

Blackspot Barb (*Dawkinsia filamentosa*)

Ecological Risk Screening Summary

U.S. Fish and Wildlife Service, February 2011

Revised, July 2018, July 2019

Web Version, 7/10/2019



Photo: S. Sajan. Licensed under Creative Commons (CC BY 3.0). Available: <https://commons.wikimedia.org/w/index.php?curid=31179931>. (July 2019).

1 Native Range and Status in the United States

Native Range

From Froese and Pauly (2019a):

“Asia: India”

From Abraham (2015):

“*Dawkinsia filamentosa* is widely distributed across peninsular India, in the east flowing Cauvery, Krishna and Tamiraparani rivers of Andhra Pradesh, Karnataka and Tamil Nadu and throughout the west flowing coastal floodplain rivers of Kerala, Karnataka and Goa. It occurs in lowland, upper and middle reaches of rivers and also in estuaries, reservoirs and marshes (Pethiyagoda and Kottelat 2005, Jayaram 2010). Occurs in the west coast of Maharashtra (S. Jadhav pers. comm. 2010).”

Status in the United States

From Mundy (2005):

“Introduced to freshwater reservoirs of O‘ahu [Hawaii] in 1984. A population became established in the Nu‘uanu Reservoir but disappeared in the drought of 1984 when the reservoir dried (Devick, 1991; Fuller et al., 1999; Yamamoto & Tagawa, 2000).”

From Nico et al. (2019):

“Status: Extirpated in Hawaii.”

This species is in trade in the United States.

From Nico et al. (2019):

“This is a popular aquarium species.”

From Arizona Aquatic Gardens (2019):

“Filament Barb Tropical Fish [...] \$7.99 [...] Category: Barbs Aquarium Fish Tag: *Puntius Filamentosus*”

Means of Introductions in the United States

From Nico et al. (2019):

“Aquarium release/escape.”

Remarks

From Nico et al. (2019):

“**Synonyms and Other Names:** *Barbus filamentosus*, *Puntius filamentosus*; Indian tiger barb, mahecola, filament barb, longfin barb, featherfin barb”

Both the accepted scientific name (*Dawkinsia filamentosa*) and scientific name synonyms (*Barbus filamentosus*, *Puntius filamentosus*) were used to search for information for this report.

From Pethiyagoda and Kottelat (2005):

“De Silva et al. (1981) studied the ontogeny of Sri Lankan specimens and concluded that *P. melanampyx singhala* (sensu Deraniyagala, 1949) was in fact the juvenile of “*P. filamentosus*.” This position was adopted without comment also by subsequent authors, including Pethiyagoda (1991). *Puntius singhala* is however, a distinct species, apparently endemic to Sri Lanka.”

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From Froese and Pauly (2019b):

“Animalia (Kingdom) > Chordata (Phylum) > Vertebrata (Subphylum) > Gnathostomata (Superclass) > Pisces (Superclass) > Actinopterygii (Class) > Cypriniformes (Order) > Cyprinidae (Family) > Barbinae (Subfamily) > *Dawkinsia* (Genus) > *Dawkinsia filamentosa* (Species)”

From Fricke et al. (2019):

“Current status: Valid as *Dawkinsia filamentosa* (Valenciennes 1844). Cyprinidae: Smiliogastrinae.”

Size, Weight, and Age Range

From Froese and Pauly (2019a):

“Max length : 18.0 cm TL male/unsexed; [Menon 1999]; common length : 11.0 cm TL male/unsexed; [Menon 1999]”

Environment

From Froese and Pauly (2019a):

“Freshwater; brackish; benthopelagic; pH range: 6.0 - 6.5; dH range: ? - 15. [...] 20°C - 24°C [assumed to represent recommended aquarium water temperature; Riehl and Baensch 1991]”

Climate/Range

From Froese and Pauly (2019a):

“Tropical [...]”

