

Latitudinal gradients in species richness for South American Mytilidae and Ostreidae: can alternative hypotheses be evaluated by a correlative approach?

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Abstract

We tested to what extent mean sea surface temperature, geometric constraints in range size frequency distributions (the mid-domain effect) and geographical coastline distance to the equator are related to species richness of coastal Mytilidae and Ostreidae in the Pacific and Atlantic coasts of South America (excluding islands). The location and magnitude of the peaks in species richness, as well as the shape of the pattern, varied between oceans. Results were not biased by spatial autocorrelation, although strong multicollinearity among predictor variables was detected. However, these regional-extent regression models suggest differences in the causal factors that explain richness gradients of studied bivalves in South American coasts, most likely related to historical events such as the Southeastern Pacific Pleistocene mass extinction of bivalves. Our results reinforced the conclusion that there is no single best explanatory cause for the latitudinal gradient in species richness and showed that the correlative approach is not useful when predictor variables are strongly correlated.

Keywords

Species Richness, Bivalve, Variance Inflation Factor, Pacific Coast, Latitudinal Gradient