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Taxonomic record and distribution pattern of the freshwater apple snail, *Pila globosa* (Swainson, 1822) (Mesogastropoda : Pilidae)

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Abstract

A study was carried out on taxonomic record and distribution pattern of the freshwater apple snail, *Pila globosa* from January 1995 to December 1996 in different waterbodies of Rajshahi University Campus. In total, 27 generic and 21 species names were recorded including the valid name *Pila globosa* (Swainson, 1822). The shell of *P. globosa* is thick and globose. The spire is not acuminate and shorter than the body whorl. The apple snail was found to occur in tanks, ponds, ditches and irrigated paddy fields of Rajshahi University Campus, Rajshahi. The apple snail preferred littoral zones of ponds and ditches but shore lines of canals and irrigated paddy fields. aestivation of the apple snails took place with the total water loss of the habitats.

Keywords : Taxonomic records; Distribution; *Pila globosa*; Synonymy; Shell

Introduction

Freshwater gastropods, which constitute the bulk of littoral fauna of tanks, ponds, beels, reservoir and rivers, play an important role in the dynamics of aquatic ecosystems. Sufficient works have been done in abroad on population dynamics, growth, reproduction, life cycle and bioenergetics of a number of gastropods (DeWitt, 1955; Duncan, 1959; Gillespie, 1969; Eckblad, 1973 and Browne, 1978). The genus *Pila* is confined in the Oriental and Ethiopian regions (Preston, 1915).

But in Bangladesh, there is a general lack of detailed information on any gastropod species. Ali and Chakraborty (1992) and Jahan (1993) mentioned the taxonomic record, distribution and some ecological notes of a few gastropods found in the country. Therefore, a study was conducted to note the taxonomic record and distribution pattern of *P. globosa* from Rajshahi University Campus.

Material and methods

Surveys were conducted at fortnight intervals throughout the tenure (January 1995 to December 1996) based on the observations and sampling in selected managed fish ponds, ditches and irrigated paddy fields in the Rajshahi University Campus (Fig.1) to find out distribution pattern of *Pila globosa*.

Collection

Random sampling of *P. globosa* was done twice a month (on the first and the 15th day) from the ponds, ditches and irrigated paddy fields of Rajshahi University Campus in the morning. A total of 1,324 specimens was collected during the tenure of which 1,175 specimens were found suitable in all respects. The snails were collected with the help of cast nets, small hand nets and hand-picking methods.

Results and discussion

1. Taxonomic record
 - 1.1 Identity
Valid name: *Pila globosa* (Swainson, 1822)
 - 1.2 Synonymy

Generic names

- 1797 *Pomus*, Mus. Calonnianum, p.58.
1798 *Pila* (Bolten) Roeding, Mus. Boltenianum, p.145 (in part).
1799 *Ampullaria* (in part), Lamarck, Prodrôme, p. 76.
1817 *Conchylium* (in part), Cuvier, Regne Anim, II, p. 426.
1821 *Ampullaria*, Sowerby, Genera 1, pl. el. XXXIV.
1828 *Pachystoma*, Guilding, Zool. J. III, p.536.
1840 *Pachylabra*, Swainson, *Malacologia*, p.339.
1847 *Pomus*, Gray, Proc. zool. Soc. London, p.148.
1854 *Ampullaria*, H. & A. Adams, Gen. Rec. Moll. 1, p.345.
1859 *Ampullaria*, Chenu, *Man. Conchyl.*, p.313.

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- 1883 *Amullaria*, Tryon, *Struct. and Syst. Conch.* II, p.276.
 1885 *Pachylabra*, Fischer, *Man. Conchol.*, p.757.
 1904 *Pila*, Dall, *Journ. Conchol.* xi., p.53.
 1910 *Pila* (subgenus), Sowerby, *Proc. malac. Soc. Lond.* IX, p.56.
 1912 *Pachylabra*, Kobelt, Martini & Chenn., *Conch. Cab.*(n.f.) Ampullariidae, p.44.
 1915 *Pila*, Preston, *Faun. Brit. Ind. Freshw. Moll.*, p.96.
 1921 *Pachylabra*, Annandale & Prashad, *Rec. Indian Mus.*, XXII, p.47.
 1932 *Pila*, Prashad, *Indian Zool. Mem.*4, p.1.
 1964 *Pila*, Meenakshi, *Comp. Biochem. Physiol.*11, p.379.
 1964 *Pila*, Brahmachary, *Experimentia*, p.133.
 1967 *Pila*, Hyman, *The Invertebrates*, vi, Mollusca, p.223.
 1976 *Pila*, Brahmanandan, *Veliger*, 19(1), p.90.
 1989 *Pila*, Subba Rao, *Handbook: Freshw. Moll. India*, p.57.

