

Peppered Corydoras (*Corydoras paleatus*)

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, July 2017
Revised, September 2017
Web Version, 11/30/2017



Photo: P. Malkowski. Licensed under Creative Commons (CC BY). Available: http://eol.org/data_objects/32395048. (September 2017).

1 Native Range and Status in the United States

Native Range

From Tencatt et al. (2016):

“*Corydoras paleatus* is known from the lower rio Paraná basin in Argentina, coastal rivers from Southern Brazil, Rio Grande do Sul State, and Uruguay, rio de La Plata basin in Argentina and Uruguay, and rio Uruguay basin in Uruguay [...]”

Status in the United States

This species has not been reported as introduced or established in the United States. This species is present in the aquarium trade in the U.S.

From ScotCat (2015):

“[...] the vast majority seen in the pet shops are being bred in the far east, mainly Singapore and also the United States, in the state of Florida.”

From Doctors Foster and Smith (2017):

“Peppered Cory Cat
(*Corydoras paleatus*)
Starting at \$4.89
IN STOCK”

Doctors Foster and Smith is based in Rhinelander, Wisconsin.

From Imperial Tropicals (2015):

“Up for sale are Paleatus Corydoras. These are a beautiful, marble colored addition to your community tank at home. These do best in groups of three or more and will help clean up the bottom of your tank. They are very peaceful in nature. They will be approximately 1" or larger in size.
\$ 7.99”

Imperial Tropicals is based in Lakeland, Florida.

Means of Introductions in the United States

This species has not been reported as introduced or established in the United States.

Remarks

From ITIS (2017):

“Synonym(s): *Callichthys paleatus* Jenyns, 1842
Corydoras marmoratus Steindachner, 1879”

From Tencatt et al. (2016):

“[...] based on the original description by Regan (1912) and on the analysis of the lectotype of *C. microcephalus*, it was possible to observe the presence of a longitudinal series of four to five large black blotches along midline of flank, clearly distinguishing this species from *C. paleatus*, which presents only three blotches. [...] For now, the most reasonable decision is to consider *C. microcephalus* as valid and removing it from *C. paleatus* synonymy until further analysis be performed.”

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2017):

“Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Deuterostomia
Phylum Chordata
Subphylum Vertebrata
Infraphylum Gnathostomata
Superclass Actinopterygii
Class Teleostei
Superorder Ostariophysi
Order Siluriformes
Family Callichthyidae
Subfamily Corydoradinae
Genus *Corydoras*
Species *Corydoras paleatus* (Jenyns, 1842)”

“Taxonomic Status:

Current Standing: valid”

Size, Weight, and Age Range

From Froese and Pauly (2017):

“Max length : 6.6 cm SL male/unsexed; [Gubiani and Horlando 2014]; 7.1 cm SL (female); max. published weight: 11.20 g [Gubiani and Horlando 2014]; max. published weight: 11.20 g”

Environment

From Froese and Pauly (2017):

“Freshwater; demersal; pH range: 6.0 - 8.0; dH range: 5 - 19.”

Climate/Range

From Froese and Pauly (2017):

“Subtropical; 18°C - 23°C [Schliewen 1992]”

Distribution Outside the United States

Native

From Tencatt et al. (2016):

“*Corydoras paleatus* is known from the lower rio Paraná basin in Argentina, coastal rivers from Southern Brazil, Rio Grande do Sul State, and Uruguay, rio de La Plata basin in Argentina and Uruguay, and rio Uruguay basin in Uruguay [...]”

“[...] the geographic distribution of the populations erroneously identified as *C. paleatus* is relatively wide, occurring in almost entire Southern region of South America [...]”

Introduced

Froese and Pauly (2017) report that *C. paleatus* was introduced to the Philippines and Spain at an unknown time from an unknown source location. It is unknown whether the species has become established in either country.

Ishikawa and Tachihara (2014) report failed introductions of *Corydoras paleatus* on Okinawa-jima Island, Japan, occurring between 1981 and 1990.

Means of Introduction Outside the United States

From Ishikawa and Tachihara (2014):

“[...] dumping of unwanted ornamental aquarium fish [...]”

From Froese and Pauly (2017):

“ornamental”

Short Description

From Froese and Pauly (2017):

“Dorsal spines (total): 1; Dorsal soft rays (total): 8; Anal spines: 0; Anal soft rays: 6”

From Tencatt et al. (2016):

“*Corydoras paleatus* can be distinguished from its congeners by presenting the following unique combination of features: perpendicularly directed serrations along entire posterior margin of the pectoral spine; three large black blotches along midline of flank; hyaline or black pectoral fin; and transversal black bars on caudal-fin lobes.”

