

Gabon Shrimp (*Atya gabonensis*)

Ecological Risk Screening Summary

U.S. Fish & Wildlife Service, May 2017

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Web Version, 10/30/2017



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<https://commons.wikimedia.org/wiki/File:Atyagabonensis.jpg>. (May 2017).

1 Native Range and Status in the United States

Native Range

From De Grave and Mantelatto (2013):

“Brazil; Cameroon; Congo, The Democratic Republic of the; Gabon; Ghana; Liberia; Mali; Nigeria; Sao Tomé and Príncipe (São Tomé); Senegal; Suriname; Venezuela, Bolivarian Republic of (Venezuela (mainland))”

Status in the United States

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

From Petshrimp (no date):

“The African Filter Shrimp used to be very rare in the hobby, and still is to a certain degree. One still does not encounter these magnificent [*sic*] shrimp in local pet stores all too often. [...] As with all filter feeding shrimp, these shrimp are also entirely wild-caught.”

Means of Introductions in the United States

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

Remarks

From Nwosu (2009):

“It has been given several common names such as African Fan Shrimp, African Filter Shrimp, African Giant Shrimp, Vampire Shrimp, Blue Rhino Shrimp, Gabon Shrimp, and Cameroon Fan Shrimp.”

From De Grave and Mantelatto (2013):

“[...] the South American populations may pertain to *Atya scabra* (Mantelatto, F.L. pers. comm. 2012) and no recent records are known in South America.”

2 Biology and Ecology

Taxonomic Hierarchy and Taxonomic Standing

From ITIS (2017):

“Kingdom Animalia
Subkingdom Bilateria
Infrakingdom Protostomia
Superphylum Ecdysozoa
Phylum Arthropoda
Subphylum Crustacea
Class Malacostraca
Subclass Eumalacostraca
Superorder Eucarida
Order Decapoda
Suborder Pleocyemata
Infraorder Caridea
Superfamily Atyoidea
Family Atyidae
Genus *Atya*
Species *Atya gabonensis* Giebel, 1875 – gabon shrimp”

“Taxonomic Status:
Current Standing: valid”

Size, Weight, and Age Range

From Powell (1983):

“Total length 12cm.”

“Often there is a size difference between the sexes, the males being larger in genera such as *Atya* [...]”

Environment

From De Grave and Mantelatto (2013):

“The species lives in larger low-land rivers, often with fast currents and on a rocky substrate.”

From Hobbs and Hart (1982):

“Motwani and Kanwai (1970) reported the occurrence of large numbers of *Atya gabonensis* in the coffer-dammed right channel of the Niger River on 4 and 5 August 1966. Gill nets ensnared them at depths as great as 11.4 m.”

“[...] C.B. Powell (pers. comm.) found *A. gabonensis* in the faster flowing sections of the [Nun and Osse] rivers that are deep, lack rocks, and, during the dry season, are sluggish.”

From Obande and Kusemiju (2008):

“It inhabits clear waters, burrows on root masses, crevices and rocky bottoms.”

From Petshrimp (no date):

“Water Parameters: wide range, not important”

From Powell (1983):

“The life cycle includes marine larval and postlarval stages.”

Climate/Range

From De Grave and Mantelatto (2013):

“This species is amphi-atlantic, occurring from the Democratic Republic of Congo through to Senegal, as well as in Venezuela, Suriname and Brazil. However the South American populations may pertain to *Atya scabra* (Mantelatto, F.L. pers. comm. 2012) and no recent records are known in South America.”

From Petshrimp (no date):

“tropical species, best kept at 75°F-84°F”

Distribution Outside the United States

Native

From De Grave and Mantelatto (2013):

“Brazil; Cameroon; Congo, The Democratic Republic of the; Gabon; Ghana; Liberia; Mali; Nigeria; Sao Tomé and Príncipe (São Tomé); Senegal; Suriname; Venezuela, Bolivarian Republic of (Venezuela (mainland))”

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 Powell (1983):

“Rostrum short, lacking dorsal teeth, flanked by a pair of lateral teeth. First and 2nd legs (chelipeds) reduced and specialised, appearing as mouthparts, their modified chela[e] bearing brushes of setae as long as the chelae. Third to 5th legs stout, ambulatory, the third much larger than the 4th or 5th. Colour uniformly dark greyish, no mid-dorsal stripe.”

