

Stegastes variabilis (Cocoa Damselfish)

Family: Pomacentridae (Damselfish and Clownfish)

Order: Perciformes (Perch and Allied Fish)

Class: Actinopterygii (Ray-finned Fish)



Fig 1. Cocoa damselfish, *Stegastes variabilis*.

[http://flowergarden.noaa.gov/image_library/fish/juvcocoadamselfishgps.jpg, downloaded 1 April 2015]

TRAITS. The cocoa damselfish is about 10cm long and has a thick body. The juveniles are very distinctive (Fig. 1), with a bright blue ring around a black spot on the back and dorsal fin, where the spines meet the soft rays. Below its eye are blue spots which are also scattered on its head, and intense blue lines are found on its forehead and snout (Humann and DeLoach, 2002). The body is yellow below and blue at the top, and there are also narrow dark diagonal lines on the sides (FishBase, 2015). The adults have brown and yellow undertones, a net pattern formed out of the dark scales, and blue colour on some scales particularly at the top and back of the body (Ericsson, 2005). The top of the eye is yellow (Fig 2).

DISTRIBUTION. *Stegastes variabilis* can be found in the western Atlantic. They extend from Florida to Brazil and also occupy Bermuda and the Gulf of Mexico. They are common throughout the Caribbean near reefs. This species of fish is non-migratory and they associate themselves with mostly reefs of a depth range of 0-30 m. They are tropical fish which can be found between 30°N and 33°S (FishBase, 2015).

HABITAT AND ACTIVITY. The cocoa damselfish tend to be the inhabitants of coral reefs and are prominent near the seaward area of the reef which has a talus (debris) slope where live corals exist. They occupy areas of high profile (slope) and coral heads, but they are also sometimes forced out by other damselfish.

FOOD AND FEEDING. This species of fish is omnivorous as benthic algae are the main food of the adult cocoa damselfish (Fig. 3). They also feed on sponges, anemones and ascidians. However, the juvenile cocoa damselfish feed on harpacticoids, nemertean and copepods, which are small invertebrates.

POPULATION ECOLOGY. Individual *Stegastes variabilis* do not overlap territories with other damselfish. They do not appear in abundance but are also not rare (Goodson, 1985). They appear to survive longer in captivity, that is, up to 18 years, than they do in the wild, where they do not live beyond 12 years. They are often solitary when observed in their habitat. Juvenile *Stegastes variabilis* may be excluded from reef areas by the more predatory *Stegastes fuscus*.

REPRODUCTION. When it is time for *Stegastes variabilis* to reproduce, they tend to pair up. When the female finds a suitable partner, she proceeds to lay approximately 1,000 eggs on the surface of the seabed (while the male swims behind) onto substrates such as stones and unoccupied shells where they become attached, afterwards it is there that the male externally fertilises the eggs. The male cocoa damselfish aerates the eggs and protects them for seven days by guarding and chasing away potential intruders. The cocoa damselfish is therefore a parental species. The larvae are 2-4mm in size and they undergo a pelagic (open-water) stage. The larva then settles in an environment which is suitable and there it develops the features of a juvenile cocoa damselfish. Later on in its life the bright blue colour fades and becomes brownish, which indicates that it is an adult and the reproductive cycle continues.

BEHAVIOUR. Male *Stegastes variabilis* have an aggressive behaviour when they guard eggs; this species is territorial but are still approachable (Humann and DeLoach, 2002). The communication between this species is mostly done during the breeding season. The males prepare a nest by clearing an area covered in invertebrates and algae using their tail and move larger substances with its mouth or with its swimming motion. Afterwards they perform a courtship ritual by chasing the females and nipping at them. They exhibit sudden bursts of forward quick motions, sometimes they become immobile and hover. They also widely extend their fins. At the climax of the display, they produce a grunting noise which is audible. Their bright colours enable them to camouflage with the coral reefs which are also bright and colourful (Fig. 4). This helps them avoid the attacks of predators. The juvenile cocoa damselfish are aggressive whereas the adults are sociable.

APPLIED ECOLOGY. This species of fish are commercially used and are kept as pets in aquariums by humans because of its size and colourful features. They are captured via traps and beach nets which contain small meshed pattern (FishBase, 2015). No entries were found on this species on IUCN (IUCN, 2014). Therefore it does not appear to have conservation threats.

REFERENCES

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Posted online: 2015



Fig. 2. The adult cocoa damselfish.

[<http://myfishgallery.com/marine-life/cocoa-damsel-fish-adult/?photo=0#title>, downloaded 1 April 2015]



Fig. 3. Cocoa damselfish feeding on algae on the reef.

[http://www.reef.org/reef_files/enews/8%20Nesting%20Cocoa%20Damselfish_carolcox.jpg, downloaded 1 April 2015]



Fig. 4. Cocoa damselfish camouflaged on coral reef.

[<http://www.brunsonimages.com/gallery/TropicalFish/tf017.jpg>, downloaded 1 April 2015]

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