

Discovering the unknown: new Antarctic bacterial genus explored

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The unexplored diversity of bacteria goes beyond our imagination. Especially in pristine areas, like Antarctica, much undiscovered bacterial life can be found. Even though it is a harsh environment, microbial life thrives in the different existing ecosystems, ranging from permanent ice-free regions to coastal habitats and even niches in lakes, including ice, the water column, sediment and microbial mats (Wilkins *et al.*, 2013). To survive in these extreme environmental conditions, Antarctic bacterial life shows adaptations in, for example, nutrient limitation stress response, thermal and osmotic pathways and primary metabolic functions (Chan *et al.*, 2013). Moreover, they have different strategies to access multiple sources of energy, one of which is phototrophy. Antarctic bacteria are known to be dominated by Acidobacteria, Actinobacteria, Bacteroidetes, Cyanobacteria, Firmicutes and Proteobacteria (Chown *et al.*, 2015; Aislabie *et al.*, 2006). This microbial diversity is now being studied better as recent molecular approaches, including metagenomics and next-generation sequencing, have risen, leading to an improved insight into their structure and functioning.

In this study, samples from a variety of terrestrial and aquatic East Antarctic environments, including soil and microbial mats, originating from lake water or gravel, were examined in the search for new bacterial diversity. Different classical biochemical tests were performed and genomes of the bacterial strains were sequenced by Illumina next-generation sequencing, whereafter these were analyzed using bioinformatics. Eventually, a new genus within the Sphingomonadaceae family (class: Alphaproteobacteria) could be identified by combining both approaches. Already four species could be assigned to this new bacterial genus, of which all present members are proven to be aerobic anoxygenic photoheterotrophs.

References

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