

GEOCHEMICAL CHARACTERISTICS OF ORGANIC COMPONENTS
IN SOILS OF THE McMURDO DRY VALLEYS,
ANTARCTICA (ABSTRACT)

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Geochemical characteristics of hydrocarbons, fatty acids, hydroxy acids and dicarboxylic acids in soil samples from the Wright and Taylor Valleys of the McMurdo Dry Valleys in Victoria Land, Antarctica are discussed in relation to source materials. Unusually, long-chain ($>C_{19}$) *n*-alkanes (*n*-C₂₃, *n*-C₂₅ and *n*-C₂₇) and *n*-alkenes [*n*-C_{23:1} (carbon chain length: number of double bonds), *n*-C_{25:1}, *n*-C_{27:1} and *n*-C_{29:2}] with a predominance of odd-carbon numbers are major hydrocarbons. Normal alkanolic acids showing a predominance of even-carbon numbers are detected, as the major fatty acids, together with small amounts of *iso*- and *anteiso*-alkanoic, and *n*-alkenoic acids. A series of 3-hydroxy (C₈-C₃₀) and (ω -1)-hydroxy acids (C₂₂-C₃₀) with a predominance of even-carbon numbers are found in the soil samples, while 2-hydroxy (C₈-C₃₀), ω -hydroxy (C₈-C₃₀) and α , ω -dicarboxylic acids (C₈-C₃₁) showed no even-carbon predominance. Visual kerogen showed that amorphous materials are major components (68–98%) with small amounts of very fine coal (2–32%), although no woody and herbaceous materials are present.

The occurrence of mature isomers of steranes and triterpanes, small amounts of *n*-alkenoic acids, visual kerogen results and microscopic data of microorganisms suggest that organic components in the soil samples were derived from various sources, *i.e.*, erosion of the Beacon Super-group sedimentary rocks, past biological debris containing vascular plant wax formed in pre- and inter-glacial periods from Eocene to Pliocene, and wind-transported cyanobacterial mats, containing various microorganisms, rather than from living microorganisms. These organic components reflect the probable drastic changes in environmental conditions over geological time for organisms in the McMurdo Dry Valleys and adjacent regions.

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