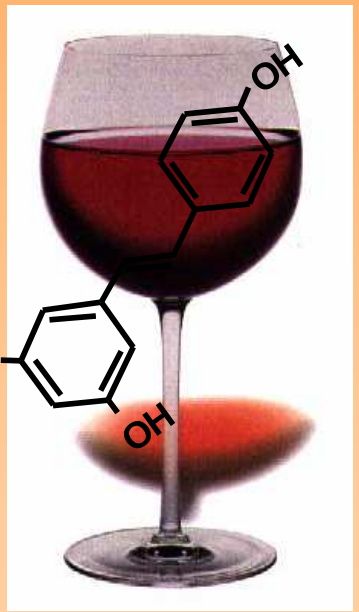
XXIIIth De Clerck Chair 7-10 September 2008

The polyphenol paradox in alcoholic beverages

A beer and wine paradox?

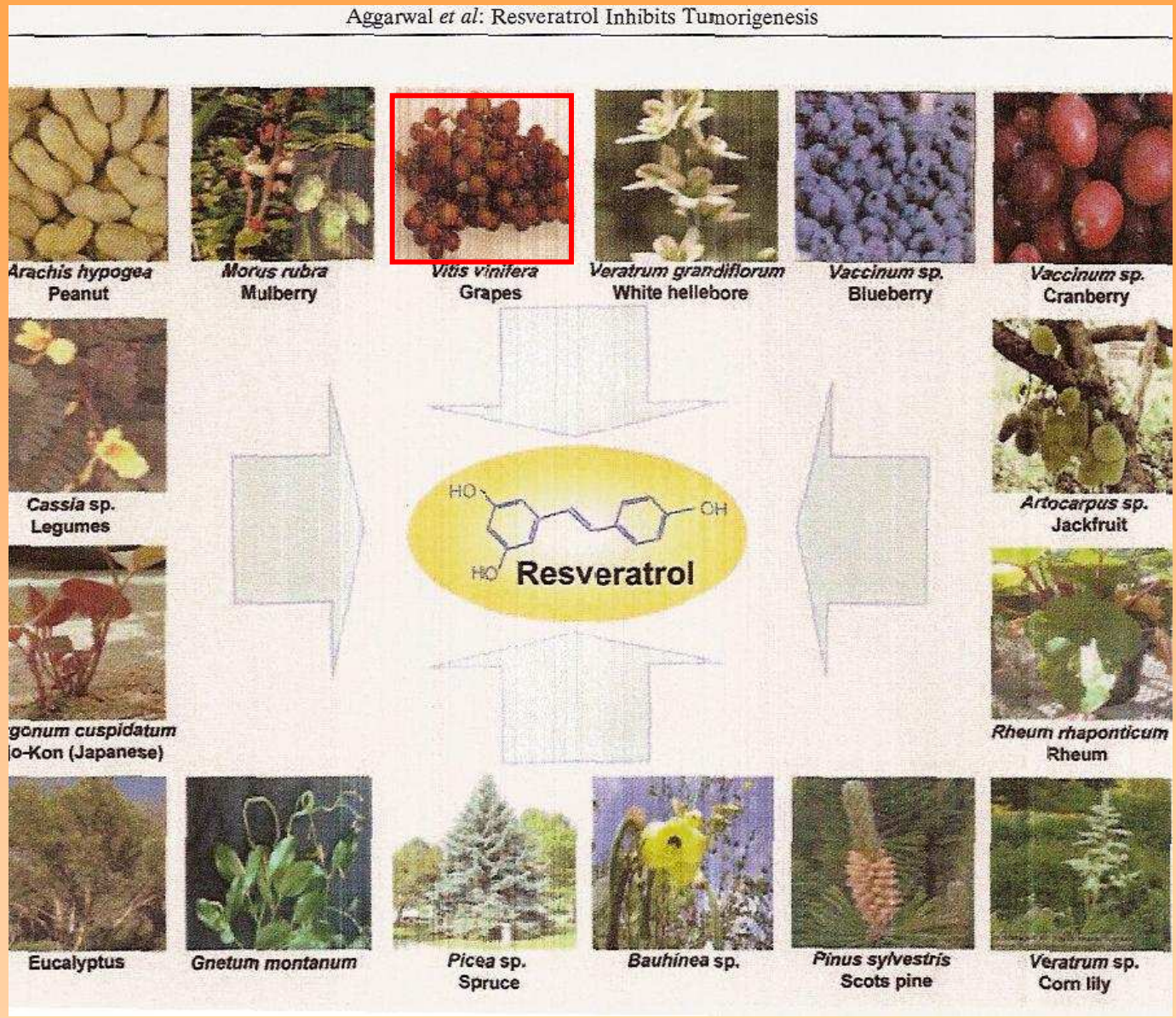
RESVERATROL AND ANALOGS IN WINE



Dr Xavier VITRAC

University of Bordeaux

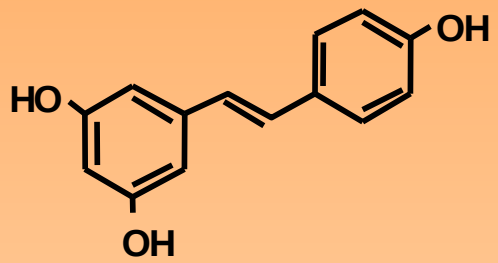
Resveratrol and analogs



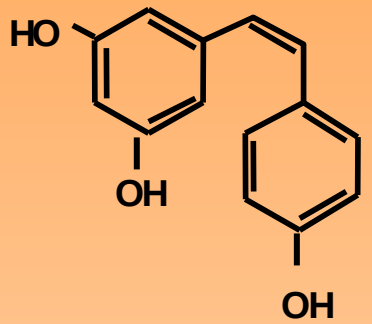
STILBENES

Monomers

trans-resveratrol



λ max = 306 nm



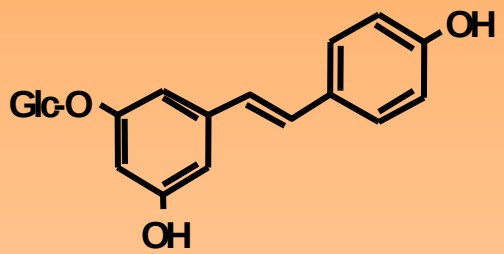
cis-resveratrol

λ max = 286 nm

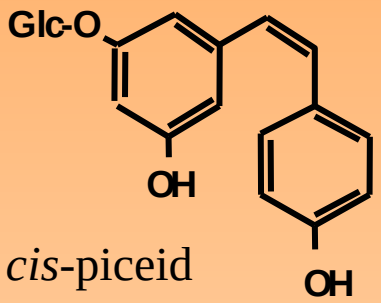
Fluorescence properties: λ exc = 330 nm; λ emi = 374 nm (Pezet et al., 1994)

