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DEVELOPMENT OF SEMI QUANTITATIVE MOLECULAR METHOD TO DETECT THE PROPORTION OF RICE IN RICE BASED PROCESSED FOOD PRODUCTS

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Rice flour plays a significant role as a wheat substitute in processed food industry due to its nutritional and health benefits. However, the level of substitution is limited as rice flour lacks gluten protein, which offers good baking properties. Hence, manufactures tend to falsify the rice percentage by mislabeling the rice based processed food products, in order to attract consumers. As food authenticity is one of the main concerns among consumers, correct labeling of food products is important. This study was planned to develop a molecular based method to semi- quantitatively detect the rice proportion in rice incorporated processed food products, as establishment of an analytical tool to detect rice adulteration has become an essential step. In the present study, amplification of a rice specific gene in genomic DNA of rice based food products was employed as the molecular method through Polymerase Chain Reaction (PCR) technique. Standard bread samples (n = 5) with known rice proportion were used to construct the standard curve of incorporated rice proportion versus DNA band intensity. Several rice based processed food products (n = 8) available in the local market were used to quantify the proportion of rice. The comparison was done by measuring the relative correlation of the DNA band intensity of the rice based food products with the standard bread samples. This study concluded that the DNeasyMericon Food Kit method provide optimum extraction conditions to extract DNA from processed food products, while local rice varieties could be amplified using Sequence-Tagged-Site (STS) E30 primers. However, amplification of DNA extracted from processed food was difficult due to the presence of PCR inhibitors. Semi-quantitative detection of rice contents was limited due to lack of sensitivity and reproducibility of the adopted method, therefore successful detection was achieved only from 100% rice based processed food products. Nevertheless, this molecular method can be used to detect 100% rice based processed food products qualitatively and semi- quantitatively, without using high cost Real-Time PCR machine.

Keywords: *DNA extraction, PCR, Rice content, Semi-quantitative detection, DNeasyMericon Food Kit*