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Research Article

Physicochemical And Phytochemical Studies On *Jatropha Curcas* L.

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Abstract: *Jatropha curcas* is a species of the genus Jatropha, belonging to the family euphorbiaceae. The study includes preparation of different extracts by successive solvent extraction for detailed analysis. Qualitative phytochemical analysis of these plant confirm the presence of various phytochemicals compounds in their ethanolic extracts. Different physicochemical parameters such as total ash value, percentage of solubility were analyzed. Fluorescence analysis of *Jatropha curcas* powder samples were noted under UV light and normal ordinary light, which signifies there characteristics. The different colored amino acid molecule with different of values constituted by paper chrmatography.
Keywords: *Jatropha curcas*, Physicochemical, Fluorescence analysis and Paper Chromatography

INTRODUCTION

In India has a very long, safe and continuous usage of many herbal drugs in the officially recognized alternative systems of health viz. Ayurveda, Yoga, Unani, Siddha, Homeopathy and Naturopathy. These systems have rightfully existed side -by –side with allopathic and are not in the domain of obscurity' [1]. Million of Indians use herbal drugs regularly, as spices, home-remedies, health foods as well as over-the-counter(OTC) as self-medication or also as drugs prescribed in the non-allopathic systems. The more than 500,000 non-allopathic practitioners are trained in the medical colleges of their respective systems of health and are registered with the official councils which monitor professionalism. Hence, these systems are not folklore or traditional herbal practices. There are basic axioms of these systems leading to a logical and systematic structure of pathogenesis and diagnosis, which serves also as a determinant for therapy.

Medical plants have curative properties due to the presense of various complex chemical substances of different composition. Which are found as secondary plant metabolites in one or more plants [2].In plant products have been used as medicine since ages to treat a number of ailments. The last couple of decades have brought the plant based medicines back into the focus of research as well as value-added product development [3].

Jatropha curcas is a shrub of about 3 meters high. When matured its leaves are green in colour and its twig is very rich in latex. Its seed coats are green when immature and yellow when ripe. It is multi-purpose in nature, drought resistant and; formerly a native of South America, but nowadays, it thrives all through Africa and Asia . *Jatropha curcas* finds usefulness in reclaiming eroded areas because of its drought resistant nature. It is also used as boundary fence or live hedges in arid and semi-arid areas. Medicinally, it has been reported that the latex of *Jatropha curcas* contained jatrophine, which is used in the treatment of cough, skin diseases and rheumatism. The latex is also known to heal wound and possessed antimicrobial properties. Its roots are known to serve as an antidote for snake bike and the extract from its leaves has an external application for piles [4].

MATERIALS AND METHODS

Collection of plant materials

The major plant source for this study was *Jatropha curcas* L., commonly known as biodiesel plant. The plants were collected from Thanjavur. Collected plants were carefully examined and identified with the help of regional Floras [5].

Preparation of powder

The leaves of plants were collected and dried under shade. These dried materials were mechanically powdered and stored in an airtight container. These powdered materials were used for further physicochemical and Phytochemical and fluorescent analysis [6].

Preparation of extracts

Various extracts were prepared according to the methodology of Indian pharmacopoeia [7]. Petroleum ether, benzene, Chloroform, ethanol, aqueous extracts were subjected to physiochemical and Phytochemical studies.

Qualitative phytochemical analysis

Qualitative phytochemical analyses were done by using the procedures [8]. Alkaloids, carbohydrates,

tannins and phenols, flavonoids, gums and mucilages, phytosterol, proteins and amino acids, fixed oils, fats, volatile oil and saponins were qualitatively analysed. Amino acid was determined by using the method of chromatographic technique.

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, water soluble ash value. Extractive value and also fluorescence properties of the plant was determined [9].

Determination of Amino Acids by Chromatograpic Technique

5 g of fresh plant leaf material of the same size and age from 4th node from the apex in all the cultivars and types were crushed with 10ml of alcohol and hydrochloric acid mixture (99:1) in a glass mortar. 30ml of chloroform was added and a separating funnel and centrifuged to remove debris. The supernatant was used for spotting.

RESULTS AND DISCUSSION

The result of qualitative and qualitative analysis of *Jatropha curcas* extract have been presented and discussed here.

The plants yield higher amount of extract in water solvent than ethanol solvent. The results were presented in Table.1.

Extract behaviour of this plant exhibited various responses in colour consistency and odour. (Table.2)

Qualitative phytochemical screening of Carbohydrates, Alkaloids, steroids, Tannins and Phenols, Saponins, Fixed oils & Fats, Gums and Mucilage, Proteins, Flavonoids and Volatile oils from the aqueous and ethanolic extracts of *Jatropha curcas*. All the phytochemical compounds were higher in ethanolic extracts that aqueous extracts (Table.3).

The ash behaviour of *Jatropha curcas* has various values such as total content was 29%. Acid insoluble was higher (79%) than other solubility results (Table.4).

UV light fluorescence behaviour was vary from one solvent to antother solvent. The plant powder colour dark green was changed into light yellow colour in powder with 50% HNO3 and dark yellow in powder with NaOH in Water (Table.5) .

Normal light fluorescence behaviour was differ from the effect of different chemical reagents (Table.6)

Fresh leaves containing amino acids were screened through the paper chromatography, which consists of Glycine, Proline, Valine and Pheynylalanine (Table.7).

Table-1 The extractive values of *Jopha curcas L*. Leaves.

S.No	Name of the material	Yielding percentage of solvent (w/w)%	
		Aqueous Extract	Ethanol Extract
1.	Plant material	6.3	5.8

Table.2: Behaviour of various solvent extracts of *Jatropha curcas* L. leaves.

