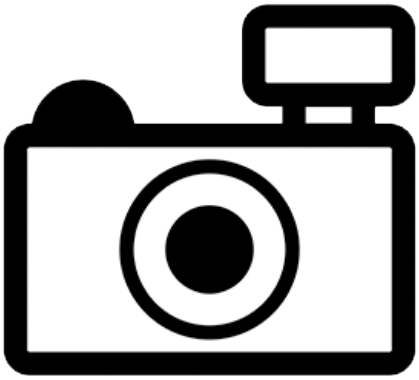
Heteropneustes microps (a catfish, no common name)
Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, December 2016
Revised, June 2017
Web Version, 1/14/2018



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1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2016):

"Asia: known to be endemic to Sri Lanka [Pethiyagoda 1991], but recorded from India [Talwar and Jhingran 1991; Shaji et al. 2000]."

Status in the United States

This species has not been reported as introduced or established in the U.S.

From FFWCC (2017):

"Prohibited nonnative species are considered to be dangerous to the ecology and/or the health and welfare of the people of Florida. These species are not allowed to be personally possessed or used for commercial activities. Very limited exceptions may be made by permit from the Executive Director […]
Freshwater Aquatic Species […]
Airsac catfishes - Family Heteropneustidae […]
Heteropneustes microps"

Means of Introduction into the United States

This species has not been reported as introduced or established in the U.S.

Remarks

From Chakraborty and Ghosh (2014):

"Interestingly, *H. microps* (type locality: Dambuwa, Sri Lanka) is distinguished from its nominal congeners *H. fossilis* only by its caudal and anal fins being confluent (vs. separate) (Günther, 1864). It has long been considered as synonymous species of *H. fossilis* (Ferraris, 2007). Pethiyagoda […] stated that *H. microps* is a result of anomalous fin regeneration in *H. fossilis*, injury being one of the possible cause and considered *H. microps* a junior synonym of *H. fossilis* (Pethiyagoda […] 1991). However, there are also reports of these two species being sympatric thus reducing chances of hybridization between the two species. In our study, one individual of *H. fossilis* has clustered away from rest of the 13 individuals of *H. fossilis* with divergence in congeneric range and has clustered with *H. microps* with low divergence, which creates the contention that *H. microps* is a distinct species and the doubtful sequence of *H. fossilis* is mislabeled."

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2016):

"Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Osteichthys
Class Actinopterygii
Subclass Neopterygii
Infraclass Teleostei
Superorder Ostariophysi
Order Siluriformes
Family Heteropneustidae
Genus *Heteropneustes*
Species *Heteropneustes microps* (Günther, 1864)"

"Current Standing: valid"

Size, Weight, and Age Range

From Froese and Pauly (2016):

"Max length : 15.0 cm TL male/unsexed; [Pethiyagoda 1991]"

Environment

From Froese and Pauly (2016):

"Freshwater; brackish; demersal. […] Enter brackish water."

"[…] 22°C - 26°C [Baensch and Riehl 1985; assumed to be recommended aquarium water temperature]"

Climate/Range

From Froese and Pauly (2016)

"Tropical; […] 8°N - 7°N"

"Can survive temperatures up to 39.8°C [Vasal and Raj 1978]."

Distribution Outside the United States

Native

From Froese and Pauly (2016):

"Asia: known to be endemic to Sri Lanka [Pethiyagoda 1991], but recorded from India [Talwar and Jhingran 1991; Shaji et al. 2000]."

Introduced

This species has not been reported as introduced or established outside of its native range.

Means of Introduction Outside the United States

This species has not been reported as introduced or established outside of its native range.

Short Description

From Hossain et al. (2013):

"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 […]"

Biology

From Froese and Pauly (2016):

"Adults occur mainly in swamps and similar still, often turbid waters (e.g. irrigation ditches). Form loose schools of about ten individuals of approximately the same size. […] An omnivore with nocturnal feeding habits. Oviparous, distinct pairing possibly like other members of the same family [Breder and Rosen 1966]. Very easily maintained in captivity. Sympatric with *H. fossilis* which is more abundant in the type locality. Best method of catch is dewatering of small water holes during drought period."

