

## Supplementary Materials

Article

# Volatile Aroma Compounds of Brandy ‘Lozovača’ Produced from Muscat Table Grapevine Cultivars (*Vitis vinifera* L.)

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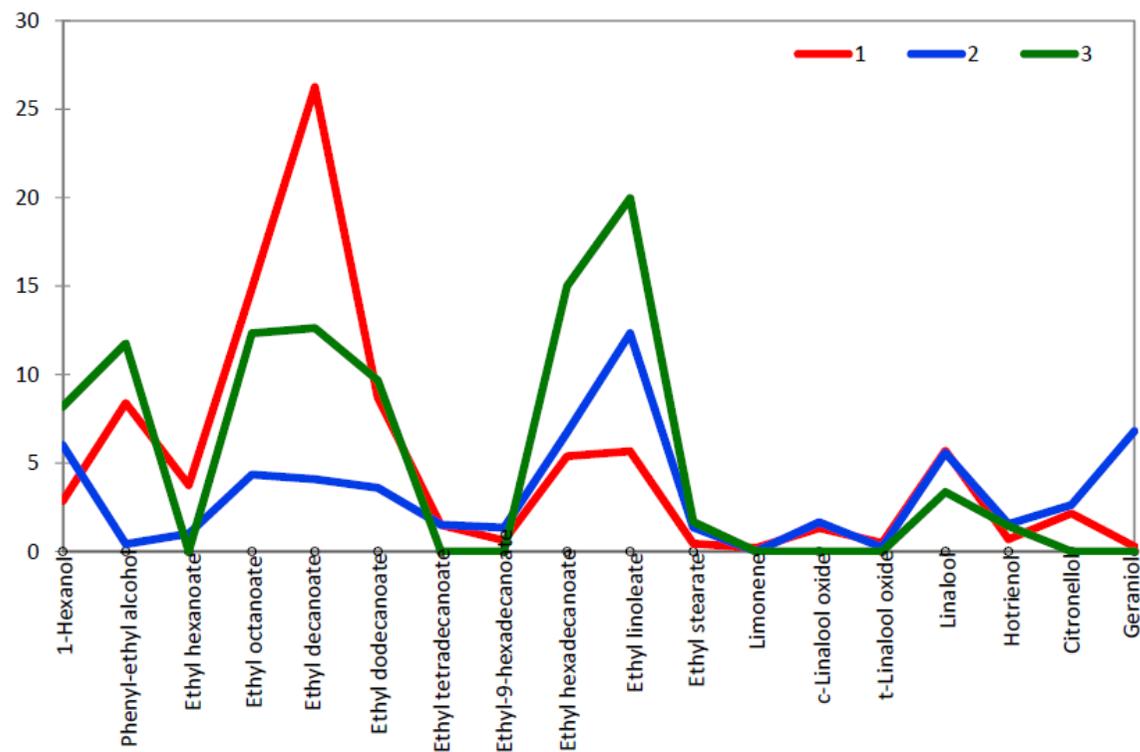
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*Supplementary Tables*

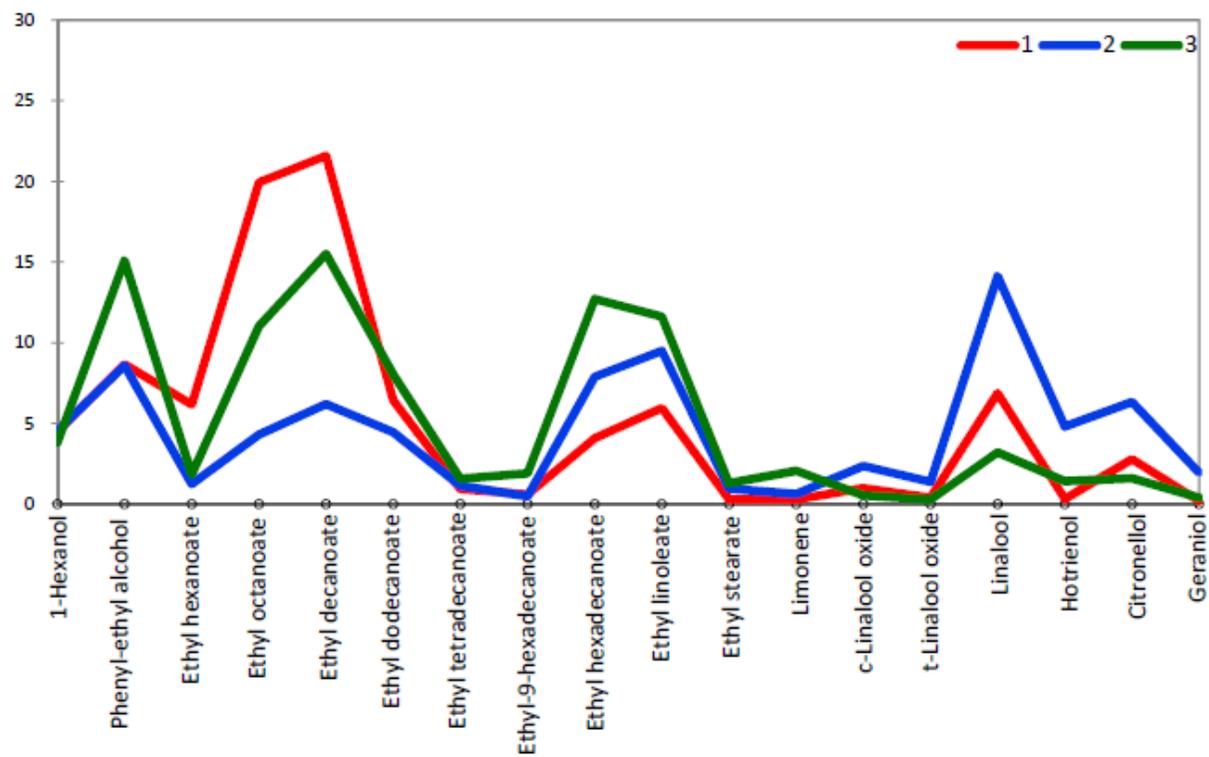
**Table S1.** Compounds identified in grape brandies produced from Muscat table grape cultivars and their aroma descriptors

<b>Class</b>	<b>Compound</b>	<b>Aroma descriptor</b>
Alcohol	1-Hexanol	Flower [27, 29, 40], green [27, 29, 40], cut grass [29, 40], grass [27], herbaceous [23, 27]
	Phenyl-ethyl alcohol	Floral [27, 40], rose [27,40], honey [27]
	1-Heptanol	Oily [40]
Acid	Octanoic acid	Rancid [23], cheese [23, 40] fatty [40], sweet [40]
	Hexadecanoic acid	Rancid [23], cheese [25], fatty [25], sweet [40]
Ester	Ethyl hexanoate	Fruity[23,25], green apple [25, 29, 40], banana [23,25], wine-like [23,25], brandy [25]
	Ethyl octanoate	Sweet [23, 40], floral [23], fruity [23, 40], banana [23], pear [23], brandy [23]
	Ethyl decanoate	Fruity, brandy, grape [37]
Terpenoid	$\alpha$ -Pinene	Pine, resinous [31]
	Limonene	Fruity, lemon [41]
	$\gamma$ -terpinene	Fruity, lemon-like [31]
	<i>c</i> -Linalool oxide	Floral [40]
	<i>t</i> -Linalool oxide	Woody, floral [40]
	Rose oxide	Floral [24], lychee-like [24], rose [37]
	Linalool	Roses, anise seed, grapefruit, green lemon and citrus [15,41]
	Hotrienol	Fresh, floral, fruity [15,41]
	Citronellol	Roses, anise seed, grapefruit, green lemon and citrus [15,41]

