Meandrina meandrites (Maze Coral)

Order: Scleractinia (Stony Corals)
Class: Anthozoa (Corals and Sea Anemones)
Phylum: Cnidaria (Corals, Sea Anemones and Jellyfish)

Fig. 1. Maze coral, *Meandrina meandrites.*

[http://www.inaturalist.org/observations/1420254, downloaded 27 February 2016]

TRAITS. *Meandrina meandrites* are colonial corals and the living colonies range in colour from tan to yellow to brown (Fig. 1). Colonies are rounded or oval in shape and can have mounded or flattened morphology (Johnson and Sebens, 1993). They are distinguished by the skeleton having deep valleys, about 10mm deep, and strong ridges, about 10-15mm in size, that are made of long thin plate-like septa (Fig. 2) (Adams, 2008). *Meandrina meandrites* was the first species described within the genus and was originally named *Madrepora meandrites* by Linnaeus, 1758 (Pinzon and Weil, 2011).

DISTRIBUTION. The maze coral is exclusive to the western Atlantic-Caribbean (Pinzon and Weil, 2011) and is found in a wide range of habitats across the Caribbean, Gulf of Mexico, Bermuda, the Bahamas and Florida (Fig. 3) (Aronson et al., 2008).

HABITAT AND ACTIVITY. The polyps of the maze coral are nocturnally active. They are found in colonies ranging from 30-90cm in diameter (Pinzon and Weil, 2011). These corals are found at depths ranging from 1-80m, although their preferred depth range is 8-30m (Richardson and Voss, 2005). They are quite common in marine environments and can tolerate high levels of turbidity and sedimentation influx (Aronson et al., 2008).

FOOD AND FEEDING. During the daytime maze corals use photosynthetic zooxanthellae (symbiotic single-celled algae) in their tissues for much of their nutrition (Johnson, 1993). However, these corals can feed at night through capturing prey by polyp tentacles. The polyps are quite large and are only protruded at night to allow maximum capture of prey (Fig. 4). The polyps have short stocky tentacles that line up along the valleys and between the septa and trap the incoming prey (Pinzon and Weil, 2011). They are passive suspension feeders and rely on water currents to bring potential prey in close enough proximity to them for prey capture. They capture and feed on zooplankton (prey) which provides much of their heterotrophic nutrition crucial for the replenishing of nitrogen, phosphorus and other nutrients that symbiotic zooxanthellae cannot supply to the coral (Heidelberg et al., 1997; Johnson and Sebens, 1993).

POPULATION ECOLOGY. *Meandrina meandrites* have a wide ecological distribution in that within the Caribbean-western Atlantic region, it can be found in abundance at most reefs, and at any depth interval from 0.5 to 80m. They are however most abundant within mid and outer-shelf reefs at intermediate depths where their colonies can grow to optimum height and diameter (Pinzon and Weil, 2011). They have the unique potential to undergo recovery thus can occupy and survive in high turbidity and high sedimentation (Aronson et al., 2008).

REPRODUCTION. *Meandrina meandrites* occurs as both hermaphrodite colonies (with both male and female gametes) and gonotropic colonies (with female gametes only) (Pinzon and Weil, 2011). Having colonies with only female reproductive organs as well as hermaphrodites allows for both self- and cross-fertilization as a means of reproduction in this species. External fertilization (broadcasting) is typical of *Meandrina meandrites*; mature gametes (sperm and egg) are released into the water and fertilization occurs resulting in larvae (Pinzon and Weil, 2011). The larvae then can then become attached to the parent polyp or can attach in close proximity, and begin to grow and develop once conditions are favourable. This is also a mechanism of sexual reproduction between hermaphrodites and gonotrophs. Asexual reproduction primarily involves fragmentation or budding where parts of the parent polyp become detached, and reattach elsewhere (Veron, 2000). *Meandrina meandrites* have annual cycles with active gamete production (gametogenesis) during the second half of the year, mostly from July to October (Pinzon and Weil, 2011).

