

A note on freshwater molluscs of Hamirsar Lake, Gujarat, India

Molluscs contribute the second most species-rich phylum in the world after the arthropods, contributing around 1,20,000 living species (Prié 2019). Molluscs are widely used as model organisms in science, and their research has led to many discoveries in evolutionary biology (Haszprunar & Wanninger 2012). Freshwater molluscs, including species of snails and bivalves, are crucial for nutrient cycling and water filtration in aquatic ecosystems (Pyron & Brown 2014). They contribute to the decomposition of organic matter and help maintain water quality by filtering out particulate matter and pollutants. Furthermore, these organisms provide essential food resources for fish, birds, and mammals, linking aquatic and terrestrial food chains (Varis 2024).

Freshwater molluscs are of particular interest due to their ecological significance and the unique challenges they face (John & Gautam 2021). Globally, about 7,000 described species of freshwater molluscs are found (Abbot 1989; Strong et al. 2008). In India around 214 species of freshwater molluscs were documented (Tripathy et al. 2024).

Bhuj, the capital town of Kachchh District in Gujarat State in India has a historical lake known as Hamirsar Lake, a 450-year-old heritage having egglike structure located in the centre of the Bhuj city. This lake is named after the

King Jadeja ruler Rao Hamirji. The main lake is spread over an area of 28 ha (Gupte 2014) has a beautiful mid-lake garden and lower Hamirsar called Chattardi Lake which is spread over 15 ha. The lake was designed in such a manner that during the rainy season, the water of the entire city flows into the lake and the lake completely gets filled with water. In very good rainfall years, the lake gets overflowed and the extra water of the lake moves to nearby area called 'Dhobi Ghats' (Verma et al. 2010). The maximum water spread is seen in the monsoon period and if there is good rainfall, the lake can hold up to about 68.75 lakh gallons of water (Gupte & Solanki 2015).

The survey was carried out at different parts of Hamirsar Lake from June to August 2024. The visual search survey method was used for the collection of molluscan species from the lake. Species were collected from the bank of the lake, under rock/cemented surface, and from wetland vegetation. At least one living individual or dead shell of each species was collected as a voucher specimen and was brought either in wet or dry conditions. The living shells were collected and narcotised, thoroughly washed to remove mucous, and then treated with ascending grades of spirit (20%, 40%, 60%) and finally preserved in 70% ethyl alcohol (Ramakrishna & Dey 2007). The identification was done using Ramakrishna & Dey (2007).

A total of 53 molluscan specimens were collected from different locations of the Hamirsar Lake, which reveals the presence of six species (five species of gastropods and one species of bivalvia) belonging to four families and six genera have been recorded from the field surveys. Among the collections, the families Viviparidae and Thiaridae were found to be dominant with two species each in gastropods.

In contrast, a single bivalve species *Lamellidens marginalis* of the family Unionidae was recorded from this survey. The species *Indoplanorbis exustus*, *Filopaludina bengalensis*, *Tarebia lineata*, and *Lamellidens marginalis* are commonly abundant in sampling sites, whereas *Idiopoma dissimilis* and *Melanoides tuberculata* are occasionally found. All these species are under the 'Least Concern' (LC) category of the IUCN Red List of Threatened Species.

The freshwater ecosystems support innumerable organisms for survival and completion of their lifecycle. Globally, the freshwater ecosystem