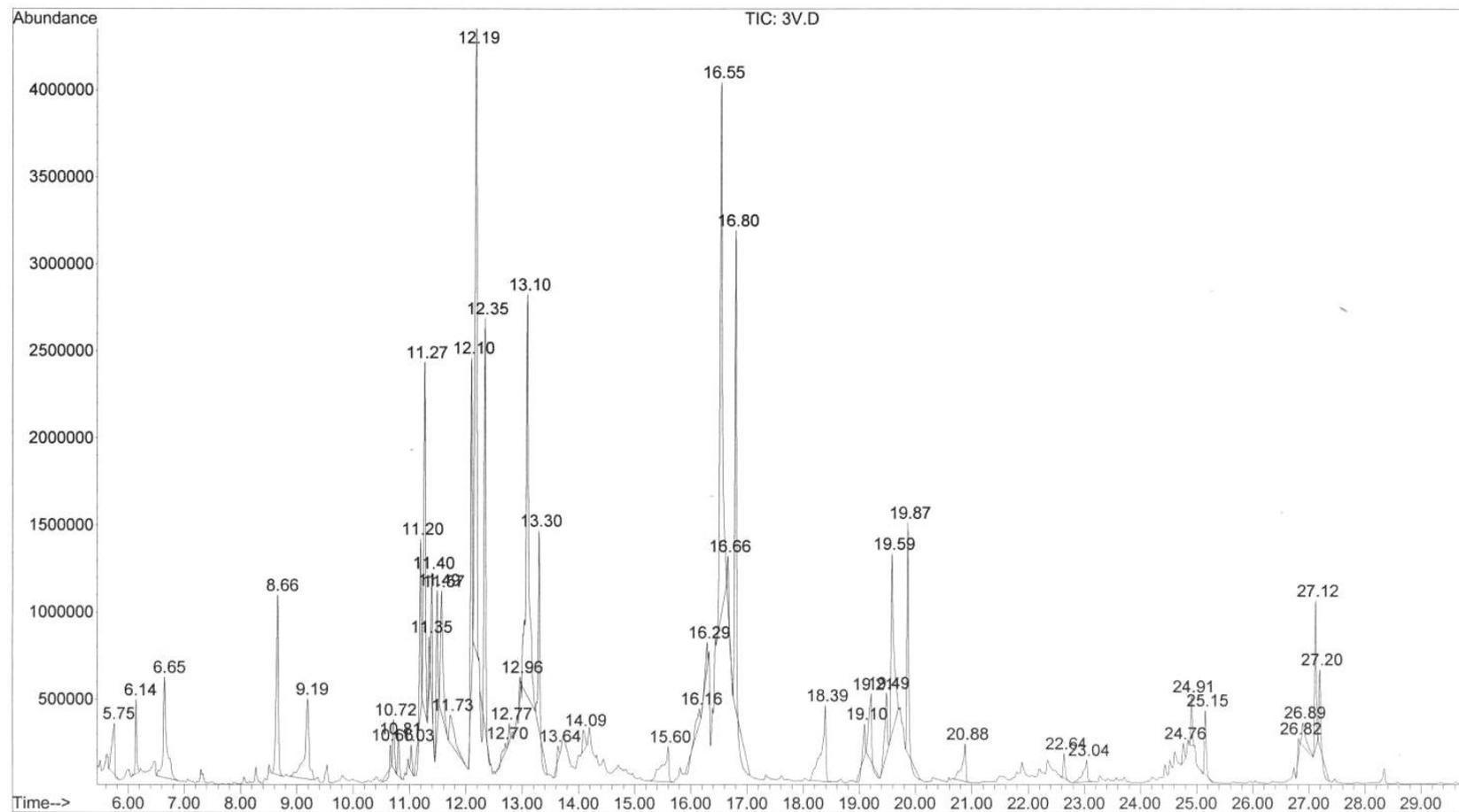




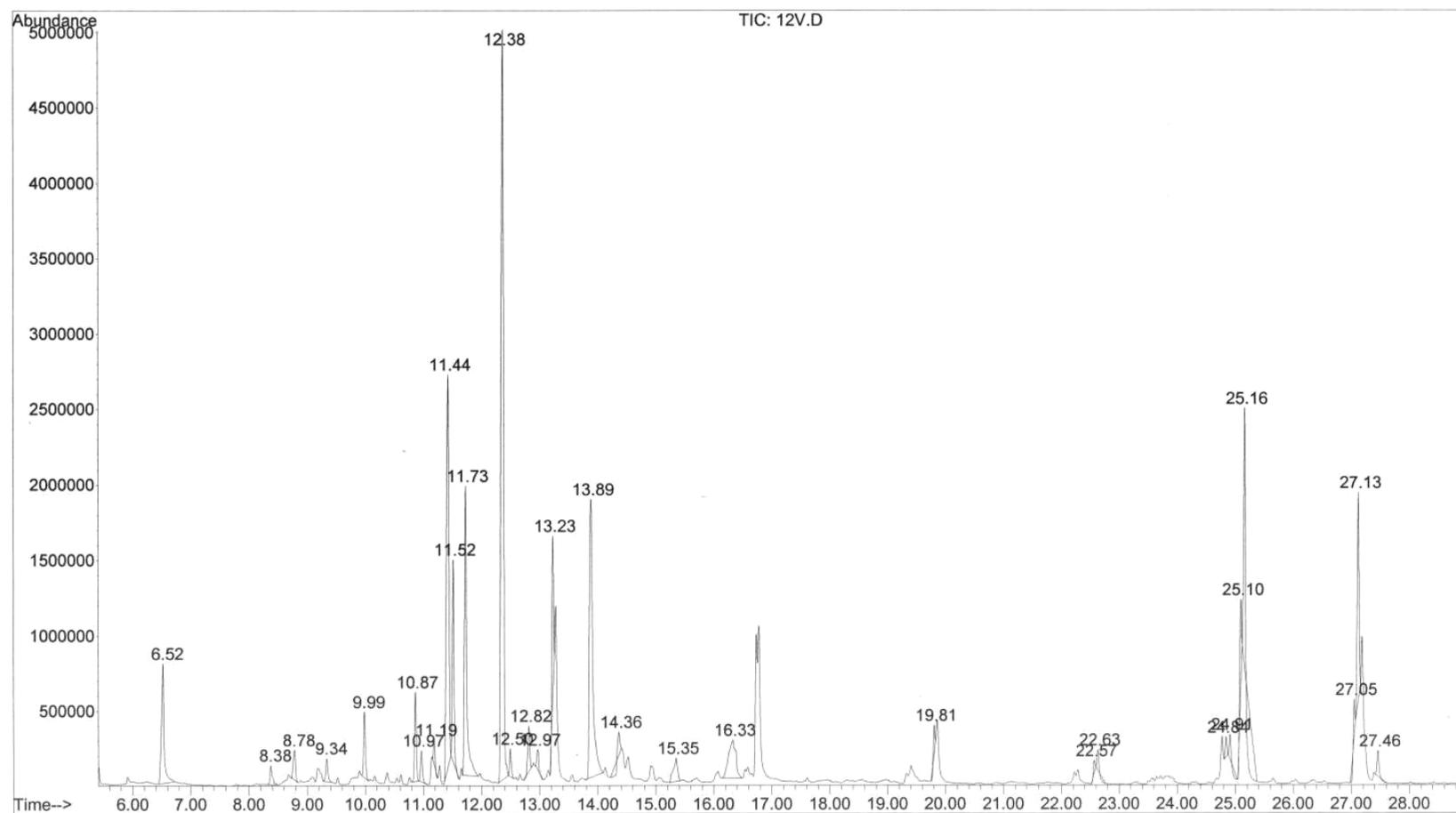
**Figure S2.** Profile plot showing volatile composition of clusters 1-3 obtained by agglomerative hierarchical clustering analysis of samples without enzyme treatment (control)



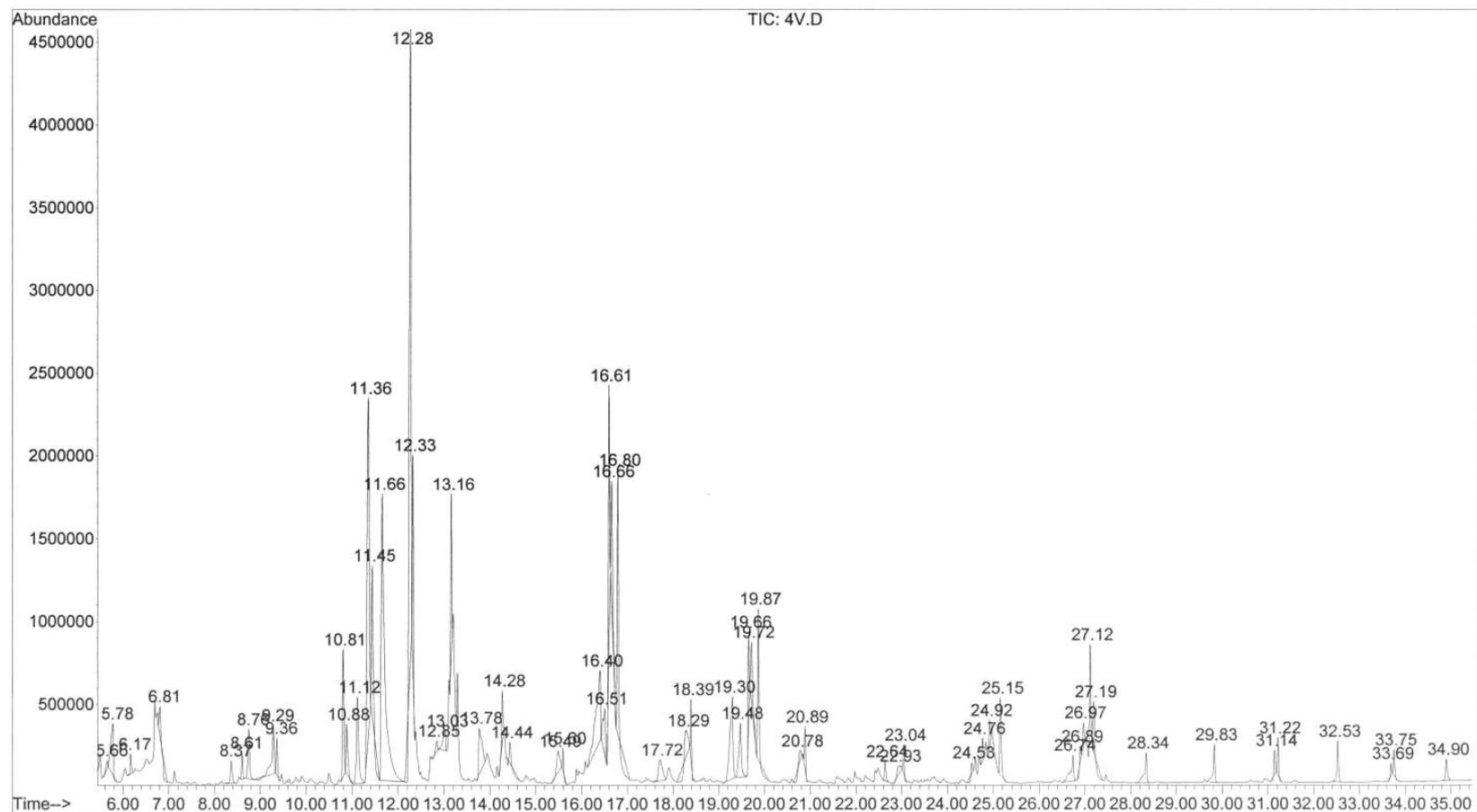
**Figure S3.** Profile plot showing volatile composition of clusters 1-3 obtained by agglomerative hierarchical clustering analysis of all samples with and without enzyme treatment



