BIOCHEMICAL CHARACTERIZATION OF BEETROOT VARIETIES

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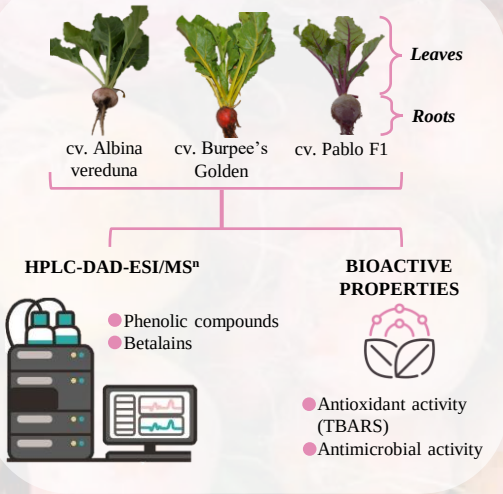
Introduction

Beta vulgaris L. subsp. *vulgaris*, commonly known as beetroot, is a vegetable species widely recognized for its fleshy taproots. The roots are very nutritious, with sucrose content being particularly notable among other essential macronutrients. Conversely, the leaves of beetroot are less commonly consumed raw or cooked in salads [1, 2].

Objective

The aim of this study was to assess the biochemical composition of the leaves and roots from three beetroot cultivars with different root colors (cv. Albina Vereduna, cv. Burpee's Golden and cv. Pablo F1).

Methodology



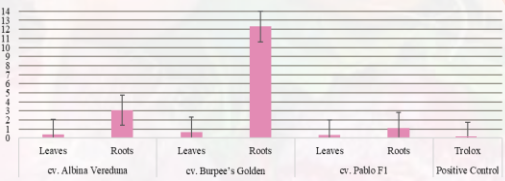


Figure 1. Antioxidant activity of the hydroethanolic extracts (mean ± SD, n = 3).

Results and Discussion

Nineteen phenolic compounds were identified in the leaves, including derivatives of vitexin, isorhamnetin and quercetin, as well as derivatives of ferulic, sinapic and *p*-coumaric acids, with the total phenolic compounds content ranging from 23.2 to 34.3 mg/g of extract. The roots had a lower content of total phenolic compounds (0.130 to 0.150 mg/g of extract), including 8 individual compounds, which all were derived from ferulic, sinapic, *p*-coumaric and caffeic acids. A total of 6 betacyanins were identified in leaves and roots of the red beetroot (cv. Pablo F1), with the prevalence of decarboxy-isobetanin (1.29 to 18.18 mg/g dw, respectively). The roots of cv. Burpee's Golden demonstrated the presence of one betaxanthin, e.g. miraxanthin-V (0.140 mg/g dw). Leaves exhibited superior antioxidant capacity **(Figure 1)**, as revealed by the TBARS assay, and all samples demonstrated significant antibacterial activity, particularly against *S. aureus*, *L. monocytogenes*, and *Y. enterocolitica*. Leaves stood out in terms of both chemical and biological properties evaluated.

Conclusion

In conclusion, while beetroot is more widely recognized for its roots, its often-undervalued leaves could be further valorized as a nutritious ingredient in a balanced and diverse diet, promoting more sustainable eating practices and the circular economy concept.

References
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This work is aligned with Goal 12 of the Sustainable Development Goals (SDGs) as it promotes the valorization of beet leaves as a nutritionally and chemically rich food, disseminating the potential benefits of this often-undervalued ingredient, reducing waste generation and promoting more sustainable consumption practices and circular economy.

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