Distribution Outside the United States

Native

From Froese and Pauly (2019a):

“Asia: India”

From Abraham (2015):

“*Dawkinsia filamentosa* is widely distributed across peninsular India, in the east flowing Cauvery, Krishna and Tamiraparani rivers of Andhra Pradesh, Karnataka and Tamil Nadu and throughout the west flowing coastal floodplain rivers of Kerala, Karnataka and Goa. It occurs in lowland, upper and middle reaches of rivers and also in estuaries, reservoirs and marshes

(Pethiyagoda and Kottelat 2005, Jayaram 2010). Occurs in the west coast of Maharashtra (S. Jadhav pers. comm. 2010).”

Introduced

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

Means of Introduction Outside the United States

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

Short Description

From Günther (1868):

“The osseous dorsal ray is smooth, feeble, not much stronger than the others. There are two longitudinal series of scales between the lateral line and the root of the ventral. Body compressed; its height is contained twice and three-fourths in the total length (without caudal); the length of the head is one-fourth of the same. Snout rather obtuse, as long as the eye, which is somewhat less than two-sevenths of the length of the head; interorbital space slightly convex; upper jaw slightly overlapping the lower; barbel very small. The height of the dorsal fin is two-thirds of the depth of the body; its origin is opposite that of the ventral, and equally distant from the root of the caudal and the end of the snout. Anal fin of moderate size, higher than long; caudal deeply forked. Silvery, greenish above; a large, cuneiform, black spot on the lateral line above the hinder part of the anal fin. Tips of the caudal lobes black, with white extremities.”

From Froese and Pauly (2019a):

“Adults differ from all other South Asian *Puntius* by a combination of the following characters: branched dorsal-fin rays prolonged into filament-like extensions in adult males only; a black band about as wide as the eye near tip of each caudal-fin lobe; lower lip continuous; a caudal blotch on 2-5 scales, commencing posterior to anal-fin origin; no distinct markings on body in advance of anal-fin origin. Distinguished from *P. assimilis* by possessing a subterminal mouth (vs. inferior); maxillary barbels shorter, 0.5-2.2 of SL % (vs. 5.5-9.3%); post-orbital head length 11.0-12.1% of SL (vs. 8.7-10.4%); and interorbital width 11.2-12.2% of SL (vs. 10.0-11.1%) [Pethiyagoda and Kottelat 2005].”

Biology

From Johnson and Arunachalam (2012):

“The diet of *P. filamentosus* was composed of a mixture of food items of both aquatic and terrestrial insects, macroinvertebrates and detritus, [...]”

From Abraham (2015):

“*Dawkinsia filamentosa* is a common fish found inhabiting a whole array of habitats, both in the hill streams and streams of the lowlands and wetlands. It exhibits sexual dimorphism during the breeding periods.”

From Froese and Pauly (2019a):

“Occurs in clear streams, lakes and ponds [Menon 1999]. Inhabits lowland rivers and also estuaries, reservoirs and marshes [Pethiyagoda and Kottelat 2005].”

Human Uses

From Froese and Pauly (2019a):

“Fisheries: commercial; aquarium: commercial”

From Abraham (2015):

“The species is often caught for consumption by local people. It is also caught for the aquarium trade.”

From Nico et al. (2019):

“This is a popular aquarium species.”

Diseases

No OIE-reportable diseases have been documented in this species (OIE 2019).

From Froese and Pauly (2019a):

“White spot Disease, Parasitic infestations (protozoa, worms, etc.)
Bacterial Infections (general), Bacterial diseases”

Poelen et al. (2014) lists *Dactylogyroides tripathii* and *Camallanus anabantis* as parasites of *Dawkinsia filamentosa* (as *Puntius filamentosus*; Strona et al. 2013; Benesh et al. 2017).

Threat to Humans

From Froese and Pauly (2019a):

“Harmless”

3 Impacts of Introductions

From Nico et al. (2019):

“The impacts of this species are currently unknown, as no studies have been done to determine how it has affected ecosystems in the invaded range. The absence of data does not equate to lack of effects. It does, however, mean that research is required to evaluate effects before conclusions can be made.”