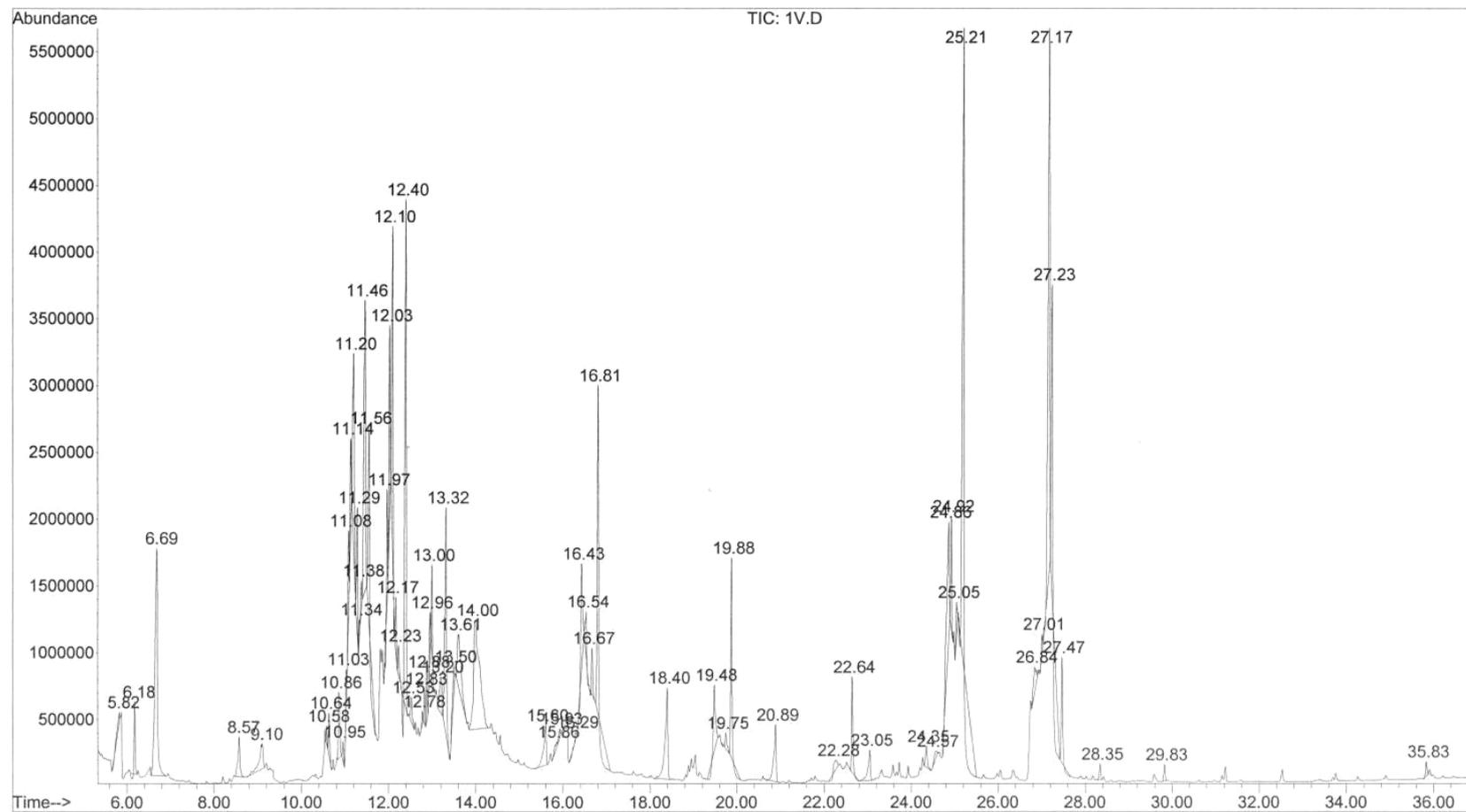
**Figure S4.** Chromatogram of the volatile aromatic compounds in Early Muscat grape brandy control - EMC



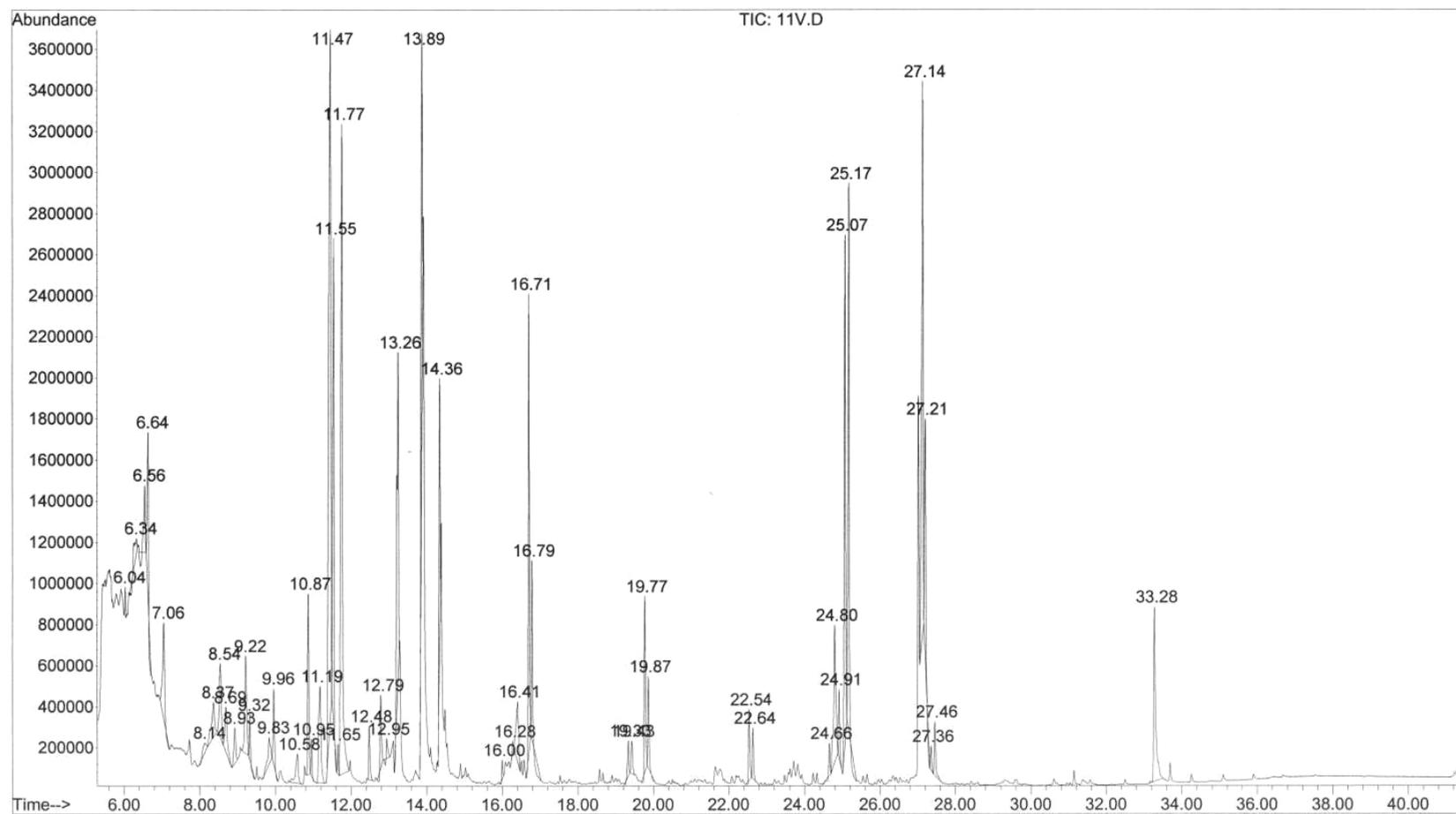
**Figure S5.** Chromatogram of volatile aromatic compounds in Early Muscat grape brandy with the addition of pectolytic enzyme - EMV1



