

EVALUATION OF ANTHOCYANIN FROM BLUE CORN BORDERLAND LANDRACES



Amol Nankar*(nankar@nmsu.edu), F. Omar Holguin, Barry Dungan & Richard Pratt
New Mexico State University, Las Cruces, New Mexico, USA

Introduction

Blue corn (*Zea mays* L.) has been of increasing interest for production of specialty products. Open pollinated varieties of blue corn are still grown in the USA-Mexico Borderland. It has been a part of traditional diets in Borderland communities. It is also increasingly used in a variety of processed food products. Blue corn can be considered a “functional food” due to its high content of anthocyanin pigment, an anti-oxidant (K, Jones., 2005).

Objectives

- Evaluate blue corn landraces for anthocyanin content
- Identify and quantify different anthocyanin components

Materials & Methods

- Evaluated eight accessions (landraces) at four locations in New Mexico and Arizona
- ### Analytical Techniques:
- Spectrophotometric Analysis: (Li et al., 2008)**
 - Estimation of Total Anthocyanin Content (TAC)
 - 530 nm wavelength
 - HPLC Analysis:**
 - 85 Minute gradient
 - Column:** 4.6 x 250 mm C18
 - Solvents:**
 - A:** Water: Formic Acid (9:1)
 - B:** Acetonitrile: Water: Formic Acid (5:4:1)

Results

Table 1. Analysis of Variance for Total Anthocyanin Content (2012)

Source	DF	Sum of Square	Mean Square	F Value	Pr > F
Location	3	1685.65	561.88	1.84	0.1588
Accession	7	14659.65	2094.21	6.85***	<0.0001
L*A Interaction	21	6579.96	313.33	1.03	0.4625
Mean (Accession)	43.27				
LSD _{0.05}	16.87				

Table 2. Average TAC

Accession	2012 (ug/100g)	2013 (ug/100g)
Navajo	49.55	57.1
Los Lunas Mid	67.40	57.1
Los Lunas Hi	36.97	43.8
Flor del Rio	10.89	19.9
Yoeme	51.69	55.0
Ohio	57.87	65.1
Hopi	48.76	54.8
Taos	29.55	41.6

Fig. 1. Identified Anthocyanin Components

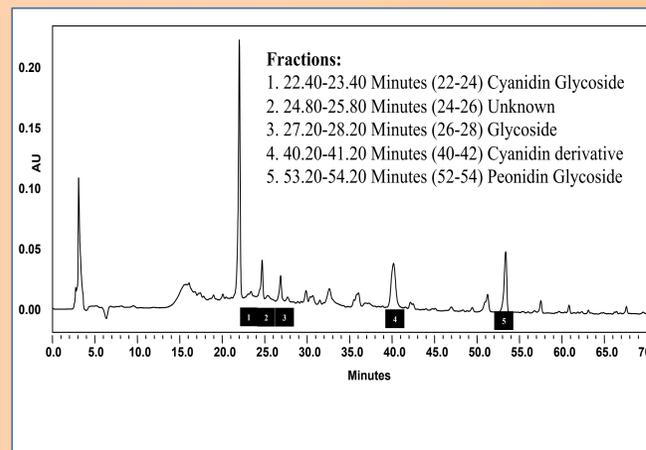
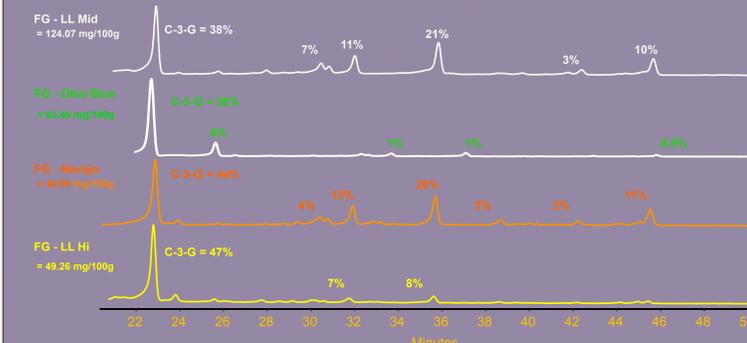


Table 3. Analysis of Variance for Total Anthocyanin Content (2013)

Source	DF	Sum of Square	Mean Square	F Value	Pr > F
Location	3	4025.41	1341.80	10.26***	<0.0001
Accession	7	18418.89	2631.27	20.12***	<0.0001
L*A Interaction	21	4461.87	212.47	1.62	0.0776
Mean (Accession)	49.49				
LSD _{0.05}	9.47				

Where, *, **, *** Significant at 0.05, 0.01 & 0.001 P Value respectively

Fig. 2. Anthocyanin Relative Abundance



Conclusions

- Dominant class of anthocyanin in blue corn is cyanidin 3 glucoside
- Peonidin and Pelargonidin anthocyanin components are also present
- Various glucosides of cyanidin, peonidin and pelargonidin are present in variable amounts across accessions
- Genetic variation for color is due to presence or absence of different components

Acknowledgement

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References

- Kenneth, Jones., 2005. The Potential Health Benefits of Purple Corn. *Herbal Gram*, 65:46-49. American Botanical Council.
Li, C., H. Kim, S. Won, Ra, H. Min, K. Park, J. Park, M. Ahn and H. Rhee. 2008. Corn Husk as a potential source of anthocyanin's. *J. Agric. Food Chem.* 56: 11414-11416.