

## *Stegastes leucostictus* (Beaugregory)

Family: Pomacentridae (Damsel fish and Clownfish)

Order: Perciformes (Perch and Allied Fish)

Class: Actinopterygii (Ray-finned Fish)



**Fig. 1.** Beaugregory, *Stegastes leucostictus*.

[<http://www.tropicalsnorkeling.com/curacao-snorkeling-pictures.html>, downloaded 28 February 2015]

**TRAITS.** *Stegastes leucostictus* are characterized by an oval shaped body which is laterally compressed. The distinctive characteristic of the beaugregory is the blue crown and back of the fish, yellow belly, and blunt snout (Wikipedia, 2015) (Fig. 1). Both the dorsal fin and the anal fin have 12-16 soft rays, but only the dorsal fin has spines (12). The caudal fin has a shallow fork (Reef.org, 2015). Adult *Stegastes leucostictus* are 6-10cm long (McGinley, 2009). Juveniles have a black spot where the soft rays and spines of the dorsal fins meet (Fig. 2), and blue stripes and spots on their head. Male and female beaugregory are only distinguished through observation during courting (Reef.org, 2015).

**DISTRIBUTION.** *Stegastes leucostictus* is common in the Caribbean, northern Gulf of Mexico, Bahamas, south Florida and western Atlantic (McGinley, 2009) (Fig. 3).

**HABITAT AND ACTIVITY.** Commonly associated with coral reefs, although they prefer the flatter side of the reef affiliated with dead corals (Reef.org, 2015). They are demersal (found near the bottom) (McGinley 2009), and also common on sea grass beds, sand and rubble, in areas in similar habitat with the three-spot damselfish and the bicolor damselfish (Renshaw, 1994). Damselfish greatly influence the algal and the benthic community structure, due to their aggressive and territorial behaviour. These diurnal fish spend a great deal of their day defending their permanent homes, chasing other fish species away. Their homes are where they feed, spawn

and find refuge from predators. They exclude many herbivorous and competitor species like angelfish from their territory (Ladywildlife, 2015). *Stegastes leucostictus* tend to prefer open areas of high quality (Fig. 4), and spend most of their energy defending such territories. Males previously occupying natural areas eventually moved over to artificial sites of superior quality (Itzkowitz et al., 1976), suggesting that they have the ability to assess the quality of a breeding site.

**FOOD AND FEEDING.** *Stegastes leucostictus* are omnivores. They eat amphipods, gastropods, foraminiferans and marine worms. The fishes create a territory which they defend in order to secure their food supply. Beaugregory also feed on green and brown microalgae and cyanobacteria, (Ladywildlife, 2015), due to the fact that they mainly rely on chemical means rather than mechanical means to digest food. The pH of their stomach secretions ranges from 1.9-3.0, and is lower than that of any other reef fish. Their incisiform (chisel-like) teeth enable them to eat algae off of rocks and substrate. Although these fish have teeth, it is still difficult for them to digest macro algae species (Michael, 2015). The average feeding frequency of beaugregories varies along the course of the day. They feed more frequently in the evening time, averaging with 113 nips per 15 minutes, and 23 nips per minute in the morning (Santangelo, 2002). Juvenile damsel fish fed mainly on small invertebrates such as copepods and polychaetes (McGinley, 2009).

**POPULATION ECOLOGY.** Beaugregory establish permanent territories, live in solitude and fight off any other fish that come into their area, influencing reef ecology (Medeiros et al., 2010). They prefer to defend open high quality sites as these sites result in twice more successful reproductive practices (Itzkowitz, 1991). At times male saddled blennies build their nest near to beaugregories to take advantage of their nest defence. Female damsel fish, only identified by behaviour, live in crevices near males (Renshaw, 1994). A study conducted by the Renshaw revealed that the average distance travelled by the female *Stegastes leucostictus* away from her crevice was 1m, and the furthest average distance was 1.87m. The fishes generally travel further distances in the morning period as opposed to the evening. Courtship represents the majority (72%) of the behavioural interactions between male and female beaugregory (Renshaw, 1994).

