

## SIGNIFICANCE OF PHYSICO-CHEMICAL STANDARDISATION IN HOMOEOPATHY PSORALEA CORYLIFOLIA LINN. AS A MODEL DRUG

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### ABSTRACT

The present study is an attempt to highlight the importance of standardisation in Homoeopathic system of medicine and also to lay down the physico-chemical standards viz. physical constants, T.L.C. profiles and spectrophotometric absorbance. The data presented are intended to form a basis for the identification of genuine drug samples.

### INTRODUCTION

*Psoralea corylifolia* Linn. (family Leguminosae, Papilionaceae) is popularly known as Baruchi in Sanskrit, Babchi in Hindi, Bavachi in Bengali and Kaarboka arisi in Tamil. *P. corylifolia* is not cultivated on a commercial scale anywhere, However, it is a common herbaceous weed which grows throughout the whole length and breadth of the plains of India. Seeds are brownish black in colour, about 2 mm long and are oblong and flattened. It is official in Homoeopathic Pharmacopoeia of India and Indian Pharmacopoeia for the medicinal value. The seeds are used in indigenous medicine as laxative, aphrodisiac, anthelmintic, diuretic and diaphoretic in febrile conditions. It is also recommended for the treatment of leucoderma, leprosy, and psoriasis and inflammatory diseases of the skin where it is applied internally and externally (Anonymous, 1989).

**Coumestan** a phyto-chemical isolated from *Psoralea corylifolia* has also exhibited the anti-fertility effect (Shah., 1997). The seeds are found to contain an essential oil (0.05%), a non volatile terpenoid oil, a dark brown resin (8.6%), a pigment (probably a hydroxy flavone) a monoterpenoid phenol named bakuchiol (C<sub>18</sub> H<sub>24</sub> O) a brown fixed oil (0.10%), raffinose and coumarin compound, viz. psoralen (identical with fucusin, (C<sub>11</sub> H<sub>6</sub>O<sub>3</sub>), isopsoralin (identical with angelicin) Isopsoralidin (C<sub>16</sub> H<sub>14</sub>O<sub>4</sub>) and corylifolin (C<sub>17</sub> H<sub>18</sub>O<sub>3</sub>). Fixed Oil of the seeds is viscous,

bitter in taste and on keeping deposits psoralen. It contains considerable resin acids (21.5%), stigmasterol present in the unsaponifiable matter. Psoralin is more potent than other furocoumarins such as xanthotoxin and bergapten (Anonymous, 1989).

In Homoeopathy, seeds are extracted in 91-95% alcohol. Because of its important medicinal value in Homoeopathy and other systems of medicine, the authors have undertaken the physico-chemical standardisation study.

### MATERIALS AND METHODS

The air dried (shade dried) sample of seeds of *Psoralea corylifolia* Linn. was supplied by Survey of Medicinal Plants and Collection Unit, Udthagamandalam Tamilnadu. The dried sample was powdered to obtain a coarse powder 10/44 (sieve size). It was subjected for determination of moisture content (loss on drying at 105°C) and total ash content, water soluble ash, acid insoluble ash, extractive value in different solvents (varying polarity). The above parameters have been determined in accordance with procedures given in Homoeopathic Pharmacopoeia of India (HPI) and Indian Pharmacopoeia, (I.P.). The mother tincture was prepared as per H.P.I. (1971). In this method 100g. of *Psoralea corylifolia* (coarse powder) was suspended in one litre of 95% alcohol for 24 hours at room temperature. It was filtered and made up to vol. 1000 ml using the same solvent. Percolation method has been used for the preparation of mother tincture.

The alcoholic extract was studied for its physico-chemical constants, chromatography and U.V. absorbance.

All chemicals and solvents used were of analytical grade. Silica gel-G. (E-merck, India) was used for thin layer chromatography. All the experiments were carried out at room temperature. An U.V. spectrum was recorded on U.V. spectrophotometer, Shimadzu, model 160A.

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## PHYSICO CHEMICAL CONSTANTS

Physico-chemical parameters viz organoleptic properties, wt. per ml., total solids, alcohol content, pH value were determined as per the procedure laid down in the Homoeopathic Pharmacopoeia of India.

