ON A NEW SPECIES OF THE GENUS *THALASSEMA* FROM BOMBAY.

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(Plate XII.)

In this paper we give the description of a new species of the genus *Thalassema* Lamarck which is fairly common in the intertidal zone in certain areas near Bombay and discuss its relationship with the other known Indian species.

Thalassema bombayensis, sp. now.

The shape of the body is variable, in a well preserved specimen, such as is figured on plate xii, fig. 1, it is elongate, cylindrical, gradually tapering posteriorly to a subtruncate tip and rounded anteriorly to where the proboscis is attached. The length of the body in the holotype preserved in 90 per cent. alcohol after fixation in formalin is 10·8 cm., but other specimens, depending on the state of preservation, vary from 7 to 12 cm. in length. The maximum breadth of the body is 2·5 cm. The proboscis, like the body, is capable of a great deal of contraction and expansion ; in a well preserved specimen, such as the one selected as the holotype, it is elongated, somewhat tubular and is broadly truncated at its free anterior end ; it is 2·4 cm. long, and its maximum breadth is ·9 cm. ; its form in a contracted condition is shown in the specimen illustrated in fig. 2. The ventral margins of the proboscis are free from one another almost to the point of attachment to the body, and unlike the condition in most of the estuarine Asiatic species of the genus, the margins are not united ventrally at the base to form a tube. The entire surface of the body is covered over by papillae, those in the middle region are minute (fig. 5, *p*), conical and hardly visible to the naked eye ; along the two ends, however, there are a large number of fairly large somewhat raised ovoidal tubercle-like structures (fig. 6, *p'*) interspersed with the microscopic papillae of the same type as are found in the middle region of the body. Some large papillae (fig. 5, *p'*) are also to be seen in the middle region of the body. The tubercles, as is clear on examination with a lens, are formed by the union of groups of 4-5 small papillae. The arrangement of the papillae and tubercles is irregular over the greater part of the body but near the two ends they appear to be arranged in regular rings. The surface of the proboscis is quite smooth.

At a distance of about a centimetre from the anterior end in the mid-ventral line there are the usual two-hooked setae of a golden-yellow colour. Lying slightly externally to the hooks are the narrow, somewhat slit-like openings of the segmental organs. In a well preserved specimen two pairs of these openings were clearly visible anterior to

the hooks and 3 on the right and 2 on the left side posterior to the hooks ; in other specimens the openings could not be clearly distinguished. The longitudinal muscular layer of the body-wall is not continuous, but in the middle region of the body it is broken up into bundles. Normally the number of bundles is 10, and these are separated by interspaces almost as broad as the bundles themselves, but in some specimens one or another of the bundles is divided into two distinct bundles and as a result 11 bundles are present. Along the ends of the body, however, the longitudinal muscles form a continuous sheath. The number of segmental organs (fig. 3, *s.o.*) is variable, usually there are 5 pairs, 2 pairs lying anterior to and 3 posterior to the setal hooks, but in some specimens only 4 pairs of well developed segmental organs were found ; of the posteriormost fifth pair a vestigial one was developed on the right or left side and the corresponding organ of the opposite side was altogether absent (fig. 3). In one specimen there was no trace of the fifth pair. The vesicles of the segmental organs are drawn out into almost whip-like structures at their free ends, while the lateral margins of the funnels are provided with very long spirally-coiled lobes. The spiral lobes are only the lateral prolongations of the margins of the funnel, and are in normal specimens only two in number, but in one case the spiral structures by irregular dichotomous branching had developed into a bunch-like structure (fig. 4). The anal vesicles, which are greatly elongated structures, are of almost the same length as the body of the animal ; from a little in front of the middle they narrow gradually to almost thread-like structures ; the funnels are arranged irregularly on the anterior one-third of their length. No caecum could be distinguished in the specimens dissected by us.

The colour of the specimens preserved in formalin is light salmon-red, but owing to the blackish mud shining through the interspaces between the muscle bands these areas appear to be rather darker in colour.

Locality.—As is noted in the introduction the species has been found only in certain areas near Bombay in the intertidal zone of the beaches, specially at Chowpatty, Worli and Colaba. So far as is known the species is not widely distributed all along the coast. The bottom in the intertidal areas at these places consists of a blackish sandy mud.

