

## Quality Evaluation of Grape Seed Oils of the Ionian Islands Based on GC-MS and Other Spectroscopic Techniques

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**Abstract :** Grape seeds are waste products of wineries and often referred to as an important agricultural and industrial waste product with the potential to be used in pharmaceutical, food, and cosmetic applications. In this study, grape seed oil from traditional Ionian varieties was examined for the determination of the quality and the characteristics of each variety. Initially, the fatty acid methyl ester (FAME) profiles were analyzed using Gas Chromatography-Mass Spectrometry, after transesterification. Furthermore, other quality parameters of the grape seed oils were determined by Spectroscopy techniques, UV-Vis and Raman included. Moreover, the antioxidant capacity of the oil was measured by 2,2'-azino-bis-3-ethylbenzothiazoline-6-sulfonic acid (ABTS) and 2,2-Diphenyl-1-picrylhydrazyl (DPPH) assays and their antioxidant capacity expressed in Trolox equivalents. K and  $\Delta$  indices were measured in 232, 268, 270 nm, as an oil quality index. The results indicate that the air-dried grape seed total oil content ranged from 5.26 to 8.77% w/w, which is in accordance with the other grape seed varieties tested in similar studies. The composition of grape seed oil is predominated with linoleic and oleic fatty acids, with the linoleic fatty acid ranging from 53.68 to 69.95% and both the linoleic and oleic fatty acids totaling 78-82% of FAMEs, which is analogous to the fatty acid composition of safflower oil. The antioxidant assays ABTS and DPPH scored high, exhibiting that the oils have potential in the cosmetic and culinary businesses. Above that, our results demonstrate that Ionian grape seed oils have prospects that can go further than cosmetic or culinary use, into the pharmaceuticals industry. Finally, the reclamation of grape seeds from wineries waste stream is in accordance with the bio-economy strategic framework and contributes to environmental protection.

**Keywords :** antioxidant capacity, fatty acid methyl esters, grape seed oil, GC-MS

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