

ECOLOGY AND DISTRIBUTION OF HYDROMEDUSAE FROM BEYPORE AND KORAPUZHA, TROPICAL ESTUARIES OF SOUTH WEST COAST OF INDIA

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Abstract: This paper deals with the ecology and distribution of hydromedusae in time and space from Beypore and Korapuzha estuaries. Hydromedusae were completely absent during monsoon and early post-monsoon period. Species diversity was very low while swarms of *Eirene ceylonensis* and *Blackfordia virginica* were observed. Salinity was found to be the limiting factor for growth and activity of hydromedusae of these estuaries. During premonsoon season there was high proliferation of hydromedusae and ctenophores and virtually all other zooplankters were depleted in Beypore estuary.

1. Introduction

Hydromedusae occupy a high trophic level within the ecosystem that is juvenile to different degrees, they are subjected to variations of ecological factors in time and space. Other carnivores are in a stable and mature ecosystem. Though hydromedusae from Cochin backwaters have been studied (Santhakumari, 1970; Vannucci, et al., 1970; Santhakumari & Vannucci, 1971) so far they have not been studied from Beypore and Korapuzha estuaries. The present study is an attempt at a methodical survey of zooplankton from these estuaries aiming at a study of seasonal and spatial variation. All the samples came from shallow depths, therefore only species that have become adapted to an environment relatively variable in its biological, physical and chemical properties might be expected. Beypore estuary has been subjected to severe pollution due to the effluent discharge from the Mavoor Gwalior Rayons factory causing severe damage to the fishery prospects of the estuary (Premchand et al., 1987).

2. Materials and Methods

Monthly collections were made for zooplankton from mouth to upstream of Beypore (Chaliyar) and Korapuzha estuaries. Samples were collected with W.P. net (mouth area 0.25 m² and mesh width 300 μ m) equipped with flowmeter. Vertical hauls were taken from bottom to surface and samples were preserved in 4% formalin. Hydromedusae were analysed and studied in detail. The estimated abundance for different species is expressed as m⁻³.

3. Results and Discussion

All the species observed here are euryhaline, highly tolerant and most of them are residents of backwaters. They were found from January to May.

Eirene ceylonensis Browne

This species was the most abundant with the highest density of 7573.2m⁻³ at Beypore from the 4th Station during April. A second peak was discernible at 7th Station and then decreased. In station near the mouth of the estuary also the density was low.

Blackfordia virginica Mayer

It was also found in collections made during the pre-monsoon and late post-monsoon periods at Beypore and Korapuzha. This was the second abundant species with a maximum density

371.2 m⁻³ at the 2nd station in April at Beypore (Fig.3). Beyond the second station a decrease in number and were absent towards the upstream. At Korapuzha, no swarm noticed.

Eutima commensalis Santhakumari

This species was observed from Beypore and Korapuzha. At Beypore the highest density of this species noticed was 1.50 m⁻³ in January at 4th station. The hydroid of this species lives as a commensal in the mantle cavity of the wood boring molluscs.

Aequorea conica (Browne)

It could be seen in very few numbers from these estuaries during January.

All these species showed male domination over females. All the species decreased in number towards the upstream, even phytoplankton and zooplankton dwindled towards the upstream. Results indicate that hydromedusae population in these estuaries during monsoon and early postmonsoon are practically nil. During premonsoon period there was high proliferation of hydromedusae and ctenophores and virtually all other zooplankters were depleted in Beypore estuary. Hydromedusae were found to be more in areas where there was pollution (Santhakumari, 1991). In these estuaries salinity is the limiting factor for growth and activity of medusae unlike the estuarine systems in temperate regions. The hydrographical conditions of these estuaries show that most of the system is flushed by freshwater during southwest monsoon. Even during postmonsoon salinity is very low in the upstream. The hydrographic system that causes tremendous changes in the environment necessitates for special adaptation of the life cycle of the species living in these areas. The hydroid of these species must have resistant stages that can survive the freshwater that exist throughout the backwater system during monsoon season. The method by which the intermonsoon waters are again repopulated by these species may probably be from the encapsulated resting stages which lie in the bottom and sprout when suitable environmental conditions occur. Detailed information on the life history, environmental changes on growth and behaviour may unravel the exact cause.

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INSECT TISSUE CULTURE: PRELIMINARY STEPS TO DEVELOP CELL LINES OF *ORYCTES RHINOCEROS* (COLEOPTERA: SCARABAEIDAE)

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The pupal tissues of *Oryctes rhinoceros* were cultured in modified Grace's Insect Medium. The method of *in vitro* culture and its maintenance without contamination for a long period are described. Recent advances in insect tissue culture focus on the production of insect cell lines which are of importance in monoclonal antibody preparation and in viral culture.

Just moulted pupae were surface sterilized in ethanol-mercuric chloride mixture and washed repeatedly in sterile water. Grace's Insect medium supplemented with fetal calf serum and antibiotic mixture formed the basic medium for the cell culture. The pupae were dissected under Laminar flow hood and the testes were kept in saline. They were dissected under Laminar flow hood and the testes were kept in saline. They were chopped into bits, washed in saline and then placed in culture vials (Borosil, sterilized under dry heat) which contain 1 ml basic medium. Similar cultures along with testis sheath also were set up. The cultures were incubated for 16 days at 28°C. Subcultures were prepared by introducing the contents of the original culture vial into new vials with a pipette. In the cultures containing testis sheath there was abundant multiplication of spermatogonia whereas the cultures without testis sheath (testis fragments alone) degenerated after 10 days. The healthy cultures were subcultured and kept for months without contamination. In the cultures differentiation of spermatogonia was not observed but they showed mitosis. In *Oryctes*

rhinoceros pupal testis contain spermatogonia (Jacob 1989). Their multiplication in the cultures in the presence of testis sheath show that the sheath contain some factors to keep the spermatogonia alive. According to Dumser (1980) spermatogonia multiply in the presence of ecdysone. Giebultowicz et al (1987) are of opinion that testis sheath contain ecdysone and this is important in mitoses of spermatogonia. In the present study cell cultures of testis of *Oryctes rhinoceros* can be produced only if cocultured along with testis sheath. The spermatogonia in culture maintained its original structure even after keeping for months.

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