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## CONTENTS

	Page No.
Synthesis of 2-Amino Pyrimidine Derivative of Wood Flour and It's Applications in Removal of Fe(II) Ions From Polluted Water <i>Harsukh Ram Chharang and Bhanwar Lal</i>	1-4
Spectrophotometric Investigation of Oxidation Kinetics of D-Ribose with Quinolinium Chlorochromate <i>J.V. Singh* and Ashish Tomar</i>	5-9
Performance and Analysis of Physico-Chemical Treatment of Distillery Effluent and its Effects on Seed Germination <i>Ashima Srivastava, Pratibha Singh, Ashish Dutta, Jyoti Pathak and Pratibha Singh</i>	10-16
A Review on Effect of Fluoride on Health <i>Meenu Mangal*, Sunil Mangal* and Kuldeep Sharma</i>	17-22
Leucas Hyssopifolia Benth-Medicinal Plant: A Review <i>Bharti Bahuguna</i>	23-26
Chemical Analysis of Some Wild Leguminous Seeds <i>Rajiv Agrawal, Udit Garg and H.K. Garg*</i>	27-28
Kinetic Principles of the Oxidation of Maleic Acid to Epoxide by Quinolinium Fluorochromate <i>J.V. Singh</i>	29-32
Hydroxamic Acids Have Several Applications in Analytical Chemistry <i>Aftab Ahmad Sulaiman</i>	33-35
Studies on Hydroxy Terminated Unsaturated Polyester Based Waterborne Polyurethane Dispersion Novel Waterborne Polyurethane Dispersion <i>Keyur. H. Acharya and H.S. Patel</i>	36-39



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# CHEMICAL ANALYSIS OF SOME WILD LEGUMINOUS SEEDS

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## ABSTRACT

The chemical composition and the water soluble carbohydrates total soluble reducing substances at room temperature as well as at 100°C from five non-edible wild Indian leguminous Seeds such as *Abrus precatorious*, *Bauhinia variegata*, *Butea monosperma*, *Lathyrus sativus* & *Psoralea corylifolia* have been quantitatively and qualitatively studied and compared.

**Key Words :** Abrus Precatorious, Bauhinia Variegata, Butea Monosperma, Lathyrus Sativus and Psoralea Corylifolia (Leguminosae), Crude Protein, Total Soluble Carbohydrates and Total Reducing Substances of Five Wild Leguminous Seeds.

## INTRODUCTION

Wild leguminous seeds indicated that they were fairly chief source of proteins and carbohydrates in Indian diet, suggested their possible inclusion in animal nutrition. The aforesaid wild leguminous seeds were analyzed for their chemical composition. The present communication reports a comparative chemical analysis of five Leguminous seeds of Bundelkhand region of central India.

## MATERIAL AND METHODS

The wild Leguminous Seeds of *Abrus precatorious*, *Bauhinia variegata*, *Butea monosperma*, *Lathyrus sativus* & *Psoralea corylifolia* (Leguminaceae) were collected from Bundelkhand region of Uttar Pradesh and authenticated by the department of Botany, D. B. S. College, Kanpur-208006 (UP) India. The seeds were cleaned and powdered 100 mash and defatted with petroleum ether (b.p.60-80°) by Soxhlet assembly. Moisture, Ash, water soluble ash, acid soluble ash, crude fibre and fat contents were determined by standard methods. Nitrogen was determined Micro-Kjeldhal' method and from the results, percentage of crude protein was calculated. Ether extractives were determined by usual methods ( Table - A).

TABLE - (A)  
 CHEMICAL COMPOSITION OF THE WILD  
 LEGUMINOUS SEEDS  
 (Percentage in dry weight basis)

Constit- uents	Abrus precat- orius	Bauhinia variegata	Butea monos- perma	Lathyrus sativus	Psoralea coryli- folia
Moisture	4.07	8.93	6.81	9.06	5.07

Ash	5.09	4.50	6.79	7.41	5.32
Water soluble	12.97	8.02	15.03	11.31	10.34
Acid soluble	33.32	31.64	29.14	18.06	18.40
Fat	8.58	11.5	11.0	7.88	4.07
Nitrogen	5.92	4.32	3.93	6.70	6.22
Crude Protein	37.05	27.10	24.43	41.72	39.80
Crude Fibre	11.96	11.60	3.28	2.76	9.16
Carbohy- drates	37.30	41.24	24.54	42.10	40.42

Extraction of defatted seed meals for the determination of total water soluble carbohydrates and total soluble reducing substances was made by the usual method at room temperature (27±3°C) as well as at 100°C. Total soluble carbohydrate was estimated by the method of Trevelyn and Harrison. Total soluble reducing substances were estimated by the method of Hagedorn and Jenson as described by hawk et al. and modified by Howden and Kilby (Table-B)



**TABLE-(B)**  
**TOTAL SOLUBLE CARBOHYDRATES AND TOTAL SOLUBLE REDUCING SUBSTANCES OF THE WILD LEGUMINOUS SEEDS.**

(g glucose / 100 grams seeds)

SEEDS	Total Carbohydrates (g glucose / 100g seeds) (27±3°C) (100°C)		Total Reducing Substances (g glucose / 100 g seeds) (27±3°C) (100°C)	
A.precatorius	10.08	9.08	2.17	2.50
B.variegata	20.12	0.22	3.07	3.05
B.monosperma	18.62	1.60	1.90	2.06
L.sativus	18.10	0.32	4.11	4.73
P.corylifolia	12.08	0.42	3.16	3.75

\* Explanation as in table-A.

Qualitative analysis of soluble sugars was performed by employing paper partition chromatography technique of Consden et al. as described by Partridge. A large number of different solvent systems have been used for the separation of carbohydrates and in the present investigation, the following solvent system were employed such as Phenol (98% w/v) : Ammonia saturated, Propanol-1 : Ethyl acetate : Water (7:1:2), Butanol-1 : Acetic acid : Water (4:1:5), Ethyl acetate : Pyridine : Water (2:1:2) and Ethyl acetate : Pyridine : Water (12:5:4). When the solvent mixture formed layers, the upper layer was employed for the development of the chromatogram and the lower layer for the interior of the chromatographic tank.

## RESULTS AND DISCUSSION

Table - A represents, the five wild non-edible leguminous seed contain (3.93 – 6.70%) of nitrogen, (3.28 – 11.96%) of crude fibre, (24.54 – 42.10%) of carbohydrates, (4.07 – 11.50%) of fat and very important constituent (24.54 – 41.72 %) of crude protein which indicates their possible inclusion in Animal nutrition .

Table - B represents, all five non-edible wild leguminous seeds contain (10.08 – 21.60 % ) water soluble carbohydrates extracted room temperature and ( 1.90 – 4.11 % ) total reducing substances, whereas (19.08 – 21.60%) water soluble carbohydrates extracted at 100°C temperature and ( 2.06 – 4.73 % ) total reducing substances. The slight increase of reducing substances at 100°C could be due to the release of reducing sugars by hydrolysis of

polysaccharides in presence of mineral salts seed origin .

## SUMMARY

Although the nature of the residual reducing substances is not very clear, the free amino acids, ascorbic acid, carbohydrates and also keto- groups appear to be the main reducing substances present in seeds. In addition, flavonoids, alkaloids, leucoanthocyanines and other seed pigments possessing phenolic properties as referred could be the other contributing factor.

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