

**СЕКЦИЯ 3  
ЕСТЕСТВЕННЫЕ НАУКИ**

**Подсекция 3.4 Химия**

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**AMINO ACID COMPOSITION OF THE *CIRCAEA LUTETIANA L.***

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*Circaea lutetiana l.* of the *Onagraceae L* family is a valuable medicinal plant, raw materials that are traditionally used in medicine as antimicrobial agents, as well as for the treatment of facial acne, removing stasis, activating the circulation of coenzymes [1].

*Circaea lutetiana* is a perennial rhizome plant. Stems are erect, 20-50 cm high, simple or branched, pubescent with soft hairs. The leaves are opposite, with a grooved petiole and an ovoid or ovate-lanceolate blade, pointed at the apex, rounded or cordate at the base, with small sparse denticles along the edges. The apical inflorescence is a simple or branched raceme. Pedicels without bracts. Calyx with a short tube and oblong-ovate, pointed, pubescent teeth. The petals are pink, equal to the calyx. Two stamens; anthers 0.6-1 mm long. Fruits are oval-pear-shaped, two-seeded, about 3 mm long, covered with long hooked-curved bristles equal to the diameter of the fruit. Blooms in June-July; bears fruit in July-August [1-3].

*Circaea lutetiana* is a perennial rhizome plant. *Circaea lutetiana l.* was collected in the summer in the Bayanaul National Park of Pavlodar region by the staff of the Institute of Botany and Phytointroduction. The herbarium code of the genus *Circaea lutetiana l.* is 5829, the herbarium specimen is kept in the resource management department of the Institute of Botany and Phytointroduction [1].

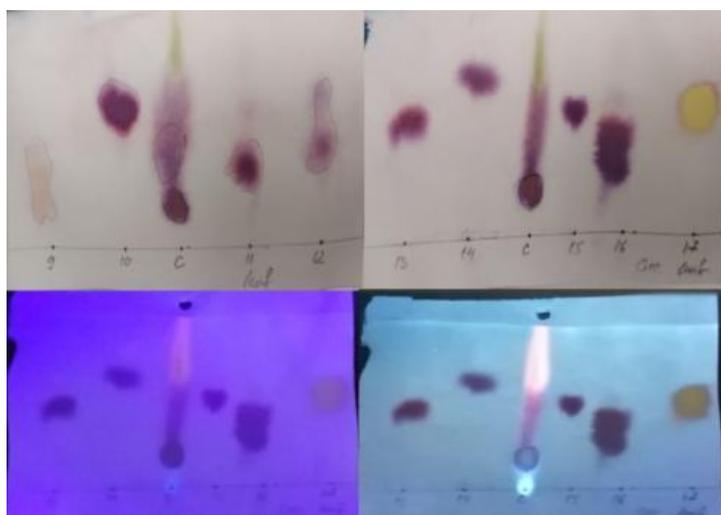
The method of one-dimensional paper chromatography was used as a method for determining the amino acid composition of plant raw materials (extract) of *Circaea lutetiana l.* As an eluent, we used a system of butanol: water: acetic acid, in a ratio of 40: 12.5: 29. 17 standard amino acid samples [4-5] (tyrosine, arginine, cystine, leucine, valine, glutamic acid, lysine, proline, methionine, ornithine, glycine, alanine, aspartic acid, histidine, phenylalanine, threonine, tryptophan) from Sigma Aldrich were used as standards. The identification of amino acids is carried out due to the qualitative reaction of amino acids with ninhydrin [6], which are subsequently reflected on the chromatogram in the form of purple swords, the results of determining the amino acid are shown in Table 1.

Table 1. Results of determination of amino acids

№	Amino acids	Rf <sub>1</sub>	Ninhydrin	Rf <sub>2</sub>	Ninhydrin	Rf <sub>3</sub>	Ninhydrin
1	Ornithine	0.31	Dark purple.	0.34	Purple.	0.29	Dark purple
2	Leucine	0.71	Dark purple.	0.69	Dark purple.	0.65	Dark purple
3	L-Histidine	0.36	Dark purple.	0.40	Light purple.	0.40	Light purple

