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Effect of heat treatment and microwave condition on structure and functional characteristics of gum karaya (*Sterculia urens*): Fourier transforms infra-red spectroscopy (FT-IR)

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Gum karaya (GK) is an exudated carbohydrate polymer. It is commercially isolated from Sterculia urens. Commercial gum karaya has many applications in cosmetic and pharmaceutical products as gelling and viscous enhancing agents. It has very weak solubility and strong swelling properties. The main objective of the current study was to investigate the effects of different thermal processing and microwave treatments (i.e., time, 8, 10 and 12 min; power, 700 and 1000 W) on molecular structure and functional characteristics of gum karaya. All non-treated and treated gums were subjected to the following assays: Fourier Transforms Infra-Red (FTIR) spectroscopy, viscosity and dynamic rheological properties, average particle size, solubility and swelling index. FT-IR spectra of gum karaya displayed some peaks at ~1736 cm-1 for carbonyl group presenting C=O stretching. It also showed several strong bonds at ~3400 cm-1, 2800-3000 cm-1, ~1380 cm-1 and ~1060-1150 cm-1 for OH group, C-H stretching, methyl C-H banding and C-O stretching for alky ether, respectively. Microwave treated gum karaya exhibited the lower viscosity than the native gum. This is a beneficial property to overcome the processing and handling problems of gum karaya. Therefore, the present work revealed that the microwave treatment of gum karaya solution at the optimum condition (i.e., elevated temperature, 700 W for 8 min) resulted in the modified gum with improved physical and functional properties.

Biography

Hamed Mirhosseini is an Associate Professor in Universiti Putra Malaysia (UPM). He has obtained his PhD from UPM. He has published more than 75 articles in reputed CIJ journals with more than 550 citations and H-index of 14. He is serving as an editorial board member and potential reviewers for more than 15 different journals. He is currently working on modification of bioactive carbohydrate and protein-based polymers through applying green technology.

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