

OBSERVATIONS ON THE GROWTH RATE OF THE COMMON GARDEN SNAIL  
*OPEAS GRACILE* (HUTTON) [STYLOMMATOPHORA : SUBULINIDAE]

N. V. SUBBA RAO, S. K. RAUT AND S. C. MITRA

*Zoological Survey of India, Calcutta*

ABSTRACT

Rates of growth in the shell length and the body whorl of *Opeas gracile* have been studied. The snails 1.84 mm. at hatching grew up to 4.25 mm. while the whorls increased from 3 to 4.68 at the end of 6th week when they became sexually mature. Growth rate was faster in the first two weeks and minimum in the third week.

INTRODUCTION

*Opeas gracile* the tiny, anthropomorphic garden snail is perhaps the commonest of all terrestrial molluscs of Indian Union, and has been the subject of study by a number of workers (Rahman *et al.*, 1975 ; Mitra *et al.*, 1976 ; Biswas *et al.*, 1976). However, the growth rate of this snail species, which has got a direct influence on its population structure, has not been studied by any of the earlier researchers. Results of our studies on the increase in length and number of whorls are presented here. Further studies involving other parameters like width, height of aperture, length—width ratio are in progress.

MATERIALS AND METHODS

To study the growth rate of *Opeas gracile* 10 newly hatched individuals were released in a terrarium measuring 30×20×20 cm. The floor of the terrarium was covered with loose humus soil, 5 cm. thick, moistened by spraying of water. They were kept active

by supplying food in adequate quantity and also by maintaining required humidity range by spraying water regularly. Growth rate was ascertained by taking measurements of shell length and by counting the number of whorls at the end of each week. The experiment was started on August 14, 1979 and continued upto October 2, 1979, when the snails became sexually mature.

OBSERVATIONS

The newly hatched snails were 1.34 to 2.19 mm. with an average of 1.84 mm. in shell length and the whorls were 2.7 to 3.5, with an average of three in number. The growth was at an increasing rate with the increase in age of the snails. At the end of 6th week, the snails attained a mean shell length of 4.25 mm. and 4.68 whorls (Fig. 1). By the middle of 6th week, six individuals attained sexual maturity as was evidenced by the presence of white eggs inside the uterus, visible through the transparent shell. The

experiment was terminated at the end of 6th week. Growth rate was faster in first two weeks. The snails added 0.84 mm. and 0.54 mm at the end of 1st and 2nd week respectively. However, minimum growth (.09 mm.) was recorded during third week, but thereafter

1976) and *Arion circumscriptus* (Frömming, 1954). It is suggested by all that with the increase in age growth rate decreases. The present observations on *Opeas gracile* tend to corroborate the findings of previous workers almost in all respects.

