SHORT COMMUNICATION

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NATURAL HISTORY OF A SUCCINEID SNAIL, INDOSUCCINEA SEMISERICA (GOULD)

Succineid molluscs are interesting from the point of view of their habitat. Majority of them are fully terrestrial and live at quite a good distance from water and high up on trees, while others are found in moist area close to water and aquatic vegetation, and still others are amphibious in nature. Our knowledge is limited to the taxonomical account of the Indian succineids (Rao, 1924, 1925) ; egg and egg laying habits of some midwestern Succineidae (Guglar, 1963) and the production of viable eggs, without mating in the succineid snails of United States (Patterson, 1970). In the present study an attempt has been made to gain knowledge on the natural history of Indian succineid snail, *Indosuccinea semiserica*.

Observations on feeding, breeding and aestivation of *I. semiserica* were carried in snail infested gardens in and around Behala, 24-Parganas district, West Bengal regularly for a period of two years, 1979 and 1980. In laboratory the snails were kept in light and dark for varying periods to ascertain their responses to the natural day and night period.

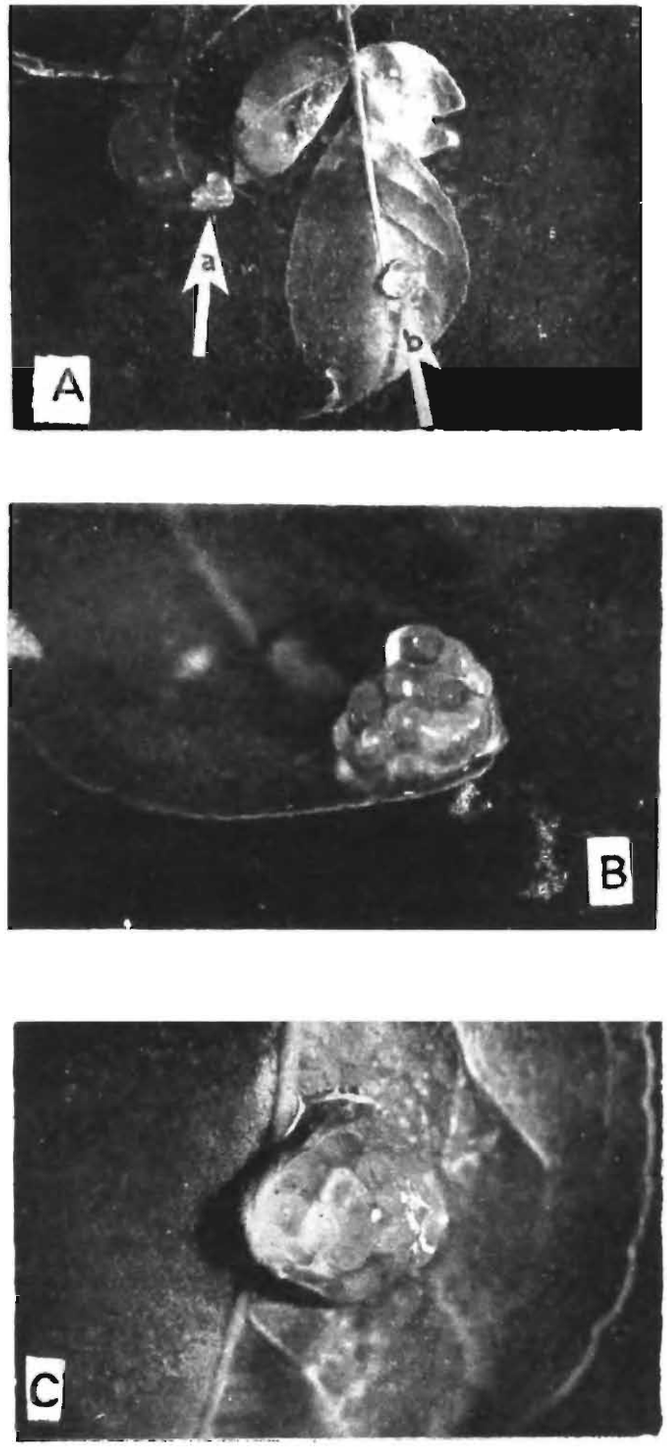
I. semiserica is a tree dweller. Apparently, it is very specific for hard wood trees. During day hours the snails are found in quiescent state on the shaded side of the trees or on the lower surface of the leaf.

