Geukensia demissa 正體中文

System: Marine

Kingdom	Phylum	Class	Order	Family
Animalia	Mollusca	Bivalvia	Mytiloida	Mytilidae

Common name Atlantic ribbed marsh mussel (English), ribbed horsemussel (English), ribbed mussel (English)

Synonym
Arcuatula demissa , (Dillwyn, 1817)
Ischadium demissa , (Dillwyn, 1817)
Mytilus demissa , (Dillwyn, 1817)
Modiola plicatulus , (Lamarck, 1819)
Modiola semicostata , (Conrad, 1837)
Modiolus plicatulus

Similar species *Septifer bifurcatus, Brachidontes exustus*

Summary Geukensia demissa (ribbed mussel) is native to the east coast of North America and have been introduced to California, Mexico, Texas and Venezuela. Geukensia demissa are reported to cause problems for the California Clapper Rail (Rallus longirostris obsoletus), with whom they share the same habitat, by the trapping and drowning of birds in marshes caused by their shells sticking out of the mud.

view this species on IUCN Red List

Species Description
Geukensia demissa grows to be an average of 10cm in length, with the maximum size being 13cm. The umbo or hump is located at the center of the growth lines which is close to the head end of the shell. The thin, glossy tissue that covers the shell is called the periostracum. It is usually olive-brown, yellowish-brown, dark brown or black. The grayish-white part of the shell is usually seen where the periostracum has been worn away. The interior of *G. demissa* is \"silvery white or bluish white, often iridescent, with purple tints toward the hind margin\" (Cohen, 2005).
Geukensia demissa settles slightly in the mud with the head end pointed downward and the large, round hind sticking out of the mud (Cohen, 2005).

Notes
On the northwest Atlantic coast this species is known as *Geukensia demissa* and on the northeast Pacific coast it is known as *Ischadium demissum* (Cohen and Carlton, 1995).

Lifecycle Stages
Geukensia demissa can live to be over 15 years (Cohen, 2005). Growth is enhanced by increasing Nitrogen levels (Evgendou and Valiela, 2002).

Uses
Geukensia demissa is a bioindicator of pollution and water quality for pollution assessment studies. This species is a filter feeder which makes it a good specimen for sediment evaluation (Coen and Walters, undated).
G. demissa improves water quality by cycling nutrients in estuarine habitats (Coen and Walters, undated). At the time of the summer tidal cycle, *G. demissa* can filter a volume of water that exceeds the total marsh volume (Jordan and Valiela, 1982). In Georgia, biodeposition from *G. demissa* is a large part of the annual marsh sediment budget which is important geologically to marshes (Smith and Frey, 1985).

Habitat Description
Geukensia demissa is found on the Atlantic coast of North America in intertidal zones and marshes (Cohen, 2005). It is often found living on the cordgrass *Spartina foliosa*. This species is abundant at the lowest shore levels of a marsh (Franz, 1997).
G. demissa is most abundant in estuarine lakes and brackish waters in Venezula (Báez *et al*. 2005). The highest water temperature tolerated is 56°C and salinities twice as salty as the ocean (Cohen, 2005). At low tide, *G. demissa* closes its shell to conserve water (Coen and Walters, undated).

Reproduction
Geukensia demissa releases sperm and eggs into the water where they can be fertilized. The larvae is in the water from the beginning of summer to the beginning of fall (Cohen, 2005). Báez *et al* (2005) discussed how *G. demissa* spawns more often in warmer temperatures. There are two distinct spawning peaks in the tropics: July and December. These are the rainy season and the dry season respectively.
Six stages represent the production of gametes in *G. demissa*. During the resting stage the sex of *G. demissa* is uncertain and no follicles are present. Packed connective tissue hinders the ability to view the genitals. During the early development stage the first signs of gametogenesis is present. In the late stage sperm can be observed. The morphologically mature stage shows sperm moving to the lumen and at this point females ova have reached maximum size. The spawned stage is when a great number of visible ova are present in the females follicles and \"dense bands of mature sperms are visible\" in the male. During the post spawn stage the follicles that held the sperm and the ova collapse and degenerate (Báez *et al*. 2005).

Nutrition
Geukensia demissa is a filter feeder that eats plankton and organic particles (Cohen, 2005) during high tide (Coen and Walters, undated). *G. demissa* feeds on bacterioplankton and is known as one of the few to do so. Feeding only occurs when the mussel is fully submerged (Coen and Walters, undated). During high tide though, aerial exposure reduces the filter feeding time of *G. demissa* (Borrero, 1987)

General Impacts
Torchin *et al.* (2005) report on the report on the distribution, abundance, and biomass of the introduced ribbed mussel, *G. demissa*, at the Estero de Punta Banda (EPB), on the Pacific Coast of Baja California Norte, Mexico. The authors report it is unlikely that *G. demissa* competes with native bivalves for space as they occupy different habitats, however, *G. demissa* could be competeing with native bivalves and suspension feeders for food as thay are capable of filtering large amounts of water.
A significant impact of *G. demissa* was its affect on vegetation. The association between the native cordgrass (*S. foliosa*) and the introduced mussel was positive, increased mussel presence due to increased reproduction resulted in increased cordgrass prodcution. Increased cordgrass meant a decrease in the habitat of other benthic muddwelling invertebrates, and many of the birds that tend to forage on tidal flats (Torchin *et al*. 2005).
The introduced mussel has an impact on the endangered California clapper rail (see *Rallus longirostris obsoletus* in IUCN Red List of Threatened Species) with which it shares a common habitat. The posterior margin of the shell which protrudes above the surface of the mud can clamp on to the toes and beaks of small birds causing toe losses and sometimes death.

