

专论与综述

冰川微生物菌群分布的研究概况及其前景

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摘要 冰川中以耐冷的生物为主, 形成一个以微生物为主要生命形式的相对简单的生态系统。冰川中的微生物包括病毒、细菌、放线菌、丝状真菌、酵母菌和藻类。其中一些病毒对人类健康具有潜在的危害性。着重论述了不同区域和不同海拔高度的冰川微生物类群和数量分布特征以及冰芯(深冰川)细菌菌群分布与气候环境的关系。综述结果表明: 一些微生物类群广泛存在于各地的冰川上, 具有全球分布特性; 另一些类群只出现在个别冰川上, 为一些地方性冰川微生物。随着海拔高度的增加, 冰川上呈现出冰、雪冰和雪环境明显不同的生态条件; 微生物类群分布也具有明显的差异性, 与冰川上的生态条件和盛行的风向有关。优势类群对冰、雪冰和雪环境具有一定的指示意义。冰川微生物数量分布不仅受到冰川上的水热、光照和营养状况的影响, 还与降雪和雪的沉积作用有关。冰芯中的细菌数量与矿物微粒含量具有密切的对应关系。最后指出了冰川微生物研究在基因多样性、气候环境变化、生物地球化学循环、微生物对环境变化的响应机制和星际生命探索中的重要性及其生态学和社会经济意义。

关键词 [冰川生态系统](#); [微生物菌群](#); [多样性](#)

分类号 [P343.6](#), [Q143](#), [Q938](#)

Progresses of community distribution of microorganisms in glacier

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Abstract Glacier is dominated by psychrotolerants, and a relatively simple ecosystem consistin g of mainly microorganisms and glacial environment. The microorganisms in glacier include viru s, bacteria, actinomyces, fungi, yeasts and algae. Some of the glacial viruses are potentially harmfu l to human health. This paper is a literature summary and study on progresses of community and q uantitative distribution of microorganisms with altitude and ice depth and in the different geographi c glaciers. Some of the glacial microorganisms exhibit ubiquitous dispersal, while the others just o ccurs in the specifical glaciers and exhibit endemic species. With the altitudinal increase, it appear s ice, ice-snow and snow ecosystem environments, and forms the different patterns of microbial c ommunities on glacier. This relates to the differences in ecosystem conditions and the prevalent wi nd direction. Thus, the predominant species can indicate the glacial environment. The quantitati ve distribution of microorganisms is influenced not only by the glacial environments such as light de nsity, hydrological and nutritional condition, but also by the snowfall and biological accumulatio n. The bacterial biomass closely corresponds to the concentration of mineral particle in ice. The lit erature survey suggested that there are profoundly prospects of glacial microoranisms in genetic di

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iversity, microbial implication of climate and environment, geobiochemical cycle, microbial responsive mechanism to glacial environmental changes and exobiology and ecological and social significance.

Key words [glacial](#) [ecosystem](#) [microbial](#) [community](#) [diversity](#)

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