Diodon hystrix (Porcupinefish)

Family: Diodontidae (Porcupinefish)
Order: Tetraodontiformes (Pufferfish, Triggerfish and Boxfish)
Class: Actinopterygii (Ray-finned Fish)

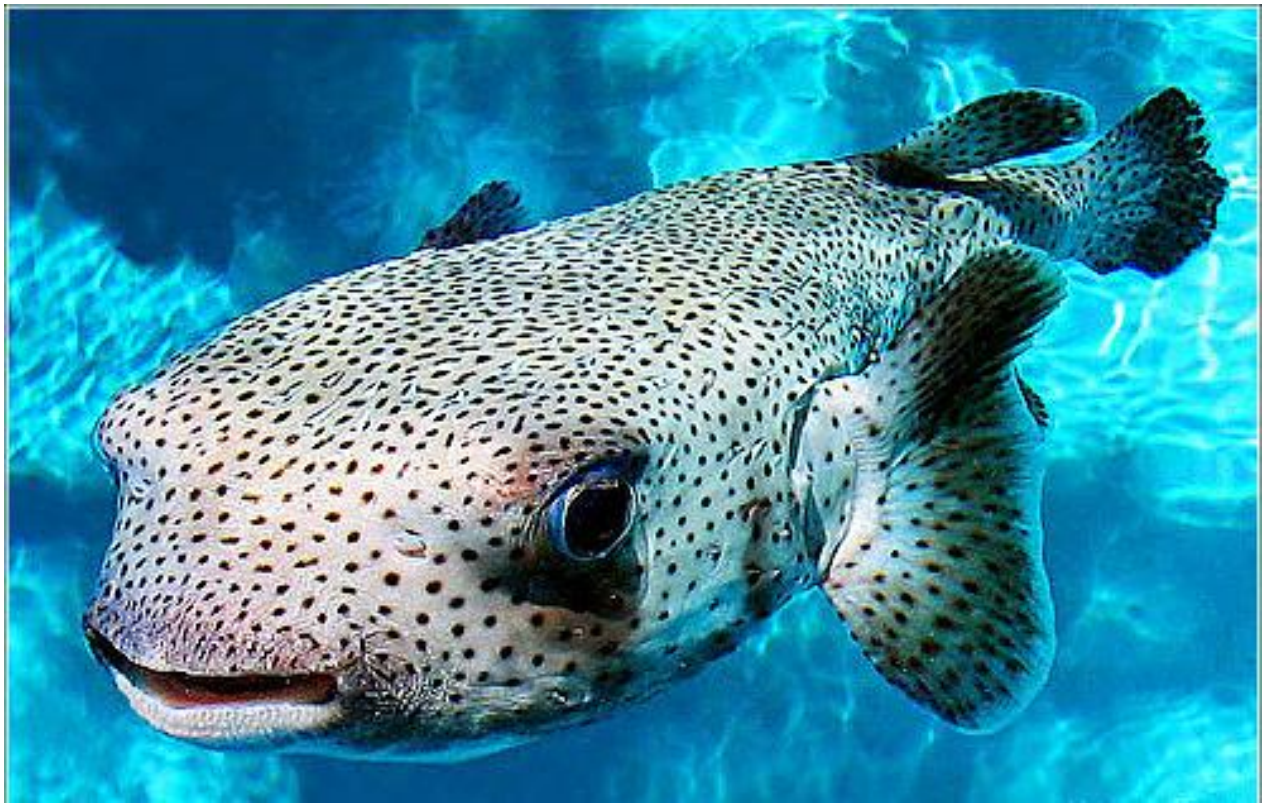

Fig. 1. Porcupinefish, *Diodon hystrix.*

[https://www.flickr.com/photos/ryyck/519998402, downloaded 10 February 2016]

TRAITS. Its colour ranges from light brown to green, with evenly distributed black spots, with tiny fins and a white stomach region. Pelvic fins are absent; the rounded anal and dorsal fins are situated near the caudal fin (Fig. 1). The spines it possesses are modified scales which stand out when it is threatened and takes in water, but usually these spines lay flat along the body. Adults can grow up to 90cm in length hence they are the largest of the spiny puffer species. Their mouth is beak-like and strong due to the fusing of all its teeth which aids in feeding. They possess large eyes and their mouths are flattened and wide. The colour and body shape is slightly different between males and females (Patton, 2009).

DISTRIBUTION. It is widely distributed, present in temperate marine areas and found circumtropically (Fig. 2). They are native to Trinidad and Tobago (Patton, 2009).

