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PRELIMINARY OBSERVATIONS ON THE BREEDING OF THE BANDED POND SNAIL, *VIVIPARUS BENGALENSIS* (LAMARCK) (GASTROPODA : VIVIPARIDAE) IN WEST BENGAL

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ABSTRACT

Some aspects of breeding in *Viviparus bengalensis* have been studied. During June-July period 100% snails were gravid, with eggs and/or young in their uterine chamber while a gradual decline noticed in the subsequent months with a minimum 29.9% in January. Maximum number of young ones (80%) in uterus was observed in winter (December to February). This phenomenon is presumably associated with the fluctuation of water temperature in the pond.

Introduction

Viviparus bengalensis (Lamarck), a common fresh-water gastropod, is found in almost in all ponds and jheels in India and its neighbouring countries. During monsoon months it is very common in the paddy fields. This snail species is largely consumed by a number of fishes, birds (including poultry ducks) and mammals (including man). Inspite of its immense economic importance, virtually, no attention has been paid on the breeding biology of this edible gastropod mollusc. Annandale and Sewell (1921), however, gave a detailed anatomical account of this snail.

The present paper includes some aspects of its breeding cycle and the influence of seasons on the same.

Materials and Methods

V. bengalensis of different size-composition were collected from a pond near Port Canning, West Bengal for a period of one year, March 1977 to February 1978. On the 15th day of each month 500 specimens were brought to the laboratory and released in a large tray with sufficient amount of water. From this lot females were separated from males based on character of the tentacles. The females were dissected and the uterine chamber of each snail was examined. The number of snails bearing eggs and young were counted separately in each month. Snails with shell less than 16 mm long were not considered for the study as the sexual maturity was noticed when the shell attains 16-18 mm long (Annandale and Sewell, 1921).

Water-temperature of the pond was recorded each time.

Observations

In course of 12 months 3258 female *V. bengalensis* were dissected and examined, of which

2389 (73.3%) snails were with eggs and young in their uterus. The phenomenon of carrying eggs and/or young has been noted throughout the year but the number varied from season to season. During June and July all the snails were with eggs and/or young while a gradual decline occured in the subsequent months with a minimum (only 29·9%) in January. Again it was at an increasing rate from February onwards. It is to be noted here that during winter (December to January) the uterine chamber is filled up with 80% young and 20% egg.

Water-temperature of the pond showed a wide range of variation during the period of observation (Fig. 1). Temperature was lowest during January (10°C) while it increased in subsequent months to as high as 38°C in June-July. The number of snails cramping the uterus with young and/or eggs has also been recorded throughout the year (Fig. 1).

Discussion

From the study it appears that *V. bengalensis* reproduces throughout the year but the rate of breeding is rather variable from season to season.

The variation in the per cent of snails bearing eggs and/or young from season to season is probably related with the temperature of the habitat. It is assumed that a higher temperature (above 25 C) favours breeding. On the other hand, lower temperature (9°C) for a few hours in a period of 24 hours during winter did not stop the breeding activity of this snail though hampered to a considerable degree. This suggests that a temperature range between 9-35°C does not play any role in keeping the eggs or young inside the uterus. But the rate of release of the young is dependent on the temperature of the water and obviously it is during high temperature (above 25°C) that the young ones are released. This is, probably with an anticipation that the young ones will not be able to survive in lower temperature or it may inhibit their growth. Thus maximum retention of young ones was observed during winter. However, temperature above 25°C encouraged breeding and multiplication of this snail species under observation. This may be indicated from the high percentage of gravid snail observed from March to August period.

Ecologists seem to agree that temperature is among the most important of the physical influence in any biotope, especially in freshwater. However, in snails this range of temperature is variable from species to species. The optimum temperature for oviposition of *Biomphalaria pfeifferi* is between 26-28°C while in planorbids (*Helisoma trivolvis*, *H. anceps* and *H. campanulatum*) 25-26°C is essential (Liang, 1973). Shiff (1964) found that up to a limit of 25°C the egg-laying of *Bulinus globosus* increased rapidly and that maturation was faster with rising temperature. Hyman (1967) stated that in the temperate regions pulmonates generally breed during the warmer part of the year. Thus it is evident that higher temperature is favourable for breeding in snails.

Annandale and Sewell (1921) reported that breeding did not take place during winter in *V. bengalensis*. From the present study it is clear that development of eggs and young is a continuous process even in winter but the release of young depends on the temperature of water.

