

Mycale grandis

System: Marine

Kingdom	Phylum	Class	Order	Family
Animalia	Porifera	Demospongiae	Poecilosclerida	Mycalidae

Common name orange keyhole sponge (English, USA, Hawaii), orange sponge (English)

Synonym

Similar species

Summary *Mycale grandis* is an introduced sponge that is considered invasive and a potential threat to corals and reefs in Hawaiian waters. It is generally restricted to shallow-water fouling communities in major harbours associated with disturbed habitats, but has recently been observed over-growing native corals in lagoon-patch reef communities in Kane'oh'e'oh'e Bay, O'ahu, Hawaii.



[view this species on IUCN Red List](#)

Species Description

Mycale grandis is an orange-red brightly coloured sponge. The colouring is both internal and external. It can grow as thickly encrusting to lobate-massive cushions up to 1 metre diameter and 0.5m thick or larger. The upper surfaces of large sponges show large ostia or "keyholes", hence the common name. The sponge's surface is uneven. The texture is fibrous and firm but compressible, and can be torn easily. The interior is cavernous, and often packed with small ophiuroids (*Ophiactis* cf. *savignyi*) (Eldredge and Smith 2001).

Habitat Description

Mycale grandis is typically restricted to shallow-water fouling communities (i.e. pier pilings, floating docks) in major harbours or on associated disturbed habitats (i.e. dredged channels and artificial lagoons). This species has also been found over-growing native coral communities in areas of Hawaii like Kane'oh'e'oh'e Bay, where it grows on patch reefs in the southeast corner of the bay as well as artificial structures (Eldredge and Smith 2001; Coles and Bolick 2006).

Reproduction

Like most sponges, *Mycale grandis* is probably capable of asexual reproduction by fragmentation but specific details regarding sexual reproduction of this species are unstudied (Eldredge and Smith 2001).

Nutrition

Mycale grandis is a filter feeder, continuously circulating water through its body. Microscopic food particles are removed from the water by specialised collar cells. Digestion is intracellular (Eldredge and Smith 2001).

General Impacts

Mycale grandis is a fouling organism whose ecological impacts have not been well studied. Observations suggest that it competes for space with native sponge and coral species and threatens lagoon-patch reef communities around Hawaii where it is overgrowing two of the dominant reef-forming corals in the Kane'oh'e'oh'e Bay. (Coles *et al.* 2004a; Eldredge and Smith 2001).



GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: *Mycale grandis*

Pathway

Unintentional introduction, most likely as fouling on ships' hull (Eldredge and Smith 2001).

Principal source: Dr. Steve Coles, Bishop Museum.

[Coles, S. L and Bolick, H. 2006](#). Assessment of invasiveness of the orange keyhole sponge *Mycale armata* in Kane`ohe Bay, O`ahu, Hawai`i.

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

Review: Steve Coles\ Research Zoologist\ Bishop Museum Hawai'i USA

Publication date: 2006-03-23

ALIEN RANGE

[2] AUSTRALIA

[1] MALAYSIA

[32] UNITED STATES

[1] INDIAN - OCEAN EASTERN

[1] MEXICO

BIBLIOGRAPHY

15 references found for *Mycale grandis*

Management 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. Sheloung, 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](http://www.cefas.co.uk/media/118009/fisk_guide_v2.pdf) is available from http://www.cefas.co.uk/media/118009/fisk_guide_v2.pdf [Accessed 13 January 2009].

[Coles, S. L and Bolick, H. 2006. Assessment of invasiveness of the orange keyhole sponge *Mycale armata* in Kane`ohe Bay, O`ahu, Hawai`i. Final Report Year 1 prepared for Hawaii Coral Reef Initiative. 23 p.](#)

Summary: Available from: <http://hbs.bishopmuseum.org/invert/mycale.html> [Accessed 22 March 2006]

[Coles, S. L. & H. Bolick., 2007. Invasive introduced sponge *Mycale grandis* overgrows reef corals in Kane`ohe Bay, O`ahu, Hawai`i. Coral Reefs \(2007\) 26:911](#)

General information

[Burton, M. 1934. Sponges. Scientific report on the Great Barrier Reef Expedition 4:513-621](#)

Summary: Synonymized *M. armata* with *M. grandis*

[Coles, S.L., DeFelice, R.C. and Eldredge, L.G., 1999b. Nonindigenous marine species introductions in the harbors of the south and west shores of O`ahu, Hawai`i. Tech. Rep. No. 15, Bishop Museum, Honolulu](#)

Summary: Survey of native and introduced species in Hanolulu Harbor., Keehi Lagoon, Kewalo Basin, Ala Wai Harbor and Barbers Point Harbor, Oahu, Hawaii, with locations of reports of *M. armata*.

