Studies on New Zealand Hirudinea. Part 1
Pontobdella benhami n.sp.

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THE presence of a leech of the genus *Pontobdella* in New Zealand waters has long been known. Professor Sir William Benham collected a specimen which is recorded without name in Hutton's *Index Faunae Novae Zealandiae* of 1904. The leech is common. Specimens have come to me from both the Dunedin and the Wellington area. The majority of these were obtained during trawling operations, being found free on the deck after the trawl had been cleared away, and for these the host is uncertain; but Professor Benham has very kindly supplied me with his specimen which was taken "attached to a skate." Other than this, I have no record of the host.

The genus *Pontobdella* is divided into three groups of species. *P. dispar* Cordero is the unique representative of the one group having five annuli to the complete somite. The second group contains species having four annuli to the complete somite. This second group includes *P. muricata* Linn, *P. aculeata* Harding, *P. rugosa* Moore, *P. planodiscus* Baird and *P. variegata* Baird (the validity of the last two species is doubtful). The third group contains triannulate species and includes *P. macrothela* Schmarda, *P. afra* Baird, *P. australiensis* Goddard, *P. loricata* Harding, *P. tasmanica* Hickman, and the present specimens which are clearly triannulate. The present material is readily separated from *P. macrothela*, which has 12 tubercles on a_2 (Ringuelet, 1944) and from *P. australiensis* (Goddard, 1909) which has only six tubercles on a_2; but resembles *P. loricata* (Harding, 1924) and *P. tasmanica* (Hickman, 1942) in having eight tubercles on this annulus. In turn, this material is distinct from *P. loricata*, in which the clitellum consists of seven annuli of which the first and last lack tubercles, whereas these specimens have a clitellum of six annuli and the first annulus is tuberculate—only the last (xiii a_1) is naked.

This material most closely resembles *P. tasmanica* (Hickman, 1942), both species having twelve primary tubercles on a_1 and a_2, but *P. tasmanica* has a clitellum of five tuberculate annuli and is distinguished specifically by the relative size of the two mid-dorsal tubercles of a_1 and a_2, which are smaller than the rest. This latter is not the case in the present material, which has the dorsal tubercles of these annuli subequal to the others. *P. afra* (Baird, 1869) is not well-defined, but the original account states that "the neck consists of 12 segments, every third one being the largest and warty, the intervening ones quite smooth, and is separated from the body by five narrow smooth segments." In this *P. afra* is obviously distinct from the present material.

Accordingly the present specimens are recognised as a new species of the genus *Pontobdella*, a species for which the name *Pontobdella*

benhami is proposed in recognition of the first record in our literature based on a report from Professor Sir William Benham.

Pontobdella benhami n.sp.

The anterior sucker (Figs. 1 and 2) is attached posterior to its centre and carries four pairs of truncate cylindrical submarginal papillae of which the anterior pair is closer to the margin than the posterior; the margin of the sucker is smooth; the mouth, central; the external surface carries an incomplete annulus extending transversely behind the second pair of papillae, and a pair of pigment patches which may be light sensitive organs central to the papillae

