

Biochemical changes during berry ripening in two white seedless table grape cultivars (*Vitis vinifera* L.) prone to berry skin browning

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Introduction



Development of browning:

- on berry surface (external)

Important quality problem

- Leads to financial losses and restricted market access
- Large variation between seasons, cultivars and vineyard blocks



External Browning

Netlike



Friction



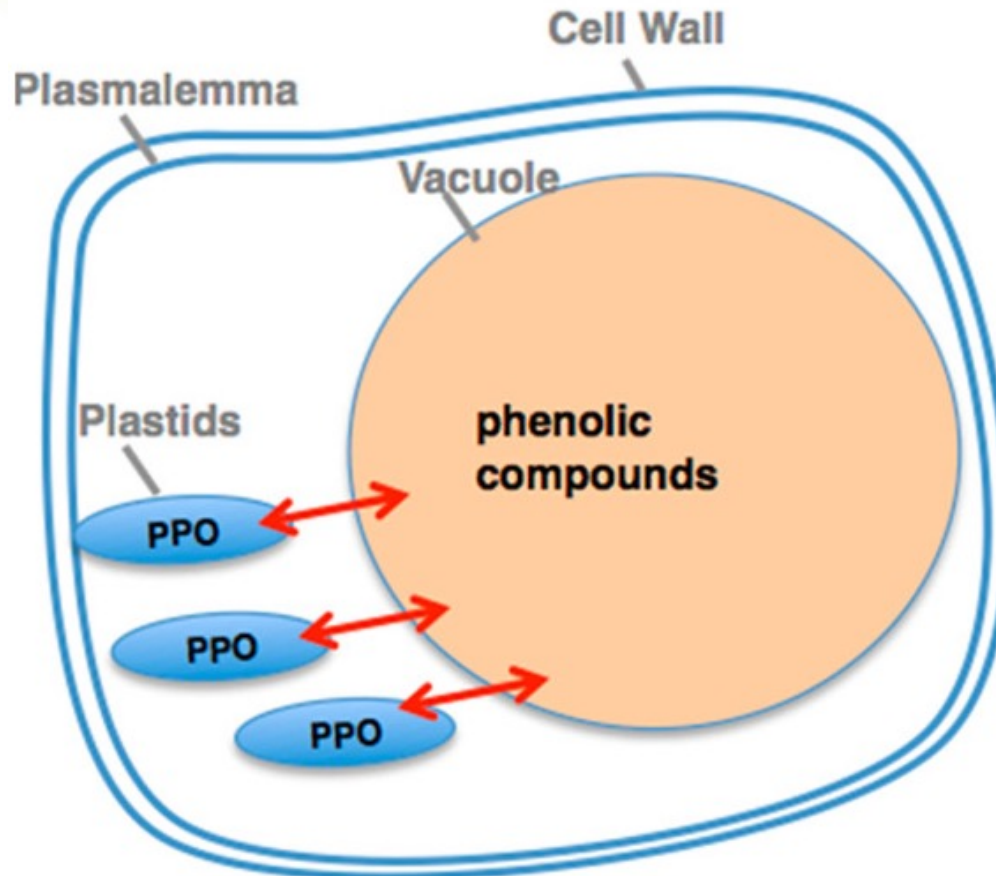
Mottled



Contact



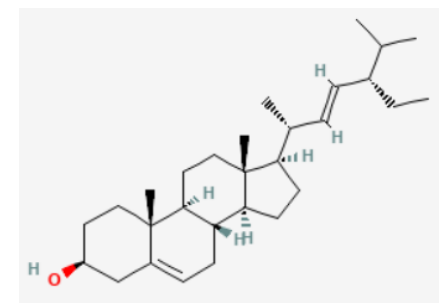
