

## Growth & Production of Benthic Bivalve, *Gafrarium pectinatum* (Linn.) from West Coast of India

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Production of *G. pectinatum* was characterized by the presence of 0, 1 and 2 y age groups. Average monthly growth in length varied from 0.6 to 3 mm. The relationship between length and weight was isometric. The average biomass was 0.21 g (dry wt)  $m^{-2}$  and total production 3.16 g (dry wt)  $m^{-2} \cdot y^{-1}$ . Production: biomass was 1:4.93. The production was maximum during the 1st y of life.

*Gafrarium pectinatum* (Linn.), which occurs in the intertidal region of sandy beaches of the west coast of India<sup>1,2</sup> is found in abundance at the low tide level at Thannirbhavi near Mangalore (lat. 12°53'N; long. 74°50'E). The present communication deals with the estimation of growth and production in this species.

Specimens (728) of *G. pectinatum* were collected between Oct. 1978 and Sept. 1979 from Thannirbhavi beach, using a quadrant (0.25  $m^2$ ) penetrating up to 25 cm depth. The size of the individuals ranged from 1 to 14 mm. Shell length was measured with a vernier callipers. Shell on weight, wet weight and dry weight on shell length was calculated by the method of least square. Production was estimated by the method of Crisp<sup>3</sup>.

**Population density**— The population density fluctuated (Fig.1) from 70  $m^{-2}$  (August) to 365  $m^{-2}$  (March). Population density was low during the monsoon season, either due to migration to subtidal region or mortality. Achuthankutty<sup>1</sup> recorded a maximum density of 440  $m^{-2}$  of *G. pectinatum* in Feb. in the sandy beaches of Goa. The prevalence of older animals was always lower than that of the younger ones and it fluctuated unevenly through the annual cycle.

**Month-wise size frequency distribution** (Fig.2) displayed a single mode during Sept. to Jan. and more than one mode from Feb. to Aug. 1979. A follow-up of the progression of the particular mode revealed wide variations in monthly growth rate which varied from 0.6 to 3 mm. Growth in length was observed to be suspended during July-Aug. The relative growth rate, in 0, 1 and 2 y, was 6, 4 and 3.7 mm respectively.

**Growth in length**— Length ranged from 1.3 to 14 mm (Fig.2). The recruitment of juveniles (> 2 mm length) appeared first in Oct. and was subsequently recorded in Feb., March and Sept. The prolonged pres-

ence of juveniles in the population suggests a protracted breeding season for *G. pectinatum* and is unlike in *Donax cuneatus*<sup>4</sup> and *D. faba*<sup>5</sup>.

**Length-weight relationships**— Regression of dry weight on shell length was calculated using the equation  $W = aL^b$  where  $W$  = weight,  $L$  = shell length and  $a$  &  $b$  constants. The relationship was isometric in all months (Table 1). The value of the equilibrium constant, indicated that the growth in *G. pectinatum* alters with time and thus supports the inference drawn from size frequency distribution data. Variations in monthly growth of other bivalves like *Donax incarnatus* and *D. spiculum* were also reported<sup>6</sup> from other sandy beaches of India.

**Production**— Annual mean biomass was 0.21 g (dry wt.)  $m^{-2}$ . The total production was 3.16 g (dry wt.)  $m^{-2} \cdot y^{-1}$ . Production was maximum in the 1st y class (Table 2) which dominated the population. High production, by 0<sup>+</sup> and 1<sup>+</sup> y group, accounting for 60% of the total population, was reported<sup>7</sup> for *Macoma balthica* in the Uthan estuary.