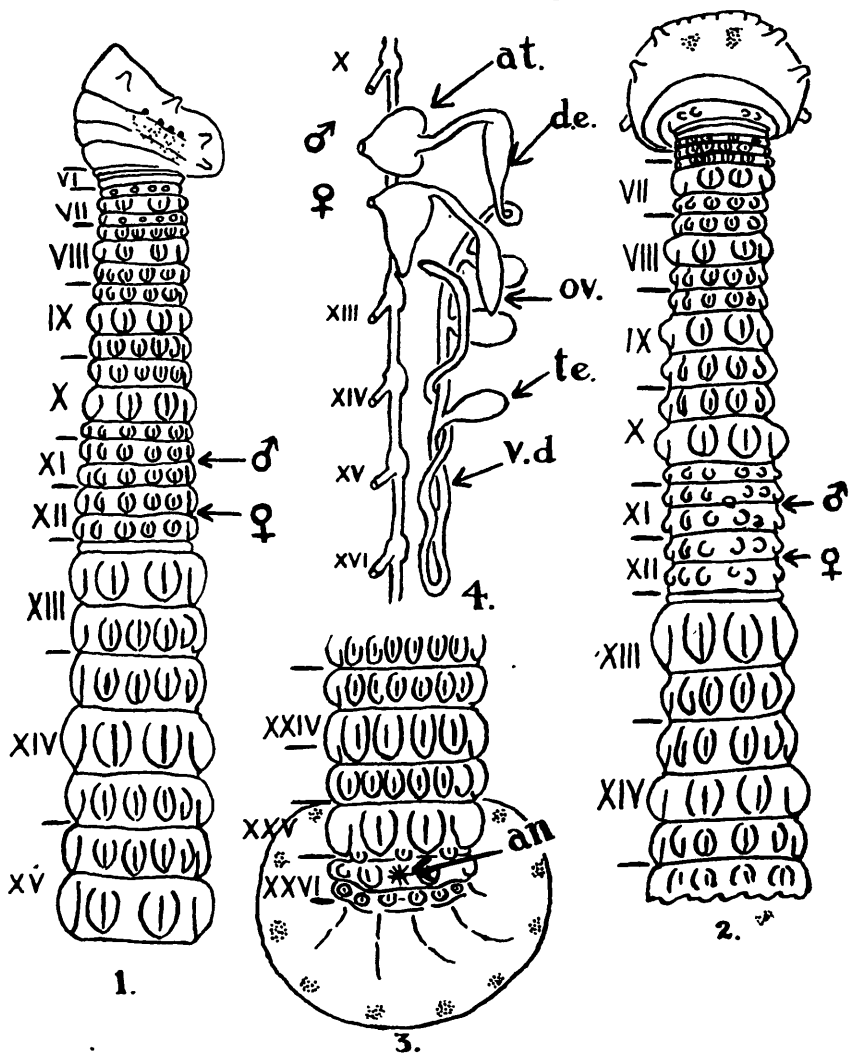
The neck extends to xiii a_2. Segment vii is the first clearly delineated and obviously trimeric segment. Anterior to vii the segments are more or less obscure depending on the degree of contraction of the sucker. One specimen (Fig. 1) shows three incomplete furrows across the dorsum of the sucker, which might indicate segment v, followed by three very narrow annuli, of which the last is tuberculate, belonging to segment vi. In a second specimen (Fig. 2), one naked and two tuberculate annuli seem to belong to vi, while anterior to these there is an incomplete tuberculate annulus which would belong to v Accordingly segment vi is taken as triannulate. The segmentation of the rest of the neck and body is uniform.

Segments vii, viii, ix and x are triannulate, with eight primary tubercles on all annuli; x a_3 is reduced, tuberculate and the first annulus of the clitellum. The clitellum, consisting of six annuli, includes x a_3, xi and xii which are both biannulate and tuberculated, and xiii a_1 which alone is unadorned. Segments xiii to xxiv are triannulate, having on a_2 eight primary tubercles carrying prominent sensillae and other smaller tubercles which lack sensillae and show clearly only on gorged specimens. Between xiv and xxiii, there are in some segments two small secondary tubercles close to the anterior margin of a_2 and situated on either side of the mid-ventral line. These form the base of a triangle of which the apex is a third, larger tubercle posterior to this pair. Throughout this portion of the body, the annuli a_1 and a_3 carry (eleven) twelve primary tubercles, with thirteen on the a_1 of some segments (e.g. xvi) or even fourteen, but the additional tubercles have only one sensilla, or none, are smaller than the primary tubercles and somewhat irregular. Segments xxv and xxvi are biannulate (Fig. 3). The anus is situated on the first annulus of xxvi. The posterior sucker carries ten to twelve paramarginal pigment patches on the smooth outer surface.

