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Introduction

Research regarding the effects dietary polyphenols have on human health has developed considerably in the last decade. The antioxidant properties of polyphenols have been widely studied, but it has become clear that the mechanisms of action of polyphenols go beyond the modulation of oxidative stress (Vinson, et. al., 1998). More recent interest has focused on the bioactive phenolic compounds in grapes. Anthocyanins, flavanols, flavonols and resveratrol are the most important grape polyphenols because they possess many biological activities, such as antioxidant, cardioprotective, anticancer, anti-inflammation, anti-aging and antimicrobial properties. The total phenolic content of grape skins varied with cultivar soil composition, climate, geographic origin, cultivation practices and level of maturation (Bruno, et. al., 2007). In this study, the total phenolic and anthocyanin contents were detected in Sicilian local grapes and wines Nero d'Avola and Perricone.

Results and discussion

The TPC in grape samples increased during the maturation period with the highest concentrations of 2062,16±7,83 mg/kg for Nero d'Avola and 2266,1±59,39 mg/kg for Perricone varieties (Fig. 1). Also the TPC in Perricone was higher than the Nero d'Avola wine (Fig. 2). The results of the flavonoid content expressed as TPC showed a major concentration for Perricone grapes (3233,29±347,32 mg/kg) (Fig. 3) and wine (3193±145,66 mg/L) with respect to the Nero d'Avola variety (Fig. 4). Furthermore the same trend was shown for the anthocyanin content in grape samples, but with lower values than flavonoids (792,09 ± 36,25 mg/kg for Perricone and 633,59 ± 15,55 mg/kg for Nero d'Avola) (Fig. 5). In wines, the anthocyanin content has shown a major concentration in Nero d'Avola than Perricone wine (369,89±21,515 mg/L) (Fig. 6). Results concerning the anthocyanin profile are expressed individually as a percentage. The most representative anthocyanins for Perricone grapes were malvidin and peonidin, whereas Nero d'Avola grapes indicated malvidin, petunidin and delphinidin (Tab. 1). From these results the anthocyanin profile can be considered specific for the varieties analyzed. This study confirms that wines produced from Perricone and Nero d'Avola varieties contain high levels of polyphenols, flavonoids and anthocyanins and, therefore, validates their antioxidant and health properties.

Materials and methods

Nero d'Avola and Perricone grape samples were detected in 4 different periods of maturation. After fermentation, we also analysed the Nero d'Avola and Perricone wines. (+)-Catechin, malvidin-3-O-glucoside were used as standards. Total Phenolic Content (TPC) was analyzed by a colorimetric assay using Folin-Ciocalteu's phenol reagent. TPC, flavonoids, and anthocyanins were detected using a UV-Spectrophotometer at 750, 280 and 540 nm respectively (Di Stefano, et al. 1995). The results were expressed as mg/kg (fresh weight) for grapes and mg/l for wines. Furthermore the anthocyanin profile was analyzed using HPLC-DAD (Squadrito, et al. 2007).

%	1 PER	2 PER	3 PER	4 PER	VINO PER	1 NDA	2 NDA	3 NDA	4 NDA	VINO NDA
Delphinidin	4,79	2,21	2,54	1,95	2,57	3,87	3,28	4,11	7,48	2,48
Cyanidin	2,83	1,11	1,37	2,90	0,51	1,40	0,49	0,67	2,61	0,09
Petunidin	11,07	8,93	5,79	7,22	4,35	9,07	7,36	7,04	7,34	5,45
Peonidin	8,76	8,51	8,95	17,09	3,73	6,13	3,68	3,73	8,59	1,16
Malvidin	49,17	63,74	54,72	58,45	52,22	50,59	52,42	47,41	43,24	59,31
Acetate	10,56	3,79	11,56	3,18	22,04	15,44	14,40	18,94	14,65	19,32
Cinnamic acid	12,80	11,69	15,06	9,20	14,57	13,48	18,36	18,08	16,07	12,19

Tab. Anthocyanins profile in grape and wine Perricone and Nero d'Avola varieties.

