

Record of the Non-indigenous Seminole Rams-Horn, *Planorbella duryi* (Wetherby, 1879) from South Karo River, India (Mollusca: Heterobranchia: Planorbidae)

Basudev Tripathy¹, Satyajit Pahari^{1,2}, Sheikh Sajan^{1*}, Gopal Sharma²

¹Mollusca Section, Zoological Survey of India, Prani Vigyan Bhawan, M-Block,
New Alipore, Kolkata 700 053, India

²Gangetic Plains Regional Centre, Zoological Survey of India, Patna

Abstract

Key words: Mollusca,
exotic, dispersal,
Jharkhand, India

Article information:

Received: 26 Jan. 2019

Accepted: 6 March 2019

Published online:

18 March 2019

Correspondence:

sksajan.sajan@gmail.
com

During the malacological survey in the Dalma Wildlife Sanctuary and different regions of Saranda forests of Deccan peninsula in Jharkhand, an unusual Florida's native freshwater mollusc Seminole Rams-Horn, *Planorbella duryi* from South Karo River was encountered. Earlier, this non-indigenous species was reported from the Godavari River in the Nasik district of Maharashtra state of India although there was confusion on the presence of *Planorbella scalaris* and *Planorbella duryi*. Occurrence of *P. duryi*, has been confirmed along with distribution, ecology, and probable dispersal hypothesis has been discussed.

Cite this paper as:

Tripathy, B., Pahari, S., Sajan, S. K., Sharma, G. 2019. Record of the non-indigenous Seminole rams-horn, *Planorbella duryi* (Wetherby, 1879) from South Karo River, India (Mollusca: Heterobranchia: Planorbidae). *Mong. J. Biol. Sci.*, 17(1): 11-14.

Introduction

Planorbidae is the most diverse, species-rich limnic pulmonates among the freshwater gastropod occurring in a wide range of habitats viz. ponds, lake, pools and rivers (Pilsbry, 1934; Burch, 1982; Albrecht *et al.*, 2007; Johnson *et al.*, 2015). Globally, planorbids have been estimated to be approximately 350 species belonging to 40 genera (Baker, 1945; Hubendick, 1955). *Planorbella duryi*, a member of Planorbidae family is the most common, widespread, and abundant species native to North America, and has been spread over Europe, South Africa and South East Asian countries (Alexandrowicz, 2003; Seddon, 2011; Johnson *et al.*, 2015). In India, 28 species of Planorbidae have been recorded of which two species viz. *P. duryi* and *P. scalaris* are subjected to taxonomic validations since Magare

(2015) although mentioned these two species, but failed to explain properly their presence.

Material and Methods

The materials reported here were collected on 23rd April 2018 by the second author during the faunal diversity assessment study in Dalma Wildlife Sanctuary in Saranda Forests Division of Jharkhand state in India. Molluscan materials including the species under report were collected from submerged grasses and leaf litter with submerged aquatic debris in the Karo river, which is shallow and submerged aquatic vegetation that flows inside the Protected Area. The area is known for its mineral deposits, mining is active in the region and transportation is frequent. The

collected samples were examined in Mollusca section of Zoological Survey of India (ZSI), based on the shell characters and morphometric measurements (see Pilsbry, 1934; Burch, 1982; Thomson, 2004; Kittle & Portell, 2010), and after identification and confirmation, were deposited in the National Zoological Collection of India at ZSI, Kolkata.

Results

Systematics account:

Class GASTROPODA Cuvier, 1795

Superfamily LYMNÆOIDEA Rafinesque, 1815

Family PLANORBIDAE Rafinesque, 1815

Subfamily PLANORBINAE Rafinesque, 1815

Genus *Planorbella* Haldeman, 1843

Planorbella duryi (Wetherby, 1879)

(Fig. 1)

Planorbis duryi Wetherby, 1879, *Jour. Cincinnati Soc. Nat. Hist.*, vol. 2, p. 99, fig. 4.

Examined material: India, Jharkhand, West Singhbhum, Hati Chawk, South Karo River, 2 ex., 23.04.2018, N 22° 09.84', E 85° 22.159', Alt. 414.5m; Gua, Saranda Forests, South Karo River, 4 ex., 23.04.2018, N 22° 10.96', E 85° 22.42', Alt. 397.7m; Baraiburu, Nala, Saranda Forests, South Karo River, 2 ex., 23.04.2018, N 22° 08.636, E 85° 21.547', Alt. 419 m, Collector: Pahari and party.

