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Selection of *Saccharomyces cerevisiae* strains for application in the fermentation and production of Arbutus-berry brandy

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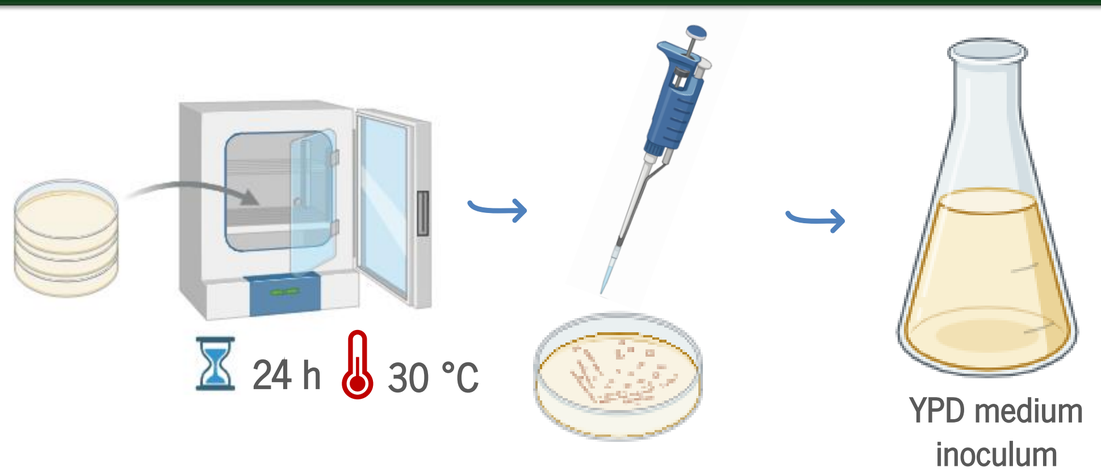
INTRODUCTION & AIM

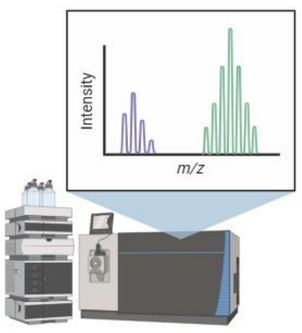
Arbutus-berry brandy is a traditional Portuguese distillate that plays a significant role in the regional economy (Cavaco *et al.*, 2007). At present, the fermentation of arbutus-berry (*Arbutus unedo L.*) occurs spontaneously, resulting in inconsistency in the quality of the final product (Santo *et al.*, 2012). In previous studies, a total of 65 strains of *Saccharomyces cerevisiae* isolated from arbutus-berry pulp (Abp) were evaluated using high-throughput methods based on 24 phenotypic tests. This approach enabled the selection of 10 strains, each exhibiting a unique profile.

This study aimed to characterize *S. cerevisiae* strains isolated from naturally fermented arbutus-berry pulp by evaluating their fermentation capacity by CO_2 production and sugar's consumption during Abp fermentation. The objective is to select strains with the potential to carry controlled Abp fermentations and a final product with quality consistency.

