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PHARMACOGNOSTIC STUDIES OF THE *JATROPHA CURCAS* LEAVES

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ABSTRACT: The *J. curcas* is considered as a biofuel plant, but the leaves are traditionally used as an anti-inflammatory and anticoagulant. In present investigation, the detailed pharmacognostic study of J. curcas leaf is carried out to lay down the standards which could be useful in future experimental studies. The study includes macroscopy, microscopy, preliminary phytochemical screening and physicochemical evaluation.
Key words: *Jatropha curcus,* Pharmacognosy, Microscopy.

INTRODUCTION

After decades of serious obsession with the modern medicinal system, people have started looking at the ancient healing systems like Ayurveda, Siddha and Unnani. This is because of the adverse effects associated with synthetic drugs. Herbal drugs play an important role in health care programs especially in developing countries. Ancient Indian literature incorporates a remarkably broad definition of medicinal plants and considers 'all 'plant parts to be potential sources of medicinal substances [1]. However a key obstacle, which has hindered the acceptance of the alternative medicines in the developed countries, is the lack of documentation and stringent quality control. There is a need for documentation of research work carried out on traditional medicines [2]. With this backdrop, it becomes extremely important to make an effort towards standardization of the plant material to be used as medicine. The process of standardization can be achieved by stepwise pharmacognostic studies [3].

These studies help in identification and authentication of the plant material. Correct identification and quality assurance of the starting materials is an essential prerequisite to ensure reproducible quality of herbal medicine which will contribute to its safety and efficacy. Simple pharmacognostic techniques used in standardization of plant material include its morphological, anatomical and biochemical characteristics [4].

Jatropha curcas linn. (JCL) belongs to the family *Euphorbiaceae* and is thus closely related to other important cultivated plants like rubber tree and caster etc. This is interesting because it has certain virtues in common with them, which can be of significance for prophylactic plant protection. The botanist Carl Von Linne first classified the plants in 1753, he gave it the botanical name "*Jatropha curcas*" from the Greek word "Jatros" meaning a "Doctor" and "trophe" meaning "nutrition". Even Linne had realised the potential of this plant for medicinal purposes. In India, *Jatropha curcas* is found in almost all the states and is generally grown as a live fence for protection of agricultural fields from damage by livestock as it is not eaten by cattle.

Preparations of all parts of the plant, including seeds, leaves and bark, fresh or as a decoction, are used in traditional medicine and for veterinary purposes. The oil has a strong purgative action and is also widely used for skin diseases and to soothe pain such as that caused by rheumatism. A decoction of leaves is used against cough and as an antiseptic after birth. Branches are used as a chewing stick in Nigeria [5].

MATERIALS AND METHODS

Fresh mature leaves were collected from fully-grown plant from fields near the outskirts of Bardoli city. The sample was authenticated for its botanical identity by Botanist, and voucher specimen deposited in herbarium of the institute. After collection the fresh leaves of the plant were preserved in F.A.A solution. Dried leaves were made into powder. An exhaustive Pharmacognosy was carried out using standard methodology [1-3, 6-18]

OBSERVATIONS

Macroscopy of leaf:

Size : 10-15 cm. x 7.5-12.5 cm.
Shape : broadly ovate
Margin : cordate
Venation : Palmate
Apex : Acute
Surface : glabrous
Colour : Dark green adaxially, light green abaxially
Taste : Characteristic, bitter
Odour : None

MICROSCOPY

Transverse section of leaf through midrib, epidermis in surface view, lamina in surface view and lamina in transverse view show following characteristic.

- Leaf is having single layer of epidermis on both the surface. Upper epidermis is covered by thin cuticle. Both the epidermis show anomocytic stomata. Simple covering trichomes are very rare on both epidermises.
- Transverse view of lamina shows single layer of closely pack palisade cells below upper epidermis.
- Midrib show 5-7 layered thick wall closely pack collenchyma on both surface. Spongy mesophyl and vascular bundle

RESULT AND DISCUSSION

The pharmacognostic standards for the leaves of *J.curcas* are laid down for the first time in this study. Morphological and anatomical studies of the leaf will enable to identify the crude drug. The information obtained from preliminary phytochemical screening will be useful in finding out the genuity of the drug. Ash values, extractive values can be used as reliable aid for detecting adulteration. These simple but reliable standards will be useful to a lay person in using the drug as a home remedy. Also the manufacturers can utilize them for identification and selection of the raw material for drug production.

Table No 1 Physico-chemical parameters of *J. curcus* leaves

Sr. No.	Parameters	Leaves
1.	Total ash value	1.71 % w/w
2.	Acid insoluble ash	0.29 % w/w
3.	Water soluble ash	0.03 % w/w
4.	Moisture content	7.8 % w/w
5.	Water soluble extractive	20.76 % w/w
6.	Alcohol soluble extractive	36.89 % w/w
7.	P. ether soluble extractive	0.15 % w/w

Table No 2. Phytochemical screening of of *J. curcus* leaves.

