

Errant Polychaetes

Some polychaetes are common inhabitants of corals, but they are cryptic and are normally not visible unless you extract them from coral sand or break open coral skeleton. Among them are highly mobile nereidids, eunicids, phylodocids and polynoids.

The nereidids have a developed head and parapodia. They are predators of small animals found in coral crevices or sand. The pharynx is equipped with a pair of large jaws.



Perinereis cultrifera, showing the anterior part with an everted pharynx. The head has eyes, and sensory palps and tentacles. Each segment of the body bears a pair of parapodia.

The eunicids are mobile predators of small crustaceans, worms and mollusks, or borers creating sinuous burrows in coral skeleton. Their muscular pharynx is armed with a complex set of jaw plates that are used for catching prey or eating endolithic algae in coral skeleton. Some species can be as long as 3 meters. The largest eunicid collected from Sharp Island is a *Polola* worm (> 10 cm long and 0.5 cm wide).

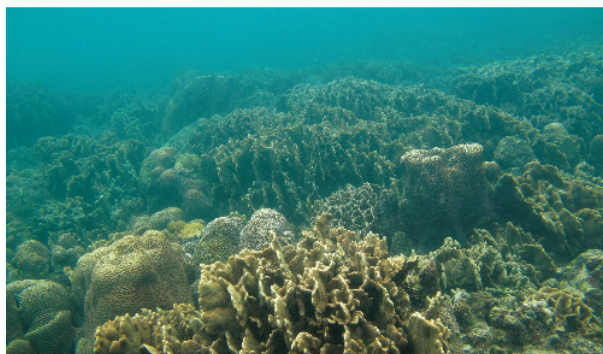


Eunice antennata, ventral view, showing the chitinated jaw plates of the partly everted pharynx.

Commonly known as "scale worms", the polynoids have an arched back that is covered by a series of overlapping leaf-like "scales". Scale worms are predators of small animals. Some species are commensals of corals, sea stars and sea anemones. Others are commonly found in crevices or under stones on the sea bottom.



Lepidonotus squamatus, showing the dorsum of several segments. Each segment is covered by a pair of "scales". On the sides are dorsal cirri and chaetae.



Ecological Roles and Conservation

Some polychaetes are important food for fish and gastropods. Others cause destruction of dead corals, creating habitat diversity and spaces for new recruits of corals and other invertebrates. *Spirobranchus tetraceros* is beneficial to the host coral as it enhances water circulation around the worm and improves dispersal of waste products. This species can be found in several species of massive corals with densities of up to two to three dozens per coral head. While its boring can damage coral skeleton, the damage is much smaller than that caused by boring bivalves, and the benefit should outweigh the minor negative effect. Other species of coral-associated polychaetes in Sharp Island are either too rare or too small to have any significant impact on coral health.

Since the most conspicuous polychaetes are often associated with live corals, collecting them will damage the corals. Divers and snorklers who want to admire the beauty of polychaetes should observe them under water without touching or damaging the corals.

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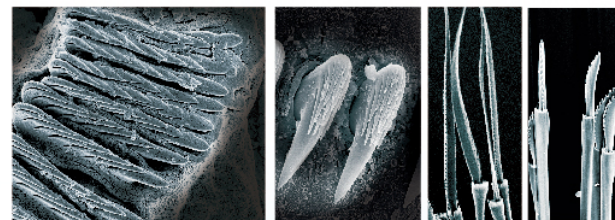
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Coral-Associated POLYCHAETES in Sharp Island

Coral ecosystems are one of the most diverse and productive ecosystems on earth. Coral communities comprise corals and many other groups of marine lives, such as algae, sponges, worms, mollusks, crustaceans, echinoderms and fishes. Polychaete worms are important to the structure and function of coral ecosystems.

What are Polychaetes?

Polychaete worms belong to the phylum Annelida. They are named for their presence of many chaetae or bristles (chitinous locomotive structures) on their parapodia (locomotive organs). Long chaetae are for crawling, whereas short chaetae aid in anchoring.



Different types of chaetae

Polychaetes exhibit two life styles: one sedentary, capturing small food particle in water using long tentacles; another errant, capturing prey using hard structures of the pharynx.



Tentacle crown of a sessile polychaete



Head with protruded pharynx of an errant polychaete

Some polychaetes bore into corals by secreting chemicals or by hard structure rasping. Others live on the surface of coral, among coral rubbles or coral sand.

