

Report of the Biological Survey of Mutsu Bay.

17. Hirudinea.¹⁾

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(With 3 text-figures),

The fauna of Mutsu Bay can not be said to be rich in Hirudinea, as it includes so far only three species of this group of Annelids. Two of these are parasitic on teleostean Fishes, while the third was found upon a Mollusc, a case quite exceptional among the Ichthyobdellidae. The absence of the genus *Pontobdella*, by no means rare on our coasts, is rather conspicuous.

The three leeches now known to occur in Mutsu Bay, systematically arranged, are as follows:

Order Rhynchobdellida Family Ichthyobdellidae

Gen. *Ichthyobdella* DE BLAINVILLE 1827, emend. OKA 1910.

1. *I. uobir* OKA 1910.

Gen. *Callobdella* VAN BENEDEN et HESSE 1864, emend. OKA 1910.

2. *C. livanovi* OKA 1910.

Gen. *Ostreobdella* OKA 1927.

3. *O. kakibir* OKA 1927.

It must be remarked that the classification of marine leeches is still in a primitive condition, being based almost exclusively upon external characters, such as form, colour, annulation, size of suckers, etc. It is therefore evident that, when the internal organization of this group is better known, a large part of the species would have to be rearranged, and the generic designations now in use are to be considered, so far as such forms are concerned, as provisional.

¹⁾ Contributions from the Marine Biological Station, Asamushi, Aomori-Ken. No. 57.

1. *Ichthyobdella uobir* OKA 1910.

OKA, A. Synopsis der japanischen Hirudineen, mit Diagnosen der neuen Species. Annot. Zool. Japon., Vol. VII. 1910.

The body is elongated, depressed, with rounded margins, and divided into two regions, the neck and body, the posterior fourth of the former being slightly narrowed to form the clitellum. The anterior sucker is cup-shaped, not much wider than the neck, and is directed ventrally. The posterior sucker is hemispherical with a diameter about equal to the widest part of the abdomen, and is fixed to the latter by a rather narrow peduncle. Specimens kept in alcohol for a long time are of a uniform pale greyish colour, but in fresh state the dorsal surface presents a series of indistinct transverse bands of a

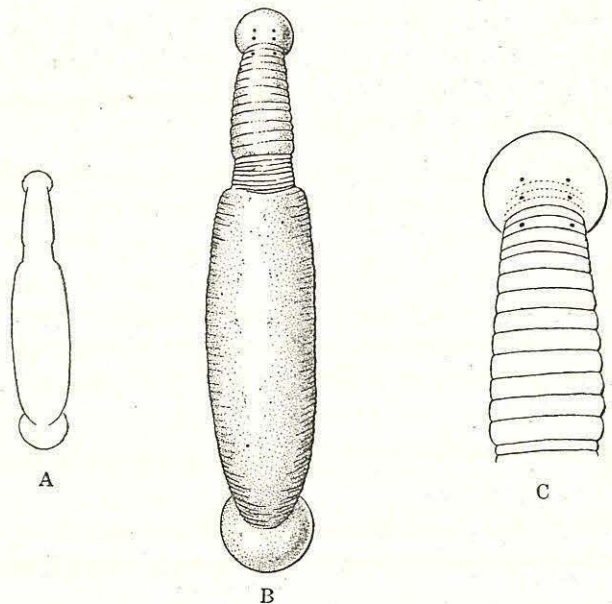


Fig. 1. *Ichthyobdella uobir*.

- A Outline of body, natural size.
 B Entire animal, $\times 2$
 C Anterior region, $\times 4$

brownish tint, that on the clitellum being somewhat darker than the rest. Besides, the oral sucker is ornamented with a narrow crescentic

band of the same colour about half way between its margin and the centre.

The largest specimen measures about 36 mm. in length and 7 mm. in breadth at the widest part, which lies in the middle of the abdomen.

The annulation is on the whole rather indistinct, especially in the abdominal region, where the integument appears in many specimens only irregularly wrinkled. In reality it consists for the most part of triannulate somites, whose primary rings are more or less clearly subdivided into secondary annuli. In the neck the rings are more distinct, and thirteen or fourteen of them may be counted in front of the clitellum. The latter is composed of seven or eight rings, much narrower than those of the neck proper. The anterior sucker shows on the dorsal surface indications of annulation, but too faint to be exactly counted. No such trace is visible on the posterior sucker.

The anterior sucker is circular in outline, and attached excentrally behind the centre. The mouth opening is very small, and is situated nearly at the centre of the concavity.

