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PHARMACOGNOSTIC STUDY OF SOME MEDICINAL PLANTS USED IN GHOTI TRIBAL REGION OF NASHIK DISTRICT

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ABSTRACT: World Health Organization appreciated the importance of medicinal plants for public health care in developing nations. The tribal region of Ghoti Taluka-Igatpuri, district-Nashik has various medicinal plant species to cure the ailments. This medicinal plant species are found in the Kokani region of Ghoti and Igatpuri. The pharmacognostic study of these medicinal plants used in ghoti tribal region can help to discover new drugs to cure various ailments provided the data given is scientifically evaluated. The present study highlights the pharmacognostical as well as phytochemical studies including parameters such as macroscopic, microscopic characters, physical evaluation and preliminary phytochemical studies of some medicinal plants used in Ghoti region of Nashik district. These observations will help in the pharmacognostical identification and standardization of the drug in the crude form and also distinguish the drug from its adulteration.

INTRODUCTION: The Ghoti region, a North Western Ghats of Nashik district of the state of Maharashtra lies between North latitude 21.150 and 21.450 and East longitude 76.570 and 77.300. Medicinal plants and derived medicine are widely used in traditional cultures all over the world, and they are becoming increasingly popular in modern society as natural alternatives to synthetic chemicals¹. The pharmacognostic study was undertaken to intend to find out the medicinal plants used by the tribal people of Ghoti region to cure various ailments.

The World Health Organization estimates that about 80% of the world's population relies mainly on herbal medicine for primary health care². The history of herbal medicine of India is very old and is practiced from ancient times. Traditionally, this treasure of knowledge passed orally from generation to generation without any written document and is still retained by various indigenous people of the world. 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 substances³. 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

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carried out on traditional medicines⁴. Thus, the present study aims at documenting plants and pharmacognostical identification of some medicinal plants such as *Jatropha curcas* (Parsi Erand), *Tagetes erecta* (Zendu), *Erythrina indica* (Pangara). These medicinal plants are used by the Tribal People as a homemade local remedy to cure their various ailments, but we are documenting these plants by doing pharmacognostic standardization. The medicinal use, macroscopy, microscopy, physico-chemical parameters, and phytochemical screening are discussed below.

MATERIALS AND METHODS:

Plant Collection and Identification: Plant samples of the 3 species were collected from their type localities in October 2013. The plants were identified & authenticated by Dr. Wankhade Rajesh T., Associate Professor, Department of Pharmacognosy (Dravyaguna), S.M.B.T Ayurved College, Nashik. A voucher specimen of the plant material has been deposited at Institute level (HNSIPER/Herb-01, 02 and 03). The collecting localities of the species were Dhamangaon (MS) and Ghoti (MS), India.

Plant Material: The powder of aerial part (leaves) of *Jatropha curcas*, *Tagetes erecta*, *Erythrina indica* was prepared by passing through sieve no. 44, and kept in zip pack polytene bags for further use. The proper precautions were taken while storing the powder drug.

Chemicals and Instruments: Compound microscope, simple microscope, glass slides, cover slips, watch glass and other common glassware were the basic apparatus and instruments used for the study. Photomicroscope (Olympus Pvt. Ltd., New Delhi; Model- CH20iBIMF) provided Magn US camera was used. Solvents *viz.* petroleum ether, water, ethanol and reagents *viz.* phloroglucinol, HCl were procured from Loba Chemicals, Mumbai, India.

Macroscopical Examinations: For morphological observations, fresh young leaves were used. The macro- morphological features of the plant parts were observed under a magnifying lens and simple microscope⁵.

Microscopical Examinations: Fresh leaves of the 3 species were studied by taking transverse

sections. The different parts of the leaf-like lamina and midrib were studied according to the methods of Brain and Turner⁶. For the microscopical studies, cross sections were prepared and stained with phloroglucinol, HCl as per the procedure of K. R. Khandelwal⁷. The different lens of photomicroscope as, OLYMPUS iNEA 5X, 10X/0.2; India, and 100X/1.25 oil India were used for capturing the photographs.

Quantitative Evaluations of the Crude Drug:

Moisture content of the powdered determined based on the loss of drying method⁸. The ash values (Total ash, acid-insoluble ash, and water-soluble ash) were determined, to find out about the physiological state and level of extraneous matter.

Extractive values (Ether, alcohol, and water) were determined according to the official methods prescribed in Ayurvedic Pharmacopoeia⁹. The successive extractive values carry out as per the procedure cited by Dr. C. K. Kokate¹⁰.

