Kinetics of mass transfer, colour, total polyphenol and texture change of Manilkara zapota during convective air drying

ABSTRACT

The effects of air temperature and product size on drying kinetics, retained total polyphenol content (TPC), hardness kinetics and total colour change (qE) kinetics of ciku (Manilkara zapota) were investigated. In addition, five terms of the theoretical model were used to estimate the effective diffusivity values during drying at temperatures from 40°C to 70°C. The drying rates of dried ciku were increased with increasing temperature and decreasing product size. It was found that hardness of ciku dried at temperature higher than 60°C increased significantly, when the moisture content was reduced to less than 0.5 g H2O/g DM (dry basis). In terms of nutritional value, the retained total polyphenol content (TPC) of dried ciku in hot air drying also increasing with temperature. The highest retained TPC was 141 mg GAE/ 100g of samples, which can be obtained from drying at 70°C.

Keyword: Manilkara zapota; Effective diffusivity; Hardness; Texture; Colour; Total polyphenol content