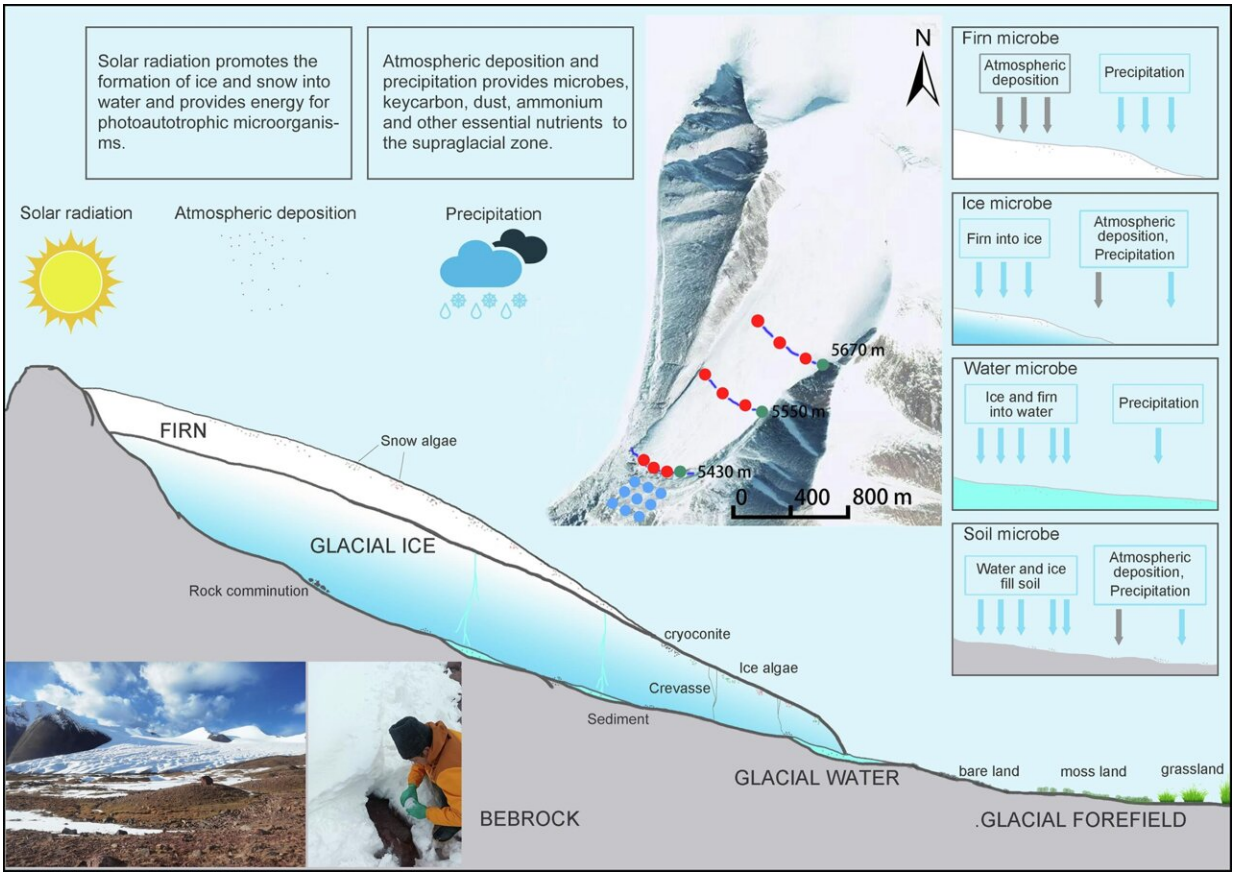
Freezing and melting reshape diversity and structure of glacier microbial communities

July 17 2024, by Zhang Nannan



Schematic diagram of sampling Dongkemadi Glacier. Credit: *Environment International* (2024). DOI: 10.1016/j.envint.2024.108788

With the increasing attention on global climate change and glacier

retreat, the study of glacier microbiota has gradually become an important field of research.

Prof. Zhang Wei's research team from the Northwest Institute of Eco-Environment and Resources of the Chinese Academy of Sciences has found that the processes of sequestration, release and colonization of glacier microbes alter the diversity and structure of glacier microbial communities as well as the complexity of microbial networks.

The researchers used a Z-P plot of species topological roles to screen the keystone taxa of glacier microbial communities. The results indicated that the keystone taxa in the glacial microbial ecosystem of the Dongkemadi Glacier mainly belong to the genus Polaromonas. The findings are published in *Environment International*.

They demonstrated that hierarchical interactions among different microorganisms increased the complexity of the bacterial–fungal–archaeal network, and this complexity increased sequentially with the processes of sequestration, release, and colonization of glacial microorganisms.

Furthermore, most keystone taxa in the glacial ecosystem are influenced by the combined properties of multiple environmental factors, suggesting that these keystone taxa are not severely lost due to sudden changes in individual environmental factors.

"As a sensitive area to climate change, the future temperature trend of the glacier area will significantly affect the structure of the glacier microbial community," said Prof. Zhang.

More information: Puchao Jia et al, Habitat changes due to glacial freezing and melting reshape microbial networks, *Environment International* (2024). DOI: 10.1016/j.envint.2024.108788

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