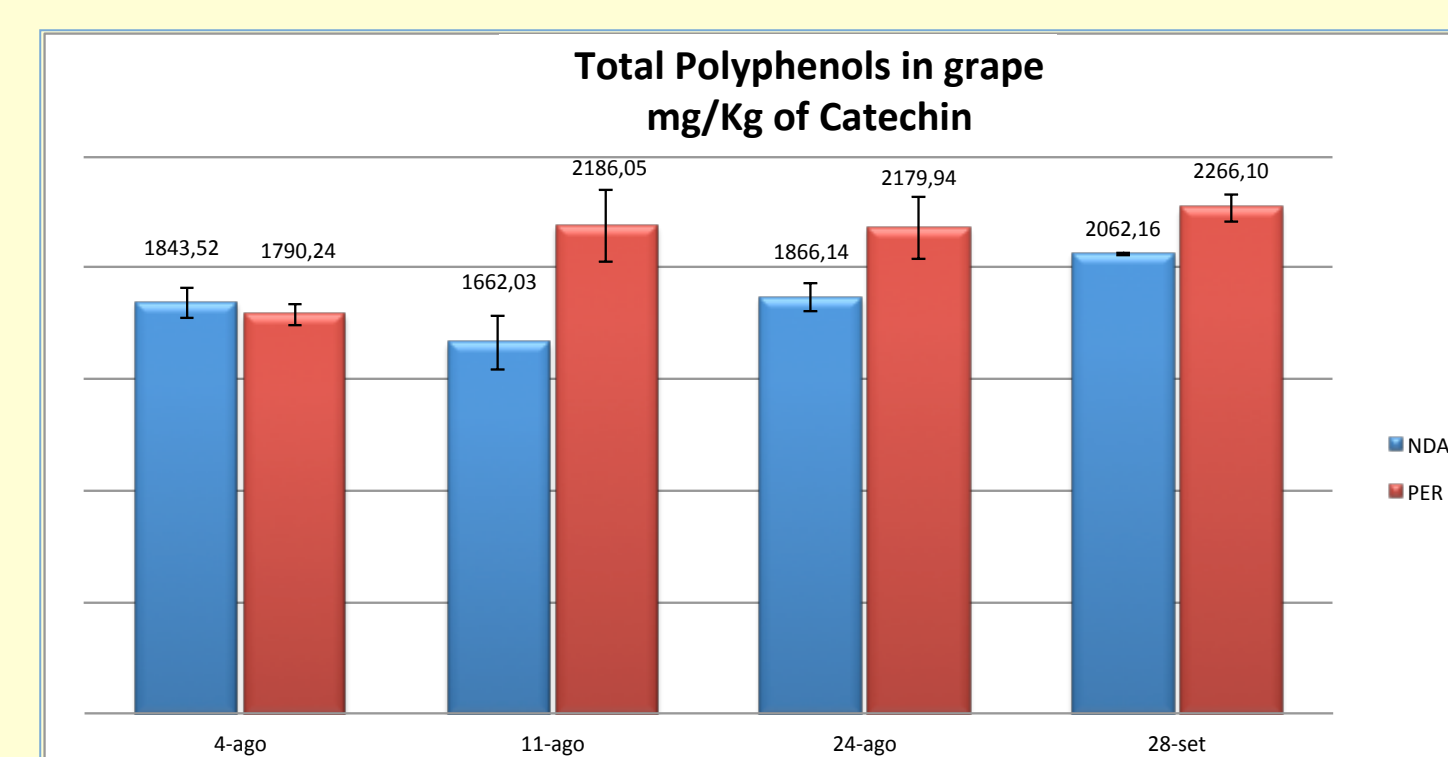


Fig. 1: PT in Perricone and Nero d'Avola grapes expressed in mg/kg of (+)-Catechin.

