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**Instructions for use**

北海道帝国大学理学部紀要 5(3): 137-142
The Fauna of Akkeshi Bay
III. Oligochaeta

By

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(With Plate VI and one Textfigure)

The present paper is based on the following collections placed at
the writer's disposal for study and identification:—1) The oligochaete
collection obtained from the biological survey of the Akkeshi Bay
carried out by Prof. T. Uchida and Messrs. Y. Hada, M. Iwasa, S.
Okuda and H. Ishizuka in 1933, 2) the specimens collected by Mr. K.
Hanaoka at Besshakudomari in August, 1932, and 3) the specimens
collected by Mr. S. Makino at Shiribazaki in July, 1933. All the collec­
tions present but a single littoral species referable to the genus
Pachydrilus belonging to the Enchytraeidae, of which many species
have been recorded from coasts of the arctic, the subarctic and the
subantarctic regions, but as yet none from the coasts of Japan. The
littoral species seems to the writer to be a new representative of the
genus. Cordial thanks must be extended to Prof. T. Uchida for his
kind guidance and criticism, and also to the above mentioned gentle­
men for specimens. Many thanks are also due to Dr. L. Černovitov
of Prague, who kindly sent a copy of important literature to the
writer.

Pachydrilus nipponicus sp. nov.

Length, 25–30 mm; maximum diameter, 0.8 mm. Number of
segments, 57–71, usually counting not far from 60. Prostomium
roughly triangular with a rounded anterior end. Clitellum encircling
segments XII–XIII and slightly extended over, both anteriorly and

posteriorly, to the neighbouring segments (XI and XIV). Body yellowish to brownish white in colour in living state and white in specimens preserved in formalin. Blood, slightly red-coloured. Head pore on O/I. No dorsal pore. Epidermis with gland cells which are deeply stained and arranged in transverse rows. Four setae bundles per segment; each bundle consists of different number of setae, which are all single-pointed and deficient in nodulus (Fig. 1. A, B). Setae in a bundle are generally sigmoid and subequal in length, but in preclitellar region, some are "enchytraene" (straight forms with or without a curved proximal end). The ventral setae commonly count 6(5–8) in number in front of the clitellum, and 5(4–6) behind it; the lateral 5(3–5) in front of, and 3(2–4) behind the clitellum. The ventral bundles of segment XII have disappeared in mature specimens. Male pores, one-paired on segment XII. Female pores, also one pair in intersegment XII/XIII. These reproductive pores are situated on the ventral setal line. Spermathecal pores, one pair on the lateral sides of intersegment IV/V.