**REPRODUCTION.** Mating season occurs in the spring and summer time for temperate regions, but is less seasonal in the tropics. One nest may contain up to 25,000 eggs (McGinley, 2009), as different females may lay their eggs in the same nest. Eggs are hidden under a rock or an empty shell. Males safeguard the nest, fan the eggs to ensure they are well oxygenated and pick out any dead eggs from within the clutch (Ladywildlife, 2015). This is the only form of direct parental care juveniles receive (Santangelo, 2002). Dipping, herding darting and making clicking sounds are actions done to encourage a female to enter a male's nesting site (McGinley, 2009). Vibrant colours also play a role in wooing the female. Male *Stegastes leucostictus* have a tendency to pursue larger females (Itzkowitz et al., 1976) and females similarly assess and evaluate males (Renshaw 1994). After the female lays her eggs, she leaves and the male fertilizes it. The entire process takes 10-20 minutes and the eggs hatch somewhere from 3-7 days. (Ladywildlife, 2015). Fishes reach sexual maturity in 2-5 years. Larger males engage in courtship activities more frequently than smaller males (Renshaw, 1994). Territory quality also influences reproductive success.

**BEHAVIOUR.** Both males and females spend a great deal of time defending their territory, or seeking a potential mate and rarely move beyond 1m off the substrate (McGinley, 2009). Greater priority is placed on defending high quality sites rather than mating (Santangelo, 2002). *Stegastes leucostictus* attack any species viewed as a threat regardless of their size, and may make clicking noises to communicate. Male beaugregory are more aggressive when guarding eggs, especially when the egg predator the wrasse is present. Males not guarding eggs pay more attention to females (Itzkowitz, 1991), or often move and go in search of higher quality territories (Santangelo, 2002). An experiment conducted by Santangelo (2002) where they bottled both a female and male beaugregory fish and placed it near the territory of another damsel fish, revealed that males in natural sites spent less time defending their territory. If the site was of a superior quality, higher biting rates were observed toward the bottled male. When only the bottled female was present, most of the time was allocated towards the female and was seen in courting behaviour. Female damsel fish use aggressive behaviour to influence the selection of males by other females (Renshaw 1994). Females would ignore each other, participate in mouth to mouth fighting or pursue each other in order to ward off the other female.

**APPLIED ECOLOGY.** From a conservational standpoint, *Stagates leucostictus* is not considered to be a species at risk due to the fact that it is widespread and abundant throughout its range and as such they are not listed on the IUCN's red list (McGinley, 2009). Beaugregory are found in local pet stores and are favoured for marine aquariums due to their small size, and beautiful colours. They may not get along with other fish and they are found to lose their colour as they develop into adults (Michael, 2015).

## REFERENCES

- Haley, Michael P, and Christian R Müller. "Territorial Behaviour of Beaugregory Damsel Fish (*Stegastes Leucostictus*) in Response to Egg Predators." *Journal of Experimental Marine Biology and Ecology*: 151-59.
- Itzkowitz, Murray, M. Draud, J. Barnes, and M. Haley. 1976. "42." In *Behavioral Ecology and Sociobiology*, 149-155. Berlin: Springer-Verlag.
- Itzkowitz, Murray. 1991. "Habitat Selection and Subsequent Reproductive Success of the Beaugregory Fish." In *Environmental Biology of Fishes*, 287-293. 3rd ed. Vol. 30. Kluwer Academic Publishers.
- Ladywildlife. 2015. "Ladywildlife's Damsel Fish." Accessed March 14, 2015. <http://ladywildlife.com/animals/damsel fish.html>.
- McGinley, Mark. "Beaugregory." *Beaugregory*. October 22, 2009. Accessed March 14, 2015.
- Medeiros, P. R., A. T. Souza, and M. I. Ilarri. 2010. "Habitat Use and Behavioural Ecology of the Juveniles of Two Sympatric Damsel Fishes (Actinopterygii: Pomacentridae) in the South-western Atlantic Ocean." *Journal of Fish Biology*, 1599-615.
- Michael, Scott. 2015. "Algae-Eating Damsel Fish." *Algae-Eating Damsel Fish*. Accessed February 28, 2015.
- Payne, Adam G., Carl Smith, and Andrew C. Campbell. "Interactions between Ophiuroids and Beaugregory Damsel Fish." *Journal of the Marine Biological Association of the UK*: 625-32.
- Reef.org. 2015. "Damsel Fishes." Accessed April 1, 2015. [http://www.reef.org/reef\\_files/beaugregory.pdf](http://www.reef.org/reef_files/beaugregory.pdf).
- Renshaw, April Dawn 1994. "Behavior of the female beaugregory damselfish, *Stegastes leucostictus*" (1994). *Theses and Dissertations*. Paper 291.
- Santangelo, N. 2002. "Resource Attractiveness of the Male Beaugregory Damsel Fish and His Decision to Court or Defend." *Behavioral Ecology*, 2002, 676-81.
- Wikipedia 2015. "Stegastes Leucostictus." Accessed February 3, 2015.