4 Global Distribution



Figure 1. Known global distribution of *Dawkinsia filamentosa*, reported from India, Sri Lanka, Hong Kong, Germany, and the United States (Hawaii). Map from GBIF Secretariat (2019). Only the occurrences reported in India were used in the climate matching analysis because the occurrence in the United States represents species presence over less than a year before extirpation, the occurrence in Germany represents the location where a museum specimen is held, the occurrences in Sri Lanka represent a different species (Pethiyagoda and Kottelat 2005), and the occurrence in Hong Kong could not be confirmed through any other source.

5 Distribution Within the United States



Figure 2. Map showing approximate location of *Dawkinsia filamentosa* collected from Oahu, Hawaii in 1984. Population is extirpated and was not a source location for climate matching. Map from Nico et al. (2019).

6 Climate Matching

Summary of Climate Matching Analysis

The Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for the contiguous United States was 0.000, indicating a low climate match. Scores between 0.000 and 0.005, inclusive, are classified as low. All states had a low climate score. Parts of southern California, southern Arizona, southern Texas, and peninsular Florida had a medium climate match, while the rest of the contiguous United States had a low climate match.

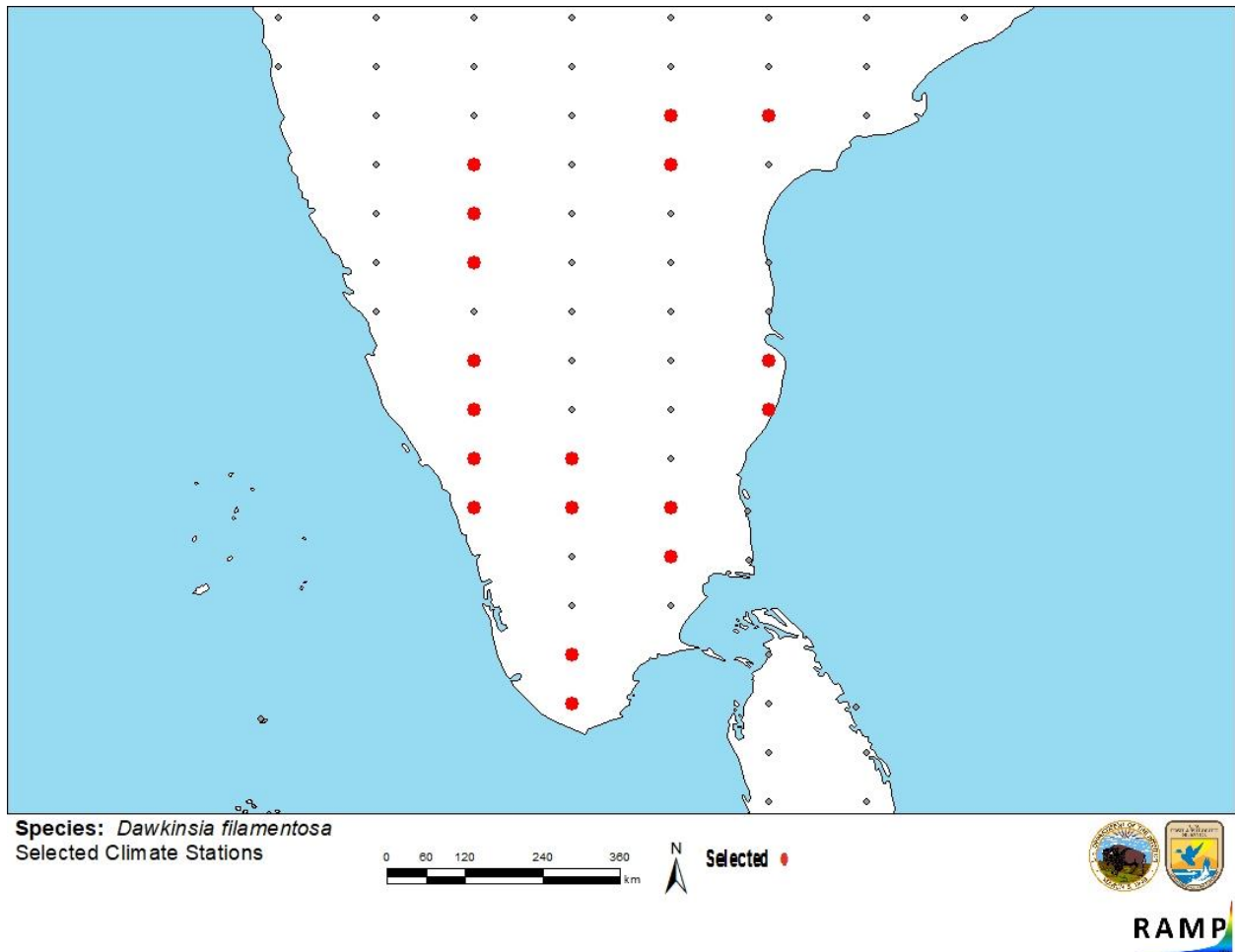


Figure 3. RAMP (Sanders et al. 2018) source map showing weather stations in southern India selected as source locations (red) and non-source locations (gray) for *Dawkinsia filamentosa* climate matching. Source locations from GBIF Secretariat (2019).

