

## PEN CULTURE OF *BABYLONIA SPIRATA* (NEOGASTROPODA : BUCCINIDAE) IN VELLAR ESTUARY, PARANGIPETTAI, INDIA

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### ABSTRACT

Juvenile *B. spirata* with an average shell length of 2.75 cm length and a weight of 6.42 g, were fed daily with bivalve flesh at a rate of 7 % of the total body weight. The density was 38 snails m<sup>-2</sup>. After 90 days the overall increase in length and weight were 3.2 mm and 4.03 g, respectively. All animals were found dead on the 105th day. Major problems with culture of *B. spirata* are discussed in relation to the environment and design of the pen.

### INTRODUCTION

The gastropod *Babylonia spirata* is a well accepted seafood in many countries. It is marketed both fresh and frozen. The shells are being used for ornamental purposes and the operculum is also considered valuable.

*B. spirata* is abundant in shallow coastal waters of the Vellar estuary. Salinity tolerance experiments proved that it tolerates wide variations in salinity (Patterson *et al.* 1994). The present study aims at feasibility of culturing *B. spirata* in pens under estuarine conditions.

### MATERIALS AND METHODS

The study period was 15 April-15 July 1994. A site with sandy substratum was selected opposite the Marine Biological Station in the Vellar estuary at Parangipettai (11°29'N 79°47'E). The mouth of the estuary is narrow, except during monsoon months, tidal range 1 m, and its influence is noticed up to 10 km from the mouth. The river bottom at the site was deepened about 60 cm to obtain a minimum water level of 75 cm at low tide. The sediment was composed of 75 % sand, 19 % silt, and 6 % clay.

The pen was rectangular (11 m<sup>2</sup>), supported by *Casuarina* sticks coated with the tar to reduce fouling. A fence of nylon net (mesh size about 2.5 cm) was submerged from the poles to contain the juveniles. The pen would stick up 1.5 m above the expected maximum water level.

*B. spirata* juveniles were collected by traps baited with dried octopus. The traps were retrieved after 30 minutes. Juveniles were acclimatized to estuarine conditions in the laboratory over a period of 7 days.

A total of 418 *B. spirata* were stocked in the pen (38 snails m<sup>-2</sup>). 20 randomly chosen juveniles were measured (Vernier Calliper, 0.1 mm accuracy) and weighed (Beam Balance, 0.1 g accuracy). Stocked juveniles had an initial shell length of 2.75 cm and weighed 6.42 g. 20 snails were picked at random and measured in the field every 15 days. Dead bivalves, *Meretrix meretrix*, were provided as daily food at a rate of 7 % of the estimated body weight of *B. spirata*.

Environmental parameters were monitored daily. Salinity and oxygen were determined by titration (Strickland and Parsons 1972). The study was carried out during summer and the pre-monsoon period. Data are summarized in Table 1. Sediment was collected with a cylindrical corer (6 cm diameter) and analyzed according to Krumbein and Pettijohn (1938)

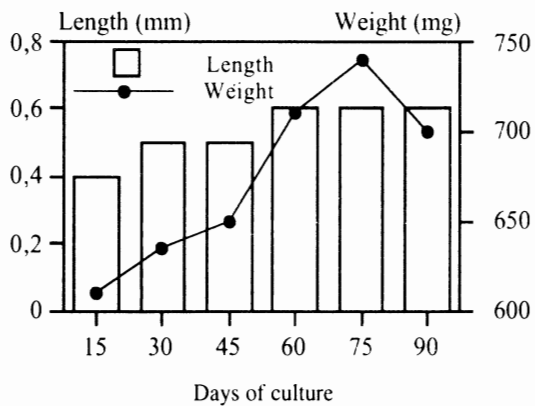
Table 1. Hydrographical parameters in the pen

Parameters	Maximum	Minimum
Atmospheric temperature	38 °C	32 °C
Water temperature	33 °C	29 °C
Water depth	114 cm	10 cm
Salinity	36.3 ppt	30 ppt
pH	8.1	7.7
Dissolved oxygen	5.9 ml/l	3.7 ml/l

### RESULTS AND DISCUSSION

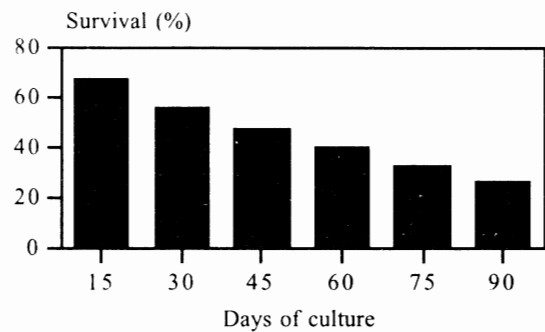
During the study period of 3 months, the total growth increment was 3.2 mm in length and 4.03 g in weight (Fig. 1). This growth rate is slightly higher than observed in a previous study of the same species (Raghunathan *et al.* 1994). In comparison Berg (1976) found a shell growth of 1.81 mm in 3 weeks in

*Strombus gigas*, Spight *et al.* (1989) 3.0 mm in one year in *Urosalpinx cinerea*, and Kraeuter *et al.* (1989) 13.2 mm in one year in *Busycon carica*.



**Figure 1.** *Babylonia spirata*: Mean fortnightly increment of length and weight during 90 days.

Growth was slow during the first 45 days which could be due to poor acclimatization. The growth rate was also low between day 75 and 90, caused by deposition of sand, strong winds, and turbid water at the pen site. The survival rate was high during the first month (Fig. 2). Thereafter it gradually decreased. Mass mortality was observed on the 105th day. Death was caused by rough winds and suffocation due to sedimentation. According to Job (1983) pen culture is not all that rosy as it appears to be. There are certain serious handicaps for successful culture in pens. Therefore, very



**Figure 2.** *Babylonia spirata*: Percentage survival during the culture period.

often growth is poor and organisms are lost to predators, or they escape from the pen. Free circulation of water is also hindered by the growth of sedentary organisms and weeds on the pens. We had good growth but high mortality, so our result is inconclusive in terms of feasibility. We agree with Job (1983) and conclude that many problems can arise with *B. spirata* in pen culture under estuarine conditions. In summary, the following problems were encountered during the study period:

Mortality during the first 15 days due to the change of environment; juveniles escaped through spaces at frames; fouling by barnacles and oysters blocked free water flow through the net; deposition of sand in the pen area; formation of H<sub>2</sub>S following sedimentation; and loss to predators (crabs and buffer fishes).

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