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## MICROBIAL DIVERSITY AND PREDICTION OF ECOLOGICAL PROCESSES BENEATH THE WEST ANTARCTIC ICE SHEET

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### RESUMO

Non-aquatic subglacial ecosystems in Antarctica may be spatially more extensive and variable in physical-chemical characteristics when compared to the subglacial aquatic habitats, however their microbial diversity is still poorly explored. In this study, we aimed to understand the microbial community structure deposited on the West Antarctic ice sheet through 16S rRNA gene sequencing, followed by a prediction of the metabolic and ecological processes. We aseptically excavated a pit structure near Criosfera1 remote Brazilian laboratory/CrioLab1 (670km from south pole), in which we collected snow/firn samples among six different depths between the surface and 200cm. The abundant phyla were classified as Proteobacteria, Firmicutes, Parcubacteria, Cyanobacteria, Bacteroides, Actinobacteria, Thaumarchaeota, Marinimicrobia, Woesearchaeota, Euryarchaeota and Chloroflexi. We found a higher proportion of marine members within Thaumarchaeota and Thermoplasmatales at the superficial strata, whereas Cyanobacteria was detected mainly at the deeper layers. Atmospheric modeling of air incursions at the study site suggest a high marine influence from the Weddell and Indian sea, as well as from the sub-antarctic environment. We also detected sequences classified as hyperthermophiles within Aquificae and Euryarchaeota. Microorganisms associated with nitrogen metabolism were more abundant among deep layers (110-180 cm), while those in superficial layers were related to functions as chemoheterotrophy, degradation of aromatic compounds and animal parasites and symbionts. The prevalence of members that occupied such distant ecosystems as marine, hydrothermal and animal bodies suggests a heterogeneity of the ice-sheet microbiome probably due to the largely aeolian dispersion over the Antarctic continent and their long-time persistence in this extreme and isolated environment.

**PALAVRAS-CHAVE:** Microbial diversity, Ecological processes, Ice sheet, West Antarctica

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