Acropora cervicornis (Staghorn Coral)

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

Fig. 1. Staghorn coral, *Acropora cervicornis.*

[http://marinebio.org/species.asp?id=610, downloaded 26 October 2016]

TRAITS. *Acropora cervicornis* is the fastest growing branching coral on reefs, with cylindrical branches in groups of three resembling stag (male deer) antlers (Fig. 1). Branches are up to 2m in length and 4-7cm in diameter. These branches can increase length by 10-20cm each year, with sub branches developing at right angles (ADW, 2016). Colonies of the staghorn coral are yellow, gold or brownish in colour with the tip of each branch having an enlarged apical (tip) polyp which is white or pale cream, and usually the actively growing part of the colony (Aronson, 2007).

DISTRIBUTION. *Acropora cervicornis* can be found on reefs in the Caribbean, southern Gulf of Mexico, and the Bahamas (Fig. 2). The species has also been recognised as far north as Florida (Sisson, 1973). Staghorn coral is native to the Caribbean (IUCN, 2016). In Trinidad and Tobago,

Acropora cervicornis can be found in Bon Accord Lagoon and Buccoo Reef, which are both situated in the Leeward Coast of southwestern Tobago (Kenny, 1976).

HABITAT AND ECOLOGY. Staghorn corals thrive in coral reefs at depths ranging 0-30m. The lower depth limit of a staghorn coral is defined due to the amount of light present and the quantity of suspended sediments whereas the upper depth limit is determined from wave action. *Acropora cervicornis* favour warm water and do not thrive in water below 20ºC (Wildscreen Arkive, 2016). Clear water, standard marine salinity and oxygenated water is also required for staghorn corals to thrive the best. *Acropora cervicornis* can take approximately 3-5 years to become sexually mature, and can then live another 4-7 years (Aronson, 2007). During daytime the coral polyps are inactive and are found retracted inside the hard coral skeleton. However at night, the small finger-like tentacles appear throughout the reef to feed (McGregor, 1974) (Fig. 3). Polyps have nematocysts which are located on the tentacles that act as stinging cells to paralyse and capture prey. Once paralysed, prey is moved to the mouth to be digested by the gastrovascular cavity (gut). Organisms that are captured by the staghorn coral polyps include larval fish and other zooplankton. *Acropora cervicornis* also obtains nutrition via its symbiotic relationships with microscopic algae called zooxanthellae that are found in the tissue of the coral polyps (Smithsonian Marine Station, 2013). The zooxanthellae supplies the coral polyps with products of photosynthesis and oxygen. In return, a habitat is provided for the zooxanthellae and nutrients from waste products of the corals (McGregor, 1974).

REPRODUCTION. Reproduction in *Acropora cervicornis* can occur both sexually and asexually. Asexual reproduction is the main form of reproduction, which includes the development of new colonies when branches break off and become attached to a substrate (NOAA Fisheries, 2014). The polyps in the broken branches then divide and produce a new colony. Sexual reproduction in staghorn corals takes place when millions of gametes are released from separate colonies, which are each hermaphrodites (with both female and male gonads). This broadcast spawning takes place every year in August or September. After fertilisation, the growth of larvae occurs in the plankton for numerous days. The planula larvae of the staghorn coral are incapable of settling for days, but after settlement it will develop into a polyp. This polyp will grow and divide to produce a new colony (Fig. 4). The growth of this new colony, although produced by sexual reproduction, takes place as a result of asexual budding (ADW, 2016).

APPLIED BIOLOGY. *Acropora cervicornis* was listed as Critically Endangered by the IUCN Red List (Beckman, 2013). This was due to the fact that the staghorn coral population has been reduced 80% over the past years. The main threat to the staghorn coral is the increase in temperatures at sea as result of global climate change. This causes coral bleaching in which results in zooxanthellae algae being lost (IUCN, 2016). As a consequence of the algae being lost the corals become unhealthy and susceptible to diseases such as the white band disease which allows the tissues to be peeled off, leaving the skeleton (Fig. 5). Ocean acidification due to high amounts of carbon dioxide have also led to the decrease in the population of the staghorn coral. Other threats include: human impacts, predation, algae outgrowth, salinity variation and natural disasters.

Acropora cervicornis can be harvested for aquariums, building materials, jewellery and curios. The trade of these dead corals is more prevalent than the trade of living corals. *Acropora cervicornis* is registered in Appendix II of CITES, and consequently the trade of this coral is

controlled, and a license is required in order to transport objects derived from corals or the coral themselves, into nations which have signed the CITES Convention (Wildscreen Arkive, 2016).

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Fig. 2. Staghorn coral geographic distribution.

[http://www.denix.osd.mil/denix/crid/Coral_Reef_Iniative_Database/Coral-A._cervicornis.html, downloaded 27 October 2016]

Fig. 3. Tentacles of emerged *Acropora cervicornis* polyps.

[http://marinebio.org/species.asp?id=610, downloaded 27 October 2016]

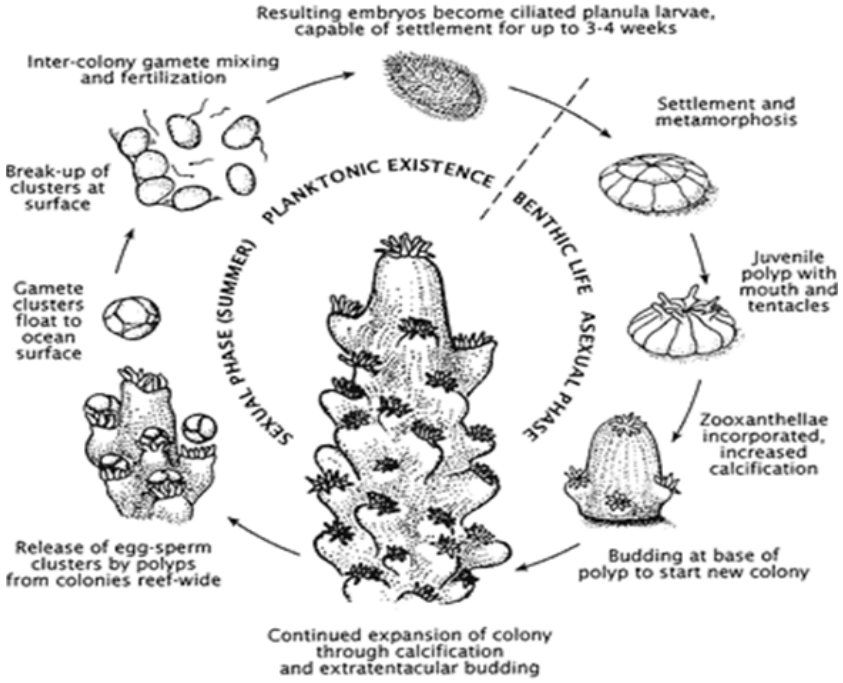

Fig. 4. Life cycle of staghorn coral.

[http://www.endangeredspeciesinternational.org/coralreefs2.html, downloaded 27 October 2016]

Fig. 5. White band disease in *Acropora cervicornis*.

[http://www.artificialreefs.org/Corals/diseasesfiles/Common%20Identified%20Coral%20Diseases.htm, downloaded 27 October 2016]