Biology

From Nwosu (2009):

“The onset of spawning was indicated in March by the prevalence of soft-bodied specimens in catch samples. Fecundity of berried females varied with size and month. With a size range of 6.5-11 cm, fecundity varied from 850-12,220 eggs/female during the study period.”

“Peak of reproductive activity was in May. No berried female was observed in samples from January to March.”

From Obande and Kusemiju (2008):

“It was observed that the organism [*Atya gabonensis*] fed on algae, diatoms, insect parts and detritus, algae and detritus forming the most important food items. Algae constituted 61.9% of food item by number and 88.5% by occurrence. Detritus occurred in 79.1% of stomachs examined. Amongst the algae, *Scenedesmus quaricauda* was the most preferred, constituting 20.7% by occurrence and 37.9% by number, followed by spirogyra which constituted 17.8% and

23.9% by occurrence and number, respectively. The least eaten food item was insect parts. *A. gabonensis* can be said to be an omnivorous detritivore, its preference for food changing with season and size of the prawn with peak in July.”

From Powell (1983):

“*Atya* species use their modified chelipeds to collect fine particles from the bottom, or filter them from flowing water (see Fryer, 1977). The life cycle includes marine larval and postlarval stages.”

From Bauer (2013):

“Amphidromy is a diadromous life history pattern, common in tropical and subtropical freshwater caridean shrimps, in which adults live, breed and spawn small-sized embryos in freshwater but have extended larval development (ELD) in marine waters. [...] An important benefit of amphidromy is dispersal among river systems via marine larvae, which increases their access to alternative habitats. [...] Delivery of larvae to the sea in many amphidromous species is accomplished by upstream hatching and river drift of larvae to the sea. [...] After development, the postlarvae must find a river mouth and migrate upstream to the adult habitat. Migrations occur at night, with juveniles swimming or crawling along the river or stream bank. Larvae are released during the wet or flood season of the year, while juvenile migrations take place during the dry or low-flow season.”

Human Uses

From Powell (1983):

“The species is harvested on a small scale in northern [sic] Nigeria (Reed, 1967: 120, 172) as well as elsewhere in West Africa. It is reputed to have a superior flavour and was sought after by some Europeans in the Ibadan area years ago. It is of no particular importance in the Delta, due to difficulties in harvesting it in worthwhile quantities. Ijaw fishermen along the River Osse take it in lengths of bamboo set on the river bottom to catch *Chrysichthys*, but customarily release it, as the traditional ‘king’ or protector of other shrimp species.”

From Petshrimp (no date):

“The African Filter Shrimp used to be very rare in the hobby, and still is to a certain degree. One still does not encounter these magnificent [sic] shrimp in local pet stores all too often. [...] As with all filter feeding shrimp, these shrimp are also entirely wild-caught.”

From De Grave and Mantellato (2013):

“The species is also found in the European aquarium trade (W. Klotz, pers comm. 2012).”

From Aquatic Arts (2017):

“The Vampire Shrimp (*Atya gabonensis*) is certainly among the most fascinating and unique aquarium shrimp available. Also known as the African Filter Shrimp, Viper Shrimp, Gabon Shrimp, and Cameroon Shrimp, this peaceful species is very rare, but ideal for the nano and planted aquarium.”

Diseases

From Okiya et al. (2015):

“Several parasites (endo and ecto) were observed and identified in *A. gabonensis* used for this work. This is in agreement with the findings of Overstreet (1973), Couch (1978), Johnson (1978) and Fontaine (1985) who reported that shrimps in their natural environment serve as hosts for a variety of parasites [*sic*] groups (nematodes, cestodes, ciliates and flagellates).”

