J. Mar. biol. Ass. India, 1967, 9 (1) : 179-181

OCCURRENCE OF THE CEPHALOCHORDATE, *BRANCHIOSTOMA LANCEOLATUM* (PALLAS) FROM THE PULICAT LAKE, SOUTH INDIA

By P. J. SANJEEVA RAJ, *Department of Zoology, Madras Christian College, Tambaram, Madras-59*

&

JAYAPAUL AZARIAH, *Department of Zoology, University of Madras Madras-5*

OF the four species of *Branchiostoma* known from Indian waters, *Branchiostoma lanceolatum* (Pallas) is perhaps the most common. It was first reported by Andrews (1893) and later by Tattersall (1903) from Ceylon. Recently, large numbers of them were collected and reported by Azariah (1965a) from off Madras. *B. lanceolatum* was earlier said to be restricted to the European waters (Franz, 1922) but subsequently, it has been reported from Madagascar, Arabian Sea and Portuguese West Africa, besides from India and Ceylon (see Webb 1956a). However, all these earlier reports of this species from the eastern waters are based on a single or a few specimens, except that of Azariah (1965a) which is based on 997 specimens dredged off Madras. *B. nigeriense* collected by Webb (1955 and 1956b) from the Lagos harbour and lagoons seems to be the only instance of a cephalochordate from estuarine waters and this species is known to have considerable tolerance for salinity fluctuations down to 13‰. The following report is based on specimens of *B. lanceolatum* collected from estuarine waters of south India and it is the first report of this species from tropical estuarine habitat.

OCCURRENCE, HABITAT AND HABITS

Twenty specimens of *B. lanceolatum* (Pallas) were dredged from the Pulicat Lake, by the post-graduate zoology students of the Madras Christian College, Tambaram. Fourteen of them were dredged on October 13, 1964 and six on October 29, 1965.

Pulicat Lake (Lat. 13° 24′ to 13° 47′ N. and Long. 80° 02′ to 80° 16′ E.) is a large and shallow brackish water lake of about 178 sq. miles in area, extending between the Madras and Andhra States. Its opening into the sea and connection with the inflowing fresh water Buckingham Canal are both located at the southern end of the lake at the Pulicat Village. The present collection of *B. lanceolatum* was obtained from shallow waters of this lake at a point about half a mile south of the mouth of the sea and about the same distance north of the Gūnakuppam Village. Two of the specimens were obtained from the more interior parts of the lake near the Moosamani Lock area. All these specimens were obtained while sieving the sand from shallow waters for interstitial fauna.

These specimens were always found in clear white sand and only occasionally were they found in white sand with a slight mixture of black sand. The salinity

at points where these lancelets were present was about 24‰. The only other animals that were always associated with these lancelets were the gastropods, *Umbonium vestiarium* (Linne). The habitat was devoid of any vegetation, and has the following percentage composition of sand grains :—

0.68%	<1.651 mm. in diameter
7.56%	1.651<0.833 mm. ,, ,,
31.86%	0.833<0.495 mm. ,, ,,
54.24%	0.495<0.246 mm. ,, ,,
4.53%	0.246<0.175 mm. ,, ,,
0.34%	0.175<0.147 mm. ,, ,,
0.13%	0.147<0.124 mm. ,, ,,
0.15%	0.124<0.104 mm. ,, ,,
0.045%	0.104<0.074 mm. ,, ,,
0.032%	less than 0.074 mm. ,, ,,

From the above details, it is evident that this estuarine habitat of *B. lanceolatum* abounds in finer sand grains (between 0.495–0.246 mm.) whereas the marine habitat off Madras from which the same species has been collected earlier (Azariah 1965a) abounds in coarser sand grains (between 0.991–0.495 mm.).

Live animals are translucent white and sometimes glistening white, very much like tiny fairy shrimps, and jump off the sand and wriggle about like the fairy shrimps themselves. When transferred to Petri dishes with lake water, they swim about by the lateral undulations of the body with spiralling movements.

