ON A NEW SPECIES OF MARINE LEECH OF THE GENUS *BRANCHELLION* (FAMILY ICHTHYOBDELLIDÆ), FROM THE INDIAN COAST.

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INTRODUCTION.

The genus *Branchellion* Savigny (1822) has not been hitherto recorded from the Indian seas although it has been reported from various parts of the Atlantic Ocean (Johnston 1865, Holt 1907, Leigh-Sharpe 1933a and Meyer 1941), the Mediterranean Sea ((Leigh-Sharpe 1933b), and from the Pacific Coast of Australia (Baird 1869, MacDonald 1877, Leigh-Sharpe 1916, and Richardson 1949). Harding (1927), however, anticipated its possible occurrence on the Indian coast and hence included in the *Fauna of British India* a brief diagnosis of the genus. More recently, Moore (1944) described a specimen of *Branchellion* (*B. torpedinis* Harding), from the British Museum, reported to have been collected by J. Hornell on July 10, 1936 from a marbled Torpedo Ray, from the Assumption Island (Lat. 9·44 S; Long. 46·30E), which is at least 2,300 miles from Cape Comorin. Hornell's specimen, being the only record of *Branchellion*, from anywhere near India, its present record from the Madras coast thus represents the first actual record of the genus from India.

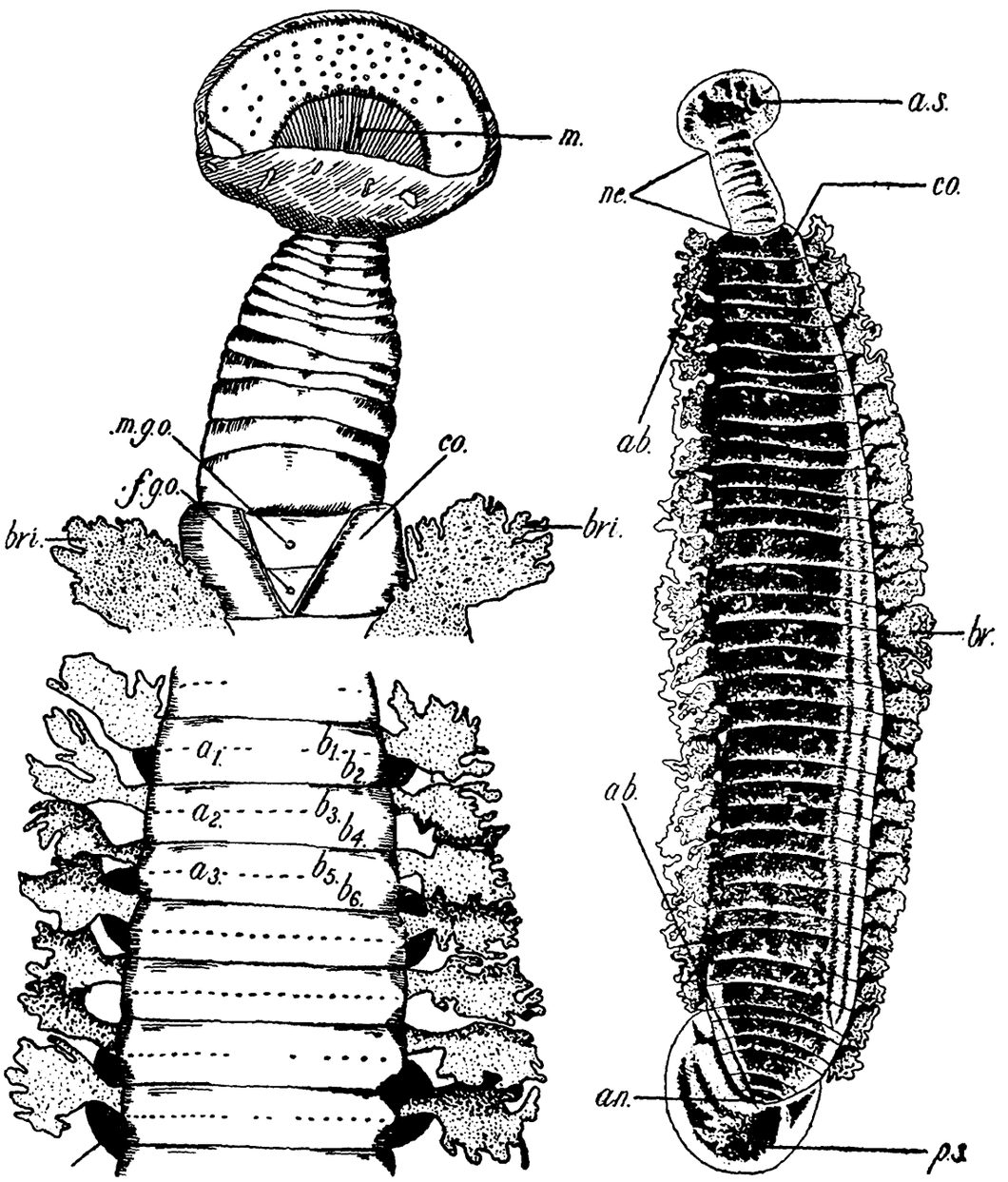
A single specimen of *Branchellion* was kindly given to me by my colleague, Mr. G. J. Phanuel, who collected it on 28th December 1952, from a fisherman's basket in which fish were brought from the coast to the fishmarket at Royapuram, Madras. It is usual for one to find in the unloaded fish basket, or near it, specimens of molluscs, and fish either damaged, or too small for consumption, and this specimen of leech was found along with such refuse. Therefore, its host is unknown. It is in an undamaged condition and in the preservative it has retained its normal form, without shrinkage. In its diagnosis, it differs considerably from the known members of the genus *Branchellion*, and hence it is described here as a new species *Branchellion plicusbranchus* sp. nov.[1]

