# Bamboo Shrimp (*Atyopsis moluccensis*)

## Ecological Risk Screening Summary

**U.S. Fish & Wildlife Service, May 2017**
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Photo: Marrabbio2. Licensed under CC BY-SA. Available: https://commons.wikimedia.org/wiki/File:Shrimp_aquarium.jpg. (May 2017).

# 1 Native Range and Status in the United States

## Native Range

From De Grave et al. (2013):

"Indonesia (Bali, Kalimantan, Sulawesi, Sumatera); Philippines; Sri Lanka; Thailand"

From Cai et al. (2007):

"With certainty only distributed in the Greater Sunda Islands (present study)."

## Status in the United States

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

From Aquatic Arts (2017):

"LARGE BAMBOO SHRIMP (*ATYOPSIS MOLUCCENSIS*) AKA SINGAPORE FLOWER SHRIMP $ 19.95"

From Petshrimp (no date):

"The Asian Filter Shrimp is commonly sold as the 'Bamboo Shrimp' or 'Wood Shrimp' in pet stores."

## Means of Introductions in the United States

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

## Remarks

From Fransen (2011):

"Synonymized names: *Atya armata* A. Milne-Edwards, 1864
*Atya gustavi* Ortmann, 1890
*Atya lineolata* de Man, 1892
*Atya moluccensis* De Haan, 1849 [in De Haan, 1833-1850]"

# 2 Biology and Ecology

## Taxonomic Hierarchy and Taxonomic Standing

From Fransen (2011):

"Animalia (Kingdom) > Arthropoda (Phylum) > Crustacea (Subphylum) > Multicrustacea (Superclass) > Malacostraca (Class) > Eumalacostraca (Subclass) > Eucarida (Superorder) > Decapoda (Order) > Pleocyemata (Suborder) > Caridea (Infraorder) > Atyoidea (Superfamily) > Atyidae (Family) > *Atyopsis* (Genus) > *Atyopsis moluccensis* (Species)"

"Status: accepted"

## Size, Weight, and Age Range

From Aquatic Arts (2017):

"Average adult size: 2 - 3 inches (5 - 7.6 cm)"

From Petshrimp (no date):

"Size: 8-12cm"

## Environment

From Cai et al. (2007):

"At coastal or insular freshwater habitats, with fast flowing hill and mountain streams, and similar riparian systems, living on rocks or among submerged roots."

From Iwata et al. (2003):

"[…] *A. moluccensis* selected 20-40 cm depth, relatively high water velocity (20-60 cm $s^{-1}$) and a boulder substrate, at the same time avoiding stream margins (i.e. 0-10% bank distance)."

## Climate/Range

From Petshrimp (no date):

"tropical species, best kept at 73°F-84°F"

## Distribution Outside the United States

### Native

From De Grave et al. (2013):

"Indonesia (Bali, Kalimantan, Sulawesi, Sumatera); Philippines; Sri Lanka; Thailand"

From Cai et al. (2007):

"With certainty only distributed in the Greater Sunda Islands (present study)."

### 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 Cai et al. (2007):

"Body robust, pigmented, eyes well developed; rostrum not strongly compressed laterally, without lateral lobes, median dorsal carina without spines, ventral keel with 7–16, usually 10–14 teeth. Anterior margin of carapace armed with strong antennal and pterygostomian spines, latter never reduced to angle; supraorbital spine absent; ventral margin of second to fifth abdominal

pleura without sclerotized spinules; telson with posterolateral angle reaching beyond setiferous posterior margin; third maxilliped not ending in a spine; pereiopods without exopods; first and second pereiopods with chelae monomorphic, without palm, little if at all longer than wide; fingers tipped with brushes of long setae apparently adapted for filter feeding, carpus of both appendages deeply excavated anteriorly, much shorter than broad, shorter than fingers; third pereiopod with a prominent meral spur in large males; branchial formula complete, with 9 pairs of gills, without mastigobranchs; epipods present on first 4 pereiopods, reduced posteriorly; endopod of first pereiopod of male rigid, rhomboidally ovate; submarginally spinose, less than 1.5 times as long from proximal articulation to base of reticulation projection as maximum width, not including margin spines; second pleopod of male with appendix masculina cylindrical, spinose over entire length distal to base of appendix interna."