STILBENES

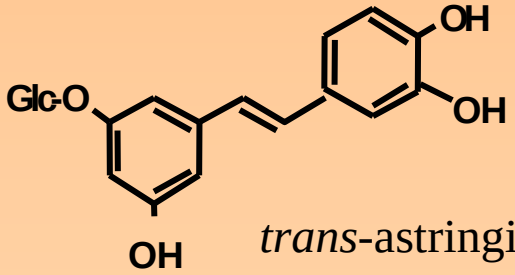
Monomer glucosides



trans-piceid

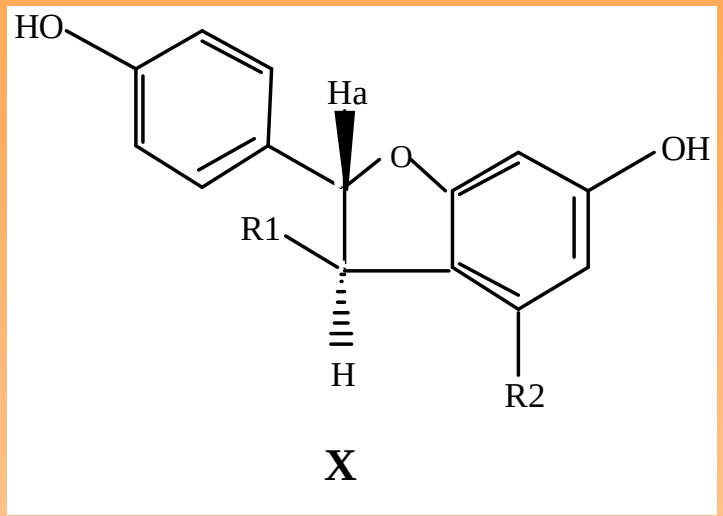


cis-piceid



trans-astringin

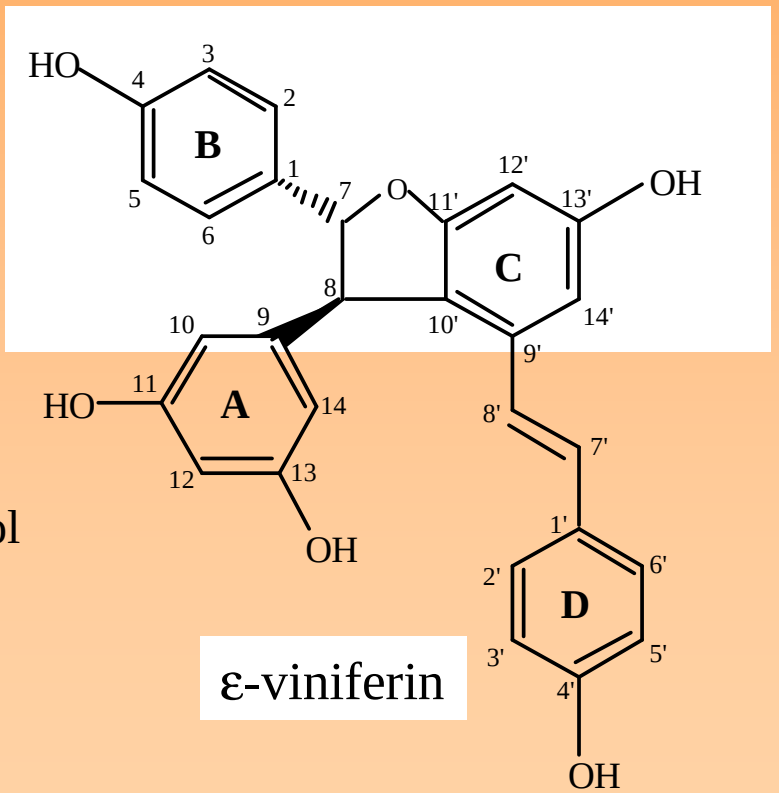
Resveratrol oligomers



X

Group A

X = Oxygen heterocyclic ring

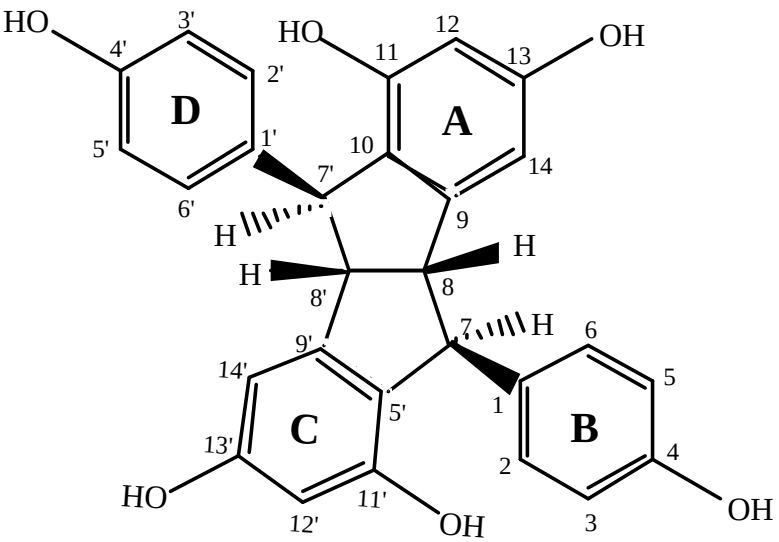


ε-viniferin

Formation *via* oxidative dimerization of resveratrol (peroxidase- H2O2 system *in vitro* or laccase of *Botrytis cinerea in vivo*)

Resveratrol oligomers

Group B: no oxygen heterocyclic ring



Pallidol

Formation directly from resveratrol (no ε-viniferin intermediary)

Resveratrol and analogs in Vitis vinifera

Induced compounds = phytoalexins

