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EUROFOODCHEM XVIII

OCTOBER 13-16, 2015

MADRID, SPAIN

UPCOMING CHALLENGES IN FOOD SCIENCE




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DETECTION OF BOTANICAL ADULTERATIONS IN PLANT FOOD SUPPLEMENTS BY MOLECULAR BIOLOGY TECHNIQUES

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In the last years, botanicals have become increasingly available in the EU market in the form of plant food supplements (PFS), which are legally considered as foods under Directive 2002/46/EC and consequently not submitted to safety assessment prior to commercialisation. A concern related with PFS regards its botanical composition since unintentional swap of plants has been reported and also because adulterations by the substitution of higher cost botanicals for closely related, but cheaper species, can occur. Thus, there is a need for reliable methodologies to authenticate botanicals in commercialised PFS. Recently, molecular biology techniques have been suggested for this purpose. However, difficulties in recovering DNA from some PFS samples have been described (1). Thus, as part of a study for the botanical authentication of PFS, this work aimed at assessing the interference of pharmaceutical excipients on the recovery/amplification of DNA. Different PFS (tablets and capsules) were submitted to DNA extraction and amplified by real-time polymerase chain reaction (PCR) targeting universal eukaryotic and plant genes using species-specific primers for Hypericum DNA barcode loci. However, some samples gave consistently negative PCR amplifications irrespective of the target gene or DNA extraction method used, raising the question of whether some excipients could interfere with DNA extraction from PFS. To address this question, model mixtures of pharmaceutical excipients and water as control, were spiked with known amounts of template maize DNA. Each mixture was then submitted to DNA extraction and maize DNA quantified by real-time PCR. The use of either 10% talc or 0.5 % dyes (iron oxide or titanium dioxide) completely adsorbed DNA, resulting in negative PCR amplifications. The use of 1% talc or 10% silica, both frequently used as diluents in PFS, allowed recovering very low amounts of maize DNA (7.1 % and 2.5%, respectively). The results showed a clear adsorption phenomena that justify the hampering effect on DNA extraction from PFS explaining the inability of recovering DNA from some samples reported in previous works. Thus, a strategy to release plant DNA from excipients, allowing its extraction and further analysis was also assayed. Hypericum species were not detected in four PFS, although being described on the label.

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