Branchellion plicusbranchus, sp. nov.

The preserved specimen measures 64 m.m. in length with a maximum width of 15·5 m. including the branchiae. The body (Text-Fig. 1) is divisible into a narrow anterior neck, bearing a sucker at its anterior extremity, and a posterior broad branchiate abdomen terminating in a larger posterior sucker. The abdomen is distinctly annulated, more conspicuously so on the ventral side.

[1] Since writing this paper Dr. P. N. Ganapathy, Andhra University, kindly forwarded a specimen of *Branchellion* collected by him in May 1952, from the nostril of *Carcharias* from Lawson's Bay, Vizagapatam. His specimen of *Branchellion* resembles the present specimen described in all features excep in size, for it measures only 37 mm. in length and 8 mm. in breadth.

Neck.—(Text-Fig. 1, *top left*) is only about one-tenth of the whole length of the body, slightly broader and more cylindrical posteriorly, where on the ventral side the genital openings are situated on segments XI and XII, constituting the clitellum. The anterior sucker which is smaller than the posterior sucker is oval in shape, elongated transversely and is directed ventrally. No eyes are visible either on the surface



TEXT-FIG. 1.—*Branchellion plicusbranchus*, sp. nov.

RIGHT : Dorsal view (viewed slightly from the left) × 1⅔ ; LEFT TOP : Ventral view of anterior region × 5 ; LEFT BOTTOM : Branchiae and pulsating vesicles of two adjacent segments enlarged (diagrammatic).

$a.^1$—$a.^5$, primary annuli ; *ab.*, abdomen ; *an.*, anus ; *as.*, anterior sucker, b^1—b^5., secondary annuli ; *br.*, branchia ; br^1., first branchia ; *co.*, collar (preputial fold) ; *f.g.o.*, female genital opening ; *m.* mouth ; *m.g.o.*, male genital opening ; *n.e.*, neck ; *p.s.*, posterior sucker ; *p. v.*, pulsating vesicles.

of the anterior sucker or on the neck, although Harding (1910) reported six eyespots anteriodorsally on the sucker. Probably they are merged with the dark mottling pattern of the anterior sucker. Since there is only one specimen, no microscopic preparations could be made to

verify this point. Ventrally the anterior sucker bears the small transverse slit like mouth opening towards the posterior end of the sucker.

