

MARINE GASTROTRICHA AND KINORHYNCHA FROM SCHEVENINGEN

by

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In the first three months of 1937 some Gastrotricha and Kinorhyncha were collected by the author at the beach of Scheveningen. Up to the present no members of these classes were recorded from this part of the North Sea, and moreover, they are all new for the fauna of the Netherlands. Therefore I summarized the results of the examination in the present paper.

During neap tide some sand of the beach was put into glassjars, which were beforehand partially filled with sea water. The sand was taken from the surface of the beach, as near to the water line as possible. As described by Remane (1936, pp. 234—235) the glassjars were put in a quiet spot without aeration for 1—2 weeks. After this time every day a proof was taken with a pipette from the surface of the sand, and examined microscopically in Petri-dishes.

The collected specimens are inhabitants from the part of the beach that is wetted and dried up twice a day. Therefore the occurrence of these species is "medio-littoral" (Zaneveld, 1937, p. 477). This only incidentally studied habitat is characterized by extraordinary varying conditions, because the structure of the bottom and especially the size of the sand grains is dependent on the mechanical effect of the water movement, on the wind, and on the sunshine. On account of this we can expect a large number of species, recorded from different habitats. The Gastrotricha dealt with here occur in the following biotopics (Remane, 1936, p. 214).

Shell formation: *Macrodasys cephalatus* and *Dactylopodalia typhle*.

Coarse gravel: *Dactylopodalia typhle*, *Platydasys maximus* and *Aspidiophorus marinus*.

Fine sand: *Turbanella hyalina* and *Xenotrichula micracanthus*.

As to the habitat of the Kinorhyncha, their occurrence is mainly restricted

to muddy areas (Remane, 1936, p. 363). Greeff (1869, p. 86), however, mentions already *Echinoderes dujardinii* as a littoral organism.

The salt concentration of the sea water near Scheveningen is 3.1 per cent approximately.

The Netherlands collecting place Scheveningen fills up a gap in the geographical distribution of some of the described animals. Both Kinorhyncha, viz., *Echinoderes dujardinii* and *Pycnophyes dentatus*, and 2 Gastrotricha, viz., *Dactylopodalia typhle* and *Turbanella hyalina* were already known from the northern part of the North Sea and from the Mediterranean.

An interesting extension of the known distribution is this locality for *Platydasys maximus*, hitherto only known from the Mediterranean, and for *Aspidiophorus marinus*, till now only recorded for the Baltic.

Macrodasys cephalatus and *Xenotrichula micracanthus* preserve their limited distribution, i.e., the North Sea.

I agree with Zelinka (1889, p. 214), who says that the living organisms are by far the best objects for studying the principal characters of the surface of the body. These outward visible characters were used for the determination, and the internal organs as far as they could be observed in living animals.

No attempt has been made to give any detailed description, this can be found in the literature cited at the end of the paper. Only a few measurements and differences with the original descriptions are given. The classification of Remane (1936) was followed, and for the synonyms I refer to this excellent publication.

Class GASTROTRICHA

Macrodasys cephalatus Remane 1927 a

Illustrations: Remane 1927 a, fig. 2; 1927 b, fig. 52; 1929, fig. 161; 1936, figs. 43 and 52.

The number of the adhesive tubes at each side of the head is 9, less than figured by Remane (1929); they are 12—15 μ long. The lateral and posterior tubes are very frequent, they are equal in length, viz., 20—24 μ . The distance between the terminal part of the body and the last posterior adhesive tube is greater than is shown in the figure of Remane (1927 a).

M. cephalatus is distinguished from *M. buddenbrocki* and *M. caudatus* by the presence of a lobe at both sides of the head and by the more or less

rounded posterior part of the body. *M. affinis* also lacks the lobes, but this species has the short acuminate terminal end closely covered with adhesive tubes and the anterior part of the bursa copulatrix is coneshaped.

Distribution. North Sea: Heligoland, Remane (1927 a).

Dactylopodalia typhle Remane 1927 a

Illustrations: Remane 1927 a, fig. 6; 1936, fig. 160.

This species which was gathered very frequently, is characterized by the clearly separated head without eyes, which is the principle difference with *D. baltica*, the forked tail and the constant number of 5 lateral adhesive tubes (in *D. baltica* there are 6). In one of the specimens there occurred a number of 6 adhesive tubes in the transverse rows on both sides of the ventral part of the head.

Each part of the forked tail possessed 6 adhesive tubes. The length of the various tubes is: lateral adhesive tubes 9—14 μ , posterior ones 7—12 μ , and anterior ones 6—12 μ .

Only one specimen has been seen with male genital organs, other specimens with ovaria.

Distribution. North Sea: Heligoland, Remane (1927 a); the Mediterranean: Gulf of Naples, Remane (1927 a).

