

Spirobranchus giganteus (Christmas Tree Worm)

Order: Canalipalpata (Fan-head Worms)

Class: Polychaeta (Bristleworms)

Phylum: Annelida (Segmented Worms)



Fig. 1. Christmas tree worm, *Spirobranchus giganteus*.

[<http://blogs.scientificamerican.com/artful-amoeba/the-overlooked-joy-of-the-christmas-tree-worm/>
downloaded 10 February 2016]

TRAITS. A marine worm with a segmented body no larger than 5cm, with two highly modified prostomial palps (mouth appendages) of spiral radioles, measuring less than 4cm in height and about 2.5cm across (Kaushik, 2015). The radioles are lined with cilia and are used for feeding and respiration. A modified radiole, called an operculum, serves as a plug to seal the tube once the worm has retracted (Vinn and ten Hove, 2011). The worm has small, hooked setae (bristles) along its body which secure it within its tube and aid in preventing predators from pulling the entire animal out, and eyes located at the base of the palps (Vinn and ten Hove, 2011). They are usually brightly coloured, including orange, red, white, and blue (Fig. 1).

DISTRIBUTION. Widespread in tropical and sub-tropical seas, ranging from Indo-Pacific regions to the Caribbean (Fig. 2) (Marinebio.org, 2014).

HABITAT AND ACTIVITY. Found burrowed into living calcareous coral reefs (Nishi and Nishihira, 1996) in tropical or sub-tropical seas in relatively shallow waters less than 100m deep (Kennedy, 2015). The worm builds a calcareous tube in coral surfaces to protect its soft body (Dai and Yang, 1995). *Spirobranchus giganteus* are sedentary and incapable of movement (Shampoop, 2014); worms do not change tubes but occupy one tube throughout their lifetime. They are very sensitive to light, shadows and motion (Sajem, 2016).

FOOD AND FEEDING. Christmas tree worms are filter feeders. Their food consists of zooplankton, phytoplankton, and detritus particles. They extend feeding palps from the opening of the tube and prey is trapped and moved by tiny cilia lining the feeding apparatus towards the opening of the tube and into the mouth (Toonen, 2012).

POPULATION ECOLOGY. These worms have a mutual symbiotic relationship with the coral. The coral provides it with support and protection while it enhances water circulation for the coral feeding (Dai and Yang, 1995). Their predators include sea urchins, fish, lobsters, and sea stars (FOSS, 2004). There are often several christmas tree worms in the same area, though they do not live in close groups or colonies (Fig. 3).

REPRODUCTION. Christmas tree worms do not mate but engage in external fertilization (Sajem, 2016). There are both male and female worms which produce their gametes within their abdominal segments. Male and female worms send their gametes (sperm and eggs respectively) into the water (Kennedy, 2015). The sperms fuse with the eggs and fertilization occurs. Fertilized eggs develop into larvae that live as plankton for 9-12 days and then settle on coral, where they produce a mucus tube which develops into a calcareous tube (Kennedy, 2015). The life span of *Spirobranchus giganteus* is over 30 years.

BEHAVIOUR. Christmas tree worms are reclusive in nature, they quickly withdraw into their burrow (Fig. 4) to protect themselves from predators (Shampoop, 2014). The worm is extraordinarily sensitive to touch, light, shadows and motion, and covers the top of its burrow with a little lid called an operculum (Sajem, 2016). Immature or juvenile worms may settle into dead, empty tubes (Nishi and Nishihira, 1996).

APPLIED ECOLOGY. The global population is thought to be stable with no major current threats. Potential threats are habitat loss, climate change and ocean acidification (Kennedy, 2015). There is no commercial fishery, it is often kept in aquariums and is of interest to divers. There are no special conservation efforts as the species is widespread and relatively common (Kennedy, 2015).

