

Breeding Muscadine for Health Beneficial

PRESENTED BY

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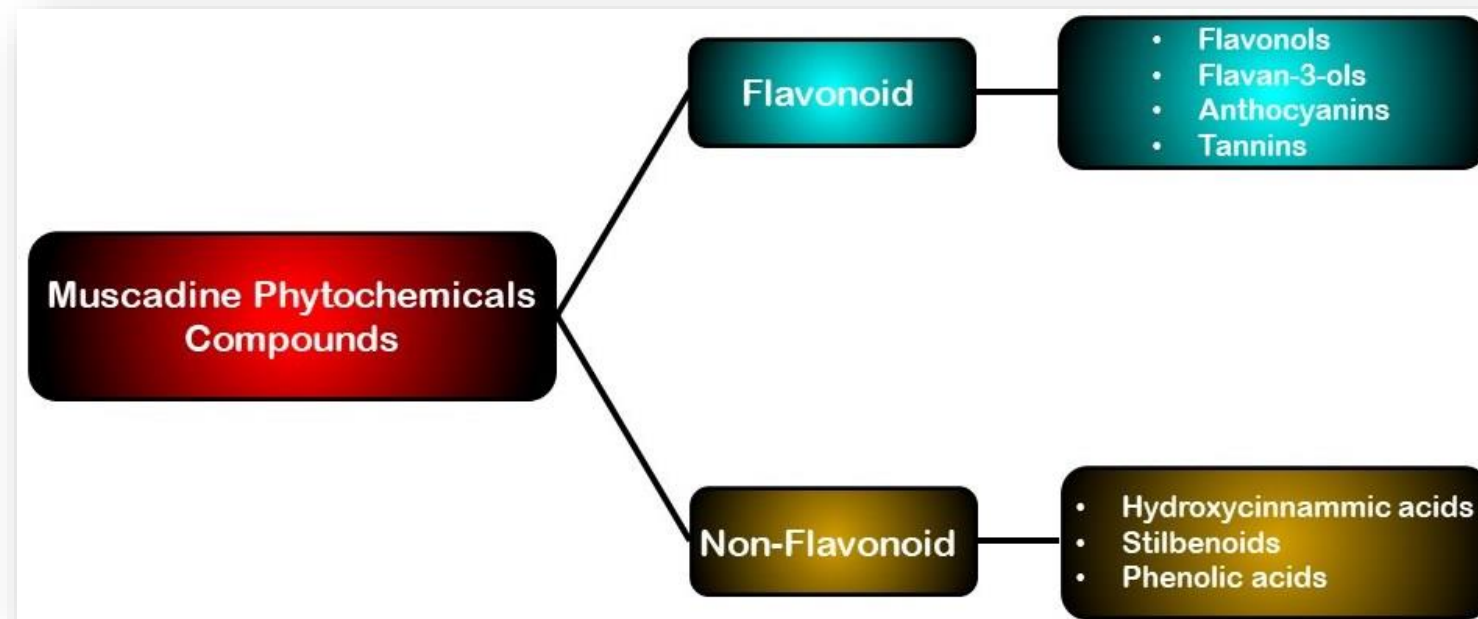
Florida Agricultural and Mechanical University

Center for Viticulture and Small Fruit Research, College of Agriculture and Food Sciences

