NOTES

Phytochemical Study of Some Medicinal Plants

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Adhatoda Vasica Nees, *Argemone mexicana* Linn and *Asparagus racemosus Willd* and their parts have been analysed for protein and amino acids. In all, seventeen amino acids were identified in the various medicinal plants.

A. Vasica Nees is a small gregarious evergreen shrub, occurring throughout the plains of India and in sub-Himalayan forest. In the Ayurvedic system of medicine, it is used for the treatment of bronchitis, asthma, fever, jaundice and efficacious in coughs[1].

A. mexicana Linn[2] is a genus prickly herb. The weed contains alkaloids, so its juice is diuretic and alterative. It is given in dropsy, jaundice and is used for skin diseases. The seed yields non-edible oil and is a purgative, narcotic and demulcent[3].

A. racemosus[4] is a climber common in India. The roots are useful in dysentery, diseases of the blood, kidney, liver and eye complaints.

Due to the medicinal value and little knowledge of the chemical aspects, it was of interest to analyse the plant parts for their complete analysis. In the present study the plant parts were analysed for nitrogen, proteins and amino acids.

The plants were collected from the foothills of Shivalik and identified botanically. The plant parts were separated, dried and powdered for chemical analysis.

The total nitrogen content was determined by micro-Kjeldahl's method[5], the crude protein was calculated by multiplying total nitrogen content of the sample with 6.25[6]. Defatted 1.0 gm dry powder was extracted with 80% ethanol and centrifuged. The supernatant was evaporated to semi-dried film in a hot water bath at 40°C and then 1.0 ml of ethanol was added into it. This solution was used for chromatography of free amino acids.

The amino acids were identified and estimated by co-chromatography and photochemical colorimeter[7].

Leaves, roots and bark of *A. Vasica*; leaves, roots and seeds of *A. mexicana*; leaves and roots of *A. racemosus* was analysed for nitrogen, protein and amino acids. These values are given in the Table 1.

From the table it is clear that the leaves of *A. vasica* and *A. racemosus* contain more protein in comparison to other plant parts. Methionine was found only in *A. mexicana*, iso-leucine was found only in *A. vasica*, while threonine is present

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only in the leaves of *A. racemosus*. Approximately 9 to 15 amino acids were identified in each plant part. In general the level of amino acids is not below average value.

TABLE 1

ANALYSIS OF AMINO ACIDS

mg/100 gm dry matter basis

Plants:	*Adhatoda vasica*			*Argemone mexicana*			*Asparagus racemosus*	
Plant Parts:	L	R	B	L	R	S	L	R
Amino acids								
Cysteine	4	++	6.4	4	3.2	0.8	+++	3.2
Cystine	+++	2	4	3.2	2	–	4.8	2.0
Histidine	++	+	–	–	–	–	7.2	++
Lysine	+++	4	+	++	+	8	–	–
Arginine	8	++	8	8	12.8	+	–	–
Serine	++	4.8	–	++	–	20	8.2	+
Glycine	–	–	–	++	11.2	–	++	+
Glutamic acid	13	12	++	++	12	–	++	10
Alanine	++	–	12	+	–	18	++	+
Proline	13	12	+	16	+	–	11.2	+
Tyrosine	16	20	12	++	+	16	++	12.8
Tryptophane	+++	+	15	24	++	+	–	–
Valine	20	40	–	++	20	–	++	+
Methionine	–	–	–	++	++	20	–	–
Phenylalanine	20	++	20	+	4.8	–	–	–
Isoleucine	++	+	24	–	–	–	–	–
Threonine	–	–	–	–	–	–	10	–
% of nitrogen	1.2	0.95	0.9	0.8	0.63	0.96	0.83	0.72
% of protein	7.50	5.93	2.62	5.00	3.93	6.00	5.18	4.50

· = not detected, + = trace, ++ = moderate, +++ = good.S = stem, L = leaves, B = Bark S = Seed, R = root ·

REFERENCES

1. *Central Indigenous Drugs Comm.* 35 (1909).

2. G. Watt, A Dictionary of the Economic Product of India, I, p. 306.

3. J.F. Dastur, Medicinal plants of India and Pakistan, D.B. Taraporevala Sons & Co. Pvt. Ltd., p. 23 (1977).

4. *Fl. Br. Ind.*, IV, 316.

5. D. Pearson, Laboratory Technique in Food Analysis, Butterworth, London and Boston, pp. 50, 105 (1973).

6. K. Peach and M.V. Tracy, Modern Methods of Plant Analysis, Vol. IV, SpringerVerlag (1955).

7. J. G. Heathcote and M. Washington, *Analyst*, **92**, 217 (1967).