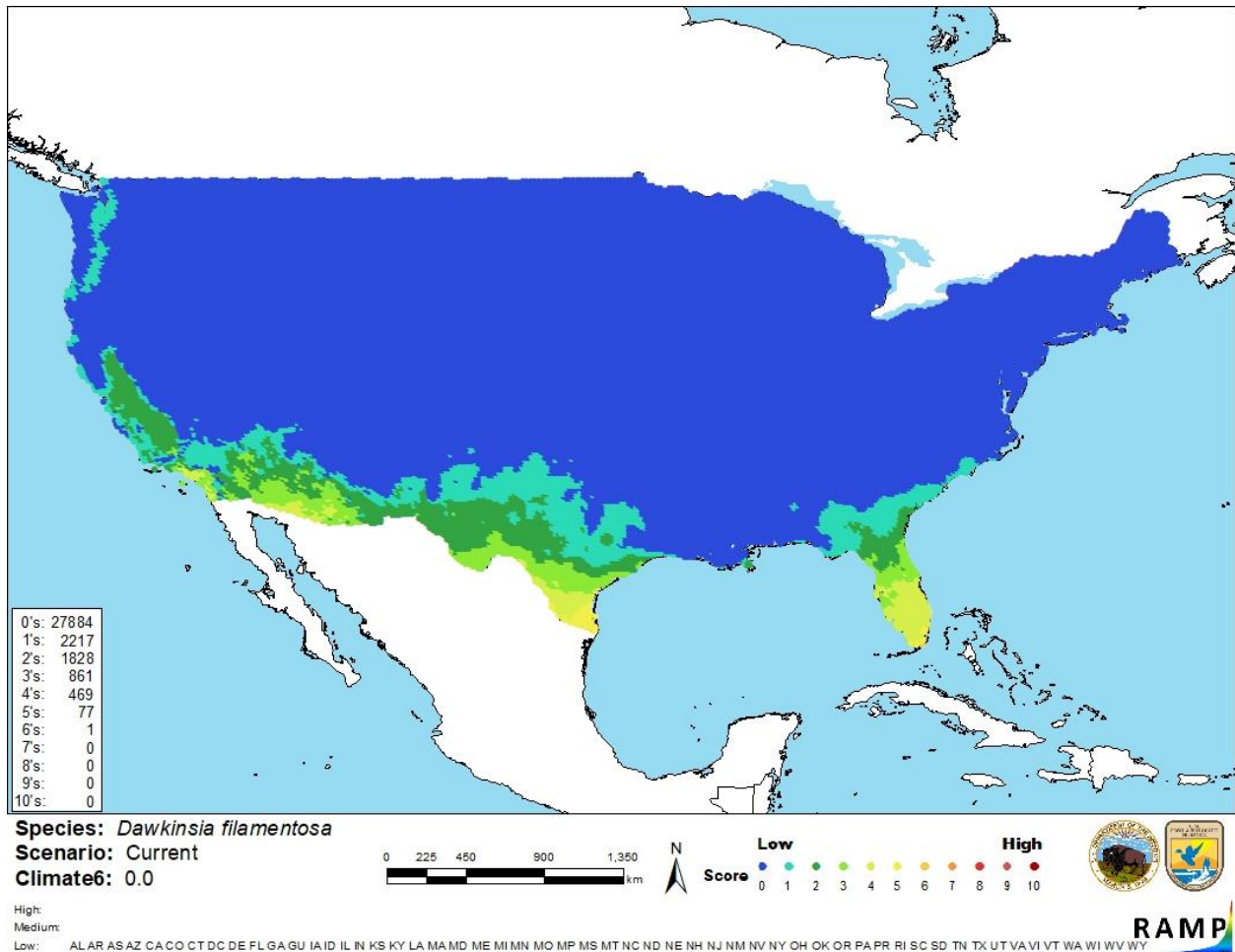


Figure 4. Map of RAMP (Sanders et al. 2018) climate matches for *Dawkinsia filamentosa* in the contiguous United States based on source locations reported by GBIF Secretariat (2019). 0= Lowest match, 10= Highest match.

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

7 Certainty of Assessment

There is adequate information available about the biology, ecology, and distribution of *Dawkinsia filamentosa*. This species has been documented as introduced outside of its native range but it did not form a self-sustaining population and no information is available on what impacts, if any, occurred due to this introduction. Further information is needed to adequately assess the risk this species poses to the contiguous United States, so the certainty of this assessment is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Dawkinsia filamentosa, the Blackspot Barb, is a small cyprinid fish native to India. It is used for local consumption and in the aquarium trade, including in the United States. This species was introduced to reservoirs in Hawaii in 1984 and then quickly extirpated, and no impacts of introduction were documented. History of invasiveness is uncertain. *D. filamentosa* has a low climate match with the contiguous United States. The southern parts of California, Arizona, Texas and Florida had a medium match. Certainty of this assessment is low because of a lack of information on impacts of this species' introduction outside of its native range. Because of this, the overall risk assessment category 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.

- Abraham, R. 2015. *Dawkinsia filamentosa*. The IUCN Red List of Threatened Species 2015: e.T172459A70086605. Available: <http://www.iucnredlist.org/details/172459/0>. (July 2018).
- Arizona Aquatic Gardens. 2019. Filament Barb tropical fish. Available: <https://www.azgardens.com/product/filament-barb-tropical-fish/>. (July 2019).
- 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>. (July 2019).
- Froese, R., and D. Pauly, editors. 2019a. *Dawkinsia filamentosa* (Valenciennes, 1844). FishBase. Available: <https://www.fishbase.de/summary/Dawkinsia-filamentosa.html>. (July 2019).
- Froese, R., and D. Pauly, editors. 2019b. *Dawkinsia filamentosa* (Valenciennes, 1844). In World Register of Marine Species. Available: <http://marinespecies.org/aphia.php?p=taxdetails&id=1021856>. (July 2019).