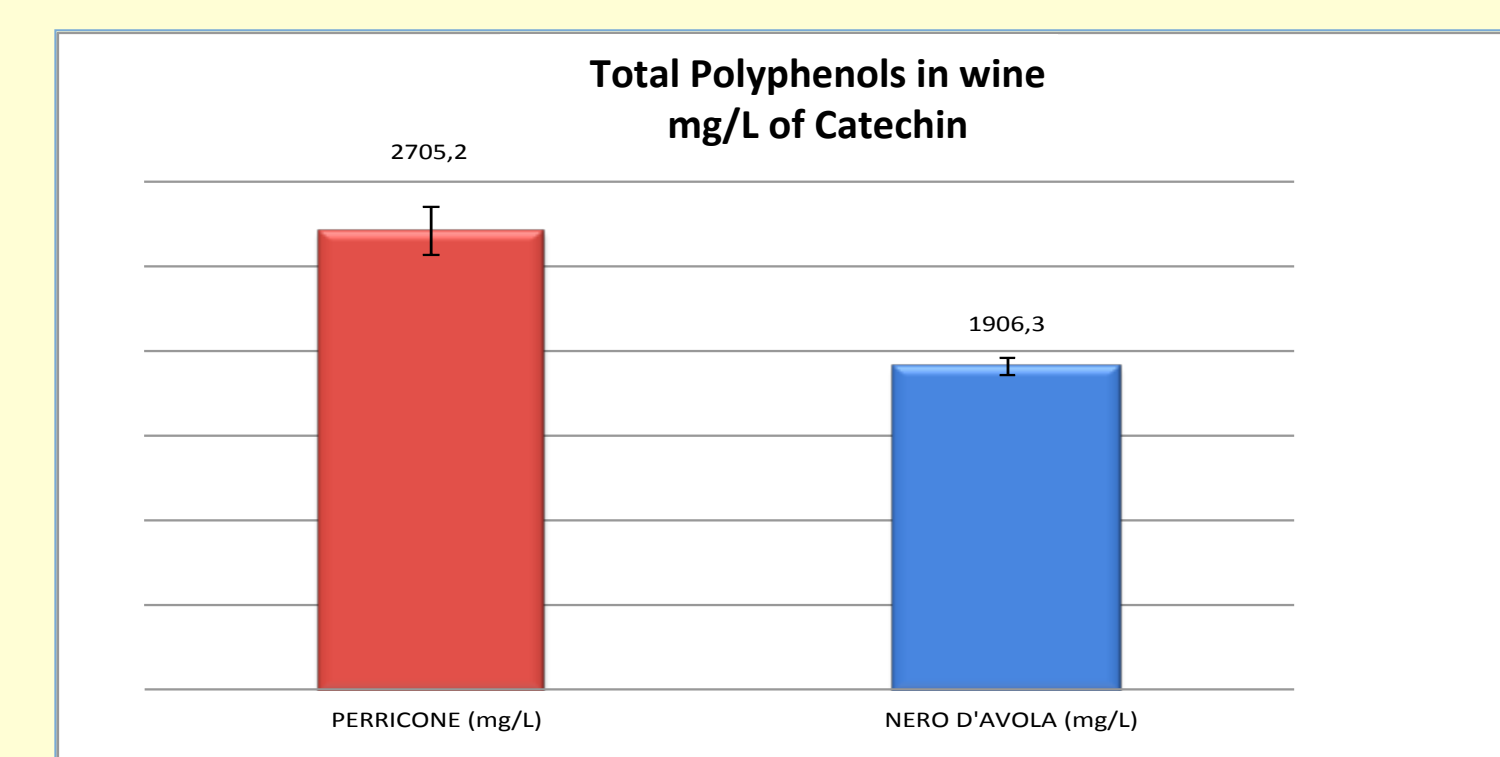


Fig. 2: PT in Perricone and Nero d'Avola wine expressed in mg/L of (+)-Catechin.

