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Adulteration detection of *Cinnamomum verum* with BarHRM technology

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Sri Lanka is the premier exporter of the true cinnamon (*C. verum*) in the global market. However, Sri Lankan true cinnamon faces a major threat due to severe competition and adulteration from its substitute cassia (e.g. *C. aromaticum*). It costs one-third of the price of *C. verum* but it contains coumarin which is a hepatotoxin at substantial amounts (up to 5%) whereas true cinnamon has only trace amounts (about 0.004%). Therefore, it is paramount to detect adulteration of *C. verum* from its substitute to protect the reputation of true cinnamon. Chemical and morphological methods can detect the adulteration of *C. verum* but when it comes to admixtures and value-added products, morphological and chemical methods are not accurate. Hence, the objective of the research was to develop a molecular assay to detect adulteration in commercially available cinnamon products. In this study, DNA sequences of C. *verum* and *C. aromaticum* were extracted from the National Center for Biotechnology Information (NCBI) using the keyword "*Cinnamomum"* and selected barcode region *"rbcL".* Gene-specific novel markers were manually designed targeting the identified diagnostic SNP sites. Primer properties were analyzed using NetPrimer software and primers with the best qualities were selected. DNA extraction of cinnamon was done using CTAB method with slight modifications. Real-time PCR and melting curve analysis at 65 ºC to 95 ºC with a ramping rate of 0.05 ºC (Qiagen, Germany) was performed. The melting curve analysis and principal component analysis of the data demonstrated a clear distinction between the two species and results confirm that *rbcL* gene-specific primers can be used to distinguish *C. verum* from *C. aromaticum.* Further, this assay has a great potential to quantify adulterants in commercially available cinnamon samples and extremely valuable for an accurate and rapid adulteration detection of cinnamon value-added products in the global and local market.

Keywords: Adulteration, BarHRM, Cinnamon, Molecular detection

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