Turbanella hyalina M. Schultze 1853

Illustrations: M. Schultze 1853, fig. 6; Remane 1936, figs. 79, 80, 110 and 111.

This wide-spread species occurs in great numbers on the beach of Scheveningen. It can be recognized by the band-like flattened body, which is divided into head, trunk and forked tail. Between the forks of the tail a papilla of 10 μ length is present. The lateral adhesive tubes all bear a long hair-like process, rising out of the middle of the tubes. The total length of these tubes inclusive the hair-processes is nearly as long as the diameter of the body, viz., 55—80 μ .

T. hyalina differs from *T. cornuta* and *T. plana* in the absence of a cone-like protuberance at both sides of the head and from *T. subterranea* in the greater number of lateral adhesive tubes and the presence of two rows of hairbushes on the posterior part of the ventral surface of the body.

Distribution. The Baltic: Labö, Remane (1925); North Sea: Cuxhaven, Schultze (1853); British Channel: Plymouth, Allen (1915); the Mediterranean: Gulf of Naples, Remane (1926 a).

Platydasys maximus Remane 1927 a

Illustrations: Remane 1927 a, figs. 10 and 11; 1927 b, fig. 61; 1929, fig. 190; 1936, figs. 5i, 74, 141, 166 and 167.

Several specimens of the only representative of this genus, hitherto only known from the Mediterranean, were observed. The total length of the North Sea specimens is 435—530 μ and the breadth 95—120 μ ; thus some of them are of somewhat greater sizes than the Mediterranean inhabitants. The 4 lateral adhesive tubes are swollen in their middle, ca. 15 μ long. All specimens had eggs and but one of these had testes.

Distribution. The Mediterranean: Gulf of Naples, Remane (1927 a).

Xenotrichula micracanthus Remane 1926 b

Illustrations: Remane 1926 b, fig. 2; 1929, fig. 44; 1936, fig. 171.

The length of the body of the two observed specimens is a little smaller than that given by Remane (1926 b), viz., 85 and 95 μ . Maximal breadth of the head 18 and 20 μ , and that of the trunk 24 and 28 μ respectively. The whole body, with the exception of the extreme anterior part, is covered by the six-angular scales with rounded edges. They are situated in 12 alternating longitudinal rows. Every scale bears a spine-cell ending in a small horizontal plate. The toes show the two parts, which are of equal length; the part corresponding with the body is 3 times as broad as the terminal one and scaled like a fir-cone. The total length of the toes is 13 and 14 μ , and the breadth 4 and 5 μ respectively. *X. micracanthus* and *X. intermedia* do not possess the remarkable tentacle at each side of the head, which is characteristic for *X. velox*, *X. pygmaea* and *X. subterranea*. *X. intermedia* is different in having a series of stiff oral bushes of hairs.

Distribution. North Sea: Heligoland, Remane (1926 b).

Aspidiophorus marinus Remane 1926 b

Illustrations: Remane 1926 b, fig. 3; 1927 b, fig. 41; 1929, fig. 193; 1936, fig. 185.

The terminal plates at the end of the spine-cells of the scales are closely united to each other, so that a "two-floored" cuticle is formed. The head bears 22 longitudinal rows of scales and the trunk 28. On the toes no scales occur.

A. marinus differs from *A. mediterraneus*, the only other marine member of the genus, in the possession of a refractive granule at each side of the head.

The new locality is interesting on account of the distribution.

Distribution. The Baltic: "Strander Bucht", Remane (1926 b).

Class KINORHYNCHA

Echinoderes dujardinii Claparède 1863

Illustrations: Pagenstecher 1875, pl. 7; Greeff 1869, pl. 4 figs. 1—5; Schepotieff 1907, pl. 17 figs. 1—6 and 15—21, pl. 18 figs. 19 and 20; Remane 1928, fig. 15; 1929, fig. 260; 1936, figs. 214 and 215.

The length of the body in the sense of Zelinka (1928), i.e., from the foremost margin of zonite III till the hindmost part of zonite XIII is ca. 490 μ . The trunk is ca. 100 μ broad. Zonite III bears the dark coloured red eyes. All the *Echinoderes* species mentioned below bear a dorsal spine on the zonites VI till X, therefore 5 in number. Now *E. canariensis* can be distinguished by the 2 extra pigment-spots, *E. ehlersi* by the sword-shaped dorsal spines, *E. ferrugineus* by the curved dorsal spines, and *E. worthingi* in having the posterior dorsal spine 3-times as long as the anterior ones.

Distribution. The Baltic: Kiel, cf. Remane (1936); North Sea: Bergen, Schepotieff (1907); Heligoland, Leuckart (1854), Metschnikoff (1869) and Greeff? (1869); coast of Normandy: St. Malo, Dujardin (1851); St. Vaast la Hogue, Claparède (1863); the Mediterranean: Balearic Islands, Pagenstecher (1875); Naples, Brindisi and Rovigno, Schepotieff (1907); Black Sea: Odessa, Reinhard (1881).