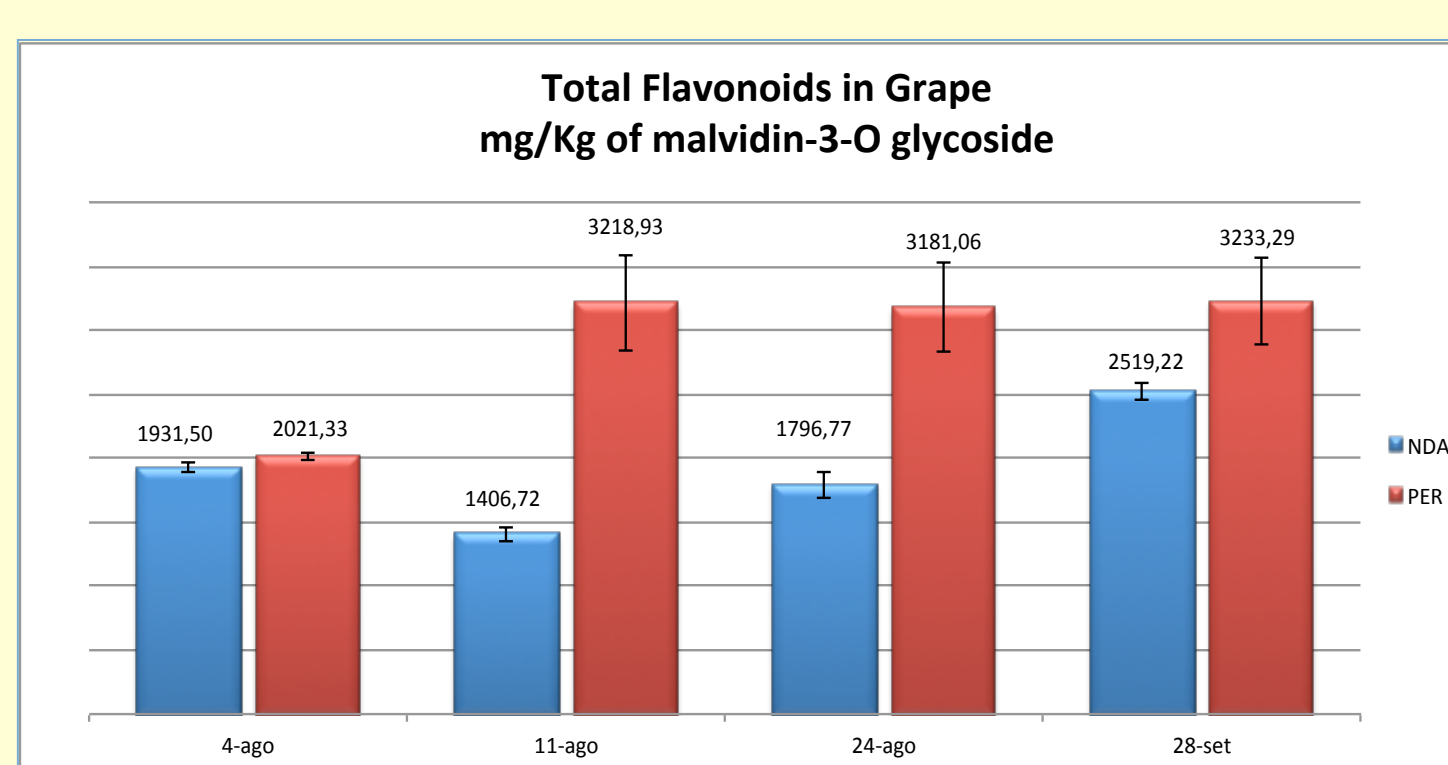


Fig. 3: FT in mg/Kg of malvidin-3-O-glycoside in Perricone and Nero d'Avola grapes.