Holotype.—No. $^{W}\frac{1525}{1}$ in the collections of the Zoological Survey of India (Indian Museum), Calcutta.

Remarks.—This animal is gregarious and is found in colonies living in muddy ooze containing a large quantity of fine sand grains ; each animal occupies a separate burrow in the colony. The burrows are easily recognised by the presence of small elliptical pellets of excreta lying in the depressions of the burrows. The number of individuals in the colonies is very large, as many as forty specimens were found on one occasion in a single colony.

The animal is very slippery owing to the presence of large quantities of mucus all over the body and especially on its posterior part.

It is found all the year round, and its breeding season is from July to September, though sometimes specimens with ripe ova and sperms are found as late as October and November.

There are no external sexual differences, but in the breeding season males can generally be recognized from the females. In the males the segmental organs, which are distended with ripe sperms, are seen through the more or less transparent skin as shining milky-white structures; while in the female these organs containing the ripe ova are dull grey. In some cases the males are bright red, while the females are usually of a dull colour.

Relationships.—Leaving out of consideration the species [1] of the genus *Thalassema* Lamarck, which have been found in estuarine areas, the first essentially marine species of this genus from along the Indian coasts was recorded from the Gulf of Manaar off Rameshwaram Island along the coast of Peninsular India, on the authority of the late Dr. Selenka, by Thurston [2] under the name *Thalassema formulosum;* this name, however, as was shown by one of us [3] is only a *nomen nudum*, and unless the suggestion made in the paper cited of *T. formulosum* being a *lapsus calami* for *T. formosulum* Lampert is correct, the identity of the species from off Rameshwaram Island must remain doubtful. In 1919 a second marine species from the mud-flats at Chandipore, Orissa, was described by Prashad [4] under the name *T. microrhynchus*, but this species and *T. branchiorhynchus* Annandale and Kemp, which was also found in association with it in the same locality, appear to belong to the group of estuarine species [5] referred to above and need not be considered here. A second truly marine species from the chank-beds at Tuticorin in the Gulf of Manaar was, however, described by Prashad in 1920 in the paper cited under the name *T. hornelli*, [6] and this completes the records of the species which are known from along the coasts of India.

T. bombayensis differs from all other extra-Indian species in having 4-5 pairs of segmental organs. In this respect it is allied to *T. hornelli*, which also has 5 pairs of segmental organs, but differs from it in general form and in having 10-11 instead of 19 longitudinal muscle bands. The variable number of both the muscle bands and the segmental organs in *T. bombayensis* suggests that the species is still in the process of evolution in these respects. The greatly divided condition of the spiral lobes of the funnels of the segmental organs, which was found in one specimen, is also of special interest.

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[1] Annandale, N. & Kemp, S. W., *Mem. Ind. Mus.*, V, pp. 58-63, text-figs. 1-3 (1915). *See* also Prashad, B., *Mem. As. Soc. Bengal*, VI, pp. 323-338, pl. xi (1919).

[2] Thurston, E., *Bull. Madras Mus.*, III, p. 116 (1895).

[3] Prashad, B., *Rec. Ind. Mus.*, XIX, p. 35 (1920).

[4] Prashad, B., *Rec. Ind. Mus.*, XVI, pp. 399-401, text-fig. (1919).

[5] Annandale in *Bijdrag. Tot. d. Dierkunde* (Max Weber Feest-Numer), p. 148 (1922) separated this interesting group of estuarine species together with *T. sabinum* Lanchester from Siam into a distinct genus for which he proposed the name *Anelassorhynchus*. Anatomically, however, these forms do not differ in any respect from the other marine species of the genus *Thalassema* Lam., and it is very doubtful whether the slight differences in the "structure, function and physiology of the proboscis" are enough for separating them into a distinct genus. It may also be noted here that no species had ever been described by Annandale & Kemp under the name *Thalassema gangetica* and apparently this name is synonymous with *Thalassema branchiorhynchus* Annandale & Kemp which was originally described from the Gangetic Delta. The page reference to this species in the *Mem. Ind. Mus.* should be 61 and not 56 as given by Annandale in the paper cited.

[6] Prashad, B., *Rec. Ind. Mus.*, XIX, pp. 36, 37 (1920).