## Biology

From Iwata et al. (2003):

"According to direct underwater observations and gut content analyses (T. Iwata, unpubl. data), *A. moluccensis* was regarded as a detritivore, which feeds mainly on drifting detrital particles by filtering from the water column with the cheliped setae."

"[…] the habitat selection by *A. moluccensis*, which filters drifting detrital particles while clinging to a substrate, appears to be affected by factors related to food supply and physiological stress. In general, suspension feeders dwelling in headwater streams prefer high water velocity, because food intake rate is proportional to current velocity (Georgian & Thorp 1992, Loudon & Alstad 1990, Smith-Cuffney & Wallace 1987). However, their metabolic costs of holding positions increase with current velocity (see Allan 1995, Fausch 1984, Hill & Grossman 1993). Therefore, for *A. moluccensis*, coarse substrates with relatively fast currents may be a better habitat in terms of potential energy profit, because the wakes behind coarse substrate materials can provide velocity refuge (see Poff & Ward 1990) while the adjacent fast water provides high drift availability."

From Uderbayev et al. (2017):

"[…] fan shrimps, *Atya gabonensis* and *Atyopsis moluccensis*, live in freshwaters in adulthood only and their free-living larvae require brackish water for successful development (Page et al., 2008) […]"

## Human Uses

From De Grave et al. (2013):

"Holthuis (1980) mentions local, small scale subsistence style fisheries for this species."

From Lipták and Vitázková (2015):

"Altogether 26 different species were identified in the aquarium pet trade in Slovakia […] There is also a quantity of other related taxa in the aquarium pet trade in Slovakia, mainly [...] *Atyopsis moluccensis* [and other shrimps and crabs)]."

From Uderbayev et al. (2017):

“List of pet-traded species of decapod crustaceans and their families, availability on market [in Kazakhstan] […]
*Atyopsis moluccensis* […] C[ommon] […]”

### Diseases
No information available. No OIE-reportable diseases have been documented for this species.

### Threat to Humans
No information available.

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

# 4 Global Distribution

**Figure 1**. Known global distribution of *Atyopsis moluccensis*. Map from GBIF (2016). The point in the Strait of Malacca was not included in the climate matching analysis because no global climate stations are located within 100 km of this reported occurrence. Occurrences must be within 100 km of a global climate station to function as a source for climate matching (Sanders et al. 2014).

# 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 6 score (Sanders et al. 2014; 16 climate variables; Euclidean distance) for the contiguous U.S. was 0.0, indicating a low climate match. Climate 6 scores of 0.000-0.005 are classified as "low". The highest local climate match occurred in southern Florida, but this match was only medium-low.