"Eggs of about 2 mm diameter are laid in lumps in a gravel nest. The parents guard the eggs and the youngs."

From Hossain et al. (2013):

"The air-breathing apparatus enables the fish to survive in low water depth, even in turbid and oxygen deficit conditions."

Human Uses

From Froese and Pauly (2016):

"Fisheries: commercial; aquarium: commercial"

From Hossain et al. (2013):

"The fishes are commercially important due to high market price and nutritional value, i.e. low fat content, and source of high amount of iron and calcium."

Diseases

No OIE reportable diseases have been documented for this species.

Threat to Humans

From Hossain et al. (2013):

"[…] this type of fish is able to deliver a stinging protein (known as poison) emanated from the venom glands around the pectoral spine (Satora et al., 2005). In humans, catfish venoms, which are reported to be neurotoxic and hemolytic (i.e. 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."

3 Impacts of Introductions

This species has not been reported as introduced or established outside of its native range.

From FFWCC (2017):

"Prohibited nonnative species are considered to be dangerous to the ecology and/or the health and welfare of the people of Florida. These species are not allowed to be personally possessed or used for commercial activities. Very limited exceptions may be made by permit from the Executive Director […]
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Airsac catfishes - Family Heteropneustidae […]
Heteropneustes microps"

4 Global Distribution

Figure 1. Part of known global distribution of *Heteropneustes microps.* Map from GBIF (2016). The type locality in Dambuwa, Sri Lanka (Hossain et al. 2013) and another collection locality near Tirunelveli, Tamil Nadu, India (Sridhar and Haniffa 1999) are not shown.

5 Distribution Within the United States

This species has not been reported as introduced or established in the U.S.

6 Climate Matching

Summary of Climate Matching Analysis

The climate match (Sanders et al. 2014; 16 climate variables; Euclidean Distance) was low throughout the contiguous United States except for southern peninsular Florida and the far southern point of Texas, where the match was medium. Climate 6 proportion indicated that the contiguous U.S. has a low climate match overall. The range of proportions indicating a low climate match is 0.000 to 0.005; the Climate 6 proportion for *Heteropneustes microps* was 0.000.

