

POLYMERIC STILBENE DERIVATIVES IN WINEMAKING BY-PRODUCTS AFFECT NF-κB MEDIATED INFLAMMATORY RESPONSE IN CACO-2 CELLS

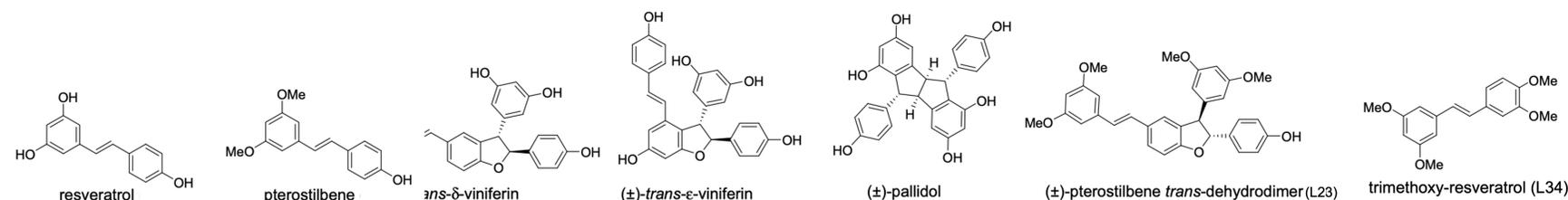


Giuditta C. Heinzl, Stefania Iametti, Luce Mattio, Andrea Pinto, Sabrina Dallavalle, Jessica Capraro and Alessio Scarafoni

Section of Chemical and Biomolecular Sciences, DeFENS, University of Milan



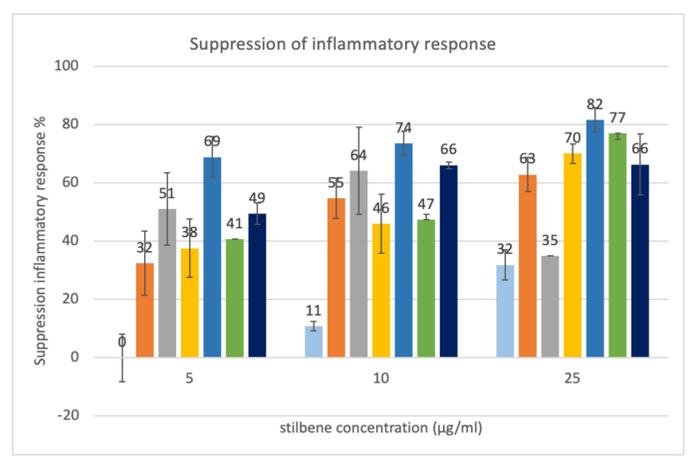
Introduction. Residuals from winemaking represents one of the most important by-products in the Italian agri-food scenario. Grape skins and stems contain high levels of various phenolics-based bioactives that - in the large family of stilbenoids - include resveratrol and the products ensuing from its radical-based polymerization. Among these is the family of viniferins.



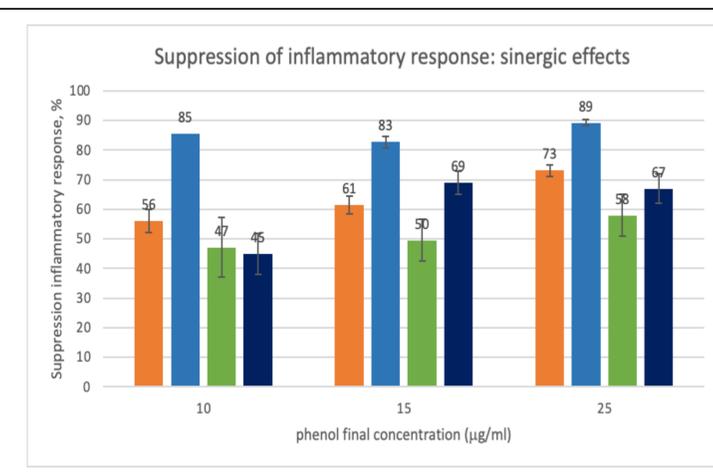
Previous results indicated that viniferins are able to interfere with the glucose metabolism in the gut, by inhibiting - in the lumen - various extracellular or membrane enzymes involved in the final steps of starch breakdown and - eventually - in glucose uptake [1].

Aim of this work was to use a RT-qPCR-based assay to assess whether these molecules (at concentrations in the 5-25 μ M range) may affect intracellular expression of NF- κ B in response to the addition of IL-1 β , and to verify whether any effect of these species was synergistic with those observed for resveratrol alone (keeping resveratrol at a fixed 5 μ M concentration).

Concentration-dependent suppression of NF- κ B expression was observed for all the tested compounds. The inhibitory effect was in the order δ -viniferin > L34 > ϵ -viniferin > L23 > resveratrol > pallidol > pterostilbene.



Naturally occurring δ -viniferin and ϵ -viniferin increased the anti-inflammatory effects of 5 μ M resveratrol in synergistic fashion, with δ -viniferin showing the largest synergistic effects. L23 and L34 elicited little effects, if not for minor competition with resveratrol at their highest concentrations.



Conclusions. The bioactivities associated with resveratrol derivatives in wine and winemaking by-products are not limited to the inhibition of extracellular enzymes. Evidence is provided for possible co-operativity occurring - rather than competition - among chemically related species even for complex intracellular inflammatory responses. These data circumstantially appear to support the "food better than pills" working hypothesis as for outlining possible intervention strategies.

