

Physicochemical and flow properties of fruit powder and their effect on the dissolution of fast dissolving fruit powder tablets

ABSTRACT

This research was conducted aiming to assess the flow and physicochemical properties of fruit powder and their relationship with the dissolution of tablets containing effervescent agents. Commercial pitaya, pineapple, mango and guava fruit powders were used as samples in this research. Fruit powder tablets were prepared by using direct compaction method. Powder properties of individual fruits as well as their tablet formulation (fruit powder + effervescent agent + artificial sweeteners) analysed using standard methods were found significantly different at $P < 0.001$. The flowability and cohesiveness as determined by Carr index and Hausner ratio of individual fruit powders and their formulation were also different but in the range of passable class. The relationship of total dissolution time with moisture, protein, fat content and porosity of fruit powder tablets was polynomial as determined by multiple regression analysis. Dissolution rate of effervescent fruit powder tablets was much higher compared to normal fruit powder tablets in both dissolution medium (water and simulated saliva fluid). Among the fruit powder tablets, pitaya powder tablet went for fast dissolution (6 min) in simulated saliva fluid whereas guava powder tablets took the longest time (90 min) for complete dissolution in water. Based on this study, a better understanding of the physicochemical properties of fruit powder and their relationship with the dissolution rate and the effect of effervescent agents on the dissolution rate has been obtained, which is essential for processing and handling of fruit powder and tablet preparation as well as for the improvement of the dissolution rate.

Keyword: Flow properties; Fruit powder; Dissolution; Fast dissolve; Tablet; Flowability