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Mathematical Model Suitability for Thin-Layer Drying of Chiangda Herbal Tea (Gymnema inodorum Lour.) under Modified Greenhouse Dryer

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Chiangda herbal tea is an herb from Thailand that has a long and varied history in traditional medicine, it has been used in ayurvedic medicine for several centuries as a safe and natural way to help regulate sugar metabolism. The objective of this study was to evaluate the influence of drying of Chiangda herbal tea with modified greenhouse dryer. Drying experiments were performed at an air temperature of 50℃ was investigated in dryer. The research was to determine on change of color, antioxidant activity, sensory evaluation and mathematical model suitability for thin-layer drying.

The research found that trend of color change of Chiangda herbal tea freshly and dried on the brightness values (L*), green value (a*)* and yellow (b*) values were decreased after drying. Highlight of this research the Chiangda herbal tea dried by modified greenhouse dryer has increased antioxidant activities. The sensory evaluation scores were acceptable in all experimental conditions. The Wang-Singh equation was found to satisfactorily describe the drying behavior Chiangda herbal tea, with good agreement obtained with the experimental data the highest value of R^2 (0.9993-) and the lowest values of MBE (-0.0007-0.00412) respectively. The moisture transfer from Chiangda herbal tea was describes by applied the Fick's diffusion model.The effective moisture diffusivity varied from 9.517×10^-11 to 2.606×10^-10 m^2/s and increased with the temperature. An Arrhenius relation with an activation energy value of 24.91 kJ/mol expressed effect of temperature on the diffusivity.

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