

## PHENOLIC COMPOUNDS OF *Geranium pusillum*

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*Geranium pusillum* L. (lesser geranium) is an annual herbal plant distributed throughout Georgia. Phenolic compounds (8.2%) were found in the aerial parts of it during a determination of the content of tanning agents in lesser geranium by the literature method [1]. The presence of ellagotannins was confirmed by qualitative reactions [2].

The content of tanning agents in the aerial part is known to be 7.8%; in leaves, 14.7% [3, 4]. Of these, ellagotannins are 14% [2].

Lipophilic substances were removed from grinded and dried plant specimens by extraction with  $\text{CHCl}_3$  and (after evaporation) ethanol (80%). The alcohol extracts were concentrated to an aqueous residue and treated with ethylacetate.

Tanning agents were isolated from the concentrated ethanol extracts by precipitation with  $\text{CHCl}_3$ . They are amorphous with a astringent taste.

Two-dimensional chromatography of the total compounds from lesser geranium first in butanol—acetic acid—water (4:1:2) and then in 2% acetic acid produced 23 spots (10 dominant) of phenolic nature. These were the hydrolyzed tanning agents and flavonoids.

Further chromatography of the ethylacetate fraction on a polyamide column (eluent  $\text{CHCl}_3$ — $\text{CH}_3\text{OH}$  in various proportions) isolated quercetin, rutin, and gallic acid. These were identified by qualitative reactions, melting points,  $R_f$  values in various solvent systems (in parallel with authentic compounds), acid-hydrolysis products (for rutin), and the bathochromic shift of maxima in the UV spectra with ionizing and complexing additives.

Studies of other components are continuing.

## REFERENCES

1. *USSR Pharmacopoeia*, XI Ed., (1990), Vol. 2, p. 286.
2. E. C. Bate-Smith, *Ellagitannin Content of Leaves of Geranium Species*, *PC*, (1972), Vol. 11, No. 5, p. 1755.
3. S. Kh. Chevrenidi, *Tanning Plants of Central Asia* [in Russian], Tashkent (1965).
4. S. Kh. Chevrenidi and L. P. Khaitmukhamedov, *Biology Problems of Annual Geraniums of U-bekistan. Potential Raw Material Plants of U-bekistan and Their Culture*, Tashkent (1979), p. 49.