

COMPLEX SPATIAL GENETIC CONNECTIVITY OF MUSSELS MYTILUS CHILENSIS ALONG THE SOUTHEASTERN PACIFIC COAST AND ITS IMPORTANCE FOR RESOURCE MANAGEMENT

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Abstract

To ensure the maintenance of natural mussel beds along the southeastern Pacific coast of Chile, it is important to understand their population dynamics. This means evaluating their genetic population structure and gene flow, and the degree of connectivity among natural beds. To do this, the spatial genetic population structure of seven natural *Mytilus chilensis* beds within the mussels' present distribution range along the Chilean coast was evaluated. Genetic differences were established between populations with cytochrome oxidase I (COI) gene sequences ($F_{st} = 0.099$) and microsatellites ($F_{st} = 0.048$), showing that locations that consistently presented greater differentiation were those at the extremes of the geographical distribution. An "isolation by distance" pattern was not observed in the COI and microsatellite data. We suggest that because of the high resolution of these markers, the differences between locations may be explained by high reproductive variance, which determines local changes in each reproductive cycle of the species. These changes would account for the differences between the natural beds. Furthermore, differentiated genetic types were observed in some locations, demonstrating the presence of local processes in some cases, perhaps caused by gene flow restrictions resulting from the local geomorphological and oceanographic conditions. The gene structure and connectivity of natural beds in sessile species with larval dispersion are strongly determined by local retention characteristics. For this reason, the data generated in this study can be used to improve population management. These data can also be used to support and motivate the creation of a marine protected area containing natural beds of this species with sufficient levels of genetic diversity.

Palabras clave

Palabras clave de autor: [Mytilus chilensis](#); [mussels](#); [COI](#); [southeastern Pacific](#); [microsatellites](#)

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