

## Salinity tolerance of the volutid *Harpulina lapponica* (Neogastropoda)

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*Harpulina lapponica* collected from the intertidal region were exposed to salinities between 22 and 38 ‰. They exhibited normal locomotion and feeding for the entire period. Salinities below 18 ‰ were lethal and all the animals died within 30 minutes of exposure.

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### INTRODUCTION

Shallow water molluscs are exposed to variations in salinity, and low values may result in mortality. Monsoons with heavy rain hit the south east coast of India from October to December, and coastal areas may become flooded resulting in decreased salinity. The Indian volute, *Harpulina lapponica* occurs in shallow coastal water. It was selected as test animal because the tolerance to decreased salinity is unknown for this species. A study of salinity tolerance will allow us to better understand the distribution of this species.

### MATERIALS AND METHODS

*Harpulina lapponica* were collected from sea grass beds during neap tide at Taruvaikulam and Vellapatti on the Tuticorin coast. The snails were brought to the laboratory and acclimatized in 36 ‰ salinity for one week. They were fed with a mixture of sea weeds: *Gracilaria edulis*, *Chaetomorpha* spp. and *Sargassum* spp. The activity was monitored and animals exhibiting sluggishness were discarded. Salinity tolerance was tested on isolated individuals in 5 to 38 ‰ salinity. Salinity of 38 ‰ was used as a control. Lower

salinities were prepared by dilution of sea water with filtered tap water and salinity was determined with a refractometer. All tanks were provided with vigorous aeration. Ten healthy volutes were introduced into each test salinity. Salinity was tested twice daily to maintain the salinity in all tanks. The test was conducted for a period of 10 days.

### RESULTS

Salinities below 18 ‰ were lethal. During the experiment all the animals introduced in 5 and 10 ‰ died within 30 minutes. In 12 ‰, the animals died after 8 hrs. Volute were mostly inactive on the first day in salinity between 18-26 ‰, but surviving snails showed slight activity. A complete survival was only recorded above 28 ‰ salinity. Snails closed their shells with the operculum when exposed to lower salinities. The animals adapted to 22-30 ‰ had normal activity within a day. Survival was 100% in the 28-38 ‰ range.

### DISCUSSION

Patterson *et al.* (1994) found that the subtidal snail *Babylonia spirata* survived between 5-15 ‰ salinity. It was therefore surprising to find

that the intertidal species *Harpulina lapponica* was less tolerant to low salinity. In low salinity, mucous secretion was evident and it may be a physiological response to the external medium when the animals were introduced at lower salinities ranging from 12-26 ‰.

Marine animals, which tolerate salinity fluctuation up to 10 ‰, are termed stenohaline. Animals, which have a wider salinity tolerance, are called euryhaline. As for the

Indian volute, *Harpulina lapponica* they must be categorized as being stenohaline. They do not tolerate salinities below 28 ‰.

#### REFERENCE

- Jamila Patterson, T. Shanmugaraj & K. Ayyakkannu, 1994. Salinity tolerance of *Babylonia spirata* (Neogastropoda: Buccinidae). - Phuket marine biological Center Special Publication 13: 184-187.