



13-14 November 2025

A COMPARATIVE PERSPECTIVE BETWEEN CHENOPODIUM ALBUM AND ATRIPLEX HORTENSIS: PERCEPTION AND NUTRITIONAL VALUE

Mihaela Lăcătuș, Petruța-Elisabeta Andrei, Mariana-Atena Poiană*, Despina-Maria Bordean

Faculty of Food Engineering, University of Life Sciences "King Mihai I" from Timisoara, 300645 Timisoara, Calea Aradului Street 119,
Romania

*Corresponding author: marianoioana@usvt.ro

Abstract: Traditional leafy plants have long been part of local diets, valued for their adaptability and nutritional richness. This study compares *Atriplex hortensis* and *Chenopodium album*, focusing on their mineral composition and nutritional roles. Results indicate that *Atriplex hortensis* is richer in proteins and antioxidants, while *Chenopodium album* provides more vitamin C, minerals, and fiber. Historically, both served as supplementary foods - *A. hortensis* being cultivated, and *C. album* gathered from the wild. Today, both species are recognized as accessible, nutrient-dense plants that can support balanced, sustainable diets.

Introduction

1.1. Origins & Adaptability

- A. hortensis*: tolerant to salinity and drought.
- C. album*: wild, easily available species.
- Both adapt well to marginal soils.

1.2. Nutritional Composition

- A. hortensis*: rich in protein and antioxidants.
- C. album*: high in vitamin C, minerals, and fiber.

1.3. Antinutrients

- A. hortensis*: saponins - reduced by processing.
- C. album*: oxalates and phytates - lowered by boiling.

1.4. Traditional Use

- Used as leafy greens and in folk medicine.
- Traditional food sources enhancing diet diversity.

1.5. Consumer Perception

- C. album*: seen as a "wild edible weed."
- A. hortensis*: viewed as a cultivated, safe vegetable.

1.6. Modern Potential

- Local nutrient - and protein - rich crops.
- Suitable for sustainable agriculture.
- Can enrich modern, balanced diets.

Material and method

Data were gathered from scientific databases and articles reporting the nutritional and mineral composition of *Chenopodium album* and *Atriplex hortensis*. Only studies with quantitative and comparable results were included. Nutritional parameters (protein, fat, carbohydrates, minerals, etc.) were standardized to common units (g/100 g or mg/100 g). Statistical evaluation and correlation analysis were performed using MVSP 3.22 software.

Results and discussions

To achieve the study objectives, data from scientific literature were compiled into a comparative table (Table 1) and visualized through graphs (Figures 1–3). Figure 1 shows nutrient distribution differences between *Atriplex hortensis* and *Chenopodium album*, with the former richer in minerals and the latter more balanced in macronutrients. Figure 2 presents relative percentages for clearer proportional comparison by plant part and data source. Figure 3 displays cluster analysis, illustrating similarities and relationships among nutritional and mineral parameters. Together, these visuals highlight the complementary nutritional potential of the two species.

