Corbicula moltkiana (a clam, no common name)
Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, September 2011
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No Photo Available

1 Native Range and Status in the United States

Native Range
From Djajasasmita (1977):

“Distribution. - Sumatra and Malay peninsula.
Type-locality. - Sumatra, no definite locality mentioned.”

From Bogan (2011):

“This species is found in Lake Singkarak, and Lake Manindjau, western Sumatra in Indonesia (Glaubrecht et al. 2003). This species has also been found in the Tiwi River, central Sumatra, Indonesia (Djajasasmita 1985). Prashad (1921) reported this species from a small stream in northeast Sumatra. Van Heurn and Paravicini (1922) reported this species from Peusang River and Lake Tawar, both of which are in northeast Sumatra. It is unknown if the sites surveyed in 1921 and 1922 still contain this species.”
**Status in the United States**
No records of *C. moltkiana* in the wild or in trade were found in the United States.

**Means of Introductions in the United States**
No introductions have been recorded outside of their native range.

**Remarks**
No additional remarks.

## 2 Biology and Ecology

**Taxonomic Hierarchy and Taxonomic Standing**
Dajasasmita (1977):

“The species of the genus *Corbicula* known from Indonesia are alphabetically listed and noted. Sixteen out of the 35 described species are considered valid, i.e. […] *C. moltkiana*, […]”

From Bogan (2011):

“Kingdom Animalia  
Phylum Mollusca  
Class Bivalvia  
Order Venerida  
Family Cyrenidae  
Genus *Corbicula*  
Species *Corbicula moltkiana* Prime, 1878”

**Size, Weight, and Age Range**
No information on size weight or age range was found for *Corbicula moltkiana*.

**Environment**
From Bogan (2011):

“This species is found in lakes and rivers. This species was found in stony and sandy substrates (Dajasasmita 1985).”

According to Lukman et al. (2018), *Corbicula moltkiana* can be found up to a depth of 10 meters.
**Climate/Range**  
From Djajasasmita (1977):

“The species of *Corbicula* are at present distributed over the tropical and subtropical regions; […].”

**Distribution Outside the United States**  
Native  
From Djajasasmita (1977):

“Distribution. - Sumatra and Malay peninsula.  
Type-locality. - Sumatra, no definite locality mentioned.”

From Bogan (2011):

“This species is found in Lake Singkarak, and Lake Manindjau, western Sumatra in Indonesia (Glaubrecht et al. 2003). This species has also been found in the Tiwi River, central Sumatra, Indonesia (Djajasasmita 1985). Prashad (1921) reported this species from a small stream in northeast Sumatra. Van Heurn and Paravicini (1922) reported this species from Peusang River and Lake Tawar, both of which are in northeast Sumatra. It is unknown if the sites surveyed in 1921 and 1922 still contain this species.”

Introduced  
*C. moltkiana* has not been reported as introduced in the wild anywhere outside of its native range.

**Means of Introduction Outside the United States**  
*C. moltkiana* has not been reported anywhere outside of its native range.

**Short Description**  
From Djajasasmita (1977):

“At first sight this species resembles *C. lindoensis*, a species from Celebes, but the shell is thicker and the concentrical ribs are more impressed. On some shells the ribs are irregular and sometimes the lunula is lighter or darker than the shell colour. The posterior side of some Shells is more rostrate.”

**Biology**  
From Glaubrecht et al. (2006):

“All *Corbicula* species endemic to Sulawesi and *C. moltkiana* from Sumatra were found to be endobranchous, i.e. to incubate their young in their inner demibranchs at least until the stage of juveniles with straight-hinged shells (D-shaped), thus being ovoviviparous.”
According to Glaubrecht et al. (2006), *C. moltkiana* can incubate several hundred larvae within their inner demibranchs.

According to Korniushin and Glaubrecht (2003), *C. moltkiana* brood their larvae in their inner demibranchs until the larvae become D-shaped and reach a size of 0.35 to 0.40 mm to be released as juveniles. This type of brooding is called synchronous.

From Korniushin and Glaubrecht (2003):

“Larvae of *Corbicula moltkiana* were found only in inner demibranchs […], being located in the water tubes formed by interlamellar septae that were thickened along their entire length […]. High cylindrical cells were visible in the epithelium of these septae under higher magnification […]. Interlamellar septae of the outer demibranch in incubating specimens were not thickened.”

**Human Uses**

From Marlina et al. (2007):

“*Corbicula moltkiana* Prime is one of the famous bivalve’s delicacies in West Sumatera, Indonesia, especially for people who stay near the lake and river shore. In West Sumatera, *C. moltkiana* is usually found at Lake Singkarak and Lake Maninjau, and is usually eaten semicooked mostly sold by street vendors.”

From Lukman et al. (2018):

“Pensi [*Corbicual moltkiana*] known as a snack food and widely liked by the people of West Sumatra.”