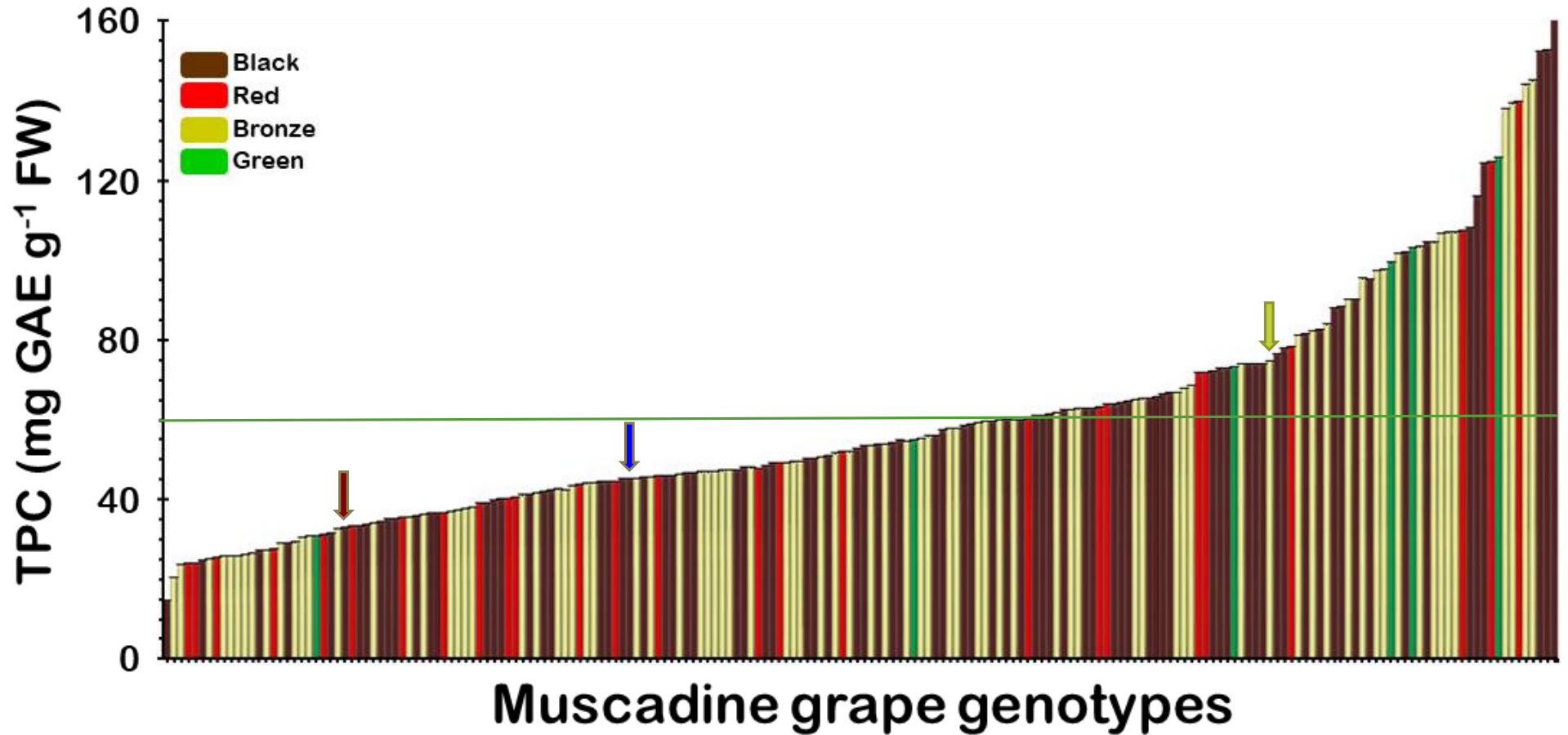
Tallahassee, Florida.

Phytochemical Properties of Muscadine Grapes

- ➔ Mainly accumulated in berry skin and seeds.
- ➔ Play important roles in plant growth and defense.
- ➔ Have potent health benefit for humans due to their antioxidant, anticancer, antimicrobial, and anti-inflammatory properties.
- ➔ Their activities depend on type and structure.
- ➔ Contribute to the taste, color and mouthfeel of grapes and wine.

