

THE FEATURES OF FATTY ACIDS IN CYANOBACTERIAL MATS FROM
THE MCMURDO DRY VALLEYS REGION, ANTARCTICA
(ABSTRACT)

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Fatty acids in fifteen cyanobacterial mat samples collected from lakes, ponds and meltwater streams of the Victoria, Wright, Taylor and Miers Valleys of Southern Victoria Land, and Ross Island, in Antarctica were analyzed using a gas chromatography-mass spectrometry to clarify their features in relation to source organisms. Normal-alkanoic acids ($n\text{-C}_{10:0}\sim n\text{-C}_{24:0}$) with a predominance of even-carbon numbers were found in all cyanobacterial mat samples, together with n -alkenoic acids ($n\text{-C}_{16:1}\sim n\text{-C}_{18:1}$) and branched (*iso*- and *anteiso*- $\text{C}_{10:0}\sim\text{C}_{19:0}$) alkanolic acids, although concentrations of long-chain n -alkanoic acids were very small. Generally, the major fatty acids (>10%) were $n\text{-C}_{16:0}$, $n\text{-C}_{16:1}$, $n\text{-C}_{18:1}$, $n\text{-C}_{18:2}$ and/or $n\text{-C}_{18:3}$. The total concentrations of fatty acids ranging from 0.014 to 2.9 mg/g of dry sample were relatively low. This may be due to sandy materials contained in the cyanobacterial mat samples.

Fatty acids in the mats are originated mainly from cyanobacteria, such as *Phormidium* spp. and *Nostoc* spp., under some influence of bacteria. The ratios of n -alkenoic acids/ n -alkanoic acids, such as $n\text{-C}_{18:1}/n\text{-C}_{18:0}$, $n\text{-C}_{18:2}/n\text{-C}_{18:0}$, might reflect the degree of degradation of the cyanobacterial mat community. Cyanobacterial mats are probably major sources of fatty acids in inland aquatic and soil environments of the McMurdo Dry Valleys region, Antarctica.

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