

NOTE

Phytochemical Study of *Achyranthes aspera* Linn

ANURAG SINGH CHAUHAN*, G.S. RAWAT and C.P. SINGH
Research Division, Department of Chemistry, R.H. Govt. (P.G.) College,
Kashipur (Udham Singh Nagar), India

Total sugar, vitamins, amino acids, nitrogen and protein were estimated from *Achyranthes aspera* Linn and new cyclic chain aliphatic fatty acid isolated from seeds of this plant.

Key Words: Phytochemical study, *Achyranthes aspera* Linn.

Achyranthes aspera Linn¹ is also called latjira and chirchitta in Hindi. It belongs to family Amaranthes. Its flowers are greenish white and numerous. It is found throughout India along roadside. It has medicinal properties. The infusion² of root is given as a mild astringent. The seeds, leaves are considered emetic and are useful in hydrophobia. The juice of leaves is given for dysentery, diarrhoea, piles, rheumatism, the inflammation of internal organs, skin diseases and lurchbites. It is also recommended in the treatment of snake bite³; roots are grounded and given with water at short intervals, until the patient vomits and regains consciousness. A fresh long piece of the root is used as tooth brush twice a day to relieve sensitive gums.

The plants were collected from foot hills of Himalayas and identified botanically. The plant's leaves, root and seeds were dried in an oven and powdered for analysis. Total sugar was estimated by the anthrone method and the spectrophotometric method.^{4, 6}

Vitamin A was identified by Carrprice method⁶, Vitamin B identified by thiochrome reaction method⁷ Vitamin C identified with ammonium molybdate reagent⁸. Results are given in Table-1.

TABLE-1

Plant parts	Nitrogen (%)	Protein (%)	Sugar (%)	Vitamin A	Vitamin B	Vitamin C
Leaves	25	1.5625	15.1	—	—	—
Roots	45	2.8130	18.2	—	—	—
Seeds	30	1.8750	18.1	—	—	—

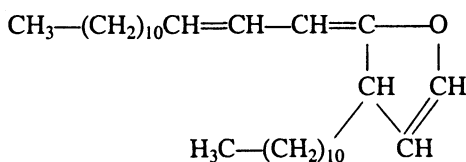
Qualitative and quantitative estimations of free amino acids were done by paper co-chromatography and spectrophotometric methods^{9, 10} which are given in Table-2.

TABLE-2
CONCENTRATION OF AMINO ACIDS mg/100 g ON DRY MATTER BASIS

Product	Amino acids	Leaves	Roots	Seeds
1	Cystine	—	6	—
2	Cystidine	—	—	24
3	Histidine	3	10	23
4	Lysine	—	—	30
5	Arginine	5	16	26
6	Serine	—	14	24
7	Aspartic acid	14	32	36
8	Threonine	—	—	35
9	Glutamic acid	—	4	—
10	Alanine	—	22	38
11	Proline	12	—	16
12	Tyrosine	—	—	20
13	Methionine	—	—	26
14	Phenyl alanine	2	5	24
15	Isoleucine	—	—	26
16	Leucine	2	4	—

— Not detected

Extraction and Isolation: Extraction of the seeds (500 g) with the soxhlet apparatus with petroleum ether (40–60°C) was done for 4 h. The extraction was found viscous in nature. The compounds was separated by using TLC technique again and again with the solvent system till the compound was obtained in pure form. The compound was analysed using spectroscopic techniques. It was identified as a cyclic chain aliphatic fatty acid.



This structure was confirmed by spectral analysis:

IR, ν_{max} (nujol) (cm^{-1}): $\nu(\text{C}=\text{C})$ 1616, $\nu(\text{C}-\text{O})$ 1082.

$^1\text{H NMR}$ [CDCl_3]: $[\delta]$ 0.91 (t, 3H, $\underline{\text{CH}_3}$ for terminal group);
 5.39 (s, 1H, $=\underline{\text{CH}}$); 2.8–3.5 (t, 3H, $=\text{CH}-\text{CH}_2$);
 1.31 (m, n (H), $(\text{CH}_2)_n$); 2.01 (s, $\underline{\alpha}$ H, CH_2);
 1.91 (s, $\underline{\beta}$ H, CH_2) ppm.

Mass spectra showed the molecular weight as 416.0.

Chemical analysis of leaves, roots and seeds of *Achyranthes aspera* Linn are given in Table which indicates that percentage composition of nitrogen was higher

in roots, seeds and leaves respectively. It was also clear that vitamins A, B and C were not found in leaves, roots and seeds, seven amino acids were present in leaves, nine amino acids in roots and thirteen amino acids in seeds.

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Tel.: (+61-3) 5227 2325 Fax: (+61-3) 5227 1040

E-mail: tucker@deakin.edu.au or swlewis@deakin.edu.au