## CHROMATOGRAPHY

For thin layer chromatography, 25 ml. of alcoholic extract was evaporated on water bath, the remaining aqueous part was extracted with 25 ml. of chloroform (three times). All the three fractions were combined and concentrated to 2 ml., 15  $\mu$ l. of the concentrate was applied on T.L.C. plate. It was developed using chloroform: ethanol (98.5:1.5v/v) as mobile phase and 5% methanolic KOH solution used for visualization.

## U.V. ABSORBANCE

For U.V. absorbance the mother tincture was diluted with 99 parts of menstruum (the specific ratio of alcohol and water i.e. 95%). The spectrum was recorded in the range of 200-600 nm. The peak of maximum absorption is depicted in the table.

## RESULTS AND DISCUSSION

*Psoralea corylifolia* Linn has been allotted for Drug Standardisation Programme at Homoeopathic Drug Research Institute, Lucknow by Central Council for Research in Homoeopathy to lay down standards for raw drug and finished product in Homoeopathic system of medicine. The raw drug studies show moisture content 7.7% w/w, total ash content 5.425%, acid insoluble ash 0.11%, water soluble ash 2.6%, extractive value in different solvents like acetone, alcohol, chloroform, methanol, petroleum ether (60-80°) and distilled water have also been determined to supplement the analytical data for laying down the standards for the drug. The results are given in Table-1. Physico-chemical standardisation studies of the mother tincture revealed the wt. per ml. 0.8 g., total solids 2.54%w/v, pH value 7.5, alcohol content 95% v/v., The values are recorded in Table-2.

T.L.C. studies of the chloroform extract of the mother tincture reveals seven prominent spots having Rf value of 0.1, 0.15, 0.22, 0.34 and 0.45 (yellow) and 0.66, 0.90 (light black) on spraying the plate with methanolic KOH solution. The results are given in Table-3. Diluted mother tincture when scanned under U.V. visible spectra in the range of

**Table-1**  
**Standardisation of Raw Drug**

S.No.	Parameters	Quantitative values
1.	Moisture content (loss on drying at 105°C)	7.7% w/w
2.	Total ash content of powdered drug	5.425% w/w
3.	Water soluble ash	2.6% w/w
4.	Acid insoluble ash	0.11% w/w

**Extractive Values in Different Solvents**

S.No.	Solvent	Extractive values
1.	Acetone	11.04% w/w
2.	Absolute alcohol	12.4% w/w
3.	Chloroform	10.25% w/w
4.	Methanol	14.5% w/w
5.	Pet-ether (60-80°)	4.75 w/w
6.	D. water	11.75% w/w