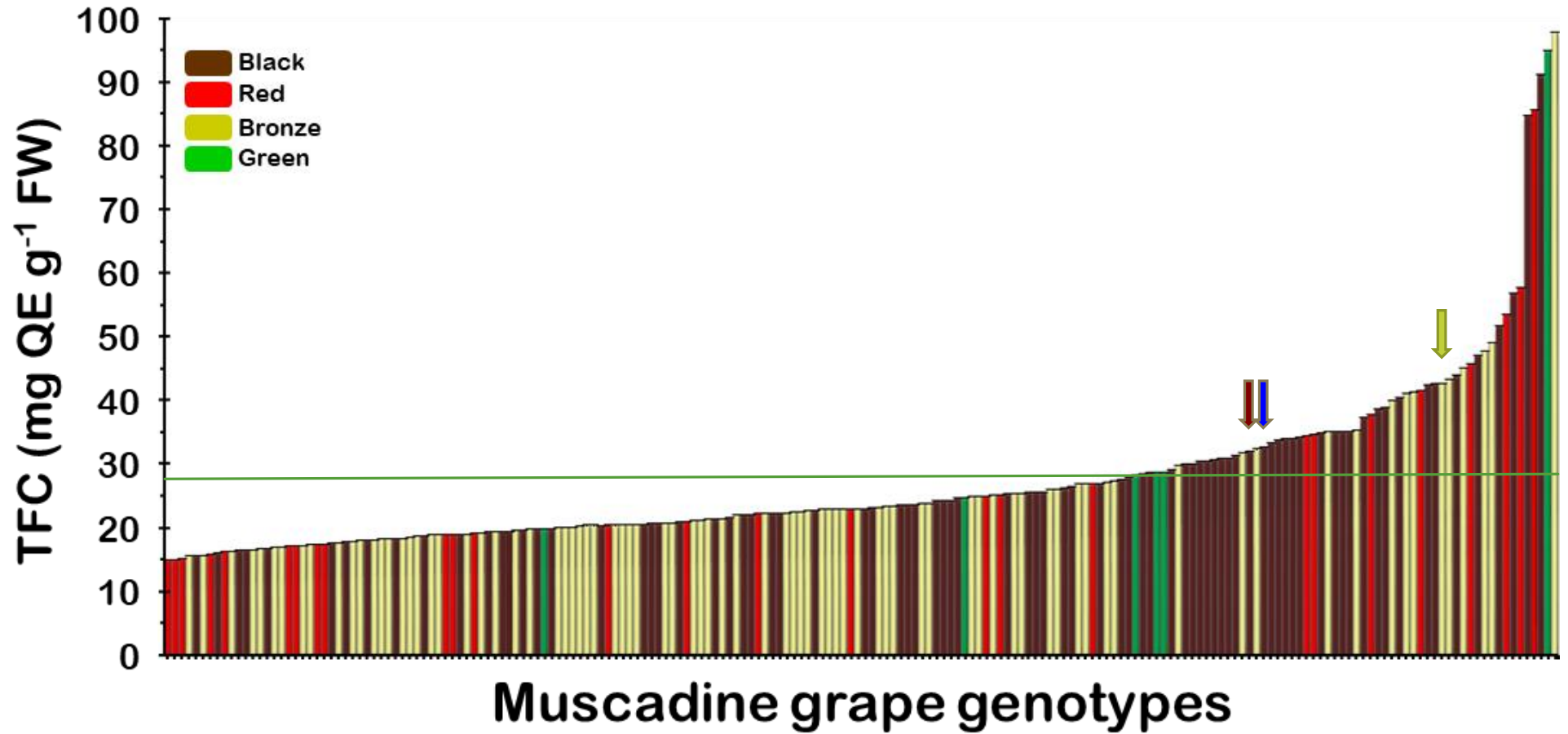


Total Phenolic Content (TPC)



