**PALAIOS, 2010, v. 25, p. 39–44**
**Research Article**
**DOI: 10.2110/palo.2009.p09-035r**

# On the completeness and fidelity of the quaternary bivalve record from the temperate Pacific coast of South America

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Keywords: Pleistocene, Holocene, mollusk, southeastern Pacific, taphonomy

## ABSTRACT

Despite the considerable knowledge gained of the patterns and processes shaping the completeness and fidelity of fossil bivalve faunas, it is still hard to generalize these patterns to the species level and to different regions around the globe. Here I analyze the completeness and fidelity of Quaternary bivalve faunas of the temperate Pacific coast of South America, summarizing >120 years of paleontological studies in the region. The degree of completeness, measured as percentage of extant forms, is only moderate. Only 45% of the 93 extant species are preserved in the Quaternary fossil record. When completeness was measured as the discoverable fraction of species (according to a non-parametric richness estimation), however, values were >88%. Missing species were not biased by shell mineralogy nor concentrated in particular taxonomic groups. Completeness was highly selective for other species traits; small size, geographic restriction, and forms inhabiting deeper areas of the shelf had lower chances of being present in the fossil record, in agreement with previous studies. A generalized linear model revealed that the effect of these variables was multiplicative—i.e., the effects of geographic range and bathymetric distribution were significant only for small-sized forms. Therefore, the moderate degree of completeness may be the consequence of a limited fossilization potential (e.g., via low preservation potential, lack of deep-shelf outcrops, or preburial down-slope transport), rather than poor sampling quality. Results suggest that the sampling effort made in the region has reached a plateau and that further progress in the completeness of species' inventories may occur only at a very slow rate.