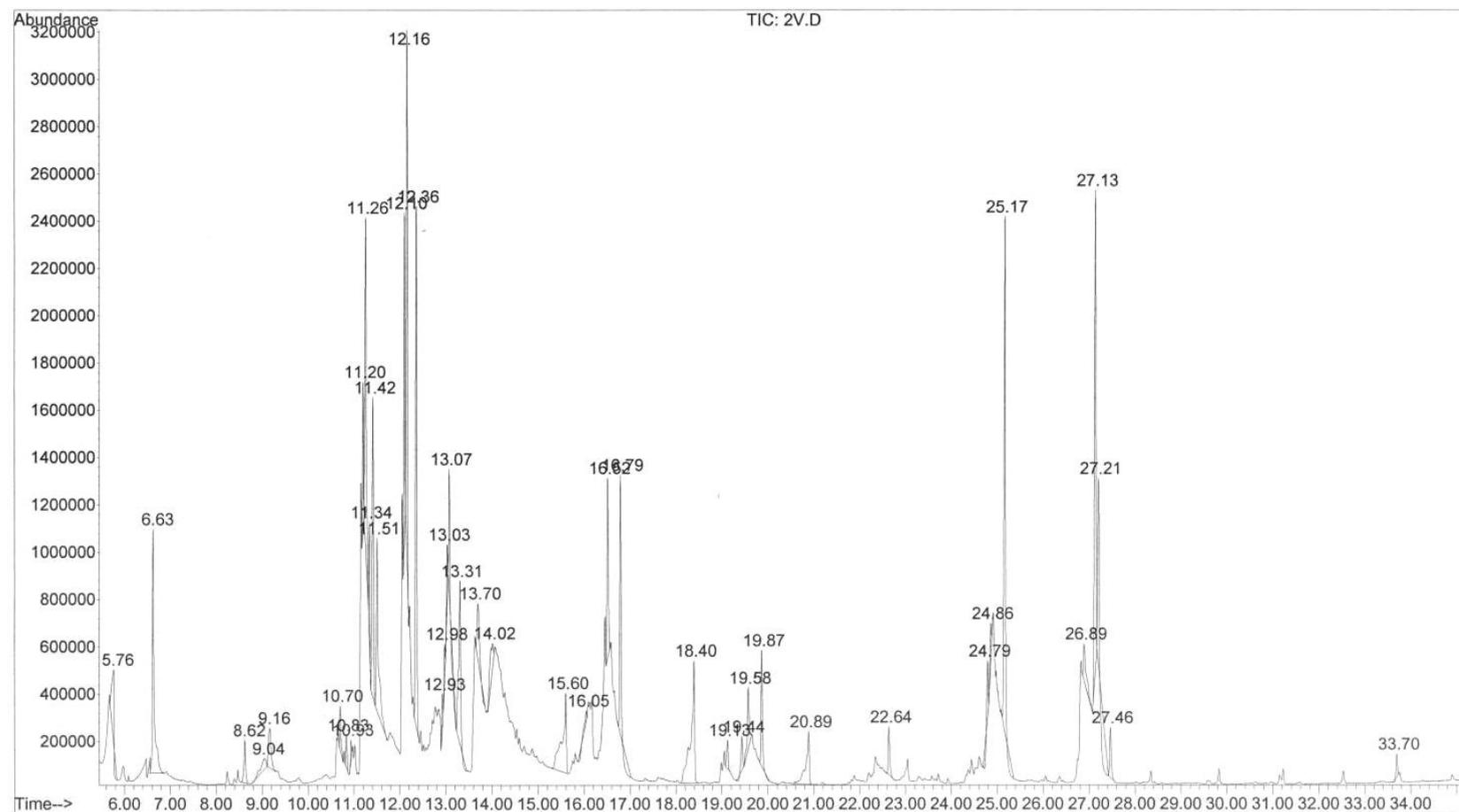
**Figure S6.** Chromatogram of volatile aromatic compounds in Early Muscat grape brandy with the addition of pectolytic enzyme – EMV2



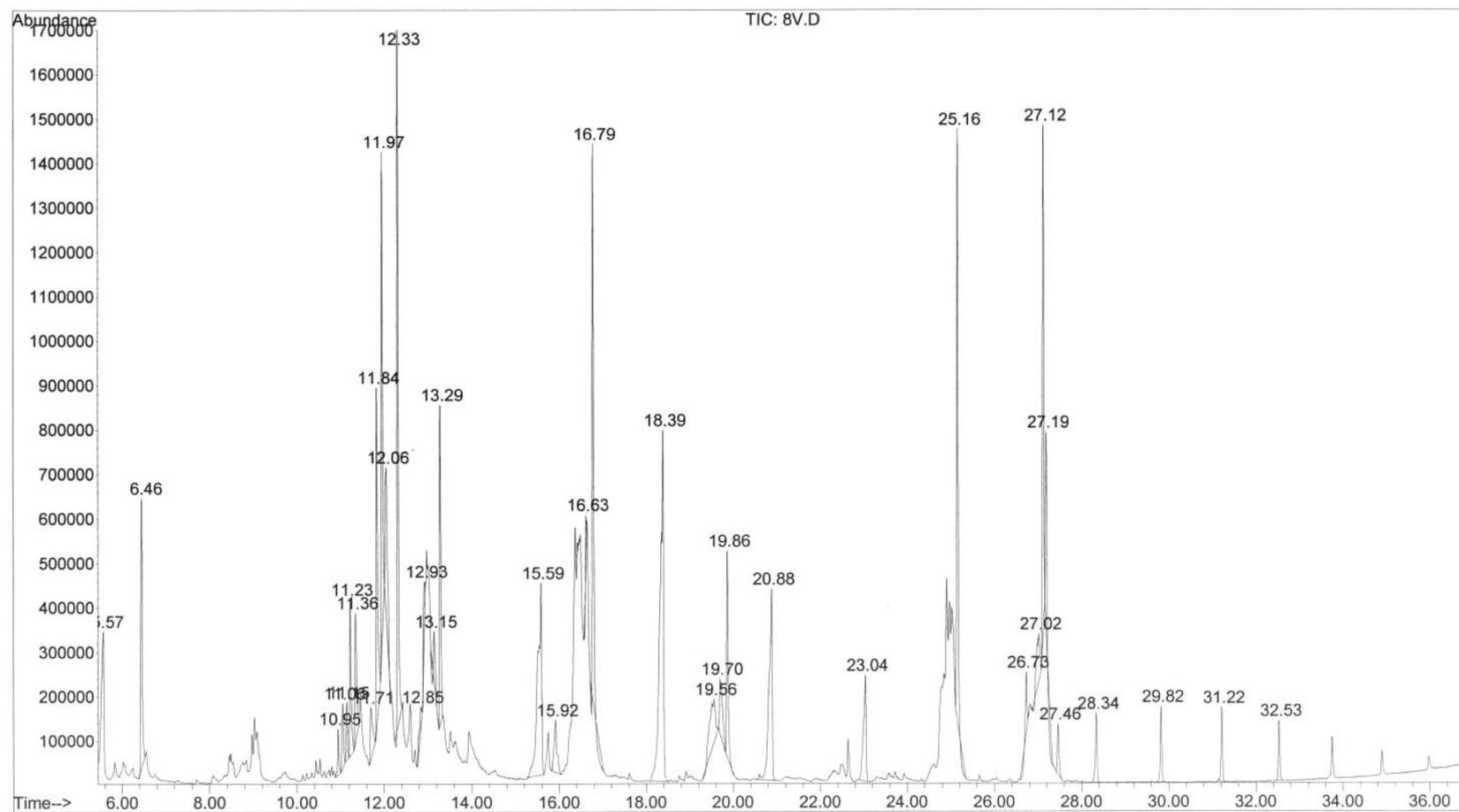
**Figure S7.** Chromatogram of volatile aromatic compounds in Radmilovac Muscat grape brandy control - RMC



