**ANTIOXIDANT AND ANTIMICROBIAL ACTIVITY OF SLOVENIAN HONEY**

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**Abstract**

Honey is a natural product, a highly concentrated solution of a complex mixture of sugars, and also small amounts of other constituents such as minerals, proteins, vitamins, organic acids, flavonoids, phenolic acids, enzymes and other phytochemicals. Many authors report that honey serves as a source of natural antioxidants, that can reduce the risk of heart diseases, cancer, immune system decline, different inflammatory process etc. Since ancient time, honey has also been used as an effective antimicrobial agent for the treatment of burns and other wounds. Antioxidant and antimicrobial activity of 40 Slovenian honey samples were evaluated. Honey samples from the seven different types of Slovenian honey were screened for total phenolic content by the modified Folin-Cicolteau method, for potential antioxidant activity using ferric reducing antioxidant power (FRAP) assay and for antiradical activity by the 1,1-diphenyl-2-picrylhydrazyl (DPPH) method. Minimal inhibitory concentration (MIC) of the honey samples was assessed against *Staphylococcus aureus, Listeria monocytogenes, Bacillus cereus, Escherichia coli* and *Pseudomonas aeruginosa.* The total phenolic content expressed as gallic acid equivalents ranged from 41.0 mg/kg in acacia honey to 354.0 mg/kg in honeydew honey. Antioxidant activity was the lowest in acacia honey and highest in honeydew, chestnut and buckwheat honey. Also, antimicrobial activities (MIC 16-500 mg/ml) were higher in darker honey such as chestnut, honeydew, buckwheat honey, and also in linden honey. Our data are well compared with the results of previous studies of Slovenian honey. Positive correlation between antioxidant and antimicrobial activities is observed.

**Keywords**: honey, phenolic content, antioxidant activity, antimicrobial activity

**ANTIOKSIDATIVNA  I ANTIMIKROBNA AKTIVNOST SLOVENSKOG MEDA**

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**Sažetak**

Med je prirodni proizvod, visoko koncentrirana otopina složene smjese šećera i malih količina drugih sastojaka, poput minerala, proteina, vitamina, organskih kiselina, flavonoida, fenolnih kiselina, enzima i drugih fitokemikalija. Mnoga istraživanja pokazuju da je med izvor prirodnih antioksidativnih tvari koje mogu pomoći u smanjenju rizika od kardiovaskularnih bolesti, raka, pada imuniteta, različitih upalnih procesa i sl. Od davnina se med koristi i kao učinkovito antimikrobno sredstvo za liječenje opeklina i drugih rana. U ovom istraživanju određena je antioksidativna i antimikrobna aktivnost 40 uzoraka slovenskog meda. Uzorcima sedam različitih vrsta meda određeni su: udio ukupnih fenola modificiranom metodom po Folin-Ciocalteau, antioksidativna aktivnost FRAP metodom (engl. ferric reducing antioxidant power), sposobnost hvatanja radikala DPPH metodom (1,1-diphenyl-2-picrylhydrazyl). Minimalna inhibitorna koncentracija (MIC) uzoraka meda određena je na *Staphylococcus aureus, Listeria monocytogenes, Bacillus cereus, Escherichia coli* i *Pseudomonas aeruginosa.* Ukupni fenoli, izraženi kao ekvivalenti galne kiseline, kretali su se od 41,0 mg/kg za bagremov med do 354,0 mg/kg u medljikovcu. Najnižu antioksidativnu aktivnost imao je bagremov med, a najvišu medljikovac, med kestena i heljde. Tamniji medovi, poput kestenovog, medljikovca, heljdinog meda, imali su i veću antimikrobnu aktivnost (MIC 16 – 500 mg/mL), kao i med lipe. Dobiveni rezultati u skladu s prethodnim istraživanjima na slovenskom medu. Uočena je pozitivna korelacija između antioksidativne i antimikrobne aktivnosti.

**Ključne riječi:** med, fenolni sastav, antioksidativna aktivnost, antimikrobna aktivnost