Nutritional analysis of chickpeas and valorization of traditional varieties

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Introduction

Legume plants can play a key role in food security and human nutrition. Rich in protein, minerals, and vitamins, legumes are an excellent option for a balanced diet. They are also important for agriculture and the environment, being used for soil enrichment due to their ability to fix the atmospheric nitrogen.

Among the most consumed legumes worldwide, chickpeas (*Cicer arietinum*) has gained evidence in these past decades, both through increased individual production, as well as through intercropping with other crops, thus improving the resilience of agroecosystems.

Concurrently, the recovery of under-exploited traditional varieties could also contribute to the preservation of biodiversity and the promotion of the sustainability of agroecological systems. In view of the above, it is imperative to diversify agronomic systems with traditional genotypes productive and nutritious. However, the scarcity of data on the diversity of traditional chickpea varieties (*e.g. black chickpeas*) and their nutritional load limit the valorization of this legume, being the focus of this work.

Objectives

To value the chickpea crop by comparing the nutritional profile of two varieties of *C. arietinum* (a commercial variety of white chickpeas and a traditional variety of black chickpeas).

Methods

- Seeds of two varieties of *C. arietinum*: a commercial white chickpea variety and a traditional black chickpea variety.
- Mineral profiling: potassium - K, phosphorous - P, magnesium - Mg, calcium - Ca, iron - Fe, zinc - Zn, sodium - Na, manganese - Mn, copper - Cu, boron - B, nickel - Ni and molybdenum – Mo, evaluated by microwave acid digestion and Inductively coupled plasma - optical emission spectrometry.

Results and Discussion

Figure 1 – White/commercial chickpeas (Kabuli) and black/traditional chickpeas (Desi).

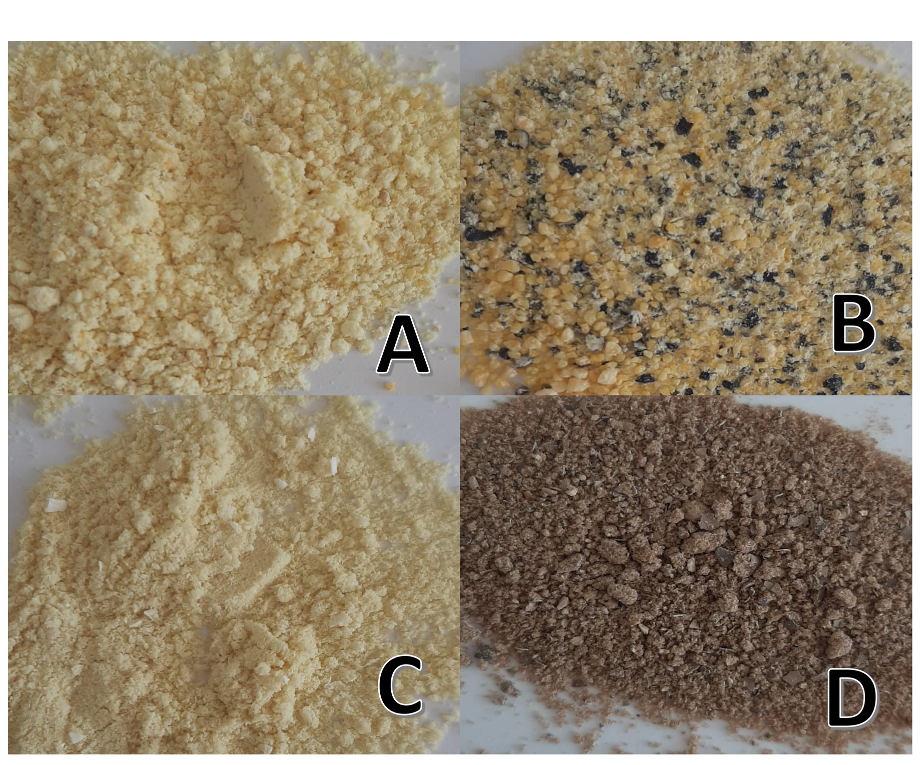

Figure 2 – Raw white chickpeas (A), raw black chickpeas (B), cooked white chickpeas (C) and cooked black chickpeas (D).

Raw grains of the **white** chickpea cultivar had **34 % more B** than the back cultivar, whereas the later had a significantly higher Na concentration (by 125 %).

Grain cooking significantly decreased N, Mn, B and Ni concentrations in the white variety (from 5 to 33 %), and Mo in the black one (by 89 %). After cooking, grains from the **black cultivar** had significantly **higher concentrations of N, Mg, Fe, Zn, Na and Mn** (from 5 to 90 %).

