



First Record of *Parambassis lala* (Hamilton, 1822) from the Upper Krishna River Basin, Maharashtra, India

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Authors' contributions

This work was carried out in collaboration between both authors. Authors SS and VD designed the study. SS conducted the fieldwork, laboratory work, data analysis, and wrote the manuscript. Both authors read and approved the final manuscript.

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ABSTRACT

The present study documents the first occurrence of the high-fin glassy perchlet, *Parambassis lala* (Hamilton, 1822), in the Upper Krishna River Basin, located in Maharashtra, India. This species is a small, translucent freshwater fish belonging to the family Ambassidae, previously known from the Gangetic plains, Brahmaputra drainage, and other eastern regions of the Indian subcontinent. Its occurrence in the northern Western Ghats represents a considerable westward extension of its known geical distribution and suggests a potential shift in the ecological boundaries of the species. Field surveys conducted between 2022 and 2024 at multiple sites along the Krishna River and its tributaries led to the collection of specimens from slow-flowing, well-vegetated sections of the river.

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The collected individuals were morphologically identified based on diagnostic characters such as a prominently elevated dorsal fin, deeply compressed translucent body, and standard meristic features, and were further verified using regional taxonomic keys.

The detection of *P. lala* in the Upper Krishna Basin may point to one of two possibilities: an anthropogenic introduction, potentially through the ornamental fish trade or inadvertent release via aquaculture systems, or a previously undocumented natural dispersal, indicating a broader ecological tolerance and adaptability than previously recognized.

This study not only contributes to the ichthyofaunal inventory of the Krishna River Basin but also underscores the importance of regular biodiversity surveys in detecting biogeoc anomalies and informing conservation efforts. Continued research is essential to understand the population dynamics, reproductive ecology, and potential ecological impacts of *P. lala* in this newly colonized habitat.

Keywords: Freshwater biodiversity; Western Ghats; aquarium release.

1. INTRODUCTION

The ornamental fish industry is an emerging and economically significant component of the global aquatic trade (Millington et al. 2022; Sandilyan 2022; Wood et al. 2022), appreciated not only for its commercial value but also for the aesthetic and therapeutic benefits associated with aquarium keeping (Tlustý 2002; Alam et al. 2024). Ornamental fishes, often described as "living jewels" due to their vivid coloration and graceful movements, are among the most popular pets worldwide—ranking just behind photoy as a recreational activity (Samal et al. 2024). These species are maintained in confined aquatic environments such as aquaria and garden ponds, contributing to mental well-being and stress relief, and are an integral part of the multi-billion-dollar global pet industry (Mendes et al. 2024; Shraborni et al. 2024).

India, despite being recognized as one of the top ten mega-diverse nations in terms of fish fauna (Moazzam & Osmany 2022; Sahil et al. 2024), contributes less than 1% to the global ornamental fish trade (Sinha & Pandey 2023). This underrepresentation exists despite the country's vast ichthyofaunal wealth, which includes over 2736 species, of which 1069 are freshwater fishes (Sarwade & More 2018; Ranjit et al. 2020; More 2022; Froese & Pauly 2023). The Indian ornamental fish trade is dominated by freshwater species, with the majority sourced from wild populations (Shraborni et al. 2024; Jain et al.n.d.; Jain & Karunasagarn.d.). Among these, the family *Ambassidae*, commonly referred to as glass perches (Moazzam & Osmany 2022), includes species that are of particular interest due to their distinct morphology and appeal in the aquarium trade (Padra. 2020).

One such species is *Parambassis lala* (Hamilton 1822), commonly known as the high-fin glassy perchlet. This small, translucent fish is appreciated for its ornamental value and is currently listed as Near Threatened by the International Union for Conservation of Nature (IUCN, 2023). Native to the eastern and northeastern parts of the Indian subcontinent, including Bangladesh, *P. lala* is typically found in lentic water bodies such as oxbow lakes, floodplain wetlands, and vegetated backwaters. The species' populations are in decline, primarily due to habitat degradation, pollution, unsustainable fishing practices, and other anthropogenic pressures.

