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Short Communication

The study of substratum preference in pestiferous land snail, *macrochlamys petrosa* (hutton)

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Abstract

The distribution and population of land snail Macrochlamys petrosa depends up on type of soil, temperature, rainfall, humidity and natural enemies. The observations on the ecology were made in the natural as well as under laboratory conditions by performing the experiments. To test experimentally the behavior of the snail towards substratum preference, round glass troughs were used as the experimental containers. Moist soil, sand and stones were collected from the natural habitat of the snail and this material was divided into four parts i.e.) moist soil ii) moist soil and sand iii) sand with stones and iv) only sand. In the centre of troughs 50 snails were placed and left for 24Hrs. After 24hrs location of the snails was noted down. Average percentage distribution and substratum preference of the snail was calculated for each type of substratum. It is observed that moist soil was preferred by 80% of snails, 10% snails preferred moist soil and sand substratum, 8% snails preferred sand with stones and only 2% snails found in only sand substratum. No mortality of snail was observed during this experiment.

Keywords: *Macrochlamys petrosa*, Pestiferous, Substratum.

Introduction

The land snails and slugs are of importance to man as pests because of damage caused in agriculture, horticulture and forestry, so that in moist regions or during rainy season the control measures are necessary.

Furthermore, snails and slugs are intermediate hosts for certain parasitic worms of man and some domestic animals. Dundee *et.al* and Gillmore made detailed survey on the distribution of land snails as pests in United States[1,2].

Early work on land molluscs was concerned with slugs whereas the snails were practically neglected. Land snails which are generally moisture loving is active in monsoon and spent the dry seasons in dormant state. The dormancy extends from November to June[3]. Monsoon influences the breeding and egg laying behavior of the snails. The distribution and population of snail depends on type of soil, temperature, rainfall, humidity and natural enemies.

The variation in population density of snails from one place to other is probably due to a number of biotic as well as abiotic factors, was reported by Raut while studying the distribution and population of two pestiferous land snails, *Achatina fulica* and *Macrochlamys indica*[4]. Burch in a study of land snails of Eastern Virginia, U.S.A., found an increase in the number of snail with the increase in Calcium, Magnesium, Potassium and organic content of the soil[5].

Materials and methods

The snails *M. petrosa* were collected from different localities in and around the city, Aurangabad. They were brought to the laboratory and were kept in glass troughs containing sufficient moist soil. They were fed once in a day on various types of leafy vegetables. To provide adequate moisture, every day the soil in the trough was sprinkled with water.

The observations on the ecology were made in the natural as well as under laboratory conditions by performing the experiments.

The animals were cleaned and their external features were studied. During the period of July to March frequent visits were made to the collection areas so as to study the several ecological aspects of *Macrochlamys petrosa*.

To test experimentally the behavior of the snails towards substratum preference, round glass troughs were used as the experimental containers. Moist soil sand and stones were collected from the natural habitat of the snail and were washed with tap water before their use in experiment. This material was divided into four parts i.e. i. moist soil ii. moist soil and sand iii. sand with stones and iv) only sand. In the centre of troughs 50 snails were placed and left for 24 Hrs. After 24 hrs location of the snails was noted down. Average percentage distribution and substratum preference of the snail was calculated for each type of substratum.

Results and discussion

Macrochlamys is a terrestrial snail which remains hidden under soil, stones; plant leaves etc. throughout the day except early morning and at night. The snails were abundantly found in gardens during peak rainy season. It was observed that during the night period these snails were move active as compared to their day time activities. However, during the periods of dark cloudy moist weather; it was observed that the snails remained active throughout the day. The snails were abundantly found in the fields after the showers of rain in the rainy season, but in the winter and harsh summer these snail undergoes aestivation. For aestivation they preferred places having sufficient amount of humidity and less temperature

Laboratory experiments were conducted in order to have a more information regarding substratum or habitat preference. For this purpose a model of ecosystem as mentioned in material and method was used. Various types of substratum prepared in round glass troughs viz. Moist soil, moist soil and sand, sand with stones and only sand, were offered to the snails for substratum preference. In the centre of trough 50 snails were placed and left for 24 hours. The number of animals preferring the particular type of substratum was noted. It is observed that moist soil was preferred by 80% of snails, 10% snails preferred moist soil and sand substratum, 8% snails preferred sand with stones and only 2% snails found in only sand substratum. No mortality of snail was observed during this experiment.