From ScotCat (2015):

“Dorsal: 1/7-8: Anal: 1/6: 22-24 bony scutes in the upper lateral series, 20-22 in the lower. Black dark olive-brown to green, flanks yellowish-green with a metallic glint, belly yellowish-white. On the back and flanks there are large, irregular blotches which may converge into transverse bars.”

“There can be a few different colour and patterned varieties depending on what area of South America they come from. Particularly nice are specimens from Buenos Aires, Argentina which possess a black pattern on the leading edge of the dorsal, anal and ventral fins. [...] They have been named as *C. marmoratus* Steindachner, 1879, which is still considered (2011) as a synonym of *C. paleatus* but may turn out in the future to be a species in its own right.”

“[...] there is of course an albino version of this *Corydoras* [...] which is not so prevalent in the hobby [...].”

Biology

From Froese and Pauly (2017):

“Found in ponds [Cordiviola de Yuan and Pignalberi de Hassan 1985]. Feeds on worms, crustaceans, insects and plant matter [Mills and Vevers 1989].”

“The female holds 2-4 eggs between her pelvic fins, where the male fertilizes them for about 30 seconds. Only then the female swims to a suitable spot, where she attaches the very sticky eggs. The pair repeats this process until about 100 eggs have been fertilized and attached [Riehl and Baensch 1991].”

Human Uses

From Froese and Pauly (2017):

“Fisheries: of no interest; aquarium: highly commercial”

From ScotCat (2015):

“This is one of the first *Corydoras* species, along with *C. aeneus*, to be bred in the aquarium and was the mainstay of the catfish side of the hobby in the early years when the hobby of fishkeeping took off with the arrival of easier air travel importation in the late fifties, early sixties. It was in fact first bred in Paris, France, by Pière Carbonier way back in the last century in 1878.”

Diseases

From Froese and Pauly (2017):

“Bacterial Infections (general), Bacterial diseases
Dactylogyrus Gill Flukes Disease, Parasitic infestations (protozoa, worms, etc.)

Skeletal deformities, Others

Procamallanus Infection 33, Parasitic infestations (protozoa, worms, etc.)”

From Plaul et al. (2010):

“*Lernaea cyprinacea* Linnaeus is an ectoparasitic copepod that infects the gills and skin of various freshwater fishes and amphibians tadpoles. [...] The pet fish *Carassius auratus* was the most affected species, but *C. paleatus* and *H. plecostomus* were infected as well in the pet shops but not in wild conditions.”

From Boeger et al. (2005):

“Specimens of *G[yrodactylus] anisopharynx* were obtained from naturally infected *C. paleatus*.”

From Marcotegui et al. (2016):

“*Trichodina corydori* [...]

Type host: *Corydoras paleatus* Jenyns, 1842 (Siluriformes: Callichthyidae) [...]

Site of infection: gills”

From Bueno-Silva et al. (2011):

“We investigated how *Gyrodactylus corydori* Bueno-Silva and Boeger, 2009 exploits two sympatric host species, *Corydoras paleatus* (Jenyns, 1842) and *Corydoras ehrhardti* Steindachner, 1910. Specimens of *G. corydori* were collected from the Piraquara and Miringuava Rivers, State of Paraná, Brazil, between 2005 and 2006. A total of 167 parasites was measured from both host species.”

No OIE-reportable diseases have been documented for this species.

Threat to Humans

From Froese and Pauly (2017):

“Threat to humans: Harmless”

3 Impacts of Introductions

No information available.

4 Global Distribution



Figure 1. Known global distribution of *C. paleatus*. Map from GBIF Secretariat (2016). Only established locations were used for the climate matching analysis. The recent revision of the taxonomy of *C. paleatus* and associated distribution map in Tencatt et al. (2016) were used to define established locations (see quoted range description in Distribution Outside the United States: Native, above).

5 Distribution Within the United States

This species has not been reported as introduced or established in the United States.

6 Climate Matching

Summary of Climate Matching Analysis

The climate match (Sanders et al. 2014; 16 climate variables; Euclidean distance) for *C. paleatus* was high in small, isolated areas near Daytona Beach and Lake Okeechobee, Florida, and Houston, Texas. Most of the eastern U.S. showed medium match except for the Upper Midwest, New York, and New England states. With the exception of a small area of medium match in southeastern Arizona, the West showed low climate match, as did the Upper Midwest and Northeast. Climate 6 score was 0.123 for the contiguous U.S. overall, which is classified as a high match.

