Violet Batissa (*Batissa violacea*)

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, July 2020
Revised, December 2020
Web Version, 3/22/2021

Organism Type: Mollusk
Overall Risk Assessment Category: Uncertain

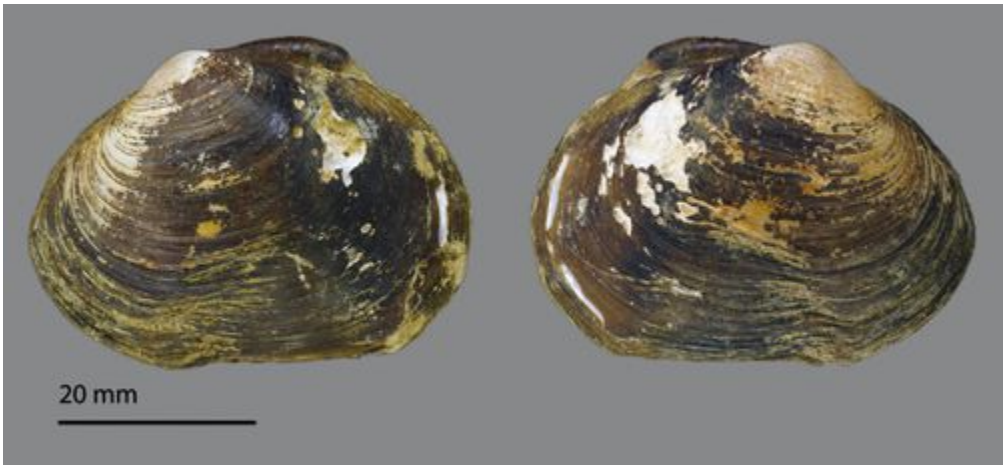

Photo: Lozouet Pierre. Licensed under Attribution 4.0 International (CC BY 4.0). Available: https://www.gbif.org/occurrence/439932838. (July 2020).

1 Native Range and Status in the United States

Native Range

From Palomares and Pauly (2020):

"Western Central Pacific."

According to Palmoares and Pauly (2020) countries within the central Pacific where *Batissa violacea* are native include Brunei Darsm, Indonesia, Malaysia, Philippines, Singapore, Timor-Leste, Australia, Fiji, Palau, Papua New Guinea, Solomon Island, and Vanuatu.

Status in the United States

Batissa violacea has not been reported as introduced or established in the United States. No records of *B. violacea* in trade in the United States were found.

Means of Introductions in the United States
Batissa violacea has not been reported as introduced outside of its native range.

Remarks
No additional remarks.

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing
From Vinarski (2019):

"Animalia (Kingdom) > Mollusca (Phylum) > Bivalvia (Class) > Autobranchia (Subclass) > Heteroconchia (Infraclass) > Euheterodonta (Subterclass) > Imparidentia (Superorder) > Venerida (Order) >Cyrenoidea (Superfamily) > Cyrenidae (Family) > *Batissa* (Genus) *Batissa violacea* (Species)"

"Status[:] accepted"

Size, Weight, and Age Range
From Palomares and Pauly (2020):

"Max length : 15.0 cm SHL male/unsexed; [Poutiers 1998]; common length : 10.0 cm SHL male/unsexed; [Poutiers 1998]"

Environment
From Mayor et al. (2016):

"The clam can be found in sandy or muddy beds of rivers, in fresh and brackish, often running water (Poutiers, 1998) and to almost freshwater areas of mangrove swamp (Carpenter and Niem, 1998)."

"The *B. violacea* tends to inhabit at a water depth range of 1.75-6.20m."

"The high density of *B. violacea* population in Cagayan River was predicted by the combination of three environmental factors such as soil pH, water pH and total suspended solids (TSS). The soil pH ranges from pH 8.10-8.45; water pH ranges from pH 8.27-9.40; and TSS from 481.34-665.26 mg/l."

Climate
Palomares and Pauly (2020):

"Tropical"

Distribution Outside the United States

Native

From Palomares and Pauly (2020):

"Western Central Pacific."