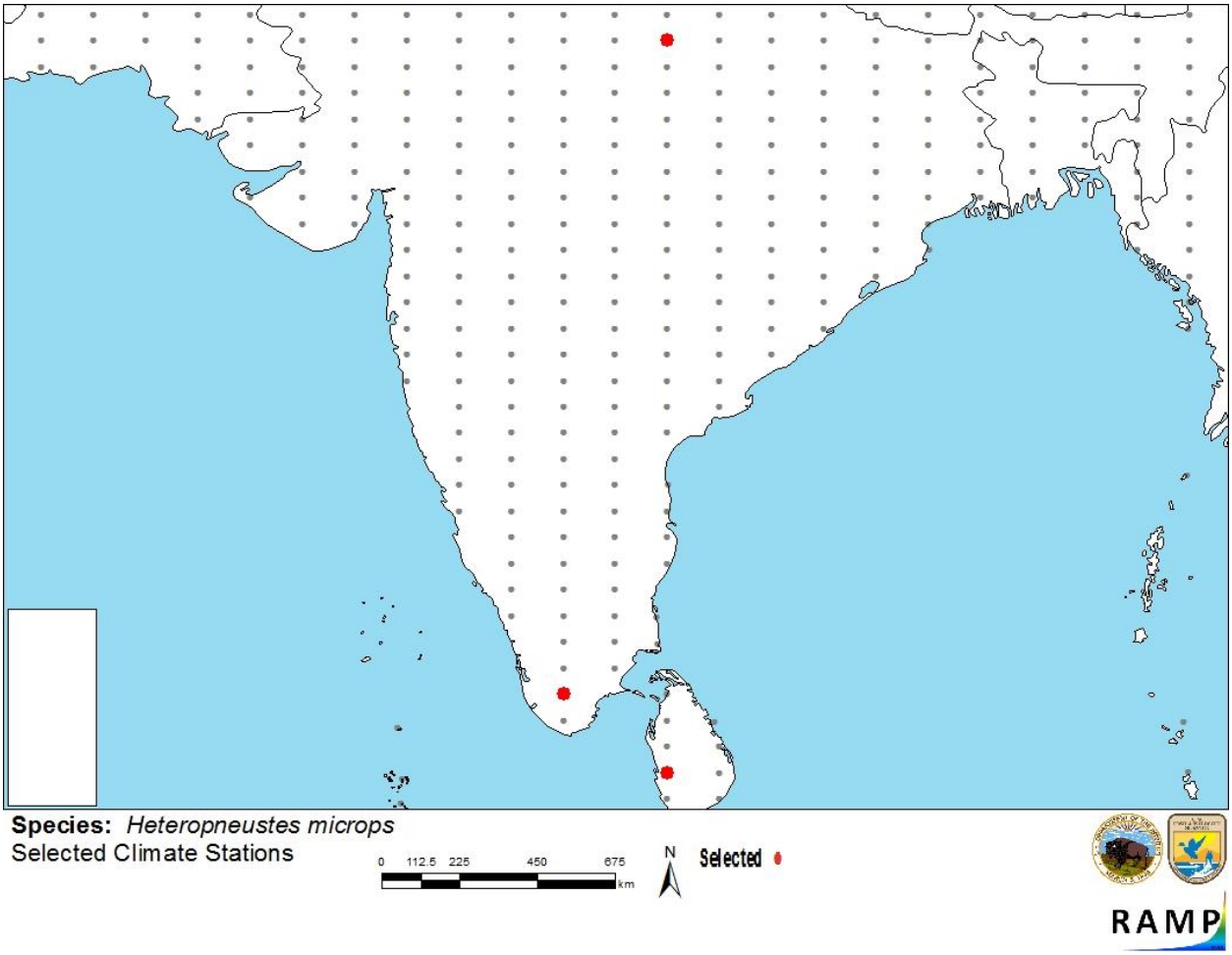

Figure 2. RAMP (Sanders et al. 2014) source map of southern Asia showing weather stations selected as source locations (red) and non-source locations (gray) for *Heteropneustes microps* climate matching. Source locations from Sridhar and Haniffa (1999), Hossain et al. (2013), and GBIF (2016).