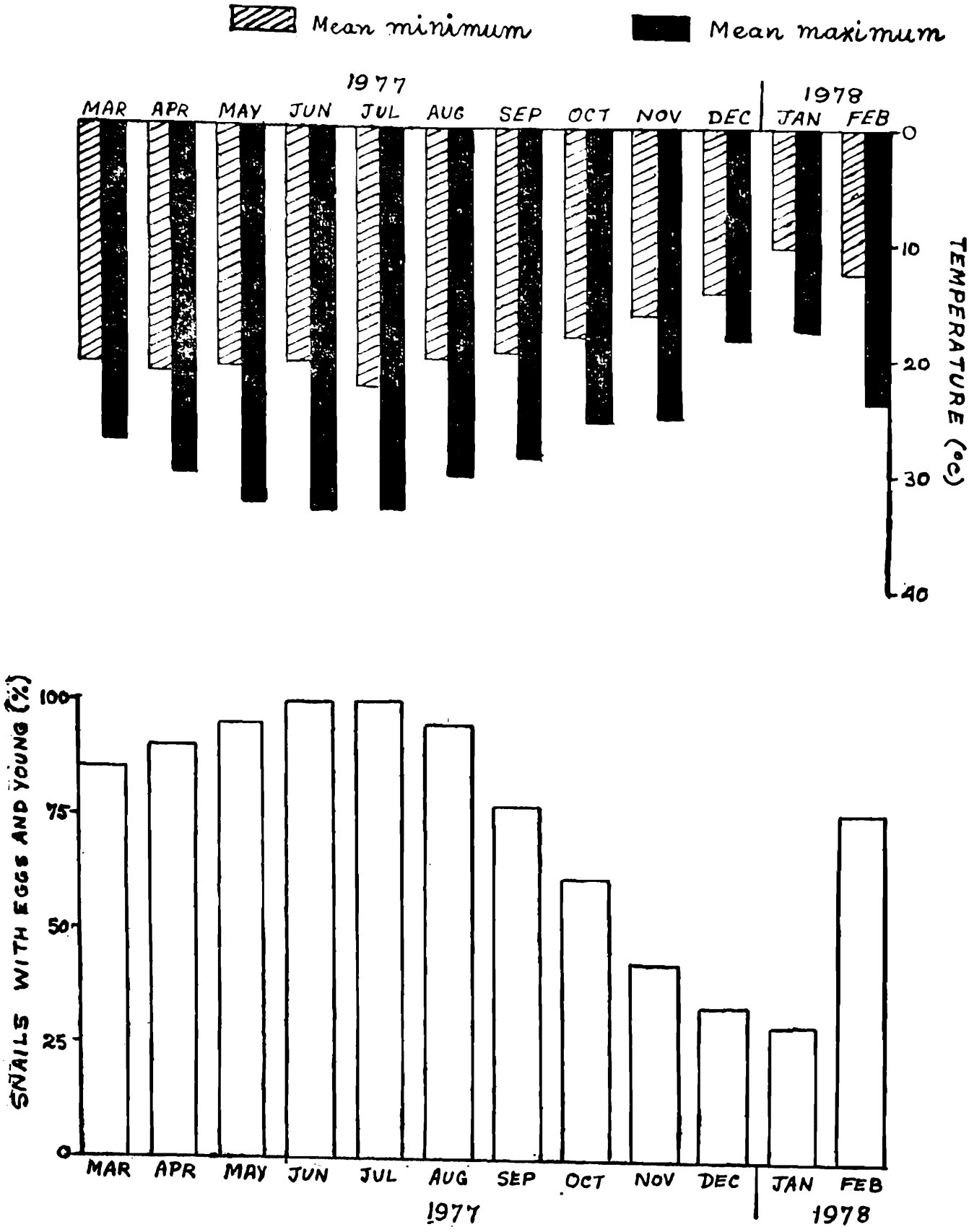

Fig. 1. Histograms showing the percentages of adult *Viviparus bengalensis* with eggs and/or young in relation to monthly temperature fluctuations of the pond-water near Port Canning, March 1977 to February, 1978.

As the low temperature appears to be unfavourable for the young, the snails developed the habit of retaining them till the advent of warmer weather—an adaptation towards successful survival and propagation of the snail.

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