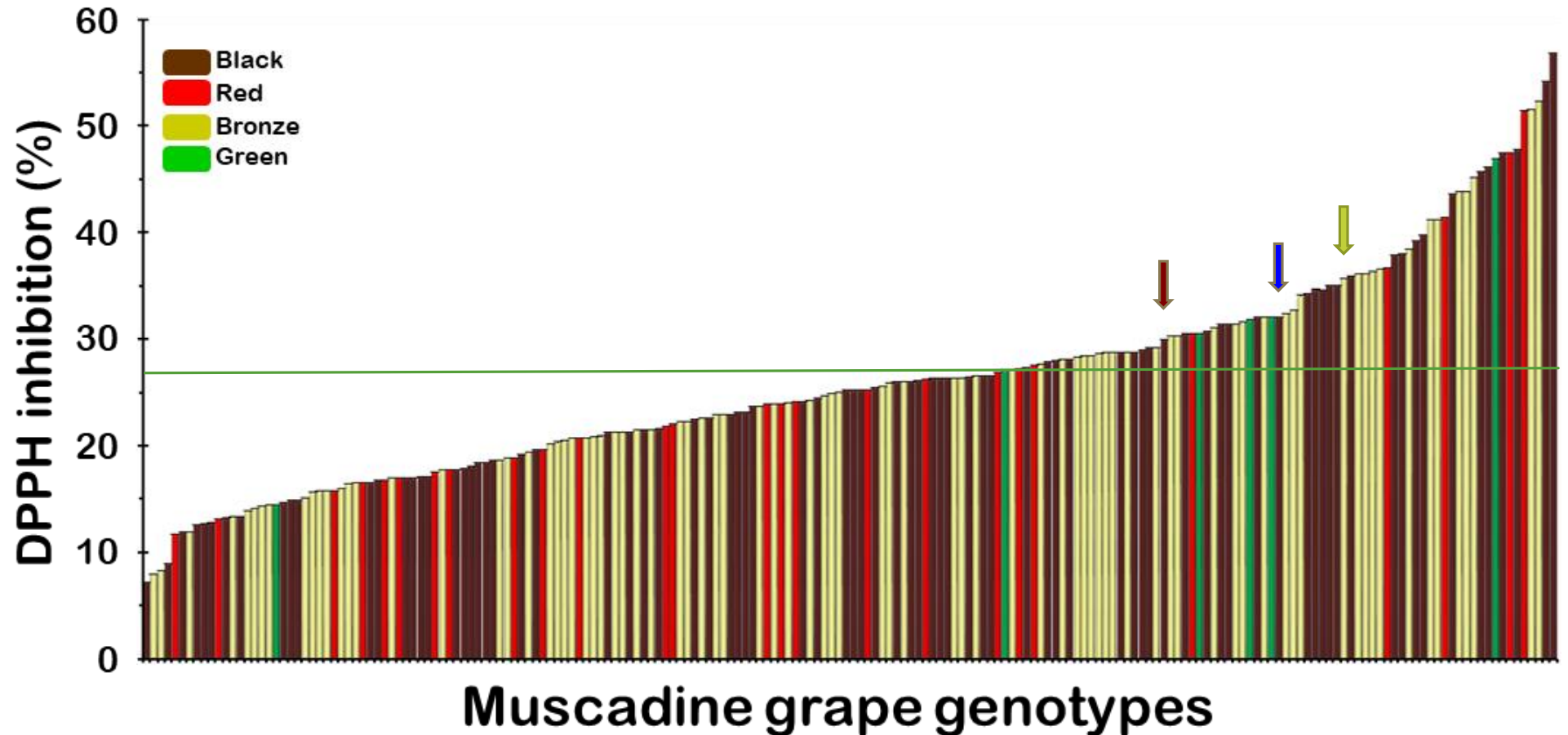
- TPC accumulation among muscadine population ranged from 15 ± 0.02 to 159 ± 0.05 mg GAE g⁻¹ FW.
- Based on average TPC accumulation (~ 60 mg GAE g⁻¹ FW), 38% of muscadine population exhibit high total phenolic content.

Total Flavonoid Content (TFC)



