Breeding Muscadine for Health Beneficial

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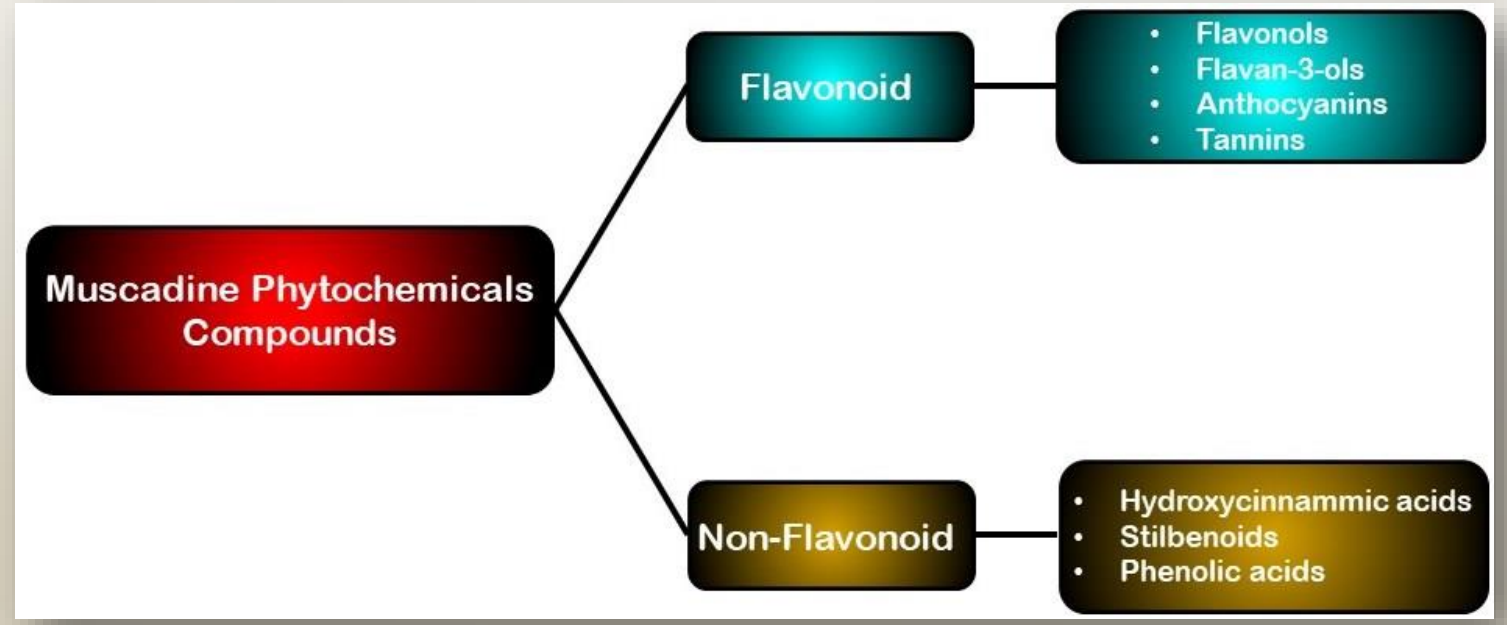
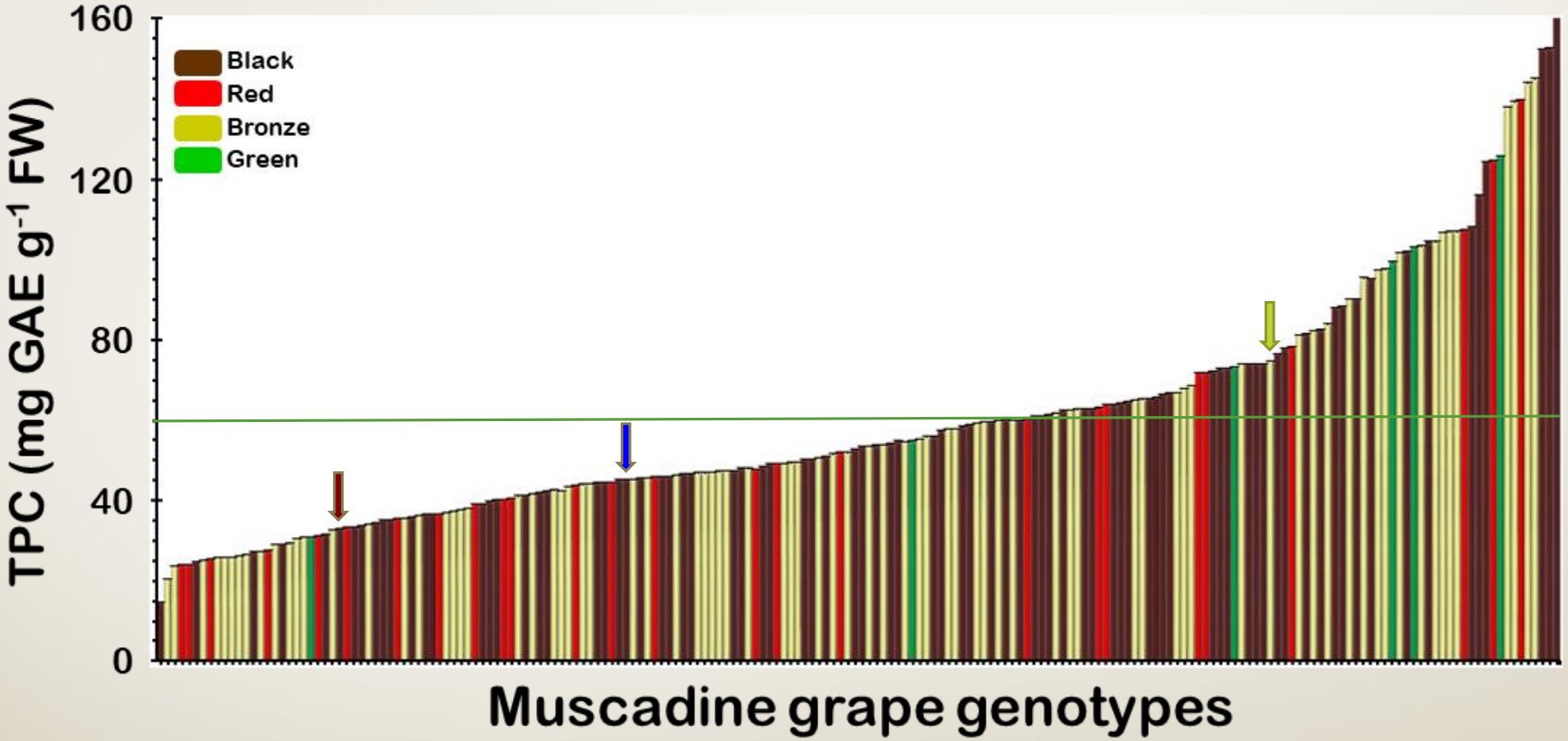
Phytochemical Properties of Muscadine Grapes