S.No.	Name of the Sample	Solvent	Behaviour of the Extract		
			Colour	Consistency	Odour
1	Leaf	Aqueous	Brown	Watery	Leafy
		Ethanol	Green	Pasty	Foul

Table:3: Qualitative phytochemical screening of *Jatropha curcas*

S.No	Name of the compound	Status of the substances	
		Aqueous Extract	Ethanolic Extract
1.	Carbohydrates	+	+
2.	Alkaloids	-	+
3.	Steroids	+	+
4	Tannins and phenols	-	+
5	Saponis	+	+
6	Fixed oils & Fats	+	+
7	Gums & Mucliage	+	+
8	Proteins	+	+
9	Flavonoids	+	+
10	Volatile Oils	+	-

+ indiacates presence whereas – indicates absence

Table.4Analytical ash values of *Jatropha curcas* L.

S.No	Parameters	Percentage Values of plant
1	Total ash value	29%
2	Acid insoluble ash value	21%
3	Acid soluble value	79%
4	Solubility % in alcohol	42%
5	Solubility % in water	28%

Table-5 Fluorescence behaviour of powder samples of *Jatropha curcas*

S.No	Powder with chemical substances	colour
1	Powder as such	Dark green
2	Powder + 50% HNO3	Light yellow
3.	Powder + IN HCL	Pale green
4.	Powder + In Na OH in water	Dark yellow
5.	Powder + in NaOH in Alcohol	Dark Green

Table.6: Behaviour of *Jatropha curcas* L. powdered samples treatment with different chemical reagents

S.No	Powder with chemical substances	colour
1	Powder + Conc. H_2SO_4	Black
2	Powder + Conc. HC1	Greenish black
3	Powder + Conc. HNO3	Light yellow
4	Powder + Acetic Acid	Light green
5	Powder + 10 NaoH	Light green
6	Powder + in HCI	Greenish black
7	Powder + Iodine solution	Light yellow
8	Powder + Ferric chloride solution	Reddish black

Table-7: Amino acids profiles of *Jatropha curcas* L.by using Paper chromatography

S.No	Name of the Amino acids	RF Values
1.	Glycine	0.170
2.	Proline	0.30
3.	Valine	0.36
4.	Phynylalanine	0.59

Jatropha curcas L. contains different secondary metabolites (phytochemicals) with biological activity that can be of medicinal values. The qualitative phytochemical analysis of the leaves extracts indicates the presence of saponins, terpenoids and alkaloids in small concentration; the presence of alkaloids in moderately high concentration; the presence of steroids in very high concentration; while tannins and phenols are absent. Saponins are known to produce inhibitory effect on inflammation. They also have the property of precipitating and coagulating red blood cells. Other characteristics of saponins include formation of foams in aqueous solutions, hemolytic activity, cholesterol binding properties and bitterness [10, 11]. Steroids have been reported to have antibacterial properties and they are very important compounds especially due to their relationship with compounds such as sex hormones [12]. Alkaloids have been associated with medicinal uses for centuries and one of their common biological properties is their cytotoxicity [13]. Thus, based on the detected phytochemicals, *Jatropha curcas* L. may has various medicinal values.

CONCLUSION

The present studies revealed that these leaves may lend credence to its use for therapeutic potentials claimed by traditional medicine practitioners which includes anti inflammatory, anti pyretic and analgesic activityt. As a result, several types of drugs could be produced from these plants as antidote and antibiotic drugs. The biotic agents contents in the leaves show medicinal values to man and edible as fodder to piggery.

REFERENCES

1. Venkat subramanian K, Steva Thomas P, Ganapaty S; Pharmacognostical Studies on leaves of *Atlantia monophylla*. Indian Journal of nature products, 2002; 18(1) : 27-29.

2. Prajapati ND, Purohit SS, Sharma A, Kumar T; A handbook of medicinal plants.1st edn. . Medicinal plants-Helicteres isora; 2003; 18: 302.
3. Alagesaboopathi C, Balu S; Antifungal activity of some species of Andrographis Wallich Ex Nees on Helminthosporium oryzae Breda dehaan. J.. Econ. Tax.. Bot., 2000; 24: 705-707.
4. Joshi SG; Medicinal plants, Oxford and IBH publications. New Delhi, 2004; 184.
5. Henry AN , Kumari GR , Chithra V; Flora of Tamil Nadu, India. Vol II. 1987. 205-206.
6. Harborne JB; Photochemical methods; Chapman and Hall; London;1973; 1-32.
7. Anonymous "Pharmacopoeia of India" II edn. Govt. of India Press, Nasik, India.1966; 947
8. Kokate CK, Khandelwal KR, Powar AP, Gohale SB; Practical Paramacognosy 3nd edition, Nirali prakashan, Pune.1995; 137-139.
9. Ayurvedic pharmacopoeia of India. Edn,I, Vol.III. Indian system of Medicine and Homeopathy. Govt of India Ministry of Health and Family welfare, The controller of publiction civil lines, Delhi, 2001: 234
10. Sodipo OA, Akiniyi JA, Ogunbamosu JU; Studies on certain characteristics of extracts from bark of Panninystalia macroceras (K Schum) Pierre Exbelille. Global J. Pure Applied Sci., 2000;6: 83-87.
11. Okwu DE; Phytochemicals and Vitamin Content of Indigenous Spices of South Eastern Nigeria, J. Sust. Agric. Env., 2004; 6: 30-34.
12. Okwu DE; Evaluation of the chemical composition of medicinal plants belonging to. Euphorbiaceae in Pakistan Vet. J., 2001; 14: 160-162.
13. 13.Nobori T, Miurak K, Wu DJ, Takabayashik LA, Carson DA; Deletions of the cyclin-dependent kinase-4 inhibitor gene in multiple human cancers. Nature, 1994; 46: 753-756.