

Caribbean barnacle

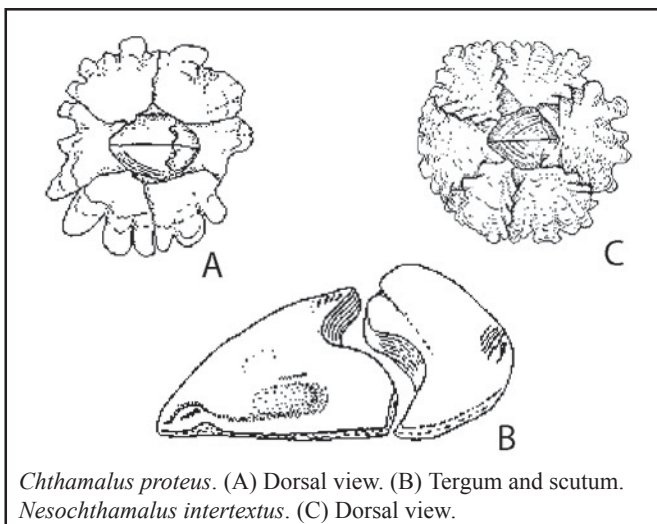
Phylum	Arthropoda
Subphylum	Crustacea
Class	Maxillopoda
Subclass	Cirripedia
Order	Thoracica
Family	Chthamalidae



Photo by J. Hoover

DESCRIPTION

Chthamalus proteus is a small light brown or gray-white barnacle (to about 1 cm diameter). Its conical shell is variable in external appearance depending on age, crowding, and degree of weathering. Shell plates may be smooth or ribbed. The photo above is of relatively uncrowded older individuals. Older weathered individuals of *C. proteus* superficially resemble *Nesochthamalus intertextus*, a native intertidal species (pictured below). The interleaving teeth between the shell plates differentiates *N. intertextus* (see illustration below), and it tends to be dull purple.



Chthamalus proteus. (A) Dorsal view. (B) Tergum and scutum. *Nesochthamalus intertextus*. (C) Dorsal view.

HABITAT

In the Hawaiian Islands, *C. proteus* inhabits the high or supra-tidal zones of protected harbors and embayments, growing on pilings and other surfaces. The native barnacle, *N. intertextus* inhabits a similar zone, but only along exposed coasts. *C. proteus* is commonly seen growing above the water line on ships' hulls in Hawaii.



A similar, but native, species of high-intertidal barnacle in Hawaii, *Nesochthamalus intertextus* (photo J. Hoover).

DISTRIBUTION

HAWAIIAN ISLANDS

Oahu – all South Shore harbors, and Kaneohe Bay

Kauai – Nawiliwili Harbor

Maui – Kahului Harbor

Hawaii – Hilo Harbor

Midway Atoll – main harbor

NATIVE RANGE

Gulf of Mexico to Trinidad and north east Brazil

PRESENT DISTRIBUTION

Western Atlantic, Hawaiian Islands and Midway Atoll, and Guam.

MECHANISM OF INTRODUCTION

Unintentional, as fouling on ships' hulls.

IMPACT

Serious nuisance fouling organism. Ecological impact unstudied, but probably some competition for space with native and nonindigenous invertebrates in the high intertidal.



Dense population of *Chthamalus proteus* in the high-intertidal on a pier piling in Hilo Harbor in 1997 (photo by R. DeFelice).

ECOLOGY

Feeding and Reproduction

(see comments for previous barnacle species)

REMARKS

This Caribbean barnacle probably appeared on Oahu sometime between 1973 and 1994. It was first observed on March, 1995 in Kaneohe Bay, but the point of inoculation was most likely Pearl or Honolulu Harbor. When surveys were undertaken in 1996, it was found to be widespread around Oahu, including Pearl Harbor (Southward et al., 1998), and by 1996-1998 it had been found on Kauai, Maui, Hawaii, Midway Island, and Guam. Southward et al. (1998) noted that the date of introduction was after 1973 (the last thorough barnacle surveys of Oahu) and it could have been as recently as 1994 or 1995. However, considering the present distribution of *C. proteus* in the islands and the usual lag time between an introduction and notable abundance, it was possibly earlier. Its abundance and widespread distribution by 1995-1996 certainly suggests an inoculation in the 1980s.

Introduction could have been either on ships' hulls or as larvae in ballast water. Southward et al. suggest that ballast water is less likely than transport of adults since a dense settlement is needed to establish a breeding population of such obligate cross-fertilizing sessile animals. The barnacle is now common on many ship and barge hulls in Hawaii, and on some which travel throughout the Pacific. It seems only a matter of time until this barnacle further invades the Pacific region.

The ecological impacts of this barnacle are not yet known. Southward et al. (1998) suggests this barnacle has established itself by exploiting a largely "vacant niche" (i.e. supratidal zone) and that this introduction may be relatively benign. *C. proteus* does, however, settle on a large number of living substrates in the higher intertidal zone (such as introduced oysters and mangroves on the south shore of Kaneohe Bay). The appearance of *C. proteus* in the Hawaiian Islands adds another Caribbean element to the nonindigenous marine fauna of the Hawaiian Islands.

REFERENCES

- Southward, A.J., R.S. Burton, S.L. Coles, P.R. Dando, R.C. DeFelice, J. Hoover, P.E. Parnell, T. Yamaguchi, and W.A. Newman. 1998. Invasion of Hawaiian shores by an Atlantic barnacle. *Mar. Ecol. Prog. Ser.* 165: 119-126.