According to Palmoares and Pauly (2020) countries within the central pacific where *Batissa violacea* are native include Brunei Darsm, Indonesia, Malaysia, Philippines, Singapore, Timor-Leste, Australia, Fiji, Palau, Papua New Guinea, Solomon Island, and Vanuatu.

Introduced

Batissa violacea has not been reported as introduced or established outside of its native range.

Means of Introduction Outside the United States

Batissa violacea has not been reported as introduced or established outside of its native range.

Short Description

From Ponder et al. (2020):

"This very large, thick-shelled bivalve is ovate to almost circular in outline; inside of the valves are purplish in colour, and the exterior is purplish with a thick black to olive periostracum. Most have well-developed concentric growth lirae on the exterior surface, particularly anteriorly. The hinge teeth are of the heterodont type, very strong, with up to three cardinal teeth (which may be bifid) in each valve. The well-developed lateral teeth are coarsely serrated. There is a strong external ligament posterior to the umbones. There is no lunule and no escutcheon. The pallial line is entire.

"The gills are eulamellibranch and the foot is a compressed, tongue shaped foot lacking a byssal groove. There are two relatively short posterior siphons and short papillae on the mantle edge. The mantle margins are not fused ventrally."

Biology

From Palomares and Pauly (2020):

"Also found in the banks and river beds, in fresh and brackish, often running water. Often lays buried with the hind tip of the shell emerging at the surface of the sediment with siphons slightly projecting between the valve margins. Capable of living deep within the sediment, with no siphonal access to the surface, to endure drought periods, then feeding from subterranean water through a narrow anterior gape of shell [Poutiers 1998]. Members of the class Bivalvia are mostly gonochoric, some are protandric hermaphrodites. Life cycle: Embryos develop into free-swimming trocophore larvae, succeeded by the bivalve veliger, resembling a miniature clam [Ruppert et al. 2004]."

"Members of the class Bivalvia are mostly gonochoric, some are protandric hermaphrodites. Life cycle: Embryos develop into free-swimming trocophore larvae, succeeded by the bivalve veliger, resembling a miniature clam."

From Mayor et al. (2018):

"The food diet of *B. violacea* is composed of 80-90% detritus and 10-20% food items such as green algae (35.83%), diatoms (33.13%), euglenophyceae (3.22%) and cryptophyceae (1.94%)."

Human Uses

From Palomares and Pauly (2020):

"Locally collected for food [Poutiers 1998]."

From Hatha et al. (2005):

"The freshwater clam, Kai (*B. violacea*) is a popular and widely consumed food item in Fiji."

Living specimens of *Batissa violacea* are not for sale in the aquarium trade, but the shell of the species can be purchased. According to Conchology (2020), a *Batissa violacea* shell can be purchased for $3.60 dollars.

Diseases

There are no known OIE-reportable diseases (OIE 2020) for *Batissa violacea*.

From Hatha et al. (2005):

"We have further characterised the plate count bacteria [of *Batissa violacea*] into various genera […]. Results indicated predominance of bacteria belonging to the genera Micrococcus and Bacillus. Other genera encountered included Vibrio, Alcaligenes, Acinetobacter, Aeromonas, Pseudomonas, Streptococcus and members of the family Enterobacteriaceae. Occurrence of Aeromonas (Rodriguez and Antillon 1989), Vibrio spp. (Garcia Cortes and Antillon 1990; Pujalte et al. 1999), Acinetobacter (Kueh and Chan 1985) and Pseudomonas (Cheng et al. 1995) were reported earlier."

Threat to Humans

Palomares and Pauly (2020):

"Harmless"

From Nurfadillah et al. (2018):

"Based on the research, it can be concluded that Pb and Cd content in *B. violacea* Lamarck in Aceh Jaya coastal waters on February 2014 had exceeded the maximum threshold of heavy metal contamination in food according to SNI 7387 in 2009 […]."

3 Impacts of Introductions

Batissa violacea has not been reported as introduced or established outside of its native range; therefore, impacts of introductions are unknown.

