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НАУЧНИ ИНСТИТУТ ЗА ПРЕХРАМБЕНЕ ТЕХНОЛОГИЈЕ

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Antioxidants

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This paper presents the physicochemical characteristics and antioxidative, antibacterial and antiproliferative effects of nineteen samples of different honey types (acacia, linden, heather, sunflower, phacelia, basil, anise, sage, chestnut, hawthorn, lavender and meadow) collected from different locations in the Western Balkans (Republic of Serbia, Kosovo, Bosnia and Herzegovina, and Northern Macedonia). Physicochemical parameters (moisture, pH, electrical conductivity, free acidity, and hydroxymethylfurfural [HMF]) were analysed. Based on the obtained results, all tested honey samples were in agreement with EU regulation. The antioxidant potential of honey samples was assessed by determination of total phenolic content (TPC) and evaluation of scavenging activity towards diphenilpicrylhydrazyl radicals (DPPH \cdot). The highest phenolic content was found in basil honey (101 ± 2.72 mg GAE/100 g), while the lowest was registered in rapeseed honey (11.5 ± 0.70 mg GAE/100 g). Heather, anise, phacelia, sage, chestnut and lavender honey samples were also rich in TP, containing 80–100 mg GAE/100 g. DPPH scavenging activity varied among the samples being the highest for lavender honey ($IC_{50} = 88.2 \pm 2.11$ mg/mL) and the lowest for rapeseed honey ($IC_{50} = 646 \pm 8.72$ mg/mL). Antibacterial activity was estimated in vitro using agar diffusion tests and measuring minimal inhibitory concentration (MIC). Among investigated bacterial strains following resistant potencies were determined: *Escherichia coli* > *Escherichia coli* ATCC 8739 > *Enterococcus faecalis* > *Proteus mirabilis* > *Staphylococcus aureus* > *Staphylococcus epidermidis*. The linden honey from Fruška Gora (MIC values of 3.12% and 6.25% against *Staphylococcus aureus* and *Staphylococcus epidermidis*, respectively) and phacelia honey (MIC values of 6.25% and 3.12% against *S. Staphylococcus aureus* and *Staphylococcus epidermidis*, respectively) showed the strongest antibacterial activity.



Antiproliferative activity was evaluated using the colorimetric sulforhodamine B (SRB) assay. The highest antiproliferative activity was obtained from linden honey sample 1 ($IC_{50MCF7} = 7.46 \pm 1.18$ mg/mL and $IC_{50HeLa} = 12.4 \pm 2.00$ mg/mL) and meadow sample 2 ($IC_{50MCF7} = 12.0 \pm 0.57$ mg/mL, $IC_{50HeLa} = 16.9 \pm 1.54$ mg/mL and $IC_{50HT-29} = 23.7 \pm 1.33$ mg/mL) towards breast (MCF7), cervix (HeLa) and colon (HT-29) cancer cells. Active components other than sugars contributed to cell growth activity.