

The aim of this work was to study the ability of some olive leaves (OL) extracts to counteract lipid oxidation in an emulsified system. Efforts were also brought to investigate how the chemical composition influences antioxidant capacity. In this way, dried young or old olive leaves were submitted to successive extractions by CH₂Cl₂, AcOEt, and MeOH. The resulting extracts were analyzed by HPLC/MS-ESI.

Effect of solvent extraction on phenolic profiles

Whatever the OL maturation degree :

- 1 → CH₂Cl₂ extract exhibits a *simple profile* with only 3 compounds: oleuropein (Ole), oleurosides & ligstrosides (Ligs).
- 2 → AcOEt extract exhibits a more complex profile and presents the *higher content* in oleuropein, oleurosides, ligstrosides & diosmetin isomers (Dios1 & Dios2).
- 3 → MeOH extract presents the *higher content* in verbascoside (Verb1 and Verb2) and luteolin-glucoside (Lut-7-O-Glu and Lut-Glu) isomers

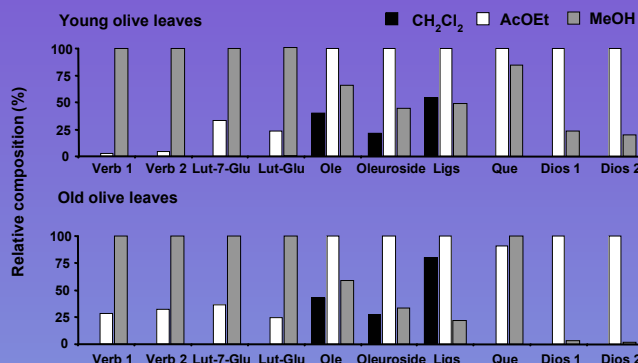


Fig 1. Proportion of phenolics extracted from young (upper graph) and old (lower graph) olive leaves by CH₂Cl₂, AcOEt, and MeOH

Effect of maturation degree on phenolic profiles

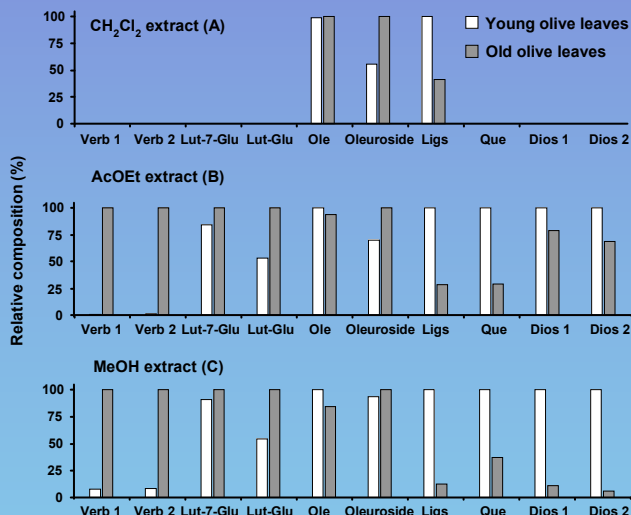


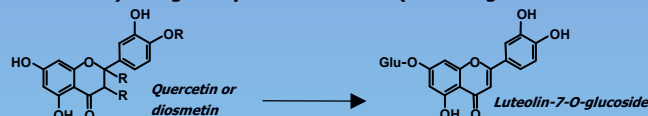
Fig 2. Proportion of phenolics extracted from young and old (olive leaves by CH₂Cl₂ (A), AcOEt (B), and MeOH (C)

Effect of OL maturation degree:

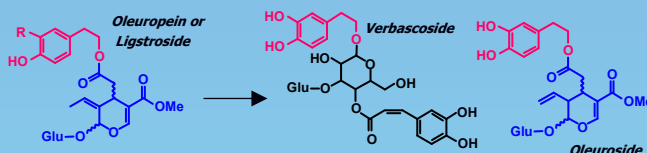
- 1 → Decrease of ligstrosides, quercetin, and diosmetin isomers
- 2 → Increase of verbascoside, luteolin-glucosides, oleurosides, and oleuropein (excepted for CH₂Cl₂ extract).

Two hypotheses could be formulated to explain this evolution :

- 1 → Conversion of *flavonoid* aglycones (quercetin & diosmetin isomers) into glucosylated flavonoids (luteolin-glucoside isomers):



- 2 → Conversion of the *secoiridoids* ligstrosides and oleuropein into oleurosides and verbascoside:



Antioxidant capacity by the conjugated autoxidizable triene (CAT) assay

- 1 → Whatever the maturation degree of OL, the order of antioxidant effectiveness is: AcOEt extract > MeOH extract >> CH₂Cl₂ extract.
Hypothesis : Oleuropein which is far more concentrated in extracts than others phenolics, are 35 % increased in AcOEt extract compared to MeOH extract.
- 2 → Whatever the solvent used, old OL extracts exert higher AC than young OL extracts
Hypothesis : Bio-conversion process transform medium antioxidants (0 or 1 catechol) into stronger antioxidant such as verbascoside (2 catechols).

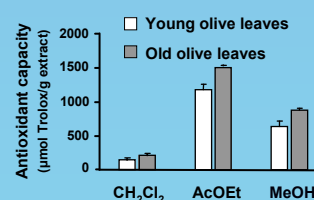


Fig 3. CAT values of young or old OL.

