

Effect of preservation on the chlorophyll content, phytochemicals, and antioxidant capacity of two different varieties of pumpkin (*Telfairia occidentalis*) leaves

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Abstract

The aim of the present study was to investigate the effect of two preservation techniques (refrigeration and freezing) on the chlorophyll content, phytochemicals, and antioxidant capacity of two different varieties of pumpkin (*Telfairia occidentalis*) leaves over a period of two weeks. The biochemical parameters assessed include chlorophyll content, total soluble protein, reducing sugar, total phenolics, total flavonoids and ferric reducing antioxidant power (FRAP). The results of the study show that in both broad and slender leaves pumpkin varieties investigated, refrigeration and freezing for two weeks led to a significant decrease ($p < 0.05$) in their chlorophyll contents. Total chlorophyll a and b content in the preserved broad leaf pumpkin variety (BLP) decreased by an average of 49.12%, whereas the average percentage decrease in total chlorophyll a and b observed in the preserved slender leaf variety (SLP) was 79.01% compared to their respective fresh leaves controls. Refrigeration and freezing for two weeks also resulted in a significant decrease ($p < 0.05$) in total soluble protein and reducing sugar contents of both broad leaf (BLP) and slender leaf (SLP) varieties of pumpkin. However, the preservative methods did not significantly ($p > 0.05$) affect the level of phenolics in the broad leaf pumpkin variety, although it was significantly decreased in the slender leaf pumpkin variety preserved by refrigeration. There was no significant difference ($p > 0.05$) in flavonoid contents among the refrigerated, frozen and fresh leaves of the broad pumpkin leaf variety (BLP). However, the preserved slender pumpkin leaves variety (SLP) again suffered a significant decrease. Though the ferric reducing antioxidant power (FRAP) of broad leaf pumpkin variety (BLP) preserved by refrigeration (4°C) and freezing (-20°C) were slightly decreased by 20.9% and 16.1%, respectively, compared to their fresh broad leaf control, the decrease was not significant ($p > 0.05$). On the contrary, the FRAP of the preserved slender leaf pumpkin variety (SLP) was significantly decreased ($p < 0.05$) relative to their fresh slender leaf control. It could be inferred from the findings of this research that the broad leaf pumpkin variety (BLP) can be preserved by freezing (temperature -20°C) for a period of two weeks without any significant ($p > 0.05$) loss of its valuable phytochemicals and antioxidant capacity compared to the slender leaf pumpkin variety.

Key words: Pumpkin (*Telfairia occidentalis*) leaves, preservation, freezing, refrigeration, chlorophyll, phenols, flavonoids, free radicals scavenging activity.

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