Description: Shell small, sinistral, pale translucent in coloration, finely striated, spire low and depressed with flat-topped, the aperture not advanced beyond upper margin and presence of

wide aperture. Plane of aperture nearly vertical when viewed from the side. Narrowly umbilicate, Whorl 3-3.5.

Distribution: the species is native to North America, but is widely introduced in Europe, South Africa and Asian countries (Alexandrowicz, 2003; Seddon, 2011; Johnson *et al.*, 2015). In India, this species has been reported from Godavari River of Dhule and Naski district in Maharashtra, however, taxonomic validity is in question (Magare, 2015).

Ecology and Co-occurrence of species:

Other freshwater mollusca along with *P. duryi* were recorded from the submerged vegetation in shallow areas at water depth of 1 to 1.5 m in the river Karo in Jharkhand (Fig. 2). *P. duryi* is known to accompany with other Planorbidae species *viz.* *Indoplanorbis exustus* (Deshayes, 1834). However, the existence of other species with *P. duryi* i.e. *Radix rufescens* (Gray, 1822) of the family Lymnaeidae, *Melanoides tuberculata* (Müller, 1774), *Mieniplotia scabra* (Müller, 1774), and *Tarebia granifera* (Lamarck, 1816) of the family Thiaridae have also been reported during the present study.

Discussion

Despite the huge distance dispersal of the species (North America to India as indicated by Alexandrowicz (2003) and invasion upto Europe), there is possible ways of dispersal of such mollusca and in the present case as evident of *P. duryi*, (Brown, 1967; Van Bruggen, 1974; Paraense, 1976; Perera *et al.*, 1984; Alexandrowicz, 2003; Mastrantuono *et al.*, 2011). Although the exact path of dispersal of *P. duryi* into the freshwater ecosystem in India is beyond the scope of

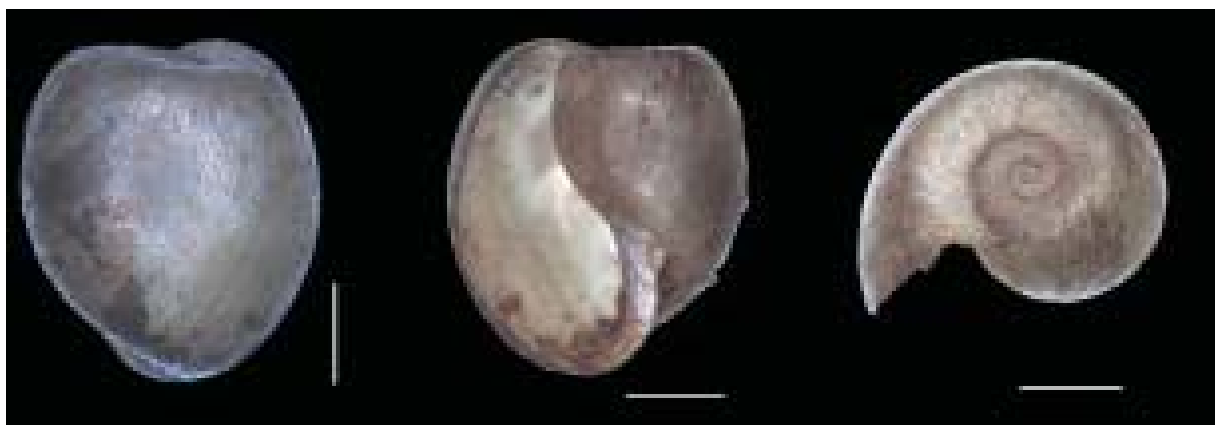


Figure 1. The shell shows the Dorsal (left), ventral (middle) and apical (right) view of the *Planorbella duryi* (Wetherby, 1879). (Scale: 1 mm)