Management Info
We have been unable to locate any management information for this particular species.

Pathway
Carlton (1992) suggests that local dispersal pathways within the wetlands in California were most likely to be with movements of shellfish and due to ballast water introductions.*G. demissa* was probably introduced into the Lake Maracaibo system, accidentally on a ships hull or in ballast water or on the legs of migratory birds (Bez *et al*. 2005).

Principal source: Cohen, Andrew N. 2005 Guide to the Exotic Species of San Francisco Bay. *Geukensia demissa* San Francisco Estuary Institute, Oakland, CA,

Compiler: National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG)

Review:

Pubblication date: 2007-05-25

ALIEN RANGE

[2] MEXICO
[1] VENEZUELA

[4] UNITED STATES

Red List assessed species 1: LC = 1;

Rallus longirostris **LC**

BIBLIOGRAPHY
20 references found for **Geukensia demissa**

Managment information
Centre for Environment, Fisheries & Aquaculture Science (CEFAS)., 2008. Decision support tools-Identifying potentially invasive non-native marine and freshwater species: fish, invertebrates, amphibians.
Summary: The electronic tool kits made available on the Cefas page for free download are Crown Copyright (2007-2008). As such, these are freeware and may be freely distributed provided this notice is retained. No warranty, expressed or implied, is made and users should satisfy themselves as to the applicability of the results in any given circumstance. Toolkits available include 1) FISK- Freshwater Fish Invasiveness Scoring Kit (English and Spanish language version); 2) MFISK- Marine Fish Invasiveness Scoring Kit; 3) MI-ISK- Marine invertebrate Invasiveness Scoring Kit; 4) FI-ISK- Freshwater Invertebrate Invasiveness Scoring Kit and AmphISK- Amphibian Invasiveness Scoring Kit. These tool kits were developed by Cefas, with new VisualBasic and computational programming by Lorenzo Vilizzi, David Cooper, Andy South and Gordon H. Copp, based on VisualBasic code in the original Weed Risk Assessment (WRA) tool kit of P.C. Pheloung, P.A. Williams & S.R. Halloy (1999).
The decision support tools are available from:
http://cefas.defra.gov.uk/our-science/ecosystems-and-biodiversity/non-native-species/decision-support-tools.aspx [Accessed 13 October 2011]
The guidance document is available from http://www.cefas.co.uk/media/118009/fisk_guide_v2.pdf [Accessed 13 January 2009].

General information
Borrero, F., 1987. Tidal Height and Gametogenesis: Reproductive Variation Among Populations of *Geukensia demissa*. *Bio. Bull.* 173: 160-168.
Summary: This was a study carried out to determine if there was a delay in gametogenesis for high and low tide populations of *Geukensia demissa*.
Brousseau, D., 1984. Age and Growth Rate Determinations for the Atlantic Ribbed Mussel, *Geukensia demissa* Dillwyn (Bivalvia: Mytilidae). *Estuaries*. 7(3): 233-241.
Summary: This study shows that seasons play a factor in growth rates of *G. demissa*. Linear shell growth is compared from one specific collection site to four other locations.
B�ez, M., Y. Garc�a de Severeyn, H. Severeyn., 2005. Reproductive Cycle of *Geukensia demissa* (Bivalvia: Mytilidae) on a Beach at Nazaret, El Moj�n, Zulia State, Venzuela. *Ciencias Marinas*. 31(1A): 111-118.
Summary: This article describes the gametogenic process of *Geukensia demissa*. It gives the spawning periods and describes in detail about the stages of gametogenesis.

Carlton J. T, 1979. History, Biogeography, and Ecology of Introduced Marine and Estuarine Invertebrates of the Pacific Coast of North America. University of California, Berkeley, 904 pp

Carlton J. T, 1992. Introduced marine and estuarine mollusks of North America: an end-of-the-20th-century perspective. Journal of Shellfish Research 11: 489–505

Coen, L., K. Walters, Undated. Ribbed Mussel *Geukensia demissa*.

Summary: This article gives a brief description of the mussel. Also given is conservation information on this species. It includes habitat description, current status, and population size.

Available from: http://www.dnr.sc.gov/cwcs/pdf/Ribbedmussel%20.pdf [Accessed January 29, 2005]

Cohen, A., & J. Carlton., 1995. Nonindigenous Aquatic Species in a United States Estuary: A Case Study of the Biological Invasions of the San Francisco Bay and Delta. United States Fish and Wildlife Service.