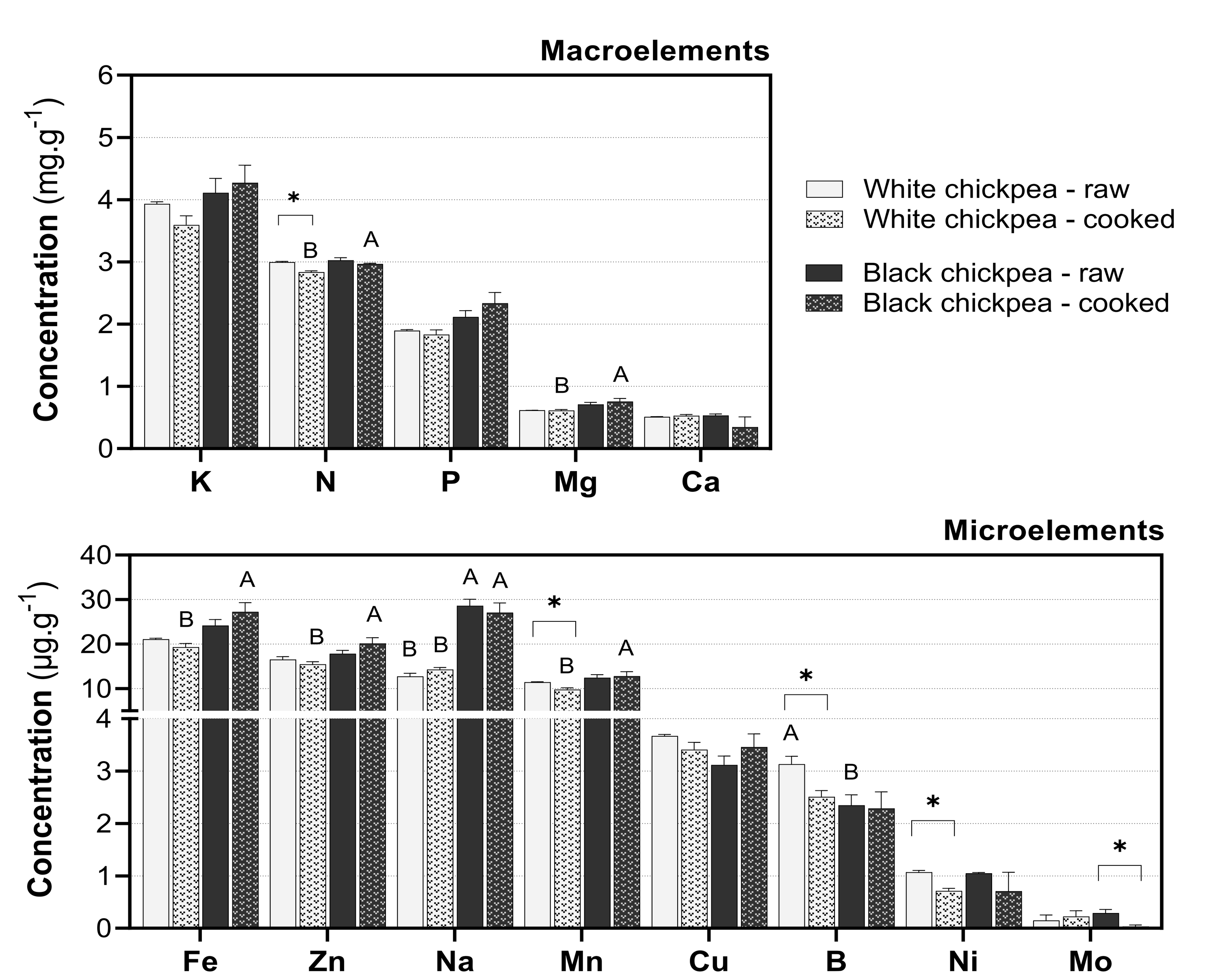

Figure 3 – Macro- and microelement profile of raw and cooked gains of chickpea varieties (white or black). Values represent the mean ± sem. Letters indicate statistically different means between varieties subjected to the same cooking procedure, while asterisks signify statistical differences between cooking procedures within each variety.

Conclusions

- ✓ The cooking procedure affects the mineral composition of chickpea, to a higher extend in the white cultivar.
- ✓ After cooking, the black chickpea delivers higher concentrations of macro- and microelements important for human nutrition (N, Mg, Fe, Zn and Mn).

Acknowledgments

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