

PHYSICOCHEMICAL CHARACTERIZATION AND ANTIRADICAL ACTIVITY OF MOLDOVAN DRY RED WINES: A CORRELATION STUDY

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Abstract. The physicochemical properties, phenolic composition, and antiradical activity of eight Moldovan dry red wines have been investigated to identify the key determinants of their radical scavenging capacity. The results revealed considerable variability in basic physicochemical parameters, phenolic compounds and antiradical activity among the samples, yet remaining compliant with the standards for dry red wines. Total phenolic content varied between 1.40 and 2.27 g GAE/L, with the highest values recorded in Gamay (Beaujolais), Codrinschii, and Saperavi wines. Gamay (Beaujolais) exhibited the highest anthocyanin content (1.256 g M3GE/L) and antiradical activity (1.94 g AAE/L), while Codrinschii wine showed the greatest proanthocyanidin content (0.36 g CE/L). The antiradical activity correlated most strongly with the total phenolic content ($R^2= 0.9854$), highlighting its primary role in the radical scavenging capacity of red wines. Anthocyanins ($R^2= 0.5739$), proanthocyanidins ($R^2= 0.4717$) and free SO₂ ($R^2= 0.4216$) also contributed to antiradical activity, showing moderate linear relationships. General compositional parameters, including sugars, titratable acidity, pH, and volatile acidity, showed only weak correlations ($R^2 < 0.20$).

Keywords: red wine, phenolic compounds, antiradical activity, DPPH^{*}, correlation study.

Received: 14 November 2025/ Revised final: 28 April 2026/ Accepted: 30 April 2026
