Diatoms define a novel freshwater biogeography of the Antarctic

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Terrestrial biota in the Antarctic are more globally distinct and highly structured biogeographically than previously believed, but information on biogeographic patterns and endemism in freshwater communities is largely lacking. We studied biogeographic patterns of Antarctic freshwater diatoms based on the analysis of species occurrences in a dataset of 439 lakes spread across the Antarctic realm. Highly distinct diatom floras, both in terms of composition and richness, characterize Continental Antarctica, Maritime Antarctica and the sub-Antarctic islands, with marked biogeographic provincialism in each region. A total of 44% of all species is estimated to be endemic to the Antarctic, and most of them are confined to a single biogeographic region. The level of endemism significantly increases with increasing latitude and geographic isolation. Our results have implications for conservation planning, and suggest that successful dispersal of freshwater diatoms to and within the Antarctic is limited, fostering the evolution of highly endemic diatom floras.