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Research Article

PHYSICOCHEMICAL AND PRELIMINARY PHYTOCHEMICAL STUDIES ON THE LANTANA CAMARA (L.) FRUITS

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ABSTRACT

The present communication attempts to evaluate the physicochemical and preliminary phytochemical studies on the fruits of *lantana camara (L.)* Verbenaceae family. A large scrambling evergreen, strong smelling shrub with stout recurred prickles. *Lantana camara* is widely distributed in tropical America, but now naturalized in many parts of India as a troublesome prickly weed. The chemical constitution for lantana camara is caryophyllene, 1-α-phellandrene, lantadene A, lantadene B, lancamarone quinine, lantanine. The plant is vulneary, diaphoretic, carminative, antispasmodic and tonic, wounds, ulcers, swelling, tumours and rheumatism. As there is no detailed standardisation work reported on fruits, the physicochemical parameters, preliminary phytochemical constants are carried out. The study revealed specific identities for the particular crude drug which will be useful in identification and control to adulterations of the raw drug. The study revealed specific identities for the particular crude drug which will be useful in identification and control to adulterations of the raw drug.

Keywords: *Lantana camara* Linn, physicochemical studies, preliminary phytochemical studies

INTRODUCTION

The plant *Lantana camara* Linn family *Verbenaceae* is available throughout central and south India in most dry stony hills and black soil. A large scrambling evergreen, strong smelling shrub with stout recurred prickles; leaves opposite, often rugose, scabrid on both sides; flowers small, normally orange but often white to dark red, in heads which are prominently capitates; bracts conspicuous and persistent. Fruits are small, 5 mm diameter, greenish-blue, blackish, drupaceous, shining with two nutlets almost throughout the year and dispersed by birds. Seeds germinate very easily. The chemical constitution for lantana camara is caryophyllene, 1-α-phellandrene, lantadene A, lantadene B, lancamarone quinine, lantanine. The plant is vulneary, diaphoretic, carminative, antispasmodic and tonic, wounds, ulcers, swelling, tumours and rheumatism[1].

EXPERIMENTAL

Collection and authentification of plant

The plant was collected from Kuppandapalayam, Tamilnadu, India in month of March 2009.The collected plant was identified at Botanical survey of India, Ministry of environment and forest, Government of India, Coimbatore.

Physiochemical screening

The air dried coarse powdered fruits of *lantana camara* Linn was subjected to the ash values (total ash, water soluble ash, acid insoluble ash, Sulphated ash), extractive values (water soluble extractive value, alcohol soluble extractive values) and also moisture content (loss on drying)[2-8].All the values were calculated and showed in the table no:1

Table 1: Physico chemical standards of powdered *Lantana camara* (Linn.) fruit

S.No	Parameters	% (w/w)
1	Total ash	1.59
2	Water soluble ash	0.48
3	Acid insoluble ash	2.1
4	Sulphated ash	10.3
5	Water soluble extractive	6.0
6	Alcohol soluble extractive	2.1
7	Loss on drying	11.3

Preliminary phytochemical screening

Extraction procedure

The fruit of *Lantana camara* Linn were dried under shade for 15 days and made into a coarse powder with mechanical grinder for further use. The fruits (900gm)was extracted with petroleum ether (60-80^{0}c) for deffating purpose in soxhlet apparatus and after complete extraction (3 to 4 hrs) the solvent was removed by distillation under reduced pressure and resulting liquid was dried using heating plate at 60^{0}c to get semisolid residue. After the extraction with petroleum ether the same plant material was dried and again extracted with chloroform, methanol and water by following same procedure[8]. All the four values of the plant *lantana camara* Linn fruits with different solvents were calculated and showed in the table no: 2

Table 2: Extraction values of different extracts of *Lantana camara* (Linn.) fruit

S.No	Extracts	Yield (gms.)	%Yield (w/w)
1	Petroleum ether	49.5	5.5
2	Chloroform	61.2	6.8
3	Methanol	130.5	14.5
4	aqueous	111.3	12.3

Qualitative phytochemical analysis

One gram of the petroleum ether, chloroform, methanol, and aqueous extracts of *lantana camara* Linn fruits were dissolved in 100 ml of its own mother solvents to obtain a stock of concentration 1% (v/v). The extracts thus obtained were subjected to preliminary phytochemical screening[2-3, 8-9]. The result obtained in the present investigation of petroleum ether, chloroform, methanol and aqueous extracts of the fruits of *lantana camara* Linn Showed in the table no: 3

TLC

The methanolic extract is referred to produce TLC because these extract only having more active constituents. The methanolic extract showed resolution of spot with following solvent system[10]

Ethyl acetate: methanol: water = (10:1.65:1.35)

The RF values were correspondingly calculated and showed in the table no: 4

Table: 3 Qualitative phytochemical analysis of extracts of *Lantana camara* (Linn.) fruit

Test of extract	Petroleum ether extract	Chloroform extract	Methanol extract	Aqueous extract
Carbohydrates	-	+	+	+
Proteins & amino acids	-	-	-	-
Glycosides	-	+	-	+
Alkaloids	-	-	-	-
Phytosteroids	+	-	+	-
Favonoids	+	+	+	+
Saponin	-	-	+	-
Tannins & phenolic comp.	-	-	+	-
Fixed oils & fats	+	-	+	-
Gums & mucilages	-	-	-	-

(+) = indicates presence, (-) = indicates absence,

Table 4: TLC analysis of methanolic extracts of *Lantana camara* (Linn.) Fruit

S.no	Extract	Solvent system	No of spot	Rf values
1.	Methanolic extract	Ethyl acetate: methanol: water (10:1.65:1.35)	1	0.47