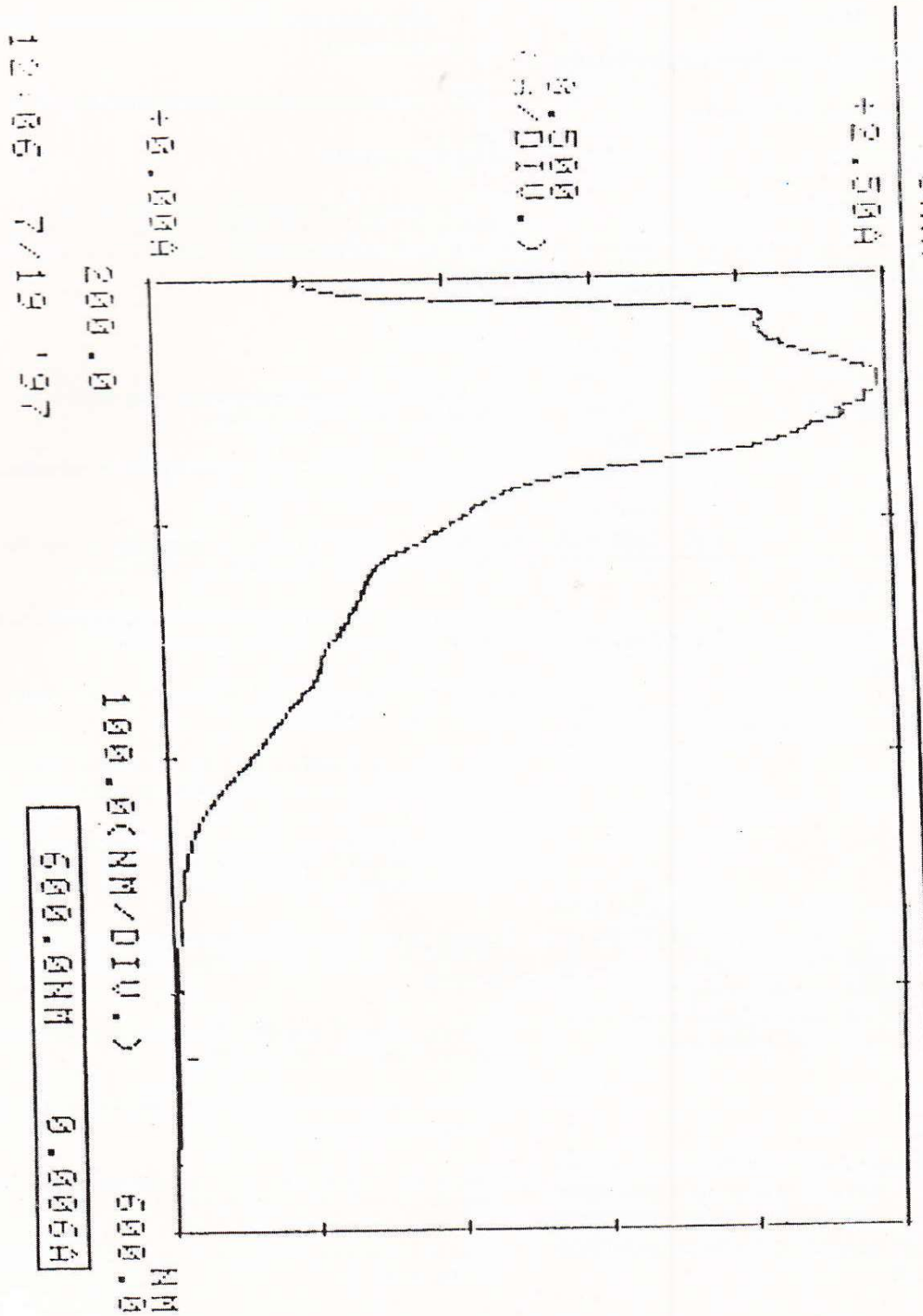
**Table-2**  
**Physico-chemical Constants**

Sl. No.	Parameter	Observations
1.	Organoleptic properties	
	a. Appearance	Clear, non viscous liquid
	b. Colour	Maroon/wine red
	c. Odour	Characteristic
2.	Sediments	Absent
3.	Wt. Per ml.	0.80 g
4.	Total solids	2.54% w/v
5.	pH at R.T.	7.5
6.	Alcohol content	95% v/v

PSORALEA CORYLIFOLIA Ø

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**Table-3**

**Chromatographic Results of *Psoralea corylifolia* Linn.**

**Extract :** Chloroform extract of the mother tincture

**Adsorbent:** Silica gel -G

**Layer Thickness:** 0.5mm in wet condition.

Sl. No.	Solvent System	Detecting agent	No. of spots	Rf. values	Colour of the spots
1.	Chloroform; ethanol (98.5:1.5v/v)	5% methanolic KOH solution	7	0.10	Yellow
				0.15	Yellow
				0.22	Yellow
				0.34	Yellow
				0.45	Yellow
				0.66	Light black
				0.90	Light black

**Table-4**

**U.V. Absorbance of Alcoholic Extract of *Psoralea corylifolia* Linn.**

S.No.	Mother tincture	No. of peaks	U.V. Absorbance
1.	<i>Psoralea corylifolia</i> Linn. 91-95% alcohol extract	01	241.5 nm

200-600 nm shows only one distinct peak at 241.5 nm (Maximum absorbance). Wave-length and graphs are shown in Table-4. Though there are seven spots in the T.L.C. study, only one peak was observed under the U.V. scanning, which clearly indicates that out of seven T.L.C. spots, one spot is having U.V. absorbing chemical.

**CONCLUSION**

The parameters determined in standardisation of crude drug and its mother tincture can be taken as characteristic standards of this drug in Homoeopathic system of medicine. The great significance attached to the physico-chemical standardisation is that:

1. Standardisation ensures the quality products to consumers.
2. The benefit and reputation to manufacturers.

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