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Preparation of low-sugar fruit jams with microcrystalline cellulose and a multicomponent fluid matrix containing leaf-based pectic substances

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Pectic substances were extracted from the leaves of *Holarrhena pubescens*. Various factors affecting yield were studied. The liquid-to-solid ratio, pH, oxalate concentration, and treatment time were found to affect the yield. A multicomponent fluid matrix was produced using the pectic substances, sucrose, calcium chloride, histidine, and ascorbic acid. The optimum concentration of each component required to form the matrix with the highest average apparent viscosity was estimated. The multicomponent fluid matrix was then used to produce a pineapple jam with microcrystalline cellulose as a filler. FTIR–ATR spectroscopy was used to study the mechanism of gel and jam formation and was found to include the formation of hydrogen bonds between the components. Both the multicomponent fluid matrix and the microcrystalline cellulose affected the textural properties of the jam, making it possible to produce jams with a predetermined textural property. The low-sugar jam contained only 0.1% of sucrose in the finished product, making it useful for diabetic patients. The leaf-based pectic substances, with a low concentration of galacturonic acid, can be used as an effective gelling agent after transforming into a composite multicomponent fluid matrix. Thus, the flow and textural properties of pectic substances may be modified by mixing with suitable ingredients to suit various applications in food and other industries. Future projects should aim to utilise pectin from other sources as well for the production of similar low-sugar food products for the welfare of the diabetic community.

Keywords: Average apparent viscosity, Fruit jam, Microcrystalline cellulose, Multicomponent fluid matrix, Pectic substances, Texture profile analysis

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