3. On some Earthworms from British India.

By Sophie M. Fedarb.[1]

[Received April 19, 1898.]

These worms, which have been collected at Dehra Dun in the N.W. Provinces, have been sent from the Calcutta Museum, through the instrumentality of Mr. F. Finn, to Mr. Beddard. He has with great kindness allowed me to investigate them at his laboratory at the Society's Gardens.

This collection contains specimens of :—

a. *Typhœus orientalis* Beddard.
b. *Perichœta cupulifera*, sp. nov.
c. *Perichœta crescentica*, sp. nov.
d. *Dichogaster parvus*, sp. nov.

Typhæus orientalis F. E. B.

Typhœus orientalis Beddard, Ann. Mag. Nat. Hist., Oct. 1893, p. 219.

This species has been previously found near Calcutta, and the present specimen, though not coming from the same neighbourhood, closely resembles the description of that one. There are, however, minor differences.

(1) The *dimensions* of the Dehra worm are :—length 158 mm.; breadth 5 mm.; number of segments 192; while the Calcutta worm measures 250 mm.

(2) The *papillæ* are not so well developed in the present specimen. There are none between segments xiii.–xv., though they are found between segments xv. and xvii. and between xviii. and xx.

Youth or a more delicate constitution might account for both the above.

The absence of the outer pair of setæ from the clitellar segments, and the markings on the penial setæ, agree with the previous description.

The five pairs of intestinal glands occur in segments xci.–xcv.

Perichæta cupulifera, sp. nov.

Length 91 mm.; breadth 4 mm.; number of segments 93.

External Characters.

The *clitellum* occupies the whole of segments xiv.–xvi. It is rather darker in colour than the rest of the body, and bears lines of setæ on the three segments.

The *papillæ* of this worm are rather distinctive and occur in two localities:

(a) *Near the spermathecal pores.* In five cases there is a pair of cup-shaped papillæ at the edge of the segment in a line with the

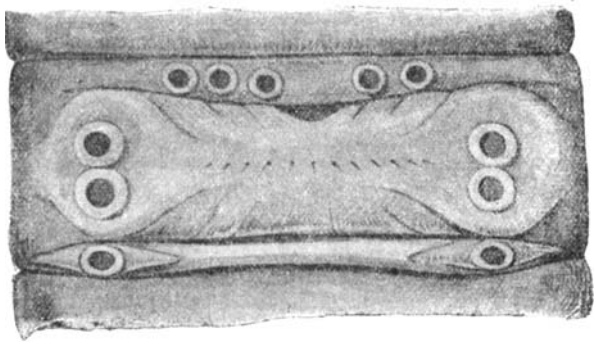
[1] Communicated by F. E. Beddard, F.Z.S.

pores between segments vi./vii. In three instances also a similar papilla exists on one side only, while in another worm they are entirely absent. One of these specimens has in addition two median papillæ of like form on segments vii. and viii., placed in front of the seta line (*cf.* the median papillæ in *P. morrisi*)[1].

(b) *Near the male pores.* These are found on segments xviii. and xix., and are more or less complicated and variable. Some of the younger worms have only a lenticular patch where in the older ones is a circular cup-shaped papilla on an ill-defined excrescence. Doubtless the patch is an incipient papilla. One of the most complicated arrangements is as follows :—

Segment xviii. is divided into three rings; the central and widest bears the setæ and the male pores. These last are placed on excrescences which thin away to the line of setæ ventrally and dorsally. Either side of each pore, *i. e.* anterior and posterior to it, are two cup-shaped papillæ (fig. 1) pressed one against the other.

Fig. 1.



Ventral surface of xviiith segment of *Perichæta cupulifera*, showing the cup-shaped papillæ.

The anterior ring bears five papillæ, three on the right side, two on the left, placed in a row with a slight ventral gap. The posterior ring has two papillæ, one on each side, in a line with the male pore. In some other specimens this last pair are intersegmental in position, or else on the xixth segment. One had also a median papilla on this segment.

Internal Features.

The *gizzard*, which is nearly globular, lies in segments viii. and ix., the septum dividing them being absent as usual, and that between segments ix./x. being reduced to threads.

The last pair of *hearts* is in segment xiii. They are very well developed.

[1] Beddard, P. Z. S. 1892, p. 166.

The *intestine* begins in segment xv. in the ordinary way, but it narrows again in xvii., xviii., and xix., and then increases to its full size in xx. This is possibly due to the size of the spermiducal glands, and to the existence of a group of little white glands, which would limit the space left for the intestine.