From Ng et al. (2016):

“We recorded freshwater molluscs from ornamental pet shops and major exporters including non-ornamental species (e.g., hitchhikers, molluscs sold as fish feed). We recorded an unexpectedly high diversity—59 species—of freshwater bivalves and gastropods, with the majority (38 species or 64%) being from the Oriental region. “

“DNA barcodes also allowed for more accurate identification of some species (e.g., confirmation of identification for *Corbicula moltkiana* […]). In addition, DNA barcodes are usually less variable than the morphology of wild and cultured individuals, which makes rapid identification based solely on external morphology difficult and sometimes unreliable.”

**Diseases**

According to Marlina et al. (2007), *C. moltkiana* can carry the pathogen *Vibrio parahaemolyticus*.

No OIE-reportable diseases (OIE 2019) were found to be associated with *Corbicula moltkiana*. 
**Threat to Humans**  
From Marlina et al. (2007):

“*Vibrio parahaemolyticus* is an enteric pathogen transmitted to human [*sic*] primarily through consumption of raw or mishandled seafood and there is a strong correlation of pathogenicity with possessions of hemolysin genes, tdh and trh (Kim et al, 1999; Wong et al, 1999).”

“The antibiotic resistance profiles of the *Vibrio parahaemolyticus* isolates from raw and cooked *Corbicula moltkiana* Prime showed that all isolates exhibited resistance to three or more of the antibiotics tested [...].”

“In summary, this study demonstrated that 36% of *V. parahaemolyticus* isolated from *C. molktiana* Prime collected from West Sumatera region possessed the tdh gene. As these isolates can cause infectious disease in humans (DePaola, et al, 2003; Robert-Pillot et al, 2004), the consumption of seafood contaminated with these bacteria pose a great risk for public health.”

**3 Impacts of Introductions**

No introductions of *Corbicula moltkiana* have been recorded.
4 Global Distribution

Figure 1. Known global distribution of *Corbicula moltkiana*. Yellow shaded region indicates *C. moltkiana* distribution. Locations are in Sumatra, Indonesia. Map from Bogan (2011).

No georeferenced observations were available for *C. moltkiana* to use in selecting source locations for the climate match. Source points for the climate match were chosen to represent the distribution as shown in Figure 1.

5 Distribution Within the United States

No records of *Corbicula moltkiana* were found in the United States.
6 Climate Matching

Summary of Climate Matching Analysis
The climate match for the contiguous United States was generally very low. There are no areas of high match and only two small areas of medium match in southern Louisiana and Florida. The Climate 6 score (Sanders et al. 2018; 16 climate variables; Euclidean distance) for the contiguous United States was 0.000, low (scores between 0.000 and 0.005, inclusive, are classified as low). All States had low individual Climate 6 scores. An area of slightly higher match, but still categorically low, was found in states along the Gulf of Mexico and mid-way up the Atlantic Coast. No georeferenced locations were available to use in selecting source locations for the climate match, so collection locations reported in the literature were used.

Figure 2. RAMP (Sanders et al. 2018) source map showing weather stations in Sumatra, Indonesia selected as source locations (red) and non-source locations (gray) for Corbicula moltkiana climate matching. Source locations represent the range of the species as described by Bogan (2011).
Figure 3. Map of RAMP (Sanders et al. 2018) climate matches for Corbicula moltkiana in the contiguous United States based on source locations reported by Bogan (2011). 0 = Lowest match, 10 = Highest match.

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

<table>
<thead>
<tr>
<th>Climate 6: Proportion of (Sum of Climate Scores 6-10) / (Sum of total Climate Scores)</th>
<th>Climate Match Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.000≤X≤0.005</td>
<td>Low</td>
</tr>
<tr>
<td>0.005&lt;X&lt;0.103</td>
<td>Medium</td>
</tr>
<tr>
<td>≥0.103</td>
<td>High</td>
</tr>
</tbody>
</table>

7 Certainty of Assessment

The certainty of assessment is low. Limited information is available for this species. No records of introduction have been found for Corbicula moltkiana, so impacts of introduction cannot be determined.
8 Risk Assessment

Summary of Risk to the Contiguous United States

*Corbicula moltkiana* is a freshwater bivalve found in lakes and streams in northern Sumatra, Indonesia. *C. moltkiana* is found in Lake Singkarak, and Lake Manindjau. *C. moltkiana* has an uncertain history of invasiveness; it has not been reported in the wild as established outside of its native range. This species is found in trade; it is considered a delicacy in Indonesia and is found in the pet trade. Although *C. moltkiana* is a popular food item, it carries the pathogen *Vibrio parahaemolyticus* which can be transferred to humans through consumption and serve as a risk to public health. The climate match for the contiguous United States was generally low with all individual states receiving a low climate score. A slightly higher, but still low, area of match was found in states along the Gulf of Mexico and the southern Atlantic Coast. No georeferenced locations were available to use when selecting source locations for climate matching, so collection locations reported in the literature were used. The certainty of assessment is low. The overall risk assessment for *Corbicula moltkiana* 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:** Consumption by humans can lead to infection with *Vibrio parahaemolyticus*.
- **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.


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.