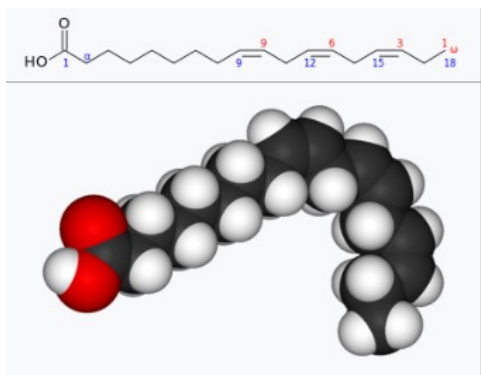
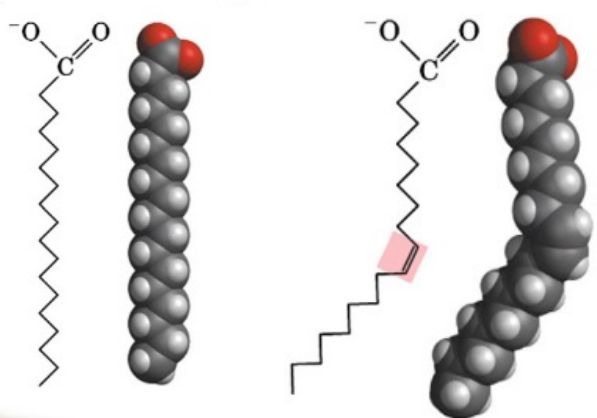
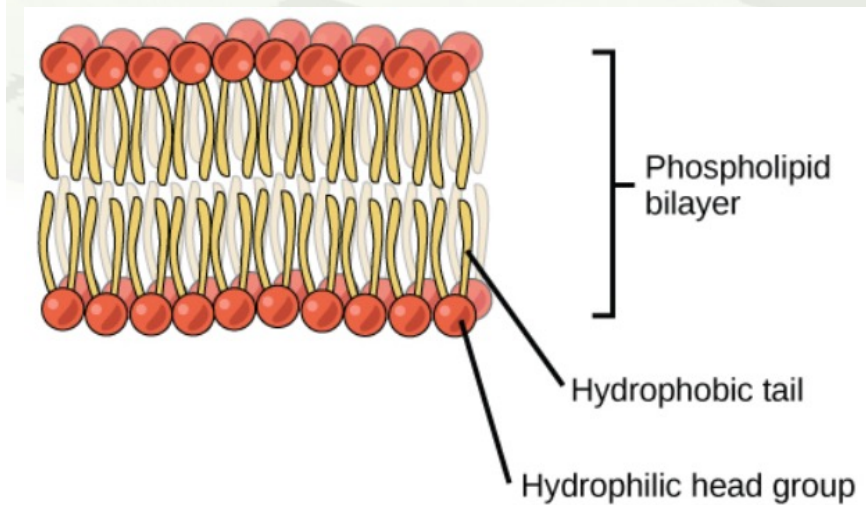
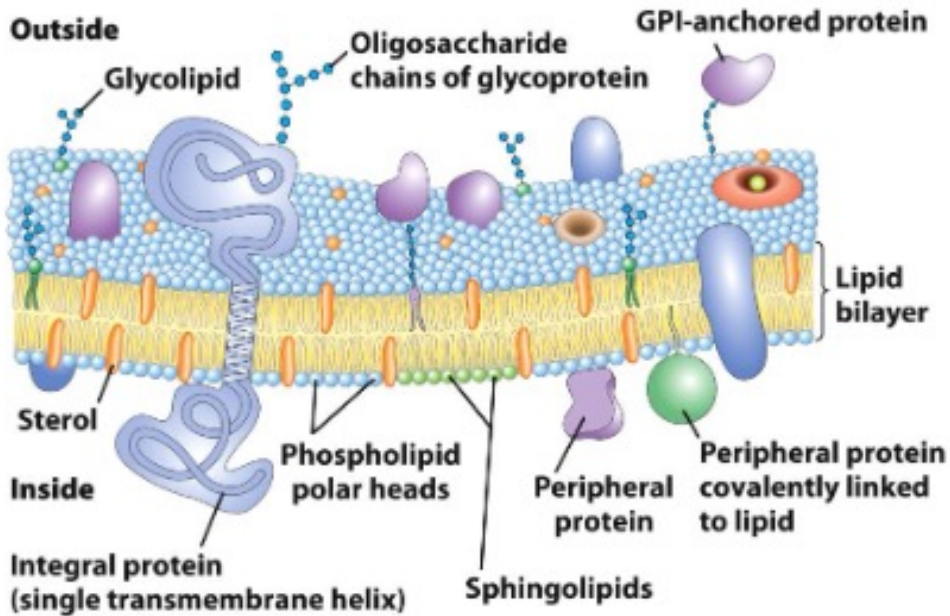
Introduction



Source: Techakanon et al., 2016



Introduction



Materials and Methods



- Two cultivars:
 - Regal Seedless
 - Thompson Seedless
- Two seasons
- Berry sampling
 - weekly from 4 WBH until harvest
- Pack grapes at commercial harvest
- At harvest evaluation



Results



Effect of season on the occurrence of the different types of browning (%) at harvest.