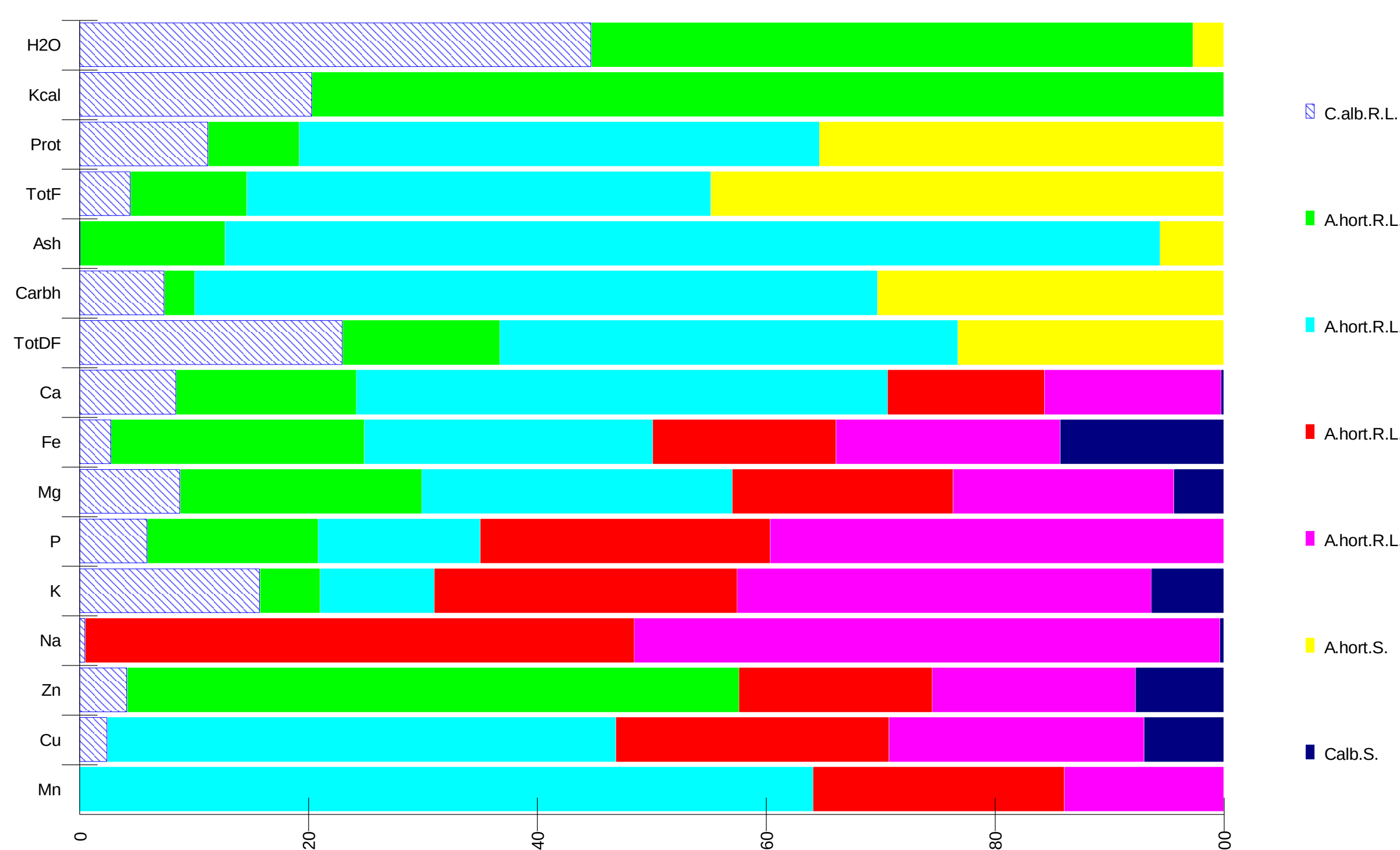


Figure 1. Comparative differences in the nutritional and mineral composition between *Chenopodium album* and *Atriplex hortensis*

