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Wine Lees from Autochthonous Grape Varieties as a Source of Value-Added Ingredients: Initial Compositional and Antioxidant Characterisation

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Background: Wine lees are a substantial yet underexplored and underutilised by-product of the wine industry, particularly compared to grape pomace and seeds, which have well-established valorisation pathways. Within the circular bioeconomy framework, their utilisation as a source of proteins and bioactive compounds represents a promising strategy for waste reduction and the development of value-added ingredients. However, the nutritional and functional potential of wine lees, especially those derived from autochthonous grape varieties, remains insufficiently characterised.

Aims: This study aimed to assess the nutritional composition and antioxidant potential of wine lees obtained from autochthonous grape varieties of the Vojvodina region (Grašac and Probus), with emphasis on inter-varietal differences and their relevance for sustainable valorisation.

Methods: Wine lees from the autochthonous varieties Grašac and Probus were analysed for proximate composition, mineral content, and amino acid profile. Phenolic composition was evaluated through total phenolic content (TPC), total flavonoid content (TFC), and total anthocyanins, alongside detailed phenolic profiling. Antioxidant activity was assessed using DPPH and ABTS radical scavenging assays.

Results: Both samples exhibited notable nutritional potential, primarily due to their protein content and favourable amino acid composition. The lees were also rich in phenolic compounds, with distinct differences between Grašac (white) and Probus (red) in total phenolics, flavonoids, and anthocyanins. These compositional differences were reflected in antioxidant activity, with Probus demonstrating higher radical scavenging capacity. Overall, the findings highlight wine lees from autochthonous varieties as a promising source of bioactive compounds for functional food applications.

Conclusions: Wine lees from the autochthonous grape varieties Grašac and Probus represent a valuable yet underutilised resource, characterised by significant protein and phenolic content. Their valorisation is consistent with circular bioeconomy principles and supports the development of sustainable food systems through the production of value-added functional ingredients.

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