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Innovative Potential of New *Lachancea thermotolerans* Strains in Winemaking

Alberto Martínez[1], Ofelia Asensio[1], María Luz Álvarez[2], Pedro Antonio Cotilla[2], Manuel Álvarez-Rangel[3], Luis Miguel Hernández[1], Manuel Ramírez[1]

1. Área de Microbiología. Depto de Ciencias Biomédicas. Facultad de Ciencias. Universidad de Extremadura. Avda. de Elvas s/n. 06006-Badajoz. España.

2. Estación Enológica, Junta de Extremadura, 06200 Almendralejo (Badajoz) España.

3. Heral Enología, S.L. 06200 Almendralejo (Badajoz), España.

INTRODUCTION & AIM

The yeast *Lachancea thermotolerans* (*Lt*) is significant in winemaking due to its ability to produce L (D)-lactic acid, aiding in biological acidification and pH reduction. As a consequence of climate change, the increase in environmental temperature has a significant impact on grape ripening, reducing the acidity of musts and wines. The aim is to isolate, characterize, and select new strains of this yeast capable to effectively increase acidity under the stressful conditions of wine fermentation.

METHOD

New strains were isolated from naturally fermenting fruits and assessed for winemaking. Their physiological and fermentative characteristics were examined in various environments. Fermentation trials with synthetic must, synthetic base wine, and grape must showed that fermentation capacity, lactic acid production, and survival depended on the yeast strain and environmental conditions.

Figure 1. Fruits with synthetic must in Falcon tubes to isolate yeasts (**A**). Synthetic must, synthetic base wine and grape must fermentations with the new isolated yeasts (**B**).

RESULTS & DISCUSSION

Adding different concentrations of tartaric and sulphurous acids affected yeast viability and acidification ability. Treatment with 1 g/L tartaric acid and 50 mg/L metabisulfite resulted in the highest yeast dominance during fermentation. Increased concentrations proved toxic, causing the disappearance of viable yeast by the seventh day. Wines made with *L. thermotolerans* had 1% less alcohol but worse organoleptic characteristics and less aromatic complexity than control wines. They also displayed an imbalance due to high acidity and low pH. *Lt* A57 and *Lt* A391 showed the best fermentation kinetics (Figure 2).

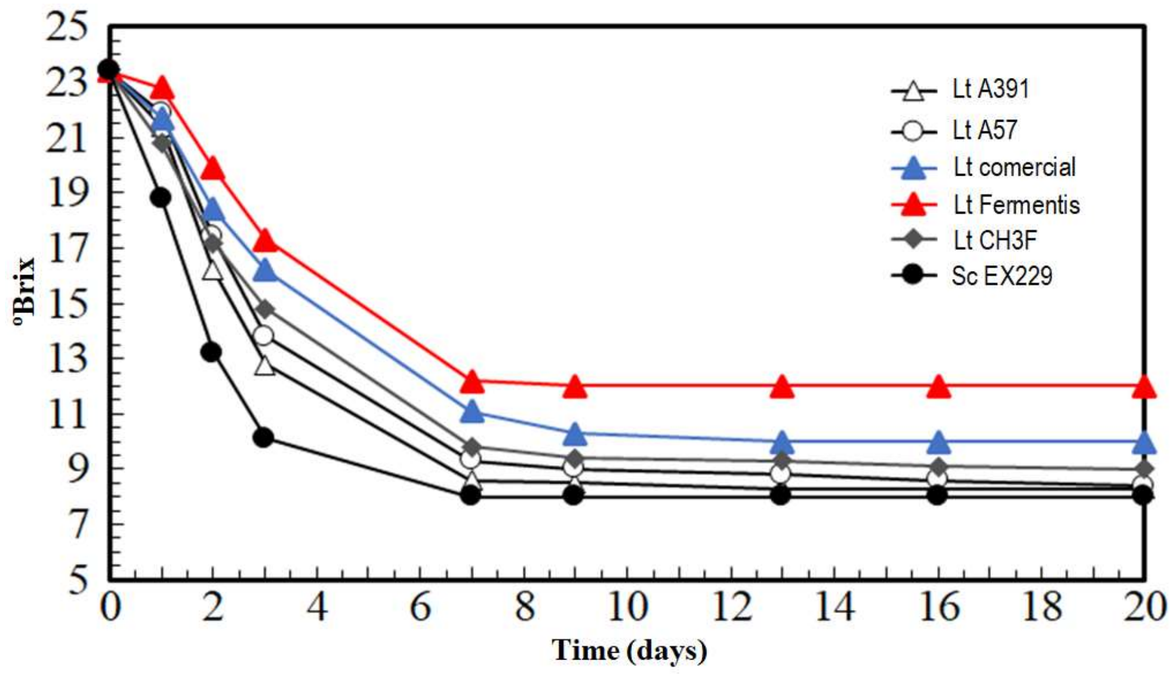

Figure 2. Fermentation kinetics of various *L. thermotolerans* yeasts inoculated in synthetic must with 1 g/L tartaric acid and 50 mg/L metabisulfite.

Grape must vinifications were done with these two selected strains. The resulting wines showed high production of lactic acid and lowering of pH (Table 1).

yeast	pH	lactic acid (g/L)	Notes
Wine Control	3.76	0.01	84
Lt A57	3.24	8.45	94
Wine Control	3.75	0.17	60
Lt A391	3.53	4.36	80

Table 1. pH results, lactic acid production, and tasting notes of the resulting inoculated wines. Wine control was inoculated with *S. cerevisiae*.

CONCLUSION

The new *Lt* strains show potential for winemaking, especially for biological acidification. Further research is needed to improve the organoleptic and aromatic qualities of their wines. Additionally, optimizing fermentation conditions and mixing with wines made with *S. cerevisiae* could enhance the overall quality and acceptance of wines produced with *Lt* strains.

FUTURE WORK / REFERENCES

Morata, A., et al. 2019. Lachancea thermotolerans as a tool to improve PH in red wines from warm regions. *European Food Research and Technology* 245 (4):885–94.