

Cherry Barb (*Puntius titteya*)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, January 2016

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Photo: B. Gratwicke. Licensed under Creative Commons (CC BY 2.0). Available: https://commons.wikimedia.org/wiki/File:Cherry_barb,_Puntius_titteya.jpg. (April 2018).

1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2018):

“Asia: Kelani to Nilwala basins, Sri Lanka.”

From Fricke et al. (2019):

“Sri Lanka.”

Status in the United States

This species has not been reported in the wild in the United States, but is present in the aquarium trade in the United States. Strecker et al. (2011) report that *P. titteya* was available in 29 of 30 pet stores surveyed in the Puget Sound area of Washington.

Means of Introductions in the United States

This species has not been reported in the wild in the United States.

Remarks

From Froese and Pauly (2018):

“The more colorful varieties are possibly being overfished for the aquarium trade.”

Froese and Pauly (2018) note that *Puntius titteya* is sometimes referred to as *Barbus titteya*. Both scientific names were used in searching for information for this report.

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 Cypriniformes
Superfamily Cyprinoidea
Family Cyprinidae
Genus *Puntius*
Species *Puntius titteya* Deraniyagala, 1929 – cherry barb”

From Fricke et al. (2019):

“**Current status:** Valid as *Puntius titteya* Deraniyagala 1929. Cyprinidae: Smiliogastrinae.”

Size, Weight, and Age Range

From Froese and Pauly (2018):

“Max length : 5.0 cm TL male/unsexed; [Talwar and Jhingran 1991]; common length : 2.5 cm TL male/unsexed; [Pethiyagoda 1991]”

Environment

From Froese and Pauly (2016):

“Freshwater; benthopelagic; pH range: 6.0 - 8.0; dH range: 5 – 19 [Schliewen 1992].”

Strecker et al. (2011) report that *P. titteya* has a minimum optimum temperature of 23.0°C.

Climate/Range

From Froese and Pauly (2018):

“Tropical; [...] 8°N - 6°N”

Distribution Outside the United States

Native

From Froese and Pauly (2018):

“Asia: Kelani to Nilwala basins, Sri Lanka”

From Fricke et al. (2019):

“Sri Lanka.”

Introduced

From Froese and Pauly (2018):

“Established in the Magdalena watershed [Colombia].”

“It is not known how many of these [*Puntius titteya* and other tropical aquarium species] have become established [in Mexico].”

Froese and Pauly (2018) report that *P. titteya* was introduced to the Philippines in the 1970s but the establishment status remains unknown.

Means of Introduction Outside the United States

From Froese and Pauly (2018):

“Widespread in [Colombian] fish rearing facilities and has presumably escaped into local waters.”

“As part of an opening ceremony for a public aquarium many exotic tropical species were released into a [Mexican] river.”

Short Description

From Fukuda and Karino (2014):

“*Puntius titteya* is a small cyprinid fish that is an endemic species of Sri Lanka (De Silva et al. 1985). This species shows remarkable sexual dichromatism; adult males exhibit bright red coloration over the whole body, while the body coloration of females is dull brown with a reddish anal fin. A male and female spawn in a pair above spawning substrate (e.g., aquatic plants), and the eggs are fertilized externally (Kortmulder 1982; Schut et al. 1984).”

Biology

From Froese and Pauly (2018):

“Occurs mainly in heavily shaded streams and rivulets, preferring shallow, slow-flowing water with silt substrate and leaf debris. Omnivorous, the gut containing detritus, green algae, diatoms, dipterans and animal matter. About 200 eggs are scattered among marginal plants. Young hatch in 1-2 days and are free-swimming after 48 hours.”

Human Uses

From Froese and Pauly (2018):

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

Strecker et al. (2011) report that *P. titteya* was available in 29 of 30 pet stores surveyed in the Puget Sound area of Washington.

Diseases

No OIE-listed diseases (OIE 2019) have been reported in this species.