- 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.

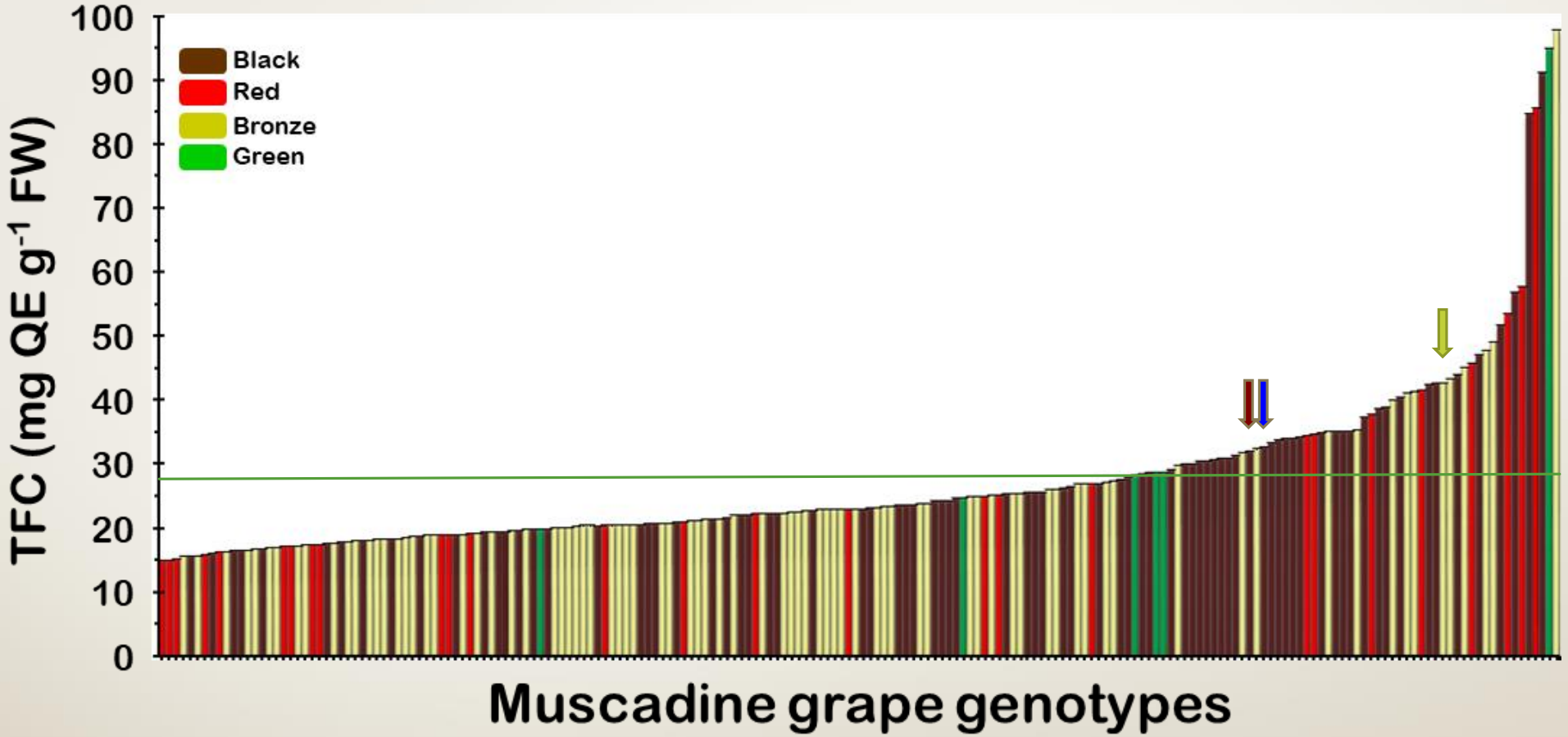


Total Phenolic Content (TPC)