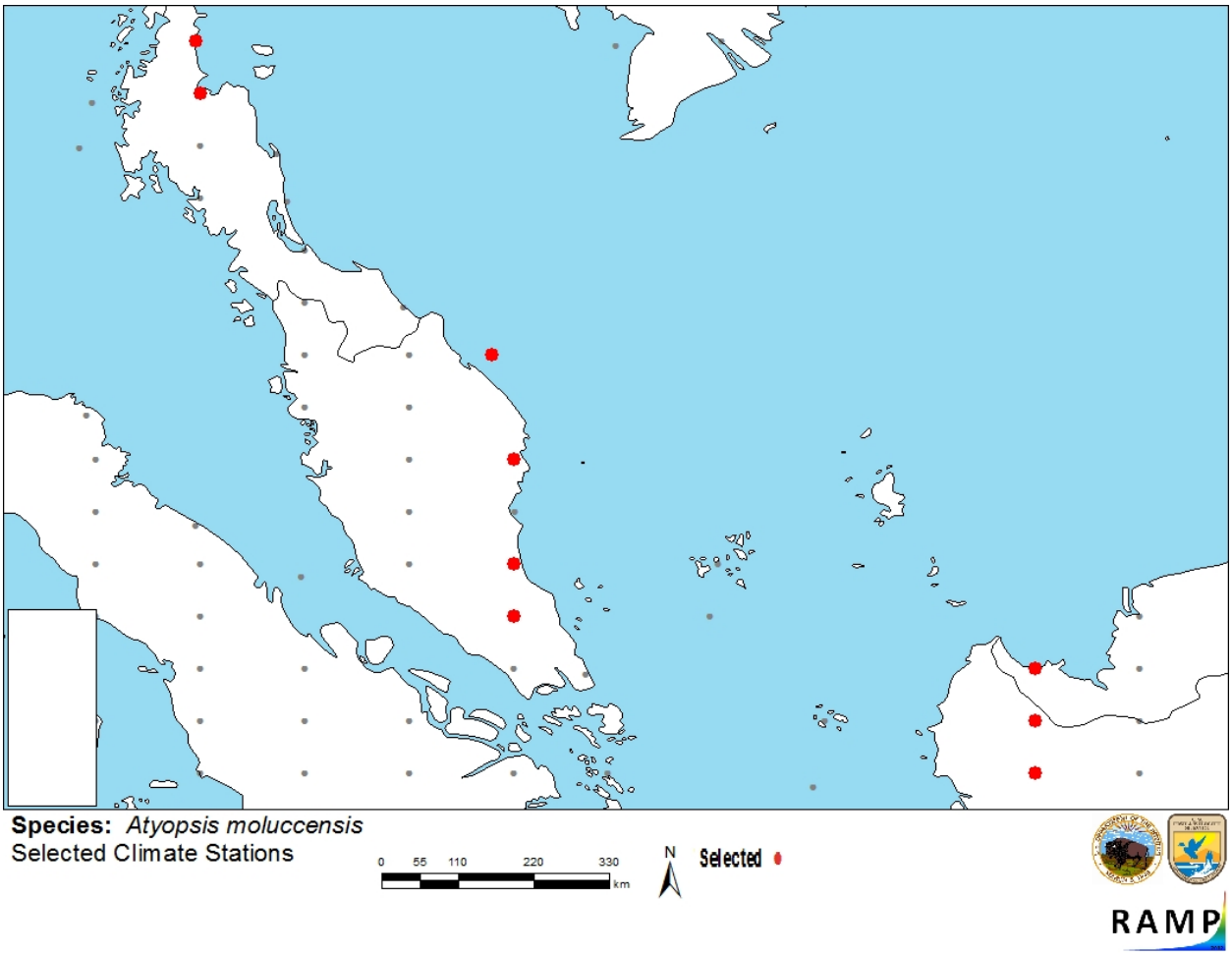


**Figure 2**. RAMP (Sanders et al. 2014) source map showing weather stations selected as source locations (red) and non-source locations (gray) for *Atyopsis moluccensis* climate matching. Source locations from GBIF (2016). The source location off the northeast coast of peninsular Malaysia was the closest source location to a reported mainland occurrence and does not represent a marine occurrence of *A. moluccensis*.

