



ORANGE-FLESHED SWEET POTATO (OFSP): MINERAL COMPOSITION AND POTENTIAL FOR FOOD FORTIFICATION

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Abstract:

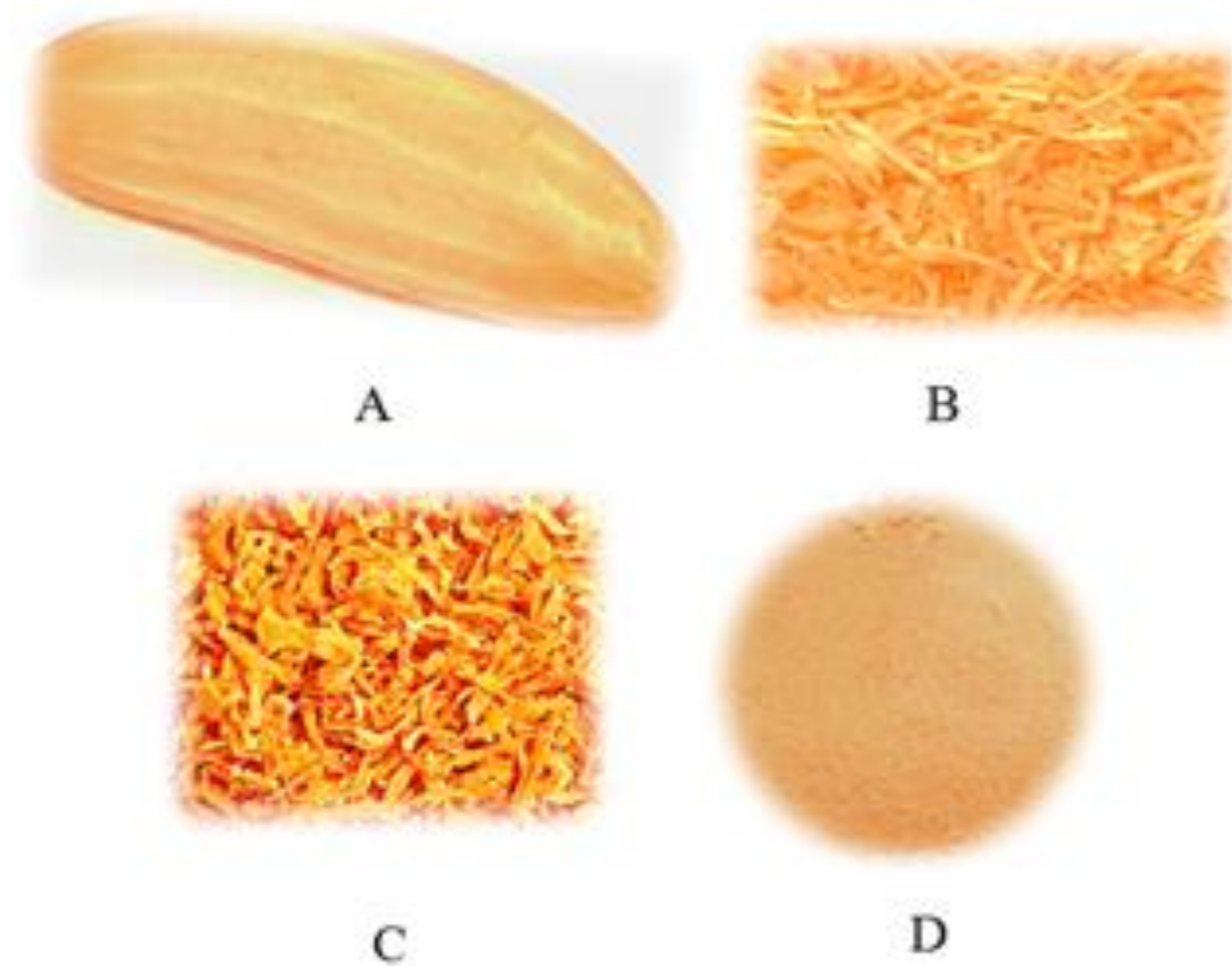
The study aims to determine the content of essential mineral elements in orange-fleshed sweet potato (OFSP) and to evaluate its contribution to dietary mineral intake. The contents (mg/100 g dry matter) varied as follows: Na (45.8–71.3), K (768–1422), Ca (68.6–130), Mg (57.8–91.7), Fe (3.86–9.07), Mn (1.95–3.76), Zn (2.11–5.02), and Cu (0.87–1.61). Consumption of 50 g of dehydrated OFSP covers 2.00% of the Na requirement, 16.71–21.85% of K, 5.33% of Ca, 9.15–17.18% of Mg, 18.95–42.65% of Fe, 58.99–75.37% of Mn, 16.18–22.25% of Zn, and 72.78% of Cu. The results highlight the potential of OFSP as a functional ingredient for mineral fortification of foods.

