



DETERMINATION OF FLAVONOIDS IN MEDICINAL PLANT EXTRACT (POLYGONUM AVICULARE L)

Aman A.E.

Kasimbekova M.D.

Ospanova G.S.

"South Kazakhstan Medical Academy", Shymkent city, Republic of Kazakhstan

e-mail: k.m.dauletbekovna@gmail.com +77011143131

<https://doi.org/10.5281/zenodo.17341954>

Relevance: *Polygonum aviculare* L., also known as knotweed or bird's-foot buckwheat, belongs to the buckwheat family (Polygonaceae). This widespread, seemingly inconspicuous plant grows along roadsides, in yards, and in wastelands. The phytochemical composition of *Polygonum aviculare* includes tannins, resins, traces of essential oil, vitamins C and K, and provitamin A. Its leaves contain significant amounts of ascorbic acid in reduced form (405–450 mg%) and reversibly oxidized form (253–300 mg%). In addition, the flavonol glycoside avicularin (C₂₀H₁₈O₁₁) has been identified; upon hydrolysis, quercetin and arabinose are formed. Oxymethylantraquinones have been found in the plant's roots. The plant exhibits anti-inflammatory, hemostatic, diuretic, antioxidant, and restorative properties. It is used for gastrointestinal and urinary tract disorders, bleeding, and in the complex treatment and rehabilitation of cancer patients.

References to herbs similar to knotweed date back to the writings of Hippocrates (5th–4th centuries BC), where they were described as astringent and hemostatic. Avicenna (Ibn Sina, 10th–11th centuries) noted their effectiveness for stomach ailments, bleeding, and urinary tract pathologies. During the Soviet period, pharmacologist N. I. Gubanov and his colleagues conducted research on the flavonoid and tannin content of knotweed, confirming its value as a source of biologically active compounds. Based on the work of domestic and international researchers, it seems relevant to study the biologically active substances of the medicinal plant knotweed, in particular, the determination of flavonoids.

Objective: To identify and characterize flavonoid compounds in knotweed (*Polygonum aviculare* L.).

Materials and Methods: The aerial parts of knotweed (*Polygonum aviculare* L.), collected during the flowering phase, were used as the study subject. The presence and content of flavonoids and tannins were determined using methods adopted by the South Kazakhstan Medical Academy (SKMA). The raw materials were dried at $\leq 40^{\circ}\text{C}$ and ground. Extraction was performed with 40–70% ethanol via maceration. Flavonoids were identified using qualitative reactions, thin-layer chromatography (TLC), and spectrophotometric analysis at $\lambda = 370\text{--}380\text{ nm}$.

Results: Flavonoids, tannins, and phenolic carboxylic acids were detected in the studied plant, collected in the surrounding area. TLC revealed yellow fluorescence under UV light, consistent with flavonoid standards. Spectrophotometric analysis confirmed significant flavonoid content.

Conclusions: Phytochemical analysis revealed that knotweed contains a wide range of biologically active substances, predominantly flavonoids, which exhibit pronounced antioxidant and potential antiviral activity. The results of qualitative reactions, thin-layer chromatography, and spectrophotometry confirm the feasibility of further preclinical studies of this plant. Knotweed may be considered a promising raw material for the creation of herbal remedies with antiviral, tonic, and immunomodulatory effects.