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From Wine Byproduct to Sourdough: The Functional Potential of Grape Pomace

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Abstract:

This study characterized the biochemical composition and native microbiota of grape pomace from six varieties to assess their potential for functional sourdough production. HPLC and GC-MS analyses revealed cultivar-dependent sugar and phenolic profiles, with linoleic acid exceeding 60% of fatty acids. Phenotypic identification detected non-*Saccharomyces* yeasts and lactic acid bacteria, including *Lactiplantibacillus plantarum*. These findings support further investigation of grape pomace as a sustainable fermentation substrate.

• Introduction

Grape pomace = wine by-product

Contains sugars, fibre, lipids and phenolics

Carries native LAB and non-*Saccharomyces* yeasts

Aim: evaluate for functional sourdough fermentation potential

• Material and methods

Grape varieties

- TR - Tămâioasă Românească
- FA - Fetească Albă
- VO - Viță de Othello
- FN - Fetească Neagră
- MH - Muscat de Hamburg
- MB - Muscat Bleu

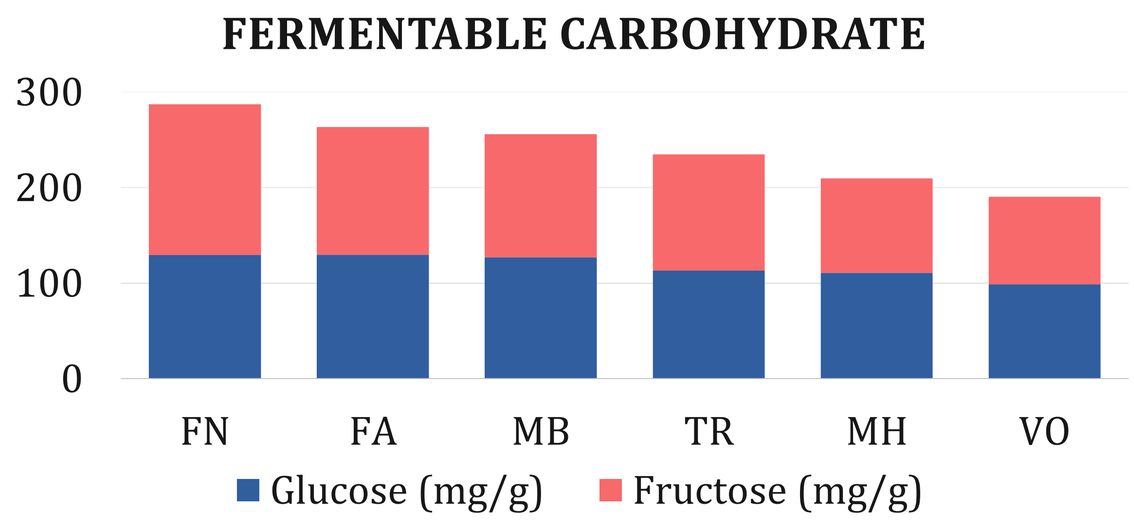
Methods

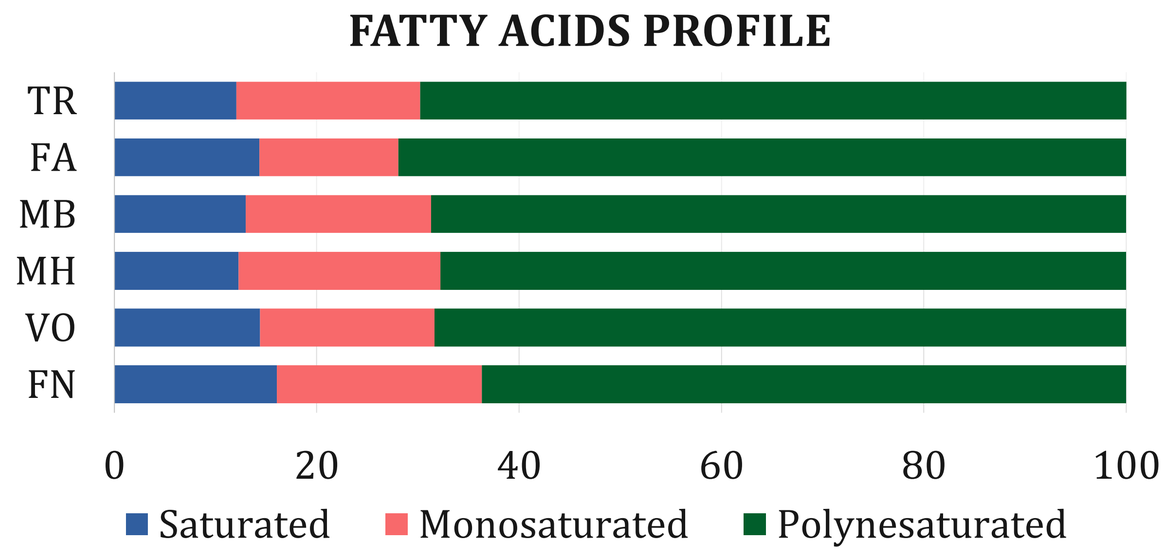
Microbiological analyses
Yeasts — API 20 C AUX
LAB — API 50 CHL

Physicochemical analyses
Protein , Crude fibre , Ash , Total lipids

Chromatographic analyses
Carbohydrates — HPLC-RID
Phenolics — HPLC-DAD/MS
Fatty acids — GC-MS

• Results and discussions





Variety	Protein	Crude fibre	Ash	Total lipids
TR	6.4	31.28	2.53	9.14
FA	6.12	20.15	3.22	5.74
VO	6.08	21.55	2.96	6.15
FN	5.7	19.72	3.01	5.18
MH	5.38	20.84	2.91	6.21
MB	4.29	22.72	4.32	4.81

Yeasts

- *Candida lusitaniae*
- *Cryptococcus laurentii / C. albidus*
- *Kloeckera* spp.

LAB

- *Lactiplantibacillus plantarum*
- *Lacticaseibacillus paracasei*
- *L. rhamnosus*

• Conclusions

Grape pomace provides a nutrient-rich matrix capable of supporting sourdough maturation, while cultivar composition strongly influences native microbial development.

The identified consortium offers complementary metabolic potential. However, slow gas production and intense proteolysis support evaluating a hybrid strategy combining native microbiota during maturation with Saccharomyces cerevisiae for final proofing.