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1968

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ABSTRACT: The northern limit of *Balanus tintinnabulum californicus* Pilsbry, 1916, previously recognized as San Francisco, California, is extended northward about 429 kilometers to Humboldt Bay, California.

Balanus tintinnabulum californicus Pilsbry, 1916, previously known to range from the Gulf of California north to San Francisco, California (Henry, 1960), is represented in the collection of the California Academy of Sciences (CAS) by specimens from four localities between San Francisco and Eureka, California (table 1; figs. 1, 2). The specimens from Mendocino and Humboldt counties were taken from navigational buoys serviced by the USS *Lupine* in 1939, and were presented to the late Frank L. Rogers for identification. Additional material was collected both by F. L. Rogers and me from shore localities along the Marin and Sonoma County coasts. These new records extend the range of this subspecies about 429 kilometers to the north.

Balanus nubilus Darwin, 1854 was the most abundant barnacle on the buoys, except in Humboldt Bay (CAS loc. 29692) where *B. crenatus* Bruguière, 1789 was also found in large numbers. The few individuals of *B. tintinnabulum californicus* obtained might indicate that their presence was fortuitous, and related to abnormal, short-term conditions that allowed settlement and growth during the 1939 season. However, two lines of evidence suggest that the northern California coast is part of the established range of this subspecies.

Haderlie (1968, pp. 335, 337; table 3) in a study of settlement and growth of fouling organisms on test panels in Monterey Harbor, found that *B.*



FIGURE 1. *Balanus tintinnabulum californicus* Pilsbry (center) with *B. nubilus* Darwin. Rodgers Break buoy, Humboldt County (CAS loc. 33294), carinorostral diameter of orifice 13.5 mm.

FIGURE 2. *Balanus tintinnabulum californicus* Pilsbry with *B. crenatus* attached. Humboldt Bay buoy, Humboldt County (CAS loc. 29692), carinorostral diameter of orifice 16.4 mm.

tintinnabulum californicus did not settle on panels exposed for three months or less, but was present on panels exposed between six and twelve months. He concluded that this barnacle might require the presence of an established biota before settlement could take place. According to F. L. Rogers' notes, the buoys tended by the USS *Lupine* were hauled and cleaned about four times a year. Extrapolation of the settling data from Monterey Harbor could thus explain the low frequency of *B. tintinnabulum californicus* on these buoys.

A single specimen of *B. tintinnabulum californicus* has also been found in

TABLE 1. Northern California localities of *Balanus tintinnabulum californicus* Pilsbry.

CAS locality no.	Locality	Collector	Specimens
40767	Bolinas, Marin County	F. L. Rogers	1, beachworn
40766	Carmet Beach, Sonoma County	V. Zullo, Feb. 3, 1962	1, low intertidal
29689	Albion whistle buoy, off entrance to Albion River, Mendocino County	D. H. Heagerty, USS <i>Lupine</i> , 1939	(see note below)
33294	Buoy off Rodgers Break, near Punta Gorda, Humboldt County	D. H. Heagerty, USS <i>Lupine</i> , 1939	1
29692	Buoys in Humboldt Bay, Humboldt County	D. H. Heagerty, USS <i>Lupine</i> , 1939	2 (1 dead)

NOTE: The specimens recorded by F. L. Rogers from this locality could not be found.

a late Pliocene deposit at Moonstone Beach in the Eureka area (University of California Museum of Paleontology, Berkeley, loc. B-7346). The large and diverse invertebrate fauna of this locality is composed predominantly of extant species that indicate hydroclimatic conditions not unlike those presently found off the coast at Eureka. Initially, this fossil occurrence in association with a cool temperate fauna so far to the north of the presumed northern limits of the subspecies was difficult to interpret. However, the Recent records now available serve to resolve this problem, and, conversely, the late Pliocene record suggests that the northern range of *B. tintinnabulum californicus* has long been established.

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