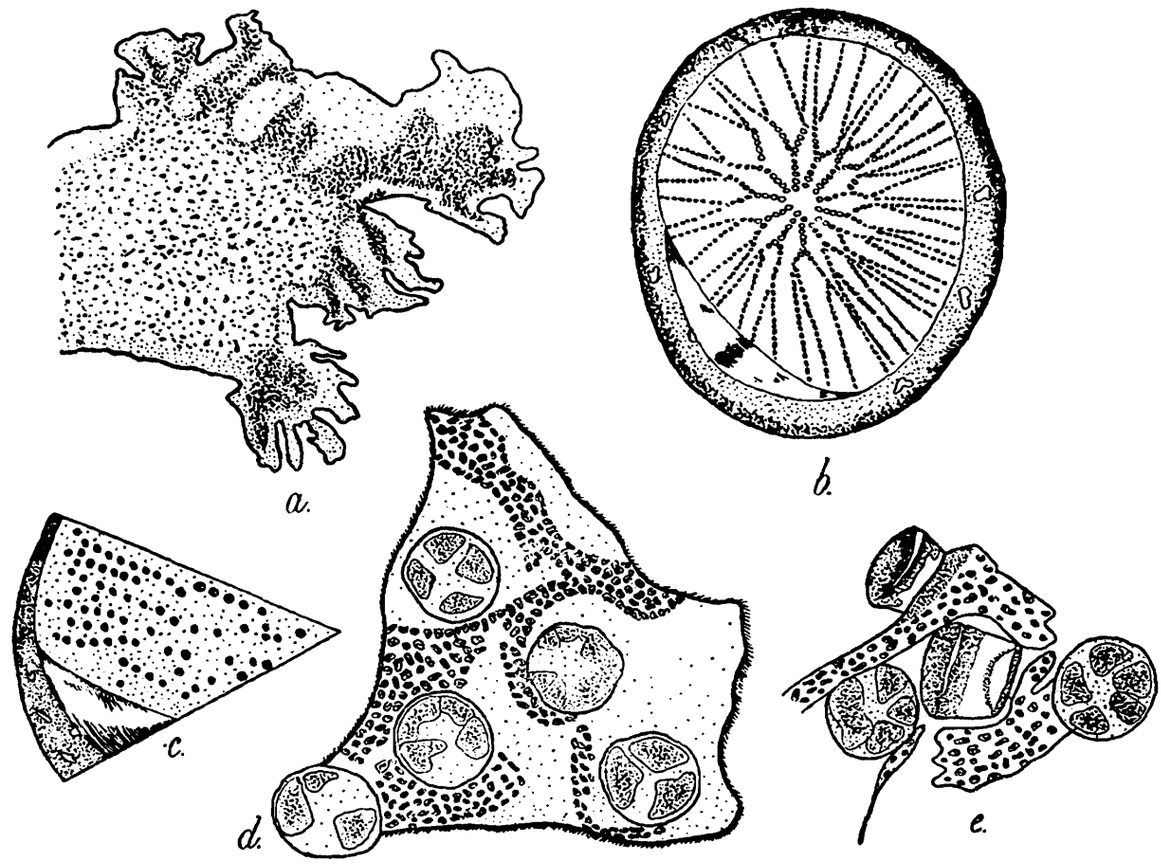
Abdomen is convex dorsally and flat ventrally. It is composed of 14 segments, all of which carry branchiae at the sides excepting the first and the last three segments. The first segment of the abdomen (segment XIII) forms a sort of conspicuous collar ("Preputial fold"; Apathy 1888), covering the last two segments, *i.e.*, XI and XII of the clitellum and bearing the genital openings ventrally. The skin is smooth and even, without any warts. Arising from the branchial stems, at regular intervals, some of the branchiae carry swollen projections at their bases, a feature also noticed in all other species of *Branchellion* and in species of *Piscicola*, etc. These are termed the pulsating vesicles of which there are eleven pairs noticeable in the specimen. The anus is situated mid-dorsally at the junction of segment XXV and XXVI.

Posteriorly the abdomen terminates in a large and ventrally directed sucker. The characteristic caudal papillae of the genus *Branchellion* are found in the posterior sucker of this specimen also. (Text-Fig. 2*b*). These papillae are mere outgrowths of the membrane lining the interior of the posterior sucker, which is continuous round the rim of the sucker with the outermost layer of bodywall, the mucous epithelium. The cellular structure and pattern are the same on this membrane lining the sucker, as on the epithelium lining the general surface of the body. These outgrowths are shaped (Text-Fig. 2*d* and 2*e*) like the adhesive pads or low suckers, but it is difficult to understand how these could function inside a large powerful and concave sucker. The papillae along the rim or the periphery of the sucker are smaller and more numerous and are densely packed than those at the centre. In the centre, the papillae are distributed sparsely in rows radiating from the centre to the periphery. By branching twice dichotomously, each radial row from the centre ends in four rows. Thus the papillae at the periphery are not only numerous but also more closely packed (Text-Fig. 2*c*). There are at least twelve radial rows at the centre.