From Froese and Pauly (2018):

“White spot Disease, Parasitic infestations (protozoa, worms, etc.)
Velvet Disease, Parasitic infestations (protozoa, worms, etc.)
Bacterial Infections (general), Bacterial diseases
Velvet Disease 2 (*Piscinoodinium* sp.), Parasitic infestations (protozoa, worms, etc.)”

From Ponpornpisit et al. (2008):

“Experimental infection of *Tetrahymena pyriformis* was conducted on ornamental fishes with skin wounded by acetic acid treatment. Among fishes used in this experimental infection, [...] cherry barbs *Puntius titteya* proved to be sensitive to challenge [...]. Exposure to *Tetrahymena* at ≥ 100 cells/mL at 25 to 30°C and at pH of 6.0 to 8.0 resulted in the successful infection of some sensitive fish species. Histological and bacteriological observations suggest that deeply destroyed skin tissues from the acid-treated method are the primary factors in successful infection.”

Threat to Humans

From Froese and Pauly (2018):

“Harmless”

3 Impacts of Introductions

No information is available on impacts of introductions.

4 Global Distribution

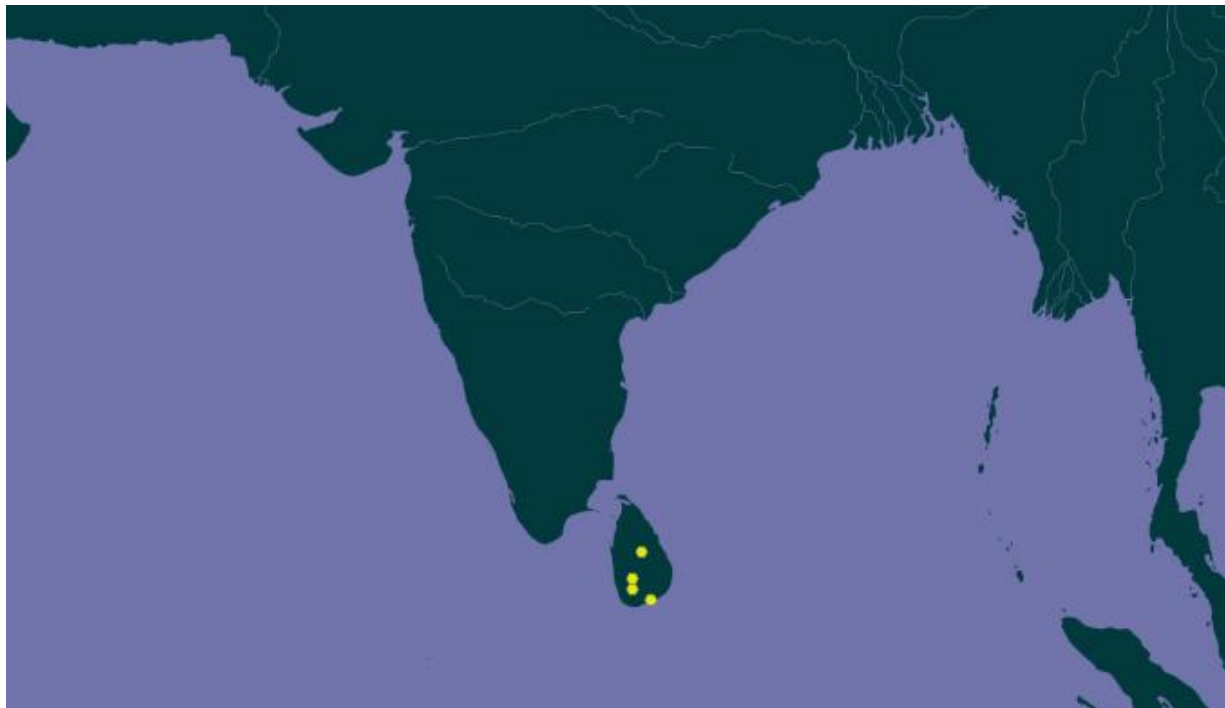


Figure 1. Known native global distribution of *Puntius titteya*, reported from Sri Lanka. Map by GBIF Secretariat (2018). No georeferenced occurrences were available for the established population in Colombia.

