

ON A NEW SPECIES OF NAIDIFORM WORM,

Dero roseola.

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When engaged, recently, in examining a number of samples of muddy water in search of protozoa for class purposes, I came upon several specimens of a very slender and elegant naidiform worm.

In view of Michaelsen's statement (1907, p. 118) that in the south-western portion of Australia, the fluviatile *Oligochæta* are very rare, my attention was at once arrested by the discovery. The particular sample of water was one taken from a horse-trough in South Perth. This trough proved, upon inquiry, to be fed by an inlet pipe connected with a deep bore (1,800 feet), the water from which is highly mineralised* and has, at the surface, a temperature of 103° F.

Further samples of the sediment from the bottom of the trough were taken and showed the worms present in great numbers, several hundred being obtained in a single dip of a large test tube. Associated with them were an unidentified *Choetogaster*, and many *Chironomus* larvæ, while the surface of the sediment was crowded with a large Ostracod and abundant *Cyclops*, the latter heavily infested with an *Epistylis*.

On allowing the mud to settle, the worms were found to collect in dense aggregations against the side of the vessel (Fig. 1), forming conspicuous pink masses. The anterior end of most was thrust downwards into the sediment, while the greater part of their length swung up more or less vertically with continuous swaying movement.

Nearly transparent, the worm (Fig. 2) appears by transmitted light of a delicate pink colour, due to the contained blood, and at once recalled the beautiful *Dero furcata* which I, at first, supposed it to be. It has at its posterior end a pair of ventrally situated, elongate cylindrical palpi, which are extremely mobile. Lateral and dorsal to these are three pairs of well developed branchiæ, richly ciliated (Figs. 4, 5). Together these structures form a fringe to the funnel-shaped chamber into which the intestine widens at its posterior end. All are contractile, the branchiæ especially so, and in preserved specimens they usually appear only as short thick knobs inturned and almost withdrawn into the anal chamber (Fig. 4). Two of these branchial processes on either side are of practically equal length, but the most anteriorly situated pair, springing from the dorso-lateral surface of the anal funnel, are somewhat shorter. In

* Analysis of the water reveals 96 parts solid per 10,000.

the living specimen a well marked insetting current of water is produced by the action of the cilia of the intestinal epithelium.

Like *Dero furcata*, too (and differing from all the other species of the genus), it shows the cephalisation restricted to the three segments behind the peristomial (Fig. 3). That is, there are present ventral setæ only upon segments 2, 3, and 4; dorsal setæ occur in the 5th and following segments.

My specimens differ, however, from *Dero furcata* as described by Bousfield (1886, p. 105), in a number of particulars. The number of segments most frequently found is 75, the worm having a length of about 12 mm. (10 mm. in the preserved state). It is in worms of that length that what I take for incipient budding is to be looked for, the 28th segment occasionally showing indications of what appears to be the formation of new small segments devoid of setæ (Fig. 2). Other than this, budding has not been observed, although many specimens with a smaller number of segments have been seen. In these latter, the branchial apparatus is usually less perfect and they are probably immature forms resulting from asexual reproduction.

In its habits the worm, under laboratory conditions, resembles rather the free *Dero* (*Autophorus*) *vaga* of Leidy's descriptions. It moves rapidly through the water by an undulating movement, or it may crawl more slowly upon the side of the vessel by means of its setæ. Numbers of them will take up their abode within decaying grass stems or in the interior of short lengths of straw, while I have seen them, not infrequently, as temporary tenants of the much too large tubes of *Chironomus* larvæ. One specimen only has been found (within a short length of straw) in its proper tube, a delicate transparent structure to which many small mud particles were adherent.

The structure and arrangement of the setæ depart but little from that which seems to characterise the other species of *Dero*. The setæ in the first ventral bundle (segment 2) are normally but three in number. In the succeeding segments there seem to be four invariably. Contrary, however, to what is stated by Bousfield of *Dero* in general (*op. cit.*, p. 98), the length of these setæ does not considerably exceed that of the corresponding structures in the later segments. On the contrary they appear to increase slightly in length in successive segments until segment 8 is reached. All the ventral setæ appear to be of the hooked (acicular) type.

Of the dorsal setæ there are but two in each bundle. The single capillate seta never reaches a length approaching that of the diameter of the body, while the short sigmoid seta accompanying it has relatively, a considerable length, projecting quite visibly well beyond the skin.

Two or three segments at the posterior end of the body are devoid of dorsal seta bundles, but the ventral setæ are missing from the last segment only.