The snails feed upon lichens, algae and mosses growing on the bark of host plants. They also consume decomposed or semidecomposed leaves with fungal growth stuck to the branches and trunk of the tree. Foliage and other live parts of the host plant are never attacked.

With the approach of darkness the snails emerge from their hidden shelters and start searching for food. Feeding starts following dusk and may extend up to 03-00 hrs. The behavioural response seems to be fixed, since regardless of exposure to different photoperiodic regimes in the laboratory, the quiescent and active periods of the snail correspond to those in their natural habitat.

With the advent of adverse climate snails become sluggish. The aestivation period in south West Bengal extends from November to June. *I. semiserica* usually aestivate in a concealed place on the plant on which they live. Prior to aestivation they secrete muco-calcareous substance which on drying form thick, whitish epiphragm closing the shell aperture perfectly, and at the same time securing the shell firmly to the tree trunk. The anchoring was so strong that any attempt to

RAUT & GHOSE PLATE VII



Figs. A-C. A. Egg-nest of *I. semiserica*
B and C. The same magnified (refer corresponding markings 'a' and 'b' in Fig, A).

remove them resulted either in the separation of a chunk of bark of the tree or damage of the shell. They aestivate singly and the perfect matching of the colour (colour of the body as visible through the semitransparent shell) with that of the bark of the plant suggests a degree of camouflage in the species.

I. semiserica is hermaphrodite. Snails start laying eggs at the shell size 4.2×3.1 mm. Eggs (24–86, the average being 54, N=138) are laid on the dorsal surface or on the ventral of the leaf with a good amount of transparent, thick mucoid substance, which soon turns to a gelatinous mass of round shape (Pl. VII, figs. 1A—1C) in which eggs remain embeded. The egg-nest measures 8-15 mm in diameter and 5-7 mm thick. Eggs are transparent, round, measure 1.3 mm in diameter and are irregularly arranged in the egg-nest (Pl. VII, figs. 1A—1C). The transparent nature of the egg-nest and eggs facilitates studies on the eggs and developing embryos. The incubation period ranges from 12—19, on the average 13.8 days (N=32). Newly hatched snails crawl to the ventral surface of the leaf and after rest for a few hours start feeding on microorganisms.

The high degree of adaptability of *I. semiserica* to an arboreal life is not on record. They restrict themselves mostly to the hard wood plants presumably due to their specialised feeding habits since the youngs feed exclusively on the microorganisms and the adults on the algae, fungi and mosses growing on the bark of such plants. Similar observations have been made on U. S.'s tree snails *Liguus fasciatus* (Modlin, 1975). Terrestrial pulmonates viz. *Discus rotundatus* (Chatfield, 1972), *Arion empiricorum*, *Rumina decollata* (Frömming, 1954, 1956), *Achatina fulica* and *Macrochlamys indica* (Raut and Ghose, 1983) feed upon such materials occasionally because Angiosperms are their chief food source. Chatfield (1976) believes that feeding of microorganisms and mosses is associated with the nutrition of the species concerned. Apart from nutritional requirements the habit of feeding on lichens, algae and mosses in *I. semiserica* may be considered as an important adaptation for arboreal life. It appears that the snails adapted for arboreal life did not consider the plant as their food, probably not to degrade the habitation.

The colour of the mantle (as seen through the transparent shell) blends perfectly with that of the bark of the tree, and the ability to produce a highly protective nest might be considered as adaptations to arboreal life.

Among the tree living snails, the peculiar egg laying habits by rolling of leaves in *Cochlostyla leucophthalma* (Sarasin and Sarasin, 1899) and by plastering leaves in *Amphidromus purus* and *Nanina javana* (Paravicini, 1921) are on record. Nesting on the dorsal surface of the leaf as in *I. semiserica*, however, has not been reported from other tree living snail species.

I. semiserica breeds in the rainy season and the possibility of getting sunlight is comparatively less due to cloudy weather. Being located on the dorsal surface of the leaf the nests are directly exposed to sunlight and the heat received from the latter helps in maintaining a higher temperature, which may in turn accelerate the development rate of the embryos. The gelatinous egg-nest absorbs moisture from the humid air during the rainy season. Direct rainfall also helps in the process and desiccation of eggs is effectively

prevented. The nesting habit is presumably an important adaptation for the tree life style of the snail *I. semiserica.*

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