Chemopreventive Properties of Olive Oil phenolic extracts derived from different Cultivar

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In previous studies we have demonstrated that different phenols isolated from olive oil possess anti-proliferative and pro-apoptotic activities. In the case of hydroxytyrosol, these effects were mediated by a pro-oxidant affect: the production of H_2O_2 in the cell culture medium. Since the phenolic composition of olive oil is quite complex and depends upon different factors including the cultivar of the olive fruit, in this study we have tested the chemopreventive ability of different phenolic extracts derived from 4 Italian cultivar (*Nocellara del Belice, Coratina, Ogliarola* and *Taggiasca*) and related this property both to the phenolic composition of the extracts and to the ability of the extracts to produce extracellular H_2O_2. Dose-response experiments have shown that the *Ogliarola* extract induced a significant anti-proliferative and pro-apoptotic effect at a concentration of 2.5 µg/ml while in the case of *Nocellara del Belice* and *Coratina* a similar effect was obtained at a concentration of 5 µg/ml. On the other hand, the *Taggiasca* extract did not induce a significant effect at 5 µg/ml. The comparison between the pro-apoptotic potential of the different extracts with their phenolic concentration evidenced an inverse correlation with hydroxytyrosol (3,4-DHPEA), tyrosol (p-HPEA) and lignans (pinoresinol and acetoxy-pinoresinol) while a clear and evident positive correlation was found with both secoiridoid derivatives 3,4-DHPEA-EDA and pHPEA-EDA. Indeed, the evaluation of purified compounds demonstrated that both 3,4-DHPEA-EDA and pHPEA-EDA possess a potent pro-apoptotic activity. Finally, we demonstrated that the addition of the H_2O_2 scavenger enzyme catalase to the culture medium did not reduce the pro-apoptotic activity of both the extracts and the purified secoiridois. It may be concluded that: a) the chemopreventive activity of olive oil phenolic extracts is mainly due to secoiridoid derivatives which are present at a concentration 3-10 times higher than the corresponding simple phenolic alcohols and lignans; b) this property is not mediated by the production of H_2O_2 in the cell culture medium.