Discussion: Ecology of snail population is dependent upon soil, climate and availability of food. These factors play an important role in the life history and development of snails. A characteristic feature of molluscs is high water content in the various body parts. As a result there is a close relationship between population density and the moisture of the soil in a particular area. Due to evaporation of water from the mantle and other parts and also due to the secretion of mucus; body water is lost and must be replaced rapidly by water uptake from the environment. This occurs not only by drinking, but also by absorption of water through the skin itself, which is non-keratinized and consists of a single cell layer[6,7]. *Macrochlamys* also maintains water percentage of body throughout year. In the dry summer months, these snails enter in an aestivation period; they prepared calcareous membrane at aperture. Throughout aestivation period it prevents the excess loss of water.

Many investigators showed that the activity of snails is depends up on weather conditions like temperature and humidity, this applies both to land and freshwater pulmonates[8]. The migratory behaviour of slugs and snails is greatly affected by the microclimatic conditions in their habitat[9,10].

Conclusion

Macrochlamys petrosa is a terrestrial snail mostly found in moist soil at Aurangabad region. This region is well known for low rain fall annually. So snails found abundantly in monsoon period i.e. from June to winter period up to December. After winter they undergo in dormant conditions. It is observed that in moist soil they buried themselves till next monsoon. So this study reviles that *Macrochlamys petrosa* prefer moist soil as substratum.

References

1. Dundee D.S., Stutts B.S. and Hermann P.W. (1965). Preliminary survey of a possible molluscan pest in the Southern United States. *Ecology,* 46(1-2), 192–193.

2. Gillmore R. (1982). On pest detection survey. *Plant Industry News, Florida Department of Agriculture and Consumer Services*, 24(2), 8-12.

3. Raut S.K. (1979). Distribution and population of two pestiferous land snails *Achatina fulica* (Bowdich) and *Macrochlamys indica* (Godwin–Austen), in west Bengal. *Bull. Zool. Surv. India*, 2(1), 7–16.

4. Raut S.K. and Ghose K.C. (1977). Effect of upwardly directed shell aperture on the aestivating land snail, Achatina fulica. *Nautilus*, 91 (1), 31 – 33.

5. Burch J.B. (1955). Some ecological factors of the soil affecting the distribution and abundance of the land snails in Eastern Virginia. *Nautilus*, 69 (2), 62-69.

6. Howess N.H. and Wells G.P. (1934). The water relationship of snail and slug:II- Weight rythum in Arion ater L and Limax flavus L. *J.Exp. Biol.,* 11, 344-351.

7. Pusswald W. (1948). Beitrage zum wasserhaushalt der pulmonaten. *Journal of Comparative Physiology A: Neuroethology, Sensory, Neural, and Behavioral Physiology*, 31(2), 227-248

8. Partsvaniya V.B. (1972). Ttemperature effect on the spontaneous activity of *Helix pomatia* neurons russ. Soobshch. *Akad. Nauk cruz SSR,* 67, 445-448

9. Newell P.F. (1968). The measurement of light and temperalure as factors controlling the surface activity of the slug, *Agriolimax reticulatus* (Muller) in measurement of environmental factors in terrestrial ecology Ed. R.M. Waldsworth, Blackwell Sci. Publications, Oxford and Edinburg. 141-146.

10. Crawford-Sidebotham T.J. (1972). The influence of weather upon the activity of slugs, *Oecologia(Berl)*, 9 (2), 141-154.