

Tubastraea coccinea 

System: Marine

Kingdom	Phylum	Class	Order	Family
Animalia	Cnidaria	Anthozoa	Scleractinia	Dendrophylliidae

Common name orange-cup coral (English), orange-tube coral (English), colonial-cup coral (English), tubastrée orange (French)

Synonym *Astropsammia pedersenii* ,
Caryophyllia aurantiaca ,
Coenopsammia affinis ,
Coenopsammia aurea ,
Coenopsammia coccinea ,
Coenopsammia ehrenbergiana
Coenopsammia manni ,
Coenopsammia radiata
Coenopsammia tenuilamellosa ,
Coenopsammia urvillii ,
Coenopsammia willeyi ,
Dendrophyllia affinis ,
Dendrophyllia aurantiaca ,
Dendrophyllia danae ,
Dendrophyllia ehrenbergiana ,
Dendrophyllia manni ,
Dendrophyllia surcularis ,
Dendrophyllia turbinata ,
Dendrophyllia willeyi ,
Lobophyllia aurea ,
Placopsammia darwini ,
Tubastraea aurea ,
Tubastraea pedersenii ,
Tubastraea willeyi ,
Tubastraea tenuilamellosa

Similar species *Cladopsammia eguchii*

Summary *Tubastraea coccinea* (orange-cup coral) has been introduced to all continents except Antarctica and is thought to compete with native benthic invertebrates for space and to compromise their communities. The reduction of native sponges and native corals could also have significant flow-on effects for entire ecosystems.



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

Species Description

Tubastraea coccinea (orange-cup coral) are non-reef building coral species that extend beautiful translucent tentacles at night (Hawaii Coral Reef Network 2005). The orange cup coral is a heterotroph (consumer) that does not contain zooxanthellae (endosymbiotic dinoflagellates or algae) as most corals do (Blomquist *et al.* 2006).

Lifecycle Stages

The reproductive age of the *Tubastraea coccinea* is around 1.5 years and growth averages at approximately 3cm² per year (Vermeij 2006). It increases in local abundance by reaching maturity at a small size and producing planula at an early age (Vaughan 1919; Van Moorsel 1989; Fenner and Banks 2004, in Vermeij 2006).

Habitat Description

Tubastraea coccinea (orange-cup coral) inhabit shaded vertical surfaces and caverns down to huge depths. Orange-cup-corals are also found in very cold water throughout the world (Hawaii Coral Reef Network 2005). Orange-cup corals often dominate tropical habitats not occupied by other coral species, such as wrecks and cryptic reef habitats (Vermeij 2006). They also colonise artificial structures (Fenner and Banks 2004, Sammarco *et al.* 2004) but experiments have demonstrated similar preferences for granite, cement, steel and tile (Creed & De Paula 2007). In Brazil they are most abundant in the shallow sub-tidal zone at shallow depths between 0m and 3m (De Paula & Creed, 2004, 2005, Creed 2006).

Reproduction

Tubastraea coccinea is hermaphroditic and produces planulae (flat, free-swimming, ciliated larva) asexually (ameiotically) (Ayre and Resing 1986). Gonads are unlikely to be involved in the asexual production of brooded larvae (Ayre and Resing 1986). It is able to form “runners” (a thin tissue outgrowth lacking polyps) which extend at a growth rate of up to 10.4cm per year until they encounter unoccupied patches of substratum. New polyps then form at the end of the runners (Vermeij 2005).

Nutrition

Cup-coral species rely upon capturing zooplankton as food (Hawaii Coral Reef Network 2005).

General Impacts

Although *Tubastraea coccinea* (orange-cup coral) is listed on the Convention on International Trade in Endangered Species website and database (see [Tubastraea coccinea in CITES species Database](#)) it often competes with other benthic invertebrates for substratum space (Vermeij 2006). This may put native species at risk, particularly sponges and native corals. Local exclusion or extinction of such species may occur and the removal of the native corals may reduce the production of the entire ecosystem, compromising ecosystem functions (Creed 2006).

Management Info

Manual: In Brazil a control and eradication programme called “Projeto Coral-Sol” is removing *Tubastraea coccinea* from the environment (Joel Creed, pers.comm., 2007).

Pathway

Mobile platforms could have contributed to dispersal of *Tubastraea coccinea* (orange-cup coral) to the Gulf of Mexico oil and gas platforms (Fenner and Banks, 2004, Sammarco *et al.* 2004).