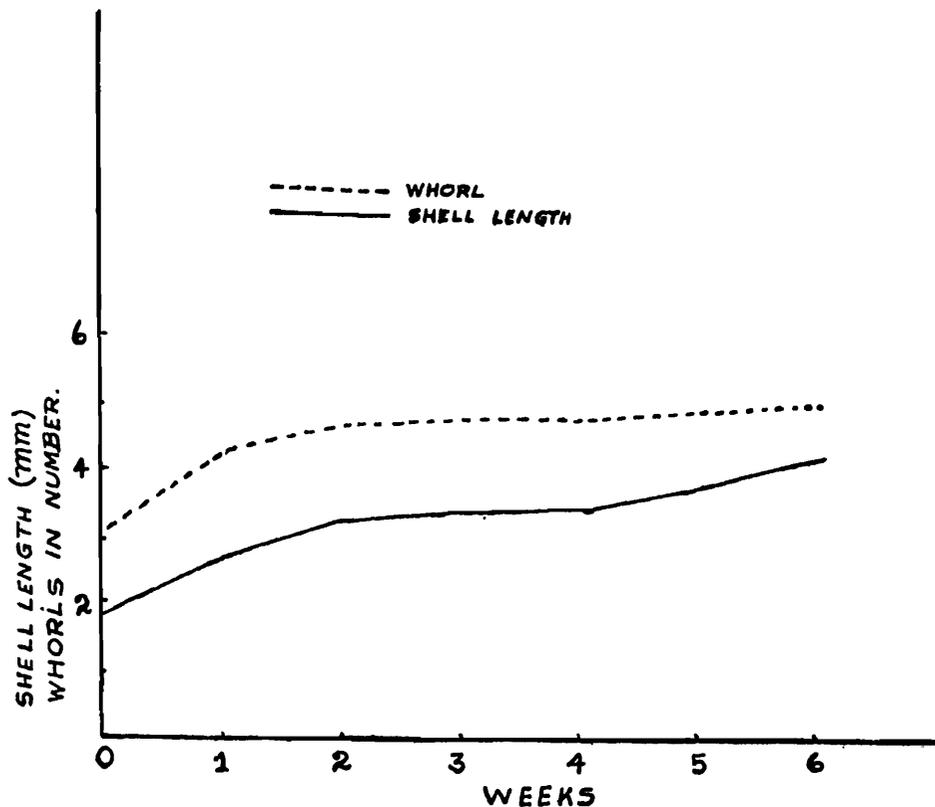


Fig. 1. Rates of growth in the shell length and the body whorl of *Opeas gracile*.

again there was a gradual increase in the rate 0.12, 0.31 and 0.51 mm. being added to the shell length during 4th, 5th & 6th week respectively. Temperature, during the period was between 24°-36°C and 90% or more humidity was maintained in the terrarium throughout.

#### DISCUSSION

In terrestrial gastropods growth rate seems to be faster for a few weeks after hatching as reported in *Achatina fulica* (Rees, 1950; Ghose, 1963; Kondo, 1964), *Macrochlamys indica* (Raut and Ghose, in press), *Ariophanta maderaspatana* (Masurekar and Bangalkote,

The faster growth rate in land snails may perhaps be associated with their high rate of food consumption. In all known cases the ratio between the amount of food consumed in 24 hours and the body weight is relatively higher in young land snails. It is followed by a gradual fall with age. Higher rate of food intake not only leads to a faster rate of growth but at the same time helps the snails to store reserve materials to tide over the long aestivation period.

#### ACKNOWLEDGEMENTS

The authors are grateful to the Director, Zoological Survey of India for facilities and

to Dr. K. C. Jayaramakrishnan, Deputy Director and Shri S. Biswas, Superintending Zoologist, Malacology Division, for encouragement. Thanks are also due to Prof. K. C. Ghose, Head, Department of Zoology, University of Calcutta for his helpful advice and criticism.

## REFERENCES

- BISWAS, S. K., RAHMAN, R. AND MITRA, T. R. 1976. Observation on the breeding habits of *Opeas gracile* (Hutton) (Gastropoda : Subulinidae). *J. Conch., Lond.*, **29** : 69-70.
- FRÖIMMING, E. 1954. *Biologie der mitteleuropaischen Landgastropoden* Berlin-Munchen, Duncker and Humbolt, Berlin.
- GHOSE, K. C. 1963. The early stages of development in *Achatina fulica* Bowdich (Mollusca : Gastropoda). *J. Bombay nat. Hist. Soc.*, **60** : 228-232.
- KONDO, Y. 1964. Growth rates in *Achatina fulica*. *Nautilus*, **78** (1) : 6-15.
- MASUREKAR, V. B. AND BANGALKOTE, M. S. 1976. Some observations on the ecology of the land snail, *Ariophanta maderaspatana* (Gray). *J. Bombay nat. Hist. Soc.*, **73** : 35-41.
- MITRA, T. R., BISWAS, S. K. AND RAHMAN, R. 1976. Observations on the feeding habit of *Allopeas gracile* (Hutton) in field and laboratory. *Science Rept. Yokosuka City Museum*, No. 22 : 23-28.
- RAHMAN, R., MITRA, T. R. AND BISWAS, S. K. 1975. The time of emergence of *Opeas gracile* (Hutton) (Mollusca : Gastropoda : Subulinidae). *J. Interdiscipl. Cycle Res.*, **6** : 129-130.
- RAUT, S. K. AND GHOSE, K. C. [In Press] Studies on the growth rate in the garden snail *Macrochlamys indica*.
- REES, W. J. 1950. *Achatina's odyssey : ravages of a globetrotting giant snail*. *Loris*, **5** (4) : 159-161.
-

