Antioxidant activity of indigenous yeasts isolated during the fermentation of table olives from Northeast Portugal

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Introduction and Objective

Yeasts have an important role in fermented foods, including table olives. These microorganisms can be a new source of natural antioxidants. Free-radical-scavenging antioxidants have potential as protective agents against various degenerative diseases caused by oxidative damage. It is believed that the antioxidant activity of yeast is mainly due to the high content of (1,3)-β-D-glucan and other β-glucans found in the cell wall (Abbas, 2006; Jaehrig et al, 2007) and like other cellular compounds, such as some antioxidant enzymes, namely, superoxide dismutase, glutathione peroxidase and catalase (Chen et al., 2010).

In Trás-os-Montes region (Portugal), there are an important PDO table olives, namely "Negrinha de Freixo" (Fig. 1).

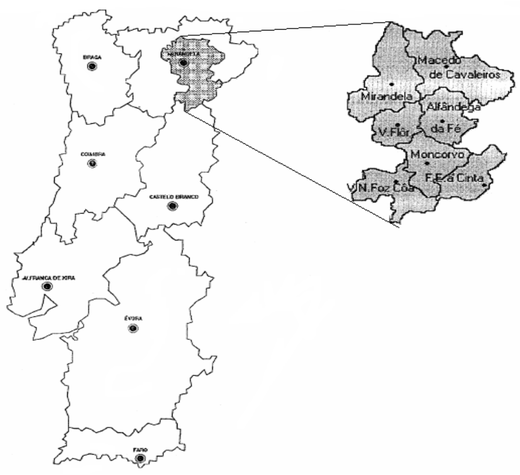

Fig.1 Geographic distribution of "Negrinha de Freixo" PDO table olives in Trás-os-Montes region, Portugal

Objective: Evaluate the antioxidant activity of indigenous yeasts isolated during the natural fermentation of table olives (Negrinha de Freixo cv.).

Material and Methods

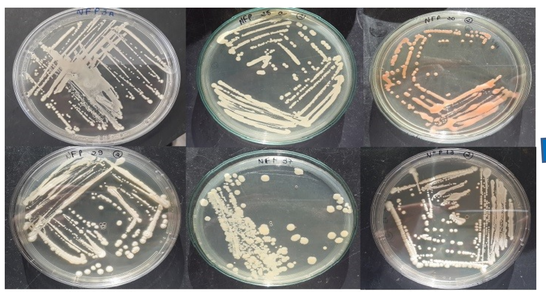

Fig. 2 - Macroscopic aspect of yeast's colonies

The isolates were previously identified by rDNA sequences of the ITS region.

The studied strains are included in the genera: *Saccharomyces, Candida, Pichia, Debaromyces* and *Galactomyces*.
Saccharomyces boulardii was included as probiotic reference strain.

The antioxidant activity was evaluated by the percentage of scavenging of 1,1-diphenyl-2-picrylhydrazyl free radical (DPPH) (Fig. 3).

Fig. 3 - DPPH solution after 30 min in the dark. The first tube corresponded to the blank and the others to samples.

The percentage of scavenging of DPPH was calculated as follows:

$$\text{DPPH scavenging activity (\%)} = \left(1 - \left(\frac{A_{517\,(sample)}}{A_{517(blank))}}\right)\right) x100$$

Results

Table 1 - Antioxidant activity of the yeast strains (mean ± standard deviation). Different letters indicate statistically significant differences ($p < 0,05$) by Tukey test.

Species	Reference	DPPH reduction activity
Saccharomyces boulardii		16.22 ± 3.50[a]
Saccharomyces cerevisiae	15B	18.34 ± 2.24[a]
Saccharomyces cerevisiae	15A	16.47 ± 3.44[a]
Candida tropicalis	1A	8.48 ± 2.16[b]
Candida tropicalis	3A	7.85 ± 0.76[b]
Galactomyces reessii	33A	8.14 ± 1.72[b]
Pichia guilliermondii	25A	7.92 ± 2.15[b]
Candida norvegica	7A	6.57 ± 0.85[b]
Debaromyces hansenii	8A	4.41 ± 1.95[b]
Candida boidinii	37A	3.52 ± 0.88[b]
Candida boidinii	32A	2.55 ± 3.45[b]

- All strains showed distinct antioxidant activity (Table 1).
- Strains 15A and 15B (*S. cerevisiae*), isolated from the pulp in contact with the brine, showed significantly higher ability to scavenge DPPH radical ($p < 0.05$) than the other strains analyzed.
- The values of *S. cerevisiae* were similar to those of *S. boulardii,* considered a probiotic strain.

Conclusion

The ability to scavenge DPPH radical indicated that *S. cerevisiae* isolated from table olives may be a promising candidate strain for use as probiotics with antioxidant activity.

References:

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