Introduction

Orange-fleshed sweet potato (OFSP, *Ipomoea batatas* L.) is recognized for its nutritional value, due to its high content of beta-carotene and essential mineral elements (K, Ca, Mg, Fe, Zn, Cu). It represents a promising option for food diversification and fortification. The aim of the study is to determine the content of Na, K, Ca, Mg, Fe, Mn, Zn, and Cu in locally marketed OFSP and to evaluate the associated mineral intake.

Material and methods

The samples (P1–P3), purchased from local retail outlets, were washed, peeled, chopped, dried at 55 ± 2 °C, and ground. The mineral content was determined by flame atomic absorption spectrometry.



Results and discussions

The mineral content varied depending on the supplier (Table 1.). Potassium was the predominant element (768–1422 mg/100 g DM), while sodium showed the greatest variability. Calcium and magnesium were present at moderate levels (107 and 76.9 mg/100 g DM, respectively). Trace elements ranged as follows: Fe (3.86–9.07), Mn (1.95–3.76), Zn (2.11–5.02), and Cu (0.87–1.61 mg/100 g DM), with maximum values frequently observed in sample P2. Consumption of 50 g of OFSP (Table 2) provides a low intake of Na and Ca, a moderate intake of K, Zn, and Mg, and a high intake of Mn and Cu; iron intake is higher for men than for women. The variability in composition highlights the influence of environmental and technological factors.

Conclusions

- The mineral content of OFSP varies significantly depending on the supplier, indicating the influence of environmental and technological factors on its composition.
- Potassium is the predominant mineral, while sodium exhibits the highest variability among samples.

Table 1. The distribution of some essential minerals in OFSP

Sample	Mineral content, mg/100g DM							
	Na	K	Ca	Mg	Fe	Mn	Zn	Cu
P1	45.8	768	68.6	57.8	3.86	1.95	2.11	0.87
P2	713	1422	130	91.7	9.07	2.43	5.02	1.61
P3	626	1218	121	81.2	7.54	3.76	3.55	1.45
Mean	59.9	1136	107	76.9	6.82	2.71	3.56	1.31

Table 2. Mineral intake (mean values) in the recommended daily diet, for men and women between 30-70 years corresponding to 50 g of dried OFSPs

Specification	Mineral intake, %							
	Na	K	Ca	Mg	Mn	Fe	Zn	Cu
Men	2.00	16.71	5.33	9.15	58.99	42.65	16.18	72.78
Women	2.00	21.85	5.33	17.18	75.37	18.95	22.25	72.78

- OFSP provides moderate levels of Ca and Mg and relatively low levels of Fe, Mn, Zn, and Cu, although considerable variability was observed among these minerals.
- The consumption of 50 g of OFSP contributes significantly to the intake of Mn and Cu, moderately to K, Zn, and Mg intake, but only minimally to Ca and Na intake.
- OFSP exhibits a favorable mineral profile; however, the variability among sources highlights the need for quality standardization to ensure optimal nutritional valorization.