“Different kinds of parasites were observed to be present in different locations in *A. gabonensis*. They occur in the exoskeleton, and gill *Tetrahymena* species appeared on the gill, exoskeleton and intestine, *Piscinoodium* species appeared on the gills; *Procamallanus* species appeared on the gill, exoskeleton and gills; *Capriniana* species appeared on gill, *Apiosoma* species appeared on the exoskeleton and gills [...] *Trichodina* species appeared on the faeces, *Capillaria* species appeared on the exoskeleton; *Ichthyophthirius multifiliis* appeared on the gill [...] *Bothricephalus* appeared on the intestine.”

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

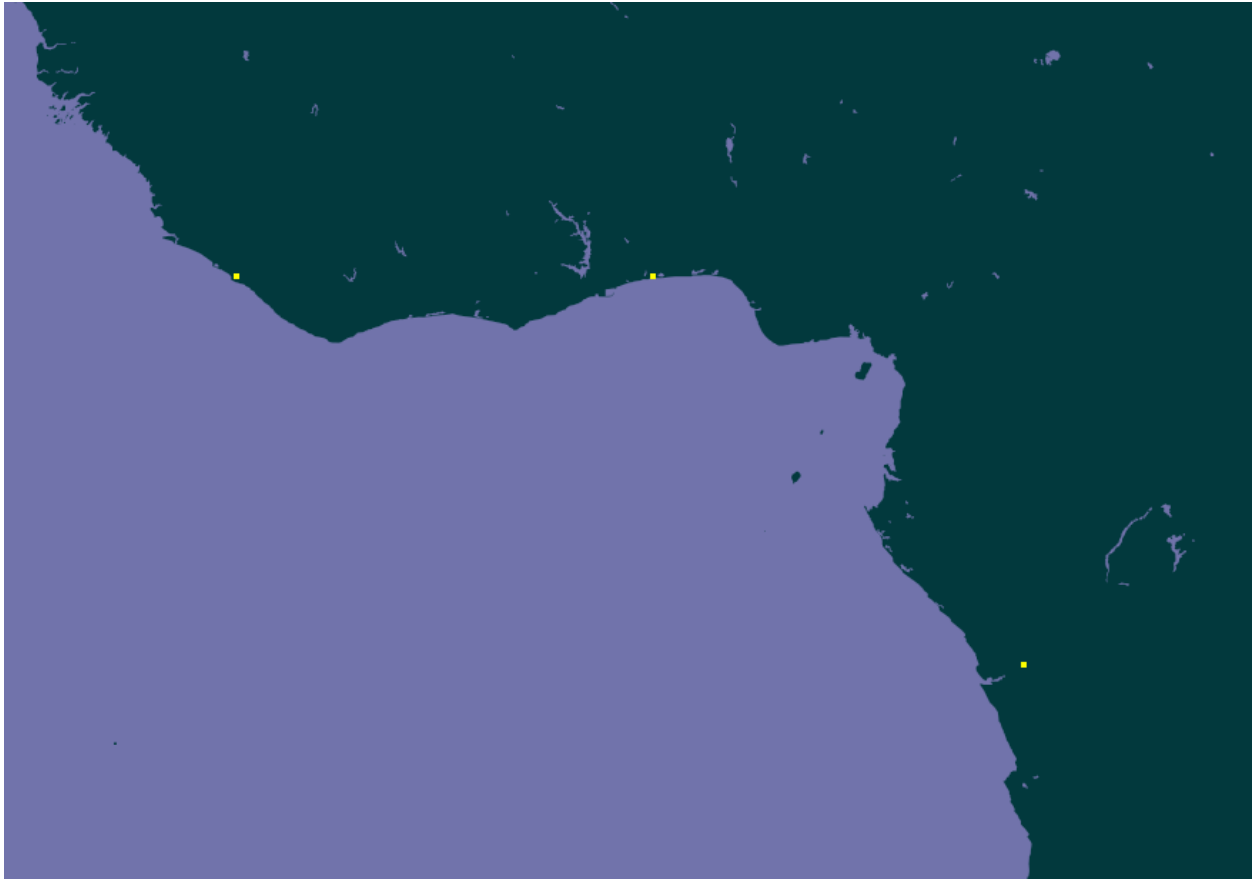


Figure 1. Known global distribution of *Atya gabonensis*. Map from GBIF (2016).

