

Indian Butter Tree: An excellent source of nutrition and livelihood generation

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ABSTRACT

Cheura (*Diploknema butyraceae*) belonging to Sapotaceae family, is an important oil seed of tree-origin, distributed from India (Garhwal, Kumaun eastward to Sikkim) to Nepal and Bhutan (sub Himalayan tracts and outer Himalayan ranges). In India, it occurs abundantly in Uttarakhand region. Fatty Oil in kernels known as phulwa or phulwara ghee and is used for cooking and frying of vegetables and food. It is also used for preparing medicines, ointment, candles, cream and other user friendly products. The cake produced after processing of Cheura is used as manure and has pesticidal properties. Keeping the above facts in view, the present study was undertaken to evaluate the nutritional aspects and preliminary phytochemical analysis of cheura seeds. A high performance thin layer chromatography method for the separation of active constituents has been developed which would be helpful in identification and isolation of the chemical markers present in cheura seeds. Qualitative analysis of the different extracts of the plants has been done by the standard methods and with the help of this analysis nature of the compounds which have been present in the plant is being identified. This study will further help in developing the value added products from cheura seeds.

Key words: Cheura (Diploknema butyraceae), Sapotaceae, tree borne oil seed, nutritional aspects, analysis, value addition. Sustainable forest management, Economic Development, Biodiversity conservation, Adaptive and integrated management, Research.

OBJECTIVE

✓ Phytochemical and Nutritional analysis of *Diploknema butyracea s*eeds

INTRODUCTION

Botanical Name

: Diploknema butyracea , syn Madhuca butyracea

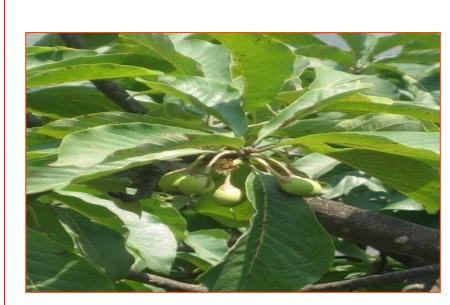
Common Name Family

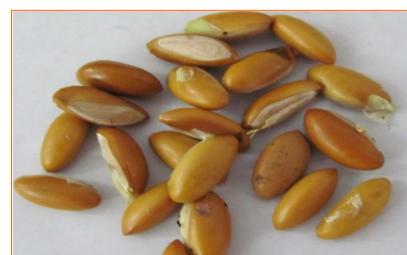
Location

Indian Butter Tree (Cheura)

: Sapotaceae

: Sub-Himalayan tract











- Fatty oil yield is 42-47% of the weight of seeds.
- ■The oil is of white color and has pleasant taste and odour.
- The major acid is Palamitic acid content (56.6%). It is also used for preparing medicines, ointment, candles, cream and other user friendly products.
- The cake produced after processing of Cheura is used as manure.
- It has pesticide properties and used as wormicide, nematicide, rodenticide and insecticide.

INNOVATIVE APPROACH/ METHODOLOGY

Preparation of **Samples and Developing Solvent** system

•Different samples of *Diploknema butyraceae* were prepared by taking 10 mg of extracts of kernels and seed skin in 10 ml vials and added 5ml corresponding solvents such as chloroform, methanol and water.

Different combinations of solvents were tried to standardize the solvent system for analysis of HPTLC of the different extracts.

Sample application and development of Chromatogram

Detection of Spots

(10x10cm) (Merck) with the help of linomat 5 applicator attached to CAMAG HPTLC system. Application of bands of each extract was carried out on TLC (each track) 6mm in length and 20µl in concentration using spray technique) by

Sample was applied on pre-coated silica gel 60F254 aluminium sheets

- keeping 16.6mm space between each track. • The HPTLC system was programmed through the WIN CATS software.
- The chromatogram was developed in twin trough glass chamber 10x10cm saturated for 20 minutes with solvents standardized for each extract.
- The air dried plates were viewed in the ultraviolet radiations.
- The chromatograms were scanned by densitometer at multiple wavelengths i.e. 200nm, 400nm and 500nm, 650nm
- After scanning, the most feasible wavelength (which shows the maximum no. of spots) has been observed for the results. The Rf values and fingerprint data were recorded by WIN CATS software.

