



Assuring the integrity of the food chain

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Exploiting DNA markers for the authentication of *Hypericum* food supplements

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ABSTRACT

During the last years, the consumption of plant food supplements (PFS) containing medicinal plants has been growing in popularity. Consequently, there has been an increasing demand for plant material that can result in a higher number of frauds (substitution of a higher cost medicinal plant for a closely related, but cheaper species) and possibility of unintentional swap/misidentification of plants.

In both cases, the PFS integrity, efficacy and safety are compromised. Therefore, methodologies for the unequivocal identification of plant species in PFS are required. In this work, DNA-markers were used to specifically identify *Hypericum perforatum* (used in for its antidepressive properties) and *H. androsaemum* (used as cholagogue and hepatic protector) in several PFS samples (tablets, capsules, tinctures and ampoules).

Different DNA extraction protocols, including in-house methods and commercial kits were tested. The extracts were amplified by real-time PCR targeting reference genes (universal eukaryotic and plant rubisco genes) and using species-specific primers targeting a DNA barcode loci (*matK* gene). Best results were achieved for capsules and tablets using Nucleospin Plant II extraction method, while for liquid samples using an in-house method based on DNA precipitation with ethanol and centrifugation.

Although labeled, three samples tested negative for *H. perforatum*. For some samples, negative amplification was obtained regardless of the targeted gene and DNA extraction method, pointing to some matrix interference, possibly due to DNA adsorption phenomena to pharmaceutical excipients.

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