

VERTICAL DISTRIBUTION OF ORGANIC CONSTITUENTS
IN LAKE FRYXELL OF THE DRY VALLEYS,
ANTARCTICA (ABSTRACT)

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Vertical distribution of organic constituents, *i.e.* total organic carbon (TOC), hydrocarbons, fatty acids and hydroxy acids in water and sediment samples from Lake Fryxell (77°35'S, 163°15'E) of southern Victoria Land, Antarctica was studied to elucidate their features in relation to stratification of the lake waters and likely distribution of microorganisms. The TOC content of the surface water (5.0 m; just below the ice cover of 4.50 m thickness) was 1.4 mgC/l. It increased markedly with depth and attained the maximum value of 21.7 mgC/l at a depth of 17.5 m, but decreased down to the bottom (13.3 mgC/l). The high TOC content of the anoxic bottom layers (≥ 15 m) is attributable to the concentration of refractory organic substances over a long period of time following the degradation of labile organic constituents. Hydrocarbons were not found in the water column, but the major constituent of the sediment was *n*-C_{29:2} alkene. Total concentrations of fatty acids in the oxic layers (≤ 10 m) were highest at 10.0 m and much higher than those in the anoxic layers (> 10 m), probably reflecting the phytoplankton population. The contents of branched (*iso* and *anteiso*) fatty acids and 3-hydroxy acids in the anoxic layers were much greater than those in the oxic layers which would seem to reflect the distribution of bacterial abundance. The differences of organic composition between the water column and the sediments imply that sinking dead organisms were quickly degraded in the lake bottom. Also the distribution of microorganisms in the water column must be very different from that in the sediments.

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