Available from: <http://hbs.bishopmuseum.org/pdf/southshore.pdf> [Accessed 6th February 2006]

[Coles, S.L., DeFelice, R.C. and Eldredge, L.G., 2002. Nonindigenous marine species introductions in Kane`ohe Bay, O`ahu, Hawai`i. Tech. Rep. No. 24, Bishop Museum, Honolulu](#)

Summary: Survey of native and introduced species in Kaneohe Bay. Oahu, Hawaii, with locations of reports of *M. armata*

Available from: <http://hbs.bishopmuseum.org/pdf/kbay-report.pdf> [Accessed 6 February 2006]

[Coles, S.L., DeFelice, R.C., Eldredge, L.G. and Carlton, J.T., 1997. Biodiversity of marine communities in Pearl Harbor, O`ahu, Hawai`i with observations on introduced species. Tech. Rep. No. 10, Bishop Museum, Honolulu](#)

Summary: Survey of native and introduced species in Pearl Harbor. Oahu, Hawaii, with locations of reports of *M. armata*

Available from: <http://hbs.bishopmuseum.org/pdf/PHReport.pdf> [Accessed 6 February 2006]

Coles, S. L., DeFelice, R., C., Eldredge, L. G. and Carlton, J. T. 1999a. Historical and recent introductions of nonindigenous marine species into Pearl Harbor, Oahu, Hawaiian Islands. *Marine Biology* 135: 147-158

Summary: Survey of native and introduced species in Pearl Harbor, Oahu, Hawaii, with locations of reports of *M. armata*

[Coles, S.L., Eldredge, L.G., Kandel, F., Reath, P.R. and Longenecker, K., 2004a. Assessment of nonindigenous species on coral reefs in the Hawaiian Islands, with emphasis on introduced invertebrates. Tech. Rep. No. 27, Bishop Museum, Honolulu.](#)

Summary: Hawaii, with locations of reports of *M. armata*

Available from: <http://hbs.bishopmuseum.org/pdf/hcri-2004.pdf> [Accessed 6 February 2006]

[Coles, S.L., Reath, P.R., Longenecker, K Bollick, H and, Eldredge, L.G., 2004b. Assessment of nonindigenous marine species in harbors and on nearby coral reefs on Kauai, Molokai, Maui and Hawaii. Tech. Rep. No. 29, Bishop Museum, Honolulu](#)

Summary: Survey of native and introduced species in harbors on the neighbouring islands of Hawaii, with locations of reports of *M. armata*.

Available from: <http://hbs.bishopmuseum.org/pdf/tr29.pdf> [Accessed 6 February 2006]

[Eldredge, L. G. and C. M. Smith. 2001 A guidebook of marine introduced species in Hawaii. Bishop Museum Tech. Rep. 21 80 pp.](#)

Summary: Illustrated guidebook to frequently found introduced species in the Hawaiian Islands

Available from: http://www2.bishopmuseum.org/HBS/invertguide/species_pdf/guide.pdf [Accessed 6 February 2006]

[Global Biodiversity Information Facility \(GBIF\), 2008. Species: *Mycale grandis* Gray, 1867](#)

Summary: Available from: <http://data.gbif.org/species/14696026/> [Accessed 15 June 2010]

Gray, J. E. 1867. Notes on the arrangement of sponges, with the description of some new genera. *Proc. Zool. Soc. Lond.* 492-558

Summary: Description of the species *Mycale grandis*

Hooper, J. N. A. and Weidenmayer, F. 1994 Porifera. In Wells, A. (ed.) *Zoological Catalogue of Australia*. Vol. 12 Melbourne: CSIRO Australia xiii 624 pp

Summary: Accepted *M. armata* as a junior synonym of *M. grandis*, to maintain the status quo lacking new evidence to make a revision, but sceptical because of known errors in Burton's 1934 work (pers. comm. To S. L. Coles, 2004)

Thiele, J. 1903. Kieselschwamme von Ternate. II Abh. *Senckenb. Naturf. Ges.* 25:933-968

Summary: Description of the species *Mycale armata*