Under the microscope the worm maintains a restless movement. Even when its movements are impeded by a mesh of cotton wool it is never still, and it is a matter of much difficulty to make out its internal structure. Under such conditions, moreover, the branchial apparatus is greatly retracted. I am able, therefore, at the present time, to state but little concerning its anatomy. The number of "contractile loops" could not be certainly determined, but seemed not to exceed two pairs; while a gastric enlargement, as distinct from a succeeding intestine, was likewise not to be readily distinguished. Nor could I certainly recognise reproductive organs, although these might have been expected to have been developed, since my specimens were taken at the end of the summer season and, as already noted, budding did not appear to be taking place at all freely. It is of course possible that the modification of the body in the region of segments 27-29 is not evidence of incipient budding but may represent a clitellar thickening, though such a position for the clitellum would seem to be unusually far back. In Bourne's figures ('91) the budding region has setæ developed from the first cutting-off of the new segments apparently, whereas in my specimens setæ seemed missing here. It is to be remarked that this thickened region was seen in relatively few specimens, all presumably mature, since they possessed what is apparently the maximum number of segments, viz. 75.

The terminal "palpi" are not, in this species, markedly longer than the branchiæ, whereas in *D. furcata*, as figured by Bousfield (*op. cit.*, figure 18), the palpi are shown more than twice as long as the branchiæ.

Bousfield stated, as his opinion, that Leidy's species *Aulophorus vagus* is identical with the *Dero furcata* of Oken, differing merely in that the worm found by Leidy was free. I have been unable to refer to Leidy's work, but find that Pratt, in a "Manual of Common Invertebrate Animals" ('16), reproduces a figure by Walton ('06) of *D. vagu* Leidy, which figure suggests a much shorter, stouter worm than *D. furcata*. In this manual *D. vaga* is said to consist of 25 to 35 segments. Bousfield defines *D. furcata* as possessing 35 segments and as tube-inhabiting. The Western Australian form has 75 segments, and has been found but once in a tube. All three agree, however, in a cephalisation differing from the remaining species of *Dero*, in that in the latter the dorsal setæ begin in the sixth segment, whereas in these three species the most anterior dorsal setæ are found in the fifth segment. All of these three species, too, are peculiar in the possession of paired terminal palpi.

Bourne (*op. cit.*) remarked upon this anomalous cephalisation in *D. furcata* (to which Bousfield had directed attention) and stated that, in his opinion, the character was one of sufficient importance

to warrant the establishment of a new genus for *D. furcata*. Bourne, however, had not apparently actually seen examples of this species and refrained from proposing a new generic name. It would seem that these three species are really quite distinct from the remaining members of the genus and might well be separated generically.

Dero roseola, n. sp. (Pl. XIV., Figs. 1-5.)

Segments, 75. Branchial area funnel-shaped, bearing a pair of mobile cylindrical palpi and three pairs of ciliated branchiæ, cylindrical in shape and almost of equal length but slightly shorter than the palpi. The first pair of dorsal setæ bundles occur in segment five. The first ventral pair of setæ bundles in segment two consist of but three setæ apiece. Succeeding ventral bundles have each four setæ. The worm is of a delicate pink colour, reaches a length of 12 mm., and is rarely found inhabiting a tube, but may be found collected into dense clusters forming a distinct pink mass.

Literature cited:—

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- '86. Bousfield, "The Natural History of the Genus *Dero*," vol. 20, Journ. Linn. Soc. Zoology. Lond., 1890.
- '80. Leidy, " , American Naturalist, 1880.
- '07. Michaelsen, "Oligochaeta," Die Fauna Südwest-Australiens, Bd. 1, Lief. 2. Jena, 1907.
- '16. Pratt, "A manual of the Common Invertebrate Animals." Chicago, 1916.
- '06. Walton, "Naididae of Cedar Point," Amer. Natur., vol. 49, 1906.

Description of Plate:—

- Fig. 1. A part of a cluster of living *D. roseola*, as seen under the binocular microscope, x 12.
- Fig. 2. An entire worm, killed and somewhat contracted, mounted in glycerine, x 25.
- Fig. 3. Anterior end of the same specimen, showing prostomium and eight segments more highly magnified, x 100.
- Fig. 4. Dorsal view of posterior end of another specimen, showing the branchiæ almost entirely retracted within the anal funnel, x 100.
- Fig. 5. Ventral view of the posterior end of a third specimen, the retracted branchiæ visible through the transparent ventral wall of the anal funnel, x 100.

Figs 2-5 drawn with the aid of a Zeiss drawing camera.



Fig. 1.

Fig. 5.



Fig. 2.



Fig. 3.



Fig. 4.





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