Schizoporella errata **System:** Marine

Kingdom	Phylum	Class	Order	Family
Animalia	Ectoprocta	Gymnolaemata	Cheilostomata	Schizoporellidae

Common name bryozoan (English), encrusting bryozoan (English), cheilostome bryozoan (English), branching bryozoan (English)

Synonym *Lepralia errata*

Similar species *Schizoporella unicornis, Schizoporella floridana*

Summary Schizoporella errata is a heavily calcified, encrusting cheilostome bryozoan. It colonises most freely available substratum, including artificial underwater structures and vessel hulls. Colonies may reach 25cm in height and are widely varying in growth form, sometimes dominating space in fouling assemblages.

view this species on IUCN Red List

Species Description
Schizoporella errata is typically dark brick red with orange-red growing margins. This species may form heavy knobbly encrustations on flexible surfaces such as algae or worm tubes, turning them into solid, sometimes erect branching structures. The thickness of the growth is dependent upon the age of the colony. Multilaminar encrustations of 1cm thick are common. The frontal surface of the zoecium (secreted exoskeleton housing of individual zooids) is porous with a wide semicircular aperture and proximal sinus. avicularia (beak-like structures) occur in varying density on colonies, located (one per zooid) to the right or left side of aperture sinus. Bleached specimens show the skeletal features clearly. Preserved specimens lose their colour.
S. errata forms massive colonies with variously shaped colony forms. Forms are determined by interactions with other organisms and hydrodynamic conditions. At exposed sites, colonies form a densely packed mass with no branching, while in calmer waters colonies are erect, highly branched and have thicker bases (Morgado and Tanaka 2001).

Lifecycle Stages
Bryozoans have swimming, lecithotrophic larvae that attach and metamorphose within 1 or 2 days following release from the colony. Larvae colonise a variety of artificial substrata including hulls (Mackie *et al.* 2006). The new recruits of *S. errata* are vulnerable to predation immediately (hours to days) after metamorphosis and attachment to the substrate. Experiments show that predators such as the small gastropod *Mitrella lunata* can result in a high mortality (around 50%) by feeding exclusively on the first zooid or ancestrula of each *S. errata* colony (Osmana and Whitlatch 2004).

Habitat Description
Schizoporella errata is usually found in harbours and embayments in shallow water on hard substrates (pilings, hulls, coral rubble, etc.) and reefs (Bishop Museum 2002). In southeastern Brazil it occurs in shallow (0–10m) water attached to rocks or pier columns. *S. errata* occurs mainly in calm waters and is one of few bryozoans that occur in water of the pleiomesohaline region (water salinity around 18-8%) (Winston 1977).

Reproduction
Each bryozoan colony begins from a single, sexually produced, primary zooid. *Schizoporella* zooids bud in lines, forming unilaminar, bilaminar or multilaminar sheets. Like most bryozoans, *Schizoporella* are hermaphroditic. Each zooid is capable of producing sperm and eggs. Larvae are brooded in an external ovicell. Larvae are cilliated and non-feeding and attach and metamorphose within 1 or 2 days following release. *S. errata* larval settlement occurs throughout the year, except during midwinter (Sutherland and Karlson 1977). Cummings (1975) described zooidal regression and regeneration in colonies of *S. floridana*, suggesting a potentially important life history response to seasonal changes in temperature and food availability.
New recruits of *S. errata* are vulnerable to predation immediately (hours to days) after metamorphosis and attachment to the substrate. Experiments show that predators such as the small gastropod *Mitrella lunata* can result in a high mortality (around 50%) by feeding exclusively on the first zooid or ancestrula of each *S. errata* colony (Osman and Whitlatch 2004).

Nutrition
Bryozoans are suspension feeders with retractable U-shaped crowns of tentacles (lophophores) that bear cilia. The movement of cilia create small currents that bring microscopic prey (plankton) and organic particles toward the animal. The particles are then guided into the mouth by action of the tentacles and cilia.

