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The investigation total content of phenolic compounds in the blackberry (*Rubus plicatus*) leaves

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Introduction. Blackberry is a perennial shrub belonging to the Rosaceae family, widely distributed across Europe, North America, and Asia. The leaves of this plant are not only valued as a food source but also recognized for their remarkable pharmacological potential. The chemical composition of blackberry leaves includes a wide range of biologically active compounds such as catechins (mainly catechin), organic acids (notably citric and malic acids), hydroxycinnamic acids (such as caffeic and ferulic acids), flavonoids, ellagitannins. These constituents contribute to the high antioxidant capacity and broad spectrum of therapeutic effects of blackberry. Numerous studies have demonstrated that catechins isolated from blackberry leaves exhibit pronounced anti-inflammatory, antimicrobial, anti-hyperglycemic, immunomodulatory, neuroprotective, and anticancer activities. Furthermore, traditional medicine has long used blackberry preparations for the treatment of fever, gastrointestinal disorders, diabetes, liver diseases, and infections. Recent research has focused on elucidating the mechanisms of action of blackberry polyphenols, particularly their ability to modulate oxidative stress, inhibit bacterial growth, and suppress pro-inflammatory signaling pathways. In addition, blackberry extracts are increasingly studied as natural antioxidants for use in functional foods, nutraceuticals, and cosmetic formulations. Given this background, the present study aimed to determine the total content of phenolic compounds in blackberry leaves using spectrophotometric methods

Materials and methods. The object of the study was leaves of blackberry (*Rubus plicatus*), collected from cultivation sites. The material was gathered in 2021 during the fruiting period in the vicinity of the village of Ternova, Kharkiv region (50°19'31" N, 36°66'93" E). The quantitative determination of the total phenolic compounds was carried out by the following was 2.0 g (exactly weighed) of the crushed raw material was placed in a 100 mL ground glass flask, poured with 40 mL of 60% ethanol and left for 1 hour in a boiling water bath. After cooling, the solution was quantitatively transferred to a 50.0 mL volumetric flask, the volume was brought up to the mark with the same solvent (solution A). 1.0 mL of solution A was added to a volumetric flask with a capacity of 50.0 mL, brought up to the mark with 60% ethanol. Then an aliquot of 1.0 mL of the prepared solution was taken, placed in a volumetric flask for 50.0 mL and bring the volume up to the mark with 60% ethanol (solution B). In a 25.0 mL flask, 1.0 mL of solution B, 1.0 mL of phosphoromolybdenum-tungsten reagent, 10.0 mL of water were mixed and the volume was made up to the mark with a solution of 290 g/L sodium carbonate. After 30 minutes, the optical density was measured at 760 nm, water was used as a compensating solution. The quantitative content of the sum of phenolic compounds, in terms of gallic acid, (X, %) was calculated according to the formula:

$$X = \frac{C_x \cdot K_{dil} \cdot 100}{m_n \cdot (100 - W)},$$

C_x – concentration of gallic acid according to the calibration graph, C·10⁻⁶, g/mL; K is the dilution factor; W – weight loss during drying, %; m_n is mass of sample, g.

Results and discussion. The total content of phenolic compounds was 4.60±0.10% expressed as gallic acid in blackberry leaves.

Conclusion. The obtained research results can be used in the development of herbal remedies, dietary supplements, and medicinal products.