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69. EXPERIMENTAL REARING OF LARVAE OF THE WEDGE CLAM, *DONAX CUNEATUS* LINNAEUS IN THE LABORATORY

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ABSTRACT

The wedge clams *Donax cuneatus* Linnaeus are found in great abundance along the surf beaten sandy beach of Parangipettai. Fertilized eggs of *D. cuneatus* developed into straight-hinge stage larvae with a shell length of 110 μ. The larval shell developed umbo at about 140 μ. The description of the larval stages is presented in this paper.

INTRODUCTION

Donax cuneatus occurs in the surf beaten sandy beaches of both the east and west coasts of India. There is no regular fishery of these clams for food or for any organised lime making industry, with the result that these valuable resources are neglected (Nayar and Mahadevan 1974). Very few works have been carried out on its biology (Nayar 1955; Rao 1967). There is no information on the larval development of this species. The present study describes the development of the larval stages of *D. cuneatus* under laboratory conditions with a view to facilitate larval identification in the plankton and predict spatfall.

MATERIAL AND METHODS

Clams were collected from the surfline of the sandyshore of the Porto Novo coast (Lat. 11°29'N; Long. 79°46' E) and were kept in plastic troughs containing seawater. The clams were fed with unialgal cultures of *Thalassiosira* sp, *Skeletonema costatum* and *Amphipora* sp. Gonadial smears were taken to ascertain condition of the gonad. Spawning was induced in batches of 10 clams by increasing the temperature and by addition of stripped sperm as suggested by Loosanoff and Davis (1963).

The seawater was filtered through cotton and then sterilized. The sterilized water was used throughout the experimental period. Fingerbowls and pipettes were washed with tapwater, sterilized chemically and washed with distilled water.

The spawned eggs were placed in fingerbowls and fertilization effected by adding sperm suspension. Early development was not studied in this investigation. The developing larvae were screened and placed in fingerbowls containing sterilized water. A pure culture of *Isochrysis galbana* was added to the container as food after changing the seawater daily. The larvae grew upto 200 μ but further development was inhibited due to ciliate attack. The terminology used in the present study for larval descriptions was after Chanley and Andrews (1971).

RESULTS

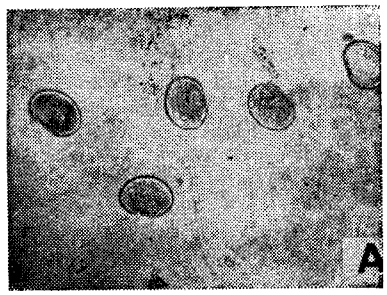
Egg

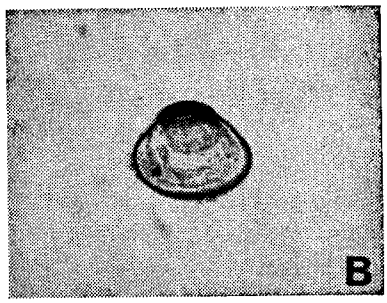
The diameter of the unfertilized egg is 70 μ.

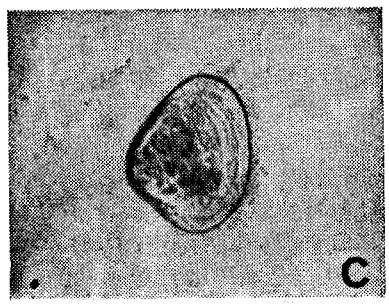
Larval development

Straight-hinge stage (Fig 1A)

The fertilized eggs develop into straight-hinge stage larvae in about 25-30 h with a minimum length of 110 μ and height of 80 μ. The hinge line measures 60 μ in length. The velum is the chief organ of locomotion. By means of their cilia, the larva swim actively in all directions and crowd near the surface of water.







A. Straight hinge larva of size 110 x 80 μ
B. Umbo stage larva of size 140 x 100 μ
C. Late umbo stage larva of size 200 180 μ

Umbo stage Fig. 1B & C)

On the 4th day, the umbo begins to obscure the hinge line when the larvae attain 140 μ in length and 100 μ in height. The shape of the umbo is broadly rounded and it becomes knobby at 200 μ in length. The height is 20 μ less than the length. The ends are equally rounded while the shoulders slope gradually at the 140 μ length. The ventral margin is well rounded, forming a semicircle with ends, shoulders and umbo about 1/3rd total height.

DISCUSSION

The larval development of *Donax vittatus* (Rees 1950), *D. venustus* (Zakhavatkina 1959), *D. variabilis* (Chanley and Andrews 1971) from other regions of the world have been reported, but information on larval development of the species under study is lacking.

The induced spawning in *Donax cuneatus* was effected by increasing the water temperature (32-34°C) and addition of sperm suspension. Rao et al. (1976) and Rao (1983) carried out induced spawning in *Perna viridis* and *Crassostrea madrasensis* with thermal, mechanical and chemical stimuli. Alagarswami et al (1983) reported various methods for induced spawning in the pearl oyster *Pinctada fucata*. Nayar et al (1984) carried out induced spawning in *Crassostrea madrasensis* by using thermal stimulus or thermal stimulus with the addition of gonad extract.

The straight-hinge larva of *D. cuneatus* is 110 μ in length, whereas in the larva of *D. variabilis* (Chanley and Andrews 1971) is 70 μ in length. The shape of the umbo in the larvae of *D. cuneatus* is similar to that of *D. variabilis* i.e., broadly rounded umbo in the early umbo stage and knobby umbo in the late umbo stage. The rearing of *D. cuneatus* larvae upto metamorphosis could not be carried out because of attack by ciliates and flagellates. However, the present study provides descriptions from which it would be possibie to identify the larvae of *D. cuneatus* in plankton samples, to find out the spwning period and predict spatfall.

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