

## AMINO ACID COMPOSITION OF *Momordica charantia* SEEDS AND PERICARP

T. V. Orlovskaya and V. A. Chelombit'ko

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*Momordica charantia* L. (Indian cucumber) is a valuable food and medicinal plant of the gourd family (Cucurbitaceae) that is cultivated in India, Malaysia, Africa, and South America. Fruit and leaves of this plant are used for skin diseases, rheumatism, gout, and spleen diseases and as an antihelminth and laxative. For leprosy, the fruit extract exhibits an insulin-like activity [1]. Therefore, it seemed interesting to study the chemical composition of this pharmacologically valuable plant.

Herein we present data on the composition and quantitative content in various *M. charantia* plant organs of one of the important groups of biologically active compounds, amino acids. Samples of raw material were collected from plants grown in the Republic of Uzbekistan.

The qualitative composition of free amino acids in the samples was determined by ascending paper chromatography on Filtrak FN-12 paper using *n*-butanol:acetic acid:water (4:1:2) and a standard set of amino acids (TU 6-09-3147-83, 1% concentration) for comparison [2]. The chromatograms were developed using ninhydrin (0.2%) in acetone.

The analysis identified six free amino acids: threonine, valine, glutamic acid, isoleucine, arginine, and methionine.

The composition of bound amino acids was established using an AAA-339 amino acid analyzer (Czech Rep.). Raw material was extracted exhaustively beforehand with hot water. The extract was filtered and evaporated to dryness in vacuo. A weighed portion (0.1 g) was placed in a sterile 20-mL flask and treated with ethanol (6 drops) and HCl (10 mL, 6 N). The hydrolysis was performed in a drying chamber at 103-105°C for 20-23 h. After the hydrolysis, the flask contents were transferred to a porcelain crucible for drying and rinsed with distilled water (5 mL). The flask with the hydrolysate was dried on a boiling-water bath to the consistency of thick sour cream and cooled. The residue was dissolved in sodium nitrate buffer (pH 2.2). The volume was adjusted to 10 mL.

The qualitative composition of amino acids was determined by retention times. A standard mixture of 18 amino acids was used as an internal standard. The investigation found 15 amino acids (Table 1) in seeds and pericarp of *M. charantia*, nine of which are essential: valine, threonine, methionine, isoleucine, leucine, lysine, phenylalanine, histidine, and arginine. The total content of essential amino acids in the seeds was 7.45% (70.35% of the total amino acids); in pericarp, 6.0 (61.23%). This indicated that proteins from these raw materials were complete. Glutamic acid dominated in all investigated samples. Arginine was also a dominant amino acid in seeds.

TABLE 1. Amino Acid Composition of Proteins from *Momordica charantia*

Amino acid	Content, % dry wt.		Amino acid	Content, % dry wt.	
	seeds	pericarp		seeds	pericarp
Aspartic acid	0.47	0.61	Isoleucine	0.75	0.61
Threonine	0.49	0.77	Leucine	0.75	1.00
Serine	0.40	0.69	Tyrosine	0.63	0.53
Glutamic acid	1.25	1.24	Phenylalanine	0.88	0.60
Glycine	0.38	0.58	Histidine	0.83	0.51
Alanine	0.5	0.76	Lysine	0.83	0.60
Valine	0.89	0.72	Arginine	1.53	0.53
Methionine	0.03	0.05	Total amino acids	10.59	9.80

Pyatigorsk State Pharmaceutical Academy, Pyatigorsk, 357500, prosp. Kalinina, 11, fax (87933) 32 31 16, e-mail: tvorlovskay@mail.ru. Translated from *Khimiya Prirodnikh Soedinenii*, No. 2, p. 195, March-April, 2007. Original article submitted December 26, 2006.

Thus, the study of proteins from seeds and pericarp of *M. charantia* showed that the pharmacological properties of this plant are due to a complex of biologically active compounds, among which amino acids are important.

## REFERENCES

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