Colouration.—In the preserved state, dorsally the anterior sucker is pale black in colour, with small yellowish streaks. The neck also is pale black with narrow transverse yellowish white streaks corresponding to the interannular regions. Abdomen and posterior sucker are deep dark dorsally, with white streaks here and there, but ventrally it is pale and all the annuli are clearly seen. The posterior sucker is flesh coloured in the interior. The branchiae are as dark as the dorsal side of the abdomen. The white spots and streaks of the abdomen extend to the branchiae also in different places. The pulsating vesicles are transparent.

Segmentation and annulation.—The whole body, as in all leeches, is composed of 34 segments. The exact number of annuli in each segment in the neck region is difficult to determine, but the total number of annuli in the whole neck region is 16. The genital openings are situated on the ventral side of the 15th and 16th annuli. These two annuli are covered over by the collar. The first annulus of the neck is very narrow and is merged with the anterior sucker.

In the abdominal region there are 38 annuli, and are grouped into distinct segments. In the branchiate region, *i.e.* from segment XIV—XXIV, there are 3 pairs of branchiae on each segment. This region shows on the dorsal side, grooves indicating biannulation, thereby showing 6 annuli for each segment. (Text-Fig. 1, *left bottom*). However, ventrally this biannulation is absent, but each segment presents only 3 primary annuli. In front of this branchiate region segment XIII presents a collar, the inner fold of which is represented by the anterior annulus and the outer by the posterior. Behind the last branchia, there are 5 annuli belonging to 3 segments, *i.e.* XXV, XXVI and XXVII, each having two annuli, excepting the last which has only a single annulus.



TEXT-FIG. 2.—*Branchellion plicusbranchus*, sp. nov.

(*a*). A single branchia viewed from anterior side to show the frilled edge × 5 ; (*b*). diagrammatic ventral view of posterior sucker enlarged ; (*c*). a section of the interior of the same showing papillae × 5 ; (*d*). inner membraneous lining bearing papillae × 42⅔ ; (*e*). side view of papillae × 42⅔.

The branchiae.—There are thirty three pairs of branchiae symmetrically arranged at the sides of the abdomen, extending between the segments XIV and XXIV Each segment being triannulate carries a pair of branchiae on each primary annulus. Each branchia (Text-Fig. 2*a*) is plate like, attached to the primary annulus proximally, at right angles to the long axis of the body. Each branchia has a broad almost squarish proximal region, the anterior and lateral ends of which are folded. Each of these folds is further frilled at the edges. All these frills being in the same plane many of these ultimate frills overlap, and the outline is irrigular, and deeply furrowed. The proximal part of the branchia

which may correspond to a stem, in its attachment to the side of the primary annulus is strictly confined to the anterior half of each primary annulus. The maximum length of each branchia is 3 m.m. and the maximum width is 10 m.m.

The *pulsating vesicles.*—(Text-Fig. 1, *left bottom*). The branchiae of primary annulus of each segment is at its base provided with the pulsating vesicles. They are eleven pairs. The first two pairs differ from the others in that the vesicle is found only on the posterior aspect of the branchial stem, whereas in others it is found that the pulsating vesicle bulges on both the anterior and posterior aspects of the branchial stem. The last one is also slightly different in being too small as to almost become inconspicuous, though it is found on both sides of the branchial stem. Whether this shrinkage in size is natural or an artificial is difficult to say. The fusion of the pulsating vesicles is not flush with the dorsolateral edge of the abdomen, but on the ventrolateral edge, they bulge and therefore are more clear on the ventral side rather than on the dorsal.

Measurements of the Holotype preserved in alcohol :—

1. Length of the leech (from the anterior end of the anterior sucker to the posterior end of the posterior sucker)	64·0 m.m.
2. Length of anterior sucker	4·5 m.m.
3. Maximum width of anterior sucker	6·0 m.m.
4. Length of neck	5·5 m.m.
5. Maximum width of neck	4·0 m.m.
6. Length of abdomen (including posterior sucker)	54·0 m.m.
7. Maximum width of abdomen (excluding branchiae)	10·0 m.m.
8. Maximum width of abdomen (including branchiae)	15·5 m.m.
9. Maximum length of branchia	3·0 m.m.
10. Diameter of posterior sucker	10·0 m.m.
11. Maximum depth of the body	5·0 m.m.

Type-specimen.—Holotype, No. W 3859/1, Zoological Survey of India, Calcutta.

DISCUSSION.

