

Authenticity of Lipid and Soluble Sugar Profiles of Various Oat Cultivars (*Avena sativa*)

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Abstract : The identification of lipid and soluble sugar components in flour samples of different cultivars belonging to common oat species (*Avena sativa* L.) was performed: spring oat, winter oat and hulless oat. Fatty acids were extracted from flour samples with n-hexane, and derivatized into volatile methyl esters, using TMSH (trimethylsulfonium hydroxide in methanol). Soluble sugars were then extracted from defatted and dried samples of oat flour with 96% ethanol, and further derivatized into corresponding TMS-oximes, using hydroxylamine hydrochloride solution and BSTFA (N,O-bis-(trimethylsilyl)-trifluoroacetamide). The hexane and ethanol extracts of each oat cultivar were analyzed using GC-MS system. Lipid and simple sugar compositions are very similar in all samples of investigated cultivars. Chemometric tool was applied to numeric values of automatically integrated surface areas of detected lipid and simple sugar components in their corresponding derivatized forms. Hierarchical cluster analysis shows a very high similarity between the investigated flour samples of oat cultivars, according to the fatty acid content (0.9955). Moderate similarity was observed according to the content of soluble sugars (0.50). These preliminary results support the idea of establishing methods for oat flour authentication, and provide the means for distinguishing oat flour samples, regardless of the variety, from flour samples made of other cereal species, just by lipid and simple sugar profile analysis.

Keywords : oat cultivars, lipid composition, soluble sugar composition, GC-MS, chemometrics, authentication

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