The male pore, with grooved lips, is situated between the two annuli or on the last annulus of xi; the female aperture, between the annuli of xii. Dissection shows (Fig. 4) there are small saccular bodies, apparently testes, on either side of the gut in xv/xiv, xiv/xiii, and xiii/xii. These join directly to the vasa deferentia which are loosely coiled, intertwine with one another, and extend posteriorly into xvi a_3 before turning anteriorly to xii where they swing laterally to enter a thin-walled ductus on either side. The ductus curves ventrally to enter the dorsal surface of the atrium midway along its side, so dividing the atrium into two dorso-lateral pockets on each side The ovaries are short tubular bodies situated dorsal to the vasa, and extending from xiii a_3 to the middle of xii where they turn ventrally to enter

a large median ovisac which has a posterior extension reaching into xiii a_2. Spermatophores occur on the skin of several specimens, but the seasonal range of the material is too limited to give any indication of the breeding season. Hickman's exceptional discovery showed that *P. tasmanica* deposits cocoons in October.

The mouth leads into a thin-walled oesophagus and this extends to the level of x, where it expands into a simple crop which reaches to xx a_1 and there opens dorsally into a simple intestine. There is a



Pontobdella benhami

FIG. 1—Right lateral and, Fig. 2, dorsal views of the anterior portion of the body.
FIG. 3—Terminal abdominal segments and posterior sucker in dorsal view.
FIG. 4—Reproductive system from the left aspect.

an., anus; at., atrium; d.e., ductus ejaculatorius; os., ovisac; te, testicular sac; v.d., vas deferens.

large simple median caecum extending from the crop ventral to the intestine to xxiv. Alveolar oesophageal glands are concentrated in x.

A freshly preserved specimen, 10 0 cm. in length, from the Cape Campbell trawling ground showed a striking colour pattern. The anterior sucker was marked with a broad triangular patch of light-green extending transversely over the dorsum and continued on the ventral aspect as three green spots between the posterior submarginal papillae. The seventeen major neural annuli were strongly marked dorsally and laterally with deep olive green which was present between the papillae, so that the general appearance was one of definite but widely separated narrow bands of green. This banding was absent from the clitellum. The posterior sucker was pale and carried thirteen green submarginal patches. The venter was lighter in colour than the dorsum. A second specimen, which lived for more than a week in the laboratory, lacked any colour pattern, and was of the uniform cream of formalin-preserved material.

A medium-sized unfed specimen with flattened (disc-like) suckers measures 67 mm. from the root of the oral sucker to the root of the posterior sucker; the neck, including the clitellum and xiii a_1 is 16 0 mm. in length, of which the clitellum is 5 0 mm. with a diameter of 2 0 mm.; the abdomen, 5 0 mm. in diameter; the anterior sucker, 4 0 mm. in diameter; the posterior sucker, 11 0 mm. in diameter.

The present species is represented in my collection by many specimens A large specimen, "removed from a skate" (per Professor Sir William Benham) measures 9 4 cm. in length and is 1·0 cm. in width across the abdomen. The neck of this specimen is markedly depressed, but the abdomen is cylindrical. Four specimens from trawlers operating out of Dunedin (per W. H. Dawbin) are 3 7 cm., 4·9 cm., 7 2 cm., and 9 9 cm. in length. In these the neck is cylindrical. Three are grossly gorged so that the tubercles of the abdomen are widely separated and the coarsely ridged appearance of the unfed specimen is lacking. The Wellington material includes a single specimen, 10·5 cm. in length, and other small specimens from trawlers operating out of Island Bay (per A. C. Kaberry)

Summary

Pontobdella benhami n.sp. from New Zealand waters is a triannulate pontobdellid characterised by the possession of eight primary tubercles on the middle annulus of each segment, twelve tubercles on the first and last annuli in each complete segment, and a clitellum of six annuli of which the last lacks tubercles.

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