Leaves (Jeandet et al., 1997)

trans-resveratrol (90 ug/g FW)
ε-viniferin (30 ug/g FW)
Trimer α-viniferin (20 ug/g FW)

Stress:
UV
Infection

Berries (Pezet et al., 1994)

trans-resveratrol
trans- and *cis*-piceid
Pterostilbene

Constitutive compounds

Stems, roots (Mattivi et al., 1998)

trans- and *cis*-resveratrol
Piceatannol
<u>Oligomers:</u>
ε-viniferin
Gnetin H
Ampelopsin
Hopeaphenol
r2-viniferin

Seeds

trans- and *cis*-resveratrol

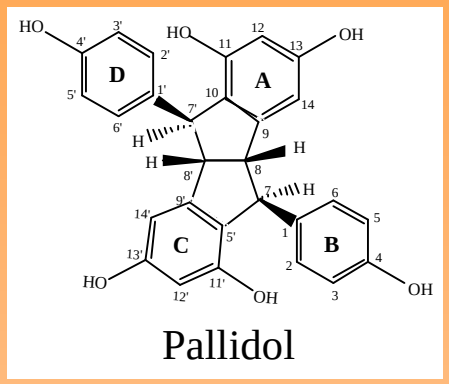
Resveratrol

wines	*trans*-resveratrol min.-max.	*cis*-resveratrol min.-max.
Total white wines (23)	n.d.-0.2	n.d.-0.9
Total red wines (39)	n.d.-13.9	n.d.-0.9