4	DL-Phenylalanine	0.67	Dark purple.	0.70	Purple.	0.66	Dark purple
5	L-Tyrosine	0.59	Light purple.	0.57	Light purple.	0.54	Light purple
6	DL-Glutamic acid	0.46	Dark purple.	0.45	Dark purple.	0.41	Dark purple
7	Cystine	0.51	Light purple.	0.46	Light purple.	0.55	Light purple
8	Aspartic acid	0.38	Dark purple.	0.39	Dark purple.	0.41	Dark purple
9	Arginine	0.36	Light pink	0.32	Orange	0.4	Light pink
10	A-Valine	0.60	Dark purple.	0.58	Dark purple.	0.59	Dark purple
11	Lysine	0.35	Light purple.	0.32	Purple.	0.34	Light purple
12	Methionine	0.42	Light purple	0.39	Light purple.	0.40	Light purple.
13	Threonine	0.42	Lilac	0.45	Lilac	0.43	Lilac
14	Tryptophan	0.63	Light purple.	0.64	Light purple.	0.58	Light purple
15	Alanin	0.49	Dark purple.	0.49	Dark purple.	0.49	Dark purple
16	Glycine	0.45	Dark purple.	0.39	Dark purple.	0.37	Light purple
17	L-Proline	0.55	Yellow	0.49	Yellow	0.51	Yellow
18	Roots (1)	0.23	Light purple.	0.18	Dark purple.	0.43	purple.
19	Roots (2)	0.22	Light purple.	0.40	Dark purple.	0.21	Light purple.
20	Leaf (1)			0.43	Purple.		
21	Leaf (2)			0.52	Light purple.		
22	Roots (3)					0,49	Dark purple
23	Plant stem	0,17	Light purple				
24	Leaf (3)			0.41	Dark purple		
25	plant stem.	0.17	Light purple				
26	Rf <sub>1</sub> (plant stem); Rf <sub>2</sub> (leaf); Rf <sub>3</sub> (roots).						

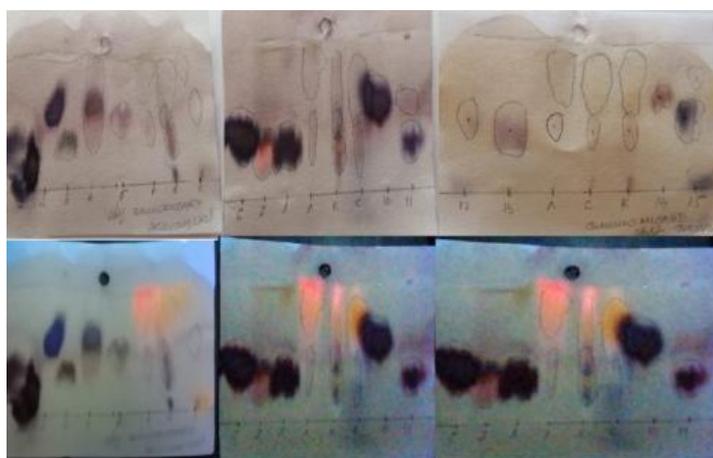
*Circaea lutetiana* (amino acids) contains Rf values and colors: Alanin, L-Proline (roots); DL-Glutamic acid, L-Histidine, Threonine, Glycine, Aspartic acid (leaf). Many color (including nominal) reactions have been developed for amino acids that are constantly found in proteins. Many of them are highly specific, which allows the determination of trace amounts of one or another amino acid. It must be remembered that all qualitative reactions are not reactions to proteins themselves, but to certain amino acids that make up their composition.



Picture 1. One-dimensional paper chromatography of *Circaea lutetiana* plants with amino acids  
 Table 2. Results of determination of related amino acids (ethyl acetate fraction)

№	Amino acids	Rf <sub>1</sub>	Ninhydrin
1	Ornithine	0.22	Dark purple.
2	Leucine	0.46	Dark purple.
3	L-Histidine	0.31	Light purple.
4	DL-Phenylalanine	0.46	Light purple.
5	L-Tyrosine	0.51	Light purple.
6	DL-Glutamic acid	0.42	Dark purple.
7	Cystine	0.24	Pink
8	Aspartic acid	0.33	Dark purple.
9	Arginine	0.36	Light pink
10	A-Valine	0.48	Dark purple.
11	Lysine	0.27	purple.
12	Methionine	0.46	Light purple
13	Threonine	0.41	Light purple
14	Tryptophan	0.62	Light purple.
15	Alanin	0.47	Purple.
16	Glycine	0.44	Dark purple.
17	L-Proline	0.57	Yellow
18	Roots (1)	0.39	Light purple.
19	Roots (2)	0.39	Light purple.
20	Leaf (1)	0.36	Light purple.
21	Leaf (2)	0.33	Dark purple.
22	Plant stem	0,28	Light purple
24	Plant stem)	0,27	Light purple

*Circaea lutetiana* (amino acids) contains Rf values and colors: DL-Glutamic acid, L-Histidine, Aspartic acid, Lysine.



Picture 2. One-dimensional paper chromatography of *Circaea lutetiana* plants with related amino acids

For the first time, the plant *Circaea lutetiana* L. was collected in the Bayanaul National Park of Pavlodar region by employees of the Institute of Botany and Phytointroduction and determined the qualitative analysis of amino acids by one-dimensional paper chromatography (Herbarium code 5829, the herbarium specimen is kept in the resource management department of the Institute of Botany and Phytointroduction).

Comparison of free and bound amino acids, it was noticed that related amino acids (ethyl acetate fractions) were the saturated color of one-dimensional paper chromatogram.

*Circaea lutetiana* ( related amino acids) contains Rf values and colors: DL-Glutamic acid, L-Histidine, Aspartic acid, Lysine and free amino acids Alanin, L-Proline (roots); DL-Glutamic acid, L-Histidine, Threonine, Glycine, Aspartic acid (leaf).

### Literature

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