Hypostomus papariae (a catfish, no common name)
Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, February 2013
Revised, September 2018
Web Version, 4/22/2019

Photo: J. L. C. Novaes. Licensed under Creative Commons (BY-NC 3.0). Available: https://www.fishbase.de/photos/PicturesSummary.php?ID=48944&what=species. (September 2018).

1 Native Range and Status in the United States

Native Range

From Fricke et al. (2018):

"Grande do Norte River basin, Brazil."

Fowler (1941) describes the holotype and a paratype from Lago Papary, Rio Grande do Norte, Brazil, and two paratypes from Rio Choró, Ceará, Brazil.

Status in the United States

This species has not been reported as introduced or established in the United States. However, unidentified members of the genus are established in the United States.

From Nico et al. (2018):

"Several morphologically distinct but unidentified *Hypostomus* species have been recorded as established in the United States: these included populations in Indian Springs in Nevada; Hillsborough County in Florida; and the San Antonio River and San Felipe Creek in Texas (Courtenay and Deacon 1982; Courtenay et al. 1984, 1986; Courtenay and Stauffer 1990; Page and Burr 1991; López-Fernández and Winemiller 2005). A population of an unidentified *Hypostomus* species is firmly established in Hawaii (Devick 1991a, b). Reported from Arizona, Colorado, Connecticut, Louisiana, and Pennsylvania. Failed in Connecticut, Massachusetts, and Pennsylvania."

This species was not found for sale from U.S.-based online aquarium retailers and it does not appear to be in trade in the United States.

Means of Introductions in the United States

This species has not been reported as introduced or established in the United States. However, unidentified members of the genus are established in the United States.

From Nico et al. (2018):

"Members of this genus have been introduced through a combination of fish farm escapes or releases, and aquarium releases (Courtenay and Stauffer 1990; Courtenay and Williams 1992). In Texas, the initial introduction occurred when *Hypostomus* entered local streams after escaping from pool and canal systems of the San Antonio Zoological Gardens in or before 1962 (Barron 1964); the Comal County introduction was probably due to an aquarium release (Whiteside and Berkhouse 1992)."

Remarks

From Nico et al. (2018):

"The genus *Hypostomus* contains about 116 species (Burgess 1989). Highlighting the serious need for additional taxonomic and systematic work, Armbruster (1997) concluded that it is currently impossible to identify most species in the genus. Several apparently different *Hypostomus* species have been collected in the United States but not definitively identified to species level (Page and Burr 1991; Courtenay and Stauffer 1990). Distinguishing characteristics of the genus and a key to loricariid genera were provided by Burgess (1989) and Armbruster (1997). Photographs appeared in Burgess (1989) and Ferraris (1991). *Hypostomus* has officially replaced the generic name *Plecostomus*. The genus was included in the key to Texas fishes of Hubbs et al. (1991) and several identifying traits were also given by Page and Burr (1991)."

According to Fricke et al. (2018), the original name of this species was *Plecostomus plecostomus papariae*. Information searches for this report were conducted using both the original name and the currently accepted scientific name.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2018):

"Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Actinopterygii
Class Teleostei
Superorder Ostariophysi
Order Siluriformes
Family Loricariidae
Subfamily Hypostominae
Genus *Hypostomus*
Species *Hypostomus papariae* (Fowler, 1941)"

"Current Standing: valid"

Size, Weight, and Age Range

From Froese and Pauly (2018):

"Max length: 11.4 cm TL male/unsexed; [Weber 2003]"

Environment

From Froese and Pauly (2018):

"Freshwater; demersal."

Climate/Range

From Froese and Pauly (2018):

"Tropical"

Distribution Outside the United States

Native

From Fricke et al. (2018):

"Grande do Norte River basin, Brazil."

Fowler (1941) describes the holotype and a paratype from Lago Papary, Rio Grande do Norte, Brazil, and two paratypes from Rio Choró, Ceará, Brazil.

Introduced

No introductions of this species have been reported.

Means of Introduction Outside the United States

No introductions of this species have been reported.

Short Description

From Fowler (1941):

"Depth 4⅗ to 4¾; head 3½ to 4, length 1⅙ to 1⅕ in its width. Snout (in profile) l 2/7 to 1⅖ in head; eye 4¾ to 5, 3⅕ to 3¼ in snout, 2½ to 2 4/7 in inter- orbital; mouth width 2 to 2⅕ in head; buccal disk width subequal with interorbital, with broad papillate lower lips and upper also papillate; each side of lower buccal disk short cirrus slightly shorter than pupil; 22 slender curved teeth each side of upper jaw and 25 similar ones each side below; interorbital 1⅚ to 1⅞ in head, depressed. Gill opening small, twice eye diameter, with lower part below eye."