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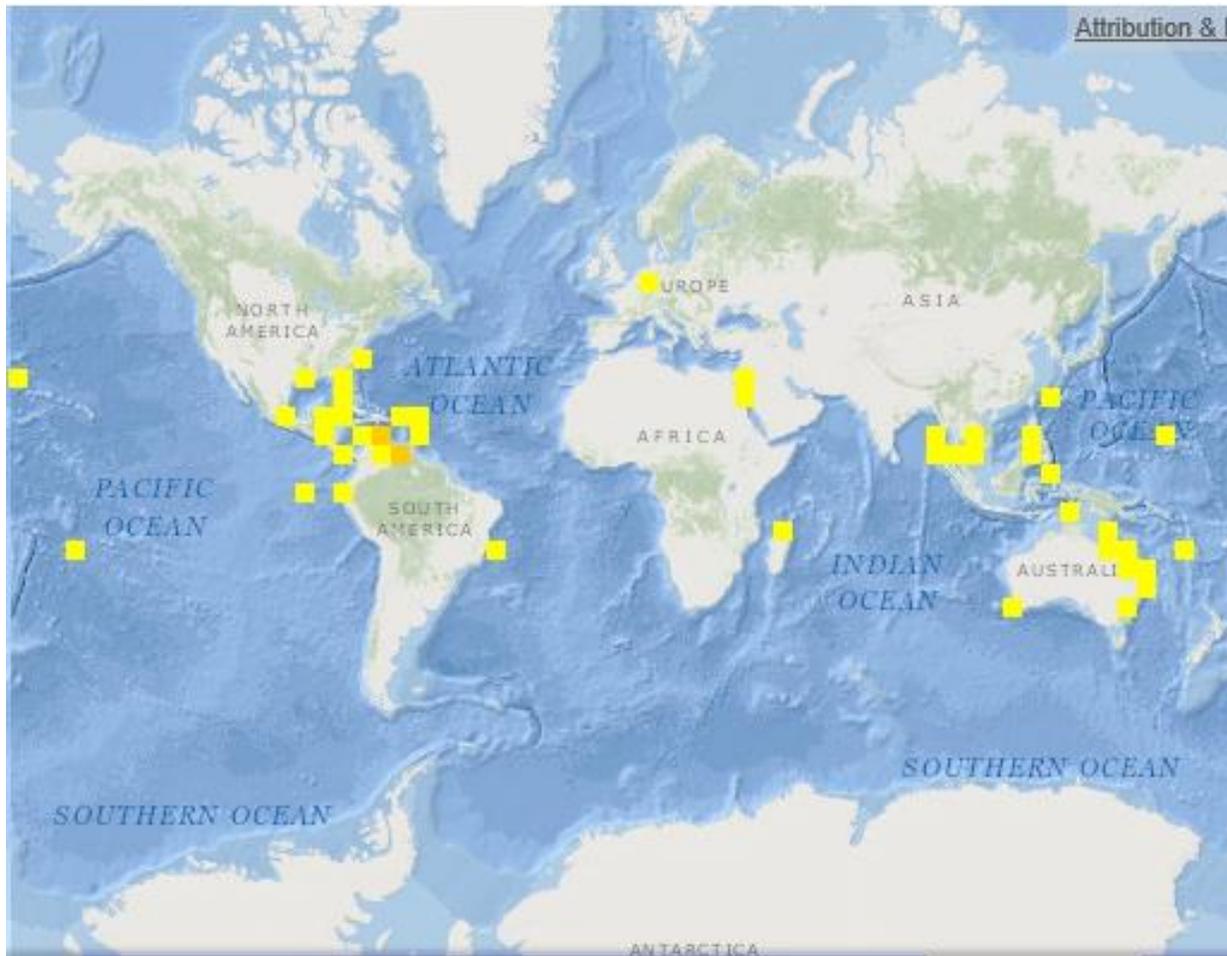


Fig. 2. Christmas tree worm geographic distribution.

[<http://marinebio.org/species.asp?id=543>, downloaded 18 February 2016]



Fig. 3. Group of *Spirobranchus giganteus* on coral.

[<http://www.amusingplanet.com/2015/12/the-christmas-tree-worm.html>, downloaded 18 February 2016]



Fig. 4. Christmas tree worm retracted into its tube.

[<http://www.advancedaquarist.com/2002/9/inverts>, downloaded 14 March 2016]