Species names

- 1822 *A. globosa*, Swainson, *Zool. Illustrations* ser.I,II, pl.eXIX, III, pl.eXX.
 1851 *A. globosa*, Philippi in Martini & Chenn., *Conch. Cab. Ampullaria*, p.8, pl.1, fig.3; p.7, pl.i, fig.1.
 1856 *A. globosa*, Reeve, *Conch. Icon.*X, *Ampullaria*, pl.X, figs.46,47; pl.XVI, fig.76.
 1876 *A. globosa* (nec Lamarck), Hanley & Theobald, *Conch. Ind.*, pp.XVII,46, pl.eXIII, figs.2-5.
 1877 *A. globosa*, Nevill, *Cat. Moll. Indian Mus.*, Fasc. E., pp.1,2.
 1885 *A. globosa*, Nevill, *Hand-list Moll. Indian Mus.*II, pp.1-2.
 1910 *A. (Pila) globosa*, Sowerby, *Proc. malac. Soc. Lond.*IX, pp.58-59.
 1912 *A. globosa*, Ghose, *Rec. Indian Mus.*, 7, p.77.
 1912 *A. globosa*, Kobelt in Martini & Chenn., *Conch. Cab.*(n.f.) Ampullariidae, p.72,pl. XXIV, figs.1-2; p.95, pl.XLI, fig.1.
 1915 *P. globosa*, Preston, *Faun. Brit. India, Freshw. Moll.*, pp.97-98.
 1923 *P. globosa*, Prashad, *J. As. Soc. Bengal*(n.s.) XVII, p.586.

Different authors such as Srivastava Rao (1929), Raja (1945), Lal and Saxena (1952), George and Desai (1955),

Raghupathiramireddy and Swami (1968), Ganapati and Hanumantha Rao (1968), Reddy *et al.* (1974), Mohan *et al.* (1975), Munnis (1978), Raut (1984), Ali and Chakraborty (1992) and Jahan (1993) used the name *P. globosa*.

Systematic position

Kingdom	Animalia
Phylum	Mollusca
Subphylum	Conchifera
Class	Gastropoda
Subclass	Prosobranchia
Order	Mesogastropoda
Family	Pilidae
Subfamily	Pilinae
Genus	<i>Pila</i>
Species	<i>P. globosa</i>

Diagnostic characters

The shell of *Pila globosa* is thick and globose. The body whorl is highly convex in profile. The aperture is wide, smooth and oblong. The spire is shorter than the body whorl and not acuminate. Columella is in the shape of a hollow twisted rod. Operculum is a flat oblong plate-like structure. The outer flat surface of it shows many concentric rings of growth around a small subcentric circle, the nucleus. The inner surface is a distinct elliptical area of creamy colour. It is surrounded by a shallow groove. The colouration varies greatly and it is always dull. The ground colour is lemon-yellow, brownish or even blackish. The inner surface of the shell is pinkish (Fig. 2).

Distribution

Pila globosa was found to occur in tanks, ponds, ditches, canals and irrigated paddy fields of Rajshahi University Campus, Rajshahi. This snail preferred littoral zones of ponds and ditches but shorelines of canals and irrigated paddy fields. These snails preferred soft or clayey substratum instead of sandy one. In the dry season, i.e., with the advancement of fall of water level in the temporary water-bodies (ditch, canal, paddy field), the snails started to

