

**PHYTOCHEMICAL STUDY OF *PEROVSKIA SCROPHULARIIFOLIA***

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Relevance: A decoction of the above-ground part of *Perovskia scrophulariifolia* Bunge (family Lamiaceae) is used in folk medicine for scabies in humans and animals, as well as for healing sunburn and skin diseases. Dried flowers of the plant are brewed and consumed as tea to relieve gastrointestinal diseases and abdominal pain. In some countries of the Asian region, *P. scrophulariifolia* is used to remove intestinal parasites from the body. The above-ground part of *P. scrophulariifolia* contains essential oil, abietane diterpenoids, flavonoid diosmetin, phenylpropanoids, anthocyanins, nitrogenous compounds, eugenol glycosides, benzyl alcohol, salidroside and terpenoids. The chemical composition of the roots of *P. scrophulariifolia* has not been studied.

Purpose of the study. Isolation and study of biologically active components of the aboveground part and roots of *P. scrophulariifolia* collected in the vicinity of the village of Omonkuton, Samarkand region of the Republic of Uzbekistan.

Materials and methods. The crushed air-dried plant material (aerial part and roots) was extracted five times at room temperature with methanol. The combined extract was evaporated in a vacuum, diluted with water and subjected to liquid-liquid extraction with gasoline, chloroform, ethyl acetate and n-butanol.

Results. Four individual substances (1-4) were isolated from different fractions of the methanol extract of the above-ground part by column chromatography on silica gel and Sephadex LH-20, and seven compounds (5-11) were isolated from the roots. Based on the study of UV, ¹H and ¹³C NMR spectra and the X-ray diffraction method, the isolated substances were identified with carnosol (1), cirsimaritin (2), stigmasterol (3) and β -sitosterol (4), cryptotanshinone (5), tanshinone IIA (6), przewalskin Y-1 (7), grandifolia B (8), rosmarinic (9), caffeic acids (10) and D-pinitol (11). Carnosol has antioxidant, antitumor and anti-inflammatory properties. D-Pinitol has antidiabetic and antioxidant activity, it is recommended for the treatment of conditions associated with insulin resistance, such as diabetes mellitus and its chronic complications.

To study the antibacterial and antifungal properties of the benzene, chloroform and ethyl acetate fractions of the aboveground part of *P. scrophulariifolia*, a modified agar diffusion method was used using the following microorganism strains as test cultures: gram-positive bacteria - *Bacillus subtilis* (RKMUZ - 5), *Staphylococcus aureus* (ATCC 25923); gram-negative bacteria - *Pseudomonas aeruginosa* (ATCC 27879), *Escherichia coli* (RKMUZ - 221) and the fungal strain *Candida albicans* (RKMUZ - 247). Impregnated disks with ampicillin/sulbactam, gentamicin and fluconazole (Himedia) were used as positive, and extraction solvents as negative controls.

The test results showed that the gasoline fraction has a pronounced antibacterial effect on the bacterial strains *B. subtilis* (12.08 $\pm$ 0.12 mm), *S. aureus* (11.04 $\pm$ 0.10 mm) and *P. aeruginosa* (11.04 $\pm$ 0.10 mm). The chloroform and ethyl acetate fractions were inactive against the studied bacterial and fungal strains.

All the described substances were isolated from *Perovskia scrophulariifolia* for the first time.



Conclusions. It has been shown that the plant *P. scrophulariifolia* is a rich source of biologically active diterpenoids, flavonoids, phenolic carboxylic acids, phytosterols and can be used to create effective medicines and dietary supplements.