5 Distribution Within the United States

This species has not been reported in the United States.

6 Climate Matching

Summary of Climate Matching Analysis

The climate match (Sanders et al. 2018; 16 climate variables; Euclidean Distance) for *Puntius titteya* in the contiguous United States is low overall, with a Climate 6 score of 0.000. Scores of 0.005 and below are classified as low match. Florida was the only state with a medium Climate 6

score; all other states had low scores. Locally, the climate match was medium in southern peninsular Florida and low elsewhere.

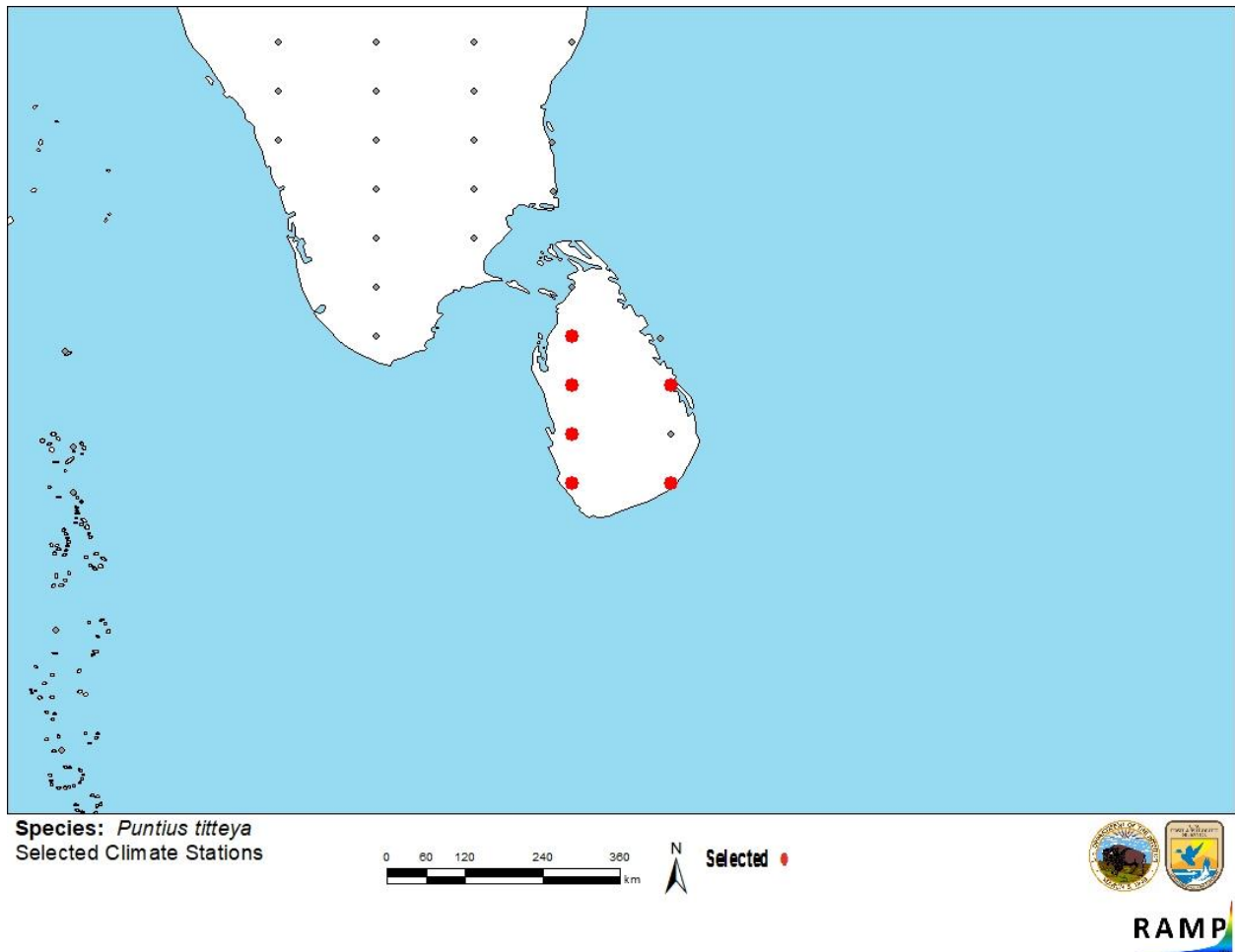


Figure 3. RAMP (Sanders et al. 2018) source map showing weather stations in Sri Lanka selected as source locations (red) and non-source locations (gray) for *Puntius titteya* climate matching. Source locations from GBIF Secretariat (2018).