There are large *sperm-sacs* in segments xi. and xii., the foremost pair of which extend into segment x. ventrally.

The *spermiducal glands* lie in segments xviii. (or xvii.)–xx. They have no muscular sacs, and have a straight duct. The lobulation is not at all deep. As before mentioned, each side has a group of little white glands evidently connected with the papillæ.

The two pairs of *spermathecæ* are in segments vi. and vii. The pouch is an oval sac, with a duct of about the same length—shorter in the specimen with median papillæ in this region. The diverticulum is swollen at its extremity, and is the length of the duct and pouch together.

This worm comes very close to *P. barbadensis*[1], but the papillæ at the male pores are most distinctly different. It also approaches *P. amazonica*[2], but that worm has no clitellar setæ.

PERICHÆTA CRESCENTICA, sp. nov.

Out of the nineteen specimens of this species in the collection only one is mature.

External Characters.

Length 80 mm.; breadth 4 mm.; number of segments 101.

The *clitellum* takes in the whole of segments xiv.–xvi. It bears three rows of setæ equal in number to those on the other adjoining segments. These setæ are not in any way modified as in *P. houlleti*[3]. They are precisely similar in form to those on the ordinary segments.

The *male pores* are separated by about 12 setæ. There are no papillæ at all, but the pores are tumid. The aperture itself is crescentic, with the horns turned outward; while its margins are crenated, suggestive that the muscular sac within is more or less eversible (cf. *P. capensis*)[4].

Internal Features.

The *gizzard*, which is bell-shaped, occupies the viiith and ixth segments.

The *intestine*, as usual, begins in segment xv., and bears *cæca* which originate at the anterior part of segment xxvii. and reach forward to segment xxiv.

There are *septal glands*, which very much increase in size behind the cæca.

[1] Beddard, P. Z. S. 1892, p. 167.
[2] Rosa, Atti R. Accad. Sci. Torino, 1894, p. 14.
[3] Perrier, Nouv. Arch. Mus. 1872, p. 99.
[4] Horst, Zool. Ergebn. Ost-Indien, p. 62.

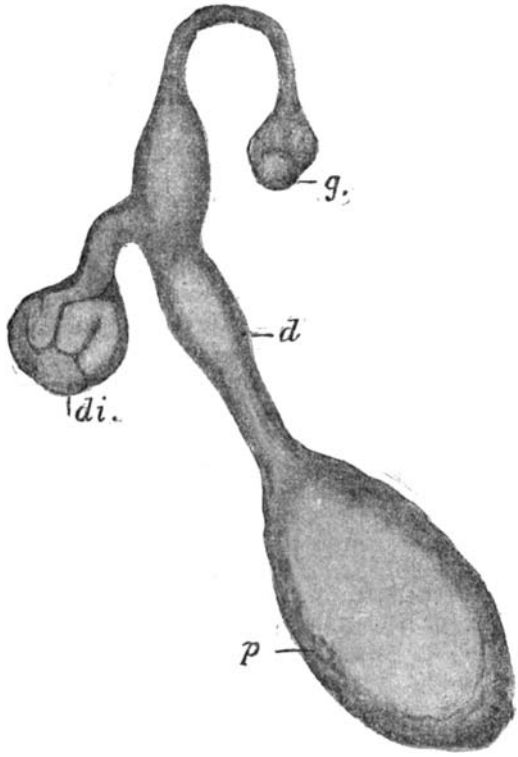
The last *hearts* are in segment xiii.

The *sperm-sacs* in segments xi. and xii. are small, but possibly not fully developed.

The *spermiducal glands* are large, with digitate lobes, which extend from segment xvi. or xvii. to xx. The muscular sac occupies nearly the whole width of segment xviii., with the spirally-coiled duct lying on it.

The *spermathecæ* (fig. 2), of which there are three pairs in segments vii., viii., and ix. respectively, are very interesting. Each one

Fig. 2.



Spermatheca from viith segment, right side, of *Perichæta crescentica*: *p*, pouch; *d*, duct; *di*, diverticulum; *g*, gland.

consists of an oval pouch with a duct of the same length. The diverticulum is coiled up at the end into a little globular knot enclosed in a delicate skin. Attached to the junction of the diverticulum with the duct is a stalked white gland nearly equal in size to the diverticulum. This gland lies forward, while the diverticulum

points in the opposite direction. The junction itself, which is close to the pore, is enlarged. It will be remembered that *P. peguana*[1] has a similar diverticulum, and that *P. houlleti* has one or two copulatory glands opening into the duct of the spermatheca.