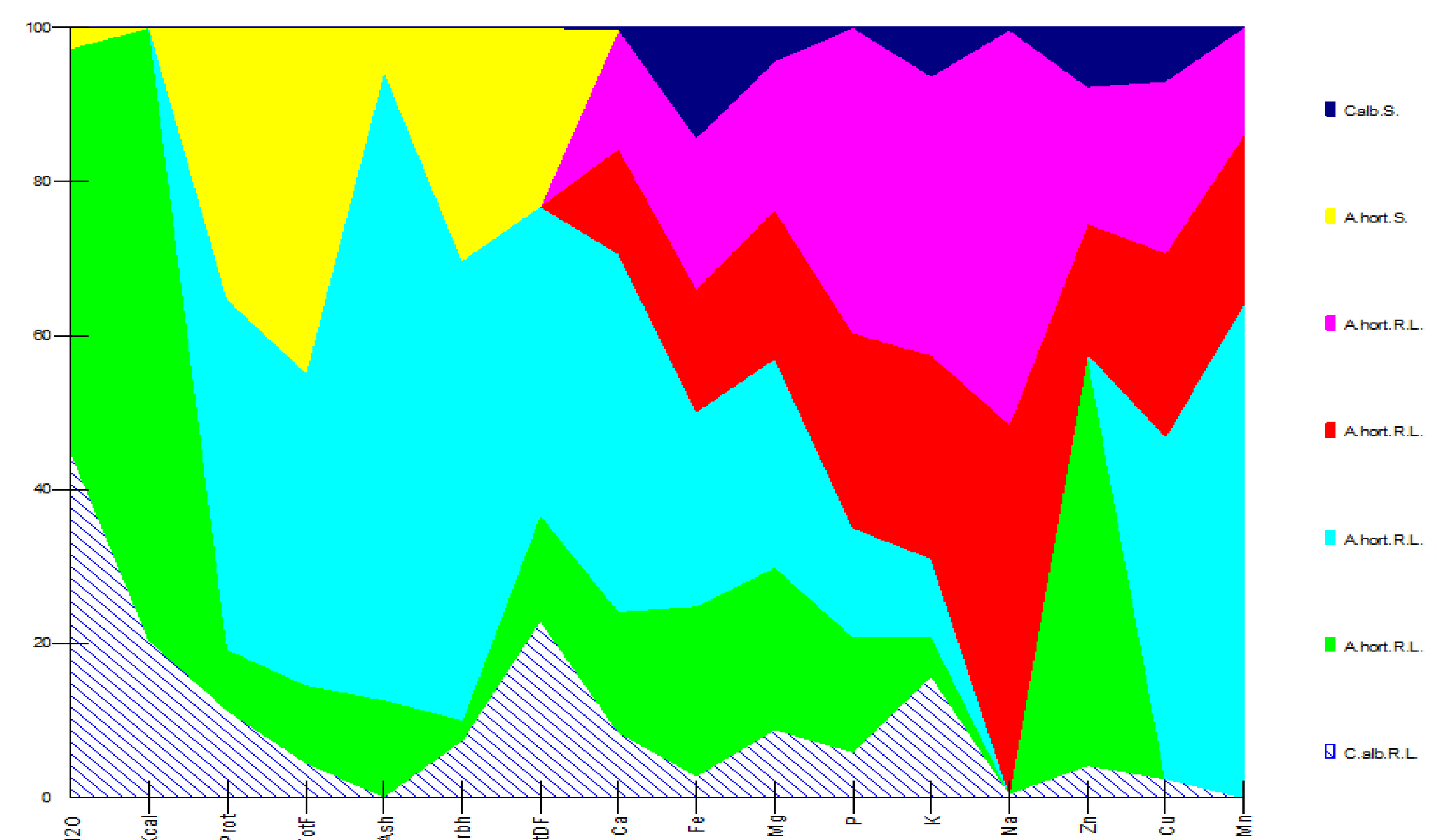


Figure 2. Distribution of macro- and microelements among *Atriplex hortensis* and *Chenopodium album*

Legend: C.alb.R.L.= *Chenopodium album* raw leaves; A.hort.R.L.= *Atriplex hortensis* raw leaves; A.hort.S.= *Atriplex hortensis* seeds; C.alb.S.= *Chenopodium album* seeds; H2O = Water; Kcal = Energy; Prot = Protein; TotF = Total fat lipid; Ash = Ash; Carbh = Carbohydrate; TotDF = Total dietary fiber; Ca = Calcium; Fe = Iron; Mg = Magnesium; P = Phosphorus; K = Potassium; Na = Sodium; Zn = Zinc; Cu = Copper; Mn = Manganese.

