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AMINO ACID AND MINERAL COMPOSITION OF *Nepeta grandiflora*

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The aerial part of *Nepeta grandiflora* Bieb. (Lamiaceae) (giant catmint) is used in folk medicine as a tonic and expectorant and for anemia [1]. The raw material for the investigation was collected during flowering in Karachaevo-Cherkes Republic (Daut gorge, Karachaev Region).

The qualitative and quantitative amino acid compositions of *N. grandiflora* were determined by column chromatography. Raw material (20.0 g) was extracted exhaustively beforehand with hot water. The extract was filtered and evaporated to dryness in vacuo. Hydrolysis was carried out using HCl (6 N) for 24 h in a drying chamber at 103-105°C. The dish with the hydrolysate was taken to dryness on a boiling-water bath to afford dry solid (0.2 g, accurate weight), which was dissolved in sodium nitrate buffer (pH 2.2) to give a solution that was adjusted to 10 mL.

Amino acids were separated on an AAA 339 M amino acid analyzer (OSTION LG ANB column, 8 mm diameter, 35 mm length). The chromatography conditions were: mobile phase, ninhydrin with added sodium citrate buffer (pH 2.2); eluent flow rate 15 mL/h; chromatography cycle 120 min. Standard amino acids were chromatographed in parallel. Table 1 lists the results.

The qualitative amino acid composition was determined from retention times. The internal standard was a standard mixture of 18 amino acids. Colorimetric determination of colored complexes formed by reaction with ninhydrin was performed at 570 nm. Quantitative analysis used automated determination of peak areas for identified acids. The investigation of the amino acid composition of giant catmint identified 15 amino acids, nine of which were essential (6.98%, or 61.72% of the total amino acids): valine, threonine, methionine, isoleucine, leucine, lysine, phenylalanine, and histidine and arginine, which are not synthesized in children.

The macro- and microelement compositions of the herb and roots were established by semi-quantitative spectral analysis using a DFS-8-1 spectrograph [2]. The employed method enabled the determination of 27 elements in the herb and 32 in roots, which could be subdivided into the following groups (herb/root, mg/kg, respectively, in absolute dry raw material):

1) essential: Fe (13/66), Co (0.004/0.013), Cu (0.13/0.66), Zn (0.2/0.39), Mn (0.79/2.62), Cr (0.03/0.08), Ca (393/131), Mg (131/66), Mo (0.02/0.01);

2) arbitrarily essential: B (0.8/1.3), V (0.013/0.13), Si (66/262), Ni (0.039/0.066);

3) biogenic: K (262/262), Na (13/39);

4) toxic: Al (79/131), Ba (2/1), Pb (0.02/0.079);

5) potentially toxic: Sn (0.004/0.007), Ag (0.00013/0.0026), Sr (0.655/0.393), Zr (0.026/0.079), Ti (2.6/5.2).

The contents of toxic and potentially toxic elements was less than the allowed values for preparations of plant origin [3].

The presence of essential amino acids and essential and biogenic chemical elements will determine the potential for giant catmint raw material and preparations of it for treatment of many diseases that are due to their deficiency in the organism.

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TABLE 1. Amino Acid Composition of *N. grandiflora* Proteins

Amino acid	Amino acid content		Amino acid	Amino acid content	
	g, %	g/kg		g, %	g/kg
Aspartic acid	0.55	5.53	Isoleucine	0.83	8.32
Threonine	0.67	6.72	Leucine	0.97	9.74
Serine	0.60	5.97	Tyrosine	0.59	5.91
Glutamic acid	1.35	13.48	Phenylalanine	0.92	9.20
Glycine	0.52	5.21	Histidine	0.53	5.31
Alanine	0.70	6.95	Lysine	1.04	10.44
Valine	1.08	10.83	Arginine	0.90	9.01
Methionine	0.04	0.45	Total amino acids	11.31	113.07

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