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STUDIES ON THE AESTIVATING POPULATION OF *ACHATINA FULICA* BOWDICH (MOLLUSCA : ACHATINIDAE) IN WEST BENGAL

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ABSTRACT

Population estimation of aestivating *Achatina fulica* in their natural habitat has been made from five districts of West Bengal. Aestivating snails were found to aggregate in protective pocket according to its capacity. The aestivating sites are categorised herein as (i) large pocket with 17—61 snails, (ii) small pocket with 5—14 snails and (iii) sparsely distributed sites with 5—19 snails per square metre area. A some sort of age dependant aggregation was noted.

INTRODUCTION

Land snails which are generally moisture loving are active in monsoon and pass the dry seasons in dormant state. In West Bengal, dormancy extends from November to June (Raut and Ghose, 1977). This is primarily due to low moisture content in the air, and the term applied for such behaviour is known as 'aestivation'. The present study was made to investigate the aestivation, aestivating behaviour and the population of the giant African snail *Achatina fulica*, a notorious agrihorticultural pest of the Indo-Pacific Islands with a view to launch suitable controlling measures.

MATERIAL AND METHODS

Aestivating snail populations were studied from 20 gardens in five districts—Calcutta, Hooghly, Howrah, Midnapore and 24-Parganas. For convenience the sites were categorised as (i) large pocket, having 15 or more aestivating snails ; (ii) small pocket, having 14 or less number of aestivating snails, and (iii) sparsely distributed *i.e.* aestivated snails scattered along the boundary of the gardens. Population was estimated as follows :

(a) Counting of all the snails aggregated in the large and small pocket as mentioned above.

(b) In case of sparsely distributed aestivating snails counting was made on the number of snails present in a square metre area, and from one garden 3 such readings were considered as the actual number of aestivating snails per square metre area of the garden. It is to be noted here that only the areas where the snails aestivated were selected for studies.

Behaviour and mode of aggregation were

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noted from other districts of the State West Bengal.

OBSERVATIONS

Aestivating sites and behaviour : Aestivating *A. Fulica* were found in a number of protective pockets but most of them were in close contact with the soil directing the shell aperture downward. Sometimes the outer lip of the shell is buried in the soil. The aestivating sites are the bushes, crevices, crotches of trees, empty pots, under decaying twigs and leaves, and inside the leaf bases of young coconut trees. Aestivating specimens huddled together in a small area, often one above the other. From all the gardens a few snails were recorded from burrows 3—6 cm deep into the soil. A some sort of age dependant aggregation during aestivation was observed.

Furthermore, whatever be the aestivating sites and the age of the snails, aestivating specimens sealed their shell apertures with the secretion of mucus, called epiphragm, leaving only a slit correspondlng to the pneumostome.