The genus *Parambassis*, established by Bleeker in 1874, comprises a variety of small-bodied, semi-transparent freshwater fishes predominantly distributed across South and Southeast Asia (Eschmeyer et al. 2017; Fricke et al. 2018a). These fishes are usually associated with slow-moving or stagnant waters rich in aquatic vegetation, where they play a role in local ecosystems while also serving as valued ornamental species (André 1984; Anderson & Heemstra 2003).

In this context, the present study reports a significant range extension of *P. lala* to the Upper Krishna River Basin in Maharashtra, a previously undocumented region for this species. Located in the northern Western Ghats, this finding represents the first confirmed record of *P. lala* in this area. This unexpected occurrence prompts important biogeoc and ecological considerations it may indicate either a broader ecological tolerance than previously known or a recent, possibly anthropogenic introduction, potentially linked to the ornamental fish trade. The presence of *P. lala* in this new locale also

raises concerns regarding its potential ecological interactions with native fish species.

This report highlights the necessity of continued ichthyofaunal monitoring and biodiversity assessments, particularly in ecologically sensitive and biodiversity-rich regions such as the Western Ghats. Understanding the distribution dynamics of ornamental and potentially invasive species is critical for the development of effective conservation and management strategies in freshwater ecosystems.

2. MATERIALS AND METHODS

During an extensive ichthyofaunal survey conducted between January 2022 and December 2023 in the upper reaches of the Krishna River Basin, several fish specimens resembling the high-fin glassy perchlet, *Parambassis lala* (Hamilton, 1822), were collected for examination. The specimens were obtained from various locations within the Satara district of Maharashtra, specifically from local fish markets in Guruwar Peth, Karad (Latitude: 17.290038°N, Longitude: 74.181307°E), Saidapur (17.309106°N, 74.187988°E), and Umbraj (17.401000°N, 74.101559°E). These locations fall within the Upper Krishna River Basin and are known to be hubs for local fish trade, often reflecting the diversity of species found in surrounding aquatic ecosystems.

The collected specimens were immediately preserved in Absolute alcohol to maintain the integrity of morphological features necessary for accurate taxonomic identification. Each specimen was labeled with its corresponding collection date and site coordinates to ensure proper traceability and reference.

Identification of the specimens was conducted in the laboratory using a stereo-zoom binocular microscope, which allowed for detailed observation of minute morphological features essential for distinguishing closely related species within the genus *Parambassis*. A comprehensive morphometric analysis was performed, including measurements of standard length, total length, head length, body depth, dorsal and anal fin lengths, eye diameter, and interorbital width. Meristic counts such as fin ray numbers, scale rows, and gill rakers were also recorded to ensure accurate species-level identification.

For species confirmation, the collected data were compared with descriptions and diagnostic features outlined in standard ichthyological taxonomic keys (Jayaram 1999; Karmakar et al. 2012; Fricke et al. 2018b; Froese & Pauly 2023), as well as with recent regional checklists and monos. Diagnostic characteristics that matched *Parambassis lala* included a moderately compressed and translucent body, a relatively high dorsal fin, a deep body profile, and the specific arrangement and number of fin rays. These morphological features clearly distinguished the specimens from other sympatric species such as *Parambassis ranga* and *Parambassis dayi*, which are known to occur in parts of peninsular India.

To further support identification and reduce the possibility of misidentification, photos of the specimens were taken (Fig. 1), and comparative observations were conducted with reference specimens and images available from credible ichthyological databases and museum records.



Fig. 1. Lateral view of *P. lala*

The confirmed presence of *P. lala* in the Upper Krishna River Basin, a region previously not reported to harbor this species, marks a noteworthy range extension and contributes a new record to the ichthyofaunal inventory of the northern Western Ghats. These findings highlight the importance of market-based sampling in biodiversity assessments, especially in regions where in-situ sampling is limited by seasonal fluctuations, access constraints, or ecological disturbances.