HABITAT AND ACTIVITY. The adults are usually situated in openings such as crevices and holes in inshore regions, which include caves and reefs, and seamount locations (Fig. 3). They are present up to a depth of 50m but most are found between 3-20m. Juveniles are found in the

open sea (pelagic) until they reach a length of 20cm then they live inshore (Bailly, 2012). It is nocturnal and uses its eyes to see, the nose or nasal cavity to detect dissolved chemicals, and its lateral line to sense changes in water pressure due to movement and vibrations (Debelius et al., 2006).

FOOD AND FEEDING. They are carnivorous, nocturnal feeders that possess strong jaws and teeth fused together for cracking open the exoskeleton of its prey such as snails (Gastropoda) and sea urchins (Echinoidea); this is known as durophagous feeding. They possess rubbery lips which protect them from broken shells while feeding. They commonly find their prey in crevices, caves and sandy areas (Eschmeyer et al., 1983). It is the host to a variety ecto- and endoparasites, as are many other fish (Quilichini et al., 2010).

POPULATION ECOLOGY. Solitary. Juveniles live in open sea areas (they are pelagic) until they are 20cm in length while larger fish are found on reefs. This species of fish is located in lagoons as well as rocky, seaward and coral reefs. It appears to be common on a global scale but that does not mean it is abundant in its various locations. It is unknown if this species maintains any territories or home range (Leis, 1997).

REPRODUCTION. It is known that this species is a broadcast spawner, meaning both sexes mate with many different partners during spawning events. Mating within this species has not been observed in the wild or in captivity, but a closely related species *Diodon holocanthus* has had its mating observed. The process of breeding begins at an approximate temperature of 25^{o}C (most likely during May-August) where multiple males mate with multiple females. The female is brought up to the water surface and if she possesses eggs they would be released. The males involved (around four to five) contribute sperm (Sakamoto and Suzuki, 1978).

BEHAVIOUR. When threatened they are able to uptake water hence swelling out their body. Their flexible skins allow an expansion up to three times their normal body size. At this point the spines are also erect from the body, which is round in shape (Fig. 4). This increase in size makes it impossible for predators to swallow them. When the threat has ceased the water is released hence returning it to its regular body size (Patton, 1999). They are usually docile, move slowly and are only seen in pairs during mating. These reef fish are often very curious and accompany divers through the water where they swim (Fig. 5). In captivity they can distinguish their feeders and behave similarly to that of dogs where they swim to the surface of the tank, awaiting food. They are considered to be a “smart” fish with a higher intelligence level than other fish (Underwater Asia, 2008).

APPLIED ECOLOGY. The IUCN has listed this species as of least concern (LC) and it is not a threat to humans (IUCN, 2015).

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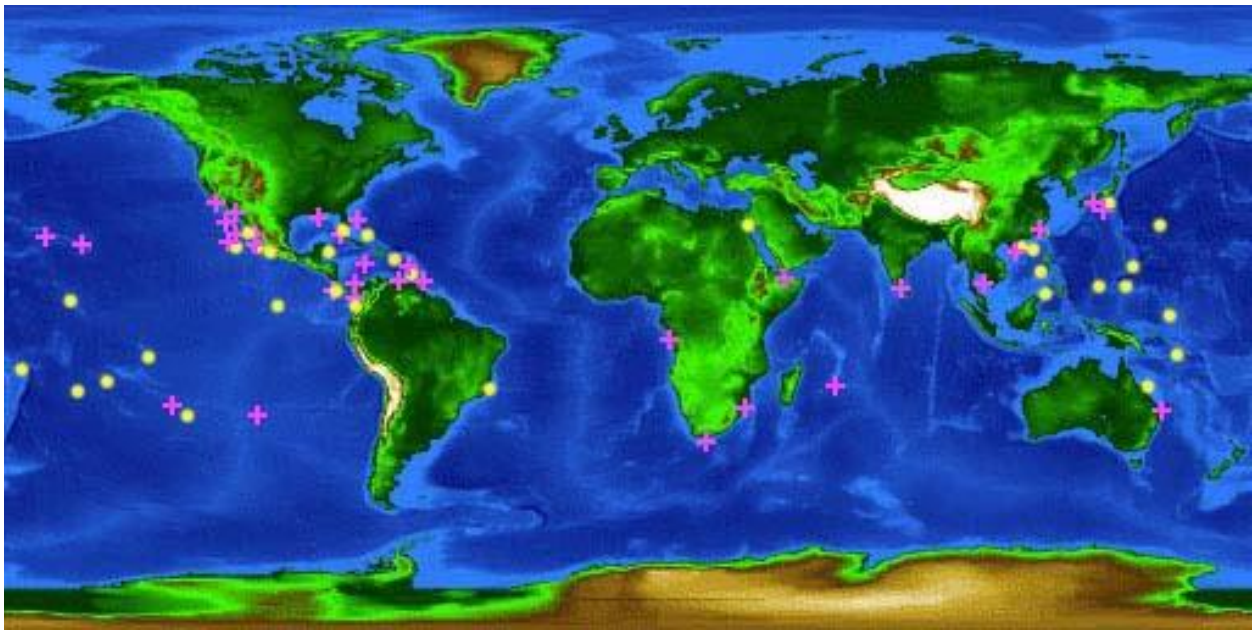