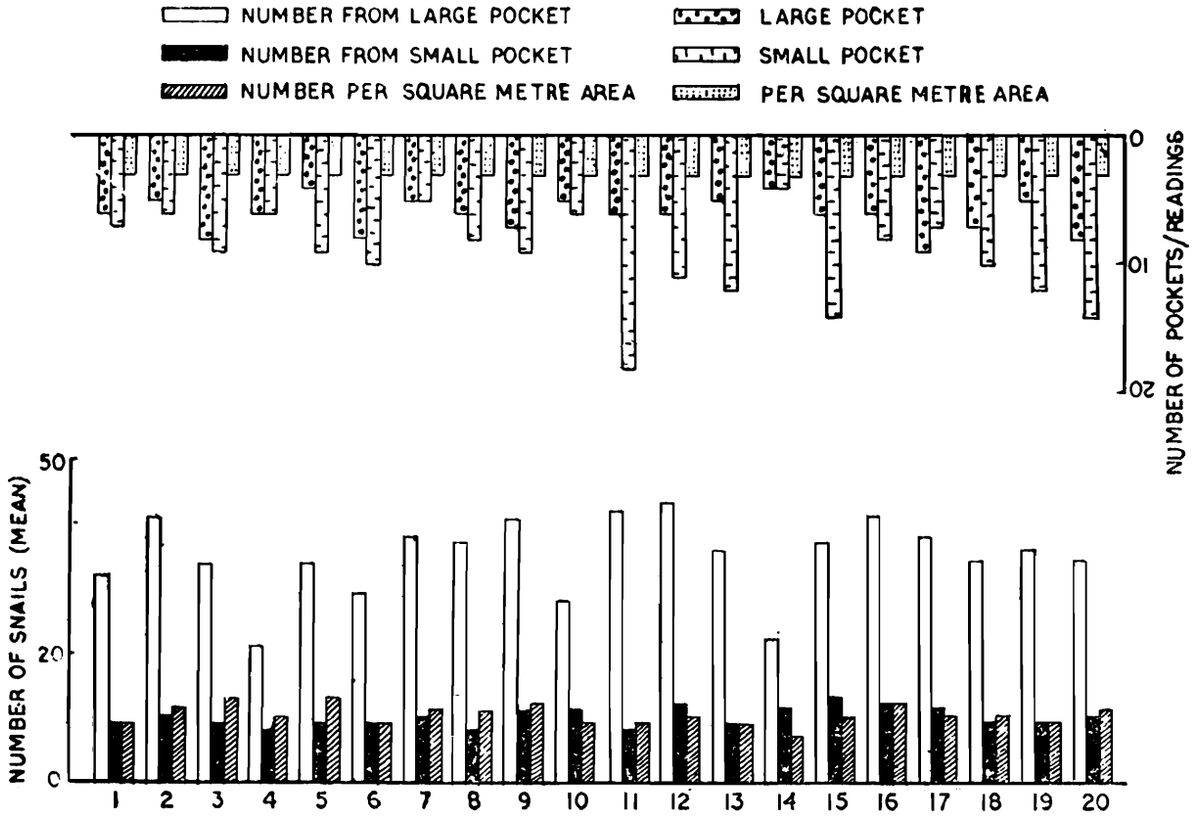

Fig. 1. Histogram showing aestivating popula tion of *Achatina fulica* from different localities of West Bengal. 1—Ballygunge, 2—Bhawanipur, 3—Sreerampur, 4—Amta, 5—Bali, 6—Uttarpara, 7—Belda, 8—Contai, 9—Dantan, 10—Egra, 11—Gobra, 12—Kalindi, 13—Mangalpur, 14—Patashpur, 15—Baruipur, 16—Birati, 17—Jadav pur, 18—Joynagar, 19—Naihati, 20—Taratala.

Population : In each garden a good number (4—9) of large aestivating pockets were recorded where 17—61 individuals took their shelter. From each 9 pockets 342 snails were counted in one garden. Small

aestivating pockets were much more in numbers (4—18) in each garden where 5—14 snails were counted with a total of 182 snails from 18 pockets. 5—19 snails have been observed sparsely aestivated per square metre area. It is interesting that in these large and small pockets there was no room for further accommodation of snails. Data collected from different stations are shown in Fig. 1.

DISCUSSION

Numerous reports on the dormant state (aestivation and hibernation) of land snails are available both from the temperate and cold countries (Bequaert 1919 ; Lang 1919 ; Hora 1928 ; Williams 1951 ; Mead 1961 ; Blinn 1963 , Pomeroy 1969 , Raut and Ghose 1977). But no account of aestivating population concerning land snails is available. It is generally believed that humidity, temperature and loss of body weight due to lack of proper nutrition are responsible for the comatose state (Duval, 1930 ; Kamada 1933 ; Howes and Wells 1934 *a*, *b* ; Wells 1944 ; Ress 1950 ; Kondo 1964).

From the present study and a perusal of literature, the major factors guiding the selection of sites for aestivation in land snails appear to be related with moisture, security and also to escape the sight of the predators.

The behaviour of congregation of aestivating *A. fulica* preferably in a protective site, the 'aestivating home', is of common occurrence. They are quite at ease aestivated even one above the other inside their aestivating home. At the onset of aestivation the snails move about in search of a suitable site and accommodate themselves neatly closed in accordance to the capacity of the pocket available. Such suitable sites being limited, a large number of snails, finding no alternative, undergo aestivation individually along the boundary line of the garden.

The phenomenon of congregation of *A. fulica* during aestivation indicates that it is easier to locate more snails during aestivating period than in their breeding season. Chemical control with the help of about 50 molluscicides has failed (Mead, 1961) and their control through biological agents such as predators and parasite is not encouraging. For these reasons, the local Governments of the infested areas, are still engaging persons for the physical destruction of the snails as a part of their eradication programme. As the snails aggregate in large number in protective pockets during aestivation (November to June), it is recommended to launch such a programme during aestivation rather than in their active period. This would necessarily involve less man-power and minimum financial outlay.

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