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Capillary electrophoresis is essential for microsatellite marker based detection and quantification of adulteration of basmati rice

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Rice is a staple and widely grown crop endowed with rich genetic diversity. As it is difficult to differentiate seeds of various rice varieties based on visual observation accurately, the harvested seeds and subsequent processed products are highly prone to adulteration with look-alike and low quality seeds by the dishonest traders. To protect the interests of importing countries and consumers, several methods have been employed over the last few decades for unambiguous discrimination of cultivars, accurate quantification of the adulterants, and for determination of cultivated geographical area. With recent advances in biotechnology, DNA based techniques evolved rapidly and proved successful over conventional non-DNA based methods to purge the problem of adulteration at commercial level. Microsatellite markers are employed for genotyping of basmati varieties and assaying purity of market samples. However, employment of diverse electrophoresis techniques across laboratories has resulted in inconsistent allele sizes, creating doubts about the suitability of the assay. This study evaluated agarose gel electrophoresis, slab gel electrophoresis, and capillary electrophoresis techniques for their efficiency in the detection and quantification of adulteration in basmati samples. Comparative analysis across eight microsatellite loci in 12 rice varieties demonstrated that the capillary electrophoresis method showed less error (0.73 bp) in the estimation of allele sizes compared to slab gel (1.59 bp) and agarose gel (8.03 bp) electrophoretic methods. Capillary electrophoresis showed greater reproducibility (<0.5 bp deviation) compared to slab gel (1bp) and agarose (>3 bp) based methods. Capillary electrophoresis was significantly superior in quantification of the adulterant, with a mean error of 3.91% in comparison to slab gel (6.09%). Lack of accuracy and consistency of the slab gel and agarose electrophoretic methods warrants the employment of capillary electrophoresis for Basmati rice purity assays.

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Fatty acids profile of meat from local poultry population of *Gallus gallus* species of Benin reared under free range and improved breeding systems

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The current study aims to determine the fatty acids profile of indigenous chicken's meat of Benin (Fulani and Sahoue ecotypes) in relation with the breeding mode and the type of muscle. Two groups of 52 chickens of each ecotype were reared respectively under traditional and improved breeding systems until 28 weeks old and then slaughtered. Breast and thigh were used for fat extraction and fatty acids profile analysis. It appears that the predominant fatty acids were palmitic and stearic (18:0) acids as saturated fatty acid (SFA), oleic acid as monounsaturated fatty acid (MUFA), and linoleic acid (LA) and arachidonic acid as polyunsaturated fatty acid (PUFA). Palmitic acid, oleic acid and arachidonic acid were the most abundant. The highest SFA and PUFA concentrations were found respectively in Fulani and Sahoue ecotypes (P<0.05). The n-3 PUFA content was lower than n-6 PUFA in all ecotypes with the highest n-3 PUFA content (5.66%; P<0.05) found in Fulani chickens. The weakest ratio n-6/n-3 PUFA was also found in Fulani chickens. The fatty acid composition was also affected by production system and muscle type. The n-3 PUFA was abundant in free range (5.01%) than in confinement breeding system (4.82%). The ratio n-6/n-3 fatty acid was similar in both breeding systems (P 0.05). The ratio PUFA/SFA was higher in meat from free range system than confinement system (P<0.05). The breast meat showed higher n-3 PUFA concentration and lower ratio n-6 PUFA /n-3 PUFA than thigh meat (P<0.001). Overall, the breast meat ensuring additional health benefit for consumers than thigh meat. Furthermore, organic free range system increases omega 3 fatty acids concentration.

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