Fig. 2. Porcupinefish geographic distribution.

[https://www.flmnh.ufl.edu/fish/discover/species-profiles/diodon-hystrix/, downloaded 12 February 2016]

Fig. 3. Porcupinefish in an inshore location.

[http://www.arkive.org/porcupine-pufferfish/diodon-hystrix/, downloaded 12 February 2016]

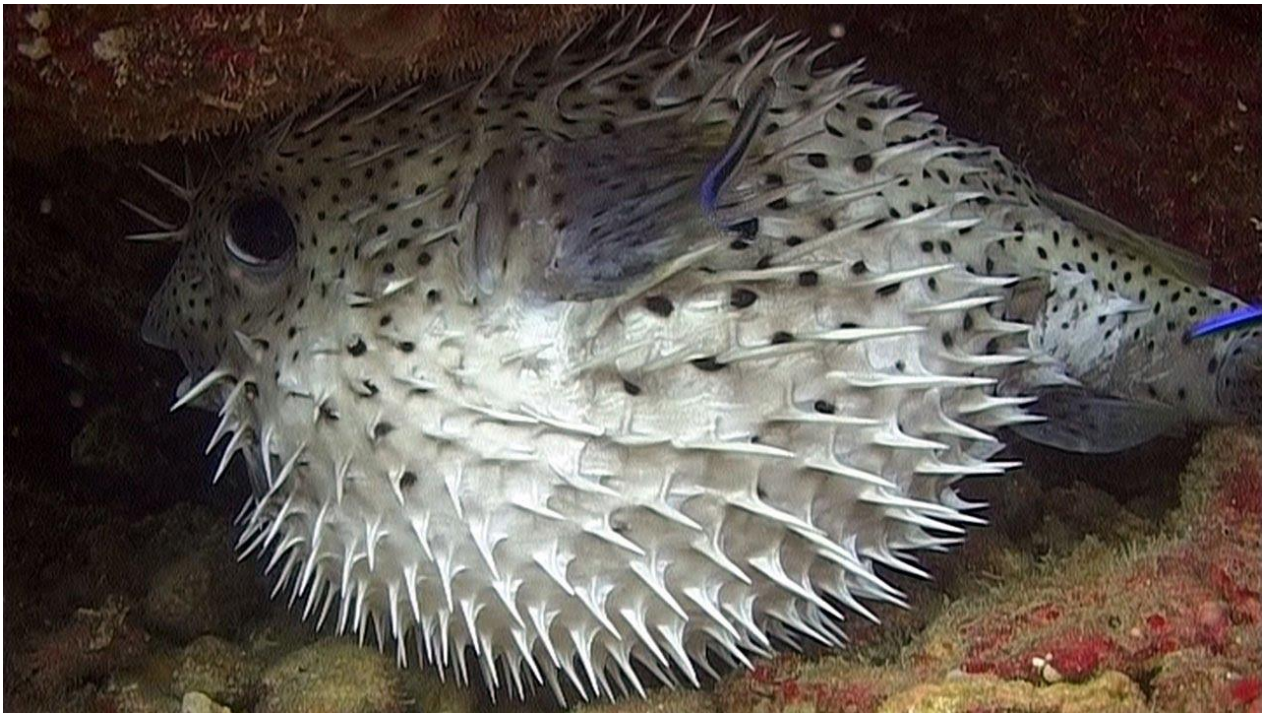

Fig. 4. Porcupinefish defensive threat display.

[https://www.youtube.com/watch?v=xDa2HctD8cs, downloaded 12 February 2016]

Fig. 5. Porcupinefish accompanying divers.

[http://www.coralreefphotos.com/night-diving-night-diving-with-ikelitegopro-video-camera/, downloaded 14 February 2016]