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# XIII International Symposium on the Chemistry of Natural Compounds

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## BIOLOGICAL ACTIVE SUBSTANCES OF LEAVES OF *Catalpa bignonioides* FROM UKRAINE

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The *Catalpa* genus includes 11 species and belongs to Bignoniaceae family. The most widespread species are *Catalpa bignonioides*, *Catalpa speciosa* and *Catalpa ovate*.

The aim of this study was to determine the qualitative and quantitative amino acids, phenolic compounds, macro- and microelements composition in the leaves of *Catalpa bignonioides* from Ukraine.

*Catalpa bignonioides* is a medium-sized deciduous tree, but under favorable conditions can be forever green. This plant grows up to 15–18 meters. It is widely grown as an ornamental tree and cultivated in the parks and gardens of all temperate countries.

*Catalpa bignonioides* has several varieties: Aurea, Nana, Kene and Purpurea. The variety “Aurea” is medium size tree with rounded and spreading crown, whose leaves during flowering are golden and then turn light green. “Nana” is undersized variety of catalpa with distinct spherical crown up to 4 meters in diameter that does not bloom and is used in landscape design. The variety “Kene” has yellow leafy plates with green veins and a speck of dark green color in the center. The variety “Purpurea” is up to 8 meters high plant with conical crown. This variety leaves have terracotta color at the beginning of the growing season, that gradually turns green.

The chemical composition and pharmacological properties of *Catalpa bignonioides* have not been sufficiently studied despite its long history of usage. This plant has long been applied as an antiseptic, laxative and sedative and now in consequences of introduction of modern technologies new properties of *Catalpa bignonioides* have been discovered. There is a possibility of using catalpa in the complex treatment of cancer, which is extremely relevant in modern times.

The leaves of *Catalpa bignonioides* variety “Aurea” were collected in Botanical Garden of the National University of Pharmacy (Kharkiv, Ukraine) in July, 2017.

The amino acids composition of leaves of *Catalpa bignonioides* was studied by HPLC method on Agilent Technologies (model 1100). In result of analysis 16 substances were identified. Nine essential amino acids were determined in test sample. The largest content had histidine (2.146  $\mu\text{g} / \text{mg}$ ), threonine (1.508  $\mu\text{g} / \text{mg}$ ) and isoleucine (1.172  $\mu\text{g} / \text{mg}$ ) among essential amino acids. Proline (5.473  $\mu\text{g} / \text{mg}$ ) and aspartic acid (1.341  $\text{mg} / \text{mg}$ ) were predominant and constituted 67.38% of the total amount of nonessential amino acids.

Phenolic compounds content was evaluated by spectrophotometry in leaves of *Catalpa bignonioides*. The total phenolic substances content was  $4.76 \pm 0.04\%$ . The test sample contained  $3.42 \pm 0.02\%$  hydroxycinnamic acids and  $1.88 \pm 0.02\%$  flavonoids.

16 macro- and microelements were identified from the leaves of *Catalpa bignonioides* by atomic emission spectroscopy. The highest contents were determined for K (2125  $\text{mg} / 100\text{g}$ ), Ca (1190  $\text{mg} / 100\text{g}$ ), Mg (380  $\text{mg} / 100\text{g}$ ).

The leaves of *Catalpa bignonioides* are a promising raw material for further phytochemical research and development of new medicines.