This worm in many respects much resembles *P. houlleti*, but as the clitellar setæ are not in any way modified, which is so very distinctive of that species, this can hardly be the same.

DICHOGASTER PARVUS, sp. nov.

Length 40 mm.; breadth 2 mm.; number of segments 132.

The *setæ* are in number 8 per segment. The two ventralmost on each side are most distinctly paired; while the two more dorsal setæ are as far from each other as one of them is from the outermost of the ventral pair. This greater distance is about twice that which separates the two setæ of the ventral pair.

The *clitellum* is rather short, only reaching from segment xiii. to xvii. On this last segment it is perfect dorsally, but it is discontinued ventrally, with a most distinct edge, to make room for the male pores. There is a kidney-shaped area where the female pores lie.

The *spermathecal pores* are small, circular, insignificant-looking openings just in front of, and exactly between, the ventral pair of setæ in segment viii.

The *male pores* are situated on ill-defined wrinkled papillæ, which approach each other in an oblique line anteriorly. The pore itself is a slit with puckered lips, following the same oblique line.

The *dorsal pores* begin between segments xi./xii.

Internal Features.

This worm has diffuse *nephridia*, but they are of considerable size.

There are two *gizzards* in segments v. and vi., the foremost being rather more globular than the other.

The *calciferous glands* are small, but exist in segments xi., xii., and xiii. Their free ends point towards the median dorsal line. The anterior pair are the largest.

In segment xi. are a pair of tongue-shaped *sperm-sacs*.

The *spermiducal glands* are tubular and bent in a zigzag manner. The duct, which is about the same width as the glandular portion, is comparatively stout. It is not provided with any penial setæ.

There is but one pair of *spermathecæ*, and these lie in segment viii. They are tubular structures without any diverticula, rather inclined to be bulbous at the end. They lie twisted across each other and across the nerve-cord.

It will be seen from the above description that it does not

[1] Rosa, Ann. Mus. Civ. Genova, vol. x. (2 *a*) 1890, p. 113.

exactly coincide with any genus of the Cryptodrilidæ. It comes nearest to *Dichogaster*[1]. This genus was created by Mr. Beddard to include a Fijian worm. Dr. Michaelsen afterwards placed in the same genus some worms that differed in several points and necessitated the definition being altered. Mr. Beddard says[2]:—"It may be noted also that there is nothing in Michaelsen's description which is opposed to uniting with his two species of *Dichogaster* my species of *Microdrilus*." The definition to include these runs:—

"Setæ paired. Dorsal pores present. Clitellum xiii.–xx. (xxiii.). Male pores on xvii. Two gizzards; three pairs of calciferous glands. Nephridia diffuse. Spermiducal glands tubular."

If it were justifiable to alter the definition so as to fit Dr. Michaelsen's worms, surely it might be stretched a little more, viz., in the variable extent of the clitellum, so as to include the present species, which comes nearest to Dr. Michaelsen's, *D. mimus*[3].

4. On a new Genus and Species of Rodents of the Family *Anomaluridæ*, from West Africa. By W. E. DE WINTON, F.Z.S.

[Received May 11, 1898.]

(Plates XXXIV. & XXXV.)

The British Museum has lately received a collection of mammals from the Benito River in the north of French Congo. Among these is a specimen of a Rodent which is quite new to science. It belongs undoubtedly to the curious family *Anomaluridæ*, but, unlike either of the hitherto described genera which can in any way be compared to it, it has no flying-membranes. Mr. G. L. Bates has, therefore, materially added to our knowledge of this group, having already obtained the first examples of *Idiurus macrotis* lately described by Mr. Miller from specimens in the Washington Museum, and examples of *Anomalurus batesi* previously described by the present author.

I have to thank Sir William Flower, Director of the British Museum, for allowing me to work out the mammals obtained by Mr. Bates, and I feel particularly grateful to Mr. Oldfield Thomas for so willingly foregoing his right of describing this fine new form.

AËTHURUS, gen. nov.

Externally resembling *Anomalurus*, but without expanded flying-membranes; with tufts of modified hairs on the ankles. The facial portion of the skull and the proportions of the teeth much resem-

[1] Beddard, Q. J. M. S. vol. xxix. 1889, p. 251.
[2] Beddard, Mon. Olig., Oxford, 1895, p. 477.
[3] Michaelsen, Arch. f. Nat. 1891, p. 202.