Statistical Analysis and Diagnosis

The following statistical analysis of the important taxonomic characters of the six specimens collected in 1965 will help in the diagnosis of the species from the Pulicat Lake.

1. Number of dorsal fin chambers : 232–278, Mean=253.8 Standard Deviation (S.D.)=15.98. S.D.=6.29% of the Mean.

2. Number of ventral fin chambers : 45–54, Mean=49.5 S.D.=3.87 S.D.=7.74% of the Mean.

3. Tallest of the dorsal fin chambers : 2.4–4.0 times as high as broad. Mean=2.91 S.D.=0.41 S.D.=14.08% of the Mean.

4. Height of the dorsal fin contained 13–18 times in the depth of the body in the mid-atrial region. Mean=15.5 S.D.=2.4 S.D.=15.1% of the Mean.

5. Post-atrioporal region : 0.37–0.55 length of the pre-atrioporal region. Mean=0.491 S.D.=0.072 S.D.=14.72% of the Mean.

6. Myotomes from anterior end to atriopore : 33–35 Mean=34 S.D.=0.63 S.D.=1.86% of the Mean.

7. Myotomes from atriopore to anus : 12–14 Mean=12.8 S.D.=0.94 S.D.=7.20% of the Mean.

8. Myotomes posterior to anus : 12–13 Mean=12.5 S.D.=0.936 S.D.=7.20% of the Mean.

9. Total myotomes : 59–60 Mean=59.3 S.D.=0.63 S.D.=1.07% of the Mean.

10. Maximum length in the sample examined : 12 mm. Minimum length 6.5 mm.

The present sample from the brackish waters resembles the marine forms of *B. lanceolatum* (Pallas), in all morphological features, except in the relative height of the dorsal fin, which is much shorter than that of the marine population. This feature is represented in the marine and brackish water samples of *B. nigeriense* also. Since the present collection of lancelets was obtained in the month of October, a few months after the breeding season of the marine population off Madras, and since all of them collected from the Pulicat Lake are juveniles, it is quite possible that they are derived from the marine population. Of the two breeding seasons of the marine population (Azariah 1965b), the possibilities for the larvae to enter brackish waters are more during the summer (July–August) breeding season, because the pelagic larvae are liable to be carried north to the Pulicat Lake from their parental breeding sites off Madras, by the East Drift of the surface currents in the Bay of Bengal. The second breeding season for these lancelets off Madras is in winter (December–January) when the direction of the current is southwards.

Planktonic larvae of *B. lanceolatum* have been collected from the shoal waters and the mouth of the same Pulicat Lake during September–October in earlier years.

It is worth investigating the salinity tolerance, migrations and biology of these estuarine forms of *B. lanceolatum*.

REFERENCES

ANDREWS, E. A. 1893. An undescribed Acraniate : *Asymmetron lucayanum*. *Stud. Biol. Lab. Johns. Hopk. Univ.* Baltimore, **5**(4) : 213.

AZARIAH, J. 1965a. Studies on the Cephalochordates of the Madras Coast. I. Taxonomic Study. *J. Mar. biol. Ass. India*, 7(2) : 348.

———. 1965b. A note on the seasonal appearance of fin rays and their bearing on the breeding cycle. *Ibid.*, 7(2) : 459.

FRANZ, V. 1922. Kurzer Bericht uber systematische Acranierstudien. *Zool. Anz.*, **54** : 241.

TATTERSALL, W. H. 1903. Report on the cephalochordata collected by Prof. Herdman at Ceylon in 1902. *Rep. Ceylon Pearl Oyster Fisheries*, Part I, *Suppl. Rep.*, **6** : 209.

WEBB, J. E. 1955. On the lancelots of West Africa. *Proc. Zool. Soc. Lond.*, **125** : 421.

———. 1956a. On the populations of *Branchiostoma lanceolatum* and their relations with the West African lancelots. *Ibid.*, **127** : 125.

———. 1956b. The effects of salinity and different sands on the distribution of a tropical *Amphioxus*. *Proc. Zool. Soc. Lond.*, **126** : 160.