Table 1. R _f valu	ies of the chromatogram of					
of kernels						

Peaks	R _f values			
	chlorofor m extract*	methanol extract**	aqueous extract***	
1	0.02	0.02	0.02	
2	0.01	0.07	0.14	
3	80.0	0.12	0.21	
4	0.23	0.21	0.32	
5	0.31	0.24	0.39	
6	0.58	0.33	0.50	
7	0.72	0.35	0.68	
8		0.61	0.81	
9		0.68		
10		0.81		
11		0.81		
	ystem: *Eth **Chloroforn		Pet ethe	

***Chloroform:

(13:7:2)

Water (16:6:1)

RESULTS

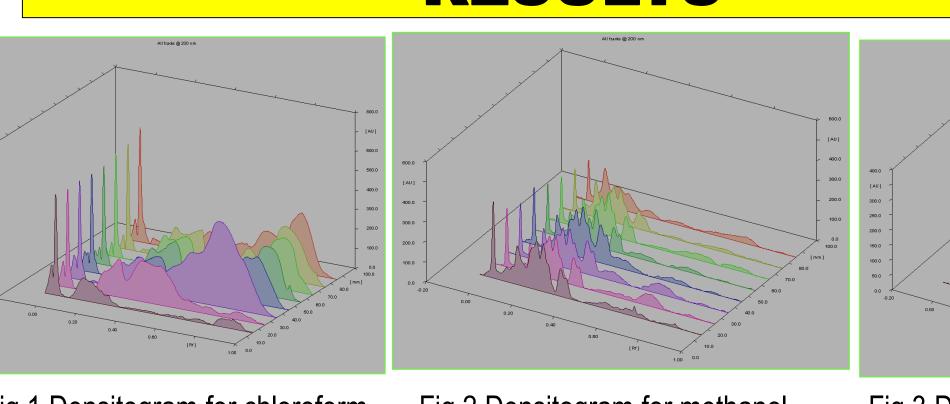


Fig.1 Densitogram for chloroform extract of kernels at 200nm

Methanol: Fig.4 Densitogram for chloroform extract of seed skin at 650nm

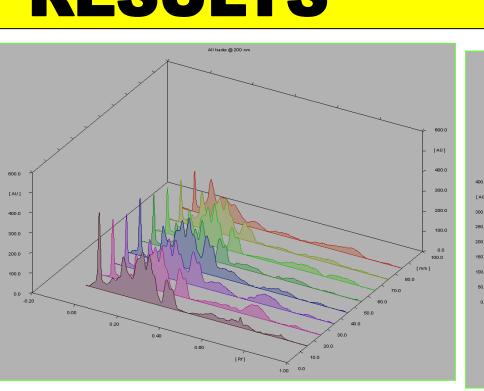


Fig.2 Densitogram for methanol extract of kernels at 200nm

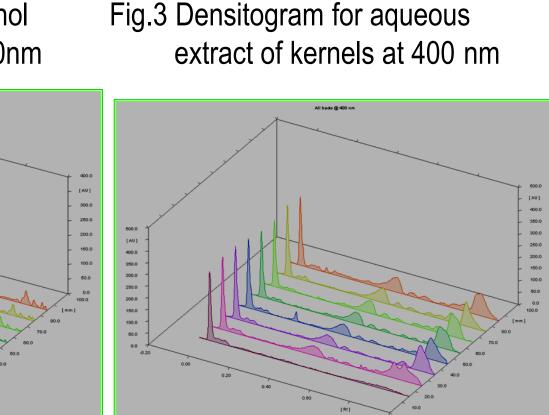


Fig.6 Densitogram for aqueous

extract of seed skin at 500 nm

Fig.5 Densitogram for methanol extract of seed skin at 400nm

Table 2. R_f values of the chromatogram of of seed skin

Peaks		R _f values			
		chloroform extract*	methanol extract**	aqueous extract***	
21 20 20 20 20 20 20 20 20 20 20 20 20 20	1	0.03	0.02	0.01	
	2	0.06	80.0	0.06	
	3	0.13	0.26	0.12	
	4	0.15	0.42	0.16	
	5	0.21	0.53	0.48	
	6	0.26	0.59	0.54	
	7	0.32		0.61	
	8	0.43		0.68	
	9	0.54		0.72	
	10	0.62		0.81	
	11	0.74		0.84	
	12	0.81			

System-Methanol: Chliorform (20:80), Solvent **24%Methanol:Chloroform (25:75)and ***Chloroform: Methanol: Water (13:7:2)

CONCLUSION

- HPTLC fingerprint profiling of different extractives of kernels and seed skin showed a number of compounds and study will be helpful in pharamocognostical studies of the plant.
- Cheura seeds are having very high percentage of fatty oil (42-47%) and it is edible also.
- Adding value to abundantly available Cheura seeds through technological interventions is the best way of augmenting the income and efforts need to be focused in this direction to realize the full potential of medicinally important tree borne oil seeds (TBOs).
- On the basis of recommendations, farmers can opt for the oilseed as cash crops and they can get good monetary return from *D. butyracea* crop production, which make them enable to achieve the sustainable livelihood and have tremendous potential to boost the economy of the rural population
- The areas have a potential to generate income varying between 0.34 and 3.13 lakh INR ha-1.