

Oreaster reticulatus (West Indian Sea Star)

Order: Valvatida (Starfish or Sea Stars)

Class: Asteroidea (Starfish or Sea Stars)

Phylum: Echinodermata (Starfish, Sea Urchins and Sea Cucumbers)



Fig. 1. West Indian sea star, *Oreaster reticulatus*.

[https://fr.wikipedia.org/wiki/Oreaster_reticulatus, downloaded 23 February 2016]

TRAITS. Also known as the red cushion sea star, this species is the largest starfish occurring in the Caribbean Sea (Colin, 1978). The body is thick, measuring up to 50cm wide (Encyclopedia of Life, 2012). The red cushion sea star is characterized by a disk-shaped centre which is surrounded by five short, tapered arms with webbing between each arm (Wikipedia, 2008); it exhibits five-fold radial symmetry (Fig. 1). The skin is hard and studded with raised, darkly or lightly coloured knobby spines, or ossicles. Colours include olive green, yellow, brown and reddish brown (Colin, 1978). Juveniles are various shades of green (Fig. 2); adults are yellow, brown or reddish brown (Encyclopedia of Life, 2012).

DISTRIBUTION. Abundant throughout the calm, shallow waters of the Caribbean and the Gulf of Mexico, to Florida. (Encyclopedia of Life, 2012).

HABITAT AND ACTIVITY. Found in tropical, saltwater or marine habitats in calm, shallow water. Juveniles occupy dense beds of seagrass which provide protection from predators as they are able to camouflage themselves in this environment; adults occupy rough, calcareous, sandy bottoms. Juveniles may also be found in the soft sand and mud of mangroves, lagoons and certain shallow, fringing coral reefs as these environments also provide protection for the developing sea stars (Scheibling, 1980a). Range of depth of habitat is 1-37m; it may also be littoral (on the shoreline) and intertidal (in rock pools). Feeding aggregations of sea stars form, move and migrate across the sandy sea bed (by the use of numerous, tiny tube feet) at about 7m per day, treating seagrass bed borders as boundaries by moving away from them.

FOOD AND FEEDING. Primarily omnivorous with both macrophagous and microphagous (large and small food items, respectively) feeding capabilities, which depends on the availability of and the opportunity to capture suitable prey. It feeds on a variety of microorganisms and particulate detritus found in sand, grassbeds and algal substrates (Scheibling, 1982). Consumes several species of sea urchin, meiofauna (small animals living between sand grains), sea cucumber juveniles and sponges by macrophagous feeding due to a specialized gut. Sand and seagrass substrata and detrital matter are ingested by microphagous feeding (Encyclopedia of Life, 2012) by extruding its cardiac stomach onto a surface (Scheibling, 1982). Macrophagous predation and scavenging is expressed as an alternative mode of feeding, on slow-moving, sessile or moribund organisms. Cannibalism may be expressed in a controlled laboratory environment and when food availability is very limited (Scheibling, 1982).

POPULATION ECOLOGY. Estimated population density ranges from 1.7-18.3 individuals per 100 m². Aggregations may become more or less diffuse depending on the nutrient availability in the immediate environment (Encyclopedia of Life, 2012). Only rare occurrences of very dense aggregations, existing only where populations inhabit a confined area. Association with certain species of seagrass, namely *Thalassia testudinum* (Fig. 3), *Syringodium filiforme*, and *Halodule wrightii*, as well as with certain species of macroalgae, namely *Halimeda incrassate* and *Penicillus capitatus*, have been observed (Scheibling, 1980a).

REPRODUCTION. Gonad development takes place during the spring (from February to March) and ends when spawning occurs during late summer or fall (from July to October) (Scheibling, 1980b). When a male and female are close (in dense aggregations where the population density is about 14 per m²), reproduction takes place in which sperm and eggs are released into the surroundings and hence, fertilization takes place externally. Large, slowly-sinking eggs are freely spawned and can be dispersed over 20m before landing on the seabed. The development of planktotrophic (plankton-eating) larvae ends within 23 days in an ideal temperature of 23°C after which they move at about 1.14 cm per minute in search of suitable substratum on which they may continue their development. These larvae probe surfaces and attach themselves by the use of a preoral or brachiolar arm. Metamorphosis into juveniles begin soon after final attachment (Encyclopedia of Life, 2012). When juveniles enter their last stage of development, at about 6-12 cm in length, they are recruited to adult populations (Scheibling, 1980b). No parental care is expressed and larvae are responsible for locating their own food as they are dispersed and move away from the parent (Encyclopedia of Life, 2012).

APPLIED ECOLOGY. The distributions of various species of sponge in the Caribbean, found mainly in coral reefs, have been restricted due to the feeding and habitat preferences of this species of sea star (Encyclopedia of Life, 2012). Overharvesting for souvenirs and ornamental purposes have greatly affected the abundance of populations in areas where the human population is high (Smithsonian Marine Station at Fort Pierce, 2008).

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Fig. 2. Juvenile *Oreaster reticulatus*.

[<http://www.snorkelstj.com/cushion-sea-star.html>, downloaded 23 February 2016]



Fig. 3. *Oreaster reticulatus* in a *Thalassia testudinum* seagrass bed in Panama.

[<http://eol.org/pages/598571/details>, downloaded 23 February 2016]

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