



Research article

EFFECT OF DRYING TECHNIQUES ON THE PRESERVATION OF ANTIOXIDANT PROPERTIES IN *ANANAS COMOSUS*

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Abstract

Preservation of antioxidant properties in pineapple (*Ananas comosus*) is crucial to maintain its nutritional value and health benefits. Pineapple is rich in polyphenols, flavonoids and other bioactive compounds that combat oxidative stress and reduce the risk of chronic diseases. However, the drying process which is essential in preserving the fruit's shelf life has the potential to reduce antioxidants contents due to the sensitivity of these compounds to heat and oxidative stress. This study analysed the impact of three drying techniques namely microwave, oven, and infrared drying on the retention of antioxidant properties in pineapple. The antioxidant activity was assessed using 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging activity and Total Phenolic Content (TPC). To ensure consistency and to facilitate an accurate comparison across the techniques, all drying experiments were conducted in triplicate (n=3) and standardized at 80 °C with microwave drying operated at 300 W. Statistical analysis revealed significant differences ($p < 0.05$) among all three drying methods. Microwave drying was the most effective in preserving antioxidant properties, resulting in the fastest moisture removal and significantly higher antioxidant retention with a TPC 729.41 ± 12.35 mg GAE/100g and 56.03 ± 1.12 %DPPH inhibition. By comparison, infrared drying demonstrated moderate antioxidant retention (516.28 ± 9.84 mg GAE/100g TPC; 44.03 ± 0.95 %DPPH), while oven drying was the least effective, resulting in the lowest retention (331.37 ± 8.15 mg GAE/100g TPC; 40.20 ± 0.88 %DPPH). The relatively poor antioxidant retention observed in oven dried samples is attributed to slower drying kinetics and extended heat exposure, which accelerates the thermal degradation of phenolic compounds.