"Scutes 23 or 24+2 in lateral series; 6 transversely between dorsal and ventral origin, 3 predorsal. Scutes without keels or ridges, or spines. Scales on chest small, in short narrow transverse median area, with short extension each side from before gill opening. Very small scales form cuboid area over fore part of belly with narrow median constricted band posteriorly. Occipital extension forms rather short broad point."

"D. I, 7, spine 1+¼ times head, terminally flexible; adipose fin 2⅓ in head, with large spine; A. I, 4, first branched ray 2 to 2⅛; least depth of caudal peduncle 2½ to 3; caudal 2⅛ to 2⅗ in rest of fish, emarginate chiefly above and upper lobe shorter; pectoral 2¾ to 3, rays I, 6; ventral I, 5, fin equals head."

"Color in alcohol dark umber, but little paler on under surface of head and belly. Iris dark gray-brown. Fins all more or less dark, or membranes dark to dusty gray. Dorsal with 2 rows of black spots on each membrane and each row close or next to fin ray, with row immediately before fin ray darker or black. Two dark spots on adipose fin. Three suffused dark bands on anal. Caudal with 6 obscure transverse dark bands. Pectoral with 7 black spots in row on outermost membrane and only few on inner membranes. Ventral with black spots like those on pectoral."

Biology
No information available.

Human Uses
No information available.

Diseases

No information available. No OIE-reportable diseases have been documented in this species.

Threat to Humans
From Froese and Pauly (2018):

"Harmless"

3 Impacts of Introductions

No introductions of *H. papariae* have been reported outside its native range so no impacts of introduction are known. However, unidentified members of the genus are established in the United States.

From Nico et al. (2018):

"The effects of these loricariid catfish is largely unknown. In Texas, Hubbs et al. (1978) reported possible local displacement of algae-feeding native fishes such as *Campostoma anomalum* by *Hypostomus*, and López-Fernández and Winemiller (2005) suggest that reductions in *Dionda diaboli* abundance in portions of San Felipe Creek are due to population increases of *Hypostomus*. Because of their abundance in Hawaii, introduced *Hypostomus*, *Pterygoplichthys*, and *Ancistrus* may compete for food and space with native stream species (Devick 1989; Sabaj and Englund 1999)."

4 Global Distribution

Figure 1. Known global distribution of *H. papariae*. Map from VertNet (2018).

5 Distribution within the United States

There is currently no known distribution of *Hypostomus papariae* within the United States; however, unidentified species of *Hypostomus* are established in Nevada, Florida, Texas, and Hawaii.

6 Climate Matching

Summary of Climate Matching Analysis

The climate match (Sanders et al. 2018; 16 climate variables; Euclidean Distance) was medium in southern Texas and southern coastal California. The remainder of the contiguous United States had a low climate match. Climate 6 score indicated that the contiguous United States was low overall. Scores of 0.005 and below are classified as low match; Climate 6 score for *H. papariae* was 0.000.