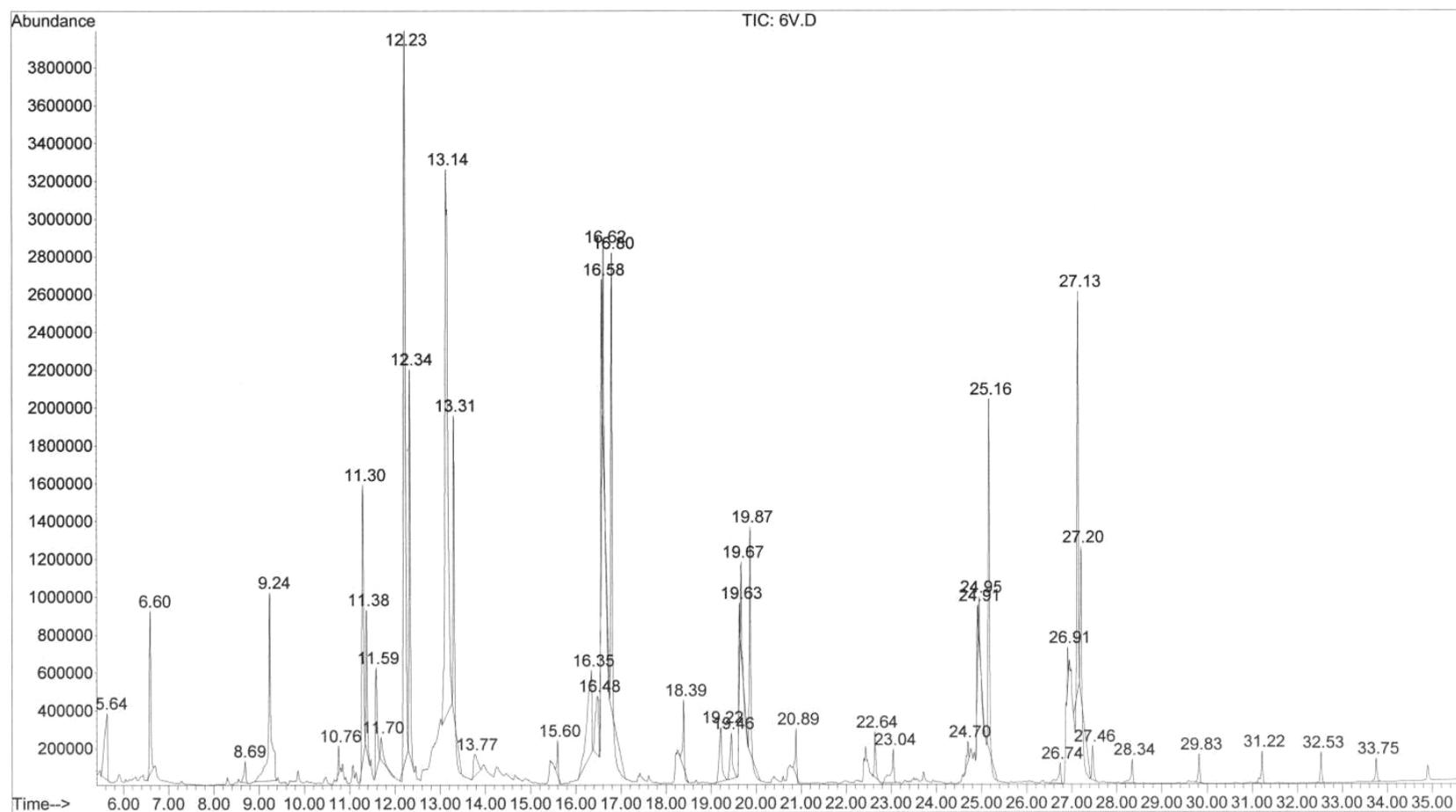
**Figure S8.** Chromatogram of volatile aromatic compounds in Radmilovac Muscat grape brandy with the addition of pectolytic enzyme - RMV1



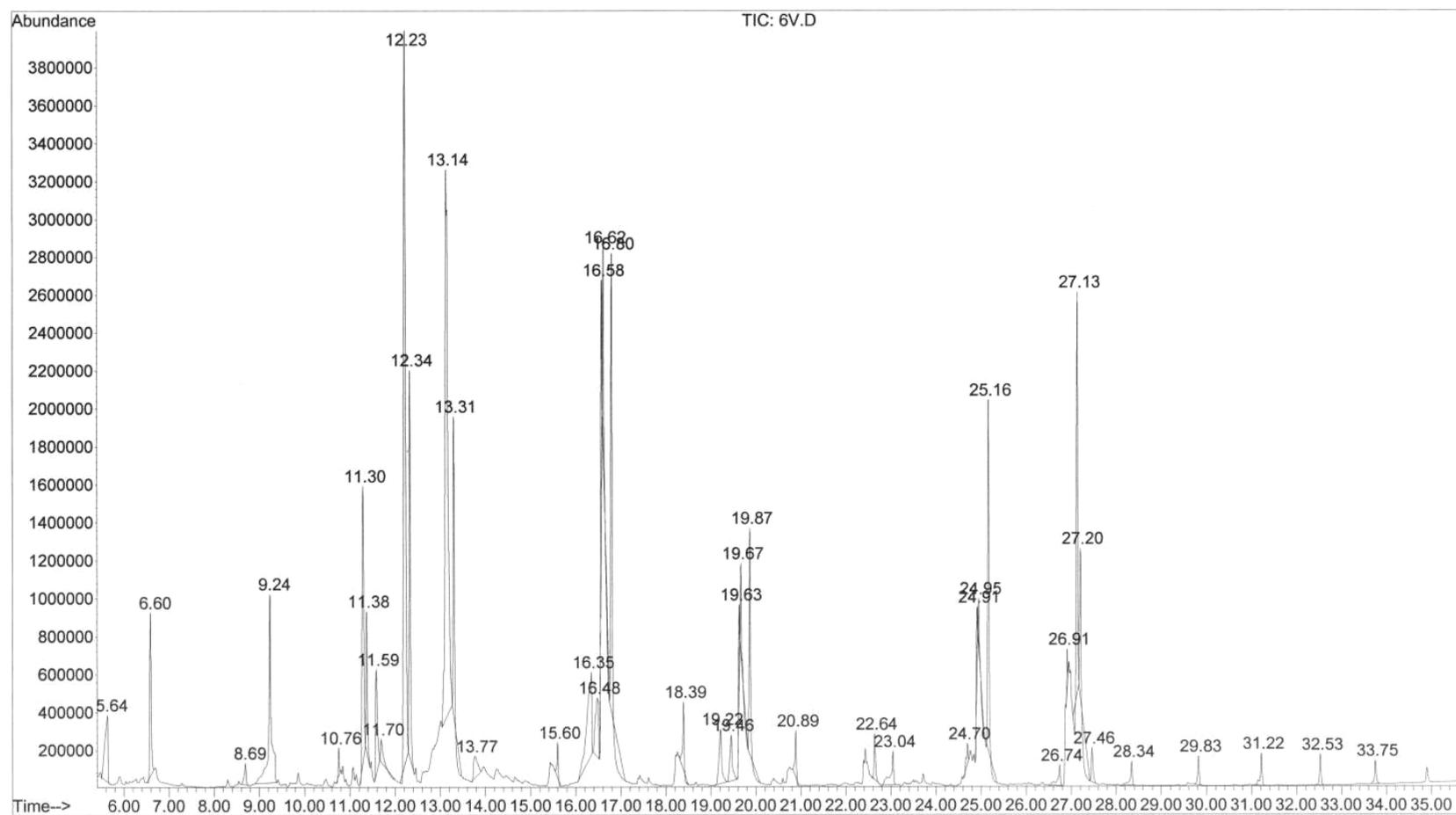
**Figure S9.** Chromatogram of volatile aromatic compounds in Radmilovac Muscat grape brandy with the addition of pectolytic enzyme – RMV2



