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Fatty acid profiles of sebaceous triglycerides by capillary gas chromatography with mass-selective detection.

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Abstract

Fatty acid methyl esters prepared from the triglyceride fraction of skin surface lipids from six adult human males were chromatographed on a 50-m fused-silica column coated with the highly polar cyanopropylpolysiloxane phase. This permitted the resolution of double-bond positional and geometric isomers. By means of mass-selective detection, 33 saturated and 14 unsaturated fatty acid chain types were analysed. Interpretation of the mass spectra combined with precise calculation of equivalent chain length values permitted the identification of 22 saturated and all of the unsaturated chain types. Quantification by integration of total-ion and selected-ion chromatograms revealed marked variation in the triglyceride fatty acid composition between different subjects. The greatest variation was observed in the concentrations of even-carbon-numbered iso-branched acids, which ranged from 1.5 to 11% of the saturated and from 1.9 to 12.7% of the monounsaturated acids. The anteiso chain structures constituted 4-9% of the saturated and 3-6% of the unsaturated members. Fatty acids with 4-methyl branch showed the least variation, in the range 5.7-7.4%. Other methyl-branched acids made up 4-10% of the saturated group, but were not detected in the unsaturated acids fraction. Two 18:1 fatty acids were identified (a Δ^8 and a Δ^9), which possibly have different anatomical origins. Similarly, two 18:2 fatty acids (linoleic and a 2,3-dimethyl derivative) were identified. A 2-methyl C17 acid, probably of bacterial origin, was detected.