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Drying characteristics of osmo-convectively dried sapota slices

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■ **ABSTRACT :** Sapota is a highly productive, nutritious and tropical fruits of India contributing 1424 MT, on 160 ha area with the productivity of 8.9 MT/ha. In India, sapota is generally consumed fresh. Ripened sapota cannot be stored more than a day or two. However, it is highly perishable in nature, ripens faster and becomes unfit for consumption very soon. The post-harvest losses in sapota fruits is in the ranged from 25-30%. These losses mainly occur due to high ethylene evaluation and metabolic activity. To avoid the huge wastage, the surplus could be processed and preserved properly. Wastage of large quantities of sapota fruits before it reaches the consumer is due to poor quality transportation as well as storage facilities. One effective method of reducing this huge loss would be by converting it into various commercial sapota products like slices, powder, juice, concentrate, etc. Therefore, it is necessary to produce the final product with wholesome, soft and of acceptable quality. The products may be dehydrated, canned and refrigerated. Dehydrated fruit products have inherent advantages, such as prolong shelf-life, higher degree of resistance to bacterial attack and lower transportation, handling and storage costs. The use of faulty dehydration process causes quality defects of dehydrated fruits as tough woody texture, slow or incomplete rehydration, loss of juiciness and shrinkage. Osmotic dehydration is less energy intensive technique than air or vacuum drying process, since it can be conducted at low or ambient temperature. It is the process of water removal from a product by immersion in concentrated aqueous solution. The osmotic process prior to convective drying can be used as a pre-treatment for the dehydration of food prior to further processing such as freezing, vacuum drying, etc. Therefore, a study was proposed to investigate osmotic behaviour and drying characteristic of sapota slices under osmo-convective drying process. The optimum conditions for osmotic treatment were determined with the values of 27.72% WR and 8.25% SG for process parameters, syrup temperature of 47.36 °C, and sugar concentration of 53.53 °B for 167.85 min duration. After optimization, osmotically treated samples were dried in convective dryer at temperature 40, 50 and 60 °C. The convective drying behavior and drying characteristics was investigated for osmo-dehydrated sapota samples, at air temperature of 40, 50 and 60 °C. It was observed that the moisture content of the product was reduced exponentially with drying time and no constant rate period was observed. To determine the most suitable drying equation the the moisture ratio data of osmosed sapota dried at various air temperatures were fitted into the six thin-layer drying models. Among those two term model as best fitted for drying data. This indicated that the total mass transfer resistance was primarily due to the internal moisture diffusion within the sample

■ **KEY WORDS :** Sapota, Osmotic, Convective drying, Diffusivity, Drying rate, Moisture ratio

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