

## ABSTRACT

The paper presents a novel method for predictive modelling of chanterelle mushrooms' drying kinetics. Use of computational techniques and mathematical modelling for chanterelle mushrooms were employed in analysing the drying process using heat pump dryer. Mushrooms were sliced into 20 mm × 20 mm × 30 mm cuboids and 20 mm × Ø40 mm cylinders. Drying air temperatures of 40 °C, 48 °C, and 56 °C were studied. Determination of the best mushrooms' drying process using selected thin layer and computational intelligence models was examined. Drying curves showed a falling rate period while moisture ratio decreased with temperature rise from 40 °C to 56 °C. Mushrooms' moisture diffusivities rose from  $23.709 \times 10^{-8} \text{ m}^2\text{s}^{-1}$  to  $41.035 \times 10^{-8} \text{ m}^2\text{s}^{-1}$  as temperature rose from 40 °C to 56 °C for the cuboid slices. Similarly, diffusivities for cylindrical mushrooms rose from  $9.322 \times 10^{-8} \text{ m}^2\text{s}^{-1}$  to  $12.1585 \times 10^{-8} \text{ m}^2\text{s}^{-1}$ . The activation energy of cuboidal mushrooms was  $29.3908 \text{ kJmol}^{-1}$  while that of cylindrical sample was  $14.2856 \text{ kJmol}^{-1}$ . Statistical parameters used showed that Midilli et al. was the most superior thin-layer drying model in predicting drying kinetics of chanterelle mushrooms. 1–3 ANN architecture was the best architectures in predicting drying process of chanterelle mushrooms. Standardized Pearson universal kernel was the best SVM filter. A  $k = 5$  value was the best kNN values tested in predicting the chanterelle mushrooms drying process. However, tested data for standardized Pearson universal kernel was the most superior among conventional and intelligent models used. Consequently, computational intelligence modelling especially the standardized Pearson universal kernel was recommendable in modelling drying kinetics of chanterelle mushrooms under heat pump dryer.