

Studies on the Wedge Clam *Donax scortum* LinneVersova Beach, Mumbai, North-west coast of India

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Abstract

Donax scortum was observed along Versova beach in Mumbai. They ranged in length between 48 to 52 mm. Analysis of meat by AAS showed high amount of heavy metals copper and cadmium in the tissues.

Introduction

Donax scortum Linne (Class: Bivalvia, Family: Donacidae), commonly called as 'Wedge clam', is distributed from Konkan coast in Maharashtra to Southeast Coast of India. It is moderately large and triangular in shape with the anterior margin of the shell round. The concentric ridges on the shell are prominent and strongly crested towards anterior and posterior margins. The surface behind keel has concave depression. The colour is dirty white, with pale violet umbo and violet inner surface. The clams generally inhabit rocky or sandy shores in mesolittoral zone (Apte, 1988).

The species were observed almost throughout the year along the sandy beaches of Versova, Mumbai, with a maximum numbers of the seen during the period April-July. The clam beds were in shallow waters from high watermark to a little beyond the low watermark. The entire area of the beds is completely submerged at high tides but a greater portion of it is exposed at the receding tides.

Among the exploited bivalve resources of India, clams are by far the most widely distributed; Several species in abundance constitute the clam resources which are edible. They are exploited all along that part of the Indian coast as mentioned above. There have been sparse studies of these bivalve resources of Maharashtra.

Subramanyam *et al.* (1949) have recorded occurrence of *D. scortum* along Mumbai coast. Mane and Talikhedkar (1976) and Talikhedkar *et al.* (1978) reported the occurrence of *D. cuneatus* from Ratnagiri coast. Apart from this, there seems to be not much information on *D. scortum* from Maharashtra, except for

reports by Apte (1988) and Jaiswar and Kulkarni (2001 and 2005) on the record of this species from Mumbai.

An attempt was made to study some aspects of this species. Initially some fishers took to marketing of this bivalve locally but the consumers later realised that the meat was tainted with metallic taste and oily smell indicating that the tissue of this bivalve was subjected to heavy metal contamination.

Materials and Methods

These bivalves were collected during full moon and new moon days when the tide was extremely low and large intertidal areas were exposed. Shell length was measured using a digital calipers and total weight was taken using an electronic balance after the specimens were dried on blotting paper. The measurements were taken as described by CMFRI (1995).

The population density was estimated by counting the number of animals from different quadrants of one square meter.

The tissue from twelve animals was removed carefully without contact with metallic objects and cleaned with sterile distilled water. Five ml of HNO₃ and 1 ml of HCL was added to 0.5 g of tissue and digestion was carried out in a closed system. Heavy metals, namely arsenic (As), copper (Cu) and cadmium (Cd) were analysed using Atomic Absorption Spectrophotometer (Perkin elmer).

Results and Discussion

The shell length ranged from 48 to 52 mm and the corresponding weight ranged between 9.061 to 15.007 g. According to Apte (1998) the maximum length of the species is 47 mm but in the present study specimens up to 52 mm in length was recorded. The density of animals ranged from 1-2 per square meter. Some live specimens were kept in the laboratory and it was observed that during feeding the animals took a vertical posture supporting themselves on the wedged side.

The heavy metal values per g of meat weight for arsenic ranged from 1.004 – 1.856 ppm (Mean: 1.274 ± 0.329 ppm), copper from 298.8 – 512.4 ppm (Mean: 392.9 ± 78.813 ppm) and cadmium from 2.948 – 4.452 ppm (Mean: 3.771 ± 0.531 ppm). According to the heavy metal results obtained, arsenic levels were below WHO permissible limit level of 4 ppm while values of cadmium were higher than the permissible limit of 2 ppm. The values of copper were much above permissible limit of 30 ppm. The higher levels can be attributed to the sewage sludge outfall from Malad creek opening into Versova area.

Clams are known to accumulate heavy metals, marine toxins, sewage and pesticide pollutants. Some of the instances of such bioaccumulation in India were reported by Karunasagar (1984) and Ray and Rao (1984). A number of attributes of bivalves have led to their use as 'monitors', 'sentinels' or 'indicators' of environmental stress (Widdows and Donkin, 1992). Based on these observations it can be inferred that due to high metal content in the tissue, they are harmful for human consumption.

Acknowledgement

The authors are thankful to Dr.K.S.Mohamed, Principal Scientist and Head, Molluscan Fisheries Division, Central Marine Fisheries research Institute, Kochi, for the guidance.

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