Principal source:

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

Review: Prof. Dr. Joel Christopher Creed, Laboratorio de Ecologia Marinha Bentica Departamento de Ecologia - IBRAG\ Universidade do Estado do Rio de Janeiro - Uerj, Brazil

Publication date: 2007-05-29

ALIEN RANGE

- | | |
|--|--------------------------------|
| [1] AMERICAN SAMOA | [1] ANGUILLA |
| [1] ARUBA | [1] ATLANTIC - EASTERN CENTRAL |
| [1] ATLANTIC - WESTERN CENTRAL | [5] AUSTRALIA |
| [1] BAHAMAS | [1] BELIZE |
| [1] BES ISLANDS (BONAIRE, SINT EUSTATIUS AND SABA) | [1] BRAZIL |
| [1] BRITISH INDIAN OCEAN TERRITORY | [1] CAPE VERDE |
| [1] CAYMAN ISLANDS | [1] CHRISTMAS ISLAND |
| [1] COLOMBIA | [3] COSTA RICA |
| [1] CUBA | [1] DJIBOUTI |
| [1] DOMINICA | [1] DOMINICAN REPUBLIC |
| [2] ECUADOR | [1] EGYPT |
| [1] FRENCH POLYNESIA | [1] GUADELOUPE |
| [1] HONDURAS | [1] HONG KONG |
| [1] INDIA | [1] INDONESIA |
| [1] JAMAICA | [1] JAPAN |
| [1] KENYA | [1] KIRIBATI |
| [1] KOREA, REPUBLIC OF | [1] KUWAIT |
| [1] MADAGASCAR | [2] MALAYSIA |
| [1] MALDIVES | [1] MARSHALL ISLANDS |
| [1] MAURITIUS | [1] MEXICO |
| [1] MOZAMBIQUE | [1] MYANMAR |
| [1] NEW CALEDONIA | [5] NEW ZEALAND |
| [1] NORTHERN MARIANA ISLANDS | [1] OMAN |
| [1] PANAMA | [1] PHILIPPINES |
| [1] PUERTO RICO | [1] SAUDI ARABIA |
| [1] SEYCHELLES | [1] SINGAPORE |
| [1] SRI LANKA | [1] TAIWAN |
| [1] TANZANIA, UNITED REPUBLIC OF | [1] THAILAND |
| [1] TURKS AND CAICOS ISLANDS | [8] UNITED STATES |
| [1] VENEZUELA | [1] VIET NAM |
| [1] VIRGIN ISLANDS, BRITISH | [1] VIRGIN ISLANDS, U.S. |

BIBLIOGRAPHY

24 references found for *Tubastraea coccinea*

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. 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](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].

General information

[Alvarado, J.J., Cortés, J., Fernández, C. and Nivia, J. 2005. Coral communities and reefs of Ballena Marine National Park, Pacific coast of Costa Rica. *Cinecias Marinas* 31\(4\): 641-651.](#)

Summary: This paper describes coral reefs and coral communities at PNMB (Ballena Marine National Park). It surveys live, dead and bleached coral coverage and compares results with previous surveys to determine which processes are mediating the coral environment. Available from: <http://redalyc.uaemex.mx/redalyc/pdf/480/48031404.pdf> [Accessed 4 January 2007]



GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: *Tubastraea coccinea*

Ayre, D.J. and Resing, J.M. 1986. Sexual and asexual production of planulae in reef corals, *Marine Biology* 90: 187-190.

Summary: This study investigates the reproduction of corals in the Great Barrier Reef, in particular the production of brooded planulae. This is investigated for both hermatypic (zooxanthellate) and ahermatypic (non zooxanthellate) scleractinian coral species.

Blomquist, C.H., Lima, P.H., Tarrant, A.M., Atkinson, M.J. and Atkinson, S. 2006. 17 β -Hydroxysteroid dehydrogenase (17 β -HSD) in scleractinian corals and zooxanthellae, *Comparative Biochemistry and Physiology, Part B* 143: 397-403.

Summary: This project attempts to characterise the isoforms of 17 β -HSD (a type of sex steroid regulator), as well as seasonal activity levels and the role played by zooxanthellae (endosymbiotic dinoflagellates), if any, to compound activity.

Brook, F.J. 1999. The coastal scleractinian coral fauna of the Kermadec Islands, southwestern Pacific Ocean, *Journal of the Royal Society of New Zealand* 29 (4): 435-460.

Summary: Overview of the coral life of the Kermadec Islands.

Available from: <http://www.rsnz.org/publish/jrsnz/1999/27.pdf> [Accessed 11 February 2008]

Cortés, 1990. *The coral reefs of Golfo Dulce, Costa Rica: distribution and community structure*. Smithsonian Institution: Washington.

Summary: This paper describes and contrast the distribution of reefs and coral communities in Golfo Dulce in reference to their community structure and the associated sediments.

Available from: <http://www.botany.hawaii.edu/faculty/duffy/arb/339-346/344.pdf> [Accessed 5 January 2007].

Cortés, H.J., Glynn, P.W. and Richmond, R.H. 1990. Coral mortality associated with dinoflagellate blooms in the eastern Pacific (Costa Rica and Panama), *Marine Ecology Progress Series* 60(3): 299-304

Creed, J.C. 2006. Two invasive alien azooxanthellate corals, *Tubastraea coccinea* and *Tubastraea tagusensis*, dominate the native zooxanthellate *Mussismilia hispida* in Brazil, *Coral Reefs* 25: 350.

