PROGRAM & BOOK OF ABSTRACTS

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April 6–7, 2016
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STABLE ISOTOPE RATIO ANALYSIS FOR AUTHENTICATION OF RED YEAST RICE

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Red yeast rice (RYR) is a non-prescription dietary supplement used in traditional Chinese medicine, obtained from rice fermented with the mold *Monascus purpureus* (*Aspergillaceae* family). Depending on the fermentation conditions, the products may contain monacolins, pigments and citrinin as secondary metabolites. The pharmacological compound Monacolin K is a naturally occurring hypocholesterolemic statin used to prevent cardiovascular diseases. The homologous prescription biosynthetic statin, lovastatin, cultured with *Aspergillus terreus* under patented and carefully controlled conditions, is not distinguishable from monacolin K. There is therefore a suspicion that RYR products are spiked with lovastatin, without being declared. As reported by different authors [1,2]. Stable Isotope Ratio Analysis represents a fast and simple way of checking whether or not a sample is of natural origin. We therefore collected around 10 samples of red yeast rice powder and 10 samples of synthetic lovastatin. Monacolin K was isolated from rice using preparative HPLC and together with lovastin, was subjected to analysis of the isotopic ratio of C using an Isotope Ratio Mass Spectrometer interfaced with an Elemental Analyser. We found that $^{13}C/^{12}C$ is able to clearly distinguish lovastatin (-17.3‰) from monocolin K (-29.8‰). In order to have an overall picture of the market, we also investigated the authenticity of 20 samples of commercial products containing RYR.

[1] Greule M, Tumino L, Kronewald T, Hener U, Schleucher J, Mosandl A, Keppler F. 2010. Improved rapid authentication of vanillin using δ13C and δ2H values. Eur Food Res Technol 231(6): 933–941.
[2] Richling E, Hohn C, Weckerle B, Heckel F, Schreier P. 2003. Authentication analysis of caffeine-containing foods via elemental analysis combustion/pyrolysis isotope ratio mass spectrometry (EA-C/P-IRMS). Eur Food Res Technol 216(6): 544-548

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