Sr. No.	Tests for phytoconstituents	Leaves
1.	Alkaloids	+ve
2.	Flavonoids	+ve
3.	Glycoside	-ve
4.	Saponins	+ve
5.	Tannins & Phenolic comp.	+ve
6.	Steroids & Terpenoids	+ve
7.	Carbohydrates	+ve
8.	Protein & Amino acid.	-ve

+ve = Present, -ve = Absent

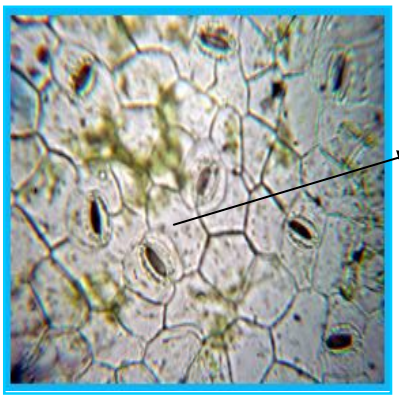

Fig: 1. Epiderims in surface view (45 x)

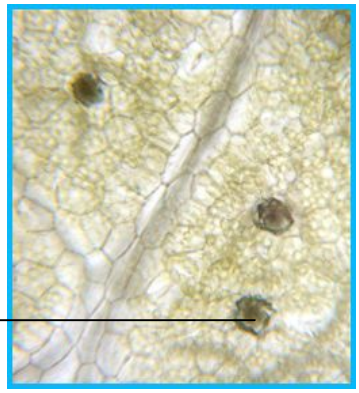

Fig: 2. Lamina in surface view

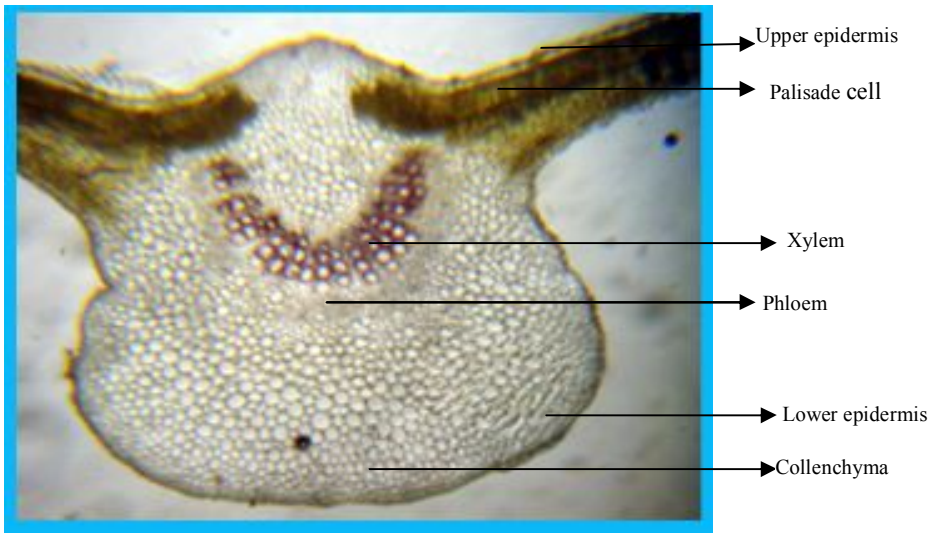

Fig: 3. T. S of Leaf through Midrib (10 x)

REFERENCES

1. Shankar, D. and Ved, D.K.: Indian Forester, 129: 275-288 (2003).
2. Dahanukar, S. A., Kulkarni, R. A. and Rege, N. N.: Ind. J Pharmacol, 32: 81-118 (2000).
3. Ozarkar, K. R.: Studies on anti-inflammatory effects of two herbs *Cissus quadrangularis* Linn. and *Valeriana wallichi* DC using mouse model. Ph.D. Thesis, University of Mumbai, Mumbai (2005).
4. Anonymous: Macroscopic and microscopic Examination: Quality Control Methods for Medicinal Plant Materials, WHO, Geneva (1998).
5. Isawumi, M.A. 1978. Nigerian chewing sticks. The Nigerian Field 43(3):111-121.
6. Johanson, D.A.O. ;Plant Microtechnique, Mc. Grew Hill Book Co., New York, (1940).
7. Anonymous, The Ayurvedic Pharmacopoeia of India, Government of India, Ministery of Health & Family Welfare, Published by The Controller of Publications, Civil Lines, New Delhi, Vol.I (2001).
8. Brain, K.R. and Turner, T.D., Practical evaluation of Phytopharmaceuticals, Wright Scientechnica, Bristol (1975).
9. Chase, C.R. (Jr.) and Pratt, R.: J Am Pharm Ass (Sci.Ed.) 38:324-331 (1949).
10. Karnick, C.R. Pharmacopoeial standards of herbal plants, Sri Saguru publication, 1994, 2,124.
11. Khandelwal, K.R., Practical Pharmacognosy, Nirali Prakashan, 5th ed. (1998).
12. Khedkar, P.V., Pharmacognostic studies in some marketed crude drugs, A thesis submitted to University of Mumbai for the degree of M.Sc. (2000).
13. Kokate, C.K., Practical Pharmacognosy, Vallabh Prakashan, Delhi (1999).
14. Kokate, C.K., Purohit, A.P. and Gokhale, S.B., Pharmacognosy, Nirali Prakashan, XII ed.(1999).
15. Kokoski, C.J., Kokoski, R.J. and Salma, F.J.: J Am Pharm Ass (Sci.Ed.) 10:715-717(1958).
16. Merina, B., Natural Product Radiance, 3: 349-350 (2004).

17. Nandhakumar, J., Nandhakumar J, Sethumathi, P. P., Malini A., Sengottuvelu, S., Duraisamy, R., Karthikeyan, D., Sivakumar, T.,: J Health Sci, 53:655-663 (2007).
18. Wallis, T.E., Practical Pharmacognosy, J. & A. Churchill Ltd., London, (Vth Ed.), (1984).

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