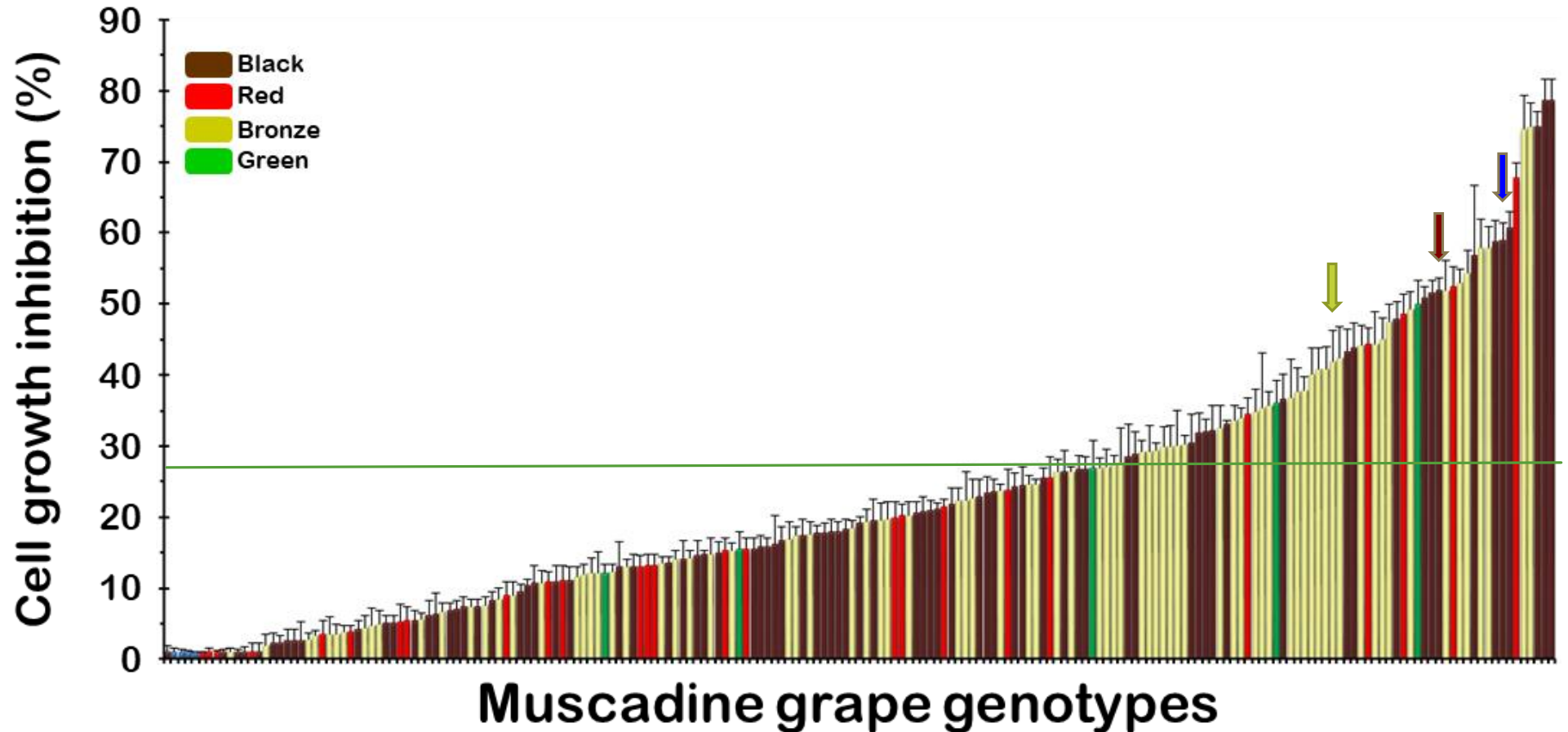
- TFC accumulation among muscadine population ranged from 15 ± 0.02 to 98 ± 0.04 mg QE g⁻¹ FW.
- Based on average TFC accumulation (~ 27 mg QE g⁻¹ FW), 32% of muscadine population exhibit high total flavonoid content.

Antioxidant capacity of Muscadine berries extracts



- Antioxidant capacity among muscadine population ranged from 7 – 57%.
- Based on average DPPH inhibition activity (~26%), 48% of muscadine population exhibit high antioxidant capacity.

