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Two Northeast Pacific deep-water barnacle populations (Cirripedia: Calanticidae and Pachylasmatidae) from seamounts of the Juan de Fuca Ridge; "insular" endemics stemming from Tethys, or by subsequent dispersal from the Western Pacific center of distribution?

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Abstract

The first adults of the calanticid, *Calantica moskalevi* Zevina and Galkin, 1989, and specimens of a new pachylasmatine balanomorph genus and species, have been recovered by MBARI's ROV *Tiburon*, from Juan de Fuca Ridge seamounts at ~46º N – 130º W in the NE Pacific off Oregon, ~1450 m and 2080 m depths, respectively. These two apparently allopathic populations evidently represent remnants of stocks most commonly confined to relatively deep waters around islands and occasionally continental margins of the Indo-West Pacific. These Juan de Fuca representatives can be inferred to be relicts of once broad Paleogene Tethyan populations rather than relatively recent immigrants by way of the NW Pacific. Apparently, the refugium afforded by seamount "islands" at bathyal and abyssal depths accounts for their survival in this relatively remote corner of Pacific Oceania.

Key words: *Calantica moskalevi*, Pachylasmatinae, *Atetrapachylasma dijonesae* **gen. et sp. nov.**, Axial and Vance B Seamounts, biogeography, Tethyan relicts, dispersal

Introduction

This paper reports on specimens of two barnacle populations recovered by the Monterey Bay Aquarium Research Institute's ROV *Tiburon*, one a calanticid previously known by two minute juveniles and now by numerous adult specimens from the same locality on Axial Seamount, the other by numerous specimens of a new pachylasmatine balanomorph genus and species from nearby Vance B Seamount (Fig. 1).

The localities, Axial Seamount (~45º 55'N–130º 00'W) and Vance B Seamount (~45° 30'N–130° 40'W), are on the Juan de Fuca Ridge and the principal physical characteristics of ambient waters at the time of collection are summarized (Table 1). Chadwick *et al.* (2010), in their introduction, note that Axial rises above the general ridge some 800 m, and is currently hydrothermally active near its summit, which is at approximately 1410 m below sea level. Nearby Vance Seamounts, being carried northwestward from the ridge crest with the Pacific Plate, consists of a chain of inactive summits (Clague *et al.* 2000) residing some 96 km SW of Axial. The fresh look of the pillow basalts from which the barnacles were taken is due to the relatively steep slopes of the outcrops being swept by gentle currents.

The two early juveniles of a calanticid described by Zevina and Galkin (1989) were from within 10 to 30 m of active vents on Axial Seamount (~45° 55'N, 130°00'W, 1410 m) were cautiously assigned to *Calantica* and described as a new species, *Calantica* (?) *moskalevi*. These authors noted that other extant species of the genus were known only from the Indo-West Pacific (I-WP). Knowledge of what are surely adult specimens of the same species collected by ROV *Tiburon* at the type locality (Fig. 2) enlarges upon as well as validates their findings.

ROV *Tiburon* also recovered samples of a new pachylasmatine balanomorph from nearby Vance B Seamount (45º 30'N – 130º 40'W, 2080 m; Fig. 4). The subfamily is represented by five extant I-WP genera, one of which has a representative, *Pachylasma giganteum* (Philippi, 1836), in the NE Atlanto-Mediterranean. While the new form

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