

Short Communication

**AN EXOTIC TROPICAL BARNACLE,
MEGABALANUS COCCOPOMA (DARWIN, 1854),
IN LOUISIANA: ITS PROBABLE ARRIVAL AND
ENVIRONMENTAL IMPLICATIONS**

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ABSTRACT—*Megabalanus coccopoma* (Darwin, 1854), a tropical barnacle native to the Pacific Coast from Mazatlan, Mexico to Peru, was found attached to pier pilings at Grand Isle State Park, Louisiana. Previous confirmed records outside the Pacific Coast tropics are limited to northward extension to California during El Nino episodes, and an introduced self-sustaining population in Brazil originally transported on ship hulls. All shells in the Louisiana colony above the low tide mark were dead. No juveniles were found. The Louisiana population was identified as a variant found on the west coast of Panama, and the introduced Brazilian population. The Louisiana shoreline population apparently is not self-sustaining, and was probably originally introduced by a passing ship. Little environmental impact is seen from this instance, but a need for concern regarding introduction of exotic marine species is indicated.

Key words: *Megabalanus coccopoma*, *cirripedia*, *barnacle*, *Louisiana*, *Brazil*.

INTRODUCTION

Megabalanus coccopoma (Darwin, 1854) is a tropical shallow water barnacle of the East Pacific Coast, Panamic Faunal Province, normally ranging from Mazatlán, Mexico (approximately 21–23°N latitude), south to Guayaquil Gulf, Ecuador-Peru (approximately 7°N latitude) (Newman and McConnaughey 1987, Laguna 1990). It has been reported several times from other regions, but only two occurrences have been confirmed in recent publications. A report by Newman and McConnaughey (1987) describes a repeated natural range extension northward as far as San Diego, California (approximately 33°N latitude) during El Niño episodes. At the end of the episodes, the species is restricted to its normal range. Young (1994, 1999), reported a permanent introduced population on the coast near Rio de Janeiro, Brazil. The most likely means of introduction was stated to be on the hulls of ships coming from the Pacific Coast. This article will report a new occurrence, confirmed by shell and opercular data, of an apparently non-sustaining population on the coast of Louisiana.

OBSERVATIONS

In July 2001, the author made a collection of intertidal/subtidal barnacles at Grand Isle State Park, Louisiana. Large numbers of relatively gigantic pink barnacle shells were found attached to wood pilings at the Park's fishing pier, in the middle intertidal/subtidal zone. Most had reached a

rostral/carinal diameter of about one inch, and all individuals above low tide mark were dead. A few living individuals were collected from the upper subtidal zone. The larger shells had been cleaned of opercular valves and inhabited by a species of small brown crab. Shells were extensively encrusted by members of the *Balanus amphitrite* complex in all stages of growth, including bases of dead individuals overgrown by newer generations. Observed shells were attached to the creosote wood pilings directly, sometimes overgrowing smaller scattered shells of the *Balanus amphitrite* group. No comparable small or juvenile populations of *Megabalanus coccopoma* were observed.

A nearby rock jetty was sampled, but did not yield identifiable *Megabalanus*. The west end of Grand Isle is also protected by a rock jetty, which yielded no large barnacles during a previous survey.

Positive identification was originally provided by a single scutum found in a half-grown individual partially overgrown by other adult *Megabalanus coccopoma* shells. It agrees in all details with illustrations in Pilsbry (1916) and Young (1994). The scutum and shell are reposed at Scripps Institution of Oceanography, catalog number SIO-BIC C-10480, as a reference specimen.

A live specimen recovered from the subtidal zone yielded a full set of operculars. It was of the original colony, and was in evident good health. The characters of the tergum are identical to a geographic variant known from Panama and the introduced Brazilian population. The variant differs in placement of the tergal spur at twice its own width from the scutal margin, and in a completely closed spur furrow.

ENVIRONMENTAL IMPLICATIONS

How did a tropical East Pacific barnacle arrive on the coast of Louisiana, and live long enough to reach adult size? Louisiana is a warm temperate/subtropical environment, subject to occasional cold spells. The dominant shore barnacles are members of the genus *Chthamalus* and *Balanus amphitrite* complex. As *Megabalanus coccopoma* is a fouling species attaching to the hulls of ships, its arrival to the area on a ship entering nearby Barataria Bay seems the most likely means of transport. There is as yet no evidence of successful breeding by the new population. All observed individuals are of a fairly uniform size, with some few, smaller individuals overgrown by their contemporaries.

Recently, *Megabalanus coccopoma* was discovered at Port Aransas, Texas (W.A. Newman, personal communication). Port Aransas is also on a barrier island, adjacent to the pass leading to Corpus Christi. A very few dead specimens were found by the author on a rock jetty just west of Destin, Florida. The geographic situation of both is similar to Grand Isle.

The following conclusions may be drawn:

1. The population of *Megabalanus coccopoma* at Grand Isle is near the

marginal limits of the habitat requirement for the species in the Gulf of Mexico. Winterkill eliminated the population above low tide mark. The northern Gulf of Mexico is normally warmer than the Eastern Pacific at equivalent latitudes. Grand Isle lies at about 29°15'N latitude, and Destin, Florida at 30°23'N latitude.

2. No second-generation specimens were found. Although conditions were favorable for the growth of waifs, they were apparently unfavorable for reproduction of the colony.

3. Transport was most likely on ship hulls originally. A possibility exists for a permanent sustaining population on offshore drilling platforms, which could repeatedly colonize the shorelines. The proximity of the two known Gulf occurrences to well-traveled commercial lanes would indicate a possibility of repeated colonization from shipping. Testing this hypothesis was beyond the scope of the present study.

4. Establishment of exotic marine species should be seen as a real potential concern. *Elminius modestus*, a barnacle native to New Zealand and Australia, has become well established in European harbors since World War II. This species has not yet been observed in the Gulf. *Chthamalus proteus*, native to the Gulf Coast and Caribbean, including Louisiana, has recently been collected in Hawaii (Southward et al. 1998).

5. Barnacles have an excellent potential as early warning environmental indicators. Many species are sensitive to temperature conditions. These should be identified, and their present ranges recorded. After a baseline survey, regular monitoring can be performed with attention to changes in the faunal ranges. Early warnings of concern can be indicated for a comparatively low budget outlay.

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