Preliminary Phytochemical Investigation: The chemical investigation was carried out using standard procedures¹¹. The chemical test for alkaloids, flavonoids, glycosides, saponins, tannins & phenolic compounds, steroids and terpenoids, carbohydrates, protein & amino acid were determined according to the official methods prescribed in Ayurvedic Pharmacopoeia¹².

RESULTS AND DISCUSSION: The comparative study of pharmacognostic standards for the leaves of *Jatropha curcas*, *Tagetes erecta*, *Erythrina suberosa* were carried out according to the official methods prescribed in Ayurvedic Pharmacopoeia¹². We come to know about the medicinal use of these plants by communicating and discussing with the local tribal people of Ghoti region¹⁶ **Table 1**.

Morphological and anatomical studies of the leaves will enable to identify the crude drug. Ash values, extractive values can be used as reliable aid for detecting adulteration. The information obtained from the preliminary phytochemical screening will be useful in finding out the genuity of the drug.

Also, the manufacturers can utilize them for identification and selection of the raw material for drug production. This study is intended to establish medicinal use, macroscopical, microscopical,

quantitative evaluation and aerial part of the plant to be used as diagnostic features in the identification, evaluation and monograph preparation of the individual plant^{13, 14, 15}.

TABLE 1: MEDICINAL PLANTS USED IN THIS REGION¹⁶⁻¹⁸

S. no.	Botanical Name/ Family	Local Name	Parts Used	Medicinal Uses	Mode of Preparation
1.	<i>Jatropha curcas</i> Linn. Euphorbiaceae	Parsi Erand	Latex	Mouth ulcer	The latex of plant is applied externally
2.	<i>Tagetes erecta</i> Linn. Asteraceae	Zendu	Flower, Leaves	Fever, Chronic ulcer	An infusion of the freshly-gathered flowers. The infusion of 1 ounce to a pint of boiling water is given internally, in doses of a tablespoonful, and externally as a local application
3.	<i>Erythrina indica</i> Linn. Papilionaceae	Pangaea	Leaf	A toothache	Leaf juice along with water is used to gargle

Macroscopic Examination: The macro-morphological characteristics of the leaves of *Jatropha curcas*, *Tagetes erecta*, *Erythrina suberosa* and is discussed in **Table 2**.

TABLE 2: MACROSCOPY OF JATROPHA CURCAS, TAGETES ERECTA, ERYTHRINA INDICA

	<i>J. curcas</i>	<i>T. erecta</i>	<i>E. indica</i>
Colour	Greenish yellow	Light green	Light-dark green
Odor	Characteristic	Aromatic	Aromatic
Taste	Bitter	Characteristic	Characteristic
Size	10-15 cm × 7.5-12.5 cm	2-3 cm × 0.2-0.5 cm	10-20 cm × 8-18 cm
Shape	Broadly ovate	Lanceolate	Ovate
Margin	Cordate	Entire	Entire
Apex	Acute	Acute	Acute

Microscopic Examination:

Trans-sections of Leaves: They are a dorsiventral (bifacial) leaf. Following tissues are present in lamina and midrib; such as upper epidermis, palisade cell, xylem, phloem, lower epidermis, collenchyma and covering trichomes. This is described in **Fig. 1**.

Quantitative Evaluations of the Crude Drugs:

The moisture content seems to be lower than necessary to support the growth of microbes to

bring any change in the composition of the drugs. Physical constant such as ash value of the drug gives an idea of the earthy matter or the inorganic composition and other impurities present along with the drug.

Extractive values are useful for the determination of exhausted or adulterated drugs. The results of the quantitative evaluations of the drug powders are given in **Table 3**.

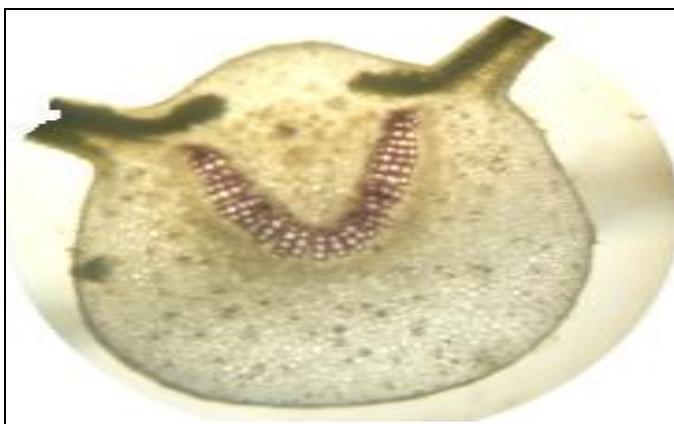
**FIG. 1A: MORPHOLOGY AND MICROSCOPY OF JATROPHA CURCAS**