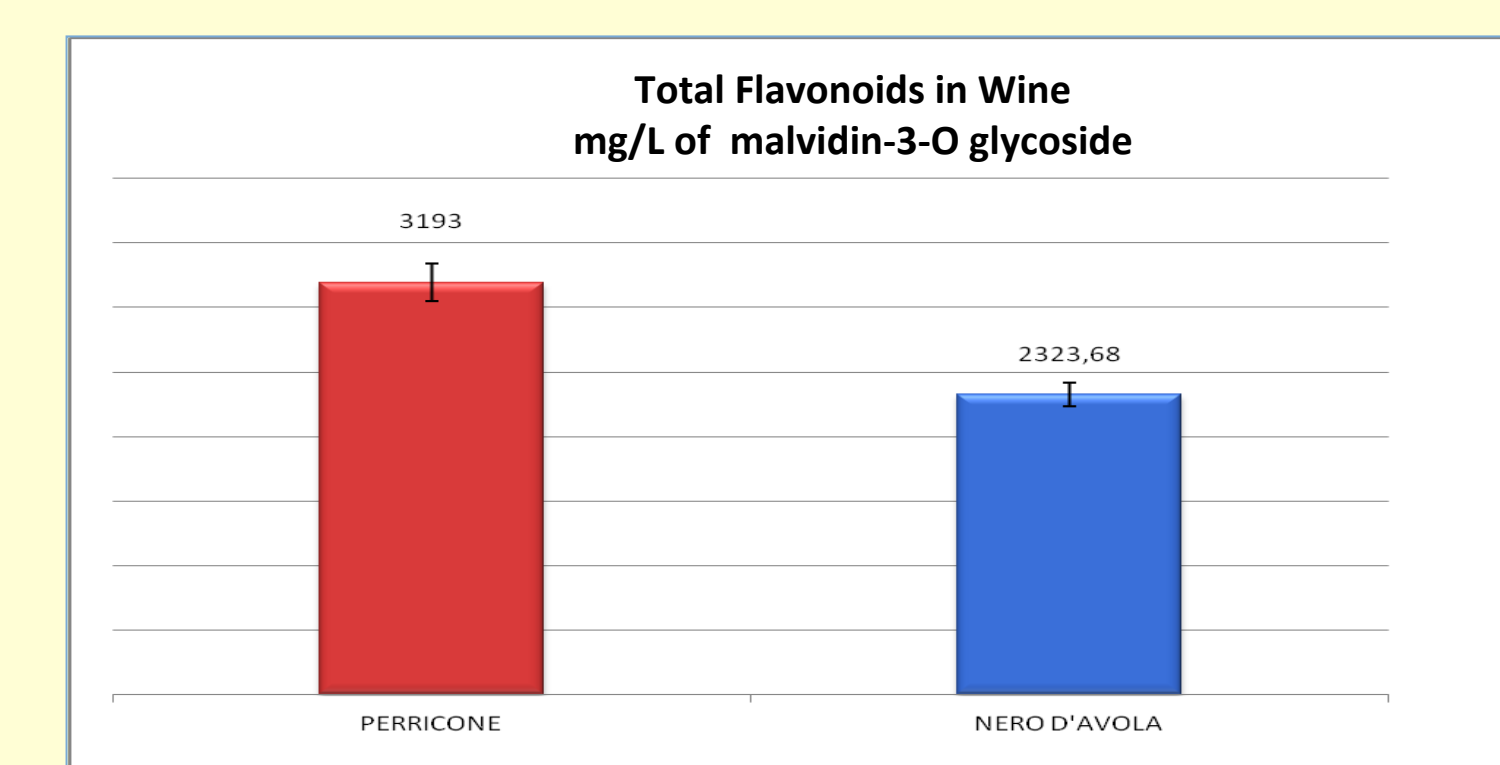


Fig. 4: FT in mg/L of malvidin-3-O-glycoside in Perricone and Nero d'Avola Wine.

