

# Antioxidant activity from inactivated yeast: Expanding knowledge beyond the glutathione-related oxidative stability of wine

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## Abstract

Maintaining wine oxidative stability during barrel ageing and shelf life storage remains a challenge. This study evaluated the antioxidant activities of soluble extracts from seven enological yeast derivatives (YDs) with increased glutathione (GSH) enrichment. YDs enriched in GSH appeared on average 3.3 times more efficient at quenching radical species than YDs not enriched in GSH. The lack of correlation (Spearman correlation  $\rho = 0.46$ ) between the GSH concentration released from YDs and their radical scavenging activity shed light on other non-GSH compounds present. After 4-methyl-1,2-benzoquinone derivatization, UHPLC–Q-ToF MS analyses specifically identified 52 nucleophiles potentially representing an extensive molecular nucleophilic fingerprint of YDs. The comparative analysis of YD chemical oxidation conditions revealed that the nucleophilic molecular fingerprint of the YD was strongly correlated to its antiradical activity. The proposed strategy shows that nucleophiles co-accumulated with GSH during the enrichment of YDs are responsible for their antioxidant activities.

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