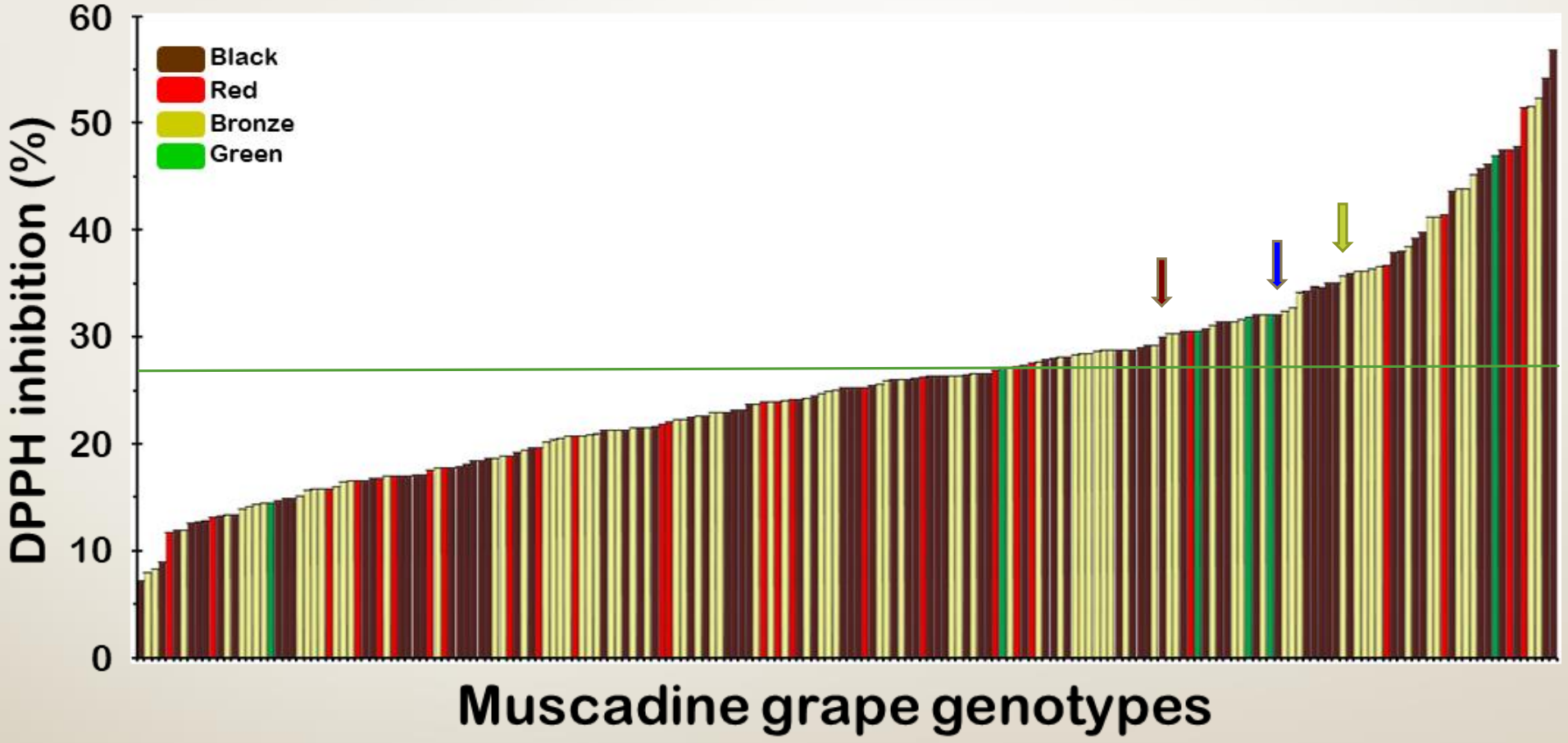
- TPC accumulation among muscadine population ranged from 15 ±0.02 to 159 ±0.05 mg GAE g^{-1} FW.
- Based on average TPC accumulation (~60 mg GAE g^{-1} FW), 38% of muscadine population exhibit high total phenolic content.