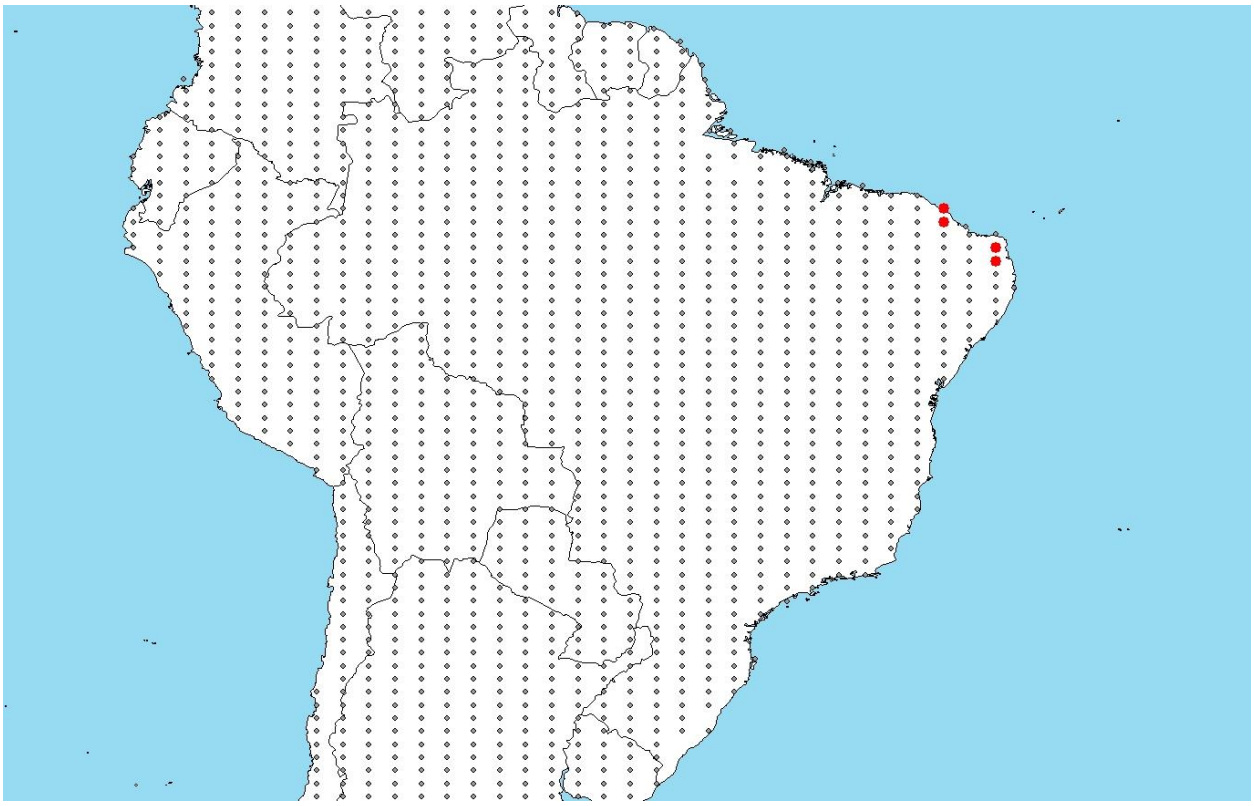

Figure 2. RAMP (Sanders et al. 2018) source map showing weather stations selected as source locations (red; Brazil) and non-source locations (gray) for *H. papariae* climate matching. Source locations from Froese and Pauly (2018).