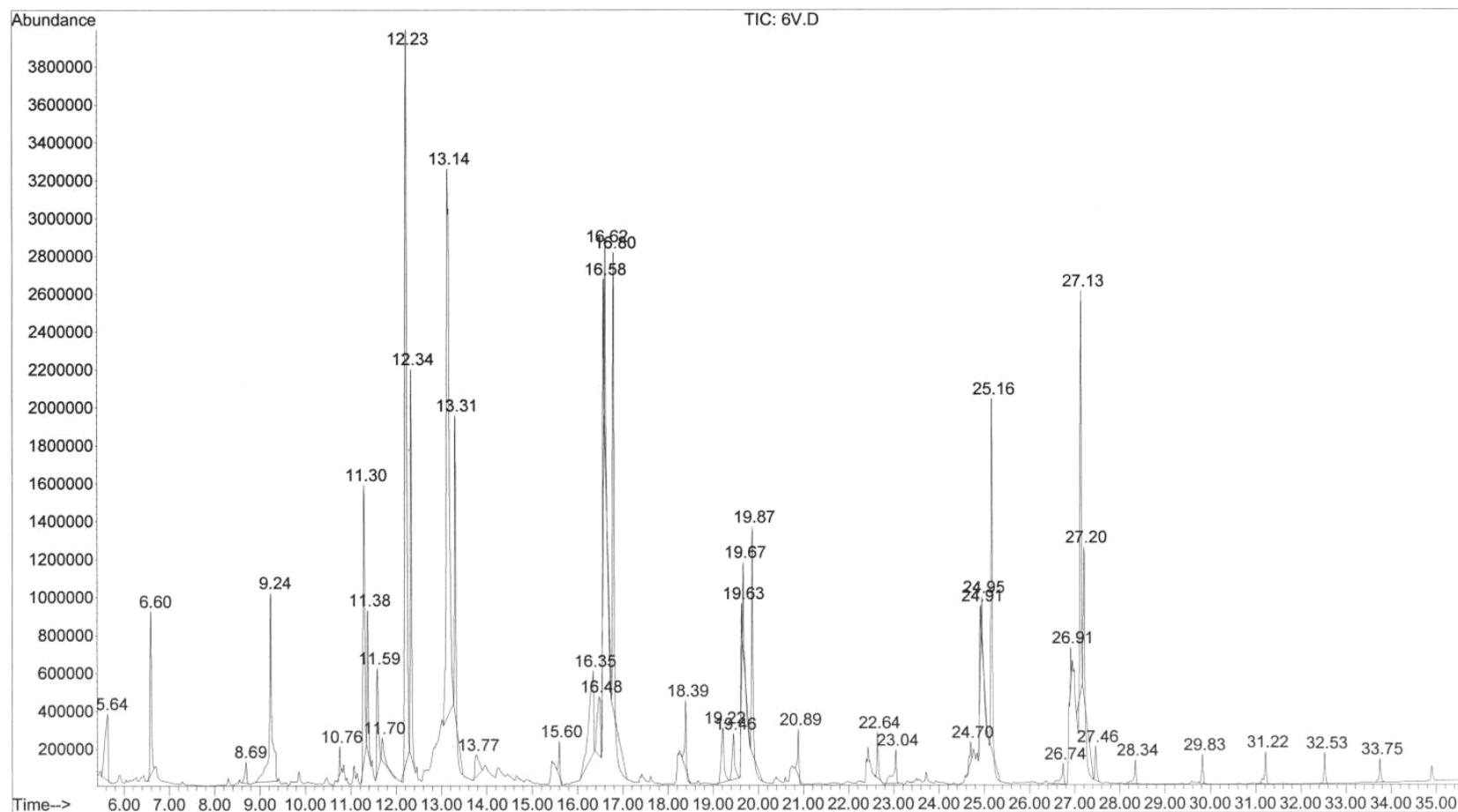
**Figure S10.** Chromatogram of volatile aromatic compounds in Banat Muscat grape brandy control - BMC



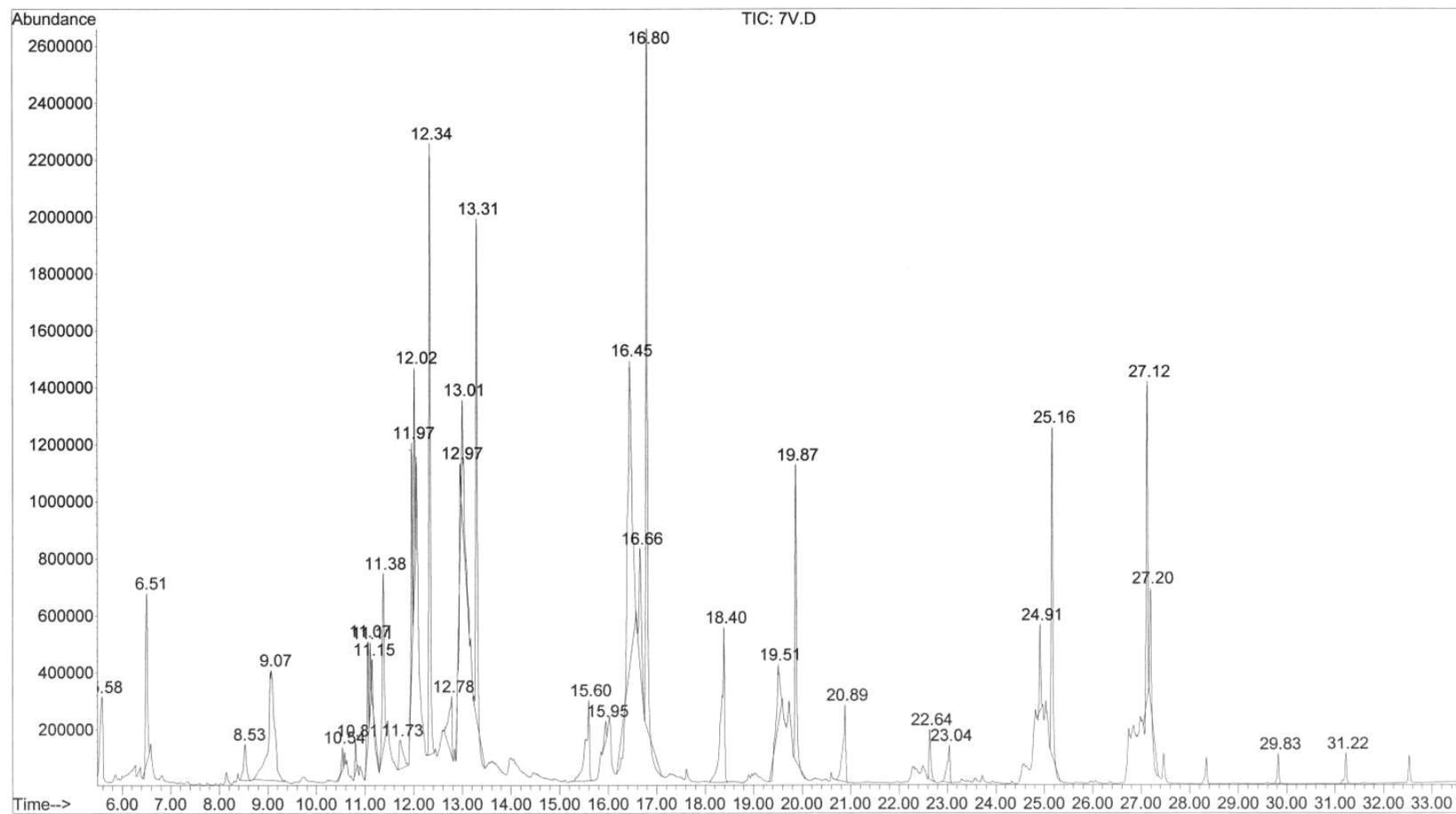
**Figure S11.** Chromatogram of the volatile aromatic compounds in Banat Muscat grape brandy with the addition of pectolytic enzyme - BMV1