- GBIF Secretariat. 2019. GBIF backbone taxonomy: *Dawkinsia filamentosa* (Valenciennes, 1844). Global Biodiversity Information Facility, Copenhagen. Available: <https://www.gbif.org/species/7741827>. (July 2019).
- Günther, A. C. L. G. 1868. Catalogue of the fishes in the British Museum, volume 7. Trustees of the British Museum, London.
- Johnson, J. A., and M. Arunachalam. 2012. Feeding habit and food partitioning in a stream fish community of Western Ghats, India. *Environmental Biology of Fishes* 93(1):51-60.
- Mundy, B. C. 2005. Checklist of the fishes of the Hawaiian Archipelago. Bishop Museum Bulletin in Zoology 6. Bishop Museum Press, Honolulu, Hawaii.
- Nico, L., P. J. Schofield, and M. Neilson. 2019. *Dawkinsia filamentosa* (Valenciennes in Cuvier and Valenciennes, 1844). U.S. Geological Survey, Nonindigenous Aquatic Species Database, Gainesville, Florida. Available: <https://nas.er.usgs.gov/queries/FactSheet.aspx?SpeciesID=631>. (July 2019).
- OIE (World Organisation for Animal Health). 2019. OIE-listed diseases, infections and infestations in force in 2019. World Organisation for Animal Health, Paris. Available: <http://www.oie.int/animal-health-in-the-world/oie-listed-diseases-2019/>. (June 2019).
- Pethiyagoda, R., and M. Kottelat. 2005. A review of the barb of the *Puntius filamentosus* group (Teleostei: Cyprinidae) of southern India and Sri Lanka. *Raffles Bulletin of Zoology Supplement* 12:127-144.
- Poelen, J. H., J. D. Simons, and C. J. Mungall. 2014. Global Biotic Interactions: an open infrastructure to share and analyze species-interaction datasets. *Ecological Informatics* 24:148-159.
- Sanders, S., C. Castiglione, and M. H. Hoff. 2018. Risk Assessment Mapping Program: RAMP, version 3.1. U.S. Fish and Wildlife Service.

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.

- Benesh, D. P., K. D. Lafferty, and A. Kuris. 2017. A life cycle database for parasitic acanthocephalans, cestodes, and nematodes. *Ecology* 98(3):882.
- Deraniyagala, P. E. P. 1949. Some vertebrate animals of Ceylon. National Museum Pictorial Series 1:1-119.

- De Silva, S. S., K. Kortmulder, and P. Maitipe. 1981. The identity of *Puntius melanampyx singhala* (Duncker, 1911) (Pisces, Cyprinidae). *Netherlands Journal of Zoology* 31:777-785.
- Devick, W. S. 1991. Patterns of introductions of aquatic organisms to Hawaiian freshwater habitats. Pages 189-213 *in* W. S. Devick, editor. *New directions in research, management and conservation of Hawaiian freshwater stream ecosystems. Proceedings of the 1990 symposium on freshwater stream biology and fisheries management.* Hawaii State Department of Land and Natural Resources, Honolulu, Hawaii.
- Fuller, P. L., L. G. Nico, and J. D. Williams. 1999. Nonindigenous fishes introduced into inland waters of the United States. *American Fisheries Society Special Publication* 27:i-x, 1-613.
- Jayaram, K. C. 2010. *The Freshwater fishes of the Indian region.* Narendra Publishing House, Delhi, India.
- Menon, A. G. K. 1999. Check list - fresh water fishes of India. *Records of the Zoological Survey of India, Miscellaneous Publications, Occasional Paper* 175.
- Pethiyagoda, R. 1991. *Freshwater fishes of Sri Lanka.* Wildlife Heritage Trust, Colombo, Sri Lanka.
- Riehl, R., and H. A. Baensch. 1991. *Aquarien Atlas, volume 1.* Mergus, Verlag für Natur-und Heimtierkunde, Melle, Germany.
- Strona, G., M. Lourdes, D. Palomares, N. Bailly, P. Galli, and K. D. Lafferty. 2013. Host range, host ecology, and distribution of more than 11800 fish parasite species. *Ecology* 94:544.
- Yamamoto, M. N., and A. W. Tagawa. 2000. *Hawaii's native and exotic freshwater animals.* Mutual Publishing, Honolulu, Hawaii.