

Halichoeres bivittatus (Slippery Dick)

Family: Labridae (Wrasses)

Order: Perciformes (Perch and Allied Fish)

Class: Actinopterygii (Ray-finned Fish)



Fig. 1. Slippery dick, *Halichoeres bivittatus*.

[http://en.wikipedia.org/wiki/Slippery_dick downloaded 2 April 2015]

TRAITS. A species of wrasse (Wikipedia, 2015), moderately elongate (cigar-shaped) with a lateral stripe extending from the pointed snout, through the eye and straight down towards the base of its tail (Fig. 1). They can also have a second stripe running from below the mouth toward the tail but this one is much fainter or even non-existent in some. They have short pelvic fins, long dorsal and anal fin bases, medium pectoral fins and a relatively short and wide caudal fin (EoL, 2015). They also have a small bi-coloured (green and yellow) spot above the pectoral fin. Most are from 12-18cm but can reach up to 23cm. They have numerous colour phases in their life cycles. Juveniles are mainly white with a black horizontal stripe from the mouth through the eye to the caudal fin base (tail) as well as another stripe on the underside as mentioned above (Fig. 2). Intermediates' (initial phase) colour schemes can range from green to brown (Fig. 3). The terminal phase slippery dick also has a dark mid-body stripe as well as shades of yellow, green or pink markings on their body and their tails also have dark triangular corners (Fig. 4). They have a pair of large canine teeth protruding from the upper jaw. They are protogynous hermaphrodites because they change sex in their life cycle.

DISTRIBUTION. Commonly found in shallow, tropical waters of the western Atlantic Ocean from North Carolina (USA) down to Brazil including Bermuda, most of the Gulf of Mexico, the Bahamas and throughout the Caribbean. Normally found in and around shallow reefs and sea-grass beds. Their depth in these areas ranges from about 1-15m.

HABITAT AND ACTIVITY. Found in habitats ranging from the more common rocky and coral reef areas to the less common sea-grass beds. They, as well as many other wrasses, can be considered diurnal due to their reduced motion or sensitivity during the night (Reebs, 2014) According to a study done in Bocas del Toro, Panama, the slippery dick as well as other species showed size segregation in different zones of habitat such as: smaller juveniles and intermediates occurred in low-complexity zones (sand rubble and turf algae) while there was an increase in size proportions from intermediate to high-complexity zones (rocky and fire coral areas) (Arosemena and Wolff, 2005).

Habitats of species may overlap, which gave rise to the anomaly of hybridization occurring between two closely related species: *H. garnoti* and *H. bivittatus*. Although both species are commonly found in shallow areas of Caribbean coral reefs, *H. bivittatus* can be found in a range of habitats, not only in shallow reefs, but reef habitats that were slightly deeper where *H. garnoti* is usually found. This overlap is what gave rise to the hybridization since both species occurred in the area of the hybrids (Yaakub et al., 2007). Diet overlap among different species of wrasse also exists (Martha and Jones, 2002).

FOOD AND FEEDING. The slippery dick's diet consists mainly of benthic organisms such as crabs, sea urchins, polychaetes (segmented worms), gastropods (slugs and snails), ophiuroids (brittle stars) and other fishes. They tend to exploit disturbances at the bottom such as the overturning of rocks which bring a swarm of them in search of food (well-camouflaged invertebrates are revealed this way). They can also be found following benthic fishes (e.g. goatfish) known as the "following behaviour" since the larger fish disturbs areas exposing invertebrates which they can then feed on. They graze the bottom with their protruding teeth and hard shells such as that of crabs are ground by their pharyngeal jaws exposing the insides.

POPULATION ECOLOGY. Juveniles and intermediates can be found in groups whereas terminal males are solitary (alone). *H. bivittatus* as well as other closely related wrasses may form schools with other species from different families but with those that didn't pose any harm such as herbivores (Nunes et al., 2013). *H. bivittatus* were also observed to exist not only in tropical areas but areas with sub-tropical characteristics such as south Florida and Bermuda. They showed a sharp break between tropical and sub-tropical waters which resulted in habitat segregation. This segregation was due to phylogenetic breaks between distinct habitats. For example, in the Florida Keys, subtropical type dominated inshore habitats (colder waters) while tropical type dominated the warmer offshore areas, hence the population distribution of genetic lineages between inshore and offshore habitats were found to be different since the areas were separated, e.g. by 15km in Florida (Rocha et al., 2005). The lifespan of the slippery dick has not yet been determined however, reef species generally live 3-5 years.

REPRODUCTION. They are protogynous hermaphrodites. They are born as females and later on in their lifespan turn into males. Before spawning, terminal males aggregate themselves forming leks by gathering and taking part in a competitive show. They do this to demonstrate

their male prowess and to attract female partners for spawning. They are pelagic (open-water) spawners; males and females swim above the reef together and release their gametes simultaneously. The fertilized eggs then drift through the currents until they hatch, hence, no parental care is given. Spawning tends to take place during daylight. *H. bivittatus* is said to be sexually dichromatic (partially) because the terminal males have a very different colour pattern compared to smaller individuals (Warner and Robertson, 1978). However, with colour there is no distinct cut off point between the terminal and intermediate phases.

In the North Carolina study, spawning behaviour was observed to be in pairs as well as in groups. When a pair was established, there was an upward rush by the pair in which gametes were released forming a white cloud very high above the substrate. Spawning took place near the edge of the reef. Group spawning also was present which saw other initial phase males interfering in the spawning at the site of gamete release, in a behaviour known as “streaking”. Fertilized eggs were 0.6mm in diameter and buoyant while unfertile eggs were not buoyant. Hatching occurred about 23 hours after fertilization and the larvae measured 1.6mm and possessed a spherical oil globule and an ovoid yolk sac (Clavijo and Donaldson, 1994). Growth and other physical characteristics developed following hatching.

BEHAVIOUR. *H. bivittatus* exhibits cleaning behaviour which is considered a form of highly developed communication between different species. They ‘clean’ by removing small organisms and other dead tissues from the bodies of other fishes (known as the ‘clients’). According to a study done on a shipwreck along the northeastern coast of Brazil, juvenile *H. bivittatus* were found to show cleaning activity (Feitoza et al., 2002). *H. bivittatus* may avoid predation by hiding in reef crevices. A form of communication could be the host fish being receptive to the cleaning activity of the wrasse. They may also hunt in small groups during the day.

APPLIED ECOLOGY. *Halichoeres bivittatus* is listed by IUCN as of least concern since there are no major known threats to the species. It is present in a number of marine protected areas but its population status still needs to be determined. Although they are scarce in Brazil, they are widespread in other parts of the Caribbean. The species are collected and kept in aquariums as part of the aquarium trade and not marketed for food. They are not known to cause any diseases in humans nor do they pose a pest problem.

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Fig. 2. Slippery dick (juvenile), *Halichoeres bivittatus*.

[<http://reefguide.org/carib/pixhtml/slipperydick2.html> downloaded 2 April 2015]



Fig. 3. Slippery dick (initial phase), *Halichoeres bivittatus*.

[<http://reefguide.org/carib/pixhtml/slippydick6.html> downloaded 2 April 2015]



Fig. 4. Slippery dick (terminal phase), *Halichoeres bivittatus*.

[<http://reefguide.org/carib/pixhtml/slippydick1.html> downloaded 2 April 2015]