4 History of Invasiveness

Batissa violacea has not been reported as introduced or established outside of its native range; therefore, impacts of introductions are unknown. This species is in trade at the local level as a food item within its native range. The history of invasiveness is classified as No Known Nonnative Populations.

5 Global Distribution

Figure 1. Known global distribution of *Batissa violacea*. Observations are reported from the Western Pacific including locations in Australia, Papua New Guinea, New Zealand, Indonesia, Cambodia, Fiji, New Caledonia, Vanuatu, the Solomon Islands, and the Philippines. Map from GBIF Secretariat (2020). Locations in North America do not represent established populations and were not used in subsequent climate matching analysis.

6 Distribution Within the United States

Batissa violacea has not been reported as introduced or established in the United States.

7 Climate Matching

Summary of Climate Matching Analysis

The overall climate match for the contiguous United States was medium. Areas of high and medium match were found primarily on the west and southeast coasts. The overall Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for the contiguous United States was 0.013, medium (scores between 0.005 and 0.103, exclusive, are classified as medium). Florida had a high individual Climate 6 score while California, Georgia, Oregon, South Carolina, Texas, and Washington had medium Climate 6 scores. All other States had low individual scores.

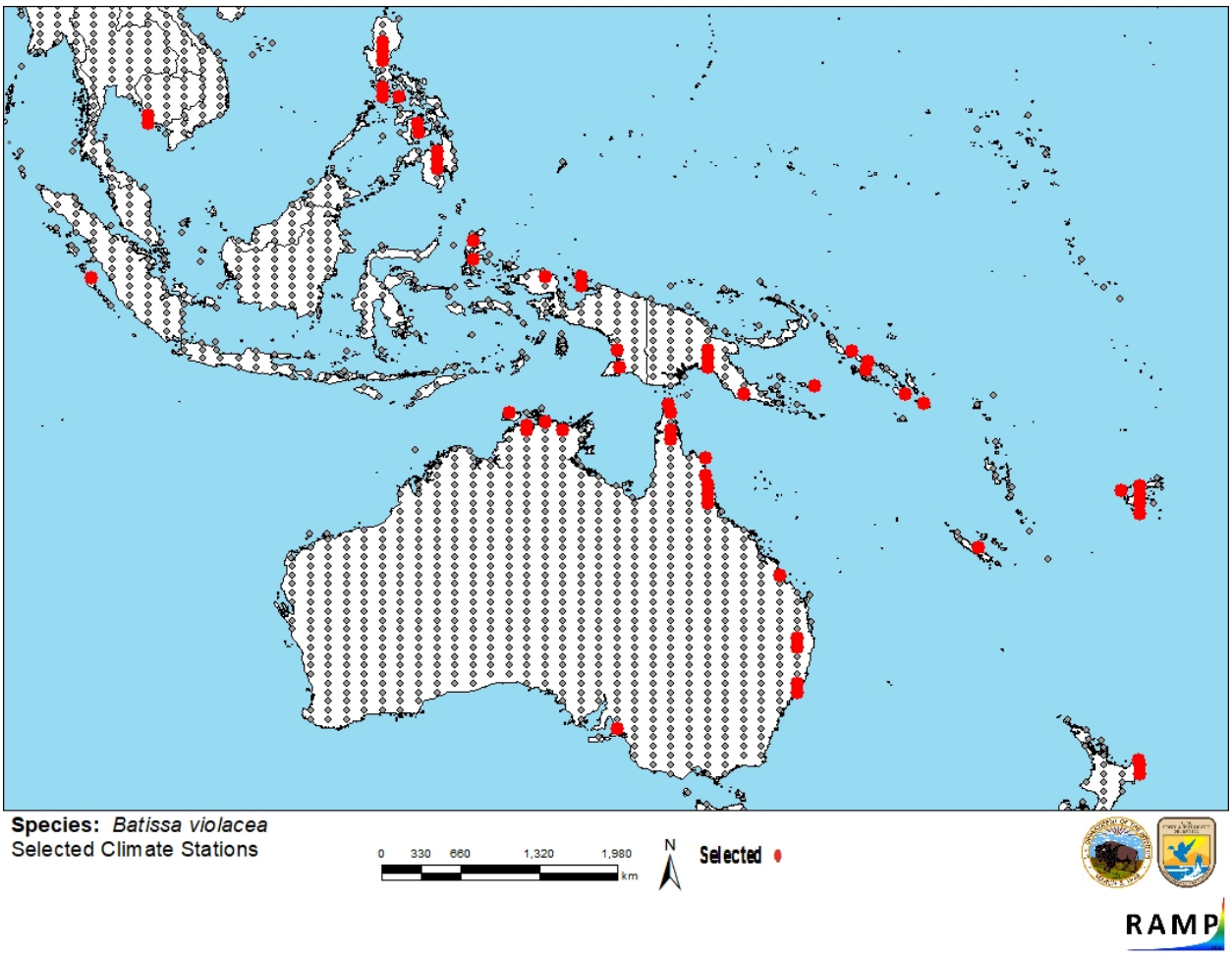

Figure 2. RAMP (Sanders et al. 2018) source map showing weather stations in Western Pacific selected as source locations (red; Australia, Papua New Guinea, New Zealand, Indonesia, Cambodia, Fiji, New Caledonia, Vanuatu, the Solomon Islands, and the Philippines) and non-source locations (gray) for *Batissa violacea* climate matching. Source locations from GBIF Secretariat (2020). Selected source locations are within 100 km of one or more species occurrences, and do not necessarily represent the locations of occurrences themselves.

