

Polyamines and flavonoids of bee pollen with anti-tyrosinase and antioxidant activity

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Bee pollen is flower pollen collected by bees with nectar and salivary substances and rich in nutrients. It has been used as traditional medicine and supplementary nutrients with diverse activities. Recently, antioxidant and tyrosinase inhibitory activity of bee pollen extract have been reported. For the characterization of constituents of compounds from bee pollen, isolation of compounds from the bee pollen of *Quercus mongolica* were conducted using various column chromatography techniques and their structures were determined by 1D-NMR (¹H NMR and ¹³C NMR), 2D-NMR (HSQC, HMBC, NOESY) and HRESI-TOF-MS. Investigation resulted in the isolation of 38 compounds including 18 polyamines and 19 flavonoids. Polyamines were further divided into two putrescines, fifteen spermidines and one spermine. Flavonoids were further grouped as one flavanone, 15 flavones and one isoflavonoid. Among them, seven polyamines were first reported from nature; One putrescine, N1-(E)-N6-(Z)-di-p-coumaroylputrescine named mogolicine A, five spermidines, N1-acetyl-N5,N10-(E)-di-p-4-methoxycinnamoyl-spermidine, N1-acetyl-N5-(Z), N10-(E)-di-p-4-methoxycinnamoyl-spermidine, N1-acetyl-N5,N10-(Z)-di-p-4-methoxycinnamoyl-spermidine, N1-(E),N5-(Z),N10-(E)-tri-p-4-methoxycinnamoyl-spermidine and N1-p-anisamide-N5-(Z),N10-(E)-di-p-4-methoxycinnamoyl-spermidine, named mogolidines A-F, and one spermine, N1,N5,N10,N14-(E)-tetra-p-coumaroylspermine named mogolidine A. The isolated compounds showed antioxidant and anti-tyrosinase activity. Interestingly, polyamines showed more strong inhibition on tyrosinase with IC₅₀ values of 19.5 - 31.7 μM whereas flavonoids showed potent antioxidant activity with IC₅₀ values of 9.7 - 34.3 μM. These results provide useful information about bee pollen as antioxidant ingredients and cosmetic therapeutics to reduce oxidative stress and hyperpigmentation.

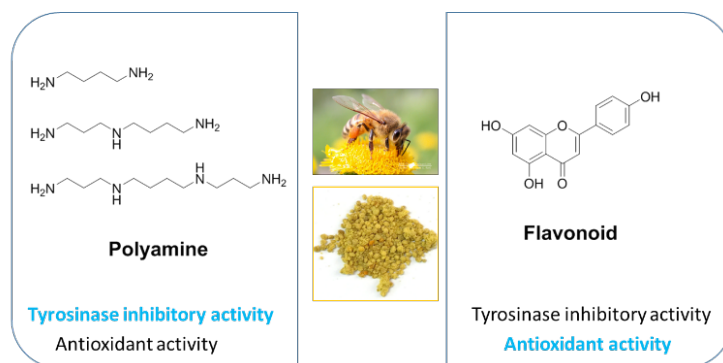


Figure 1: Constituents and biological activities of bee pollen.

Biography

Mi Kyeong Lee is interested in the values of plants and natural products. Her main research is the isolation and characterization of constituents as well as the evaluation of biological activities of natural products. Recently, she is focused on the diversity of plants, such as different parts of plants, different maturation stages and post-harvest process.

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