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Efficiency of PCR-RFLP for the Identification of Adulteries in Meat Formulation

Authors : Hela Gargouri, Nizar Moalla, Hassen Hadj Kacem

Abstract : Meat adulteration affecting the safety and quality of food is becoming one of the main concerns of public interest across the world. The drastic consequences on the meat industry highlighted the urgent necessity to control the products' quality and to point out the complexity of both supply and processing circuits. Due to the expansion of this problem, the authentic testing of foods, particularly meat and its products, is deemed crucial to avoid unfair market competition and to protect consumers from fraudulent practices of meat adulteration. The adoption of authentication methods by the food quality-control laboratories is becoming a priority issue. However, in some developing countries, the number of food tests is still insignificant, although a variety of processed and traditional meat products are widely consumed. Little attention has been paid to provide an easy, fast, reproducible, and low-cost molecular test, which could be conducted in a basic laboratory. In the current study, the 359 bp fragment of the cytochrome-b gene was mapped by PCR-RFLP using firstly fresh biological supports (DNA and meat) and then turkey salami as an example of commercial processed meat. This technique has been established through several optimizations, namely: the selection of restriction enzymes. The digestion with BsmAI, SspI, and TaaI succeed to identify the seven included animal species when meat is formed by individual species and when the meat is a mixture of different origin. In this study, the PCR-RFLP technique using universal primer succeed to meet our needs by providing an indirect sequencing method identifying by restriction enzymes the specificities characterizing different species on the same amplicon reducing the number of potential tests.

Keywords : adulteration, animal species, authentication, meat, mtDNA, PCR-RFLP
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