BEHAVIOUR. At night, soft, short, sticky polyps containing nematocysts can be seen covering the surface of maze coral so as to capture prey such as zooplankton and small fish (due to larger sized polyps) (Adams, 2008). The nematocysts on the polyps are stinging cells that protect the coral from predators such as some types of fish (*Sparisoma viride* - parrotfish) and snails (Aronson et al., 2008).

APPLIED ECOLOGY. According to the IUCN**,** *Meandrina meandrites* is labelled as 'least concern'. The major threat to this coral species is disease such as the white plaque and black band. Other threats include bleaching (Fig. 5) and localised predation by the parrotfish (Aronson et al.,

2008). Harvesting of corals for jewellery and trips to coral reefs also have adverse effects on the corals **(**Green and Shirley, 1999). Although this coral species in particular does very well in high risk environments, drastic changes in global climate could have negative effects on its global population. Human impact by the development of industries, housing, tourism and infrastructure are also added stressors on the health and livelihood of corals worldwide (Aronson et al., 2008).

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Posted online: 2016

Fig. 2. *Meandrina meandrites* skeleton showing the plate-like septa.

[http://www.advancedaquarist.com/2008/5/aafeature1, downloaded 27 February 2015]

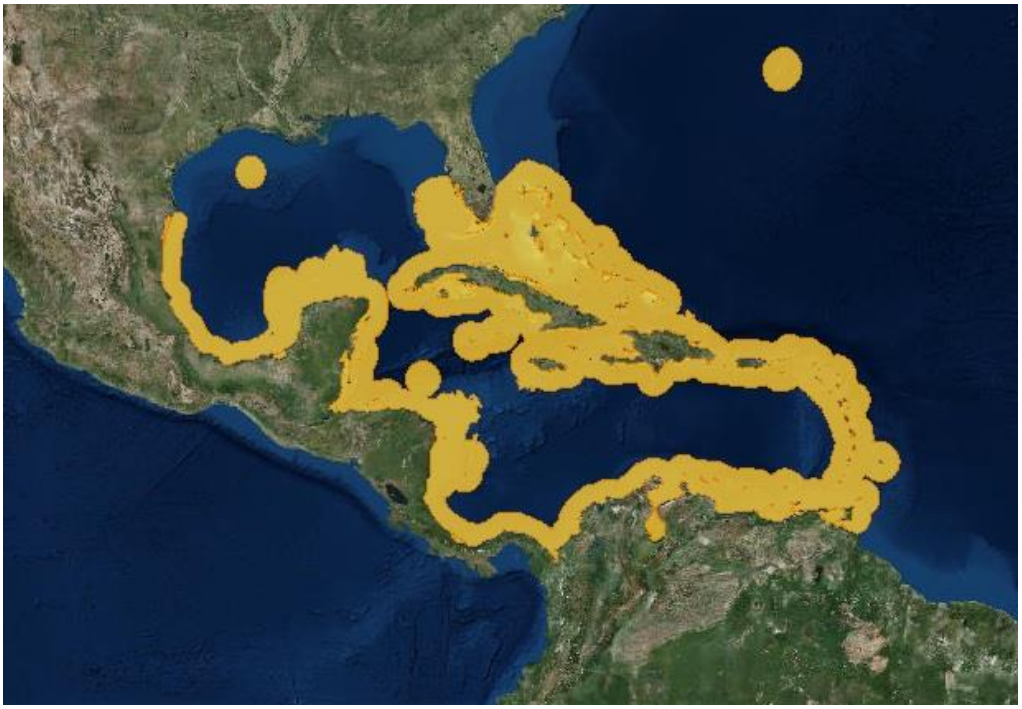

Fig. 3. Maze coral (*Meandrina meandrites*) geographic distribution.

[http://maps.iucnredlist.org/map.html?id=133224, downloaded 27 February 2016]

Fig. 4. Maze coral (*Meandrina meandrites*) large polyps extended at night.

[http://species-identification.org/image_window.php?url=BIS/caribbean_diving_guide/pictures/m_meanr2.jpg, downloaded 1 March 2016]

Fig. 5. Bleaching of a maze coral (*Meandrina meandrites*).

[http://www.ima.gov.tt/home/what-new/128-building-resilience-of-coral-reefs-to-climate-change-impacts.html, downloaded 6 March 2016]