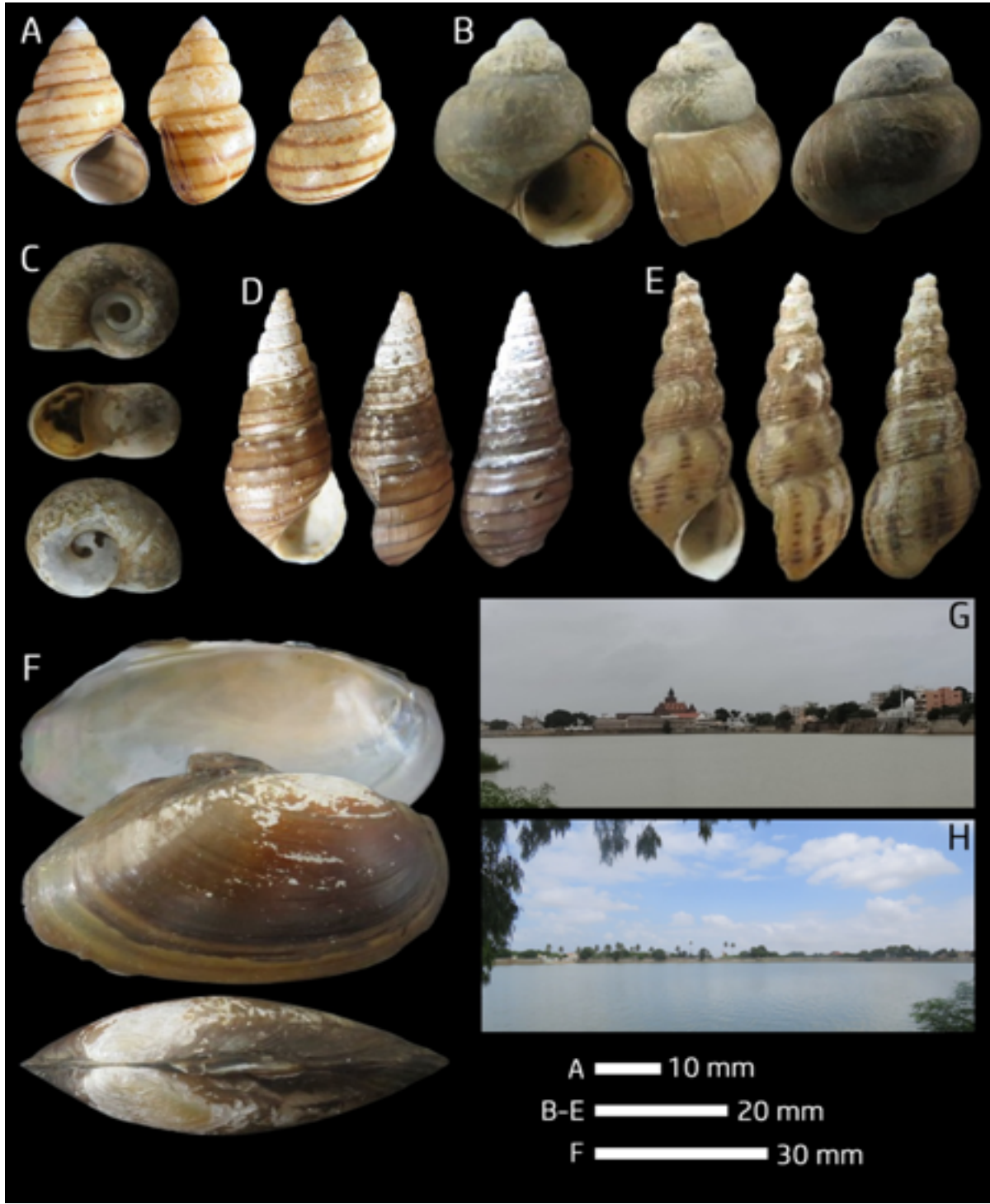
supports around 1,28,449 species, of which India represents approximately 9,456 species (Chandra et al. 2017). The freshwater ecosystems in India harbour a rich diversity of molluscs, around 214 species are recorded from different waterbodies (Tripathy et al. 2024).

Hamirsar Lake is a man-made lake situated within the Indian desert biogeographic zone (Rodgers & Panwar 1988) to support local biodiversity and also groundwater recharge for the city. Thus, this study is the first report on the freshwater molluscs in Hamirsar Lake.

There is evidence that numerous pressures are endangering India's freshwater biological resources (Chandra et al. 2017). During the current survey, recreational activities and run-off of garbage from nearby areas are the major anthropogenic activities that may threaten the lake ecosystem and wetland species. Also, can directly impact on molluscan species.

Common name	Scientific name	IUCN Red List status	Figure
Common Banded Pond Snail	<i>Filopaludina bengalensis</i> (Lamarck, 1822)	LC	A
Pond Snail	<i>Idiopoma dissimilis</i> (O.F. Müller, 1774)	LC	B
Ram'shorn Snail	<i>Indoplanorbis exustus</i> (Deshayes, 1834)	LC	C
Spiky Tower Snail	<i>Tarebia lineata</i> (Gray, 1828)	LC	D
Red-rim Melania	<i>Melanoides tuberculata</i> (Müller, 1774)	LC	E
Freshwater Mussel	<i>Lamellidens marginalis</i> (Lamarck, 1819)	LC	F

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Freshwater Mollusca (A–F) See Table. & Hamirsar Lake (G–H).

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