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PHARMACOGNOSTIC AND PRELIMINARY PHYTOCHEMICAL SCREENING OF LEAVES OF *CYNODON DACTYLON* PERSOON

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ABSTRACT: Many plants used as traditional medicine. Pharmacognostic studies of crude drug play a very important role in the identification of the purity and quality of crude drugs. The present study deals with the pharmacognostic, preliminary phytochemical investigation of *Cynodon dactylon* Persoon belonging to family Poaceae. In this, pharmacognostic studies are concerned for the determination of physicochemical parameters like ash values, extractive values, and loss on drying fluorescence analysis also the macroscopic and microscopic evaluation carried out. .The leaves were subjected to successive soxhlation using petroleum ether, ethyl acetate, alcohol, and water. The extracts thus obtained were studied for preliminary phytochemical investigation for detection of the presence of various chemical constituents like alkaloids, glycosides, steroids, tannins, saponins, fats and oils, flavonoids, *etc*.

INTRODUCTION: A Medicinal plant is defined as any substance with one or more of its organ containing properties that can be used for therapeutic purposes or which can be used as precursors for the synthesis of various drugs [1]. *Cynodon dactylon* belonging to family Poaceae is elegant perennial grass grows everywhere in India. The various vernacular names of the plant areas Sanskrit- Doorva. Hindi- Doorva, Maharashtra- Doorva. Cynodon dactylon possess various uses like fresh juice of the plant is demulcent, astringent and diuretic [2]. The juice of the plant is astringent and is applied externally to fresh cuts and wounds.

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It is also useful in the treatment of catarrhal ophthalmic, dropsy, hysteria, epilepsy, insanity, chronic diarrhea, and dysentery. The plant is a folk remedy for anasarca, calculus, cancer, carbuncles, cough, hypertension, snakebites, stones, gout, fever, skin diseases and rheumatic infections [3, 4, 5].

MATERIAL AND METHOD:

Collection and Identification of Plant Material: In the present study, the leaves of Cynodon dactylon, Persoon (Family-Poaceae), was collected from the local areas of Jalgaon district. The plants were authenticated from Agharkar Research Institute (ARI) Pune. (An autonomous, grant-in-aid research institute of the Department of Science and Technology (DST), Government of India).

Soon after authentication, all the crude drugs were dried at room temperature until they freed from moisture and subjected to physical evaluation with different parameters.

Macroscopic: The macroscopic characters such as size, shape, margin, nature, texture, apex, surface, color, odor, taste were studied for morphological investigation [6]. The results are reported in **Table 1.**

Microscopic: For microscopy, freehand section leaf was cut and stained according to the prescribed method [7].

Physicochemical Evaluation: The extractive values, ash values, and loss on drying [8], fluorescence analysis [9] were performed according to the official methods. The results are reported in **Table 2** and **3**.

Preparation of Extracts: In the present study, the crude drugs were carefully selected and shade dried. The dried material was reduced to coarse powder in a mechanical grinder and passed through a Sieve No.40 to obtain a powder of desired particle size.

About 200 gm of powdered material was subjected to exhaustive extraction successively with petroleum ether, ethyl acetate, and ethanol at a temperature of 45º - 50 ºC to about 40 cycles per batch for 8 batches. The extraction was continued until the solvent in the thimble became clear then few drops of solvent were collected in a test tube during the completion of the cycle (during siphoning), and chemical test of that solvent was performed. Extraction was completed only when a chemical test shows negative results. Finally, the drug was be macerated with chloroform water. After each extraction, the solvent was distilled off rotary evaporator, and the extract was concentrated at low temperature. These extracts were used for phytochemical investigation.

Phytochemical Screening: The preliminary phytochemical screenings of extracts were carried out as per standard procedures [10-16]. The results are reported in **Table 3**

RESULT AND DISCUSSION: The first step towards ensuring the quality of starting material is authentication. Thus, in recent years there has been a rapid increase in the standardization of selected medicinal plants of potential therapeutic significance. Despite the modern techniques, identification of plant drugs by pharmacognostic studies is more reliable. The standardization of crude drugs is important before any work carried out. The morphology, microscopy, physico-chemical tests are the first step towards establishing the identity and the degree of purity of such materials and should be carried out before any tests are undertaken. The result of this study as follows:

Microscopic Characters of Leaf: Lamina shows epidermis having irregularly cutinized outer wall, bulliform cells present on the dorsal side which are grouped and lie at the bottom of a well-defined groove in between the veins; these are thinly walled and lack chlorophyll, extend deep into the mesophyll; mesophyll not differentiated into palisade and spongy parenchyma; row of collateral vascular bundles; bundle sheath single, and consists of thin-walled more or less isodiametric parenchyma cells containing chloroplast; mesophyll tissue broken by 1 or 2 thin-walled colorless cells which extend from bundle sheath to the thin-walled parenchymatous band of stereome near upper and lower epidermis. Paracytic stomata are present on the epidermis.

