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PHYTOCHEMICAL SCREENING OF LEAVES OF *JATROPHA CURCAS* PLANT

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ABSTRACT
The various extract of leaves *Jatropha curcas* Linn. belonging to the family Euphorbiaceae were investigated for its physicochemical and phytochemical screening. Ash value (total ash, acid insoluble ash and water soluble ash), extractive values, Loss on drying were studied dry weight. Ash content analysis was showed total ash, acid insoluble ash and water soluble ash [7.40 %, 4.42 % and 6.12 % respectively]. The moisture content was found to be 1.70 %. Preliminary phytochemical analysis test showed the presence of steroids, flavonoids, alkaloids, saponins, triterpenoids, tannins and carbohydrate.
KEYWORDS: *Jatropha* curcas, Euphorbiaceae, phytochemical screening and Physicochemical screening

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INTRODUCTION

Phytochemical studies have attracted the attention of plant scientist due to development of new and sophisticated techniques. These techniques played a significant role in giving the solution to systematic problems on the one hand and in the search for additional resources of raw material for pharmaceutical industry on the other hand. Plant synthesizes a wide variety of chemical compounds, which can be sorted by their chemical class, biosynthetic origin and functional groups into primary and secondary metabolites. With the development of natural product chemistry, the potential of chemotaxonomy is now becoming increasingly obvious. The application of chemical data to systematic has received serious attention of a large number of biochemists and botanists during the last three decades[1].

The leaves of *Jatropha curcas* Linn belonging to the family Euphorbiaceae is a large shrub, 3-4 m high, native of tropical America, occurring throughout India and In Andaman and Islands known as Jangalierandi in Hindi[2].

The leaves of *Jatropha curcas* Linn contain apigenin, vitexin and isovitexin. α-amyrin, stigmasterol, stigmastenes along with two new flavonoids founds in leaves and twigs[3]. Three Deoxypreussomerins, Palmarumycins CPI, JC1and JC2 have been isolated from stem of *Jatropha curcas* Linn.[4].

Leaves are galactagogue, rubefacient, suppurative, insecticidal and are used in foul ulcers and tumors. It is successful local remedy for scabies, eczema and ringworm[5].

Not much more data was fond on physicochemical and phytochemical analysis of leaves of *Jatropha curcas* Linn. Hence, in the present study, we have concentrated on physicochemical and phytochemical screening of various extracts of leaves *Jatropha curcas* Linn.

MATERIALS AND METHODS

Procurement of Plant material

The leaves of *Jatropha curcas* Linn. has been collected from the local area of Nandurbar (Maharashtra). This plant is authentifying by Dr. Santosh Tayade, Dept. of Botany, Art's, Science and Commerce College, Lonkheda, Shahada, Dist-Nandurbar (MS).

Preparation of extract

The authenticated material was dried under shade and powdered by the help of mechanical process. The coarse powder of leaves was subjected to successive hot continuous extraction with petroleum ether, alcohol and finally macerated with chloroform - water. Each time before extracting with next solvent the powdered material was air dried. After the effective extraction, the solvent was distilled off and the extract was concentrated under vacuum. The various concentrated extract was stored in air tight container for further studies[6].

Powder Microscopy

In present study the dried leaves of *Jatropha curcas* Linn. was pulverized into fine powder separately. The

powder was investigated for their microscopic characteristic. The pulverized powder of leaves was boiled separately with chloral hydrate solution in small quantity. Remove cleaved powder in three separate watch glass respectively and stain with one drop each of phloroglucinol and concentrated hydrochloric acid. Mount a little of the treated powder in dilute glycerine and observed the slide under microscope at low power. The characteristic structures observed for the powdered leaves of *Jatropha curcas* Linn. was tabulated in table no.1[7,8]

Physicochemical Analysis

The coarse powder of leaves *Jatropha curcas* Linn. was subjected to various physicochemical studies for determination of ash values like total ash, ash insoluble and water soluble ash values. Extractive values like water soluble, alcohol soluble and petroleum ether soluble extractive and also determine the fluorescence properties of plant[9,10].

Preliminary Phytochemical analysis

Qualitative screening of various extracts of *Jatropha curcas* Linn. leaves was performed for the identification of various classes of active chemical constituents like alkaloids, carbohydrates, glycosides, proteins, amino acids, steroids etc. using different methods Raman[11] and Wagner[12].

RESULTS AND DISCUSSION

The result of microscopic characteristic of leaves *Jatropha curcus* Linn. was tabulated in Table-1. It shows the microscopic characters like calcium oxalate crystal, vascular bundle, stone cells and mucilaginous matter. From Table 2, the result of extractive value shows water and alcohol have higher percentage of extract in comparison to other solvent like petroleum ether. The moisture content of the powdered drug was found to be 1.70 %. The results of preliminary phytochemical study were tabulated in Table-3. They show presence of steroids, flavonoids, alkaloids, saponins, triterpenoids, tannins and carbohydrate in the plant.

CONCLUSION

The Phytochemical study revealed the presence of steroids, flavonoids, alkaloids, saponins, triterpenoids, tannins and carbohydrate. The preliminary phytochemical tests are helpful in finding chemical constituents in the plant material that may lead to their quantitative estimation and also in locating the source of pharmacologically active chemical compound.

