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INSTITUTE™

The Olive Wellness Institute is a science repository on the nutrition, health and wellness benefits of olives and olive products, which is all subject to extensive peer review.

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About Hydroxytyrosol

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Background

Hydroxytyrosol is a powerful polyphenol which occurs naturally in the olive fruit, pulp, leaves and mill waste waters.^{1,2} Chemically, hydroxytyrosol is described as 4-(2-hydroxyethyl)-1,2-benzendiol, with an empirical formula $C_8H_{10}O_3$.² Hydroxytyrosol is a well-known minor component found in Extra Virgin Olive Oil, which is derived from hydrolysis of the polyphenol oleuropein during olive maturation and olive oil storage.^{1,2} The compound plays an important role (amongst other minor components) in the complex and varied flavor of olives and olive oil.¹ It is also a vital component which largely adds to the stability of olive oil.² Hydroxytyrosol is hydrophilic, and absorbed in a dose-dependent manner in humans, with absorption occurring in the small intestine and colon.¹ Uniquely, hydroxytyrosol is the only polyphenol which is able to cross the blood brain barrier, which allows it to have a significant action to scavenge free radicals in the nervous system.³

Health Benefits

Hydroxytyrosol has a potent antioxidant activity – it has one of the highest known ORAC (oxygen radical absorbance capacity) results known for a natural antioxidant. (ORAC is a method used to determine the antioxidant capacity of a food or chemical substance).²

There is also evidence related to the health benefits of hydroxytyrosol in the following areas:

Anticancer activity

Hydroxytyrosol has the capacity to inhibit proliferation and promote apoptosis of several tumour cells.¹ Therefore, it has been suggested that hydroxytyrosol may have anticancer effects.² The exact mechanism of these effects is not well defined, and research continues in this space.

Anti-inflammatory activity

Research has shown that hydroxytyrosol can reduce the production of cytokine tumor necrosis factor alpha (TNF alpha) in animal models of inflammation.² Animal based research has also shown that hydroxytyrosol may be able to reduce acute inflammation and associated pain.¹

Antimicrobial activity

In vitro experiments have shown that hydroxytyrosol has antimicrobial properties against infectious respiratory and gastrointestinal pathogens.¹ It is also known that hydroxytyrosol has activity against gram positive and gram-negative bacteria.² In general, phenolic compounds have been reported to have wide antimicrobial activity, such as antibacterial, antiviral and antifungal effects.² The exact mechanism by which hydroxytyrosol exerts its antimicrobial action is not well known.²

Antithrombotic activity

A human study showed that hydroxytyrosol was able to lower serum thromboxane B2 levels, leading to an anti-aggregatory

platelet effect.² Other research supports this finding, showing that hydroxytyrosol significantly reduces platelet aggregation.¹

Antiatherogenic capacity and cardioprotective effect

It is known that hydroxytyrosol is a powerful scavenger of free radicals which allows for the reduction in oxidation of low-density-lipoproteins (LDL), potentially reducing the risk of atherosclerosis.^{1,2}

Retino-protective activity

Hydroxytyrosol may play a role in reducing the risk of age-related macular degeneration, however further research is required in this area to determine the exact mechanism and importance of this preliminary research finding.²

Skin related effects

It is believed that oxidative stress plays a major role in UVA-induced protein damage to the skin.⁴ Preliminary research shows that hydroxytyrosol can work to prevent such UVA damage in melanoma cells.⁴

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