New Record of Stinging Catfish, *Heteropneustes microps* (Gunther, 1864) from Vellayani Fresh Water Lake, Kerala, Southwest Coast of India

Reenamole, G. R.¹, Ambili, T.²

Department of Zoology, Zoology Research Centre, F. M. N. C., University of Kerala

Abstract: This paper documents the first record of the occurrence of stinging catfishes in Vellayani Freshwater Lake at Thiruvananthapuram district, Kerala, the southern part of Western Ghats region, which are native to Asia and endemic to Sri Lanka. Vellayani Lake, an important wetland in south India, is a natural habitat of freshwater and the livelihood of about 100 traditional fishermen depends on the fish resources of this lake. The one year fish diversity study from June 2013 to May 2014, revealed the occurrence of the stinging catfish in the lake. The morphological taxonomy proved that the specimen is *Heteropneustes microps*, Gunther, 1864 (Nelson, J.S, 1994; Allaby, M, 1991; Arunachalam et al., 1999; U Fowler 1937; Devi and Raghunathan, 1999; Easa & Shaji, 2003; Hubbs & Lagler, 2004) of the family Heteropneustidae. About 42 species of freshwater fishes have been documented from the lake by various authors, primarily from the Department of Aquatic Biology and Fisheries, University of Kerala (Biju Kumar et. al, 2013). From Heteropneustidae family, *Heteropneustes fossilis* (Bloch, 1794) had already been identified as the native of this lake. Another species, *Heteropneustes microps* (Gunther, 1864) is reported for the first time from this second largest fresh water lake in Kerala.

Keywords: Heteropneustidae, airsac catfishes, Heteropneustes microps, Vellayani Freshwater Lake

1. Introduction

The stinging catfishes, *Heteropneustes* spp. of family Heteropneustidae, are native to Asia, distributed in freshwater habitats of Bangladesh, India, Myanmar, Nepal, Pakistan, Sri Lanka, Thailand and Vietnam (Berra, 2007). According to Froese Rainer and Pauly Daniel (2011), *Heteropneustes microps* is a species of airsac catfish possibly endemic to Sri Lanka, though records from India have been made. These are inhabited in ponds, ditches, canals, flooded rice fields, swamps, marshes, waterlogged areas and rivers of India. Arunachalam et al. (1999) described the occurrence and morphology of *H. microps* from Western Ghats, India. In Kerala, *H. microps* is first recorded by Arunachalam et al. (1999) from Northern Kerala. It is reported by Easa & Shaji (2003) from inland waters of Trissur and Mananthavadyupuzha in Wayanad from Kerala.

*H. microps* is a peculiar looking and an air-breathing freshwater fish (Pethiyagoda, R. 1994). Pethiyagoda, R. (1991) said that it inhabits both fresh and brackish waters. A long air sac acts like a lung that extends back from the gill chamber and enables the catfish to breathe air (Nelson, J.S. 1994). The air breathing apparatus enables the fish to survive in low water depth, even in turbid and oxygen deficit conditions. This fish is also known as stinging catfish. This fish is a component of local commercial fisheries, as well as being found in the aquarium trade (Froese, Rainer and Pauly, 2011). These are commercially important due to high market price and nutritional value that is low fat content and source of high amount of iron and calcium.

Up to date, only *H. fossilis* (Fig. 2) is reported from Vellayani Freshwater Lake, in Kerala, Thiruvananthapuram (Biju Kumar and Pramod Kiran, 2013). In this study, a fish biodiversity survey during 2013 June – 2014 May, observed that two species of *Heteropneustes* occurred in the freshwater ecosystem of Vellayani Lake, clearly described as *H. microps* is a new species, reported for the first time from this lake.

2. Materials and Methods

2.1 Study Area

The Vellayani Freshwater Lake (8° 24’ 09”- 8° 26” 30” N and 76° 59’ 08”- 76° 59’ 47” E)/Thiruvananthapuram District in Kerala (Fig.1), is located 19 km away from the Thiruvananthapuram city. The Lake is situated 29 meters above mean sea level with a length of 3.15 km and width of 1km. The depth of the lake varies from 2 to 6 m. The lake is a rich repository of flora and fauna which support the livelihood of local people around it. The livelihood of about 100 traditional fishermen depends on the fish resources of the lake. Vellayani Lake is an important wetland in south India used by waterfowls, both as feeding and breeding grounds.