3. RESULTS AND DISCUSSION

The collected specimens exhibited key diagnostic morphological characteristics consistent with the high-fin glassy perchlet, *Parambassis lala* (Hamilton, 1822). Notable features included a prominently elevated dorsal fin with elongated anterior rays, a semi-translucent body, and distinct pigmentation patterns localized on the caudal peduncle and operculum. These traits align closely with original species descriptions by Hamilton (1822) and subsequent taxonomic treatments by Jayaram (1999), confirming their identification as *P. lala*. This observation represents the first confirmed record of *P. lala* from the Krishna River basin. Previous studies and faunal surveys conducted in the Krishna River system have not documented the presence of *P. lala*. The absence of *P. lala* in earlier reports suggests either its recent range expansion, underreporting due to taxonomic oversight, or limited sampling in specific microhabitats where the species might occur. The current observation, therefore, represents a significant addition to the ichthyofaunal diversity of the Krishna River basin and highlights the need for more comprehensive and fine-scale biodiversity assessments in the region (Lakra et al. 2016; Koushlesh et al. 2021; Kumbar et al. 2021; Bhoi-Kamble & Kumbar 2025) and signifies a notable westward extension of its known distributional range. Historically, the species has been documented primarily from the Gangetic plains and associated river systems across eastern and northeastern India, with scattered occurrences in parts of Bangladesh. An earlier unconfirmed presence in Maharashtra was reported from the Dhule and Nandurbar districts by Patole & Jadhav (2017), and Shirdi, Ahmednagar district, Godavar river basin (Chowdhury et al. 2023), marking the first record for the state. However, the present study provides the first verifiable documentation from the Upper Krishna River Basin, within the northern Western Ghats.

The occurrence of *P. lala* in this previously undocumented locality raises important questions regarding its biogeoc dispersal. One plausible explanation is anthropogenic introduction, particularly through the ornamental fish trade, given the species' popularity in aquarium markets due to its attractive appearance and manageable size (Singh & Lakra 2011; Reid et al. 2013; Chan et al. 2019). Such introductions, whether intentional or accidental, have been increasingly implicated in altering freshwater fish communities across the Indian subcontinent.

Alternatively, this record may reflect an underappreciated natural dispersal capability or cryptic connectivity among drainage systems facilitated by episodic hydrological events or palaeogeoc processes. The potential for range expansion through natural mechanisms, although less commonly documented for *P. lala*, cannot be ruled out and warrants further investigation.

In either case, the presence of *P. lala* in the Upper Krishna Basin highlights the need for continued ichthyofaunal surveys, genetic analyses to trace population lineage, and ecological assessments to determine its potential impacts on native fish assemblages. Given the ecological sensitivity of the Western Ghats, a biodiversity hotspot with high endemism, the establishment of non-native or range-expanding species could have significant conservation implications.

4. CONCLUSION

The present study documents the first confirmed occurrence of *Parambassis lala* in the Upper Krishna River Basin, significantly extending the known western limit of its distribution. The identification was supported by key diagnostic features consistent with established taxonomic descriptions. While earlier reports suggested its presence in parts of northern Maharashtra, this study provides the first verifiable record from the Krishna Basin, thereby filling a critical gap in the biogeoc knowledge of the species.

