A STUDY OF THE PHENOLIC COMPOUNDS IN THE FLOWERS OF COMMON LILAC OF BUFFON VARIETY

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Introduction. Flavonoids and hydroxycinnamic acids are the most numerous classes of phenolic compounds that feature structural diversity, versatile and high biological activity and low enough toxicity. Over 4000 different flavonoids isolated from the plant material are known worldwide and their structure has been determined. The variety of biological properties of flavonoids and hydroxycinnamic acids is wide enough and not only limited to the antioxidant activity. In the in vivo and ex vivo studies they have shown to possess antitumor, antianginal, antiallergic, anti-inflammatory and radioprotective activity. Thus the search of new plant sources of phenolic compounds is a prospective phytochemical trend.

The object of our research was the flowers of common lilac of Buffon variety. The plant material for the study was collected in the National Botanical Garden nd. a. M. M. Grishko (Kyiv).

Aim. The aim of our research was the phenolic composition study of the flowers of common lilac of Buffon variety.

Materials and methods. The extraction of the sum of biologically active compounds (BAC) from the plant material was carried out with purified water. 50.0 of the crashed flowers were placed to a conical flask with ground glass joint where 150 ml of water was added. The extraction was carried out 5 times on a water bath, 30 min each. The solutions were combined and then evaporated to 200-250 ml, then cooled and filtered through a paper filter to a measuring flask with capacity of 250 ml where purified water was added till the mark (solution A).

Paper, thin-layer chromatography and quality reactions were used for the phenolic compounds identification. Compounds were identified by the R_f value and colouring before and after ammonia vapor treatment. Quantitative analysis was carried out by the means of spectrophotometric method using the Mecasys Optizen POP (Korea) spectrophotometer.

The sum of flavonoids content was determined spectrophotometrically calculated on rutin. 2.0 ml of the solution A were placed into a measuring flask with the capacity of 25 ml where 2.0 ml of 3% aluminum chloride in 96 % ethanol was added and then the mixture was stirred. 70% ethanol was added till the mark. The absorbance of the solution obtained was measured in 30 min on the spectrophotometer in a 10 mm thick cuvette at the wavelength 420 nm.

The solution containing 2.0 ml of the solution A in the 25 ml measuring flask with 70% ethanol added till the mark was used as a reference solution. The absorbance of Pharmacopoeial Standard Solution (PhSS) of rutin was measured in parallel under the same conditions. 0.01 g of rutin was placed into a measuring flask with 25 ml capacity, where 96% ethanol was added till the mark and the solution was shaken. 2.0 ml of aluminum chloride solution in 96% ethanol were added to 1.0 ml of the solution obtained and 70% solution was added to 25 ml. the solution containing 1 ml of rutin PhSS solution in the 25 ml measuring flask with 70% ethanol added till the mark was used as a reference solution. The content of flavonoids (X, %) calculated on rutin and absolutely dry plant material was calculated using the formula: $X = A \cdot m_0 \cdot 250 \cdot 1 \cdot 25 \cdot 100 \cdot 100 / A_0 \cdot m \cdot 2 \cdot 25 \cdot 25 \cdot (100 - W)$, where A – absorbance of the solution studied; A_0 – absorbance of the rutin PhSS with aluminum chloride complex; m_0 – weight of the rutin PhSS, g; m – weight of the plant material, g; W – weight loss on the plant material drying, %.

The hydroxycinnamic acids content was determined spectrophotometrically calculated on chlorogenic acid. 1.0 ml of the solution A was placed into a measuring flask eith 2000 ml capacity where 20% ethanol was added till the mark. The absorbance was measured at the wavelength 327 nm. The experiment with chlorogenic acid was carried out in parallel under the same conditions. 0.05 g of chlorogenic acid were placed into a measuring flask with 100 ml capacity and diluted with 20% ethanol, adding the same solvent till the mark. 1.0 ml of the solution obtained was placed into a measuring flask with 50 ml capacity, where 20% ethanol was added till the mark and the mixture was shaken. Then the absorbance was measured. 20% ethanol was used as a reference solution. The content of hydroxycinnamic acids (X, %) calculated on chlorogenic acid and absolutely dry plant material was calculated using the formula: $X = A \cdot 200 \cdot 50 \cdot 100 / A^{1\%}_{1\ см} \cdot m \cdot 1 \cdot (100 - W)$; where A – absorbance of the solution studied; m – weight of the plant material, g; W – weight loss on the plant material drying, %; $A^{1\%}_{1см}$ – specific absorption rate of chlorogenic acid which equals 531.

Results and discussion. The results of the chromatographic study have allowed to identify such flavonoids as rutin and quercetin and hydroxycinnamic acids such as chlorogenic and caffeic acids.

As a result of quantitative analysis of the phenolic compounds in the flowers of common lilac of Buffon variety it was determined that the content of flavonoids was 1.5±0.8%, and hydroxycinnamic acids – 5.5±1.5%.

Conclusions. The results of the studies carried out prove the prospects of further research on the flowers of common lilac of Buffon variety with the aim of the new effective phytoremedies working out.