

The distribution of this species, according to Beddard, is Celebes, Philippines, India, Bahamas.

4. *Megascolex armatus* (Bedd.).

Perichæta armata, Beddard: Ann. Mag. Nat. Hist. [5], vol. xii (1883), p. 216.
Megascolex armatus, Rosa: Mus. Civ. Genova, vol. vii (2a), 1889, p. 139.

Hab.—Calcutta, Burmah, Labuan (Borneo), Seychelles, Nias.