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, which is classified as “Low”. Climate 6 scores ≤ 0.005 indicate a low climate match. Locally, the climate match was medium in southern Florida and a small area of southern Texas, and low elsewhere.

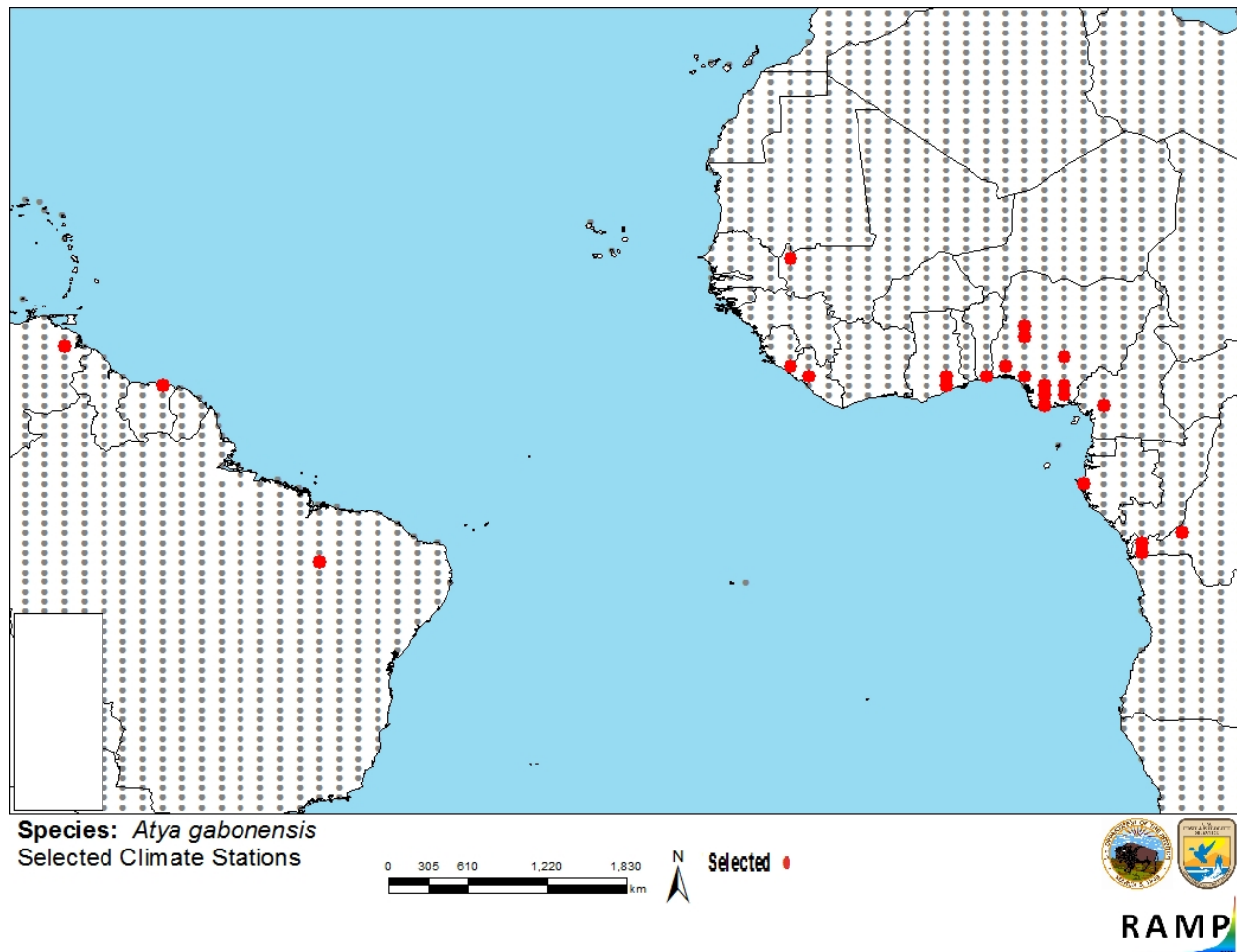


Figure 2. RAMP (Sanders et al. 2014) source map showing weather stations selected as source locations (red) and non-source locations (gray) for *Atya gabonensis* climate matching. Source locations from Hobbs and Hart (1982) and GBIF (2016). Additional locations from Nwosu (2009; Nigeria) and Okiya et al. (2015; Nigeria).