Resveratrol glucosides

wines	*trans*-piceid min.-max.	*cis*-piceid min.-max.
Total white wines (23)	n.d.-7.0	n.d.-0.9
Total red wines (39)	n.d.-26.0	n.d.-24.1

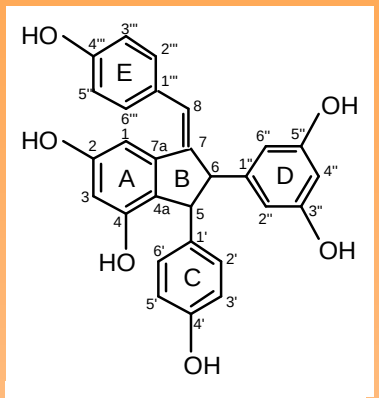
Resveratrol dimers



Pallidol

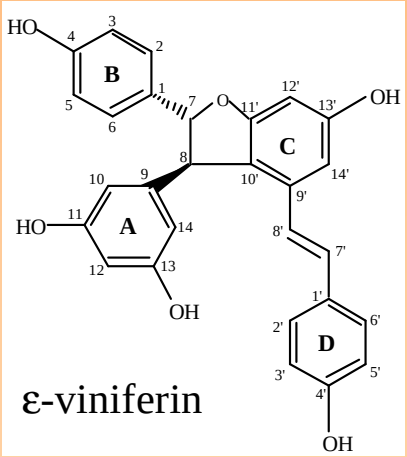
Average 2.5 mg/L

Vitrac et al., 2001
French red wines



Parthenocissin

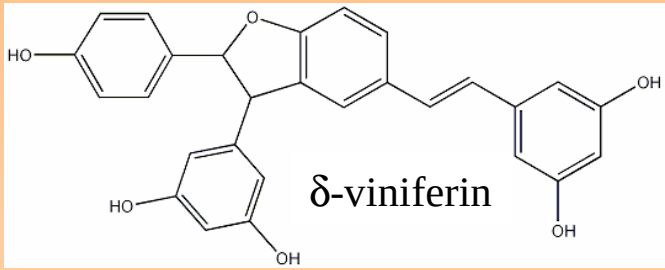
Not quantified



ε-viniferin

Average 2 mg/L

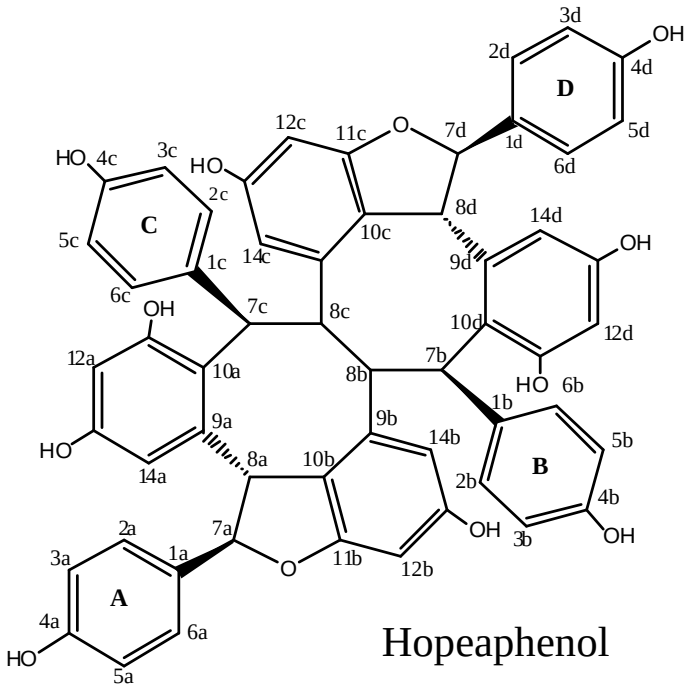
Vitrac et al., 2005
Brazilian red wines



Average 6.4 mg/L

Resveratrol tetramer

Guebailia et al., 2006
Algerian wines



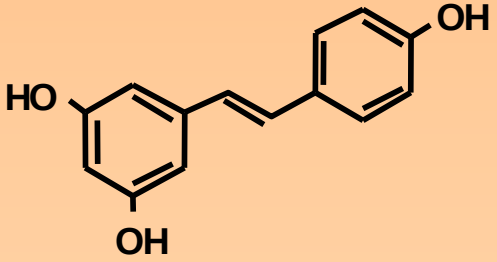
Hopeaphenol

Max: 3.8 mg/L

CONCLUSION

Wine contributes to antioxidants daily intake

3 glasses / day
Total stilbenes **:** **5 mg** / day



GESVAB

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