We studied the biodiversity of coral-associated polychaetes in Sharp Island, a small island in Port Shelter in 2008-2010. Despite its small size, Sharp Island has 46 species of hard corals, representing 55% of the total coral species in Hong Kong. Dominant corals in Sharp Island include agariciids (*Pavona decussata*), faviids (*Platygyra*, *Favites*, *Leptastrea* and *Cyphastrea*) and poritids (*Porites*, *Goniopora*), which are common in the eastern waters, including Hoi Ha Wan and Tung Ping Chau Marine Parks.



Map of Hong Kong showing the location of Sharp Island



Platygyra carnosus



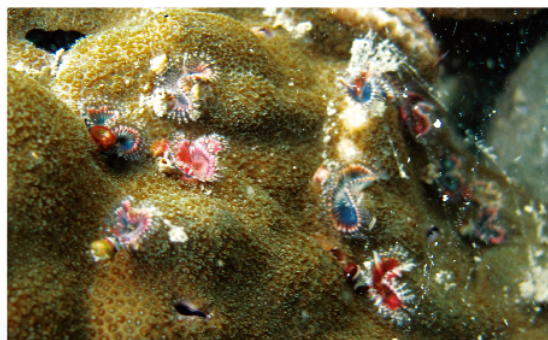
Pavona decussata

Species found in Sharp Island

A total of 61 species belonging to 22 families of polychaetes were recorded. They can be classified into sedentary and errant polychaetes.

Sedentary Polychaetes

Species usually seen by divers are those that reside in a calcareous tube and have colorful tentacle crowns. The tentacle crowns can be extended from tube for gas exchange and ciliary suspension feeding. They belong to family Serpulidae.



Spirobranchus tetraceros, a close relative of the Christmas tree worm commonly found in tropical waters, has two colorful tentacle crowns, but they are flat rather than spiral-shaped. This species is often seen as a group of individuals on massive corals such as *Porites*, *Montipora* and *Platygyra* in Hong Kong.



The Coco Worm, *Protula bispinalis*, inhabiting a large tube of up to 20 cm long and 1 cm wide, has two pinkish spiral tentacle crowns. This species is usually solitary, and is common throughout tropical Pacific reefs.

Hydroides elegans, a small worm with a tube of up to 2.5 cm long and 0.1 cm wide, occurs in low densities in Sharp Island, but it is the most common species on shallow hard structures throughout the tropical Pacific. Shown is the tube, tentacle crown and operculum that can be used to close the tube following the withdrawal of the tentacles.

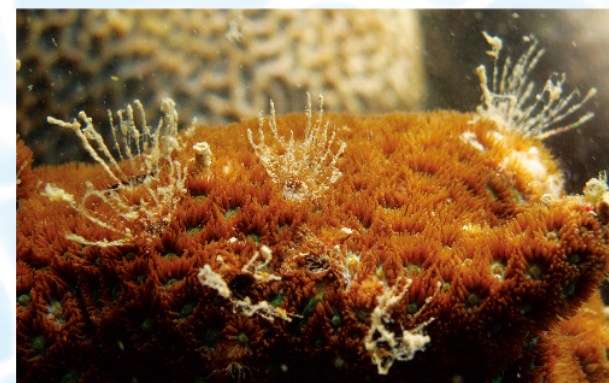


Fan worms belong to family Sabellidae. Like serpulids, they have two tentacle crowns, but their tube is parchment-like and covered with mud debris. They usually live on dead corals or in coral sand, with their tentacle crowns extending into the water column. The feather duster *Sabellastarte japonica* is a common sabellid in local coral communities. This species is usually solitary, found in rock crevices or sand.



Sabellastarte japonica, a large worm with up to 10 cm long and 1 cm wide, has two fan-shaped white tentacle crowns.

Instead of living inside a tube, some polychaetes bore into live corals directly. One of such species associated with living massive corals in Hong Kong is the flabelligerid worm *Pherusa parmata*. This species has a cephalic cage composed of about 30 long chaetae, which can be extended into the water to capture food. The surface of the chaetae is often coated with fine mud.



Several individuals of *Pherusa parmata*, extending cephalic cages from the coral *Leptastrea pruinosa*.