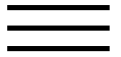


Biogeography of Indo-Pacific larger foraminifera and scleractinian corals: a probabilistic approach to estimating taxonomic diversity, faunal similarity, and sampling.

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Research paper

Biogeography of Indo-Pacific larger foraminifera and scleractinian corals: A probabilistic approach to estimating taxonomic diversity, faunal similarity, and sampling bias

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Abstract

The eastward decline in the diversity of Indo-Pacific scleractinian corals and larger foraminifera is due primarily to the shallowing of the thermocline and significant cooling of the Equatorial Undercurrent in the eastern Pacific. The coral larvae carried eastward across the Pacific encounter temperatures below 18°C; which is lower than the optimum for the long-term survival of reef-building corals. This thermal barrier to dispersal of the Indo-Pacific fauna is particularly effective in an area within 2000 km west

of the Galapagos Islands. Nevertheless, trend-surface analysis of faunal similarity based on the probabilistic index of Raup and Crick (1979) suggests that the modern scleractinian fauna of the eastern Pacific region exhibits a high degree of similarity to that of the Indo-Pacific region.

The newly assembled data on the generic occurrence of larger foraminifera and the results of the probabilistic analysis based on the method of Henderson and Heron (1977) indicate that the observed diversity of a fauna constituted, on average, 65% of the true diversity; the remaining 35% can be viewed as a measure of the sampling bias. Last, the maximum north-south range of a genus belonging to modern scleractinian corals or larger foraminifera is $70^{\circ} \pm 5^{\circ}$ and its east-west range never exceeds the distance that is four times the north-south range. The reason for a correspondence between the maximum latitudinal and longitudinal ranges of genera belonging to these two unrelated groups is believed to lie in the similarity of their dispersal capabilities, which were largely controlled by temperature.



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