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Study: Bee Pollen Has Health Protective Potential, Antioxidant Activity

Antioxidant Effects of Flavonoid from Croatian *Cystus incanus* L. Rich Bee Pollen

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Oxidant/antioxidant status, estrogenic/anti-estrogenic activity and gene expression profile were studied in mice fed with *Cystus incanus* L. (Cistaceae) rich bee pollen from location in Central Croatia's Dalmatia coast and offshore islands.

Seven phenolic compounds (out of 13 tested) in bee pollen sample were detected by high performance liquid chromatography (HPLC) analysis. Phenolics detected in *C. incanus* L. bee pollen belong to flavonol (pinocembrin), flavanols (quercetin, kaempferol, galangin, and isorhamnetin), flavones (chrysin) and phenylpropanoids (caffeic acid).

Bee pollen as a food supplement (100mg/kgbw mixed with commercial food pellets) compared to control (commercial food pellets) modulated antioxidant enzymes (AOE) in the mice liver, brain and lysate of erythrocytes and reduced hepatic lipid peroxidation (LPO).

Bee pollen induced 25% of anti-estrogenic properties while no estrogenic activity was found.

Differential gene expression profile analyses after bee pollen enriched diet identify underexpressed gene *Hspa9a*, *Tnfsf6* (liver) and down-regulated gene expression of *Casp 1* and *Cc121c* (brain) which are important in the apoptosis pathway and chemotaxis.

These results indicate that used bee pollen possess a noticeable source of compounds with health protective potential and antioxidant activity.

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