Pycnophyes dentatus (Reinhard 1887)

Illustrations: Reinhard 1887, pl. 20 figs. 1—18; Remane 1936, fig. 256.

Zonite III forms the closing apparatus of which the sternal and episternal plates cover the whole ventral part of the zonite. The median part of the zonites XI and XII is distinctly thickened. The pachycycles are broad and well developed.

P. dentatus comes very near to *P. robustus*, but the latter has the terminal spines very long, ca. 1/3 as long as the length of the body, whereas they are as long as zonite XII in *P. dentatus*.

Distribution. The Baltic: Kiel, cf. Remane (1936); North Sea: St. Andrews Bay, Brady (1903); Irish Sea: Dublin, Southern (1914); Black Sea: Odessa, Reinhard (1881).

LITERATURE CITED

- ALLEN, E. J., 1915. Polychaeta of Plymouth and the South Devon Coast including a list of the Archannelida. Journ. Mar. Biol. Ass. N.S., vol. 10.
BRADY, G. S., 1903. Echinoderes. Nat. Hist. Trans. Northumberland, Durham, vol. 14.

- CLAPARÈDE, E., 1863. Beobachtungen über Anatomie und Entwicklungsgeschichte wirbelloser Tiere an der Küste Normandiens angestellt. Leipzig.
- DUJARDIN, F., 1851. Observations zoologiques I. Sur un petit animal marin, l'Echinodère. Ann. Sc. Nat., Zool. (3), vol. 15.
- GREEFF, R., 1869. Untersuchungen über einige merkwürdige Formen des Arthropoden- und Wurm-Typus. Arch. f. Naturgesch., vol. 35, I.
- LEUCKART, R., 1854. Bericht über die Leistungen in der Naturgeschichte niederer Tiere für 1848—1853. Arch. f. Naturgesch., vol. 20, II.
- METSCHNIKOFF, E., 1869. Bemerkungen über Echinoderes. Mélanges biologiques 7. Bull. Ac. St. Pétersbourg, vol. 4.
- PAGENSTECHER, H. A., 1875. Echinoderes Sieboldii. Zeitschr. wiss. Zool., vol. 25, Suppl.
- REINHARD, W., 1881. Über Echinoderes und Desmocolex der Umgegend von Odessa. Zool. Anz., vol. 4.
- , 1887. Kinorhyncha (Echinoderes), ihr anatomischer Bau und ihre Stellung im System. Zeitschr. wiss. Zool., vol. 45.
- REMANE, A., 1925. Neue aberrante Gastrotrichen. II: Turbanella cornuta nov. spec. und T. hyalina M. Schultze 1853. Zool. Anz., vol. 64.
- , 1926a. Morphologie und Verwandtschaftsbeziehungen der aberranten Gastrotrichen I. Zeitschr. Morph. u. Oekol. d. Tiere, vol. 5.
- , 1926b. Marine Gastrotrichen aus der Ordnung der Chaetonotoidea. Zool. Anz., vol. 66.
- , 1927a. Neue Gastrotricha Macrodasyoidea. Zool. Jahrb., Syst. vol. 54.
- , 1927b. Gastrotricha. Tierwelt der Nord- und Ostsee, part VII d1.
- , 1928. Kinorhyncha. Tierwelt der Nord- und Ostsee, part VII d2.
- , 1929. Gastrotricha and Kinorhyncha. Kükenthal-Krumbach, Handb. d. Zool. vol 2.
- , 1935 and 1936. Gastrotricha und Kinorhyncha. Bronns Kl. u. Ordn. d. Tierr., vol. 4, Abt. II, Buch 1, Teil 2.
- SCHEPOTIEFF, A., 1907. Die Echinoderiden. Zeitschr. wiss. Zool., vol. 88.
- SCHULTZE, M., 1853. Über Chaetonotus und Ichthyidium (Ehrb.) und eine neue verwandte Gattung Turbanella. Müll. Arch. Anat., Phys., Wiss. Medic., Jahrg. 1853.
- SOUTHERN, R., 1914. Nematelmia, Kinorhyncha and Chaetognatha. Clare Island Survey 54. Proc. Roy. Irish Acad. vol. 31.
- ZANEVELD, J. S., 1937. The littoral zonation of some Fucaceae in relation to desiccation. Journ. of Ecol., vol. 25.
- ZELINKA, C., 1889. Die Gastrotrichen. Eine monographische Darstellung ihrer Anatomie, Biologie und Systematik. Zeitschr. wiss. Zool., vol. 49.
- , 1907. Zur Kenntnis der Echinoderen. Zool. Anz., vol. 32.
- , 1928. Monographie der Echinodera. Leipzig.