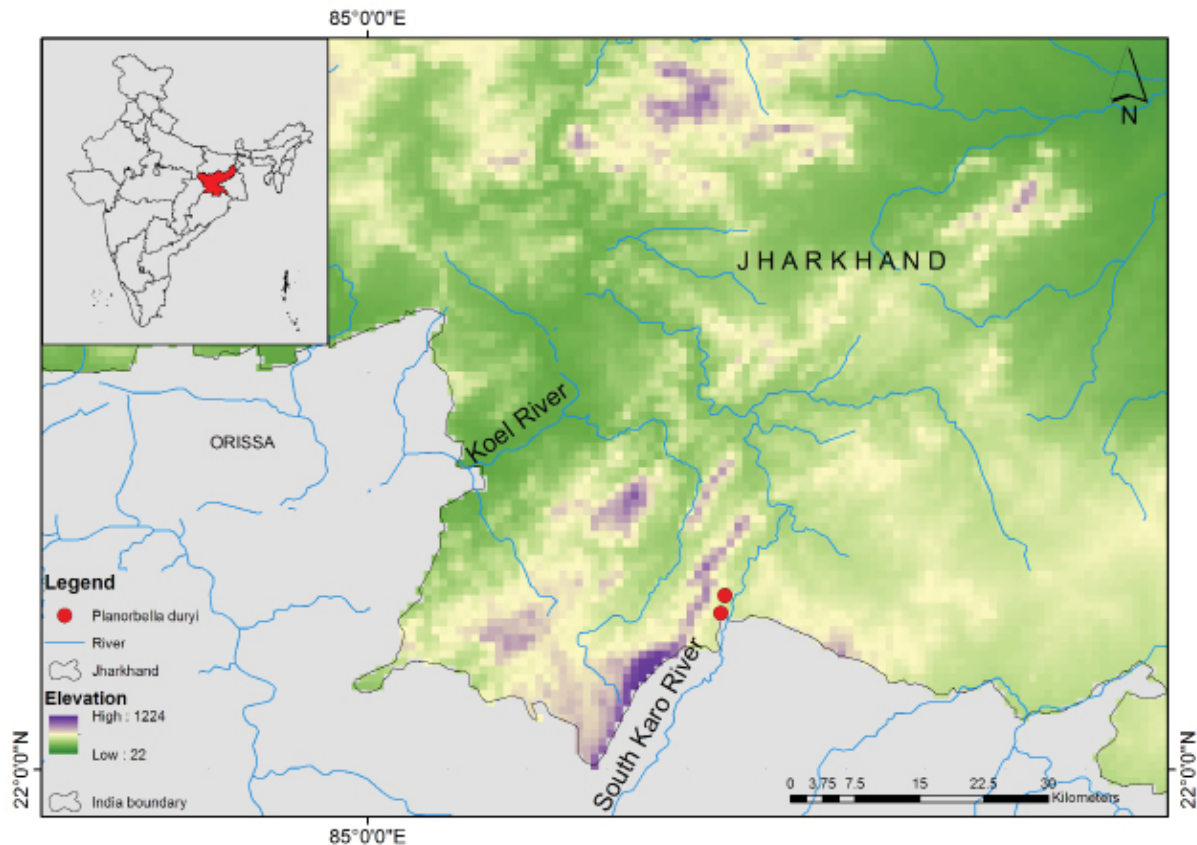


Figure 2. Locality of *Planorbella duryi* in South Karo River of Jharkhand, India.

investigation through the present study, the following possibility of invasion could be due to increasing in global trades through waterways, thus there is a chance of attachment/transportation with other materials through passenger and cargo ships (materials such as river sand, mineral, coal etc. import), attaching with the feathers of migratory birds (Rees, 1965; Gittenberger, 2012; van Leeuwen & van der Velde, 2012; Rusiecki & Rusiecka, 2013); through intentional human activities as in the case of invasion of giant African land snail, *Lissachatina fulica* (Férussac, 1821) in India (Sajan *et al.*, 2018), and through aquarium and ornamental fish trade. Nevertheless, the details of population assessment and ecological value, as well as their impact to the native freshwater mollusca and associated organisms is required.

Acknowledgements

The authors are grateful to the Director, Zoological Survey of India, Kolkata for the necessary facilities and support. We are thankful to the Jharkhand Forests Department for permission and field work. We thanks Mr. Satish Chandra Rai, Divisional forests officer, Chainbasa and forests

officers for their support during field surveys. The funding for the above study was provided by the Jharkhand Biodiversity Board.