There are three pairs of eyes, two on the dorsal surface of the anterior sucker and one on the dorsal surface of the anterior part of the neck. They are small, black, and arranged as shown in Fig. 1, C.

The sexual pores are both on the ventral surface of the clitellum. The male orifice, which occupies the median region, is very large and conspicuous. The female pore, on the contrary, is extremely small and often difficult to detect; it is located near the posterior margin of the clitellum.

The anus is separated from the posterior sucker by two postanal annuli.

Six pairs of low round elevations which are sometimes observable on the ventral surface of the abdomen indicate the positions of the testes.

Locality: Higashi Tazawa-oki; on the inner surface of operculum of *Gadus macrocephalus*. 8. II. 1929. Twelve specimens.

2. *Callobdella livanovi* OKA 1910.

OKA, A. Synopsis der japanischen Hirudineen, mit Diagnosen der neuen Species. Annot. Zool. Japon., Vol. VII. 1910.

OKA, A. Sur la morphologie et la variabilité de la *Callobdella livanovi*. Proc. Imp. Acad., Vol. IV. 1928.

The body is cylindrical or claviform, little if at all depressed, and terminated by a sucker at each end. The length is about 30 mm. and the breadth about 4 mm. at the widest part. The body proper is divided into two regions, as in the preceding species, but unlike the latter the abdomen is provided with twelve pairs of globular respiratory vesicles, some of which, however, may be hidden when contracted. The anterior and posterior suckers are both separated from the body by well marked constrictions.

The anterior sucker is hemispherical or discoidal, about as long as wide, and fixed excentrically. It presents on its dorsal surface a number of shallow concentric furrows, which are no doubt interannular

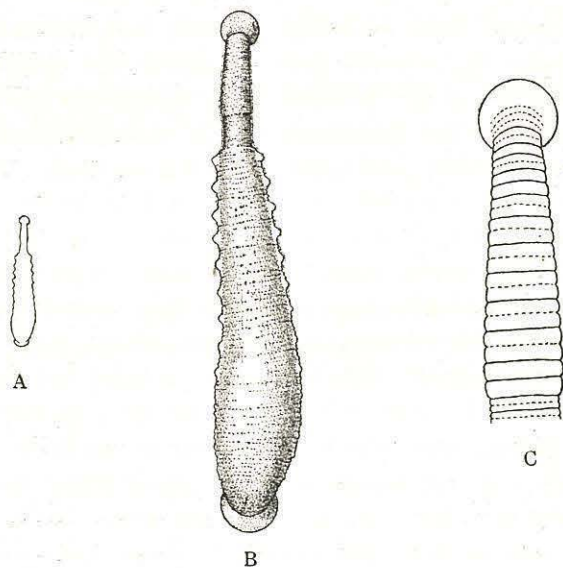


Fig. 2. *Callobdella livanovi*.

- A Outline of body, natural size.
 B Entire animal, $\times 4$
 C Anterior region, $\times 10$

furrows of the cephalic region. The mouth opening is at the centre of the lower surface of the sucker. There are no eyes.

The neck is formed of about twenty rings of unequal size, the larger ones being subdivided by a more or less distinct transverse furrow. The posterior third of the neck is transformed into a clitellum, on the ventral surface of which the sexual pores are placed. The latter are separated from each other by four small rings, and between the female pore and the commencement of the abdomen are two small rings, of which the posterior is generally concealed in the deep furrow separating the cervical region from the abdominal.

In the abdominal region it is easy to recognize from the position of the lateral respiratory vesicles, that each somite consists of six secondary rings resulting from the subdivision of the three primary annuli. There are twelve such somites, then follow six rings forming three groups of two rings each. The anus opens on the last ring but one, at some distance from the posterior sucker.

The posterior sucker is relatively small and directed posteriorly, so that it looks like a simple continuation of the abdominal region. Like the anterior sucker it presents a number of parallel circular furrows, indicating the boundaries of the postabdominal annuli, but they become too faint posteriorly to be counted with certainty.

This species is remarkable for its extreme variability in coloration. The ground colour is in some specimens dark olive green, almost black, in others reddish brown, while in still others it is pale brown or even whitish. In certain individuals the dorsal and ventral surfaces are of different colours, for instance, the ventral surface being pale brown and the dorsal blackish. The respiratory vesicles are always opaque white, and may be joined with one another by a narrow longitudinal white line running along the lateral margin of the body. In addition to this there is a longitudinal series of small white spots arranged metamericly at a little distance from the lateral vesicles and on the same ring, both dorsally and ventrally. These spots as well as the marginal lines are of course not so conspicuous on light coloured individuals as on dark ones.