The presence of *P. lala* in this region may be attributed either to anthropogenic introduction via the ornamental fish trade or to an overlooked natural dispersal potential. This finding underscores the importance of sustained ichthyological surveys and molecular studies to trace the origin and pathways of such range expansions. Moreover, in the context of the

ecologically sensitive Western Ghats, further ecological assessments are essential to evaluate the potential interactions of *P. lala* with native fish fauna and to anticipate any conservation concerns arising from its establishment in new habitats.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

- Alam, M., Abbas, K., Zehra, Z., & Kamil, F. (2024). Genetic advancement, global trade dynamics, persistent challenges and future prospects in ornamental fish culture. *Asian Journal of Research in Zoology*, 7(1), 32–46.
- Anderson, M. E., & Heemstra, P. C. (2003). Review of the glassfishes (Perciformes: Ambassidae) of the western Indian Ocean. *Cybiu*, 27(3), 199–209.
- André, L. (1984). *Ambassis bleekeri* nom. nov. et réhabilitation d'*Ambassis gymnocephalus* (Lacepède, 1801) (Pisces, Teleostei, Ambassidae).
- Bhoi-Kamble, A. V., & Kumbar, S. M. (2025). Diversity and threats of freshwater fishes of Yerla River, Northern Western Ghat, Maharashtra, India. *International Journal of Ecology and Environmental Sciences*.
- Chan, F. T., Beatty, S. J., Gilles Jr, A. S., Hill, J. E., Kozic, S., Luo, D., ... & Verreycken, H. (2019). Leaving the fish bowl: The ornamental trade as a global vector for freshwater fish invasions. *Aquatic Ecosystem Health & Management*, 22(4), 417–439.
- Chowdhury, B. R., Tudu, A. K., Singh, P., Rath, S., & Kosygin, L. (2023). First record of the highfin glassy perchlet, *Parambassis lala* from Maharashtra, India. *Life Science Bulletin* (1 & 2), 01–02.
- Eschmeyer, W. N., Fricke, R., & Van der Laan, R. (2017). *Catalog of fishes: Genera, species, references*.
- Fricke, R., Eschmeyer, W. N., & Van der Laan, R. (2018a). *Catalog of fishes: Genera, species, references*. California Academy of Sciences, San Francisco, CA, USA.
- Fricke, R., Eschmeyer, W. N., & Van der Laan, R. (2018b). *Catalog of fishes: Genera, species, references*. California Academy of Sciences, San Francisco, CA, USA.
- Froese, R., & Pauly, D. (2023, June). *FishBase*. World Wide Web Electronic Publication.
- Hamilton, F. (1822). *An account of the fishes found in the river Ganges and its branches* (Vol. 1). Archibald Constable.
- Jain, A. K., & Karunasagar, I. (n.d.). Ornamental fish and aquarium trade in the globalized world (pp. 1–70). In *Ornamental Fisheries and Aquarium Keeping*. CRC Press.
- Jain, A. K., Kaur, V. I., & Rane, A. J. (n.d.). Impact of exotic ornamental fishes on aquatic resources of India (pp. 267–289). In *Ornamental Fisheries and Aquarium Keeping*. CRC Press.
- Jayaram, K. C. (1999). *The freshwater fishes of the Indian region*.
- Karmakar, A. K., Yadav, B. E., Bairagi, N., & Jadhav, S. S. (2012). Freshwater fishes of Maharashtra (pp. 247–367). In *Freshwater fishes of Maharashtra*.
- Koushlesh, S., Sajina, A. M., & Roshith, C. M. (2021). Ichthyofaunal diversity of the major Indian rivers: A review. *Journal of the Inland Fisheries Society of India*, 53(1 & 2), 22–35.
- Kumbar, S. M., Jadhav, S. S., Lad, S. B., Ghadage, A., Patil, S. S., & Shankar, C. S. (2021). On the freshwater fish fauna of Krishna River, Sangli District, Maharashtra, India. *Journal of Threatened Taxa*, 13(8), 19093–19101.
- Lakra, W. S., Singh, M., Goswami, M., Gopalakrishnan, A., Lal, K. K., Mohindra, V., ... & Ayyappan, S. (2016). DNA barcoding Indian freshwater fishes. *Mitochondrial DNA Part A*, 27(6), 4510–4517.