General Impacts
Bryozoans are one of the main groups of fouling organisms that form encrustations on ships, piers, buoys and other man-made structures in oceans (VMNH 2005). Exotic species may compete for space with natives. *Schizoporella errata* is known to inhibit the growth of adjacent species (Sutherland and Karlson 1977), Introductions in some areas could potentially contribute to community productivity by providing substratum. In southeastern Brazil *S. errata* forms colonies of up to 25cm in height and supply a diverse range of secondary structure used by cryptic faunal species, including polychaetes, crustaceans and echinoderms (Nalesso *et al.* 1995; Duarte and Nalesso 1996 in Morgado and Tanaka 2001).
S. errata has a high recruitment rate over the summer months and is common on pilings. In the US Atlantic, Sutherland (1978) noted colonies were particularly common in areas of space that are regularly cleared by urchin grazing; larvae appear to be relatively inefficient at recruiting into established fouling communities.

Management Info
Preventative measures: A two-year study was undertaken for the Department of Environment and Heritage (Australia) by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) to identify and rank introduced marine species found within Australian waters and those not found within Australian waters.
All of the non-native potential target species identified in this report are ranked as high, medium and low priority, based on their invasion potential and impact potential. *Schizoporella errata* is identified as one of ten potential domestic target species most likely to be spread to uninfected bioregions by shipping. *S. errata* is also identified as one of ten most damaging potential domestic target species, based on overall impact potential (economic and environmental). A hazard ranking of potential domestic target species based on invasion potential from infected to uninfected bioregions identifies *S. errata* as a 'medium priority species' - these species have a reasonably high impact/or invasion potential.
For more details, please see Hayes *et al.* 2005.
The rankings determined in Hayes *et al.* 2005 will be used by the National Introduced Marine Pest Coordinating Group in Australia to assist in the development of national control plans which could include options for control, eradication and/or long term management.
Ballast water control measures can help control the spread of *Schizoporella errata* from the oyster aquaculture industry (PWSRCAC 2004). Cu (copper) based antifouling coatings on boat hulls can prevent growth of *S. errata* and stop its spread to new locations (Piola and Johnston 2006).

Pathway

Principal source: Bishop Museum 2002. *Schizoporella cf. errata* (Waters, 1878). Guidebook of introduced marine species of Hawaii.

Compiler: IUCN/SSC Invasive Species Specialist Group (ISSG) with support from La Fondation d'entreprise Total

Review: Dr. Josh Mackie, Invertebrate Zoology and Molecular Ecology Lab. Moss Landing Marine Laboratories. California USA

Pubblication date: 2007-05-23

ALIEN RANGE

[1] ATLANTIC COAST (NORTH AMERICA)
[3] AUSTRALIA
[1] CHINA
[1] GERMANY
[1] ISRAEL
[1] UNITED KINGDOM
[1] UNITED STATES MINOR OUTLYING ISLANDS
[1] WEST AFRICA
[1] ATLANTIC - WESTERN CENTRAL
[1] BRAZIL
[1] EGYPT
[2] INDIAN - OCEAN WESTERN
[1] NEW ZEALAND
[11] UNITED STATES
[1] VANUATU

BIBLIOGRAPHY

36 references found for **Schizoporella errata**

Managment information

Allen, F. E. 1953. Distribution of marine invertebrates by ships. Australian Journal of Marine and Freshwater Research 4: 303-316.

Carlton, J.T. 1989. Man s role in the changing face of the ocean: Biological invasions and implications for conservation of near-shore environments. Conservation Biology 3(3):265-273.

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].

Hayes, K., Sliwa, C., Migus, S., McEnnulty, F., Dunstan, P. 2005. National priority pests: Part II Ranking of Australian marine pests. An independent report undertaken for the Department of Environment and Heritage by CSIRO Marine Research.

Summary: This report is the final report of a two year study designed to identify and rank introduced marine species found within Australian waters (potential domestic target species) and those that are not found within Australian waters (potential international target species).

Available from: http://www.marine.csiro.au/crimp/reports/PrioritypestsFinalreport.pdf [Accessed 25 May 2005]

Henderson, R.S. 1986. Effects of Organotin Antifouling Paint Leachates on Pearl Harbor Organisms: A Site Specific Flowthrough Bioassay, *Oceans 18*: 1226-1233

Summary: Effect of tributyltin (TBT) treatment on marine communities at Pearl Harbor (Hawaii, USA).