HPTLC

The methanolic extract is further subjected to HPTLC for the conformation of the active constituents. The methanolic extract showed four resolutions of spot with the same solvent system. It is conformed to the Flavonoids is one of the active constituent for the plant of lantana camara Linn fruit[2]. The slide showed in figure no: 1 - 5. The RF values were correspondingly calculated and showed in the table no: 5

Table: 5 Peak table

Track	Peak	RF	Height	Area	Assigned substance
A	1	0.38	25.2	1425.1	Flavonoids 1
A	2	0.47	43.7	2994.5	Flavonoids 2
A	3	0.54	88.7	5044.3	Flavonoids 3
A	4	0.67	82.4	4889.5	Unknown *
A	5	0.79	88.2	4468.6	Flavonoids 4
B	1	0.29	139.7	16708.2	Rutin

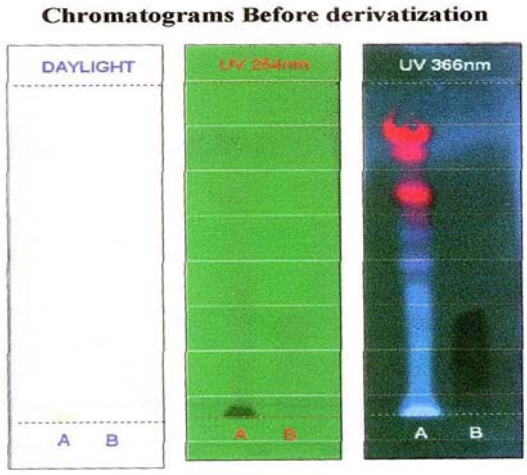


Fig.1: HPTLC analysis of methanolic extracts of *Lantana camara* (Linn.) Fruit

Fig. No. 2 Track A– Baseline display of Sample (Scanned at 366nm)

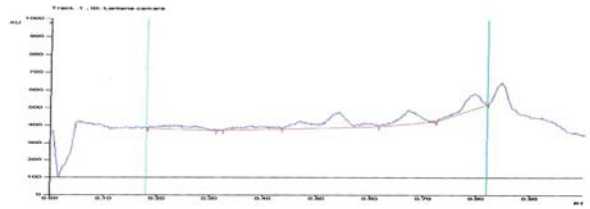


Fig.No. 4 - Track B– Baseline display of Reference (Scanned at 366nm)

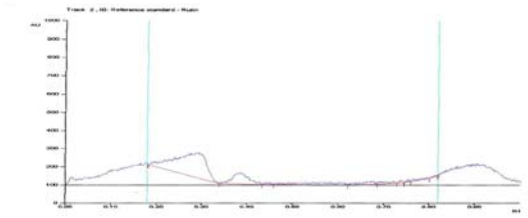


Fig. No. 3 -Track A– Peak densitogram display of Sample (Scanned at 366nm)

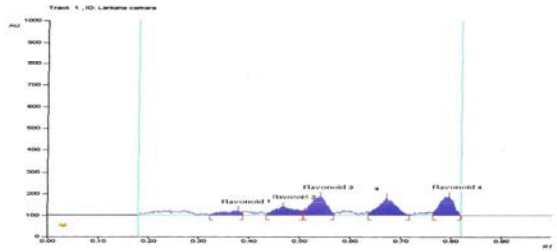
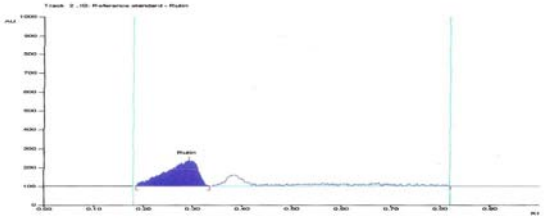


Fig. No. 5 - Track B– Peak densitogram display of Reference (Scanned at 366nm)



RESULTS AND DISCUSSION

The fruit of *Lantana camara* Linn was collected and analysed the various standardisation parameters. Physio chemical parameters of the fruit of *Lantana camara* Linn are tabulated in Table 1. Preliminary phytochemical screening was performed in the fruit of *Lantana camara* Linn.

The fruit are extracted with different solvents and the percentage yields are tabulated in the table no: 2. Quantitative phytochemical analysis is performed in the all extracts and the results showed the presence or absence of certain phytochemicals in the drug. Phytochemical test revealed the presence of carbohydrates, glycosides, phytosteroids, saponins, flavonoids, tannins & phenolic compound, fixed oils & fats and results are given in table 3. Thin layer chromatographic technique was used to separate the chemical compounds present in the drug. Various solvent systems were checked to separate the maximum number of chemical compounds in the drug. TLC of the methanol extract developed in the mobile phase of Ethyl acetate: methanol: water (10:1.65:1.35) and observed 1spots at Rf value 0.47. The methanolic extract is further subjected to HPTLC for the conformation of the active constituents. It is conformed to the Flavonoids is one of the active constituent for the plant of *lantana camara* Linn fruit for the same solvent system and observed 5 spot as compared with reference standard flavonoid (figure 1-5). The value is tabulated in the table no: 5.

CONCLUSION

Preliminary phytochemical as well as various aspects of the fruits sample were studied and described along with, physico chemical, TLC and HPTLC studies in authentification adulteration for quality control of raw drugs. The fruit of *Lantana camara* Linn exhibits a set of diagnostic characters, which will help to identify the drug in dried condition. It has been concluded from this study that estimation is highly essential for raw drugs or plant parts used for the preparation of compound formulation drugs. The periodic assessment is essential for quality assurance and safer use of herbal drugs.

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