Chthamalus proteus (Caribbean Barnacle)

Order: Sessilia (Acorn Barnacles)
Class: Maxillopoda (Crustaceans: Barnacles)
Phylum: Arthropoda (Arthropods)

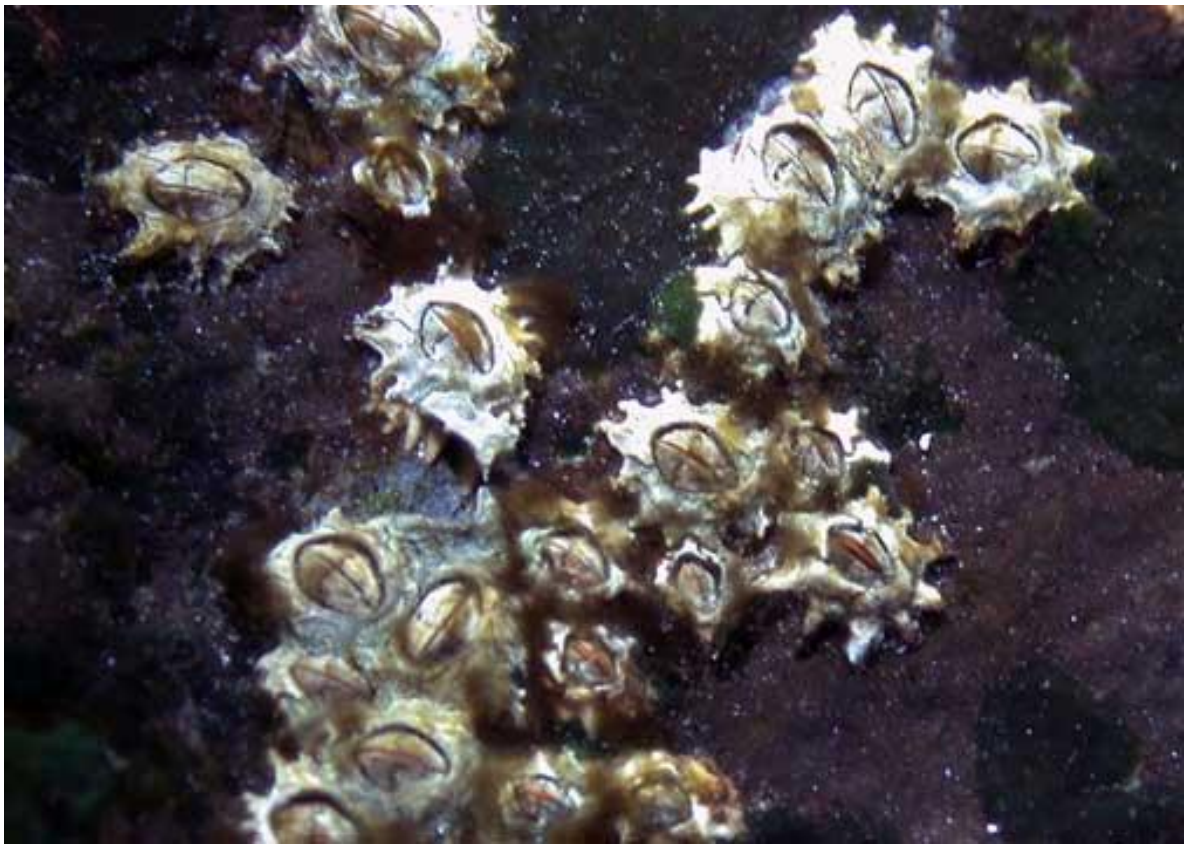

Fig. 1. Caribbean barnacle, *Chthamalus proteus*.

[http://www.botany.hawaii.edu/basch/uhnpscesu/htms/NPSAinv downloaded 10 March 2015]

TRAITS. The Caribbean barnacle, also referred to as the Atlantic barnacle, is approximately 5-10mm in diameter and has a shell that is conical to low conical shaped (Dando and Southward, 1980). Its shell is most commonly greyish white when weathered or in sometimes appears light brown colour (ISC, 2011). The shell is kite-shaped and usually made up of six segments. Its shell is smooth when it is young but becomes ribbed due to erosion when mature (Dando and Southward, 1980).

