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APPLICATION OF FTIR SPECTROSCOPY AND DIFFERENT METHODS TO DETECT ADULTERATION IN MANGO DRINKS

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ABSTRACT

The increasing popularity of fruit drinks in meals, diets, school lunchboxes, and restaurants has raised concerns about the authenticity and quality of these products due to potential adulteration. Efficient and reliable analytical techniques are crucial for the detection of such adulteration. In this study, random samples of mango drink brands accepted by school students sold in Egyptian markets were evaluated for adulteration using Fourier transform infrared (FTIR) spectroscopy, fruit juice percentage, sugars, and preservatives. Findings revealed that brands C, D, E, and F exhibit significant levels of adulteration, as evidenced by fruit percentages that are lower than the assigned value. Brands C and D contained higher concentrations of preservatives and sucrose levels, respectively, than the standard specification, as indicated by high-performance liquid chromatography (HPLC). FTIR spectroscopy of drinks free from adulteration showed that the main functional groups detected were in the molecular structure of brand A, which contained abundant hydroxyl groups, polysaccharide, and phenols at 1330–1340 and 3449–3620cm^{-1}, followed by brand B. Brands D and F had an amide 111-band aromatic ester at 1253–1255cm^{-1} with transmittance percentages of 50.38 and 21.11, respectively, potentially indicating the addition of water, polymer, and plasticizer. Accurate labeling of fruit drinks is essential for protecting consumers from potential health risks associated with adulterated fruit drinks.