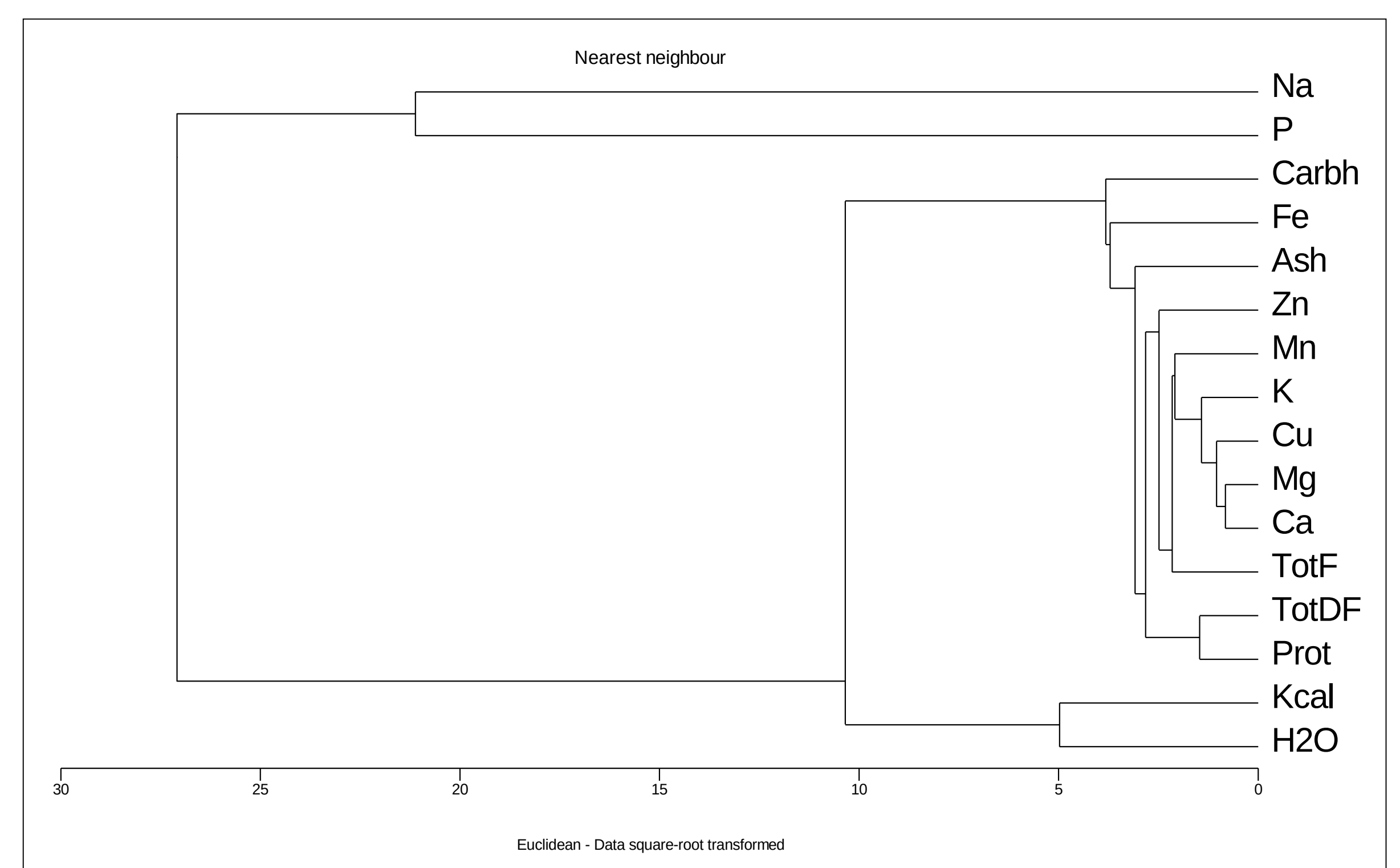


Figure 3. Compositional similarities among nutritional factors based on cluster analysis

Conclusions

Chenopodium album and *Atriplex hortensis* show distinct yet complementary nutritional profiles. *A. hortensis* is richer in key minerals (K, Mg, Ca), while *C. album* provides more carbohydrates and moisture, supporting energy and hydration. Combined use could yield a balanced, nutrient-dense food source with functional and sustainable potential. Both species stand out for their adaptability and local availability, aligning with goals of resilient and eco-friendly nutrition. Future research should quantify antinutrients (oxalates, phytates, saponins) and explore processing methods to reduce their effects while preserving nutritional quality.

Acknowledgement: Acknowledgments This study was funded by the University of Life Sciences "King Mihai I" from Timisoara and the results will be included in the PhD Thesis of Mihaela Lăcătuș.