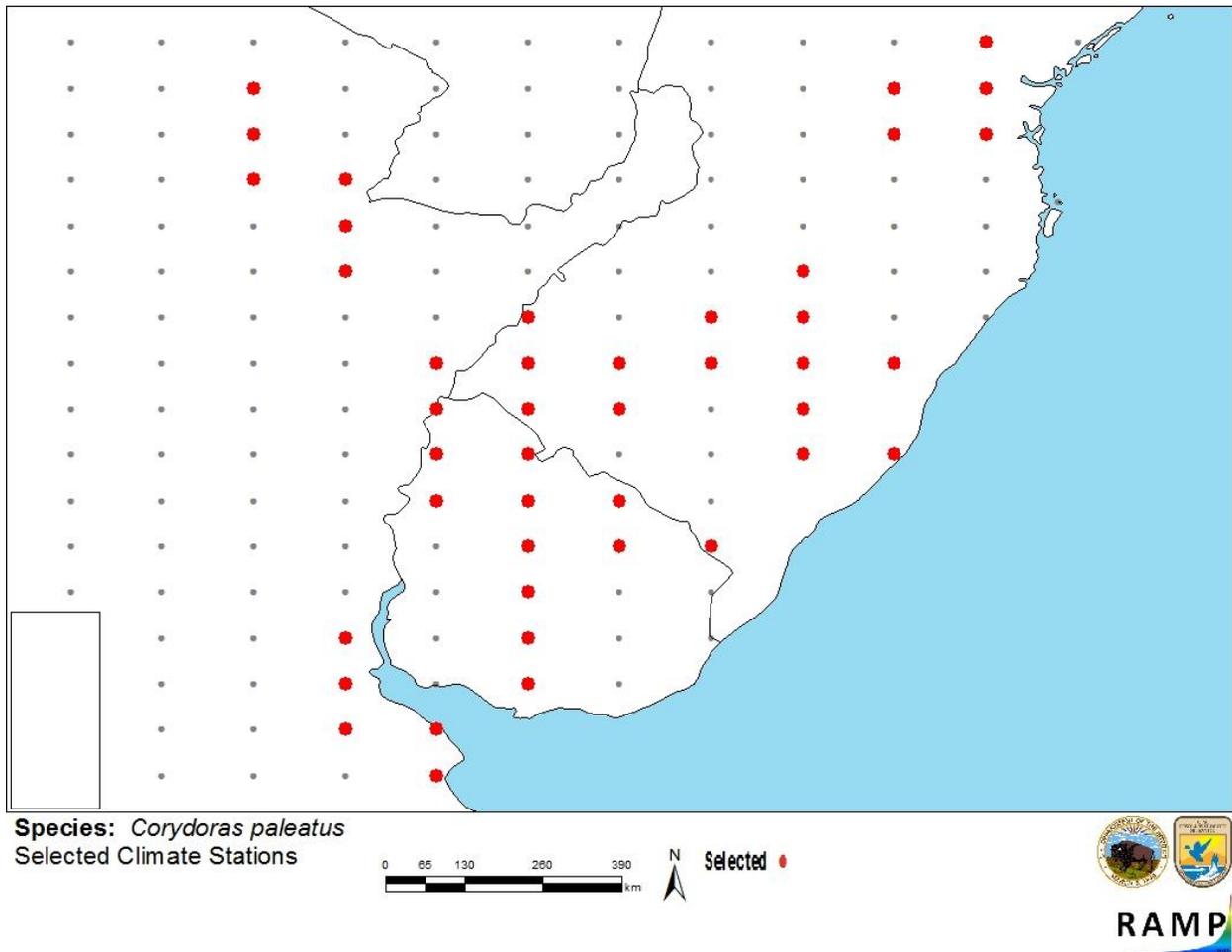


Figure 2. RAMP (Sanders et al. 2014) source map showing weather stations selected as source locations (red) and non-source locations (gray) for *C. paleatus* climate matching. Source locations from GBIF Secretariat (2016) and validated using Tencatt et al. (2016).

