

Deep genetic divergence between austral populations of the red alga *Gigartina skottsbergii* reveals a cryptic species endemic to the Antarctic continent

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Abstract

The almost complete isolation of Antarctica after the intensification the Antarctic circumpolar current (ACC) during the middle-Miocene has been challenged by recent molecular data showing the existence of allelic exchange across the ACC. For organisms present on both sides of the ACC, two hypotheses have then been discussed to explain the origin of the Antarctic populations: (1) They correspond to recent immigrants from adjacent continents, or (2) they have evolved in situ and have survived the dramatic effects of the last Quaternary glaciations in this region. The red algae *Gigartina skottsbergii* presents a disjoint distribution and is reported in both Antarctica and southern South America, a distribution pattern that largely exceeds its dispersal capacity. Mitochondrial sequences of the intergenic region Cox2-3 ($n = 233$) and partial chloroplastic RuBisCo large subunit gene ($n = 26$) sequences were obtained for individuals from the Chilean sub-Antarctic ecoregion and Antarctic Peninsula localities. The results strongly support the persistence of populations on each side of the Drake Passage during glacial periods and the existence of dispersal barrier due to the ACC. On both sides of the ACC, the last Quaternary glaciations have induced strong bottlenecks that were followed by rapid colonization events.