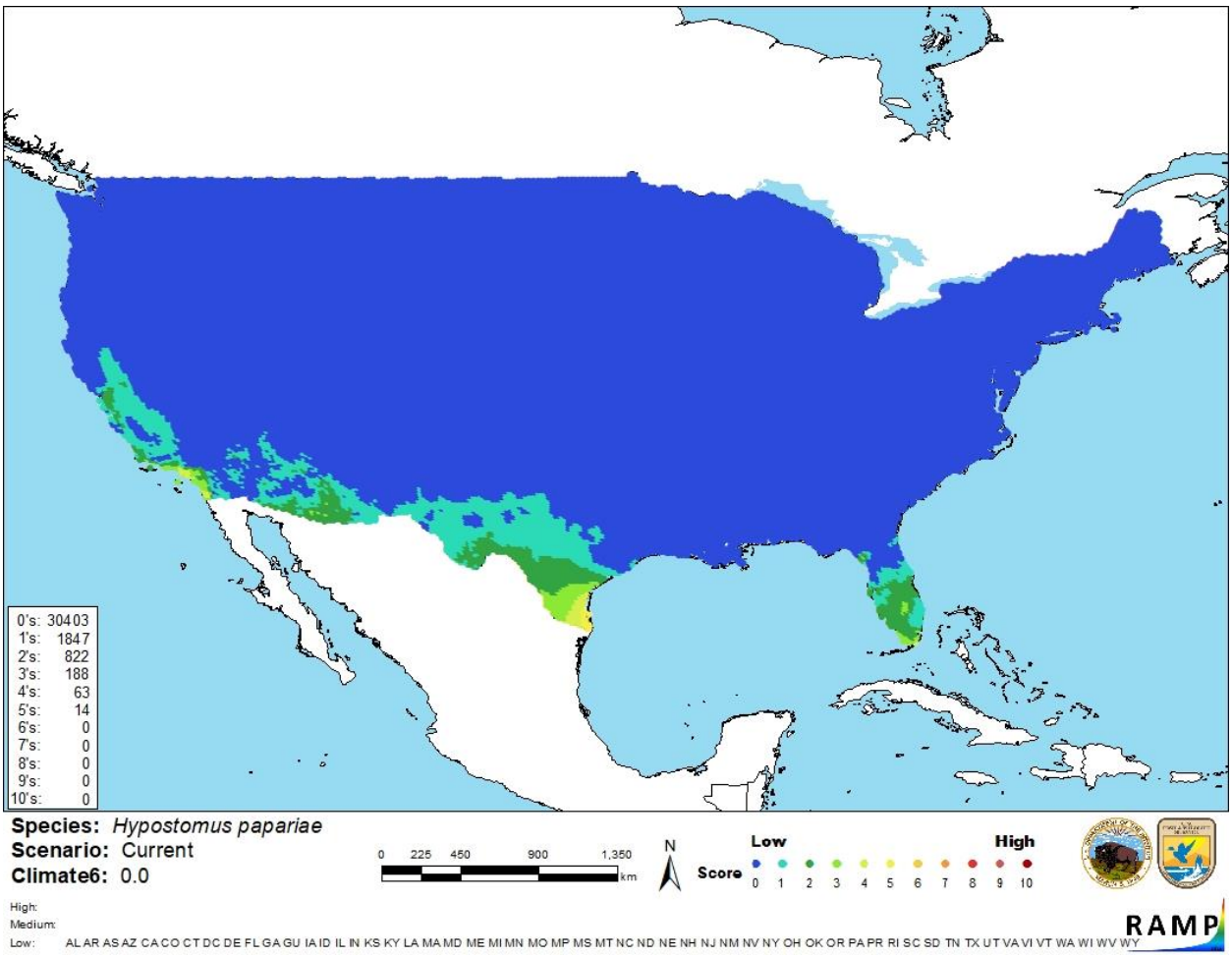

Figure 3. Map of RAMP (Sanders et al. 2018) climate matches for *H. papariae* in the contiguous United States based on source locations reported by Froese and Pauly (2018). 0= Lowest match, 10= Highest match.

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≤X≤0.005	Low
0.005<X<0.103	Medium
≥0.103	High

7 Certainty of Assessment

Limited information was available on the biology and ecology of *H. papariae*. It has not been reported as introduced outside its native range, so no impacts of introduction are known. However, unidentified species of *Hypostomus* have become established in the United States, and it is possible that one or more of those populations could be identified later as *H. papariae*. There is considerable uncertainty about the taxonomy of this genus and about species-level identification. Certainty of this assessment is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Hypostomus papariae is a catfish native to the states of Rio Grande do Norte and Ceará, eastern Brazil. This species has no documented history of introduction in the United States or elsewhere outside its native range. However, unidentified species of *Hypostomus* are established in the United States. *H. papariae* does not appear to be present in trade in the United States or elsewhere. Climate match was low throughout the contiguous United States. Because of the lack of documented introduction history and substantial taxonomic uncertainty, certainty of this assessment is low and overall risk 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.

Fowler, H. W. 1941. A collection of fresh-water fishes obtained in eastern Brazil by Dr. Rodolpho Von Ihering. Proceedings of the Academy of Natural Sciences of Philadelphia 93:123-199, 336.

Fricke, R., W. N. Eschmeyer, and R. van der Laan, editors. 2018. Catalog of fishes: genera, species, references. Available: http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp. (September 2018).

Froese, R., and D. Pauly, editors. 2018. *Hypostomus papariae* (Fowler, 1941). FishBase. Available: https://www.fishbase.de/summary/Hypostomus-papariae.html. (September 2018).

ITIS (Integrated Taxonomic Information System). 2018. *Hypostomus papariae* (Fowler, 1941). Integrated Taxonomic Information System, Reston, Virginia. Available: https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=680216#null. (September 2018).

Nico, L, P. Fuller, and M. Neilson. 2018. *Hypostomus sp.* Lacepède, 1803. USGS Nonindigenous Aquatic Species Database, Gainesville, Florida. Available: https://nas.er.usgs.gov/queries/FactSheet.aspx?SpeciesID=762. (September 2018).

Sanders, S., C. Castiglione, and M. Hoff. 2018. Risk Assessment Mapping Program: RAMP, version 3.1. U.S. Fish and Wildlife Service.

VertNet. 2018. VertNet. Available: http://vertnet.org/. (September 2018).

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.

Armbruster, J. W. 1997. Phylogenetic relationships of the sucker-mouth armored catfishes (Loricariidae) with particular emphasis on the Ancistrinae, Hypostominae, and Neoplecostominae. Doctoral dissertation. University of Illinois, Champaign-Urbana, Illinois.

Barron, J. L. 1964. Reproduction and apparent over-winter survival of the sucker-mouth armoured catfish, *Plecostomus* sp., in the headwaters of the San Antonio River. The Texas Journal of Science 16:449.