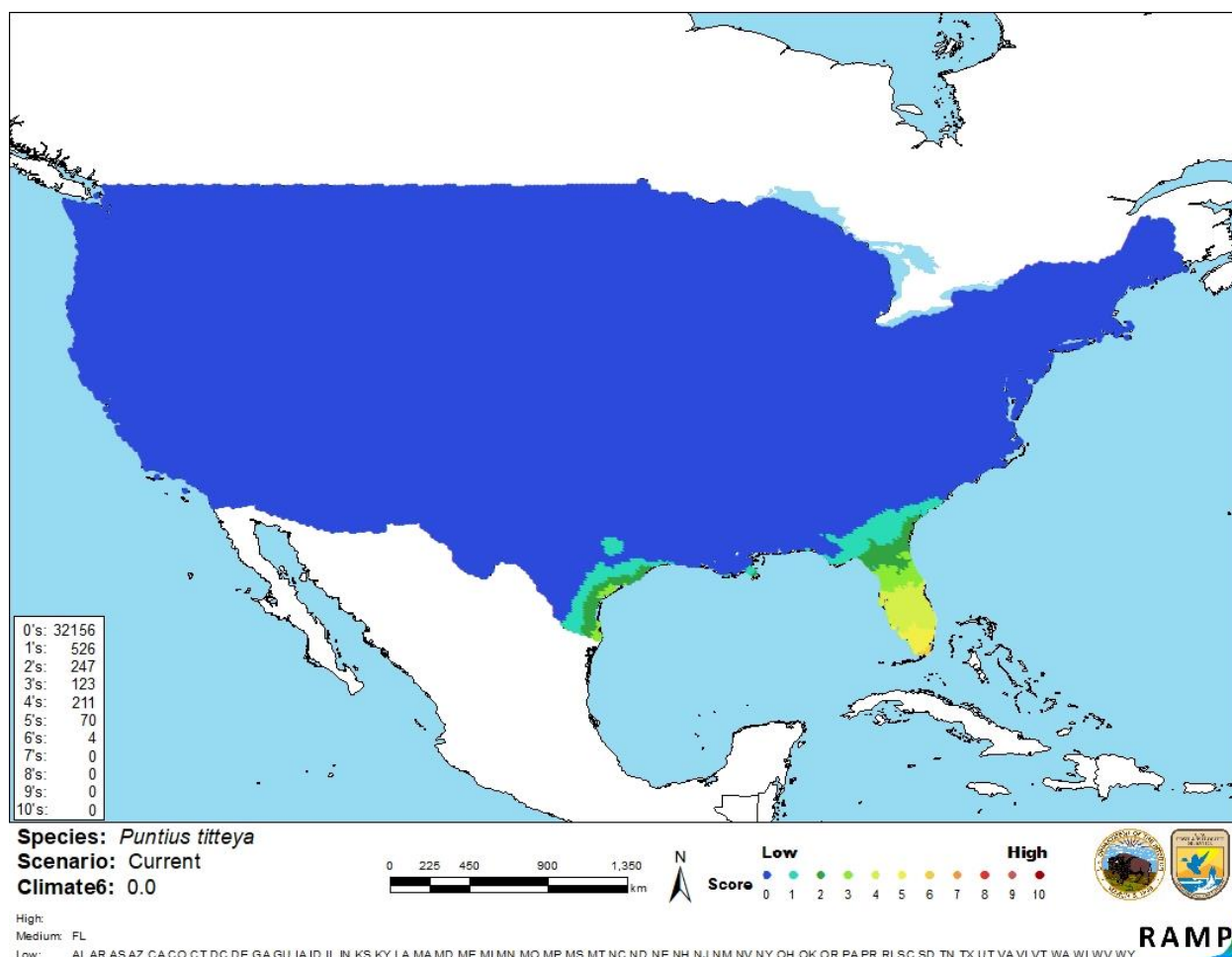


Figure 4. Map of RAMP (Sanders et al. 2018) climate matches for *Puntius titteya* in the contiguous United States based on source locations reported by GBIF Secretariat (2018). 0=Lowest match, 10=Highest match.

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

7 Certainty of Assessment

Some information on the biology and ecology of *P. titteya* is available. However, georeferenced occurrences were not available within the introduced range of *P. titteya* and no information on impacts of introduction was available. More research evaluating distribution and impacts is needed. Given the existing knowledge gaps, certainty of assessment for *P. titteya* is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Puntius titteya, the cherry barb, is a fish species native to Sri Lanka. A colorful cyprinid that is popular in the hobbyist trade, the popularity of this fish led to its introduction to Colombia, Mexico, and the Philippines. Establishment has been confirmed for Colombia only. The species has not been reported as introduced in the wild in the United States. Introduction pathways have included escape from aquaculture facilities and ceremonial release. Because of a lack of information on impacts of introduction, the history of invasiveness is classified as “none documented” and certainty of assessment is low. *P. titteya* has a low climate match with the contiguous United States. The only area of medium climate match occurs in peninsular Florida. The overall risk of *P. titteya* in the contiguous United States is uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 3): None Documented**
- **Climate Match (Sec. 6): Low**
- **Certainty of Assessment (Sec. 7): Low**
- **Important additional information: Carrier of white spot disease, velvet disease, and bacterial infections.**
