Uttar Pradesh J. Zool. 22(3) : 277-278, 2002 ISSN 0256 - 971X

SUBSTRATE PREFERENCE AMONG GASTROPOD SPECIES IN A POND IN THE ARID REGION OF RAJASTHAN

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Substrate preference among four gastropod species namely *Digoniostoma pulchella*, *Gabbia orcula*, *Indoplanorbis exustus* and *Gyraulus rotula* was studied in freshwater pond in the Indian desert as well as under laboratory conditions. Prosobranch snails *D. pulchella* preferred pond mud while *G. orcula* floated close to surface. Pulmonate *G. rotula* remained associated with *Hydrilla* while *I. exustus* preferred pond pebble though it harboured almost any kind of available substrate.

Ecology of a great majority of the Indian freshwater molluscs is not known (Subba Rao, 1989). In hot desert freshwater ecosystem offers typical harsh and hostile conditions to the community, including high salinity, alkalinity, hardness and wide diurnal and seasonal thermal fluctuations. Having a slow pace of motility, freshwater molluscs have to withstand favourable and unfavourable conditions alike without escape. Because of their benthic or periphytonic mode of life, substrate is one of the very important ecological factors for such communities. The present study is devoted to ascertain the substrate preference among natural molluscan population in a pond situated in the Indian desert.

A year round study (1997 - 1998) was carried out on the diversity and ecology of molluscan community at Harsolao pond located 5 km west of Bikaner city (28^0N, $73^0$17'E, MSL 228 m) in the Indian desert region. This village pond has an area of 1500 m^2 and maximum depth as 5 m.

Four gastropod species were recorded from the pond namely *Digoniostoma pulchella*, *Gabbia orcula* (subclass Prosobranchia), *Indoplanorbis exustus* and *Gyraulus rotula* (subclass Pulmonata). Besides other ecological aspects of the fauna (Singh, 2000; Singh & Saxena, 2001), its substrate preference was studied in the field as well as in the laboratory. In the field, observations were made with respect to the substrate preferred by individual species in water. In laboratory, to study this aspect, 20 healthy specimens of each recorded species were released in an aquarium containing pond water and mud. Vegetation *Hydrilla* and wood pieces (dried twigs) were also placed in the aquarium as in natural ecosystem. Observations were made every 24 hrs for 5-days. Number of specimens on each substrate were counted during observation. Mean number of colonization per substrate was calculated for each species.

The different species of snail presented different choice for natural and artificial substrates, perhaps to avoid interspecific competition (Fig. 1). Prosobranch snail *D. pulchella* basically inhabited the pond mud (95%) and to a lesser degree (5%) pond pebbles. It did not harbour macrophytes and artificial substrate. Subba Rao & Mitra (1982) also noted the two prosobranch snail species, *Thiara* (*Melanoides*) *tuberculata* and *T.* (*Tarebia*) *lineata*, as mud-loving, commonly crawling on mud, submerged stones or bricks and very seldom on weeds. The other prosobranch *G. orcula*, however, showed a different substrate preference. Strikingly high number of snails (70%) were found to float close to surface. Twenty per cent snails had a choice for wood and 5% each for *Hydrilla* and pond pebbles.

Like prosobranchs, the two pulmonates also presented different choice of substrate. While all *G. rotula* remained associated with *Hydrilla*, none *I. exustus* preferred this macrophyte as a substrate. The later snail preferred pond pebbles (80%) with a little choice also for wood (15%) and glass (5%). Field observation revealed that *I. exustus* harboured almost any kind of substrate

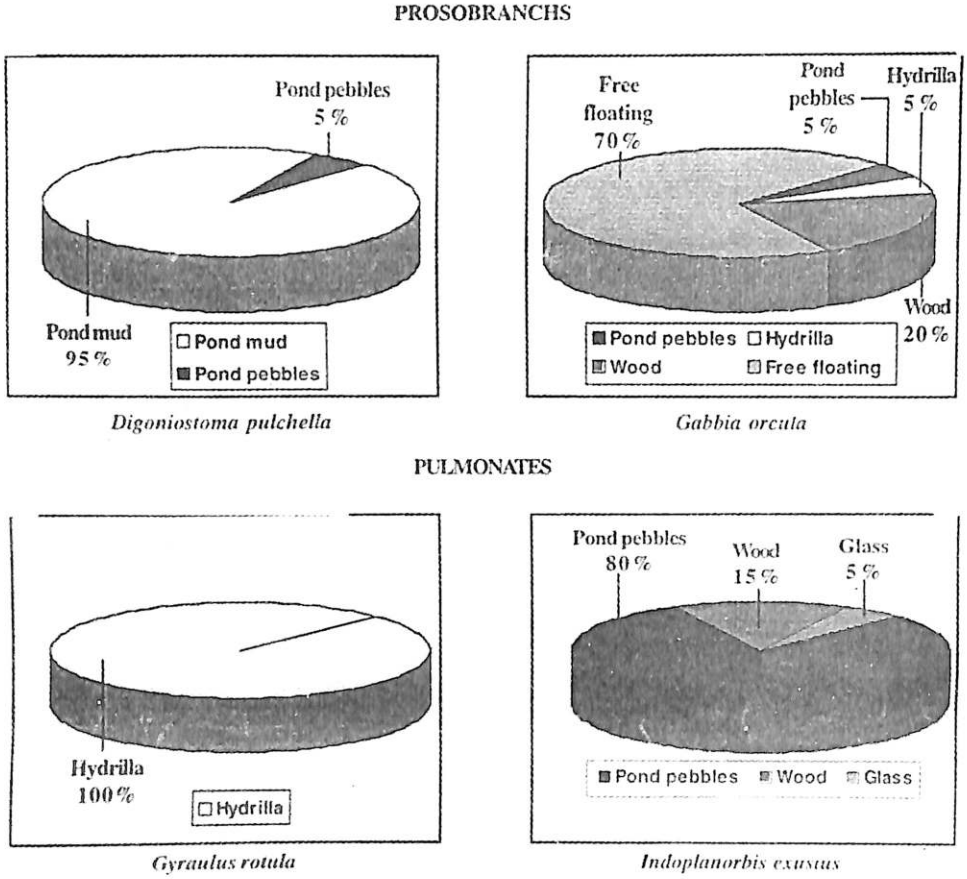

Fig. 1 : Substrate preference in different molluscs species.

available including floating dry twigs, polythene bags, paper and algal mats on the banks.

ACKNOWLEDGEMENTS

The authors are thankful to the Principal and Head of the Department of Zoology, Dungar College, Bikaner for providing the necessary facilities.

REFERENCES

SINGH, Y. 2000. A malacological study on a freshwater pond in the Indian desert. *Ph. D. Thesis. M.D.S. University, Ajmer, India.*

SINGH, Y. & SAXENA, M.M. 2001. Thermal tolerance in some gastropods of Indian desert region. *Uttar Pradesh J. Zool.* 21(2) : 109 - 112.

SUBBA RAO, N.V. 1989. *Handbook of Freshwater Molluscs of India.* ZSI, Calcutta. pp.289.

SUBBA RAO, N.N. & MITRA, S.C. 1982. Bioecology of two melaniid snails (Mollusca : Gastropoda) in ponds near Calcutta. *J. zool. Soc. India.* 34(1 & 2) : 21 - 32.