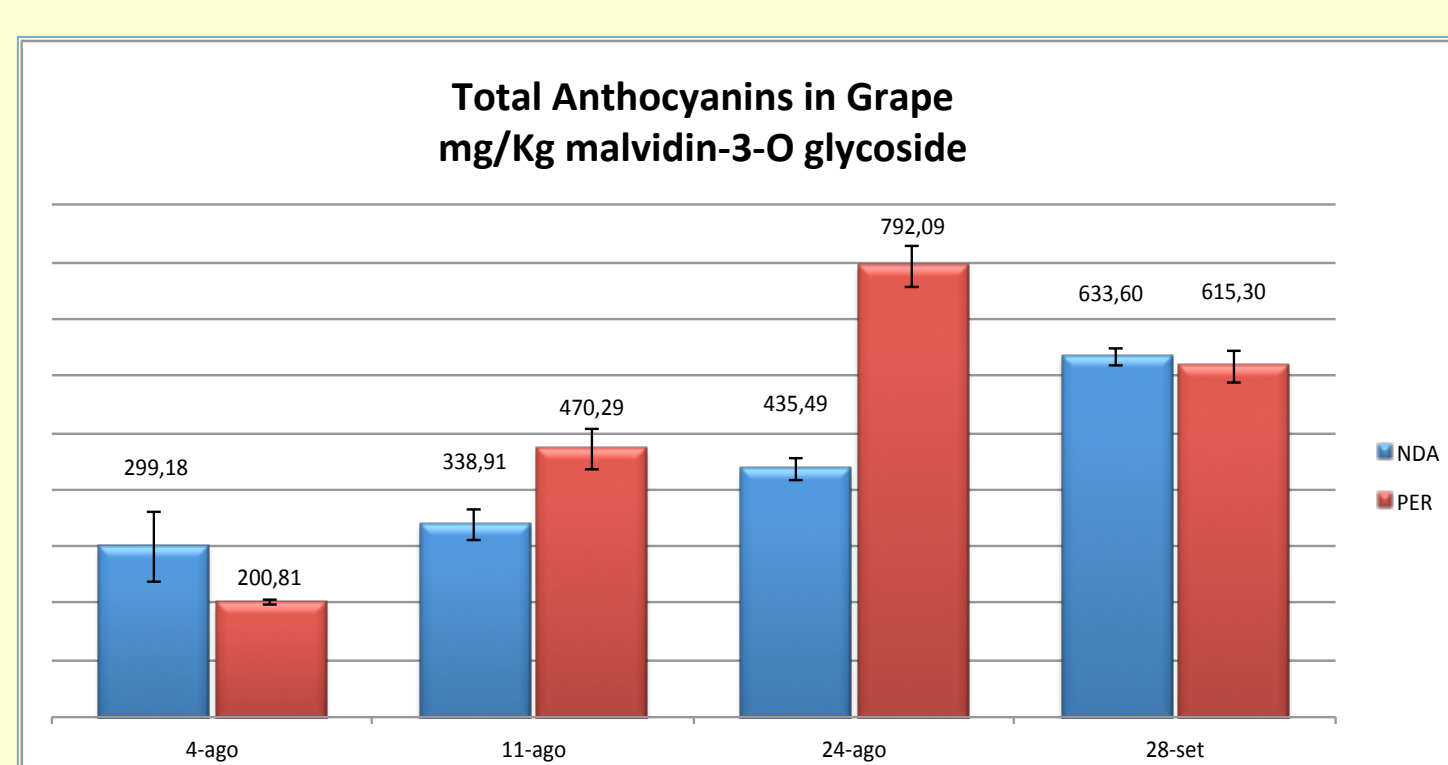


Fig. 5: AT in mg/Kg of malvidin-3-O-glycoside in Perricone and Nero d'Avola grapes

