



NOTE

An Insight into Fatty Acid Composition of *Calliergonella cuspidata*BORIS PEJIN^{1,*}, LJUBODRAG VUJISIC², MARKO SABOVLJEVIC³, VELE TESEVIC² and VLATKA VAJS²¹Department of Organic Chemistry, Faculty of Chemistry, University of Belgrade, 11000 Belgrade, Serbia²Center of Chemistry, Institute of Chemistry, Technology and Metallurgy, University of Belgrade, 11000 Belgrade, Serbia³Institute of Botany and Garden, Faculty of Biology, University of Belgrade, 11000 Belgrade, Serbia

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The fatty acid composition of the moss *Calliergonella cuspidata* (Hedw.) Loeske (Amblystegiaceae) was preliminary analyzed by gas chromatography (GC FID) and gas chromatography-mass spectrometry (GC-MS). Six fatty acids were identified in its chloroform-methanol extract 1/1: palmitic acid (66.83 %), stearic acid (11.73 %), oleic acid (8.21 %), linolenic acid (6.01 %), α -linolenic acid (3.95 %) and arachidic acid (3.26 %). Arachidonic acid and *cis*-5,8,11,14,17-eicosapentaenoic acid, typical long-chain polyunsaturated fatty acids for many mosses, were not detected in *Calliergonella cuspidata*.

Key Words: Moss, Amblystegiaceae, Phytochemistry, GC FID, GC-MS.

Bryophytes, the second biggest group of terrestrial plants, are known to be a reservoir of interesting and useful chemicals¹. Many new compounds are described from bryophytes, mainly liverworts, which possess oil-bodies rich in terpenes and terpene-like substances. Mosses, another group of bryophytes, remain less chemically studied since its members do not possess oil-bodies in their cells². Fatty acids are known to be present within mosses but there are many assumptions and generalizations from a small number of species studied³⁻⁵. Therefore, in this study the moss *Calliergonella cuspidata* (Hedw.) Loeske (Amblystegiaceae) has been screened on those chemical constituents and found to be rich in saturated fatty acids. According to our best of knowledge, there is no previous report on fatty acid chemistry of this moss species.

The moss was collected in the surrounding of Bonn (Germany) in December, 2007. Voucher specimen has been deposited in the Herbarium of the Institute of Botany, University of Belgrade, Serbia (bryophyte collection-BEOU No. 4704).

C. cuspidata was carefully selected and cleaned from soil and other contaminants. The gametophyte tips were used for the extraction. Air-dried parts of the sample were ground (1 g) and extracted three times with the chloroform-methanol 1/1 for 1 h at room temperature. The extract was evaporated to dryness and further *trans*-esterified with 5 % H₂SO₄ in MeOH (v/v) for 4 h at 80 °C. The resulting methyl esters of fatty

acids were analyzed by comparing its GC FID chromatogram with that of standard mixture (Supelco 37) obtained under the same conditions and/or by analysis of GC-MS data using NIST 5 and Wiley 7 libraries.

GC analysis was performed on Agilent 7890A GC system equipped with 5975C MSD and FID detector, using DB-23 column (30 m × 0.25 mm × 0.25 μm). Injection volume was 1 μL and injector temperature was 220 °C with 10:1 split ratio. Carrier gas (He) flow rate was 0.9 mL/min while column temperature was linearly programmed in a range of 150-240 °C at a rate of 4 °C/min and hold at 240 °C for 10 min. Transfer line was heated at 240 °C. The FID detector temperature was 300 °C. EI mass spectra (70 eV) were acquired in *m/z* range 40-500.

Six fatty acids were identified in its chloroform-methanol extract 1/1: palmitic acid (66.83 %), stearic acid (11.73 %), oleic acid (8.21 %), linolenic acid (6.01 %), α -linolenic acid (3.95 %) and arachidic acid (3.26 %). Arachidonic acid and *cis*-5,8,11,14,17-eicosapentaenoic acid, typical long-chain polyunsaturated fatty acids for many moss species^{6,7}, were not detected in the examined species. This may be the consequence of the period when the moss has been collected (temperature, water regime or both, *etc.*), so further studies in seasonal *i.e.* environmental variation of these chemical constituents in *C. cuspidata* are needed.

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