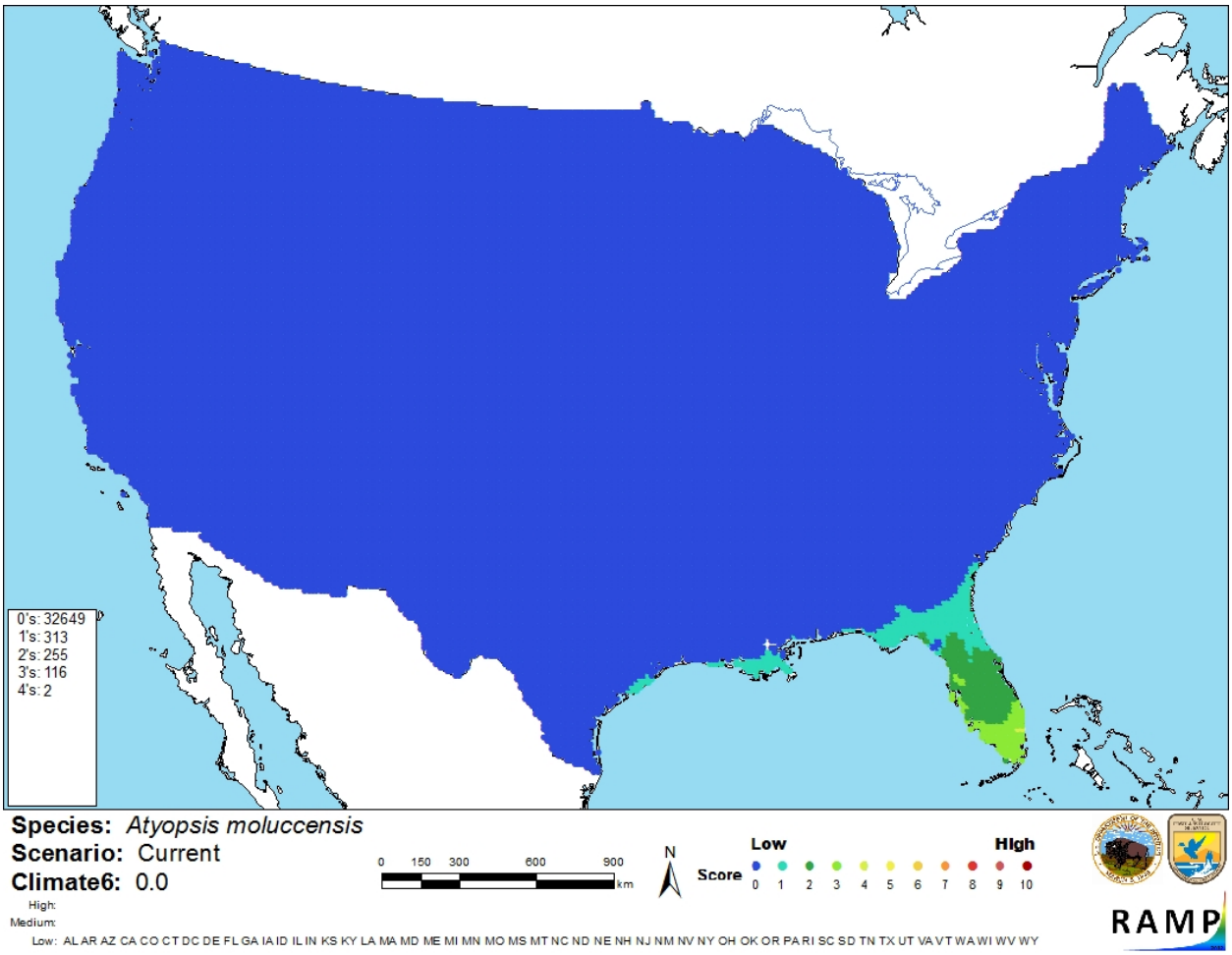


**Figure 3**. Map of RAMP (Sanders et al. 2014) climate matches for *Atyopsis moluccensis* in the contiguous United States based on source locations reported by GBIF (2016). 0=Lowest match, 10=Highest match. Counts of climate match scores are tabulated on the left.

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

# 7 Certainty of Assessment

There is some information available on the biology of *Atyopsis moluccensis*, but the native range of the species is somewhat uncertain. There are no documented introductions of this species outside of its native range, despite its use in the aquarium trade. Because of the lack of introduction history, certainty of this assessment is low.

# 8 Risk Assessment

## Summary of Risk to the Contiguous United States

*Atyopsis moluccensis* is a freshwater shrimp native to southeast Asia. This species has no documented history of introduction despite its use in the aquarium trade in the United States, Europe, and Asia. *A. moluccensis* has a low climate match with the contiguous United States. Overall, the 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
- **Remarks/Important additional information:** In trade in the U.S.
- **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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Iwata, T., M. Inoue, S. Nakano, H. Miyasaka, A. Doi, and A. P. Covich. 2003. Shrimp abundance and habitat relationships in tropical rain-forest streams, Sarawak, Borneo. Journal of Tropical Ecology 19(4):387-395.

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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.**

Allan, J. D. 1995. Stream ecology. Chapman & Hall, London.

Fausch, K. D. 1984. Profitable stream positions for salmonids: relating specific growth rate to net energy gain. Canadian Journal of Zoology 62:441-451.

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Holthuis 1980 [*Source did not provide full citation for this reference.*]

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Smith-Cuffney, F. L., and J. B. Wallace. 1987. The influence of microhabitat on availability of drifting invertebrate prey to a net-spinning caddisfly. Freshwater Biology 17:91-98.