Міністерство охорони здоров'я України
Міністерство освіти і науки України
Національний фармацевтичний університет
Кафедра фармацевтичної хімії
Кафедра загальної хімії
Українське товариство з медичної хімії

Міжнародна internet-конференція

Modern chemistry of medicines

7 листопада 2025 р.
м. Харків, Україна

Посвідчення Державної наукової установи «Український інститут науково-технічної експертизи та інформації» № 850 від 26.12.2024 р.

The investigation total content of phenolic compounds in the blackberry fresh fruit

Artem Marchenko[1], Mykola Komisarenko[1], Oleksandr Maslov[1]

[1]*National University of Pharmacy*
**Corresponding author e-mail: chemistry29@meta.ua*

Introduction. Blackberry (*Rubus fruticosus* L.) is a shrub of the *Rosacea* family. The distribution area is Europe, North America, Asia. The chemical composition of blackberry fruits is represented by anthocyanins (cyanidine-3-O-glucoside), organic acids (citric acid) and hydroxycinnamic acids (caffeic acid). There are a lot of numbers of research about investigation pharmacological activity of blackberry fruit. It is known that anthocyanins from blackberry fruit, possess: anti-inflammatory, antimicrobial, anti-hyperglycemic, immune-modulation, and anticancer effects. Besides, in folk medicine *R. fruticosus* are traditionally applied to treat fever, infections, diabetes, and liver diseases. In our view, the anthocyanins are perspective for the development of new antimicrobial, and antioxidant pharmaceuticals. So, the aim of the study was determine the total content of phenolic compounds in fresh blackberry fruits.

Materials and methods. The object of the study was fresh fruits of blackberry (*Rubus plicatus*), collected from cultivation sites. The material was gathered in 2021 after 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:

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

Cx – concentration of gallic acid according to the calibration graph, $C \cdot 10^{-6}$, 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 0.65±0.02% expressed as gallic acid in blackberry fresh fruit.

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