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Assessing the effect of pharmaceutical excipients on the DNA extraction from plant food supplements

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In the last years, medicinal plants and derived products have become increasingly available in the EU market as ingredients in formulations, which are sold as plant food supplements (PFS). Among the several issues that may affect the safety of PFS, the most relevant concerns adulterations by the illegal addition of pharmaceutical drugs and/or the swap/misidentification of plant material, with cases of acute toxicity already reported [1]. Owing to the high similarity and distinct therapeutic uses of several medicinal plants, accurate and fast methodologies allowing their distinction are required. For that purpose, DNA-based methods are considered fast, sensitive and highly specific tools, allowing the unequivocal identification of plant species. Up to date, most of DNA methodologies reporting the identification of plant species essentially concern medicinal plants [2], with few works being developed for the authentication of PFS.

Since PFS are mainly sold as tablets and capsules, they often contain pharmaceutical excipients such as micronized talc (hydrated magnesium silicate) and silicon dioxide, which are known to have adsorbent properties. Thus, the aim of this work was to evaluate the possible hamper effect of such excipients in the recovery of DNA from PFS. For this purpose, known amounts of maize DNA (50 ng, 10 ng, 5 ng, 1 ng and 0.5 ng) were added to two types of tablets of PFS (one with talc and other with talc/silicon dioxide) (n=10). Additionally, 50 ng of maize DNA were also added to water and rice to evaluate its recovery during extraction and possible matrix effects. The extracts were further amplified by real-time PCR with primers and hydrolysis probe targeting the *adh* maize reference gene [3]. Preliminary results showed the recover of 56.6% of maize DNA from water, without the effect of matrix. Taking this value as reference, it was possible to recover 21.1% of maize from rice, which evidenced a negative matrix effect on the efficiency of DNA extraction. With respect to PFS spiked with maize DNA, only the sample of 50 ng of DNA in PFS with talc amplified positively with an estimated recovery of 0.24%. These results seem to suggest a potential adsorption of the DNA to PFS containing talc or the mixture of talc/silicon dioxide. However, further research is still required to clarify these preliminary findings.

POSTER

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