IVANA SOLA
University of Zagreb,
Croatia

Phytochemical Analyses Reveal Antioxidant, Antidiabetic, Anti-Inflammatory and Antiproliferative Properties of underutilized Rosaceae flowers

Abstract:

The objective of this study was to evaluate the potential utility of young flower clusters from Prunus, Malus and Chaenomeles for application in the food industry, while also establishing a polyphenolic profile to ensure quality control. Various bioactive compounds and their antioxidant capacities were assessed through spectrophotometric methods. Identification and quantification of primary phenolic compounds were conducted using LC-DAD-MS. Additionally, the potential antidiabetic and anti-inflammatory effects were determined through α-amylase and α-glucosidase inhibition assays, as well as a 5-lipoxygenase inhibition assay, respectively. Cytotoxicity was assessed using an MTT assay. Statistical analyses including one-way ANOVA, principal component analysis, hierarchical clustering, and Pearson's correlation coefficient were employed to unveil relationships among samples and parameters measured. A total of 77 compounds were identified, with M. purpurea exhibiting low sugar concentration at 1.56 ± 0.08 mg/g DW. C. japonica demonstrated the highest efficacy in inhibiting antidiabetic enzymes and the anti-inflammatory 5-lipoxygenase. The inhibition of α-glucosidase showed a strong positive correlation with total and condensed tannins, procyanidin dimers, and procyanidin tetramers, and a very strong correlation with chlorogenic acid. In terms of α-amylase inhibition, C. japonica and P. serrulata 'Kiku Shidare Zakura' were equally effective as the standard inhibitor, maltose. P. avium showed the most significant inhibition of growth and proliferation in HepG2, HCT116, and HaCaT cells. These findings suggest that inflorescences from Prunus, Malus and Chaenomeles could serve as functional food ingredients.

Biography

Ivana Sola is a PhD Assistant Professor at the University of Zagreb, Croatia, within the Department of Biology. With a focus on scientific research and education, Ivana contributes to advancing knowledge in biological sciences. Her expertise spans areas such as Plant Molecular Biology, Plant Biology, Plant Biochemistry, Plant Tissue Culture, Plant DNA Extraction, combining academic rigor with a passion for discovery. Ivana Šola plays a vital role in mentoring students and conducting impactful research within her field.