Season	Browning (%)			
	Total External	Contact	Friction	Mottled
2011	13.2 a	3.7 a	4.4 a	3.4 a
2012	5.0 b	1.6 b	0.3 b	1.0 b
<i>P value</i>	0.0009	0.0122	<0.0001	0.0017
<i>LSD (5%)</i>	0.6	0.7	0.5	0.7

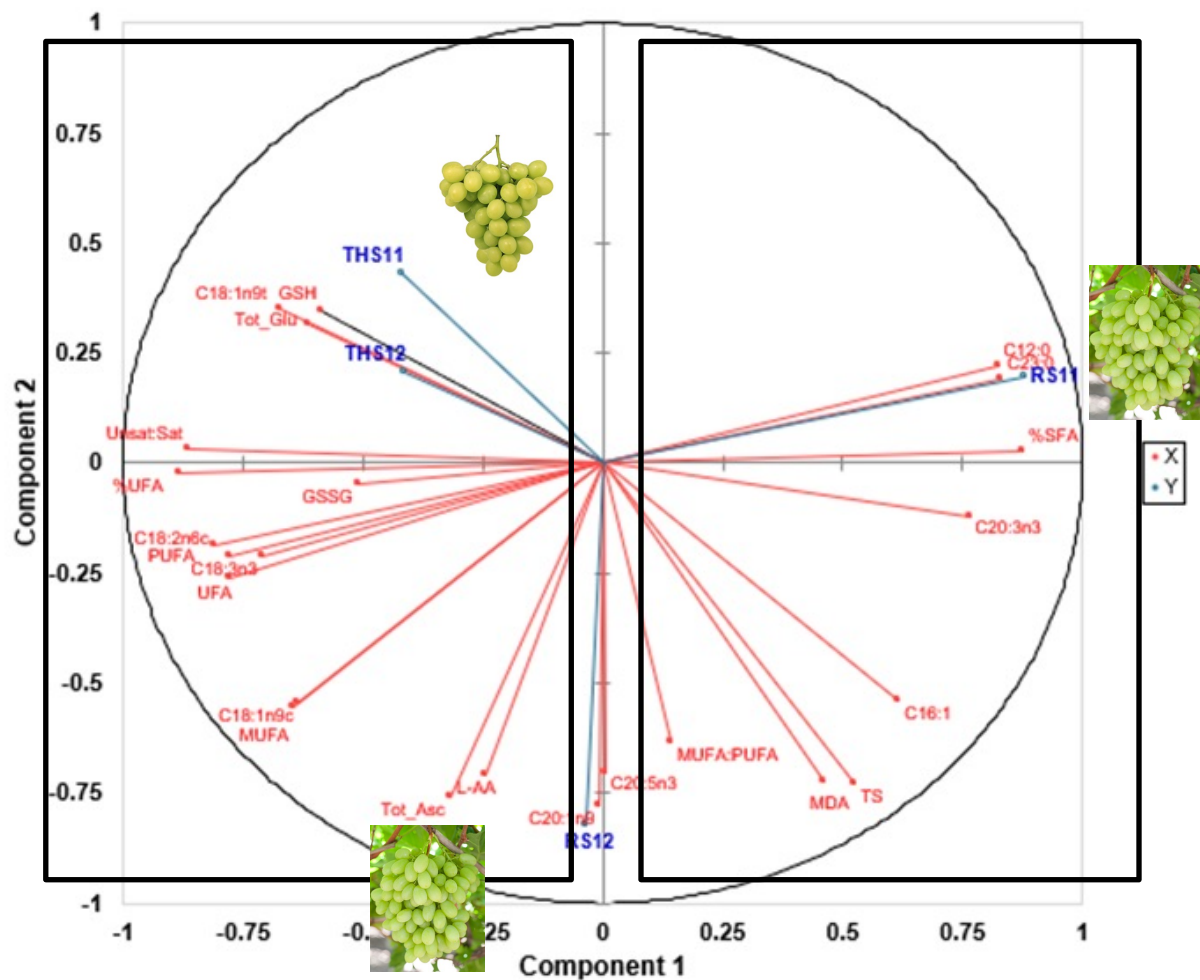
Effect of cultivar on the different types of browning (%) at harvest.