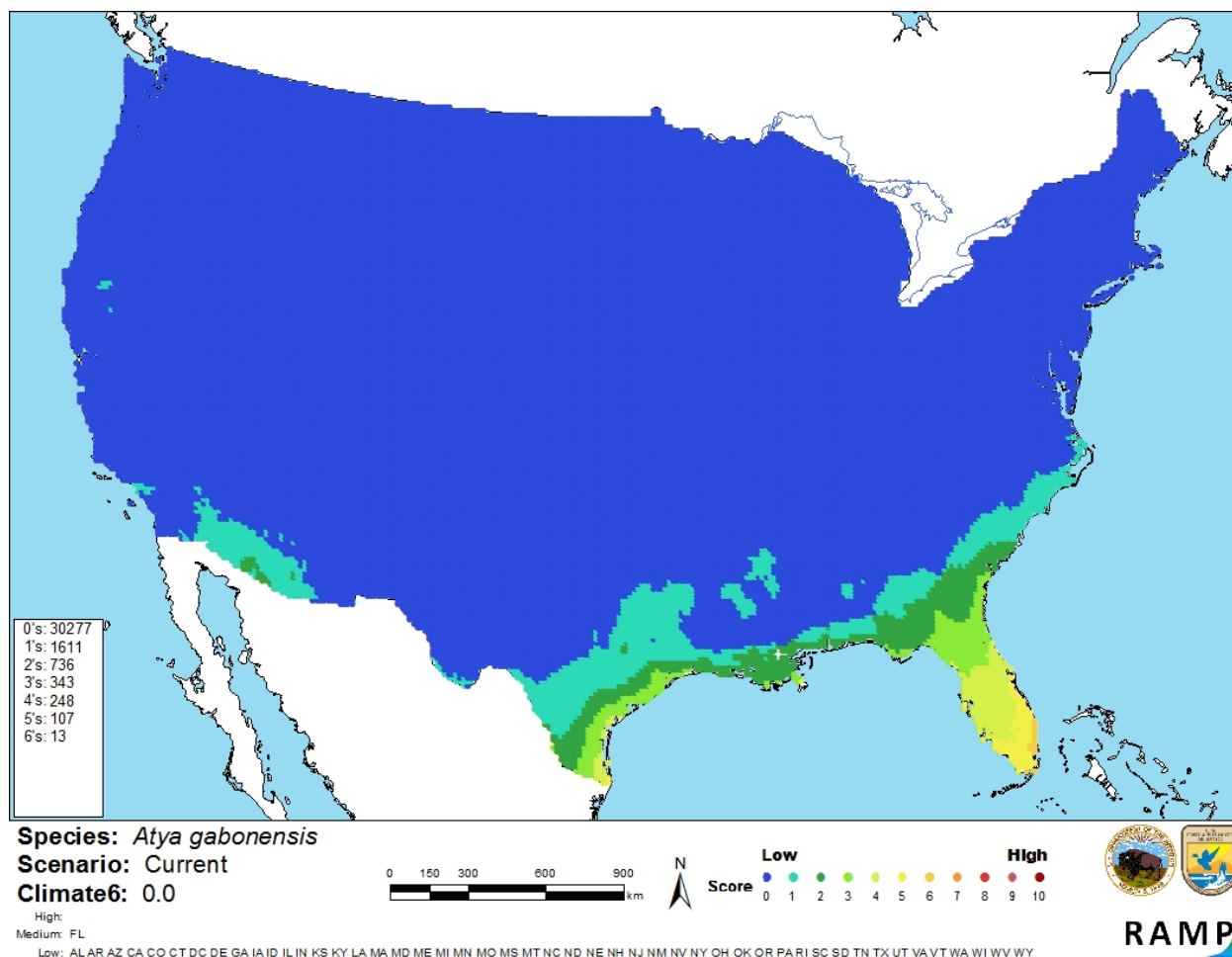


Figure 3. Map of RAMP (Sanders et al. 2014) climate matches for *Atya gabonensis* in the contiguous United States based on source locations reported by Hobbs and Hart (1982) and GBIF (2016). Additional locations from Nwosu (2009; Nigeria) and Okiya et al. (2015; Nigeria). 0=Lowest match, 10=Highest match. Counts of climate match scores 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 |
|--|---------------------------|
| $0.000 \leq X \leq 0.005$ | Low |
| $0.005 < X < 0.103$ | Medium |
| ≥ 0.103 | High |

7 Certainty of Assessment

There is comprehensive information available on *Atya gabonensis*. Its habitat, diet, reproductive habits, and life history have been documented in scientific literature. There is some uncertainty concerning this species’ range; it is disputed whether there is a viable population of *A. gabonensis* in South America. There have been no impacts of introduction reported for this

species because it has never been reported outside of its native range, despite its use in trade. Certainty of this assessment is low.

8 Risk Assessment

Summary of Risk to the Contiguous United States

Atya gabonensis is a species of freshwater shrimp native to the west coast of Africa. It has also been reported from South America, but it is not clear if this population still exists because it has not been documented in 15 years. *A. gabonensis* is utilized in the aquarium trade in the United States, but no history of invasiveness has been documented for this species. This species has a low climate match with the contiguous U.S. 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
- **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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- Bauer, R. T. 2013. Amphidromy in shrimps: a life cycle between rivers and the sea. *Latin American Journal of Aquatic Research* 41(4):633-650.
