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Untargeted DNA-based methods for the authentication of wheat species and related cereals in food products

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Abstract

New food commodities, particularly pasta, bread and cookies, made with mixed flours containing ancient wheat species and other cereals, have become popular in recent years. This calls for analytical methods able to determine authenticity of these products. Most DNA-based methods for the authentication of foodstuff rely on qPCR assays specifically targeting each plant species, not allowing the identification of unsearched ingredients. Moreover, the discrimination among closely related plant species, particularly congeneric ones like *Triticum spp*, remains a challenging task. DNA fingerprinting through tubulin-based polymorphism (TBP) and a new assay, TBP *light*, have been optimized for the authentication of different wheat and farro species and other cereals and tested on a set of commercial food products. The assay has a sensitivity of 0.5-1% w/w in binary mixtures of durum wheat in einkorn or emmer flour and was able to authenticate the composition of test food sample and to detect possible adulterations.

Keywords: PCR; TBP; DNA profiling; wheat species authentication; adulteration

Highlights

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