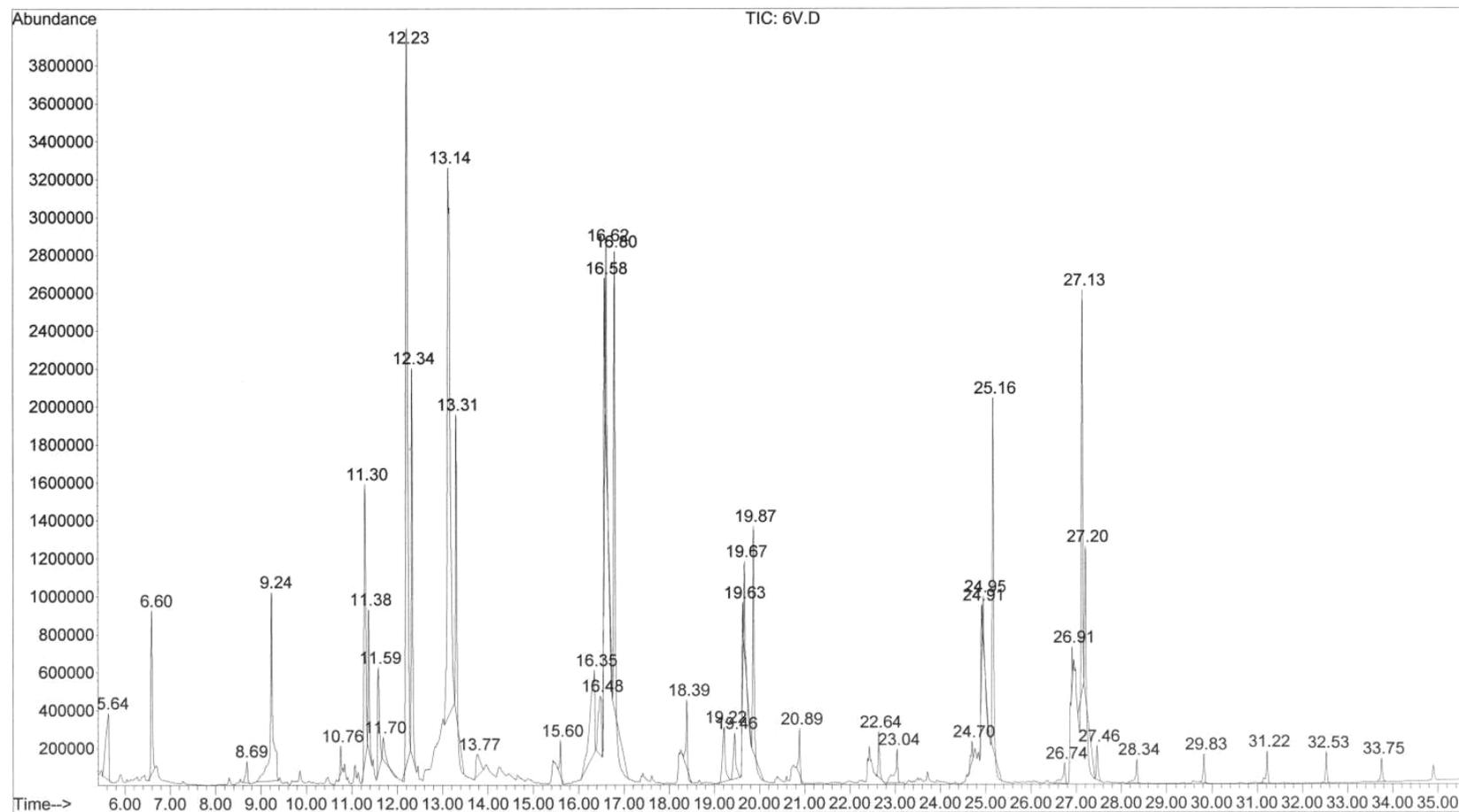
**Figure S12.** Chromatogram of volatile aromatic compounds in Banat Muscat grape brandy with the addition of pectolytic enzyme – BMV2



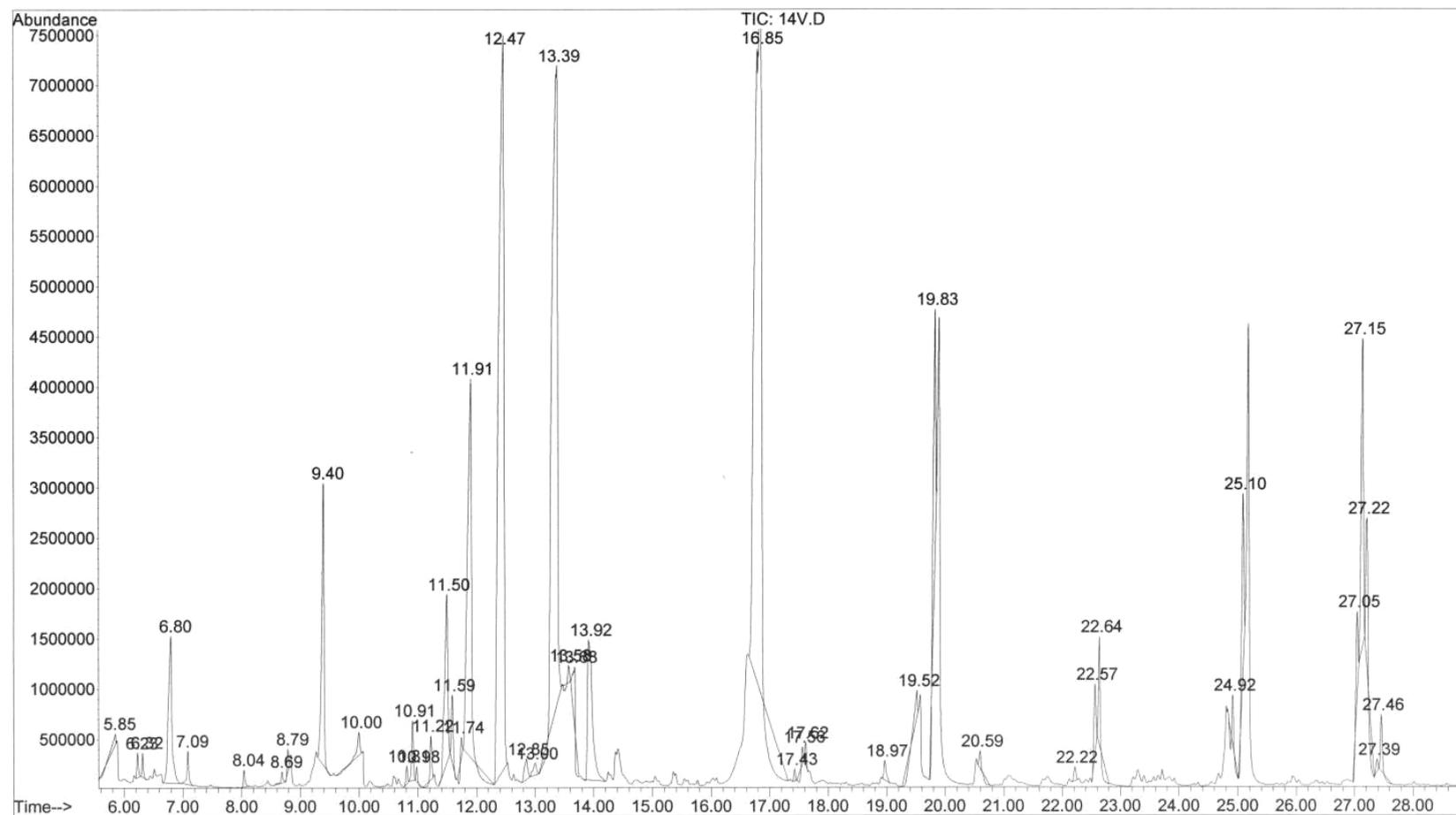
**Figure S13.** Chromatogram of volatile aromatic compounds in Italia Muscat grape brandy control - IMC



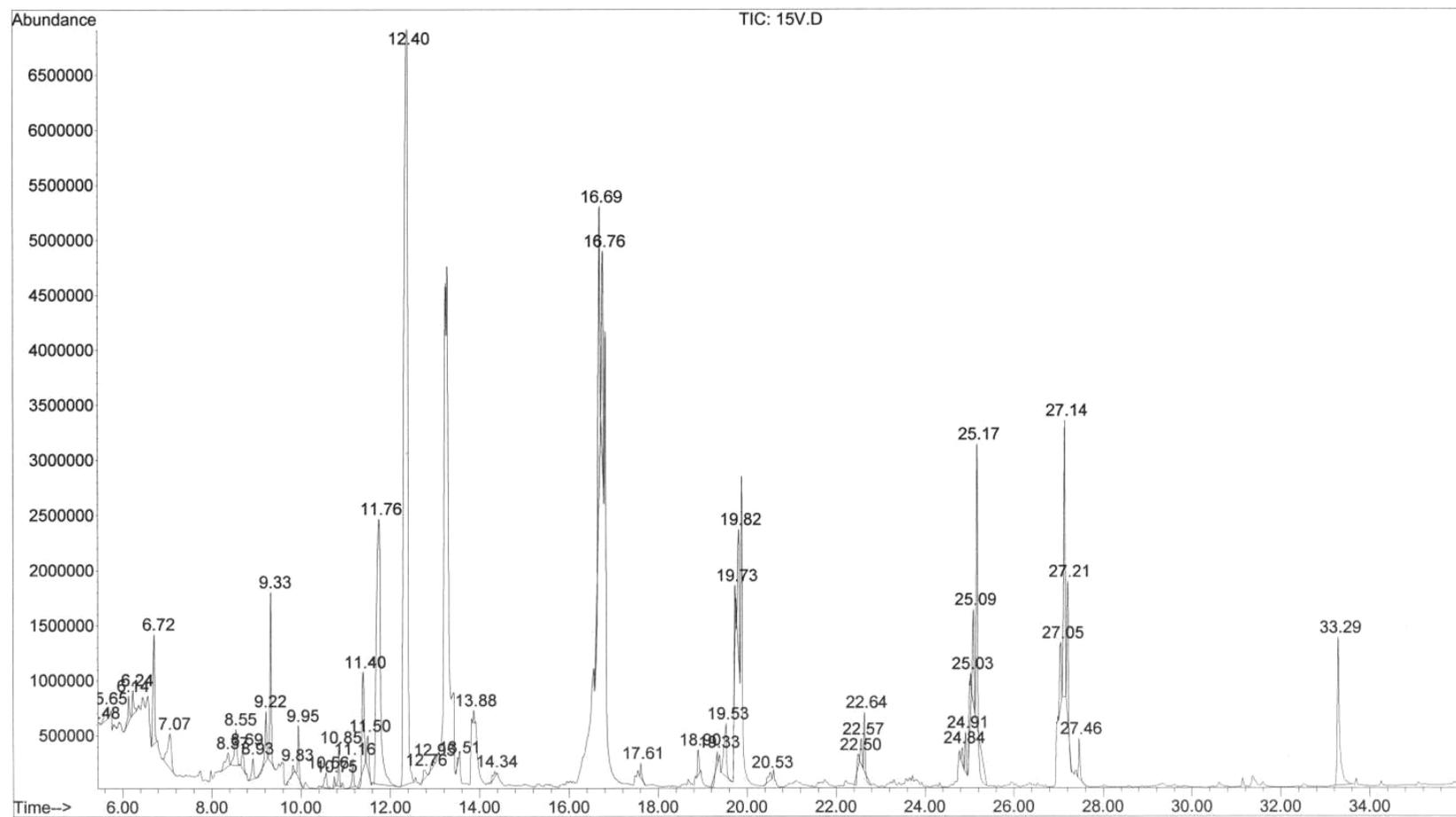
**Figure S14.** Chromatogram of volatile aromatic compounds in Italia Muscat grape brandy with the addition of pectolytic enzyme – IMV1