Piola, R.F. and Johnston, E.L. 2006. Differential resistance to extended copper exposure in four introduced bryozoans, *Marine Ecology Progress Series 311*: 103-114.

Summary: A review of copper tolerance in four species of bryozoans.

General information

Bishop Museum. 2002. *Schizoporella errata* (Waters, 1878), *Guidebook of introduced marine species of Hawaii*. Hawaii Biological Survey, Bishop Museum.

Bock, P. 2000. *Schizoporella cf. errata* (Waters, 1878). RMIT University: Melbourne.

Summary: This source provides some distributional information for *S. errata*.

Cocito, S. 2004. Bioconstruction and biodiversity: their mutual influence, *Scientia Marina 68* (Suppl.1): 137-144.
Summary: This paper describes the role of main benthic constructors and reviews processes by which bioconstructions increase diversity and abundance of associated biota.
Cocito, S. Ferdeghini, F.. Morri, C. and Bianchi, C.N. 2000. Patterns of bioconstruction in the cheilostome bryozoan *Schizoporella errata*: the influence of hydrodynamics and associated biota, *Marine Ecology Progress Series 192*: 153-161.
Summary: This article describes the structure, pattern and building process of giant colonies of *S. errata*.
Cummings, S. G. 1975. Zoid regression in *Schizoporella unicornis floridana* (Bryozoa, Cheilostomata), Chesapeake Science 16:93-103
Fuller, P. 2007. *Schizoporella unicornis*. USGS Nonindigenous Aquatic Species Database, Gainesville, FL.
Summary: Available from: http://nas.er.usgs.gov/queries/FactSheet.asp?speciesID=275 [Accessed 23 May 2007]
Ghobashy, A.F.A. and El Komy, M.M. 1980. Fouling in the southern region of the Suez Canal, *Aquatic Ecology 14*(3): 179-185.
Summary: This paper investigates fouling organisms and ecological conditions in the Suez Canal.
Hayward, P.J. 1974. Studies on the cheilostome bryozoan fauna of the Aegean island of Chios, *Journal of Natural History 8*(4): 369-402
Hayward, P. J. and Ryland, J. S. 1979. British Ascophoron Bryozoans. London: Academic Press.
Hewitt, C. L, Campbell, M. L., Thresher, R. E., Martin, R. B., Boyd, S., Cohen, B. F., Currie, D. R., Gomon, M. F., Keough, M. J., Lewis, J. A., Lockett, M. M., Mays, N., McArthur, N., O Hara, T. D., Poore, G. C. B., Ross, J. D., Storey, M. J., Watson, J. E. and Wilson, R. S. 2004. Introduced and crytogenic species in Port Phillip Bay, Victoria, Australia. Marine Biology 144: 183-202.
ITIS (Integrated Taxonomic Information System), 2005. Online Database *Schizoporella errata*
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=156301 [Accessed 8 December 2006]
Jara, V.C., Miyamoto, J.H.S., da Gama, B.A.P., Molis, M., Wahl, M. and Pereira, R.C. 2006. Limited evidence of interactive disturbance and nutrient effects on the diversity of macrobenthic assemblages, *Marine Ecology Progress Series 308*: 37-48.
Summary: This paper reports experiments carried out at an oligotrophic and eutrophic site in Brazil to assess the interactive effects of disturbance and nutrient enrichment.
Mackie, J.A., Keough, M.J. and Christidis, L. 2006. Invasion patterns inferred from cytochrome oxidase I sequences in three bryozoans, *Bugula neritina*, *Watersipora subtorquata*, and *Watersipora arcuata*, *Marine Biology 149*: 285-295
Summary: This paper studies population structure in invasive bryozoans using genetic analysis. There is evidence of widespread, rather than genetically independent introductions of bryozoans.
McKinney, F. K. and McKinney, M. J. 2002. Contrasting marine larval settlement patterns imply habitat-seeking behaviours in a fouling and a cryptic species (phylum Bryozoa), *Journal of Natural History 36*: 487-500.
Summary: This paper describes distributional patterns of settled larvae of *S. errata* and *P. patina* in laboratory conditions. The consistency of these patterns with the distribution of the two species in their natural environment is discussed.