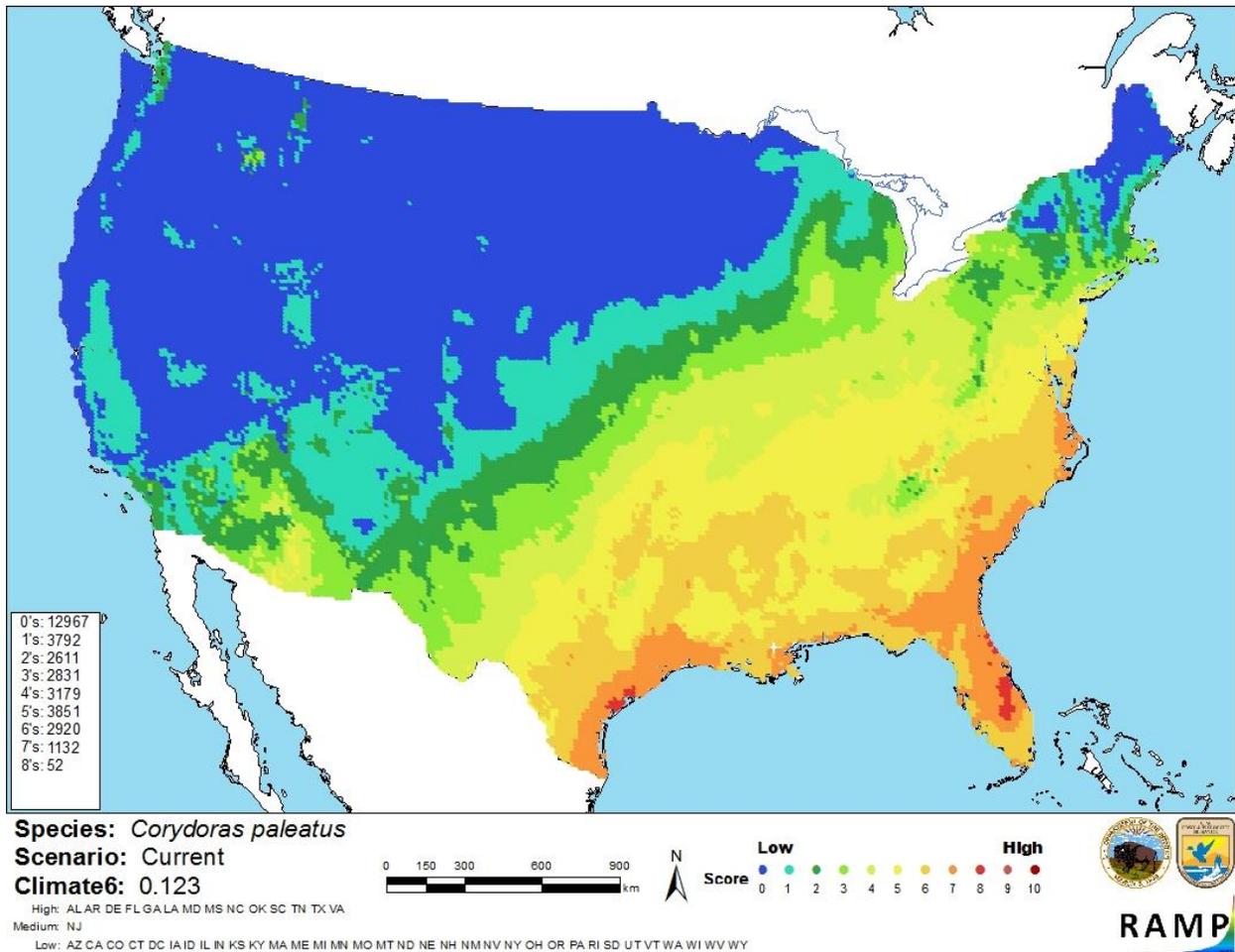


Figure 3. Map of RAMP (Sanders et al. 2014) climate matches for *C. paleatus* in the contiguous United States based on source locations reported by GBIF Secretariat (2016) and validated using Tencatt et al. (2016). 0=Lowest match, 10=Highest match.

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 |
|--|---------------------------|
| $0.000 \leq X \leq 0.005$ | Low |
| $0.005 < X < 0.103$ | Medium |
| ≥ 0.103 | High |

7 Certainty of Assessment

There is a fair amount of information available on the biology and range of *C. paleatus*. However, an area of research that has not been adequately addressed is the potential impact of introduction. Because of the lack of information on this crucial aspect of the risk assessment, the certainty of the assessment is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Corydoras paleatus is a small catfish native to southern Brazil, Uruguay, and northern Argentina. *C. paleatus* has a high climate match in the continental United States. Based on climate match information, it is plausible that if introduced, *C. paleatus* could establish populations in substantial areas of the U.S., particularly the East and Gulf Coast regions. At present, there are no reports of introduction within the U.S., but introductions have occurred in the Philippines, Japan, and Spain. The impacts of these introductions are unknown; at least one has failed. *C. paleatus* is popular in the aquarium trade and is present in trade in the U.S. Because of the lack of information about potential impacts of introduction to the U.S., the overall risk assessment category is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 3): None Documented**
- **Climate Match (Sec. 6): High**
- **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.