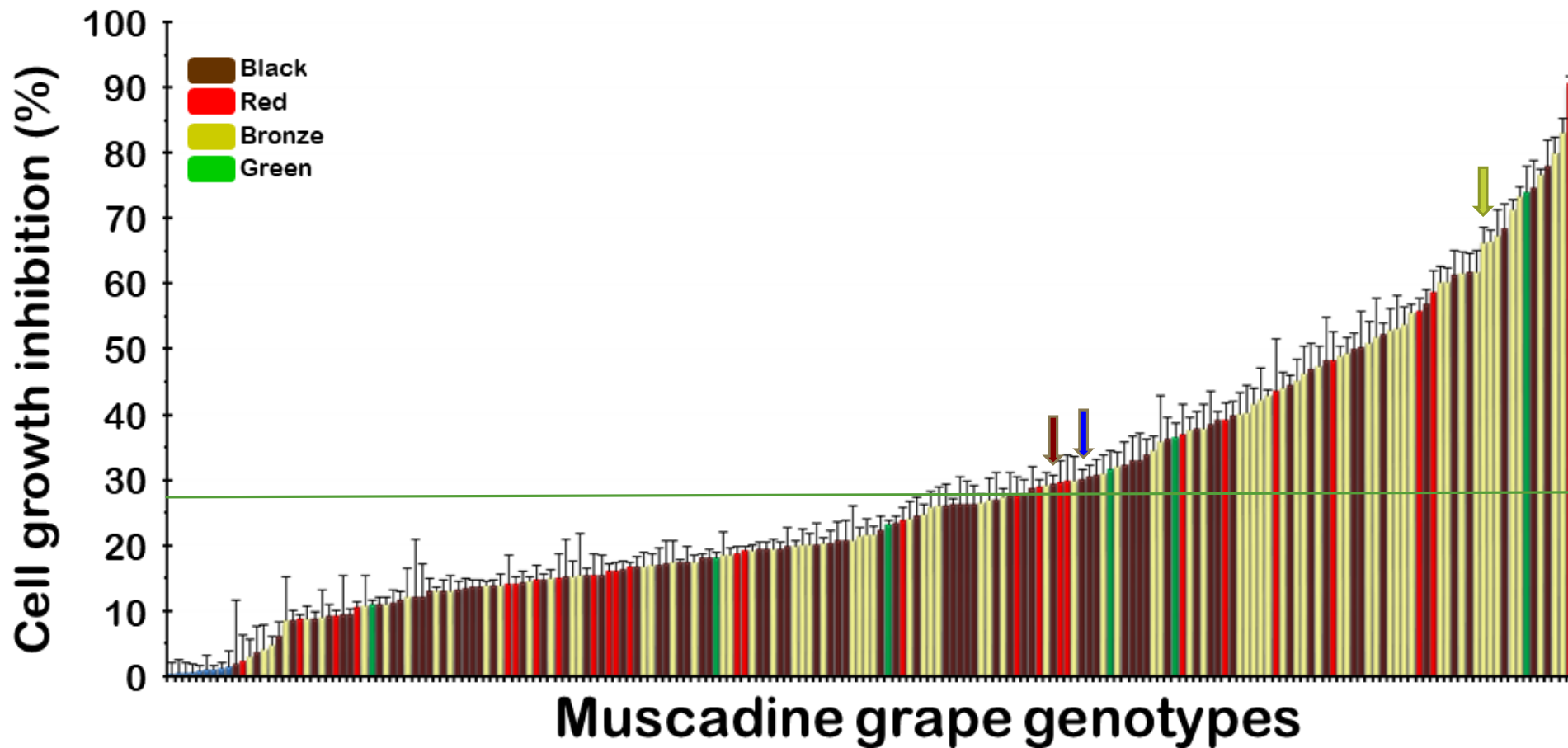
Breast Anticancer Activity Caucasian Breast-Cancer Cell Line



- ➔ Cytotoxicity for Caucasian breast-cancer cell line among muscadine population ranged from 0 – 79%.
- ➔ Based on average cytotoxicity (~26%), 42% of muscadine population exhibit high Caucasian breast anticancer activity.

Breast Anticancer Activity

African American Breast-Cancer Cell Line



- Cytotoxicity for African American breast-cancer cell line among muscadine population ranged from 0 – 91%.
- Based on average cytotoxicity (~28%), 39% of muscadine population exhibit high African American breast anticancer activity.

Research Outcomes

- ➔ Total anthocyanin content (TAC) is not associated with any of the evaluated traits.
- ➔ Both TPC and TFC traits are significantly involved in defining muscadine antioxidant capacity.
- ➔ TPC and antioxidant capacity are the major factors, contributing to the ultimate breast anticancer activity in muscadine grapes.

Research Outcomes

➔ Muscadine selections showed high antioxidant capacity.



O16-9-1



O35-2-1



O34-21-3



O43-1-1

Research Outcomes

➔ Muscadine selections showed high dual breast anticancer activity.



O16-5-1



O02-6-1



D07-16-1



O043-16-1

Research Outcomes

➔ Muscadine selections showed high Caucasian breast anticancer activity.



A19-13-8



A18-15-2



O1-3-2



O15-12-4

Research Outcomes

⇒ Muscadine selections showed high African American breast anticancer activity.



O18-1-2



C8-7-1



O41-3-1



O41-5-1

Acknowledgement



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