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Chemical Examination of the Leaves of *Butea Superba Roxb.*

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In the present work we describe the chemical examination of the leaves of *Butea superba Roxb.*

INTRODUCTION

Butea superba Roxb[1–3] belongs to the natural order Leguminosae which is commonly known as 'Palaslata' in Hindi. It is found in forests over a large part of the country. Its leaves are used topically for piles. Its roots and flowers are used for the treatment of snake-bite. Petroleum-ether extract of the seeds of this plant is reported to possess anthelmintic activity.[4]

EXPERIMENTAL

The plant matreial was collected from 'Pachmarhi' forest area. 2 kg of air dried and finely powdered leaves of this plant were mixed with small quantity of calcium carbonate in distilled water (500 mL) and refluxed for 3 h on the water bath. The reaction mixture was separated by decantation. This process was repeated several times with distilled water. The aqueous filtrates were combined and a 10% w/v solution of lead acetate was added till the precipitate was obtained. The solution was filtered and made alkaline with ammonia and H_2S gas was bubbled through the filtrate to remove the excess of lead acetate as lead sulphide. The neutral solution of the filtrate obtained above was concentrated under reduced pressure to give a viscous residue.

Identification of Sugars: For identification of the sugars, the spots of the concentrated test mixture and authentic sugars were applied on Whatman No. 1 filter paper and chromatograms were developed in the following solvent systems:

(1) *n*-Butanol : Acetic acid : water (4:1:5 v/v)[5]

(2) s-collidine[5]

The developed chromatograms were dried in air and sprayed with aniline hydrogen phthalate[6] reagent and kept at 100–100°C for 15 min to develop the colour. The identities of test sugars were confirmed by comparison of their R_f values with those of authentic sugars (Tables 1 and 2).

Identification of amino acids: For the identification of amino acid composition, the leaves (25 g) of the plant was hydrolysed by refluxing with 6 N HCl for 24 h at 105–110°C. The hydrolysate were dissolved in water (50 mL), filtered and concentrated to dryness. The excess of acid was removed by evaporation and finally dissolved in 10% isopropanol. The solution thus obtained above was subjected to paper chromatography and identity of amino acids was confirmed

by co-chromatography with authentic samples. The results were recorded in Table-3.

TABLE-1
SOLVENT SYSTEM (1): *n*-BUTANOL : ACETIC ACID : WATER (4 : 1 : 5 v/v)
Butea superba Roxb.

S.No.	Sugar	R_f reported[5]	R_f found
1.	D-Galactose	0.16	0.15
2.	Lactose	0.09	0.10
3.	L-Rhamnose	0.37	0.36
4.	D-Glucose	0.18	0.17
5.	D-Raffinose	0.05	0.04
6.	Maltose	0.11	0.10
7.	D-Fructose	0.23	0.24
8.	D-Mannose	0.20	0.18

TABLE-2
SOLVENT SYSTEM (2): s-COLLIDINE *Butea superba Roxb.*

S.No.	Sugar	R_f reported[5]	R_f found
1.	D-Galactose	0.34	0.35
2.	Lactose	0.24	0.08
3.	L-Rhamnose	0.59	0.61
4.	D-Glucose	0.39	0.38
5.	D-Raffinose	0.20	0.21
6.	Maltose	0.32	0.33
7.	D-Fructose	0.42	0.40
8.	D-Mannose	0.47	0.46

TABLE-3

S.No.	Amino acids identified	R_f reported	R_f observed
1.	Arginine	0.57	0.56
2.	Alanine	0.61	0.62
3.	Cystine	0.28	0.27
4.	Glycine	0.55	0.56
5.	Glutamic acid	0.51	0.50
6.	Histidine	0.79	0.78
7.	Leucine	0.76	0.75
8.	Lycine	0.48	0.50
9.	β-Phenyl alanine	0.56	0.55
10.	Tyrosine	0.64	0.65
11.	Valine	0.41	0.40

The quantitative estimation of the amino acid was done by the method of Price[7] and defined in terms of mg of glycine per 16 mg of nitrogen. The results were recorded in Table-4.

TABLE-4

S.No.	Amino acids	Quantity (Expressed in mg)
1.	Arginine	1.98
2.	Alanine	1.65
3.	Cystine	0.68
4.	Glycine	3.25
5.	Glutamic acid	2.32
6.	Histidine	1.02
7.	Leucine	2.15
8.	Lycine	2.43
9.	β-Phenyl alanine	1.90
10.	Tyrosine	0.72
11.	Valine	2.12

RESULTS AND DISCUSSIONS

The above results indicated the presence of eight carbohydrates *viz.* D-galactose, lactose, L-rhamnose, D-glucose, D-raffinose, maltose, D-fructose, D-mannose. Amino acids were found to consist of arginine, alanine, cystine, glycine, glutamic, histidine. leucine, lycine, β-phenyl alanine, tyrosine, valine. Out of these above amino acids only glycine, leucine, β-phenyl alanine and valine were found to predominate over rest of the amino acids.

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