

## *Stegastes partitus* (Bicolour Damselfish)

Family: Pomacentridae (Damselfish and Clownfish)

Order: Perciformes (Perch and Allied Fish)

Class: Actinopterygii (Ray-finned Fish)



**Fig. 1.** Bicolour damselfish, *Stegastes partitus*.

[<http://reefguide.org/carib/bicolordamsel.html>, downloaded 14 March 2015]

**TRAITS.** *Stegastes partitus* is one of the five most commonly found fishes amongst the coral reefs within Trinidad and Tobago. Length: total length in males and females is 10cm (Rainer, n.d.). Contains a total of 12 dorsal spines and 14-17 dorsal soft rays in addition to a total of 2 anal spines and 13-15 anal soft rays. A blunt snout is present on the head with a petite mouth and outsized eyes. Colour: Damsels show even distribution of black and white coloration with a yellow section separating both between the last dorsal spine and the anal fin (Fig. 1), however during mating, males under differentiation in their coloration (Schultz, 2008). There are colour variations depending on the geographic region and juveniles differ from the adults.

**DISTRIBUTION.** Distribution is spread throughout the western Atlantic (Fig. 2), spanning from Florida to the Bahamas and the Caribbean with possible extension to Brazil (Rainer, n.d.). They are also found along the coast of Mexico.

**HABITAT AND ACTIVITY.** Found at a depth of approximately 30m, damsels are found in habitats bordering coral reefs, that is areas of dead coral, boulders and man-made structures where algae is most likely to grow. Here they spend the time protecting their territory and cultivating their algal gardens. The size of the habitat occupied by the individual is dependent on their size as well as their capabilities of defending their area (Schultz, 2008). The damselfish are also more likely to inhabit areas having stronger water currents (Schrandt, 2010).

**FOOD AND FEEDING.** The species of *Stegastes* are like farmers as they tend to their food sources which are the algal fields present in their habitats. *Stegastes partitus* however show different feeding behaviours in that they also feed on plankton. In this aspect they are similar to another genus of damselfish, *Chromis* which also feeds on plankton, as opposed to other *Stegastes* species (Schultz, 2008).

**POPULATION ECOLOGY.** Mainly solitary and territorial. Bicolor damselfish occupy the same area from inception as a juvenile until death unless ruled out by another dominant individual (Schultz, 2008). As a juvenile, higher growth rates are observed in those spawned in the fore reef compared to the back reef. In addition to growth rate, the mortality rate of the juveniles is higher amongst those spawned on boulder coral habitats compared to rubble habitats (Nemeth, 1998). Generally living alone, the bicolour damselfish may form groups with up to 20 other individuals however there will be a dominant male at the head of the group. Should the alpha damselfish be challenged by a younger male and lose, the alpha position is passed onto the winner therefore dominance is dependent on the ability of the damselfish.

**REPRODUCTION.** Reproduction begins with a mating ritual instigated by males exhibiting colour changes signalling their readiness to mate as well as their capabilities for reproductive success (Knapp and Kovach, 1991). Whereas the male damselfish has a 50/50 distribution of black and white, during mating they exhibit greater black coloration. The mating dance is a sequence of sudden multidirectional movements, with grunting sounds produced at the peak of the mating dance, is performed to charm a female. The accepting female is then led to the spawning ground prepared by the male before laying a single layer of eggs that are attached to the surface. The male then fertilizes the eggs laid by the female and watches over them until they hatch (Knapp and Kovach, 1991). Preparation of the spawning area occurs before the mating ritual and is done by cleaning the area of debris and even invertebrates by use of their tail, and for larger objects, their mouth (Schultz, 2008). More than one area may be cleared as males are capable of fertilizing eggs daily and may have multiple partners during the mating season. Females however require a period of recovery after laying eggs and are usually able to lay another nest after a few days to another male suitor, preferentially that with a high courting rate (Knapp and Kovach, 1991). The male cares for the eggs by fanning, removing any debris and removing unfertilized eggs. The eggs are hatched after approximately one week and are dispersed as larvae (Schultz, 2008).

**BEHAVIOUR.** Larvae progress away from the nesting area towards shallower waters in an attempt to evade adults as they may be subjected to attacks (Hepburn et al., 2008). In the shallow water, the juvenile will feed until it transforms into the adult phenotype and then into deeper waters to establish its own territory. Juveniles demonstrate high site fidelity and will guard their terrain from settlement into maturity (Schrandt, 2010). As an adult, monogamous relationships can be established between individuals of the opposite sex however generally the individuals live alone. In some bicolor damselfish however, relationships can be formed and territories can grow to include not one but up to 20 individuals, both male and female (Schultz, 2008).

Anti-predator behaviour: Bicolor damselfish are very territorial beings as such they give warning signals to any organism venturing into their area before they attack. Although solitary, the bicolor damselfish may form aggregations of about 10-20 individuals and have a propensity of defending their territory in a squadron formation (Schultz, 2008). Their attacking nature is primarily biting of the intruder. Larger damselfish show higher levels of aggression compared to smaller individuals, and undergo courting at higher rates (Schrandt, 2010).

Communication: Sound production in the form of a "three pulse chirp" is specific to *Stegastes* species during courtship and is acknowledged by the members of their species (Myrberg and Spires, 1972), and is distinguishable by the different *Stegastes* species. A similar sound is also used to warn intruders who are venturing close to their territories (Schultz, 2008). Visual communication occurs in the form of a bodily colour change in males. When trying to catch the attention of a female, the male becomes primarily black and only the base of the tail retains the white coloration. The tail itself however becomes black as well to match the black colour of the body. The colour change signals a male which is ready for reproduction as well as it signals to the female the fitness of the male and his potential capabilities (Knapp and Kovach, 1991).

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**Fig. 2.** Geographic distribution of the bicolor damselfish, *Stegastes partitus*.

[[http://www.aquamaps.org/receive.php?type\\_of\\_map=regular#](http://www.aquamaps.org/receive.php?type_of_map=regular#), downloaded 25 March 2015]

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