SAAFoST
SOUTH AFRICAN ASSOCIATION for FOOD SCIENCE & TECHNOLOGY
CONGRESS 2021
Welcome to SAAFoST's 24th Biennial International Virtual Congress
20 – 22 September 2021

Impact of Household Cooking Techniques on Phenolic Compounds, Carotenoids and Antioxidant Capacity of *Momordica Balsamina* L. (African Pumpkin) Leaves

Petunia Mashiane, Vimbainashe Manhivi, Tinotenda Shoko, Retha Slabbert, Dharini Sivakumar

Tshwane University of Technology, Pretoria, South Africa

Abstract

It is known that traditional leafy vegetables contribute micronutrients and functional compounds to the diets of consumers and can be included in diet diversification to fight against hunger, food insecurity and malnutrition. Furthermore, traditional leafy vegetables constitute an abundant source of phytochemicals, which are antioxidants. The objective of this study was to evaluate the impact of different household cooking techniques on carotenoid components, total phenols and the antioxidant activity of the leaves of African pumpkin. The antioxidants and the antioxidant activities were quantified using the standard methods.

Microwaving increased the lutein content (60.24%) compared to raw and other cooking methods. Conversely, microwaving caused a significant loss of zeaxanthin by 50.8%, while stir-frying increased zeaxanthin content by 146.2% compared to raw and the other cooking methods. Stir-frying increased the β-carotene (117.02%), while boiling caused a loss of β-carotene (19.15%). Boiling resulted in the significant loss of total phenolic content by 71.18%, while steaming reduced the loss of total phenolic content by 36.84% compared to the raw leaves. Steamed leaves showed the highest FRAP (92.42 µmol TEAC/g), DPPH (IC_{50} 1.78 mg/mL) and ABTS (IC_{50} 0.78 mg/mL) activities compared to the other three cooking methods; however, boiling and microwaving reduced the FRAP, DPPH and ABTS activities compared to raw leaves.

Based on the results of the current study, a serving portion of stir-fried African pumpkin leaves may contribute 0.09% µg/day RAE for β-carotene for males, 0.12% µg/day RAE for females and 0.21% µg/day RAE for children. Consequently, the inclusion of African pumpkin leaves in daily diets will add benefits for consumers and investing in traditional leafy vegetables will play a pivotal role in the local economy through employment, improving the livelihoods of rural people and commercial revenue generation.

Biography: Petunia Mashiane

Petunia Mashiane is currently a PhD student at the Department of Crop Sciences under Phytochemical and Food Network, with an M-Tech qualification in Horticulture.