RESEARCH PAPER

Thin-layer drying and mathematical modeling for *Simarouba glauca* leaves

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Abstract : A comparative drying study was conducted to investigate the thin-layer drying characteristics of *Simarouba glauca* leaves, known for their presence of quassinoids, phenols, flavonoids and antioxidants. The study aimed to determine the most effective drying method for preserving the best quality of the leaves. Shade drying, sun drying and tray drying at 55°C were employed, and the drying process was evaluated based on drying rate, drying time and moisture ratio. The results demonstrated that tray drying exhibited the highest drying rate (0.3307 kg/kg$_d$.h), while shade drying showed the lowest drying rate (0.0810 kg/kg$_d$.h). Ten mathematical models for thin-layer drying were applied to describe the drying behavior of *Simarouba glauca* leaves. These models were assessed based on their fit to the moisture ratio data, using correlation co-efficient (R^2) and root mean square error (RMSE) as comparison metrics. The midilli model displayed the highest correlation co-efficient and the lowest RMSE, indicating its superior performance in describing the drying characteristics of the leaves. In terms of the drying methods, the midilli model exhibited the highest R^2 and the lowest RMSE, suggesting its suitability for predicting the drying behaviour under various conditions.

Key Words : *Simarouba glauca*, Thin-layer drying, Convective drying, Drying rate, Mathematical modelling, Correlation

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