Investigation of the effect of drying conditions on phytochemical content and antioxidant activity in pineapple (*Ananas comosus*)

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Abstract

Pineapple, with its attractive sensorial and nutritional characteristics, is the most traded tropical fruit worldwide. However, due to its high-water content (85–92 w.b %), it is highly perishable, and therefore, postharvest loss of this fruit is a global concern. Drying is an important preservation technique to increase the self-life and to preserve the essential vitamins, minerals, fiber, carbohydrate, and antioxidant properties. In this study, the impact of drying conditions on the phytochemical properties of pineapple was investigated. Experiments have been conducted using different process variables in convective drying (CD) and intermittent microwave convective drying (IMCD) to monitor the changes in total phenolic (TPC), total flavonoid content (TFC), and their antioxidant activity. Samples were dried at temperatures of 50 °C, 60 °C, and 70 °C. Results show that highest TPC was observed in IMCD dried sample at 60 °C compared to CD and fresh samples. However, significant decrease was observed in TFC in both IMCD and CD samples at different drying conditions. IMCD dried sample exhibit strongest antioxidant activity compared to CD and fresh samples. Antioxidant activity was highest in IMCD dried sample at 60 °C compared to CD samples and fresh samples. This is due to disruption of hydrophilic regions of cell such as vacuoles and apoplasts that triggers the release of bound phenolics with oxidative and hydrolytic enzymes that would destroy the antioxidants in fruits. However, high temperature at 60 °C deactivates these enzymes and prevents the loss of phenolic acids, leading to the increase of total phenolic content, thus exhibiting stronger antioxidant activity.