

Scarus guacamaia (Rainbow Parrotfish)

Family: Scaridae (Parrotfish)

Order: Perciformes (Perch and Allied Fish)

Class: Actinopterygii (Ray-finned Fish)



Fig. 1. Rainbow parrotfish, *Scarus guacamaia*.

[<http://cdn1.arkive.org/media/1F/1FE9F2C5-29CA-488B-A7CF-B864BA9737E3/Presentation.Large/Rainbow-parrotfish.jpg>, downloaded 8 March 2016]

TRAITS. This species is the largest parrotfish, and the largest herbivorous fish, in the Atlantic Ocean. They can grow to a maximum length of 1.2m and a weight of 20kg. The large males are brightly coloured, particularly green and orange; the head, fins and tail are bright orange while the back is a bright green (Fig. 1). However, females and small males are dull coloured. The teeth of the parrotfish are clustered together, forming a tough mouthpiece that looks like a parrot's beak (Fig. 2), where its name was derived. They also possess a pharyngeal apparatus, where teeth are seen in rows, found in the throat and specialized to disintegrate food (Eol.org, 2016).

DISTRIBUTION. Found quite widely in the western Atlantic Ocean, in the Caribbean to Venezuela, Bermuda to south Florida and in the Bahamas, including Trinidad and Tobago and many Latin American countries (IUCN, 2016)

HABITAT AND ACTIVITY. Commonly found in sheltered coral reefs within depths of 3-25m (Arkive.org, 2016). At night time, they hide in cracks and corners in order to secure themselves from predation. Their young are mainly found in mangroves located near to coral reefs, but may also be found on rocks in the ocean, the majority of times in shallow waters. The young fish are found in mangroves as these serve as a safe habitat free from serious predators, and with a rich supply of nutrition.

FOOD AND FEEDING. The rainbow parrotfish are at the herbivore trophic level. They mostly get food in the coral reefs, with their diet consisting mainly of algae, seaweed and organic matter from the coral surfaces. Its specialised teeth aid in the process of scraping algae off the coral surfaces. The newly hatched larvae begin to feed after three days but it is uncertain as to how long this stage lasts. Also, they may form large groups in order to go feeding in an attempt to ward off predators (Eol.org, 2016).

POPULATION ECOLOGY. Currently, the population of the rainbow parrotfish is diminishing. This is as a result of the fact that their coral reef and mangrove habitats are being destroyed for development of the coastline and extraction of oil. In the 1960s the rainbow parrotfish population was at peak as during this period, mangroves and coral reefs were still intact. It was found that in areas that were protected, the populations of these fish were significantly higher than in those that had minimal safeguard against overfishing. An estimate of this decline may be seen when comparing the rainbow parrotfish populations in Bonaire which has protective measures in place since 1979, as opposed to Barbados where fishing is rampant and parrotfish are captured for their beauty. The statistic is for every 10,000 m², there can be found 16 individuals in Bonaire, whereas it is almost 10 times lower in Barbados and other non-secure locations.

REPRODUCTION. The individuals in this species must undergo three distinct phases within the life cycle. The first phase consists of sexually immature juveniles, which have a characteristic drab colour. The second phase is called the Initial Phase and consists of sexually mature males and females. The final Terminal Phase consists of only mature males that are brightly coloured as seen in Fig. 1 (Eol.org, 2016). The rainbow parrotfish have a very complex system of reproduction. They live in a harem group, whereby one single terminal male is dominant in a group of females. This dominant male mates with the females in the group, and deters other male competition (Wikipedia, 2016). The species is diandric, meaning that the population includes primary and secondary males. A primary male was born that sex. However, a secondary male is a fish born female, that transforms into a male. This transformation of a female fish to a male fish occurs upon the death of a Terminal Phase male. His death signals the largest Initial Phase female to undergo morphological and behavioural changes, transforming into a male (Eol.org, 2016). "Sneak spawning" may also occur, where Initial Phase males disguise themselves as a female in an attempt to enter the harem. At peak spawning, they release a cloud of gametes in an attempt to overwhelm the fertilisation by the Terminal Phase males. They are adapted for this process, as they have larger testes than the Terminal Phase male, therefore producing more gametes than the latter (Eol.org, 2016). This increases their chance of fertilising the female.

APPLIED ECOLOGY. The rainbow parrotfish are mainly used for decorative and aesthetic purposes. They are not consumed as their flesh can be dangerous due to the accumulation of

toxins (Eol.org, 2016). On the IUCN Red list of threatened species, the *Scarus guacamaia* is described as “Near Threatened” (IUCN, 2016). Due to factors such as excessive fishing, increasing human population, lack of species protection through marine reserves and increased interference and destruction of their main habitats such as coral reefs and mangroves, there has been a decrease in the density of the species. According to some, *Scarus guacamaia* has become extremely rare over the past three decades (IUCN, 2016).

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Posted online: 2016



Fig. 2. Close up view of the characteristic ‘beak-like’ teeth of *Scarus guacamaia*.

[<http://cdn2.arkive.org/media/97/97F26AFD-2665-46EE-A9E7-A6760838B2DD/Presentation.Large/Rainbow-parrotfish-portrait.jpg>, downloaded 8 March 2016]