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The diversity and biogeography of the Antarctic surface snow bacteriome

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90% of Antarctica is ice and snow-covered, and while environmental conditions are considered extreme by human standards, microorganisms thrive in these ecosystems. Yet, only few studies have investigated microbial diversity of Antarctic snow. The aims of this study were to identify the Antarctic snow surface bacteriome, to investigate cell activity and the presence of relic DNA, and to evaluate the impacts of human presence on microbial communities. By sampling a transect from Signy Island, Livingstone Island, down the Antarctic Peninsula to the Ellsworth Mountains, we identified the surface bacteriome of pristine Antarctic snow. We observed a latitudinal change in microbial communities, notably with a decrease in alpha diversity at southern latitudes. We identified indicator species within each location and interestingly, northern sites presented more endemic OTUs than southern samples, suggesting more variable and opportunistic communities in southern, more extreme systems. Then, we investigated the impact of human presence on the snow microbiome by sampling around the Lake Ellsworth drill site. Results suggest that while human presence had limited impacts on the snow bacteriome across Antarctica, intense human activities did impact with natural communities at specific locations.