Burgess, W. E. 1989. An atlas of freshwater and marine catfishes: a preliminary survey of the Siluriformes. Tropical Fish Hobbyist Publications, Inc., Neptune City, New Jersey.

Courtenay, W. R., Jr., and J. E. Deacon. 1982. Status of introduced fishes in certain spring systems in southern Nevada. Great Basin Naturalist 42(3):361-366.

Courtenay, W. R., Jr., D. A. Hensley, J. N. Taylor, and J. A. McCann. 1984. Distribution of exotic fishes in the continental United States. Pages 41-77 *in* W. R. Courtenay, Jr., and J. R. Stauffer, Jr, editors. Distribution, biology, and management of exotic fishes. John Hopkins University Press, Baltimore, Maryland.

Courtenay, W. R., Jr., D. A. Hensley, J. N. Taylor, and J. A. McCann. 1986. Distribution of exotic fishes in North America. Pages 675-698 *in* C. H. Hocutt, and E. O. Wiley, editors. The zoogeography of North American freshwater fishes. John Wiley and Sons, New York.

Courtenay, W. R., Jr., and J. R. Stauffer. 1990. The introduced fish problem and the aquarium fish industry. Journal of the World Aquaculture Society 21(3):145-159.

Courtenay, W. R., Jr., and J. D. Williams. 1992. Dispersal of exotic species from aquaculture sources, with emphasis on freshwater fishes. Pages 49-81 *in* A. Rosenfield, and R. Mann, editors. Dispersal of living organisms into aquatic ecosystems. Maryland Sea Grant, College Park, Maryland.

Devick, W. S. 1989. Disturbances and fluctuations in the Wahiawa Reservoir ecosystem. Project no. F-14-R-13, Job 4, Study I. Division of Aquatic Resources, Hawaii Department of Land and Natural Resources.

Devick, W. S. 1991a. Disturbances and fluctuatuions in the Wahiawa Reservoir ecosystem. Project no. F-14-R-15, Job 4 Study I. Division of Aquatic Resources, Hawaii Department of Land and Natural Resources.

Devick, W.S. 1991b. Patterns of introductions of aquatic organisms to Hawaiian freshwater habitats. Pages 189-213 *in* New directions in research, management and conservation of Hawaiian freshwater stream ecosystems. Proceedings of the 1990 symposium on freshwater stream biology and fisheries management. Division of Aquatic Resources, Hawaii Department of Land and Natural Resources.

Ferraris, C. J., Jr. 1991. Catfish in the aquarium. Tetra Press, Morris Plains, New Jersey.

Hubbs, C., R. J. Edwards, and G. P. Garrett. 1991. An annotated checklist of freshwater fishes of Texas, with key to identification of species. Texas Journal of Science, Supplement 43(4):1-56.

Hubbs, C., T. Luciere, G. P. Garrett, R. J. Edwards, S. M. Dean, and E. Marsh. 1978. Survival and abundance of introduced fishes near San Antonio, Texas. The Texas Journal of Science 30(4):369-376.

López-Fernández, H., and K. O. Winemiller. 2005. Status of *Dionda diaboli* and report of established populations of exotic fish species in lower San Felipe Creek, Val Verde County, Texas. Southwestern Naturalist 50(2):246-251.

Nichols, J. T. 1919. “Cascudos” brazileiros do genero *Plecostomus* do Museu Paulista. [Brazilian catfishes of the genus *Plecostomus* from the Museu Paulista.] Revista do Museu Paulista 11:409-426 [1-8+1-8]. (In Portuguese and English.)

Page, L. M., and B. M. Burr. 1991. A field guide to freshwater fishes of North America north of Mexico. The Peterson Field Guide Series, volume 42. Houghton Mifflin Company, Boston.

Sabaj, M. H., and R. A. Englund. 1999. Preliminary identification and current distribution of two suckermouth armored catfishes (Loricariidae) intrdouced to Oahu streams. Bishop Museum Occasional Papers 59:50-55.

Weber, C. 2003. Loricariidae - Hypostominae (armored catfishes). Pages 351-372 *in* R. E. Reis, S. O. Kullander, and C. J. Ferraris, Jr., editors. Checklist of the freshwater fishes of South and Central America. EDIPUCRS, Porto Alegre, Brazil.

Whiteside, B. G., and C. Berkhouse. 1992. Some new collections locations for six fish species. The Texas Journal of Science 44(4):494.