

Biology of *Mactra violacea* (Gmelin 1791) from Kerala, south-west coast of India

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The surf clam *Mactra violacea* (commonly known as violet trough shell), is distributed all along the sandy beaches of north Kerala. It occurs in the surf zone, upto 75-100 m depth. It is a large clam (upto 80 mm) with high meat content and nutritive value which is collected and consumed by the local people. The biology of the surf clam was studied to understand its growth, edibility and potential for mariculture.

Monthly samples of the surf clam *M. violacea* were collected by diving and picking from the surf zone along Thalassery Beach (11.75° N, 75.49° E), off Kannur District, Kerala during 2005. Clam samples could not be collected in June and during September-December due to turbulent conditions. The total length was measured using digital vernier calipers to the nearest 0.1 mm along the antero-posterior axis and width along dorso-ventral axis. The maximum distance between the valves when they are closed was considered as height. The total weight, wet meat weight and shell weight were recorded to the nearest 0.1 g. Gonad smear was examined under the microscope to determine the maturity stages as given

by Ropes (1968). The percentage edibility was studied as percentage of wet flesh weight in total weight of the clam (Durve, 1965).

The biological details are shown in Table 1. The size ranged from 38-80 mm, with modal classes in 54-56 (12%) and 56-58 (11%). The mean size was 55.6 ± 5.5 mm. The mean sex ratio was 0.7:1 (M: F), with females being dominant throughout the period of observation except during January and July. The mean meat content was $24.3 \pm 1.4\%$ and ranged between 22.9 and 26.7%. The meat content was high during January-March, declined during April-May and again increased during July-August. The changes in the meat content were in relation to the gonadal condition. The clams were in spent stage when the meat content was low and the meat content increased when the gonads matured. The monthly variation in the gonadal condition of the clams is shown in Fig. 1. Nearly 60% of the clams were mature and 44% were spent during the period. The surf clam is a continuous breeder with peak spawning during February-April and probably another peak spawning during October-November.

Table 1. Biological details of *M. violacea*

Month	Mean TL (mm)	Mean TW (mm)	Mean T Wt (g)	Size range (mm)	Modal class (mm)	Meat (%)	Sex ratio
Jan. 05	49.6	..	26.3	42-67	48-50, 46-48	23.2	1:1
Feb. 05	61.9	51.3	49.0	40-80	56-58, 68-70	26.7	0.9:1
Mar. 05	59.9	50.0	44.0	48-79	58-60	25.2	0.3:1
Apr. 05	52.4	43.0	31.7	41-65	40-42, 56-58	23.0	0.6:1
May 05	48.6	37.1	25.1	38-67	40-42	22.9	0.2:1
Jul. 05	60.7	50.6	49.5	50-68	56-58, 58-60, 66-68	23.9	1.4:1
Aug. 05	56.0	45.6	37.7	39-68	54-56, 58-60	25.1	0.8:1
Mean \pm SD	55.6 \pm 5.5	46.2 \pm 5.5	37.6 \pm 10.2	38-80	54-56, 56-58	24.3 \pm 1.4	0.7:1

(TL = Total length, TW = Total width, T Wt = Total weight, SD = Standard deviation)

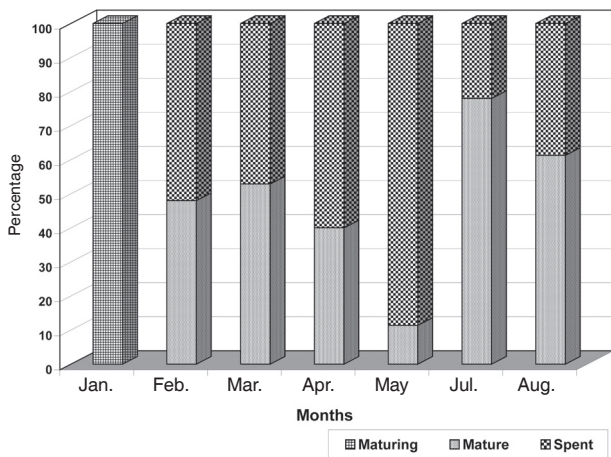


Fig. 1. Gonadal variations in female *M. violacea* during 2005

M. violacea is a large marine clam. Clams below 38 mm size were not found in the surf zone and it is therefore possible that juveniles form a habitat in deeper areas where surf action is less severe. The larger clams possess a large foot and bury deep into the sandy substrate of the surf zone and are able to withstand the frequent disturbances in the sand due to tidal effects (Gaspar *et al.*, 2002). The meat content in *M. violacea* is very high ranging from 23 to 27% compared to those reported in *Meretrix meretrix* (7.6 – 16.1%), *Paphia malabarica* (8.86 to 20.8%), *Villorita cyprinoides* (6.2 – 18.76%) and *M. casta* (7.6 to 16.1%). The seasonal variation in the meat content is not marked as compared to other clam species.

Landing of the dog whelk, *Nassaria nivea* and the beak shell, *Tibia fusus* by trawlers at Tuticorin Fisheries Harbour during January-March, 2009

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At Tuticorin Fishing harbour, during peak fishing season (June-October 2009), more than 200 trawlers operate daily. During January-March 2009, the trawl catch was generally poor and the number of trawlers under operation fell by 25-30%. In January 2009, around 20 trawlers started operating for deepsea prawns and the total catch per day ranged between 800 and 2,500 kg. In addition to the prawn catch, 25 to 40 kg of gastropods were also landed regularly by each boat upto March 2009 (Table 1). Enquiries revealed that the area of operation for deepsea prawn was 40 miles from the shore, north of Tuticorin at a depth of 200-400 m. Each boat landed 60-130 kg of *Parapenaeopsis stylifera* which was sold at the landing centre for Rs. 20 per kg. The dominant species among the deepsea prawns was *Solenocera hextii* (Wood-Mason and Alcock).

Two species of gastropods were identified in the landings - *Nassaria nivea* and *Tibia fusus* (Fig. 1 and 2). The maximum shell diameter (MSD) of *N. nivea* ranged from 0.81 to 1.40 cm and weighed 1.1 g to 5.2 g. A 15 kg basket of *N. nivea* was sold at the landing centre for Rs. 200/- and *T. fusus* for Rs.150/-.



Fig. 1. Catch of *Nassaria nivea* and *Tibia fusus*



Fig. 2. *Nassaria nivea*