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Amino Acids from *Leucas lanata*

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THE genus *Leucas*[1] belonging to *Labiatae* family comprises 100 species found throughout the world. The species, *Leucas lanata* Benth.[1,2] is found in Tripura along with *L. aspera* Spreng. It is a perennial herb with much branches from a stout rootstock having white flowers in axillary dense whorls, which have calyx straight mouths and setaceous bracts. Tender shoots are used as vegetables and leaves, and used medicinally[1]. To find out the diet value of the plant with respect to amino acid content, we investigated chemically for the first time the aerial parts of the plant and isolated fourteen amino acids among which six are essential. In this communication, we report the isolation, characterisation and relative occurrence of these amino acids.

The aerial parts of the plant, *L. lanata* were collected from Khayerpur area of Agartala in September, 1985. The air-dried milled aerial parts (1 kg) were extracted with petrol (b.p. 60–80°) and 90% ethanol successively in a Soxhlet for 48 h each. The alcoholic extract was concentrated and decolourised by refluxing with a little charcoal. The greenish filtrate was evaporated under reduced pressure to a gummy residue (30.2 g). A part of the residue (1.5 g) was chromatographed[3,4] through Amberlite IR 120(H). Working up the column for neutral and basic amino acids as described[5] led to the identification of lysine, threonine and histidine by co-pc with authentic samples.

Another portion of the crude residue (2.0 g) was chromatographed through Amberlite 1RA 400(OH) and elution with 2 *N* acetic acid for basic and neutral amino acids led to the characterisation of glycine, serine, aspartic acid, glutamic acid, hydroxy proline, proline, alanine, tyrosine, tryptophan, methionine and phenyl alanine by co-pc with authentic samples.

The relative occurrences of amino acids in μg per g of air-dried aerial parts isolated through their ninhydrin complexes and estimated colorimetrically[6] were found to be histidine, 6 80 ; lysine, 4.80 ; threonine, 2.40 ; aspartic acid, 2.28 ; proline, 2.18 ; alanine, 2.01 ; phenylalanine, 1.98 ; glycine, 1.60 ; serine, 1.40 ; tyrosine, 1.05 ; glutamic acid, 1.01 ; hydroxyproline, 0.93 ; tryptophan, 0.75 and methionine, 0.30. The amounts of glycine and serine may be inaccurate as their bands were very close in preparative pc. Among these, histidine, lysine, threonine, phenyl alanine, tryptophan and methionine are essential amino acids for human system.

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Amino Acids from *Spilanthes paniculata*

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THE genus *Spilanthes*[1] belonging to *Compositae* family comprises 60 species found in tropical America and exotic in other countries. The species, *Spilanthes paniculata* Wall. ex DC.[1,2] is found in the jhum land and waste places of Tripura. It is an annual herb of 2.5–5 cm long with many branches and yellow paleae embracing flowers. The juice of this plant is used by the tribesmen in the relief of gum pain. We investigated chemically for the first time the aerial parts of the plant and isolated twelve amino acids among which six are essen-

tial. In this communication, we report the isolation, identification and relative occurrence of these amino acids.

The aerial parts of the plant, *S. paniculata* were collected from Khayerpur area of greater Agartala in September, 1985. The air-dried milled aerial parts (1 kg) were extracted with petrol (b p. 60–80°) and 90% ethanol successively in a Soxholet for 48 h each. The alcoholic extract was concentrated to gummy residue (30.5 g). Chromatography[3,4] of a part of the residue (1.5 g) through Amberlite 1R 120(H) and elution of the column for basic amino acids with 2 *N* aqueous HCl as described[5], led to the identification of lysine, glycine and proline by co-pc with authentic samples.

Another portion of the crude residue (1.5 g) was chromatographed through Amberlite 1RA 400 (OH) and elution of the column with 2 *N* acetic acid for neutral and acidic amino acids, led to the identification of histidine, glutamic acid, hydroxyproline, proline, alanine, methionine, threonine, tyrosine, valine and leucine by co-pc with authentic samples. Proline was also found from the column of cation-exchange resin.

All these amino acids from their mixture were isolated as their ninhydrin complexes by preparative pc[6] on Whatmann no. 3 mm using solvent-1 as developing solvent and their relative occurrence in μg per g of the air-dried aerial parts estimated colorimetrically[5] was found to be alanine, 3.20; lysine, 2.75; threonine, 2.40; methionine, 1.68; leucine, 1 54; valine, 1.52; proline, 1.33; hydroxy proline, 1.31; tyrosine, 1.30; histidine, 0.50; glutamic acid, 0.39 and glycine, 0.03. This is the first report of the amino acid composition from the genus, *Spilanthes*.

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Selective Separations of Mercury(II) from various Divalent Metal Ions by Extraction from Mercury(II)–Phenanthroline–Rose Bengal Ternary Systems

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1,10-phenanthroline and its derivatives react with many divalent metal ions to form stable cationic complexes which can be extracted with non-coordinating anionic dyes as ion-pair systems. These systems due to their high molar absorptivity have been extensively investigated by several workers. Rose Bengal extra (tetrachlorotetraiodofluorescein), erythrocyn (tetraiodofluorescein), eosin (tetrabromofluorescein) were used as anionic counter ions for the extraction of cationic complexes of Zn^{II}[1,3], Cd^{II}[2,3], Co^{II}[4,5], Cu^{II}[6], Mn^{II}[6], Ni^{II}[4,5] and Pb^{II}[6] with 1,10-phenanthroline which yield intensely coloured extracts in chloroform and ethyl acetate. The molar absorptivity in each case is greater than the corresponding metal dithizonate. We have earlier reported the effect of solvent on the nature of extracting species in the case of Ni^{II}[7] and Zn^{II}[8] ternary systems with 1,10-phenanthroline and Rose Bengal.

In our investigations on the extraction of Hg^{II} with 1,10-phenanthroline and Rose Bengal, surprisingly we have observed that extraction of Hg^{II} is completely inhibited by the excess presence of Rose Bengal, whereas many divalent metal ions can be quantitatively extracted under these conditions. Based on these results, a procedure for the selective separation of Hg^{II} from diverse metal ions has been developed and these results are presented in this communication.

Experimental

Extraction procedure: To an aliquot of Hg^{II} solution (containing 100 μg Hg) in a 125 ml separatory funnel, solutions of 1×10^{-2} *M* 1,10-phenanthroline (2.5 ml) and 1×10^{-4}*M* Rose Bengal (5 ml) were added. The pH was adjusted to 8.5 by adding dilute NaOH and made volume upto 20 ml with distilled water. The solution was shaken with chloroform (20 ml) for 5 min. After separation of the two phases, the orgainc phase was removed and its absorbance measured at 560 nm against reagent blank. To determine the percentage extraction of Hg^{II} under different conditions, the orgainc phase was back-extracted with 0.1 *N* H_2SO_4 and Hg^{II} was then determined by Hg–dithizone method.