

Evaluation of Tunisian olive oils from different cultivars

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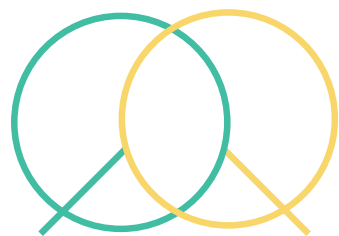
Olive oil is a highly appreciated food product due to sensory and healthy attributes, being quite prone to frauds. So, physicochemical evaluation of olive oils is legally required. In this study, 43 olive oil samples produced in Tunisia from different olive cultivars (groups: Sahli cv – 11 samples; Chetoui cv- 26 samples; and, Other cvs – 4 samples including Leguim cv and Arbequina cv) were physicochemically evaluated taking into account: (i) free acidity (FA), K_{232} and K_{270} extinction coefficients, ΔK , and, peroxide values (PV), required for quality level classification (i.e., extra-virgin, virgin and lampante olive oil: EVOO, VOO and LOO); and (ii) other useful data for olive oil overall characterization (total phenols (TP); antioxidant capacity (DPPH); and, oxidative stability (OS)). Based on the levels found for FA, PV and extinction coefficients (K_{232} , K_{270} and ΔK), the 43 olive oils were classified as: EVOO (4 samples), VOO (5 samples) and LOO (33 samples). It was verified that TP, DPPH and OS levels of EVOO, VOO and LOO samples were statistically similar (P -value ≥ 0.2340 for one-way ANOVA). Also, the olive cultivar (i.e., Sahli cv, Chetoui cv and other cvs) did not statistically influenced the mean levels of the FA, PV, TP, K_{232} and DPPH evaluated (P -value > 0.05), and slightly influenced the mean levels of K_{270} and OS (P -value < 0.05). Finally, as expected an almost linear tendency could be established between DPPH and OS or TP. The possibility of using the 8 physicochemical parameters for classifying olive oils according to cultivar; as well as TP, DPPH and OS for differentiating among olive oil quality levels was assessed through a fusion physicochemical data-chemometric tools approach and further evaluated using a repeated K-fold cross-validation procedure. The results from the linear discriminant analysis (LDA) coupled with a simulated annealing (SA) variable selection algorithm pointed out that the physicochemical data evaluated did not possess the aimed discrimination potential (sensitivities around 80% for cross-validation). So, for these olive oils, the identification of potential putative markers for the recognition of olive oil cultivar and quality level must be performed. Alternatively, the potential use of other analytical procedures like electrochemical analysis should be evaluated considering the satisfactory results already achieved by the research team [1].

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