

LAND SNAIL SPECIES DISTRIBUTION IN SELECTED SITES IN THE NORTHERN KNUCKLES REGION OF SRI LANKA

H.M.I.M. Herath and M.M. Goonasekera

Faculty of Applied Sciences, Rajarata University of Sri Lanka, Mihintale, Sri Lanka.

Approximately 246 species of land snails are known from Sri Lanka majority (83%) of which endemic¹. The land snails are of economic importance to humans because of the damage they cause in agriculture, horticulture and forestry. They are also of importance in medical and veterinary practice, as intermediate hosts for certain parasitic worms of man and his domestic animals². Habitat loss is the main threat faced by land snails in the country today. Species belonging to endemic genera such as *Acavus* and *Ratnadvipia*, which are found in synanthropic habitats, are severely affected by agrochemicals³. The present study focused in finding out whether the communities living in such habitats participate in the conservation of land snail species, in identifying the land snail species present in the study area and to identify the threats faced by land snail species.

The study was conducted from December, 2011 to April, 2012. An area including the villages of Mahalakotuwa, Atanwala, Pitawala and Illukkumbura to the North of the Knuckles mountain range was selected (annual rain fall 3000-5000 mm; Temperature 5.5- 35°C). Four 30 x 2 m belt transects were used in each study site. Each transect was divided in to 5 x 1 m plots. All the plots were covered using the Timed Direct Transect method. Shannon, Simpson and Margalef Diversity Indices and Evenness were calculated. Individuals from 100 households were selected to participate in a questionnaire survey. Threats created and the conservation measures practiced by the community to land snails were identified through the prepared Questionnaire. SPSS software was used for the analysis of social data. 45 land snail species were found during the study; 28 were identified up to species level and 26 were endemic (92.8%). Distribution of land snail species varied from one site to the other (Mahalakotuwa-31; Illukkumbura-20; Pitawala-14 and Atanwala-7). *Some species were restricted to a specific study site Eg: Aulopoma itieri only from Atanwala; Cryptozona bistrialis and Microcystina sp., only from the Pitawala forest patch.* Diversity of land snail species was higher in lower elevations. The land snails in the four study sites were reasonably distributed (Table 1). Evenness varied between sites and between transects. When the evenness was high the diversity was also found to be high.

Table 1: Evenness, Simpson, Shannon and Margalef Indices according to Elevation

Study site	Elevation (m)	Simpson Diversity	Shannon Diversity	Margalef Diversity	Evenness
Atanwala	1256	0.819	0.896	1.309	0.913
Pitawala	787	0.754	0.931	1.015	0.905
Mahalakotuwa	752	0.895	2.017	2.099	0.917
Illukkumbura	616	0.919	2.116	2.422	0.935

Participation in the control of land snail species

Out of the 100 individuals who took part in the questionnaire survey, 98 had taken some action to control land snail species. There were four main control methods used by the villagers viz. chemicals, killing, using ash and hand picking. Comparatively, the use of chemicals was less in Mahalakotuwa and Illukkumbura. Highest percentage of participation in controlling land snails was shown by females (98.2%), in the age category, >45 years (98%) and all these individuals had educational qualifications up to O/L, A/L or higher. There was a higher tendency for educated people to be more involved in the control of land snail species than non educated people.

Participation in the conservation of land snail species

Out of the 100 individuals included in the survey, only 5 were involved in the conservation of land snail species. This included one male out of 44 (2.2%), who considered, killing snail species as a sin. Out of the 56 females in the survey 4 were involved in the conservation of land snail species (7.14%). Overall, the number of people involved in snail conservation was negligible. The children of the Atanwala village collected snail shells as a hobby due to their diversity. This suggested an important change in the attitudes of children regarding the value of land snails.

Threats for land snails

Threats for land snails can be categorized as natural threats; due to unfavourable environmental conditions and anthropogenic threats; created by people. It was observed that in periods of drought land snails were less in number. Land snails favor moist environments to survive. Fifteen percent of the people who took part in the survey had observed that there were leeches inside the shells of land snails. Therefore, they have inferred that leeches are a threat to land snails. This inference is also in agreement with the studies done previously and hence leeches could be considered as natural invertebrate predators of land snail species. Moreover, *Centropus sinensis* (Graeter Coucal) was also found to be a predator of land snail species. Use of agro-chemicals for crop cultivation, a considered anthropogenic threat was higher in Atanwala and Pitawala study sites (80%). There was a reduction of diversity in those sites suggesting an adverse effect of using chemicals by man.

In conclusion, a total of 45 land snail species were found of which 28 species were identified and 92.8% were endemic. Diversity of land snail species was higher in lower elevations. The number of people who are involved in snail conservation was only 5%.

REFERENCES

1. Naggs, F., and Raheem, D., 2000. *Land snail diversity in Sri Lanka*. The Natural History Museum, London, pp. 203.
2. Godan, D., 1983. *Pest slugs and snails, biology and control*. Springer-Verlage, Berlin, Heidelberg: 445 pp.
3. Bambaradeniya, C.N.B., 2006. *The fauna of Sri Lanka, Status, taxonomy, Research and conservation*. pp. 88-99.