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PROTEIN BOUND AMINO-ACIDS OF *THEVETIA PERUVIANA* LEAVES

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The amino-acids are the fundamental units of proteins structure. Protein bound amino-acids from the protein hydrolysate of defatted powdered leaves of *T.peruviana* have been separated and identified by uni and two dimentional paper chromatography. Determination and distribution of amino-acids were carried out by paper chromatography and price method.

INTRODUCTION

Thevetia peruviana (pers) (N.O. Apocynaceae)[1,2] is widely cultivated in gardens and in the plains throughout India. It possesses medicinal value due to cardiotonic properties. The leaves of this plant were examined for protein quality in terms of amino-acid composition. The following describes their free as well as protein-bound amino-acids. The leaves of *T.preuviana* were found to contain protein, which consisted of following amino-acids expressed in mg glycine per 16 mg nitrogen, glutamic acid (4.98 mg), leucine (3.07 mg), glycine (2.27 mg), isoleucine (2.04 mg), arginine (1.73 mg), valine (1.37 mg), alanine (1.17 mg), proline (1.14 mg), phenylalanine (1.09 mg), aspartic acid (1.07 mg), cystine (1.06 mg), lycine (1.02 mg), serine (0.96 mg), tyrosine (0.91 mg), histidine (0.90 mg), threonine (0.77 mg), methionine (0.49 mg) and tryptophan (present quantity not determined).

EXPERIMENTAL

The plant material was obtained from m/s. L.R. Brothers, Seedsmen & Nurserymen, Saharanpur, India. The powder of dried leaves were defatted with petroleum ether (b.pt. 60–80°C) in a soxhlet extractor and employed in all investigations. Free amino-acids separated by paper partition chromatography[3,4] were identified by employing the various special spray reagents[5–10]. Total free amino-acids were estimated by the method of Rosen[11].

Accurately weighed quantities 50 mg of defatted leaves powders of *T.peruviana* were hydrolysed with 6N HCl and 6N NaOH in a sealed tube in an air oven (100–110°C) till the hydrolysates was negative to biuret test. The hydrolysated were distilled under reduced pressure repeately on removal of acid and alkali. These concentrated hydrolysates were taken in 10% *iso*propanol and were subjected to chromatographic analysis for identification. The quantitative determination of

individual protein-bound amino-acids were made by procedure of Price[12] and expressed in terms of glycine. The results are shown in Table 1.

TABLE 1
PROTEIN-BOUND AMINO-ACIDS OF POWDERED DEFATTED THEVETIA PERUVIANA LEAVES
(Expressed as mg glycine per 16 mg nitrogen)

Animo-acid	mg glycine/16 mg N	Animo-acid	mg glycine/16 mg N
Glutamic acid	4.98	Aspartic acid	1.07
Leucine	3.07	Cystine	1.06
Glycine	2.27	Lycine	1.02
Isoleucine	2.04	Serine	0.96
Arginine	1.73	Tyrosine	0.91
Valine	1.37	Histidine	0.90
Alanine	1.17	Threonine	0.77
Proline*	1.14	Methionin	0.49
Phenylalanine	1.09	Tryptophan	‡

*Optical density measured at 440 mu
‡Present quantity not determined.

RESULTS AND DISCUSSION

The results of the study revealed that there were eighteen amino-acids including essential and non-essential amino-acids. Among them glutamic acid, leucine, glycine, isoleucine were predominating over arginine, valine, alanine, proline, phenylalanine, aspartic acid, cystine, lycine, serine, tyrosine, histidine, threonine, methionin and tryptophan.

It is noteworthy that sulphur containing amino-acid cystine is also present in good concentration as it is one of the requisite amino-acid for sheep for wool. In view of the wide availability of *T.peruviana* in country the leaves could be utilized as sources of amino acids in nutrition after removal of toxic glycoside present in it.

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REFERENCES

1. The Wealth of India: Raw Materials, Vol. X, CSIR Publication, New Delhi, p. 225 (1976).
2. R.N. Chopra, S.L. Nayar and I.C. Chopra, Glossary of Indian Medicinal Plants, CSIR Publication, New Delhi, p. 243 (1956).
3. R. Consden, A.H. Gordon and A.J.P. Martin, *Biochem. J.*, 38, 224 (1944).

4. S.P. Datta, C.F. Dent and H. Narris, *Science,* **112,** 620 (1950).
5. J.J. Pratt and J.L. Auclair, *Science,* **108,** 213 (1984).
6. D. Mutiny, *Naturwissenschaften,* **39,** 303 (1952).
7. I. Smith, *Nature,* **43,** 171 (1953).
8. R.J. Block, H.M. Winegard and G. Toennies, *Science,* **108,** 506 (1948).
9. S.S. Sakaguchi, *Biochem. J.,* **5,** 25 (1925).
10. R. Pant and H.C. Agarwal, *Naturwissenchaften,* **50,** 530 (1953).
11. H. Rosen, *Arch. Biochem. Biophys.,* **67,** 10 (1957).
12. G.M. Price, *Biochem. J.,* **86,** 372 (1963).

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