Summary: This report tells of how invaders in San Francisco Bay are taking over other species. These invaders dominate the food web, cause structural changes to habitats, and are causing problems for endangered marsh birds and mammals.

Available from:http://www.anstaskforce.gov/Documents/sfinvade.htm [Accessed January 29, 2007]

Cohen, Andrew N., 2005. Guide to the Exotic Species of San Francisco Bay. *Geukensia demissa*. San Francisco Estuary Institute, Oakland, CA, www.exoticsguide.org

Summary: This website has very informative information on distribution, habitat, food, and similar species.

Available from: http://www.exoticsguide.org/species_pages/g_demissa.html [Accessed January 29, 2007]

eNature.com, 2005. *Geukensia demissa*.

Summary: This article gives a brief description about the mussel and its distribution around the world.

Available from: http://www.enature.com/flashcard/show_flash_card.asp?recordNumber=SS0012 [Accessed Januarry 29, 2007]

Evgenidou, A., I. Valiela, 2002. Response of growth and density of a population of *Geukensia demissa* to land-derived Nitrogen loading, in Waquoit bay, Massachusetts. *Estaurine, Coastal and Shelf Science*. 55(1):125-138.

Summary: A study was done to determine if nutrient enrichment has an effect on the gowth of *G. demissa*. Different ages of mussels grew at different rates and they also grew best in the low intertidal zone.

Fossils of Nova Scotia (FONS), 1998. *Geukensia demissa*.

Summary: This website gives a picture of the fossil and describes where it was found, the period in which it originated, and the taxonomy.

Available from: http://museum.gov.ns.ca/fossils/gallery/specimen/9801962.htm [Accessed January 29, 2007]

Franz, D, 1997. Resource Allocation in the Intertidal Salt-Marsh Mussel *Geukensia demissa* in Relation to Shore Level. *Estuaries*. 20(1): 134-148.

Summary: This article has information regarding growth and reproduction in cunjunction with shore level.

ITIS (Integrated Taxonomic Information System), 2007. Online Database *Geukensia demissa*

Summary: An online database that provides taxonomic information, common names, synonyms and geographical jurisdiction of a species. In addition links are provided to retrieve biological records and collection information from the Global Biodiversity Information Facility (GBIF) Data Portal and bioscience articles from BioOne journals.

Available from:http://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=79555 [Accessed January 29, 2007]

Jordan, T., I. Valiela, 1982. A nitrogen budget of the ribbed mussel, *Geukensia demissa*, and its significnce in Nitrogen flow in a New England salt marsh. *Limnol. Oceanogr*. 27(1): 75-90.

Summary: The article compares the nitrogen budget of a mussel population and a salt marsh. It was determined that the mitrogen budget of the mussel population exceeds that of the marsh.

McClary, M., 2004. *Spartina alterniflora* and *Phragmites australis* as Habitat for the Ribbed Mussel, *Geukensia demissa* (Dillwyn), in Saw Mill Creek of New Jersey s Hackensack Meadowlands. *Urban Habitats*. 2(1): 83-90.

Summary: This is a study that was done to determine if *G. demissa* would still live amongst *Spartina alternaflora* when *Phragmites australis* was present.

Available from: http://www.urbanhabitats.org/v02n01/ribbedmussel_pdf.pdf [Accessed January 29, 2007]

Nonindigenous Aquatic Species (NAS), 2005. United States Geological Survey (USGS). *Geukensia demissa*.

Summary: This website gives collection data on where a species is found and whether or not it has an established population in the area.

Available from: http://nas.er.usgs.gov/queries/collectioninfo.asp?SpeciesID=103 [Accessed January 29, 2007]

Smith, J., R. Frey., 1985. Biodeposition by the Ribbed Mussel *Geukensia demissa* in a Salt Marsh, Sapelo Island, Georgia. *Journal of Sedimentary Petrology*.. 55(6):817-828.

Summary: This article discusses how *G. demissa* is responsible for a large portion of the sediment budget in Georgia salt marshes.

Torchin, M., R. Hechinger, T. Huspeni, K. Whitney, K. Lafferty, 2005. The introduced ribbed mussel (*Geukensia demissa*) in Estero de Punta Banda, Mexico: interactions with the native cord grass, *Spartina foliosa*. Biological Invasions. 7: 607-614.

Summary: This study was done to determine habitats for the invader, *Geukensia demissa*. Bird surveys were conducted to determine the habitat overlap of *G. demissa* and light-footed clapper rails.

Available from: http://striweb.si.edu/publications/PDFs/Torchin%20et%20al_BINV_2005a.pdf [Accessed January 29, 2007]

Western Atlantic Mollusk Database (WAMD), 2005. *Geukensia demissa demissa*.

Summary: Information is given about the distribution of *G, demissa* and its synonyms.

Available from: http://data.acnatsci.org/wasp/search.php/12194 [Accessed January 29, 2007]