References

- Albrecht, C., Kuhn, K. & Streit, B. 2007. A molecular phylogeny of Planorboida (Gastropoda, Pulmonata): insights from enhanced taxon sampling. *Zoologica Scripta*, 36: 27–39.
- Alexandrowicz, S. W. 2003. *Planorbella duryi* (Wetherby, 1879) from the crater-lake Albano (Central Italy). *Folia Malacologica*, 11: 89–93.
- Baker, F. C. 1945. *The Molluscan Family Planorbidae*. Urbana, IL: University of Illinois Press.
- Brown, D. S. 1967. A review of the freshwater Mollusca of Natal and their distribution. *Annals of the Natal Museum*, 18: 477–494.
- Bruggen, A. C. Van. 1974. Alien planorbid (Mollusca Gastropoda, Pulmonata) from South West Africa erroneously recorded as *Biomphalaria pfeifferi*. *Zoologische Mededelingen*, 48: 11–18.
- Burch, J. B. 1982. North American freshwater

- snails: identification Keys, Generic Synonymy and Supplemental Notes. *Walkerana*, 1: 217–365.
- Gittenberger, E. 2012. Long-distance dispersal of molluscs: ‘Their distribution at first perplexed me much’. *Journal of Biogeography*, 39: 10–11.
- Hubendick, B. 1955. Phylogeny in the Planorbidae. *Transactions of the Zoological Society of London*, 28: 453–542.
- Johnson, P. D., Bogan, A. E., Brown, K. M., Burkhead, M. N., Cordeiro, J. R., Garner, J. T., Hartfield, P. D., Lepitzki, D. A. W., Mackie, G. L., Pip, E., Tarpley, T. A., Tiemann, J. S., Whelan, N. V. & Strong, E. E. 2015. Conservation Status of Freshwater Gastropods of Canada and the United States. *Fisheries*, 38(6): 247–282.
- Kittle, B. A & Portell, R. W. 2010. Mollusca: Fort Thompson Formation (Late Pleistocene). *Florida Fossil Invertebrates*, 12: 1–32.
- Magare, S. R. 2015. New Record of Exotic species of a Snail, *Planorbella duryi* Form *seminolis* in India. *Scholarly Research Journal for Interdisciplinary Studies*, 3(16): 2785–2787.
- Mastrantuona, L., Livretti, F. & Mancinelli, T. 2011. Short note on an alien *Planorbella* (Gastropoda: Pulmonata) in volcanic lakes in Central Italy. *Aquatic Invasions*, 6(1): S125–S128.
- Paraense, W. L. 1976. A natural population of *Helisoma duryi* in Brazil. *Malacologia*, 15: 369–376.
- Perera, G., Young, M. & Pointier, J. P. 1984. First report for Cuba on the distribution of freshwater mollusks on the Isle of Youth (Isle of Pines) Cuba. *Walkeriana*, 2: 125–130.
- Pilsbry, H. A. 1934. Review of the Planorbidae of Florida with notes on other members of the family. *Proceedings of the Academy of Natural Sciences of Philadelphia*, 86: 29–66.
- Rees, W. J. 1965. The aerial dispersal of Mollusca. *Proceedings of the Malacological Society of London*, 36: 269–282.
- Rusiecki, S. & Rusiecka, A. 2013. Hairy snail *Trochulus hispidus* (Linnaeus, 1758) in flight – A note on Avian dispersal of snails. *Folia Malacologica*, 21(2): 111–112.
- Sajan, S. K., Tripathy, B., Sivakumar, K. & Khatun, S. 2018. Invasion of Giant African Alien Land Snail *Lissachatina fulica* (Férussac, 1821) in Sagar Island of India. *Records of the Zoological Survey of India*, 118(1): 100–102.
- Seddon, M. B. 2011. *Planorbella duryi*. The IUCN Red List of Threatened Species 2011: e.T156073A4885770. Downloaded on 17 July 2018.
- Thompson, F. G. 2004. An identification manual for the Freshwater Snails of Florida. <https://www.floridamuseum.ufl.edu/malacology/fl-snail/snails1.htm>
- van Leeuwen, C. H. A. & van der Velde, G. 2012. Prerequisites for flying snails: external transport potential of aquatic snails by waterbirds. *Freshwater Science*, 31(3): 963–972.
