SERA014 Progress Report 2005

USDA – ARS Lane, Oklahoma

Antioxidant content of muscadine grape selections

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Because of hurricane Katrina, all muscadines were lost at Poplarville, Mississippi for the 2005 season. Under these unfortunate circumstances, I am requesting help from anyone in SERA014 that may have muscadines frozen from the 2005 season (e.g. from North Carolina or Georgia locations for instance) that would be willing to send fruit for antioxidant analysis and comparison to any selections we can get from the University of California -Davis location. The selections used in 2004 that we hoped to replicate in 2005 are listed in Table 1. Please feel free to email me for details.

In 2004, muscadine grapes of the same varieties grown at Poplarville, Mississippi or at the Germplasm Repository in Davis, California were harvested and analyzed for total anthocyanins, total phenolics, and FRAP. Grapes in California ripened 3-4 weeks later than those in Mississippi, and tended to be higher in total phenolics (Table 1). Comparisons of antioxidant tests (from 2003 and 2004 berries) showed a poor correlation with anthocyanin and Trolox (FRAP) and a strong correlation with total phenolics and Trolox (FRAP). Total anthocyanin is not an accurate indicator of total phenolics; in other words, a bronze muscadine can be as high in total phenolics or FRAP as a purple muscadine.

Table 1. Comparison of muscadine grapes from Davis, California and Poplarville, Mississippi, 2004 harvest.

CV	Source	total phenolics mg/gkg	total anthocyanin mg/kg	berrywt g	FRAP trolox umol/g	FRAP ferric umol/g	PUREE PH	%TITRA-TABLE ACIDITY	SOLUBLE SOLIDS CONTENT(%)	SSC/TA
Summit (B)	MS	1080.8	0.6	9.6	2.31	4.45	3.52	0.25	18.1	72.5
Summit	CA	**1597.8**	6.8	9.1	4.16	8.04	3.77	**0.31**	**22.9**	73.6
Watergate (B)	MS	1155.1	2.8	10.0	2.48	4.78	3.28	0.36	17.4	48.9
Watergate	CA	1341.2	5.6	6.3	2.99	5.77	3.55	0.34	**20.1**	**59.2**
Magnolia (B)	MS	1013.1	10.7	5.6	1.70	3.29	3.03	0.46	14.6	31.5
Magnolia	CA	1282.5	5.1	5.6	2.92	5.64	3.44	**0.34**	19.7	**58.8**
Cowart (P)	MS	1581.3	**171.6**	7.7	3.81	7.36	3.40	0.40	21.3	52.6
Cowart	CA	1298.3	83.8	6.2	2.68	5.19	3.59	0.34	21.3	**62.2**
Dixie (B)	MS	1180.3	1.1	5.2	2.50	4.82	3.43	0.32	17.6	55.8
Dixie	CA	**1906.8**	8.4	3.8	5.84	11.28	3.50	0.34	19.6	58.4
Fry (B)	MS	1567.9	3.9	11.0	4.16	8.04	3.54	0.34	19.0	56.2
Fry	CA	**2057.8**	5.1	8.8	7.43	14.34	3.71	0.23	22.8	**99.8**
Higgins (B)	MS	1619.6	8.4	9.6	4.68	9.05	3.45	0.36	17.6	48.4
Higgins S46:01	CA	1255.5	2.8	8.5	2.79	5.38	3.60	0.33	19.1	57.5
Higgins S46:31	CA	1384.6	2.8	5.0	3.07	5.94	3.26	0.28	17.6	63.9
Nesbit (P)	MS	1124.7	**187.1**	8.6	2.71	5.23	3.48	0.31	16.4	52.8
Nesbit	CA	**1686.8**	121.6	6.5	4.66	8.99	3.34	**0.65**	**21.5**	32.9
Redgate (B/R)	MS	1319.7	13.5	4.7	3.06	5.90	3.42	0.35	16.4	47.3
Redgate	CA	**1855.9**	2.8	4.0	6.96	13.44	3.28	**0.57**	19.3	34.0
Regale (P)	MS	1417.5	**432.1**	4.2	4.39	8.49	2.93	0.54	13.7	25.5
Regale	CA	1601.8	149.6	5.5	4.58	8.84	3.29	0.57	19.3	**33.8**

B=bronze; P=purple; B/R=Bronze/red color.

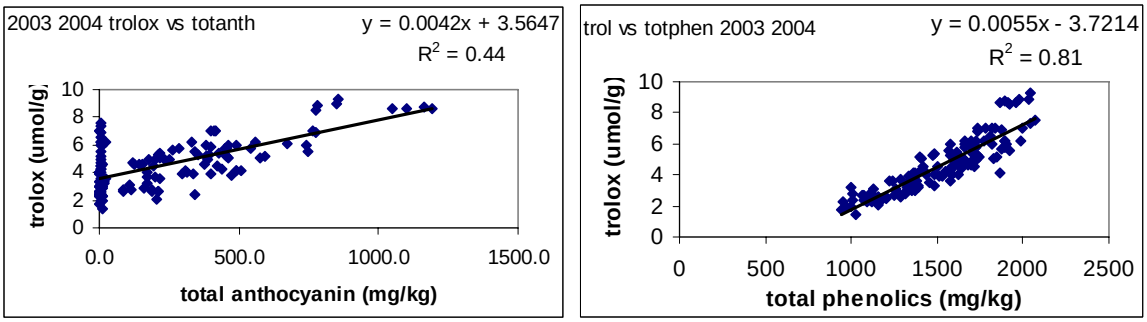

Figure 1. Relationships between FRAP (trolox), total phenolics, and total anthocyanins in muscadine grapes.