- Mendes, L. F., Calado, J. F., Feitosa, C. V., Gurjão, L. M., Gouveia, M. T. J., Rocha, L. M., & Barreto, L. M. (2024). Tourism, environmental education, and aquarium trade (pp. 281–316). In R. K. P. Kikuchi, Z. M. A. N. Leão, M. E. De Araújo, & T. M. C. Lotufo (Eds.), *Brazilian Coral Reefs*. Springer International Publishing.
- Millington, M. D., Holmes, B., & Balcombe, S. R. (2022). Systematic review of the Australian freshwater ornamental fish industry: The need for direct industry monitoring. *Management of Biological Invasions*, 13(2), 406–434.
- Moazzam, M., & Osmany, H. B. (2022). A review of glassfishes (Family Ambassidae) from Pakistan. [Journal or publisher details missing]
- More, R. M. (2022). *Nutritional profiling and molecular phylogenetics of Hyporhamphus limbatus and Xenentodon cancila of Ujani Reservoir Maharashtra (India)* [PhD thesis].
- Padra, S. (2020). *Study on biology and growth performance of Parambassis lala (Hamilton, 1822) through feeding intervention* [PhD thesis]. Central Institute of Fisheries Education.
- Patole, S. S., & Jadhav, S. S. (2017). An overview of fishes of Dhule and Nandurbar districts, Maharashtra, India. *Records of the Zoological Survey of India*, 113–117.
- Ranjit, M. M., Jiwan, P. S., Monika, B. G., & Shubhda, S. R. (2020). Length-weight relationships of *Xenentodon cancila* (Hamilton, 1822) and *Hyporhamphus limbatus* (Valenciennes, 1847) from Bhima River of Maharashtra, India. *Journal of Aquatic Biology & Fisheries*, 8, 90–92.
- Reid, G. McG., Contreras MacBeath, T., & Csatádi, K. (2013). Global challenges in freshwater fish conservation related to public aquariums and the aquarium industry. *International Zoo Yearbook*, 47(1), 6–45.
- Sahil, Mogalekar, H. S., Lal, J., Nayak, S. K., & Kumar, S. (2024). Indigenous small fish diversity from selected wetlands of Eastern India (pp. 79–100). In A. Sinha, A. Roy, & P. Gogoi (Eds.), *Perspectives and Applications of Indigenous Small Fish in India*. Springer Nature Singapore.
- Samal, G., Dubey, S., Sahu, A., & Singh, M. K. (2024). Small indigenous fish species in India: Perspective on distribution, nutritional value, livelihood, conservation, and management (pp. 151–160). In *Handbook of Sustainable Aquaculture and Fisheries*.
- Sandilyan, S. (2022). Alien fish species in Indian inland wetlands: Current status and future challenges. *Wetlands Ecology and Management*, 30(2), 423–437.
- Sarwade, J. P., & More, R. M. (2018). Freshwater fish fauna of Pune District (MH): A review article. *JETIR*, 5(12).
- Shraborni, A., Mandal, S. C., & Parhi, J. (2024). Freshwater ornamental fishes of India: Sustainable management and conservation (pp. 155–173). In D. Sarma, S. Chandra, & S. K. Mallik (Eds.), *Aquaculture and Conservation of Inland Coldwater Fishes*. Springer Nature Singapore.
- Singh, A. K., & Lakra, W. S. (2011). Risk and benefit assessment of alien fish species of the aquaculture and aquarium trade into India. *Reviews in Aquaculture*, 3(1), 3–18.
- Sinha, A., & Pandey, P. K. (2023). *Breeding and culture of freshwater ornamental fish*. CRC Press.
- Thlusty, M. (2002). The benefits and risks of aquacultural production for the aquarium trade. *Aquaculture*, 205(3–4), 203–219.
- Wood, L. E., Guildler, J., Brennan, M. L., Birland, N. J., Taleti, V., Stinton, N., ... & Thrush, M. A. (2022). Biosecurity and the ornamental fish trade: A stakeholder perspective in England. *Journal of Fish Biology*, 100(2), 352–365.

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