2.2 Sample Collection

During a fish biodiversity survey of Vellayani Freshwater Lake, observed a phenotypically different stinging catfish among catches of local fishers. Samples were collected using „Pattu Vala”, a type of seine net; during night. The adult specimens of this species were collected and brought to the Laboratory for taxonomic identification. Previously published descriptions available from the internet and the standard keys of Easa & Shaji, 2003 and Biju Kumar and Pramod Kiran, 2013, were used to make comparison with the newly described species. Further identification up to species level was carried out using the distinguishing characteristics provided by Nelson, J.S, 1994; Allaby, M, 1991; Arunachalam et al., 1999; U Fowler 1937; Devi and Raghunathan, 1999. Measurements were taken follow the published descriptions available from the internet and the standard keys of Easa & Shaji, 2003 and Biju Kumar and Pramod Kiran, 2013, were used to make comparison with the newly described species. Further identification up to species level was carried out using the distinguishing characteristics provided by Nelson, J.S, 1994; Allaby, M, 1991; Arunachalam et al., 1999; U Fowler 1937; Devi and Raghunathan, 1999. Measurements were taken follow the keys of Hubbs & Lagler, 2004. The identified specimen is
preserved at the Laboratory of the Fatima Mata National College, Kollam, under the University of Kerala.

Figure 1: Map of the Vellayani Freshwater Lake

3. Results and Discussions

The oviparous, airsac catfishes are in the genus of *Heteropneustes* (J. P. Muller, 1840) and are native to Asia. This genus is the only one in its family *Heteropneustidae* (Nelson, 2006). The tiny sized, airsac catfish are dreaded by local fishermen due to the sharp poisonous spine in each pectoral fin that can inflict a painful sting on any person wading in its territory (Nelson, J.S, 1994; Allaby, M, 1991). The pectoral fins also have an associated venom gland and are considered dangerous. The sample fish was confirmed as the genus *Heteropneustes*, based on the following characters (Nelson, J.S, 1994; Allaby, M, 1991; and Easa & Shaji, 2003).

- Their bodies are elongated and compressed with greatly depressed heads.
- Four pairs of barbels (fleshy projections) protrude from around the mouth.
- The dorsal fin is short and has no spine.
- A long anal fin on the rear underside of the body, and a rounded tail fin.
- In each pectoral fin has the sharp poisonous spine
- They have long air sacs that serve as lungs that extend from the gill chamber.

Ferreres (2007) and Hossain *et. al* (2013) described five nominal species of *Heteropneustes* genus are *Heteropneustes fossilis* (Bloch, 1794) from Tamil Nadu of India, *H. microps* (Gunther, 1864) from Dambuwa of Sri Lanka, *H. Kemratensis* (Fowler, 1937) from the Chao Praya River of Thailand, *H. longipectoralis* (Devi & Raghunathan, 1999) from Western Ghats of India and *Heteropneustes nani* (Hossain, Sarker, Sharifuzzaman & Chowdhury, 2013) from Noakhali, Bangladesh. The sample specimen was identified as *Heteropneustes microps* Gunther, 1864 (Fig.2) as per the keys provided by Nelson, J.S, 1994; Allaby, M, 1991; Arunachalam et al., 1999; U Fowler 1937; Devi and Raghunathan, 1999.

Key to species of *H. fossilis* and *H. Microps* are given below (U Fowler 1937; Arunachalam et al., 1999; Devi and Raghunathan, 1999).

- Body yellow or dark purplish-brown in above and lighter in ventral side, extended backward mouth, pectoral spine attached to rays by membrane with 3-4 antorse serrae along inner edge at anterior tip, and separated anal-caudal fin by a distinct notch [Tamil Nadu, India] .................................................................................................. *H. fossilis*
- Body depth equals to head length, terminal mouth with well developed lips, pectoral spine separated from rays and serrated along inner edge, and anal fin confluent with caudal without notch [Dambuwa, Sri Lanka] .................................................................................................. *H. microps*
Pethiyagoda & Bahir (1998) suggested *H. microps* as synonymous to *H. fossilis*, because the occurrence of fused conjoined anal and caudal fins, which is a distinct character of *H. microps*, may arise in wild populations (2%) of *Heteropneustes* due to an injury. This observation proved to be redundant by Arunachalam et al. (1999). However, *H. fossilis* and *H. microps* are the two widely recognized species and the former is better known (Berra, 2007; Nelson, 2006). According to him, the Synonyms of *H. fossilis* are *Silurus fossilis* (Bloch, 1794); *Silurus singio* (Hamilton-Buchanan, 1822); *Saccobranchus singio* (Cuvier & Valenciennes, 1831) and *Saccobranchus fossilis* (Muller & Henle, 1837; Gunther, 1864; Day, 1878). The Synonym of *H. microps* is *Saccobranchus microps* (Gunther, 1864; Day, 1878). The sample specimen was identified as *Heteropneustes microps*, based on the following characters.

