

Effect of different drying techniques on flowability characteristics and chemical properties of natural carbohydrate-protein Gum from durian fruit seed.

ABSTRACT

Background: A natural carbohydrate biopolymer was extracted from the agricultural biomass waste (durian seed). Subsequently, the crude biopolymer was purified by using the saturated barium hydroxide to minimize the impurities. Finally, the effect of different drying techniques on the flow characteristics and functional properties of the purified biopolymer was investigated. The present study elucidated the main functional characteristics such as flow characteristics, water- and oil-holding capacity, solubility, and foaming capacity. Results: In most cases except for oven drying, the bulk density decreased, thus increasing the porosity. This might be attributed to the increase in the inter-particle voids of smaller sized particles with larger contact surface areas per unit volume. The current study revealed that oven-dried gum and freeze-dried gum had the highest and lowest compressibility index, thus indicating the weakest and strongest flowability among all samples. In the present work, the freeze-dried gum showed the lowest angle of repose, bulk, tapped and true density. This indicates the highest porosity degree of freeze dried gum among dried seed gums. It also exhibited the highest solubility, and foaming capacity thus providing the most desirable functional properties and flow characteristics among all drying techniques. Conclusion: The present study revealed that freeze drying among all drying techniques provided the most desirable functional properties and flow characteristics for durian seed gum.

Keyword: Carbohydrate biopolymer; Durio zibethinus; Agricultural biomass waste; Solubility; Foaming properties; Water holding capacity; Oil holding capacity; Flow characteristics.