Cultivar	Browning (%)			
	Total External	Contact	Friction	Mottled
Regal Seedless	13.6 a	4.10 a	4.0 a	3.5 a
Thompson Seedless	5.9 b	1.50 b	1.4 b	1.3 b
<i>P value</i>	0.0025	0.0134	0.0005	0.0195
<i>LSD (5%)</i>	0.6	0.7	0.5	0.7

Results

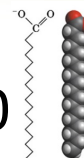


PLS-DA correlation loadings plot illustrating the correlations of the variables with the first two components



Model quality (R^2Y cum) for Component 1+2+3: 72%

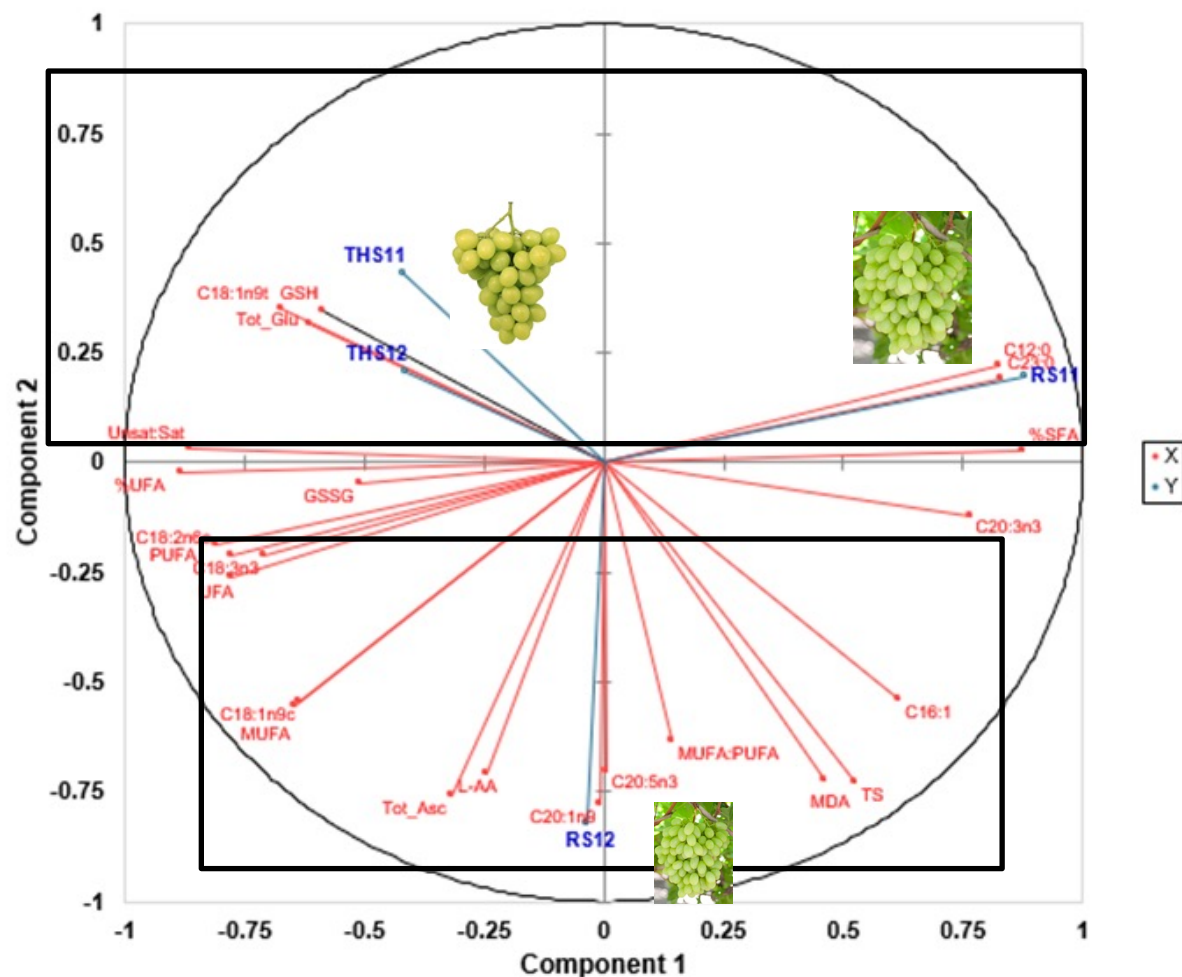
- C12:0 and C23:0
- ↑ %SFAs
- ↑ TS



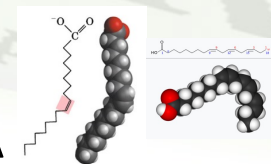
Results



PLS-DA correlation loadings plot illustrating the correlations of the variables with the first two components