DISTRIBUTION. It is native to Trinidad and Tobago and is also found on coastal regions throughout most of the Caribbean islands, Gulf of Mexico and widespread throughout the southwestern Atlantic (Zardus and Hadfield, 2005) (Fig. 2). It was also

recently introduced accidentally to the Pacific region, and is now an invasive species in Hawaii and Guam.

HABITAT AND ACTIVITY. The Caribbean barnacle occupies the shallow intertidal zones of marine habitats along the coastlines, harbours and mangroves of the Caribbean, Gulf of Mexico and Southwestern Atlantic Ocean (Dando and Southward, 1980). It lives on hard substrates, such as sea rocks, metals such as the outer hull of boats, concrete structures, plastic, other hard shelled animals and mangrove trees and roots and occupies habitats in salty or brackish water (Dando and Southward, 1980). It is sessile when mature and once it has attached it cannot move from its substrate (Fig. 3). It is most active at an optimum temperature ranging between 24-28 °C (Zabin, 2005).

FOOD AND FEEDING. It has a diet which consists mainly of plankton and small pieces of detritus. It is a filter feeder which uses feeding appendages which are called cirri which move about in the wave currents and trap microorganisms and move them into its mouth (GISD, 2007). Adults are sessile and cannot move because they are bound to a substrate. However, in the larvae stage of its lifecycle, it is planktonic and able to move in the ocean currents, seeking a suitable habitat to settle (Southward et al., 1998).

POPULATION ECOLOGY. Found in clusters on hard surfaces and utilize all areas of substrate that is available to it. It flourishes in saline waters and is where abundance is usually the highest (GISD, 2007). These individuals exist in very high numbers and close proximity to each other when bound to a substrate in their adult stage. However, interspecific competition between other species especially limpets and mussels is seen and the Caribbean barnacle displaces them by occupying all of the substrate available and reduce the availability to aquatic snails and molluscs (GISD, 2007).

Caribbean barnacles are native to the Caribbean region with a large number being found around the coasts of Trinidad and also the northern coasts of Colombia (Dando and Southward, 1980). It is also found throughout the Caribbean islands but they are not as dominant, only being seen in harbours, brine lagoons and estuaries. However, its abundance is seen in the waters of southwestern Florida and extends, in smaller numbers to the coasts of North Florida, Texas, Gulf of Mexico and on the Caribbean side of Panama. The Caribbean barnacle is not seen on the coasts of the Bahamas, the Florida key and on the Atlantic side of Florida coast and is displaced by another species of barnacle (Dando and Southward, 1980). In Hawaiian coastal waters and the Pacific region, the Caribbean barnacle is an invasive species which spread quickly throughout and displaces native species (Zabin 2005). In Hawaii mainland of Kaneohe Bay, *C. proteus* is the most abundant species of barnacle and invaded the bay in flooding events, depositing larvae into it (Southward et al., 1998).

REPRODUCTION. Caribbean barnacles are hermaphroditic but are able to cross fertilize when in very high densities in which the penis of one is able to extend into the operculum of another barnacle (GISD, 2007). When fertilized, eggs are hatched and the planktonic larvae are broadcasted directly into the water column. It undergoes a series of six other stages in its life cycle until it finds a suitable substrate (ISC 2011). The larvae

are able to detect when it has found a suitable substrate and secrete a very sticky binding agent which secures it. Here it stays and grows (Fig. 4).

APPLIED ECOLOGY. Much information is still needed on the ecology of this species as it is not documented by the IUCN. It is abundant on the shores of Hawaii main islands where its numbers have grown very high. It is an invasive species, outcompeting other intertidal species such as mussels and crustaceans for habitat and food. It can be found on the hulls of ships and small passenger ferries where there create problems by reducing the efficiency of the watercraft through water (Dando and Southward 1980).