The new species of *Branchellion* described in this paper is the largest recorded so far. The colouration consists of white spots and streaks scattered irregularly on a dark background unlike the regular longitudinal rows of white spots on the first annulus of each segment described in *B. borealis* (Leigh-Sharpe, 1916) and *B. torpedinis* (Harding, 1910). The eyes are not visible in this specimen although they have been described in other species like *B. torpedinis* (Harding 1910). No warts are observed on the surface of the body as are seen in *B. borealis* (Leigh-Sharpe 1916) and *B. torpedinis* (Harding 1910). The posterior sucker with papillae in its interior is characteristic of the genus *Branchellion*. Concerning the

distribution of the papillae in this specimen, the larger ones which are sparsely distributed are at the centre agreeing with Moore's (1944) description, and unlike MacDonald's (1877) who described the larger ones at the periphery. (Text-Fig. 2*c*).

The clear biannulation of the dorsal side of the abdomen in this specimen is a feature described only in *B. torpedinis* (Moore 1944 and Apathy 1888). The number of branchiae and the distribution is the same as in the type specimen of *B. torpedinis*. The attachment of the branchial stem on each primary annulus, however, is different from all the other descriptions excepting that of Moore (1944). The branchial stem does not stretch the whole side of the primary annulus but takes its origin from and is mainly restricted to only the anterior half of the primary annulus. Since the primary annulus shows biannulation on the dorsal side it can be more precisely expressed that the branchial stems of a segment are restricted to only b^1, b^3 and b^5 of each segment (Moore's 1927 nomenclature). The edge of the branchiae is highly frilled and lobed and is very different from that of *B. torpedinis* (Harding 1910 and Moore 1944), or any other known species of *Branchellion*.

The position of the pulsating vesicles on the branchial stems is the same as in the type *B. torpedinis* (Harding 1910), but differs from that of *B. torpedinis* (Moore 1944), in being situated on the branchial stem of the first primary annulus of each segment and not on the second. Moore's specimen of *B. torpedinis* was unique in having the pulsating vesicles confined to only the posterior aspect of the branchial stems, *i.e.*, on b^4 of each segment. But the type specimen of *B. torpedinis* (Harding 1910) has the pulsating vesicles on both the anterior and posterior aspects of the branchial stems. In the present specimen the first two pairs of pulsating vesicles are on the posterior aspect of the branchial stem alone, but the rest are on both the anterior and posterior aspects of the branchial stems. Thus *Branchellion* shows a great amount of variation with regard to the nature and location of the pulsating vesicles. The accompanying table shows the important characters of the nearly related forms for an easier comparsion.

Table 1.

Table giving the relationships of *B. plicusbranchus*, sp. nov.

Important taxonomic characters.	*B. torpedinis* Type specimen.	*B. torpedinis* Moore's specimen.	*B. borealis* Leigh-Sharpe.	*B. orbinensis* Quatrefages	*Branchellion plicusbranchus*, sp. nov.
1. Biannulation of the abdomen on the dorsal side.	X	—	X	X	—
2. No. of pairs of branchiae –.	—	—	X	—	—
3. Position of branchial stem	X	—	X	X	—
4. Frilled edge of branchiae –.	X	X	X	X	—
5. No. of pairs of pulsating vesicles.	—	—	—	—	—
6. Location of vesicles on primary annulus.	—	X	—	—	—
7. Extension of vesicles on branchial stem.	X	X	X	X	—
8. Eyes . .	X	?	—	X	—
9. Length of body . .	X	X	X	X	—
10. Warts on the surface of the body.	X	?	X	—	—

"—" indicates resemblance, and "X" indicates difference from the characters of the present specimen given in the last column.

CONCLUSION.

This specimen conforms to the main generic features of the genus *Branchellion* Sav. in the form of the body, number of branchiae and vesicles, and in the presence of caudal papillae, but differs in some minor points such as length of the body, and details of the attachment of the branchial stem and extension of the pulsating vesicles. A noteworthy feature here is the conspicuous biannulation seen on the dorsal side of the abdomen described only in Moore's specimen. In all the other characters it agrees either with the majority of the described forms or with only one of them. In the nature of the frills and folds of the branchiae, the present specimen is unique. Since the possession of the branchiae is an outstanding characteristic of the genus *Branchellion* Sav. and as the present specimen presents a unique feature of the branchiae with their frilled and folded edge, there is sufficient justification for assigning the specimen to a distinct species.

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