- De Grave, S., and F. Mantelatto. 2013. *Atya gabonensis*. The IUCN Red List of Threatened Species 2013: e.T198241A2517516. Available: <http://www.iucnredlist.org/details/198241/0>. (May 2017).
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- Obande, R. A., and K Kusemiju. 2008. Food and feeding habits of *Atya gabonensis* from Lower River Benue in northern Nigeria. West African Journal of Applied Ecology 13(1):77-82.
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- Sanders, S., C. Castiglione, and M. H. Hoff. 2014. Risk Assessment Mapping Program: RAMP. US 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.

- Couch, J. A. 1978. Diseases, parasites and toxic responses of commercial penaeid shrimps of the Gulf of Mexico and South Atlantic coasts of North America. Fishery Bulletin 76:1-44.
- Fontaine, C. T. 1985. A survey of potential disease causing organisms in bait shrimp from West Galveston Bay, Texas. US National Marine Fisheries Services, Galveston, Texas.
- Fryer, G. 1977. Studies on the functional morphology and ecology of the atyid prawns of Dominica. Philosophical Transactions of the Royal Society of London, Biological Sciences 277(952):57-129.
- Johnson, S. K. 1978. Handbook of shrimp diseases. Department of Wildlife and Fisheries Sciences, Texas A&M University, College Station, Texas.
- Motwani, M. P., and Y. Kanwai. 1970. Fish and fisheries of the coffer-dammed right channel of the River Niger at Kainji. Pages 27-48 in S. A. Visser, editor. Kainji, a Nigerian man-made lake. Kainji Lake Studies, Volume I: Ecology. Nigerian Institute of Social and Economic Research.
- Overstreet, R. M. 1973. Parasites of some penaeid shrimps with emphasis on reared hosts. Aquaculture 2:105-140.

Reed 1967. [Source material did not give full citation for this reference].