- **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.

- Fricke, R., W. N. Eschmeyer, and R. Van der Laan, editors. 2019. Eschmeyer’s Catalog of Fishes: genera, species, references. Available: <http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp>. (June 2019).
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- Fukuda, S, and K. Karino. 2014. Male red coloration, female mate preference, and sperm longevity in the cyprinid fish *Puntius titteya*. *Environmental Biology of Fishes* 97:1197-1205.
- GBIF Secretariat. 2018. GBIF backbone taxonomy: *Puntius titteya* Deraniyagala, 1929. Global Biodiversity Information Facility, Copenhagen. Available: <https://www.gbif.org/species/2364223>. (April 2018).
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Ponpornpisit, A., M. Endo, and H. Murata. 2000. Experimental infections of a ciliate *Tetrahymena pyriformis* on ornamental fishes. *Fisheries science* 66(6):1026-1031.

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Strecker, A. L., P. M. Campbell, and J. D. Olden. 2011. The aquarium trade as an invasion pathway in the Pacific Northwest. *Fisheries* 36(2):74-85.

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.

De Silva, S. S., J. Schut, K. Kortmulder. 1985. Reproductive biology of six *Barbus* species indigenous to Sri Lanka. *Environmental Biology of Fishes* 12:201-218.

Kortmulder, K. 1982. Etho-ecology of seventeen *Barbus* species (Pisces; Cyprinidae). *Netherlands Journal of Zoology* 32:144-168.

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Schut, J., S. S. De Silva, and K. Kortmulder. 1984. Habitat, associations and competition of eight *Barbus* species indigenous to Sri Lanka. *Netherlands Journal of Zoology* 4:159-181.

Talwar, P. K., and A. G. Jhingran. 1991. Inland fishes of India and adjacent countries, volume 1. A.A. Balkema, Rotterdam, The Netherlands.