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Table 1: Microscopic Characteristic of Leaves of *Jatropha curcas* Linn.

Sr No.	Observations
1.	Calcium Oxalate
2.	Vascular bundles
3.	Stone cells
4.	Mucilaginous matter

Table 2: Physical Constants for leaves of *Jatropha curcas* Linn.

Sl. No.	Parameters	Observation
		Leaves
1.	**Physical Tests**	
	• **Color**	Greenish yellow
	• **Odour**	Characteristic
	• **Taste**	Tasteless
	• **Shape**	Long petioled, Orbicular and cordate
	• **Size**	10-15 cm in length
2.	**Ash Value (%w/w)**	
	• Total Ash	7.40%
	• Acid Insoluble Ash	4.42%
	• Water Soluble Ash	6.12%
3.	**Fluorescence Analysis**	
	• At 254 nm	No
	• At 366 nm	fluorescence
4.	**Loss on Drying (%w/w)**	1. 70%
5.	• **Extractive Values (% w/w)** • Water-soluble Extractive	16.1%
	• Alcohol soluble Extractive	10.8%
	• Pet ether soluble Extractive	3.2%

Table 3: Phytochemical Investigation of *Jatropha curcas* leaves extracts

Sl. No.	Name of the Test	Pet. ether extract	Alcoholic extract	Aqueous extract
1.	**Test for sterols**			
	a. Test solution + Sulphur (Sulphur powder test)	+	-	+
	b. Libermann Reaction	-	-	+
2.	**Test for glycosides**			
	a. Keller – Killiani Test	-	+	+
	b. Baljet's Test	-	-	-
	c. Legal test	-	-	-
	d. Raymond test	-	+	+
3.	**Test for saponins**			
	a. Haemolytic test	-	+	+
	b. Foam test	-	+	+
4.	**Tests for proteins**			
	a. Xanthoprotein test	-	-	-
	b. Millon's test	-	-	-
	c. Biuret test	-	-	-
	d. Ninhydrin test	-	-	+
5.	**Test for tannins**			
	a. Gelatin test	-	-	+
	b. Ferric chloride test	-	-	+
	c. Lead acetate test	-	-	+
	d. Dil HNO_3 test	-	-	+
6.	**Test for alkaloids**			
	a. Dragendroff's test	-	-	-

	b. Mayer's test	-	+	-
	c. Hager's test	-	+	-
	d. Wagner's test	-	-	-
7.	**Test for carbohydrates**			
	a. Barford's test	-	-	-
	b. Benedict's test	-	-	+
	c. Molisch's test	+	+	+
8.	**Test for Triterpenoids**			
	a. Libermann Burchardt's Test	-	-	+
	b. Salkowaski Test	+	-	+
9.	**Test for flavonoids**			
	a. Shinoda test	-	-	+
	b. Alkaline reagent test	-	-	+
	c. Lead acetate test	-	-	+
10.	**Test for Lipids**			
	a. Sudan III reagent	+	-	-
	b. Solubility test	+	-	-

Fig :-1 *Jatropha Curcas* **Leaves** and **Fruits**

Fig :-2 *Jatropha Curcas* **Plant**

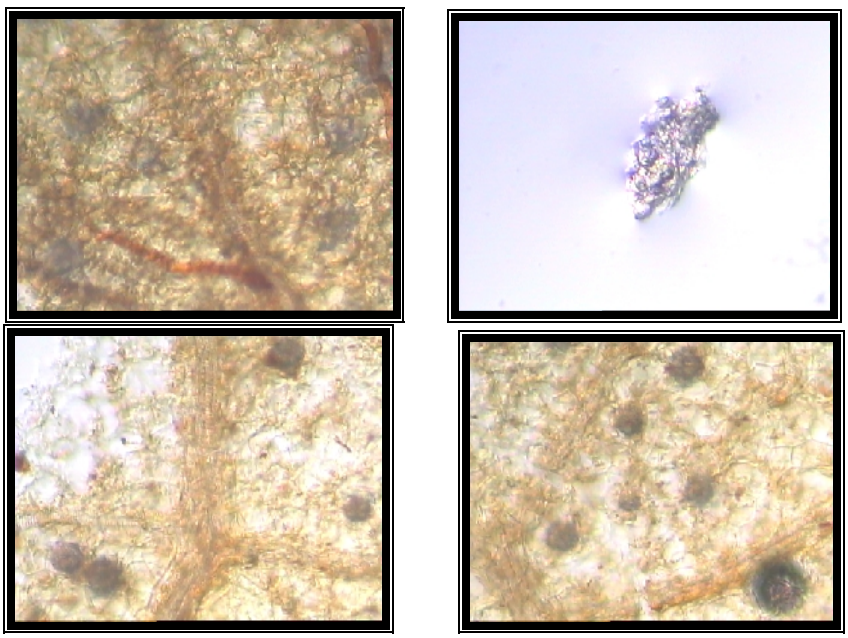

Fig. 3: Microscopic Characteristic of Leaves of *Jatropha curcas* Linn.

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