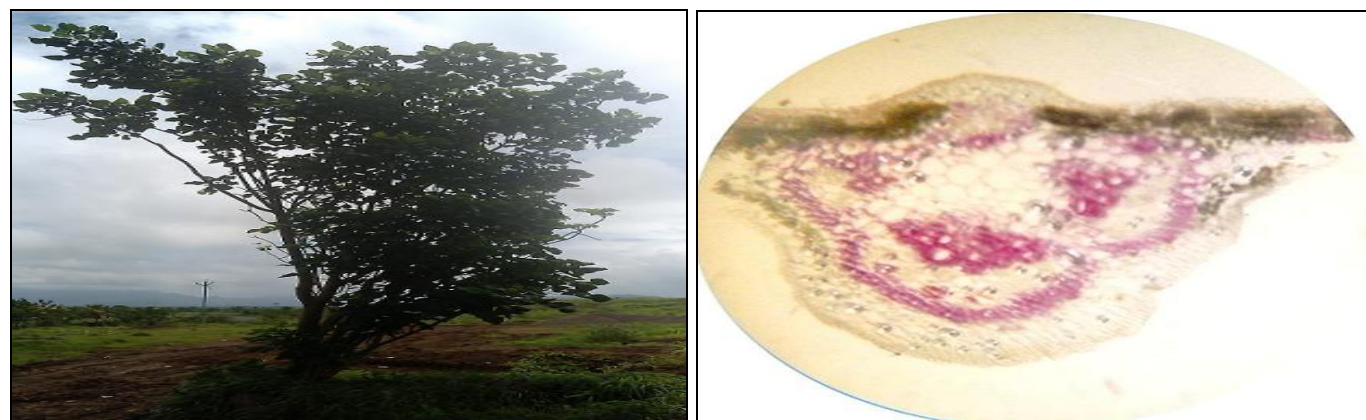
FIG. 1B: MORPHOLOGY AND MICROSCOPY OF *TAGETES ERECTA*FIG. 1C: MORPHOLOGY AND MICROSCOPY OF *ERYTHRINA INDICA*

TABLE 3: PHYSICO-CHEMICAL PARAMETERS

S. no.	Parameters (% w/w)	<i>J. curcus</i> leaves	<i>T. erecta</i> leaves	<i>E. indicam</i> leaves
1.	Total ash value	15 %	7 %	8.5 %
2.	Acid insoluble ash	2 %	1 %	1.8 %
3.	Water soluble ash	4.5 %	2.5 %	3.5 %
4.	Loss on drying	7 %	1.2 %	9 %
5.	Water soluble extractive	23 %	21 %	25 %
6.	Alcohol soluble extractive	28 %	31 %	28 %
7.	P. ether soluble extractive	1.9 %	2 %	1 %

Preliminary Phytochemical Investigation:

Revealed the presence of primary and secondary metabolites as alkaloids, flavonoids, glycosides,

saponins, tannins & phenolic compounds, steroids & terpenoids, carbohydrates, protein & amino acid

Table 4.

TABLE 4: PHYTOCHEMICAL SCREENING

Phytoconstituents	Leaves								
	<i>J. curcus</i>			<i>T. erecta</i>			<i>E. indica</i>		
	W	E	P.E	W	E	P.E	W	E	P.E
Alkaloids	+	+	-	+	+	+	+	-	+
Flavonoids	+	-	-	+	-	+	+	+	+
Glycoside	-	-	-	-	-	-	+	-	+
Saponins	+	+	-	+	-	-	-	-	-
Tannins & Phenolic comp.	+	-	-	+	+	+	+	+	+
Steroids & Terpenoids	+	-	+	+	-	+	+	+	+
Carbohydrates	+	+	+	+	+	+	+	+	-
Protein & Amino acid	-	-	-	-	-	-	-	-	-

CONCLUSION: The Tribal People of Ghoti Region use this Medicinal Plants to cure their various ailments. We are putting their Traditional Knowledge in front of the global world. The pharmacognostical Standards are detected and are an essential measure for correct identity, quality and purity of the crude drug, it can also prevent Adulteration. These simple but reliable standards will be useful to a layperson in using the drug as a home remedy. This study will help to discover new crude drugs for various emerging diseases to Serve Public Health Care.

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CONFLICT OF INTEREST: Nil

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