Total Flavonoid Content (TFC)



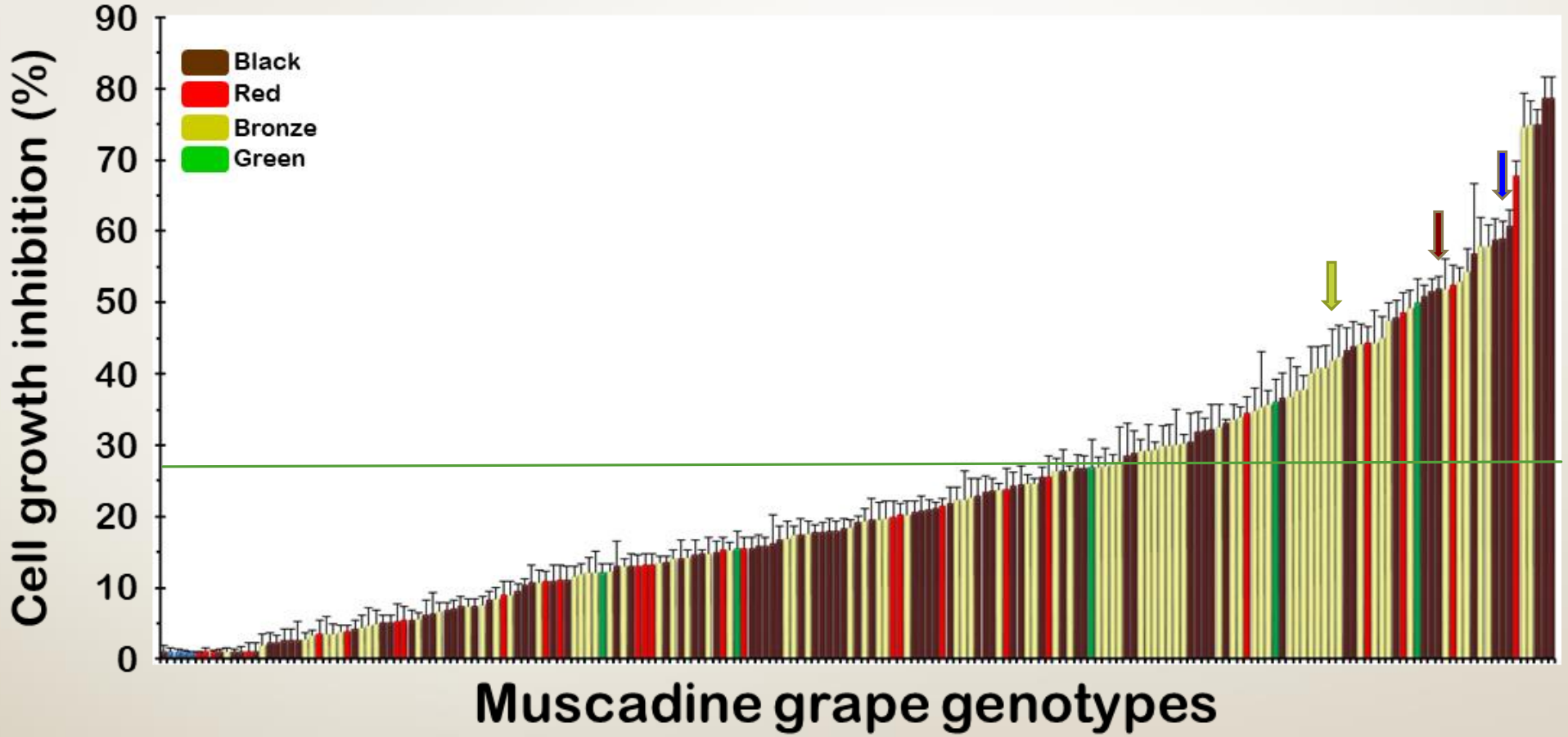
- TFC accumulation among muscadine population ranged from 15 ±0.02 to 98 ±0.04 mg QE g^{-1} FW.
- Based on average TFC accumulation (~27 mg QE g^{-1} FW), 32% of muscadine population exhibit high total flavonoid content.

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.