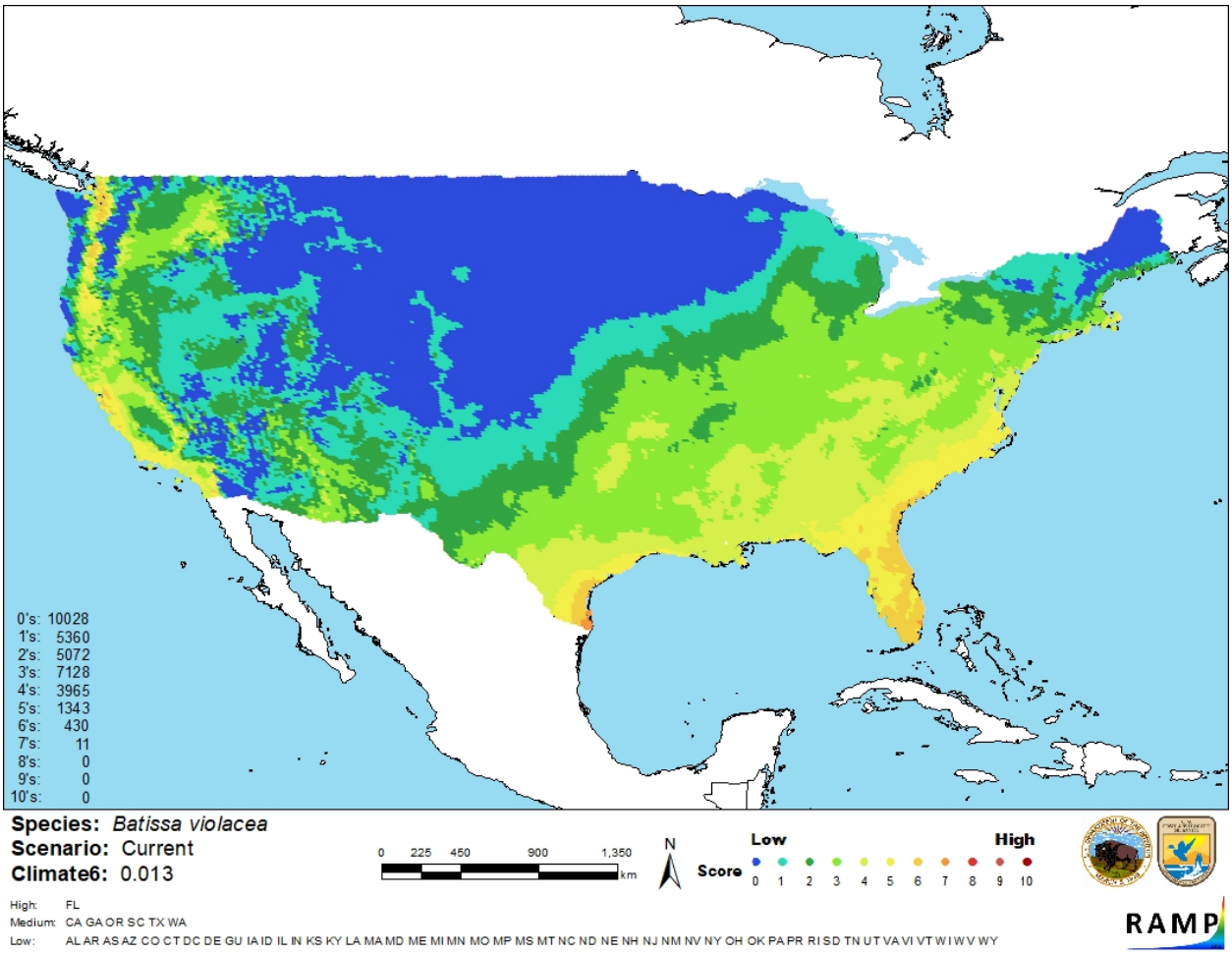

Figure 3. Map of RAMP (Sanders et al. 2018) climate matches for *Batissa violacea* in the contiguous United States based on source locations reported by GBIF Secretariat (2020). Counts of climate match scores are tabulated on the left. 0/Blue = Lowest match, 10/Red = Highest match.

The High, Medium, and Low Climate match Categories are based on the following table:

Climate 6: (Count of target points with climate scores 6-10)/ (Count of all target points)	Overall Climate Match Category
0.000≤X≤0.005	Low
0.005<X<0.103	Medium
≥0.103	High

8 Certainty of Assessment

No records of *Batissa violacea* introductions outside of its native range were found. General information about the species was available from a variety of peer reviewed journals and online databases. Native range and distribution information was also available. *Batissa violacea* is not

in the aquarium trade, but their shells may be purchased. With no information available regarding impacts of introduction, the certainty of this assessment is low.

9 Risk Assessment

Summary of Risk to the Contiguous United States

Batissa violacea, the Violet Batissa, is a freshwater mollusk species that is native to the Western Central Pacific (Brunei Darsm, Indonesia, Malaysia, Philippines, Singapore, Timor-Leste, Australia, Fiji, Palau, Papua New Guinea, Solomon Islands, and Vanuatu). This species is not found in the aquarium trade, but the shells of individuals can be purchased. *B. violacea* is also utilized locally as a food source within its native range. Since no records of introductions outside of its native range were found, the history of invasiveness is classified as No Known Nonnative Population. The overall climate match for the contiguous United States was medium, with areas of high and medium match in the west and southeast coastal areas. The certainty of this assessment is low due to limited information available regarding the history of invasiveness of *B. violacea*. The overall risk assessment category for *Batissa violacea* is Uncertain.

Assessment Elements

- **History of Invasiveness (Sec. 4): No Known Nonnative Population**
- **Overall Climate Match Category (Sec. 7): Medium**
- **Certainty of Assessment (Sec. 8): Low**
- **Remarks, Important additional information: No additional information to report**
- **Overall Risk Assessment Category: Uncertain**

10 Literature Cited

Note: The following references were accessed for this ERSS. References cited within quoted text but not accessed are included below in Section 11.

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11 Literature Cited in Quoted Material

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.

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Cheng CA, Hwang DF, Tsai YH, Chen HC, Jeng SS, Noguchi T, Ohwada K, Hashimoto K. 1995. Microflora and tetrodotoxin producing bacteria in a gastropod, *Niotha clathrata*. Food Chemistry and Toxicology 33:929–934.

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Kueh, Chan. 1985. [Source material did not give full citation for this reference.]

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