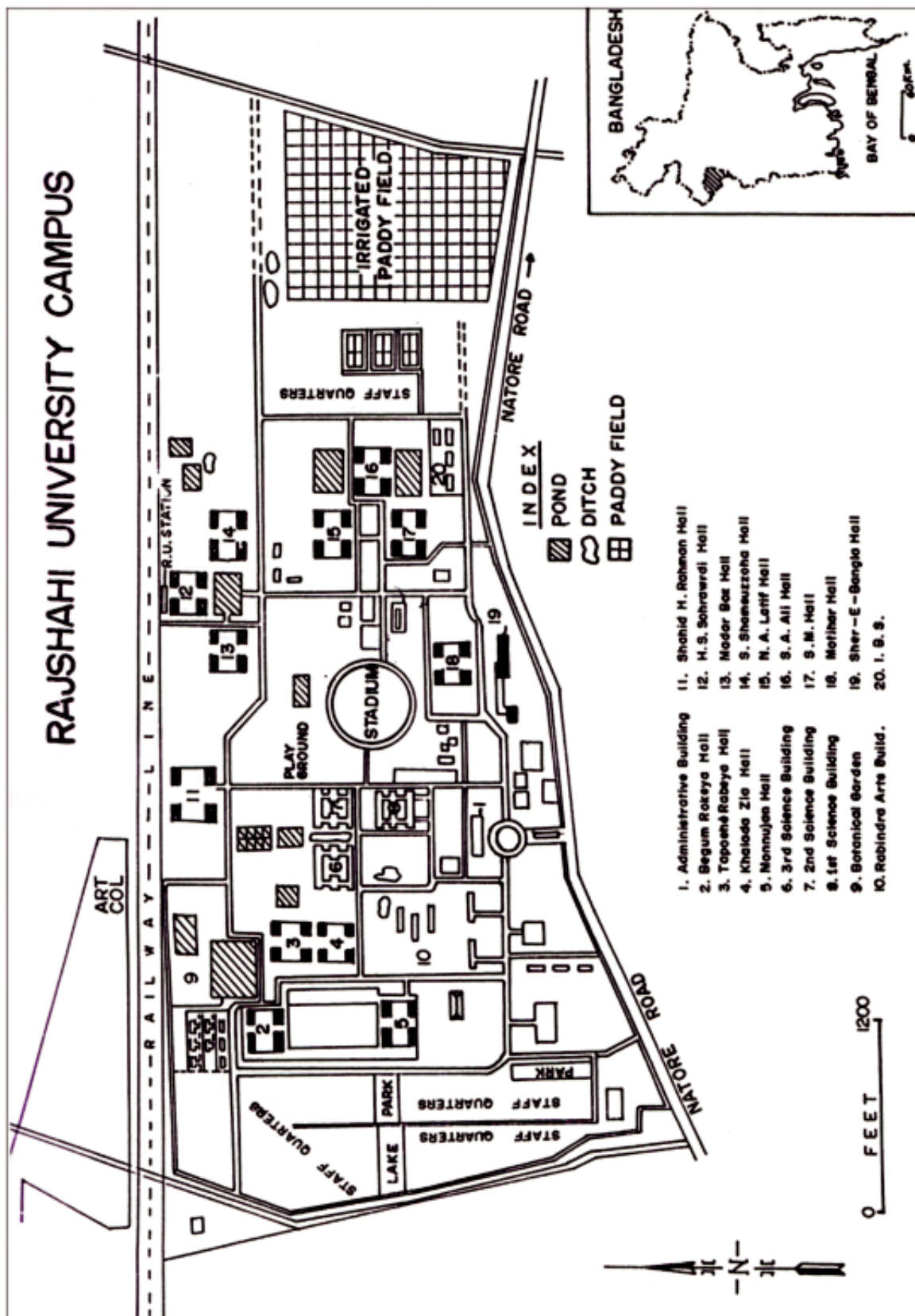


Fig. 1. Rajshahi University Campus showing sampling stations.

was performed completely with the total waterloss of the habitats. Saxena (1956) observed *P. globosa* to occur usually near the banks of the lakes and sometimes encountered a few snails in the deeper waters during aestivation period. A study by Raut (1984) was made to observe the distribution of *P. globosa* which suggests that this amphibious prosobranch usually occurred in large numbers in the paddy fields during monsoon and in the ponds throughout the year.



Fig. 2. Apertural (a) and abapertural (b) views of *Pila globosa*.

Conclusion

Pila globosa is an edible mollusc and its flesh is highly proteinous. In the recent past, it was abundant in our stagnant waterbodies but it is declining rapidly. The information obtained in the present investigation may be useful for taxonomy of molluscan fauna and may be helpful for proper management, development and conservation strategy to restore this edible snail.

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