Summary: This article gives the information on two invasive coral species in Brazil.

Creed, J.C., Paula, A.F. De, 2007. Substratum preference during recruitment of two invasive alien corals onto shallow-subtidal tropical rocky shores. *Mar Ecol Progr Ser* 330: 101-111

De Paula A F, Creed J C, 2004. Two species of the coral *Tubastraea* (Cnidaria, Scleractinia) in Brazil: a case of accidental introduction. *Bull Mar Sci* 74:175-183

De Paula A F, Creed J C, 2005. Spatial distribution and abundance of nonindigenous coral genus *Tubastraea* (Cnidaria, Scleractinia) around Ilha Grande, Brazil. *Bras J Biol* 65: 661-673

Fenner, D. and Banks, K. 2004. Orange Cup Coral *Tubastraea coccinea* invades Florida and the Flower Garden Banks, Northwestern Gulf of Mexico, *Coral Reefs* 23: 505-507.

Summary: This is the first report of *Tubastraea coccinea* in Florida and the Flower Garden Banks of the northwestern Gulf of Mexico.

Fenner, D., Clark, T.H., Turner, J.R. and Chapman, B. 2004. A checklist of the corals of the island state of Rodrigues, Mauritius, *Journal of Natural History* 38: 3091-3102.

Summary: This study created an inventory of the coral species which occur in the shallow waters around Rodrigues island.

Ferreira, C.E.L. 2003. Non-indigenous corals at marginal sites, *Coral Reefs* 22: 498.

Summary: This article provides information on non-indigenous corals in southeast Brazil.

Guzman, H.M., Guevara, C.A. and Breedy, A.O. 2004. Distribution, diversity, and conservation of coral reefs and coral communities in the largest marine protected area of Pacific Panama (Coiba Island), *Environmental Conservation* 31(2): 111-121.

Summary: This study characterises the richness and distribution of scleractinian and gorgonian coral communities. It describes live cover and relative abundance of corals and other sessile organisms in such coral communities.

Harrison P.L. & Wallace, C.C. 1990. Reproduction, dispersal and recruitment of scleractinian corals. In: Dubinsky Z (ed) *Ecosystems of the World: Coral Reefs*. Elsevier Science, New York p 133-207.

Hawaii Coral Reef Network. 2005. *Family Dendrophyllidae: Cup Corals*.

Summary:

Available from: <http://www.coralreefnetwork.com/stender/corals/orange/orange.htm> [Accessed 15 January 2007]

ITIS (Integrated Taxonomic Information System). 2006. *Online Database Tubastraea coccinea*.

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=53808 [Accessed 8 December 2006]

Ridgl, B. and Velimirov, B. 1994. The structure of coral communities at Hurgada in the northern Red Sea, *PSZNI: Marine Ecology* 15(3/4): 213-231.

Summary: This study looks at coral cover and abundance as indicators of reef community difference. It investigates zonation patterns and uses them to estimated changes in species richness and diversity.

Sammarco P W, Atchison A D, Boland G S, 2004. Expansion of coral communities within the Northern Gulf of Mexico via offshore oil and gas platforms. *Mar Ecol Progr Ser* 280: 129-143

UNEP-WCMC. 2008. *UNEP-WCMC Species Database: CITES-Listed Species Tubastraea coccinea (orange-cup coral)*

Summary: Available from:

<http://sea.unep-wcmc.org/isdb/CITES/Taxonomy/tax-species-result.cfm?Genus=Tubastraea&Species=coccinea&source=animals> [Accessed 11 February 2008]

USGS (United States Geological Survey). 2006. *Tubastrea coccinea*. Retrieved 9 January 2007, from Nonindigenous Aquatic Species Database.

Summary: This website provides information on the distribution of *Tubastrea coccinea* in the USA.

Available from: <http://nas.er.usgs.gov/queries/CollectionInfo.asp?SpeciesID=2586&> [Accessed 9 January 2007].

Vermeij, M.J.A. 2005. A novel growth strategy allows *Tubastrea coccinea* to escape small-scale adverse conditions and start over again, *Coral Reefs* 24: 442.

Summary: This article discusses the growth strategy of *Tubastrea coccinea* employed under adverse conditions.



GLOBAL INVASIVE SPECIES DATABASE

FULL ACCOUNT FOR: *Tubastraea coccinea*

Vermeij, M.J.A. 2006. Early life-history dynamics of Caribbean coral species on artificial substratum: the importance of competition, growth and variation in life-history strategy, *Coral Reefs* 25: 59-71.

Summary: The development of a coral benthic community was monitored and quantified for six years (1998–2004) on an artificial settlement substrate in Curacao (Netherlands Antilles).