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 were 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. Come Bojole and Saperavi wines exhibited the highest total phenolics (2.27 and 1.96 g GAE/L) and anthocyanin levels (1.256 and 0.681 g M3GE/L), while Codrinschii showed the highest proanthocyanidin content (0.36 g CE/L). Come Bojole wine demonstrated the greatest DPPH radical scavenging activity (1.94 g AAE/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) and proanthocyanidins (R^2= 0.4717) also contributed to antiradical activity, but to a lesser degree. Moreover, other chemical parameters such as sugar content and pH were positively associated with antiradical potential, while titratable acidity had a negative influence.

Keywords: red wine, phenolic compound, antiradical activity, DPPH$^{\bullet}$, correlation study.