- ↑ UFA:SFA
- ↑ MUFA:PUFA
- ↑ ascorbic acid



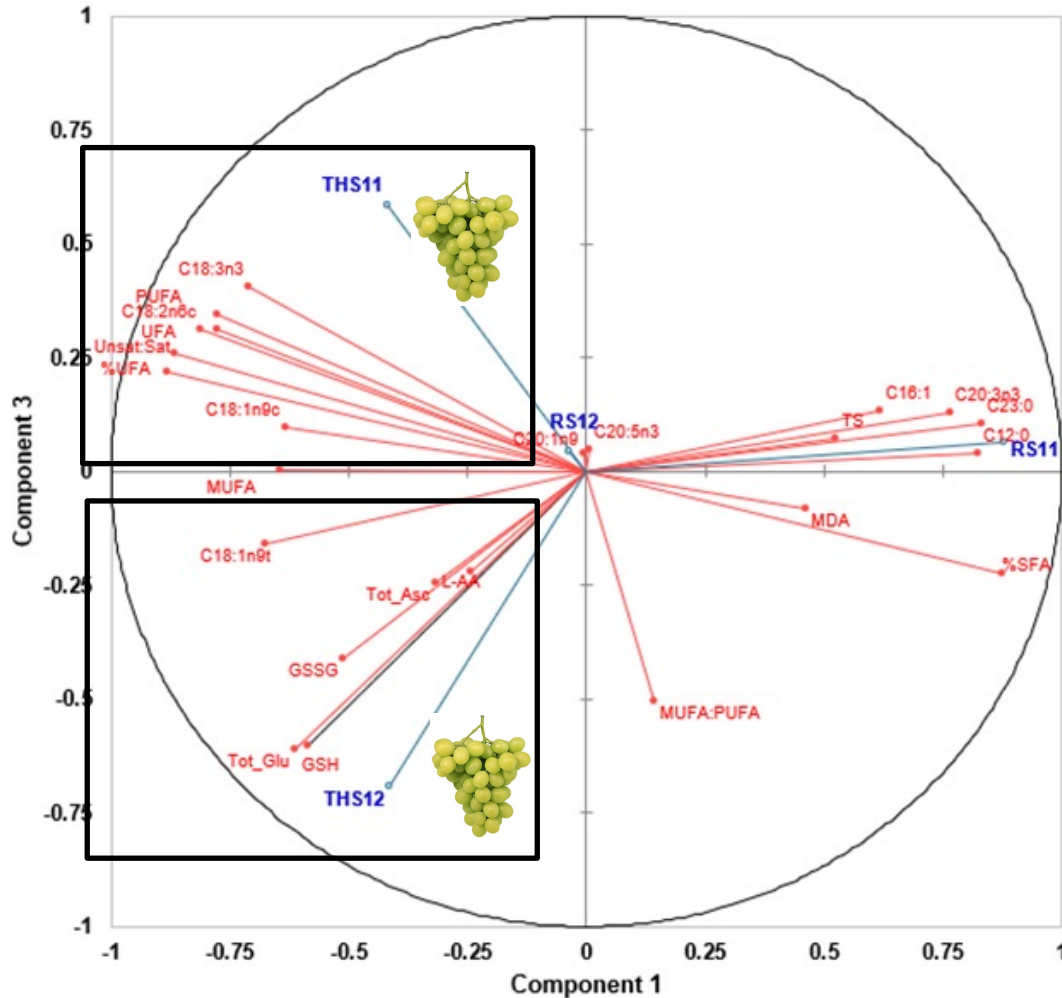
Thompson vs Regal:

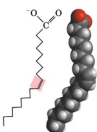
- ↑ UFA and PUFA
- ↑ glutathione

Results



PLS-DA correlation loadings plot illustrating the correlations of the variables with component 3



- ↑ MUFA 
- ↑ MUFA:PUFA
- ↑ TS
- ↑ antioxidants

Conclusions



- Regal more prone to external browning
- Variation in browning levels between seasons
- Linoleic acid (C18:2n6c) - highest concentration in both cultivars
- Investigate preharvest factor or factors lead to difference in external browning between seasons



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by

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