

## *Tripneustes ventricosus* (West Indian Sea Egg)

Order: Camarodonta (Globular Sea Urchins)

Class: Echinoidea (Sea Urchins)

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



**Fig. 1.** West Indian sea egg, *Tripneustes ventricosus*.

[[http://echinoderms.lifedesks.org/image/view/1105/\\_original](http://echinoderms.lifedesks.org/image/view/1105/_original), downloaded 28 March 2015]

**TRAITS.** The test (shell) of *T. ventricosus* can be dark reddish brown, purple or black in colour and hemi-spherical in shape. It is capable of growing up to 150mm in diameter horizontally. The test is responsible for supporting the spines, internal organs, and tubular feet. The test is covered with short white spines 1-2cm long (Fig. 1), and also has tube feet and pedicellariae (small claw-shaped structures). These may keep pieces of seagrass and other debris in place to protect the urchin from intense sunlight in shallow water (Wikipedia, 2015).

**DISTRIBUTION.** *Tripneustes ventricosus* populates shallow regions of the western Atlantic Ocean, Caribbean Sea and Gulf of Mexico. Its extension ranges from Bermuda, the Carolinas and Florida to Belize, Venezuela and Brazil (Fig. 2).

**HABITAT AND ACTIVITY.** *T. ventricosus* can be located in tropical habitats in two places that are dissimilar in characteristics. These are the dense sandy beds of algae and grass, and on reefs including reef crest, bedrock and the shorelines among the rocks. It is also capable of withstanding harsher environments and usually coexists with another sea urchin, *Lytechinus variegatus*. The tropical environment *T. ventricosus* thrives in is usually warm throughout the year and it is rarely located in waters more than 10m deep. *T. ventricosus* is omnivorous depending on environmental conditions, it consumes small organisms, sea grasses, and algae. The globular tipped pedicellariae are poisonous and automise (are shed) after use, which triggers the neighbouring pedicellariae to react and automise as well. This is a defence mechanism against predators such as *Oreaster reticulatus* also known as the cushion sea star, *Diadema antillarum* also called the long-spined sea urchin, and *Eucidaris tribuloides* also called slate pencil urchins.

**FOOD AND FEEDING.** *T. ventricosus* is omnivorous and it consumes plants such as sea grasses, and algae and small organisms using its lantern jaw mechanism which allows it to eat and ingest its food. Changes in temperature can affect the rate of feeding, higher temperatures show a decline in feeding while lower temperatures show an increase in feeding.

**POPULATION ECOLOGY.** The abundance of *T. ventricosus* varies greatly as a result of interannual changes, one year a significant increase in juveniles can be seen followed by some years of low settlement. Naturally, the fluctuations are the result of disparities in obtaining plankton, favourable currents for the transport of larvae to appropriate habitats as well as settling and surviving effectively when it reaches the benthos. Maintaining a successful abundance is affected by *T. ventricosus* short life span of three years, as it would depend on settlement success of the first two years minus the collective loss from natural deaths and deaths caused by fishing activities. The annual stock yield depends on the preceding year's settlement. Fishing removes most of the adults each year, overfishing of the urchin depletes the stock yield. Natural disasters such as hurricanes and storms also affect the urchin's abundance. Storms resulting in heavy rains and soil erosion, the run-off of which can cause siltation of the water which damages the urchins.

**REPRODUCTION.** *T. ventricosus* reproduces sexually and fertilization occurs externally. This external fertilization together with the aquatic environment makes it unnecessary for males and females to mate or make physical contact, when the time is right both genders simply discharging their respective gametes which later comes into contact with each other and fertilize. The ratio of males to females is the typical 1:1, but the larger individuals (80-150 mm) are mostly females, with a sex ratio of 1:1.5. Temperature and age contribute to the reproductive activity, there is a four-fold decrease in reproduction with increasing age. Gonads are temperature dependant, decreasing temperatures affects the spawning patterns. Two spawnings a year occur at six month intervals. Progeny does not require parental care because when the egg becomes fertilized it may be far away from either parent.

**BEHAVIOUR.** *T. ventricosus* dislikes light and responds to it via phototaxis. The tubular feet are used to pick up dense objects to cover the surfaces exposed to the light. When threatened by predators, *T. ventricosus* utilizes its poisonous pedicellariae, which when activated automise other pedicellariae.

**REFERENCES**

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Wikipedia. 2015. *Tripneustes ventricosus*. [http://en.wikipedia.org/wiki/Tripneustes\\_ventricosus](http://en.wikipedia.org/wiki/Tripneustes_ventricosus).

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**Fig. 2.** Geographic distribution of *T. ventricosus*.

[<http://eol.org/pages/598177/overview>, downloaded 1 April 2015]

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