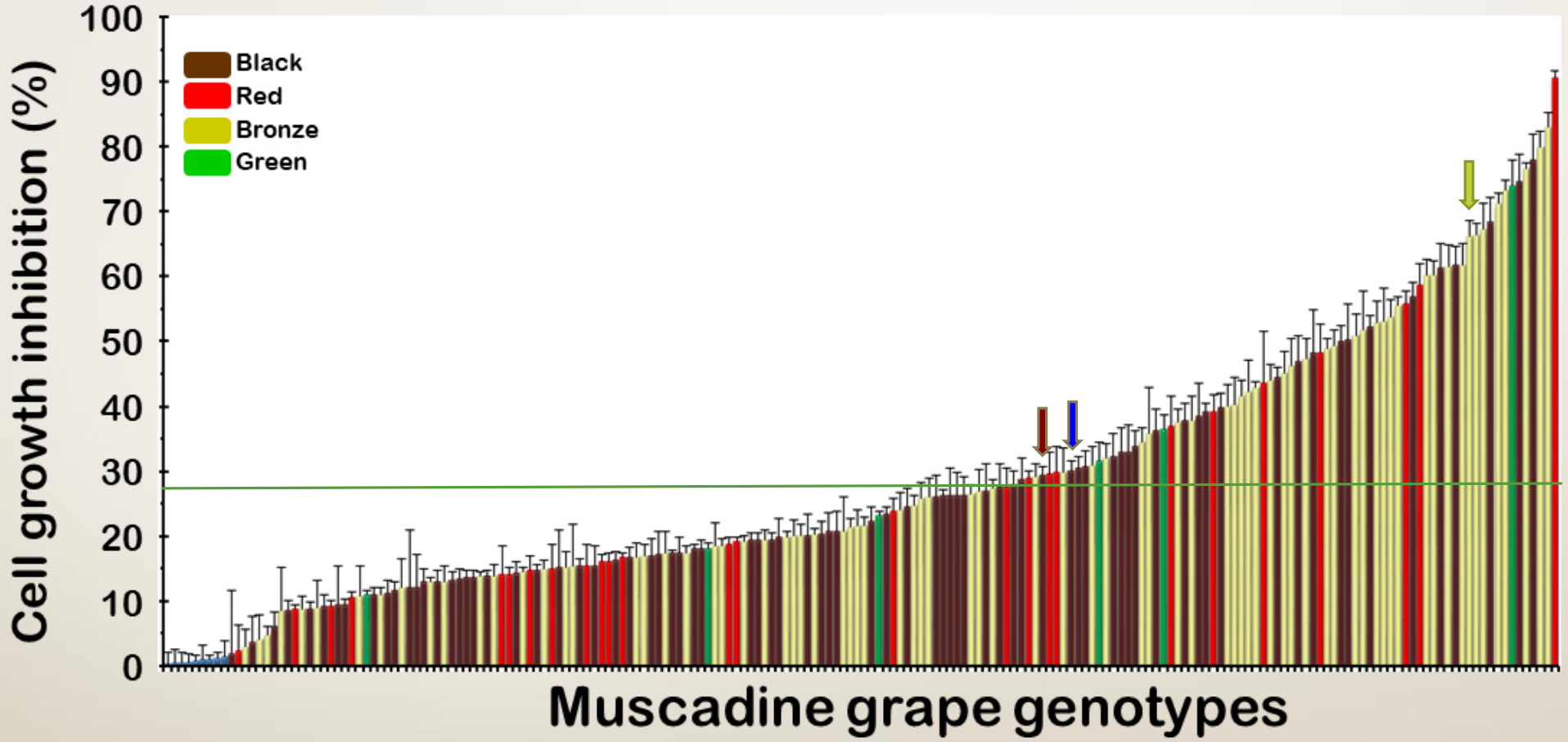
Breast Anticancer Activity
Caucasian Breast-Cancer Cell Line



- 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

O2-6-1

D7-16-1

O43-16-1

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

FLORIDA SPECIALTY CROP FOUNDATION

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Established 1923

USDA
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FAMU
COLLEGE OF AGRICULTURE + FOOD SCIENCES
FLORIDA AGRICULTURAL AND MECHANICAL UNIVERSITY

Thank You