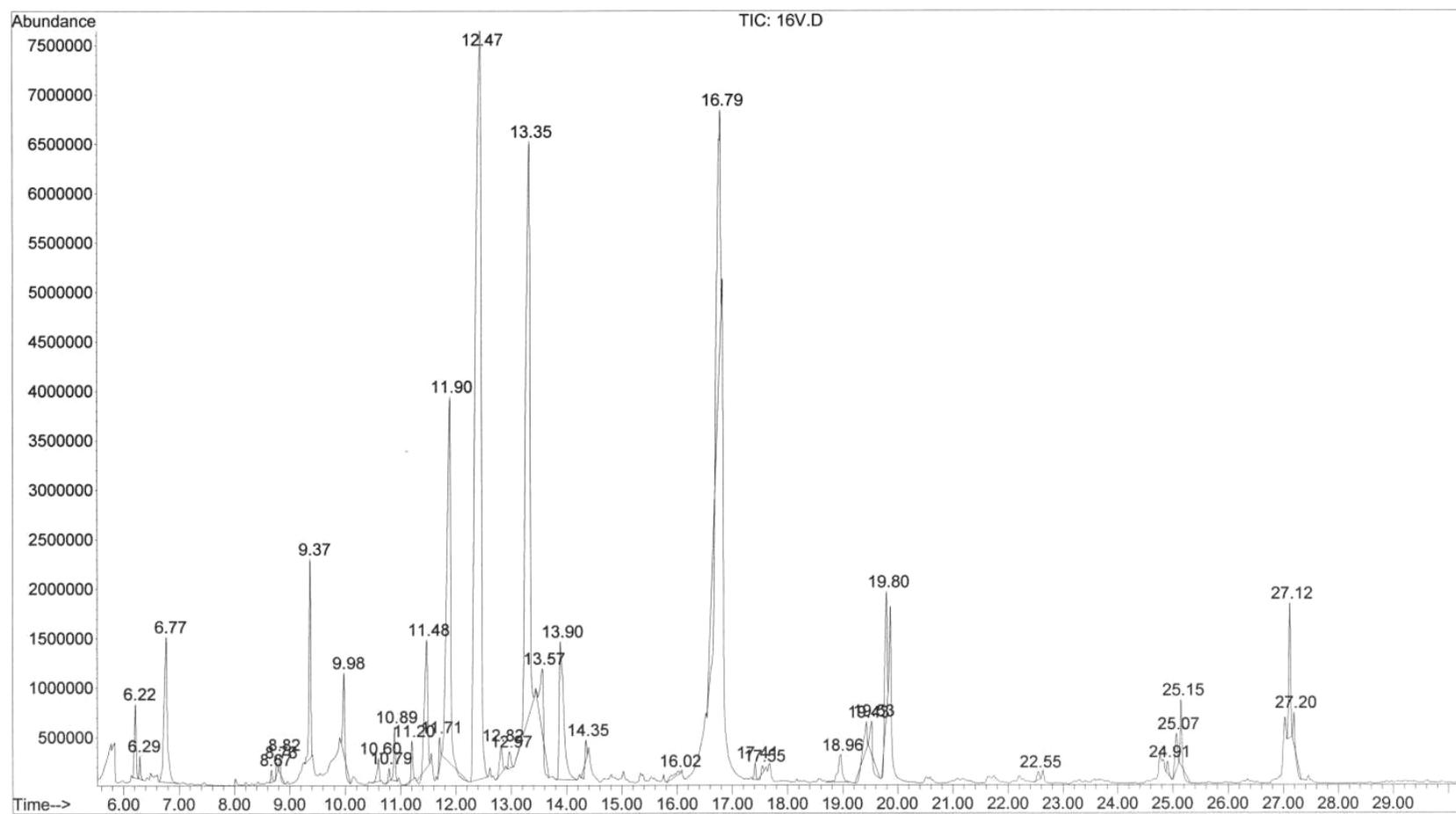
**Figure S15.** Chromatogram of volatile aromatic compounds in Italia Muscat grape brandy with the addition of pectolytic enzyme – IMV2



**Figure S16.** Chromatogram of volatile aromatic compounds in Muscat Hamburg grape brandy control – MHC



**Figure S17.** Chromatogram of volatile aromatic compounds in Muscat Hamburg grape brandy with the addition of pectolytic enzyme – MHV1



**Figure S18.** Chromatogram of volatile aromatic compounds in Muscat Hamburg grape brandy with the addition of pectolytic enzyme – MHV2

## References

23. Peinado, R.A.; Mauricio, J.C.; Moreno, J. Aromatic series in sherry wines with gluconic acid subjected to different biological aging conditions by *Saccharomyces cerevisiae* var. *capensis*. *Food Chem.* **2006**, *94*, 232–239.
24. Mahattanatawee, K.; Perez-Cacho, P.R.; Davenport, T.; Rouseff, R. Comparison of three lychee cultivar odor profiles using gas chromatography-olfactometry and gas chromatography-sulfur detection. *J. Agric. Food Chem.* **2007**, *55*, 1939–1944.
25. Peinado, R.A.; Moreno, J.; Bueno, J.E.; Moreno, J.A.; Mauricio, J.C.; Comparative study of aromatic compounds in two young white wines subjected to pre-fermentative cryomaceration. *Food Chem.* **2004**, *84*, 585–590.
27. Genovese, A.; Lamorte, S.A.; Gambuti, A.; Moio, L. Aroma of Aglianico and Uva di Troia grapes by aromatic series. *Food Res. Int.* **2013**, *53*, 15–23.
29. Garcia-Carpintero, E.G.; Sanchez-Palomo, E.; Gomez Gallego, M.A.;Gonzalez-Vinas, M.A. Effect of cofermentation of grape varieties on aroma profiles of La Mancha red wines. *J. Food Sci.* **2011**, *76*, C1169–C1180
31. Qian, M.C.; Wang, Y. Seasonal variation of volatile composition and odor activity value of ‘Marion’ (*Rubus spp. hyb*) and ‘Thornless Evergreen’ (*R. laciniatus* L.) blackberries. *J. Food Sci.* **2005**, *70*, C13–C20.
37. Wu, Y.; Zhu, B.; Tu, C.; Duan, C.; Pan, Q. Generation of volatile compounds in litchi wine during winemaking and short-term bottle storage. *J. Agric. Food Chem.* **2011**, *59*, 4923–4931.
40. García-Carpintero, E.G.; Sánchez-Palomo, E.; Gallego, M.A.G.; González-Viñas, M.A. Volatile and sensory characterization of red wines from cv. Moravia Agría minority grape variety cultivated in La Mancha region over five consecutive vintages. *Food Res. Int.* **2011**, *44*, 1549–1560.
41. Diéguez, C.S.; de la Peña, M.L.G.; Gómez F.E. Approaches to spirit aroma: contribution of some aromatic compounds to the primary aroma in samples of Orujo spirits. *J. Agr. Food Chem.* **2003**, *51*, 7385–7390. doi: 10.1021/jf0302916