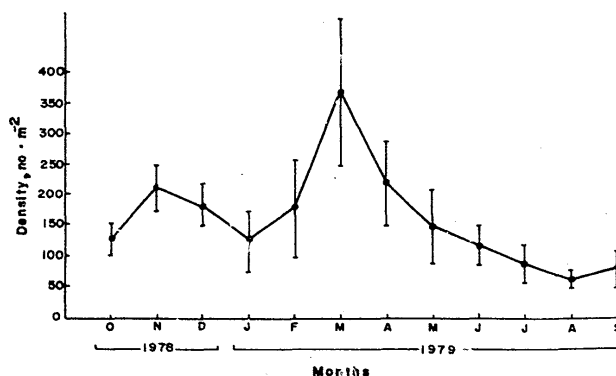


Fig. 1— Monthwise population density (no.  $m^{-2}$ ) of *G. pectinatum*

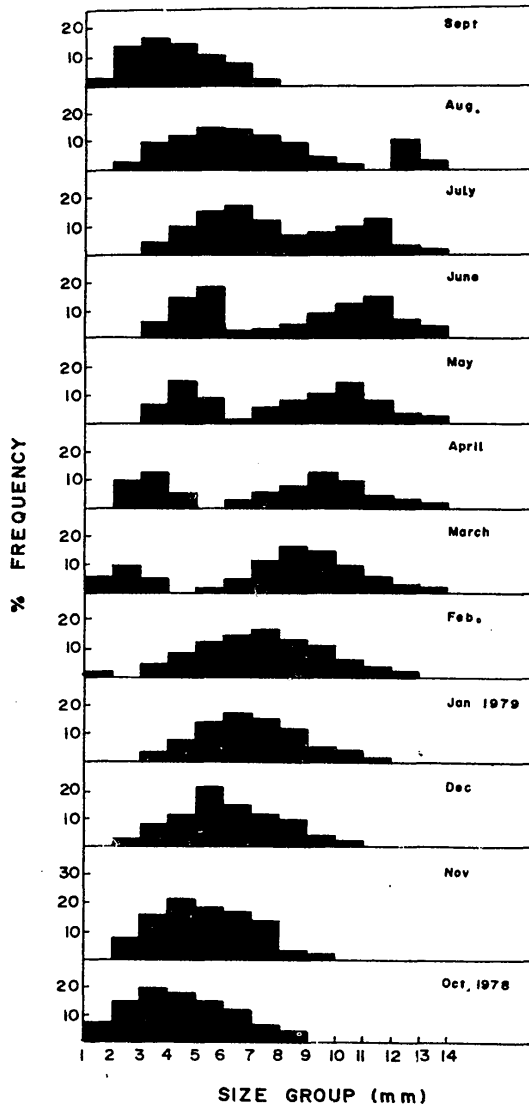


Fig. 2—Length frequency distribution in *G. pectinatum*

The relationship between production (P), elimination (E) and average biomass (B) was used for assessing production in benthic organisms<sup>6,8</sup>. In *G. pectinatum* P/B ratio was 4.93 as against 5.83 in *Donax incarnatus* whose life span is reported<sup>6</sup> to be not more than 2 y. Mortality in the younger animals to certain extent can be ascribed to predation as observed from an examination of the gut-content analysis of star

Table 1—Regression Equation of Dry Weight on Shell Length

Month	Equation
1978	
Oct.	$W = 0.026 L^{1.41}$
Nov.	$W = 0.038 L^{1.23}$
Dec.	$W = 0.040 L^{1.02}$
1979	
Jan.	$W = 0.052 L^{0.88}$
Feb.	$W = 0.043 L^{0.97}$
March	$W = 0.027 L^{1.39}$
April	$W = 0.031 L^{1.26}$
May	$W = 0.039 L^{1.08}$
June	$W = 0.060 L^{0.91}$
July	$W = 0.051 L^{1.12}$
Aug.	$W = 0.043 L^{1.22}$
Sept.	$W = 0.034 L^{1.31}$
Annual cycle (Oct - Sept.)	$W = 0.049 L^{1.12}$

Table 2—Annual Production ( $g m^{-2}$ ); Average Biomass (dry mean wt in  $g m^{-2}$ ) and Elimination per  $m^2$

Year Class	Production (P)	Biomass (B)	Elimination (E)	P/B	E/B
0	0.83	0.18	0.26	4.61	1.44
1	1.27	0.22	0.41	5.77	1.86
2	1.06	0.24	0.44	4.41	1.83

fishes from the study area. Some evidence of the adult mortality during the monsoon season, probably due to sudden lowering of salinity, was also discernible.

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