Localities:

Horotsuki, 18. V. 1927. 2 specimens.

„ , on *Tetrodon* sp. 20. V. 1927. 2 specimens.

Asamushi, 23. VI. 1927. 1 specimen.

„ , on *Cottus* sp. 7. VII. 1927. 9 specimens.

- Asamushi, on *Sebastichthys* sp. 29. VII. 1927. 5 specimens.
 " , on *Sebastodes schlegeli*. 29. VII. 1927. 8 specimens.
 " , " " 5. VIII. 1927. 27 specimens.
 " , " " 11. VIII. 1927. 10 specimens.
 " , on *Sebastichthys* sp. 14. VIII. 7 specimens.
 " , on *Sebastodes mitsukurii*. 16. VIII. 1927. 8 specimens.
 " , " " 26. VIII. 1927. 2 specimens.
 " , " " 15. IX. 1927. 21 specimens.

As may be seen from the above list, this is by far the most common of the marine leeches in Mutsu Bay. It is found almost exclusively upon Acanthopterygian fishes.

3. *Ostreobdella kakibir* OKA 1927.

OKA, A. Sur une nouvelle Ichthyobdelle parasite de l'Huitre. Proc. Imp. Acad., Vol. III. 1927.

This is a very small leech, the largest specimen measuring only

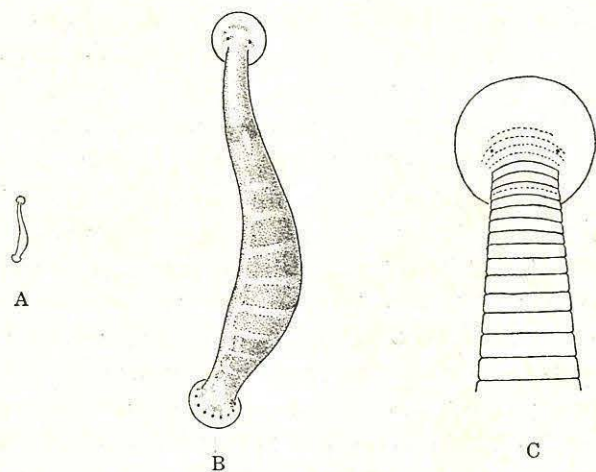


Fig. 3. *Ostreobdella kakibir*.

- A Outline of body, natural size.
 B Entire animal. $\times 6$
 C Anterior region, $\times 15$

14 mm. in length and 2 mm. in breadth at the widest part. The body is claviform or fusiform, tapering toward both ends, where it bears

a relatively large sucker. Unlike most of the Ichthyobdellidae, there is no distinction between the neck and abdomen, and the cross section is circular at any point of the body. The clitellar region, too, cannot be distinguished by its form externally.

The surface of the body is perfectly smooth, no papillae or tubercles being recognizable. The colour in general is a dark brown, a little paler on the ventral surface. An oval whitish patch on the dorsal surface indicates the position of the clitellar region. Behind this the ground colour is interrupted metamerically by transverse bands of whitish tint, which may be joined with one another by narrow longitudinal streaks of the same colour. In the cervical region, the transverse bands are broken up into transverse rows of round patches, which may be jointed in the same way by longitudinal lines.

The anterior sucker is circular and disc shaped; it is attached to the neck excentrically posterior to the centre. The mouth opening is situated at the centre of the under surface. The upper surface is convex and shows a number of more or less distinct concentric furrows, evidently the interannular furrows of the cephalic region.

A pair of small black eyes are seen on the dorsal surface of the anterior sucker. They are rather wide apart, and are separated from the neck by two cephalic rings. In specimens preserved in alcohol they are generally concealed by the brown pigment of the skin.

The number of rings composing the body proper is about 80. In general four rings form a somite, of which the second is easily recognizable by the presence of the whitish transverse band referred to above.

This species is very remarkable in having the rings subdivided by delicate annulations into a definite number of minute annuli. Toward both extremities, however, there is no trace of such secondary annulation.

The sexual pores are situated on the ventral surface of the clitellar region about opposite to the large white patch mentioned above. They are separated from each other by three rings.

The anus is placed on the dorso-median line just behind the last ring, i. e. between the abdomen and posterior sucker.

The posterior sucker is circular, cup-shaped, and directed obliquely backward. It is divided into rings by interannular furrows, of which the first two or three are fairly distinct, while the succeeding ones are

in most cases too faint to be counted. Eleven black eye-like spots are arranged along the posterior and lateral margins of the sucker.

Locality: Asamushi, on the shell of living *Ostrea gigas*. 24. III. 1927. Two lots, 7 and 2 specimens.