- Boeger, W. A., D. C. Kritsky, M. R. Pie, and K. B. Engers. 2005. Mode of transmission, host switching, and escape from the Red Queen by viviparous gyrodactylids (Monogenoidea). *The Journal of Parasitology* 91(5):1000-1007.
- Bueno-Silva, M., W. A. Boeger, and M. R. Pie. 2011. Choice matters: incipient speciation in *Gyrodactylus corydori* (Monogenoidea: Gyrodactylidae). *International Journal for Parasitology* 41(6):657-667.
- Doctors Foster and Smith. 2017. *Corydoras* catfish for sale: cory cats in many varieties. LiveAquaria.com. Available: <http://www.liveaquaria.com/category/1161/>. (September 2017).
- Froese, R., and D. Pauly, editors. 2017. *Corydoras paleatus* Jenyns, 1842. FishBase. Available: <http://fishbase.org/summary/Corydoras-paleatus.html>. (September 2017).
- GBIF Secretariat. 2016. *Corydoras paleatus* (Jenyns, 1842). In GBIF backbone taxonomy. Global Biodiversity Information Facility, Copenhagen. Available: <https://www.gbif.org/species/2342720>. (September 2017).

- Imperial Tropicals. 2015. Paleatus Cory (*Corydoras paleatus*). Available: <https://imperialtropicals.com/products/paleatus-cory-corydoras-paleatus?variant=19512834113>. (September 2017).
- Ishikawa, T., and K. Tachihara. 2014. Introduction history of non-native freshwater fish in Okinawa-jima Island: ornamental aquarium fish pose the greatest risk for future invasions. *Ichthyological Research* 61:17-26.
- ITIS (Integrated Taxonomic Information System). 2017. *Corydoras paleatus* (Jenyns, 1842). Integrated Taxonomic Information System, Reston, Virginia. Available: https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=164313#null. (July 2017, September 2017).
- Marcotegui, P. S., L. Basson, and S. R. Martorelli. 2016. Trichodinids (Ciliophora) of *Corydoras paleatus* (Siluriformes) and *Jenynsia multidentata* (Cyprinodontiformes) from Argentina, with description of *Trichodina corydori* n. sp. and *Trichodina jenynsii* n. sp. *Acta Protozoologica* 55:249-257.
- Plaul, S. E., N. García Romero, and C. G. Barbeito. 2010. Distribution of the exotic parasite, *Lernaea cyprinacea* (Copepoda, Lernaeidae) in Argentina. *Bulletin of the European Association of Fish Pathologists* 30(2):65-73.
- Sanders, S., C. Castiglione, and M. H. Hoff. 2014. Risk Assessment Mapping Program: RAMP. U.S. Fish and Wildlife Service.
- ScotCat. 2015. *Corydoras paleatus* (Jenyns, 1842). Factsheet 089. Available: http://www.scotcat.com/factsheets/c_paleatus.htm. (July 2017).
- Tencatt, L. F. C., M. R. de Britto, and C. S. Pavanelli. 2016. Revisionary study of the armored catfish *Corydoras paleatus* (Jenyns, 1842) (Siluriformes: Callichthyidae) over 180 years after its discovery by Darwin, with description of a new species. *Neotropical Ichthyology* 14(1):e150089.

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.

- Cordiviola de Yuan, E., and C. Pignalberi de Hassan. 1985. Fish population in the Paraná River: lentic environments of Diamante and San Pedro areas (Argentine Republic). *Hydrobiologia* 127:213-218.
- Gubiani, E. A., and S. da S. Horlando. 2014. Length-weight and length-length relationships and length at first maturity for freshwater fish species of the Salto Santiago Reservoir, Iguaçú River Basin, Brazil. *Journal of Applied Ichthyology* 30:1087-1091.

Mills, D., and G. Vevers. 1989. The Tetra encyclopedia of freshwater tropical aquarium fishes. Tetra Press, New Jersey.

Regan, C. T. 1912. A revision of the South American siluroid fishes of the genus *Corydoras*, with a list of the specimens in the British Museum (Natural History). *Annals and Magazine of Natural History* 10:209-220.

Riehl, R., and H. A. Baensch. 1991. *Aquarien Atlas*, volume 1. Mergus, Verlag für Natur-und Heimtierkunde, Melle, Germany.

Schliewen, U. K. 1992. *Aquarium fish*. Barron's Education Series, Incorporated.