Morgado, E.H. and Tanaka, M.O. 2001. The macrofauna associated with the bryozoan *Schizoporella errata* (Walters) in southeastern Brazil, *Scientia Marina 65*(3): 173-181.
Summary: This study examines the structure of the macrofaunal assemblage associated with colonies of *S. errata* at two sites differing in water movement in SE Brazil.
NEMESIS (National Exotic Marine and Estuarine Species Information System). 2006. *Schizoporella errata*. Retrieved 19 December, from Chesapeake Bay Introduced Species Database.
Osman, R.W. & Whitlatch, R.B. 2004. The control of the development of a marine benthic community by predation on recruits, *Journal of Experimental Marine Biology and Ecology 311*: 117-145.
Summary: This study examines the consequences of post-settlement predation on sessile invertebrates at two sites in southern New England.
Perkol-Finkel, S. and Benayahu, Y. 2004. *Recruitment of benthic organisms onto a planned artificial reef: shifts in community structure one decade post-deployment*. Article in press.
Summary: Available from: http://www.tau.ac.il/lifesci/departments/zoology/members/benayahu/documents/3aip.pdf [Accessed 19 December 2006]
Prince William Sound Regional Citizens Advisory Council. 2004. *Non-indigenous Aquatic Species of Concern for Alaska. Fact Sheet 9. Single Horn Bryozoan.*
Summary: This source provides biology, distribution, impact and control information about the single horn bryozoan (*Schizoporella unicornis*).
Available from: http://www.pwsrcac.org/docs/d0015800.pdf [Accessed 19 December 2006]
Reichert, K. 2002. *Tentaculata Bryozoa (dt. Moostierchen) Iris Menn*.
Summary: Record of *S. errata* in Helgoland, Germany.
Ryland, J. S. 1965. Volume 2: Polyzoa. In Catalogue of main marine fouling organisms (found on ships coming into European Waters). OECD.
Ryland, J. S. 1968. On marine polyzoa III. *Schizoporella ansata auctt*. Journal of Natural History 2: 535-546.
Sutherland, J.P. 1978. Functional Roles of *Schizoporella* and *Styela* in the Fouling Community at Beaufort, North Carolina, *Ecology 59*(2): 257-264.
Summary: This article looks at removal experiments designed to test the effect of the removal of two organisms (*Schizoporella* and *Styela*) on the distribution and abundance of other species.
Sutherland, J.P. and Karlson, R.H. 1977. Development and Stability of the Fouling Community at Beaufort, North Carolina, *Ecological Monographs 47*(4): 425-446.
Summary: This study looks at larval recruitment patterns of fouling species at Beaufort (North Carolina, USA).
Tao Yan and Wen Xia Yan. 2002. Fouling of Offshore Structures in China—a Review. *Biofouling 19* (Supplement): 133-138
Summary: This paper reviews the effect of marine fouling on offshore structures, looks at the development of offshore fouling studies in China, and characterises marine fouling in relevant areas.

United States Geological Survey. 2007. *Schizoporella errata*. USGS Nonindigenous Aquatic Species Database, Gainesville, FL.
Summary: Available from: http://nas.er.usgs.gov/queries/FactSheet.asp?speciesID=274 [Accessed 23 May 2007]
Virginia Museum of Natural History (VMNH), 2005. More Bryozoan Information. VMNH Virginia, USA.
Summary: An overview of the biology and problems caused by bryozoans.
Winston, J.E. 1977. Distribution and Ecology of Estuarine Ectoprocts: A Critical Review, *Chesapeake Science18*(1): 34-57.
Summary: This article reviews the special ecological and physiological features of brackish-water ectoprocts (bryozoans) and their global distributions.
Winston, J. E. 1982. Marine bryozoans (Ectoprocta) of the Indian River area (Florida). Bulletin of the American Museum of Natural History 173: 102-176.
Wyatt, A.S.J., Hewitt, C.L., Walker, D.I. and Ward, T.J. 2005. Marine introductions in the Shark Bay World Heritage Property, Western Australia: a preliminary assessment, *Diversity and Distributions 11*(1): 33-44
Summary: This paper discusses the management of introduced marine species in the Shark Bay World Heritage Property (Australia).