

# PHYSICOCHEMICAL ANALYSIS OF OVEN DRIED RAW TAMARIND (TAMARINDUS INDICA) POWDER TO PRODUCE VALUE-ADDED PRODUCTS

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## ABSTRACT

Tamarind (*Tamarindus indica* L.) is a versatile fruit used for culinary and medicinal purposes. It is considered a seasonal underutilized species in Sri Lanka and its post-harvest losses are high. Drying is a suitable alternative method for the reduce its post-harvest losses and can be used to produce value-added products. The present study was aimed to investigate the effective drying temperature to produce raw tamarind powder by oven drying method. In here matured raw tamarind was subjected to four different drying temperatures as 50°C, 60°C, 70°C, and 80°C to produce tamarind powder and physicochemical properties; moisture content, pH, total soluble solid content, powder properties, rehydration properties, colour and particle size of these powder samples were evaluated. According to the results, the final moisture content was reduced from 9.11±0.30% (50°C) to 6.42±0.42% (80°C). With the increase of temperature (50-80°C), pH (2.25±0.02-2.43±0.02) was increased and the acidity (17.38±0.47-22.81±1.09%) and total soluble solid contents (38.23±0.47-43.27±0.05°Brix) were decreased. Powder recovery (41.64±1.84-43.08±0.97%), bulk density (359.85±3.37-71.34±14.97kgm<sup>-3</sup>), tapped density (403.49 ±4.19-733.24±16.06kgm<sup>-3</sup>), true density (1313.17±10.04-1358.25±74.88kgm<sup>-3</sup>) and rehydration properties; solubility (61.13±0.96-73.67±1.96%), flowability (medium to free-flowing), wettability (0.26±0.03-0.49±0.03sec.) and sinkability (0.7±0.06-10.21± 0.44sec.) were changed significantly (p<0.05) with the increase of temperature. Porosity (47.8±0.02-72.48±0.21%), hygroscopicity (22.78±0.44-25.86±0.31%) and degree of caking (89.98±0.04-97.41±0.91%) were high in low temperatures respectively. According to chroma values desirable characteristics were shown in sample dried at 70°C (L\* = 27.10±0.173; a\* = 17.26±0.89; b\* = 28.78±0.45). Particle size was not changed significantly with the drying temperature. X-ray diffractogram revealed the amorphous nature of the dried powder. Powder samples exhibit type IV adsorption isotherm which shows a swellable hydrophilic character. Considering all the evaluated physicochemical characteristics, 70°C temperature is the most effective temperature to produce raw tamarind powder by oven drying method.

*Keywords: Oven drying, Physicochemical properties, Raw powder, Tamarind; Tamarindus indica L., Temperature*