Septa begin with intersegment IV/V; septal glands on three septa, IV/V, V/VI and VI/VII; those located on septa V/VI and VI/VII are fairly bulky (Pl. VI, 2); the hindmost belonging to septum VI/VII projects backwards into the cavity of segment VII, barely reaching septum VII/VIII. Coelomic corpuscles, oval or elongated pear-shaped disks, 30–40 μ in longer diameter, nucleated. They are found floating freely in the coelomic fluid or attached to septa through their narrow ends. Their cell bodies are granular in constitution and stainable blue with Delafield's Haematoxylin. Oesophagus merges gradually into intestine. No salivary gland which is found in Fridericia and many species of Enchytraeus, while one pair of pharyngeal bulbs are present as usual in Pachydrilus. No chyle cell present. Cerebral ganglion, roughly rectangular, its length longer than its width. The hinder end of the cerebral ganglion, slightly concave, forming two short blunt lobes. Dorsal vessel originates on segment XIV or XV. Nephridia begin in segment VIII, but segments XI, XII and XIII are destitute of the organ. The anteseptal part of the nephridium, small and consists of a funnel only; the postseptal of an oval compact mass, flattened from side to side and narrowing anteriorly (Fig. 1, D). Its duct is given off from the hinder end of the postseptal, and passes downwards and forwards to its external opening located in front of the ventral setae bundle.
One pair of testes attached to the ventral end of septum X/XI; each consists of a number of elongated pear-shaped (or club-shaped) lobes, containing in their investing membrane male reproductive cells in various stages of development (Pl. VI, 5). The lobes radiate from their attachment at their narrow end, extending forwards into segment X and backwards into XI. One pair of male funnels, in segment X, long and cylindrical, slightly narrower backwards, about three times as long as broad. Their free margin very wide. Sperm duct, very long and folded several turns in segment XII. One pair of ovaries, in segment XII, attached to the ventral wall at intersegment XI/XII. They are much lobed. One pair of penial bulbs, in segment XII, attached to the ventral wall. They are so-called “lumbricilline” type (Pl. VI, 6). Each bulb is a large subspherical mass about
330–400 μ by 200–280 μ in mature specimens. It is provided with a strong muscular capsule which is a reflection of the musculature of the body wall. The interior of the bulb is filled with two kinds of cells. The first cells surrounding the penial lumen are long columnar and faintly stained, with nuclei at their basal portion. The second cells occupying the peripheral part of the bulb, are deeply stained, fusiform, with their long axes directed toward the penial lumen. The sperm duct enters the penial bulb from its post-lateral side faced toward the body wall, and opens into the penial lumen by a narrow canal situated in the central part of the bulb. Spermathecae, a single pair in segment V, are rather cylindrical (Fig. 1, C), communicating with the oesophagus. There are gland cells along the whole length of their duct, forming a glandular envelope. Those cells located at the ectal end of the duct are so elevated that they are distinguishable as a basal glandular collar. The wall of the duct has a well-developed muscle layer near its lumen (Pl. VI, 7). Arppulla small, pear-shaped and distinguished from the duct by the lack of such a glandular envelope. Copulatory glands located from segment XIV to XVIII, XIX or XX (mostly in segments XIV–XIX). The glands are more or less different in size in segments and individuals; well-developed ones usually extend above the ventral nerve cord, but do not enclose it (Pl. VI, 3). In segments III–IX, small copulatory glands are found. They are attached to the lower half of the ventral nerve cord and are observable only in sections. The gland cells of these copulatory glands contain much fine secretion stainable with eosin. Their ductules are long and slender assembling into a bundle under the ventral nerve cord. They pass downwards through the muscle layers of the body wall, and then are divided inside the epidermis so as separately to open outside in a definite area.

Localities and Habitat:—The present species is common along the shore of Akkeshi Bay, crowding under stones or half decayed sea-weeds on sandy beaches or on the gravelly flat between the high and low tide marks. In July and August, 1933 the species was found in abundance quite on the shore of Kojima. The principal features of this habitat are a smooth, small-gravelly, gently sloping beach where small pieces of organic matter in various stages of decomposition are scattered among small gravels. The specimens collected from Oshoro in 1932 by Dr. T. Uchida and Mr. M. Iwasa, and from
Motomari (Muroran') in 1934 and Shibetsu (near Nemuro) in 1935 by Mr. S. Okuda seem to be identical with the present species. It is, therefore, supposed that the present species is widely distributed on the coasts of Hokkaido.

Remarks:—So far as the writer is aware, although many enchytraeids are known in the western coasts of North America, no littoral enchytraeid has hitherto been reported from the Asiatic coasts of the North Pacific. The present species seems to resemble *Pachydrilus annulatus* (Eisen) reported from Alaska. But both species are mainly different in form and structure of nephridia and in body length. The "enchytraene" setae observed in the present species are present in *P. viridis* (Steph.) and *P. aegialites* (Steph.). But, in both of Stephenson's species, the copulatory glands are very much smaller or fewer than those of the present species.

Literature

Michaelsen, W. 1900 Oligochaeta (Das Tierreich Lief. 10).
— 1930 The Oligochaeta, Oxford.
Ude, H. 1902 Die arktischen Enchyträiden und Lumbriciden sowie die geographische Verbreitung dieser Familien. Fauna Arctica Bd. 2.
Explaination of Plate VI

Pachydrilus nipponicus n. sp.

1. Dorsal view of body (Total mount), \(\times 5\).
2. Lateral view of anterior part of body, showing septal glands (s) (Total mount), \(\times 20\).
3. Transverse section of the copulatory gland in segment XVI, \(\times 160\); l, lobe of the gland; n, nerve cord.
4. Transverse section of the copulatory gland in segment V, \(\times 480\); g, gland cells; n, nerve cord.
5. Transverse section through segment XI, showing testes, \(\times 55\).
6. Transverse section through segment XII, showing penial bulbs, \(\times 160\).
7. Transverse section of duct of spermatheca, showing well-developed muscle layer and glandular envelope, \(\times 480\); g, glandular envelope; m, muscle layer.
8. Transverse section of ampulla of spermatheca, \(\times 480\).
H. Yamaguchi: Oligochaeta of Akkeshi Bay