- The sample fishes have the Total length (TL) of 13.7-15.5 centimetres.
- Body is dark brown.
- Ventral surface is lighter.
- The pectoral spine is Separated from rays and serrated along inner edge.
- Anal fin confluent with caudal without notch (Fig.2)
- Body depth equals to head length (3.5-3.7cm)
- terminal mouth with well developed lips

**Systematic Position of the *H. microps***

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<tr>
<th>Kingdom</th>
<th>Animalia</th>
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<tr>
<td>Phylum</td>
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<td>Grade</td>
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<td>Class</td>
<td>Actinopterygii</td>
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<td>Order</td>
<td>Siluriforms</td>
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<tr>
<td>Family</td>
<td>Heteropneustidae</td>
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This is a venomous fish. Incidentally, this type of fish is able to deliver a stinging protein, known as „poison“ originated from the venom glands around the pectoral spine (Satora et al., 2005). Reports exist of fatal encounters between humans and it in the wild. Realistically it should come with a “buyers beware” sticker (Rohan Pethiyagoda and Mohamed M. Bahir, 1998). In humans, catfish venoms, which are reported to be
neurotoxic and hemolytic that is destruction of red blood cells, can produce local numbness, inflammation and severe painful physical conditions of the limb under attack (Wright, 2009). Warm water bath, application of luke warm turmeric paste, ejection of blood, and traditional herbal medicine are commonly used for healing. Local fishers remain extremely cautious to avoid its sting (Hossain et al., 2013).

4. Conclusion

This airsac catfish is classified as Vulnerable (VU) on the IUCN Red List. There are no known conservation measures currently in place for the vulnerable airsac catfish. It is recommended that the monitoring and conservation of this species.

References


Author Profile

Reenamole G.R received the B.Sc. degree in Zoology from H.H.M.S.P.B.N.S.S.College for Women, Neeramankara. B.Ed in Natural Science has taken from Govt. Anchal College, Kollam. M.Sc. degree in Zoology took from Mahatma Gandhi College, Thiruvananthapuram. M. Phil in Aquatic Biology and Fisheries from the Department of Aquatic Biology & Fisheries in the University of Kerala, Kariavatoom in 2012: All the degrees were received from the University of Kerala, Thiruvananthapuram, India. She has published 14 research papers and designed a text book of “Vellayani Fish Census- a Field Guide and Report” (Author: Dr. A. Biju Kumar & Dr. Pramod Kiran R.B) published by Dept. of Aquatic Biology and Fisheries, University of Kerala and Supported by Agency of Development of Aquaculture, Kerala (ADAK) 2013. During 2008-2009, she worked as a Project Fellow in Central Marine Fisheries Research Institute in Vizhinjam, Thiruvananthapuram, Kerala, India. She now is doing Ph.D in Zoology at Zoology Research Centre, Department of Zoology, Fatima Mata National College, Kollam, University of Kerala, India.

Ambili. T received the B.Sc. degree in Zoology from Sree Narayana Womens College, kollam. M.Sc. degree in Zoology from Fatima Mata National College, Kollam. B.Ed taken in Natural Science and awarded SET also. She has taken DCA. In 2012, she took M. Phil in Aquatic Biology and Fisheries from the Department of Aquatic Biology & Fisheries in the University of Kerala, Kariavatoom. All the degrees were received from the University of Kerala, Thiruvananthapuram, India. She has published 14 research papers. She now is doing Ph.D in Zoology at Zoology Research Centre, Department of Zoology, Fatima Mata National College, Kollam, University of Kerala, India.