REFERENCES

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Posted online: 2015

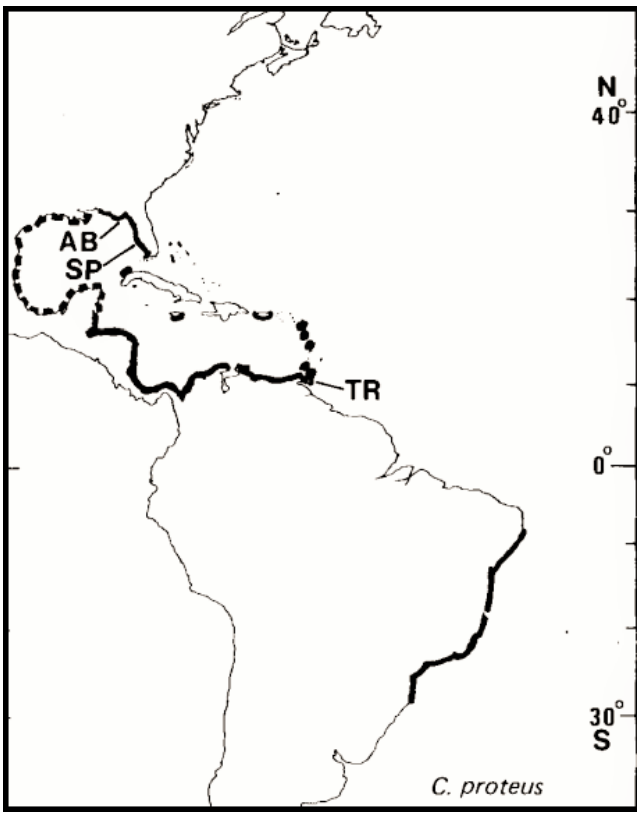

Fig. 2. Caribbean barnacle distribution throughout the Caribbean and South America.

[http://journals.cambridge.org/download.php?file=%2FMBI%2, downloaded 24 March 2015]

Fig. 3. Adult Caribbean barnacles with eroded shells.

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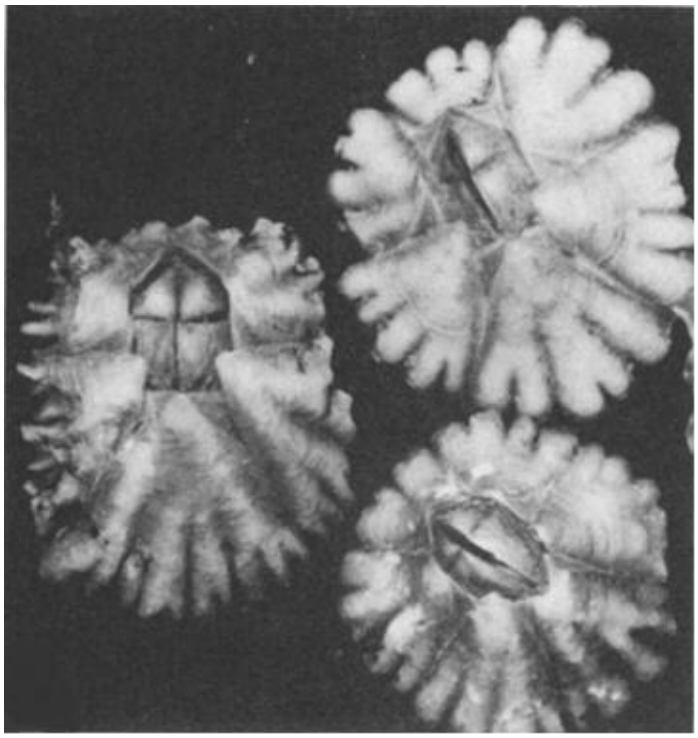

Fig. 4. Juvenile Caribbean barnacles showing operculum and smooth shell curvature.
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