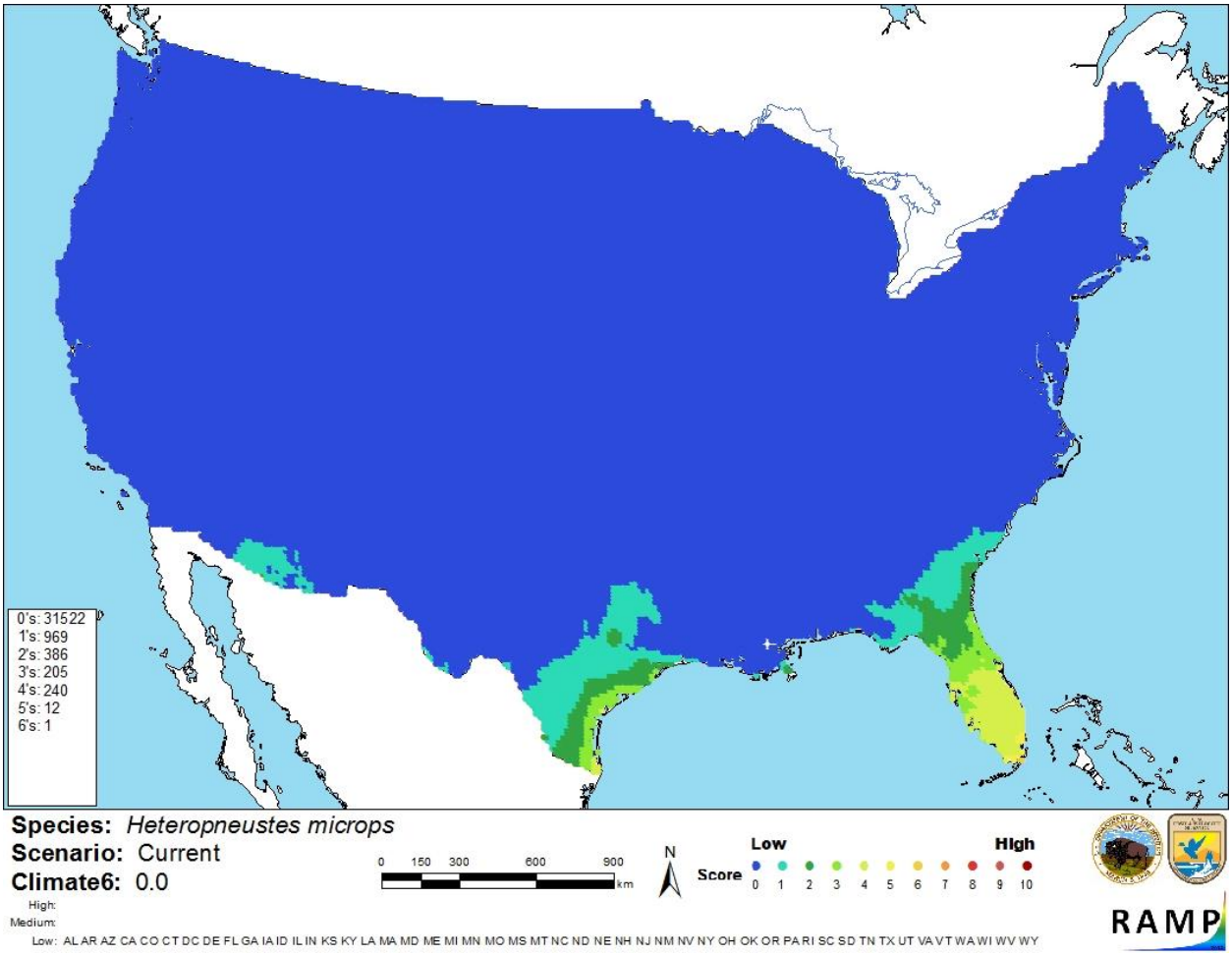

Figure 3. Map of RAMP (Sanders et al. 2014) climate matches for *Heteropneustes microps* in the contiguous United States based on source locations reported by Sridhar and Haniffa (1999), Hossain et al. (2013), and GBIF (2016). 0=Lowest match, 10=Highest match. Counts of climate match scores are tabulated on the left.

The "High", "Medium", and "Low" climate match categories are based on the following table:

Climate 6: Proportion of (Sum of Climate Scores 6-10) / (Sum of total Climate Scores)	Climate Match Category
$0.000 \leq X \leq 0.005$	Low
$0.005 < X < 0.103$	Medium
≥ 0.103	High

7 Certainty of Assessment

There is limited information available on the biology and distribution of *Heteropneustes microps*, and the species has been the subject of taxonomic uncertainty. Further information is needed to conduct a thorough assessment of the risk and potential negative impacts of this species outside of its native range. Certainty of this assessment is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Heteropneustes microps is native to Sri Lanka and India and is not known to have been introduced outside of its native range. The species has been the subject of a taxonomic debate and some authors have considered the name to be a synonym for *H. fossilis*, although recent genetic data suggest that the two taxa are indeed distinct species. *H. microps* has a low climate match to the United States overall, with medium climate match in southern Florida. Overall risk assessment category for this species is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 3): Uncertain**
- **Climate Match (Sec. 6): Low**
- **Certainty of Assessment (Sec. 7): Low**
- **Overall Risk Assessment Category: Uncertain**

9 References

Note: The following references were accessed for this ERSS. References cited within quoted text but not accessed are included below in Section 10.

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10 References Quoted But Not Accessed

Note: The following references are cited within quoted text within this ERSS, but were not accessed for its preparation. They are included here to provide the reader with more information.

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