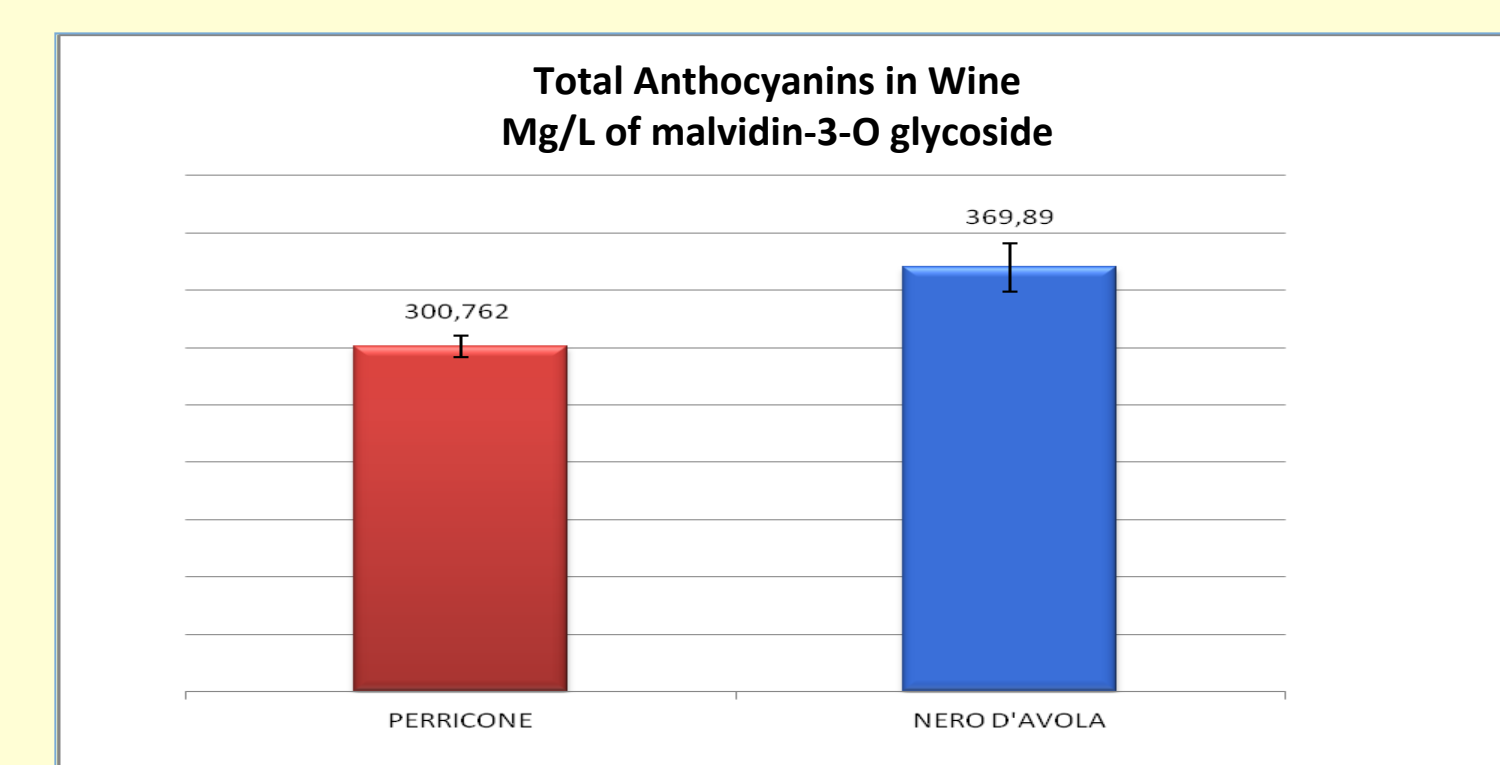


Fig. 6: AT in mg/L of malvidin-3-O-glycoside in Perricone and Nero d'Avola wine

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This study , in relation to the project “ Tracciabilità e sicurezza degli alimenti: un valore aggiunto alle produzioni agricole del territorio siciliano”, was financed by Assessorato Regionale dell'Agricoltura, dello Sviluppo Rurale e della Pesca Mediterranea – Regione Siciliana.