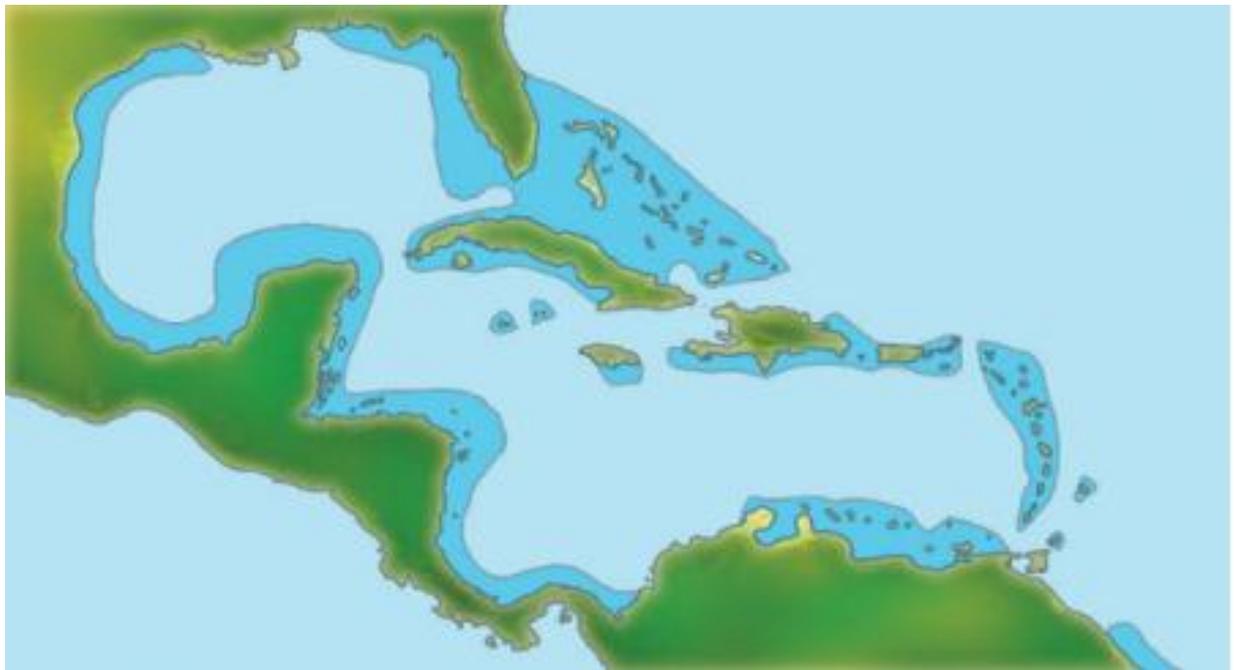
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**Fig. 2.** Juvenile *Stegastes leucostictus*.

[<http://www.reef.org/node/6666>, downloaded 12 March 2015]



**Fig. 3.** Distribution of the beaugregory, *Stegastes leucostictus*.

[<http://community.oceana.org/en/explore/marine-wildlife/threespot-damselfish>, downloaded 14 March 2015]



**Fig. 4.** Habitat of the beaugregory, *Stegastes leucostictus*.

[<http://lauren-lee.deviantart.com/art/Giant-Anemone-2-397983247>, downloaded 28 March 2015]

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