METHODS



CO_2 production measured by daily weigthing of flask cultures



High performance liquid chromatography (HPLC) and analysis of chromatograms

RESULTS

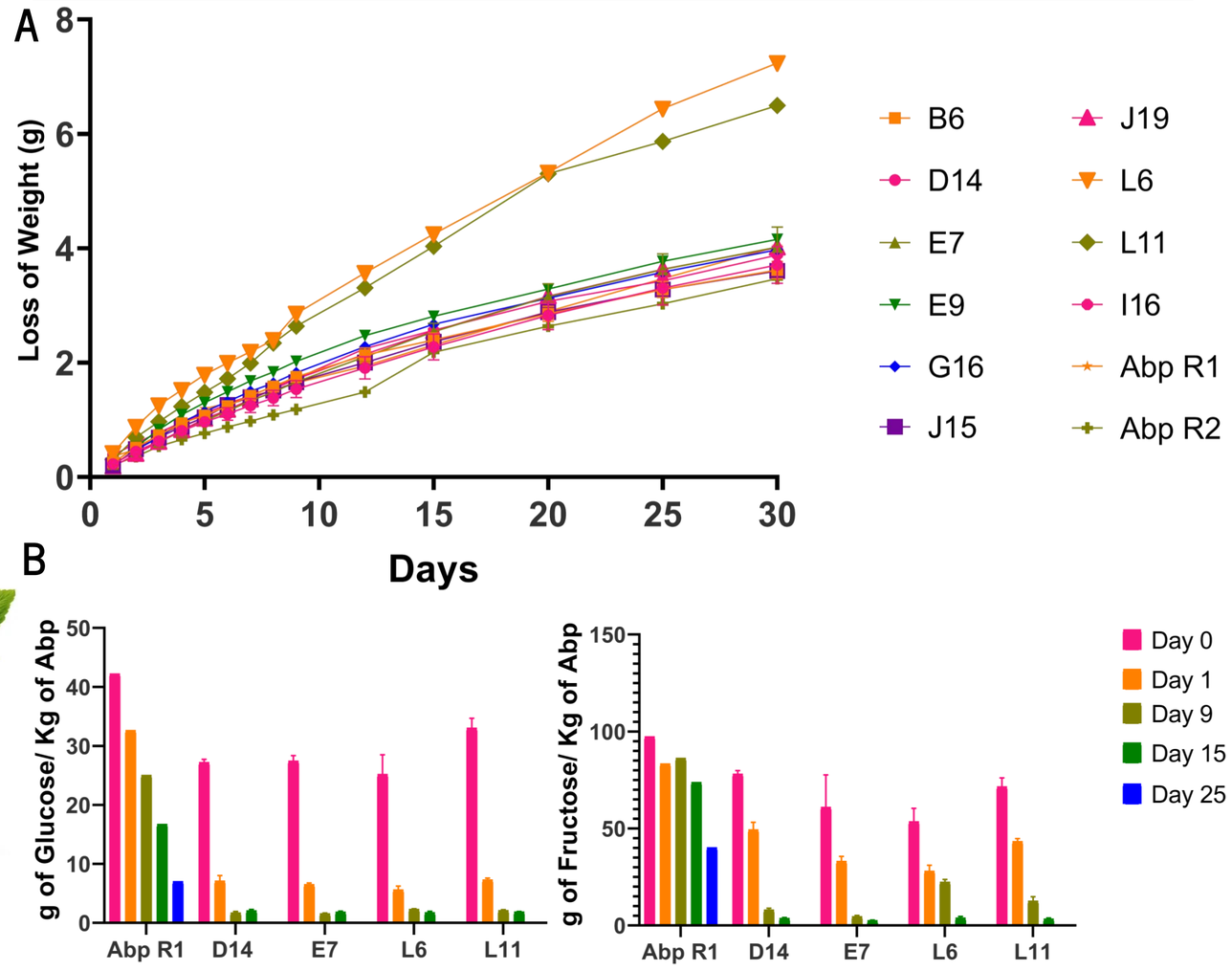


Figure 1. (A) Weight loss (g) along 30 days fermentation of arbutus-berry pul (Abp) by ten *S. cerevisiae* isolates (B6, D14, E7, E9, G16, I16, J15, J19, L6 and L11), and along control Abp fermentation (two replicas, R1 and R2) as a measure of CO_2 production/fermentation capacity; (B) Glucose and fructose consumption (g/Kg of Abp) by D14, E7, L6, L11 isolates, and along a control fermentation R1.

DISCUSSION/CONCLUSIONS

The analysis of weight loss over time reveals that yeast strains **L6** and **L11** exhibited a higher fermentation capacity measured by **CO_2** production compared to the other isolates, associated with a similar consumption of glucose by the 4 isolates but a slower consumption of fructose by **L6** and **L11** at day 9, which resulted in a faster fermentation process. With regard to the sugars analyzed, it was found that fructose was present in greater quantities in the Abp, but that glucose was the preferred.

To conclude, the present study revealed that **L6** and **L11** isolates are potential candidates to carry a controlled fermentation for the industrial production of arbutus-berry brandy.

REFERENCES

Santo, D. E., Galego, L., Gonçalves, T., & Quintas, C. (2012). Yeast diversity in the Mediterranean strawberry tree (*Arbutus unedo L.*) fruits' fermentations. Food Research International, 47(1), 45–50. https://doi.org/10.1016/j.foodres.2012.01.009

Cavaco, T., Longuinho, C., Quintas, C., & De Carvalho, I. S. (2007). Chemical and microbial changes during the natural fermentation of strawberry tree (*Arbutus Unedo L.*) fruits. Journal of Food Biochemistry, 31(6), 715–725. https://doi.org/10.1111/j.1745-4514.2007.00138.x

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