TABLE 1: MACROSCOPIC CHARACTERS OF *CYNODON DACTYLON* LINN. LEAF

S. no.	Parameters Physical Tests	Observation
I	Shape	Flat or sometimes folded or convoluted, tapering towards the apex
II	Size	The leaves are variable in size, from 2.5-20 cm long, 0.5-1 cm broad
III	Colour	Green
IV	Odor	Characteristic
V	Taste	Characteristic

TABLE 2: PHYSICOCHEMICAL ANALYSIS OF *CYNODON DACTYLON* LINN. LEAVES

S. no.	Parameters	*Achyranthes aspera*
I	Physical tests	
	Nature	Coarse powder
	Colour	Green
	Odor	Characteristic
	Taste	Characteristic
II	Extractive value	
	Pet. ether	3.2% w/w
	Ethyl acetate	2.25% w/w
	Alcohol	2.79% w/w
	Aqueous	7.2% w/w
III	Loss on drying	7.21% w/w
IV	Ash values	
	Total ash	6.40% w/w
	Acid-insoluble ash	3.80% w/w
	Water soluble ash	5.70% w/w

TABLE 3: POWDER ANALYSIS OF *CYNODON DACTYLON* WITH DIFFERENT CHEMICAL REAGENTS

S. no.	Reagent	UV (254nm) Fluorescence	UV (366nm) Fluorescence
1	Powder as such	Green	Light Brown
2	Powder + 1 N NaOH	Green	Blackish
3	Powder + 50% HCL	Green	Green
4	Powder + 50% H_2SO_4	Blackish Green	Dark Black
5	Powder + 50% HNO_3	Dark Green	Blackish
6	Powder + Iodine solution	Green	Black
7	Powder + 5% $FeCl_3$	Yellowish Green	Blackish Green

TABLE 4: PRELIMINARY PHYTOCHEMICAL INVESTIGATION OF *CYNODON DACTYLON* LEAVES

S. no.	Chemical Tests	PE	ETA	ALC	AQ
1	Tests for Carbohydrates				
	Molish's test (General test)	+	-	+	+
	Tests for reducing sugars				
	Fehling's test	+	-	+	+
	Benedicts test	+	-	+	+
	Test for Monosaccharides				
	Barfoeds test	+	-	-	+
	Test for Pentose sugars	-	-	-	-
	Tests for Hexose sugars				
	Tollen's phloroglucinol test for galactose	-	-	-	-
	Cobalt chloride test	-	-	-	-
	Test for Non-reducing sugars	-	-	-	-
	Tests for Non-reducing polysaccharides (starch)				
	Iodine test	-	-	-	-
	The tannic acid test for starch	-	-	-	-
2	Tests for Proteins:				
	Biuret test (General test)	-	-	+	+
	Millions test for proteins	-	-	+	+
	Xanthoprotein test	-	-	+	+
	Test for proteins containing sulphur	-	-	+	+
	Precipitation test	-	-	+	+
3	Tests for Amino acids:				
	Ninhydrin test (General test)	-	-	+	+
	Test for tyrosine	-	-	-	-
	Test of tryptophan	-	-	-	-
	Test for cysteine	-	-	-	-
4	Tests for Fats and Oils:				
	Solubility test	-	-	-	-
	Saponification test	-	-	-	-
	Paper staining test	-	-	-	-
5	Tests for Steroids:				
	Salkowski reaction	-	+	+	-
	Liebermann – Burchard reaction	-	+	+	-
	Liebermann reaction	-	+	+	-
6	Tests for Triterpenoids:				
	Salkowski reaction	-	+	+	-
	Liebermann – Burchard test	-	+	+	-
7	Tests for Glycosides:				
	Tests for Cardiac Glycosides:				
	Baljet test	-	-	-	-
	Legals test (Test for cardenolides)	-	-	+	+
	Test for deoxy sugars (Killer Killani test)	-	+	-	-
	Liebermann's test (Test for Bufadenoloids)	-	+	-	-
	Tests for anthraquinone glycosides:				
	Borntraggers test	-	-	-	-
	Modified Borntragger's test	-	-	-	-
	Tests for Saponin glycosides				
	Foam test	-	-	+	-

	Hemolysis test	-	-	+	-
	Test for Cyanogenetic glycosides,				
	Guinard-reaction or Sodium picrate test	-	-	-	-
	Tests for Coumarin glycosides				
	Alkaline reagent test	-	-	-	-
	NaOH Soaked paper test	-	-	-	-
8	Tests for Flavanoids:				
	Ferric Chloride test	-	-	-	+
	Shinoda test	-	-	-	+
	Alkaline reagent test	-	-	-	+
	Lead acetate test	-	-	-	+
9	Tests for Alkaloids:				
	Dragendroff's test	-	-	+	-
	Mayers test	-	-	+	-
	Hagers test	-	-	+	-
	Wagners test	-	-	+	-
	Murexide test for purine alkaloids	-	-	-	-
10	Tests for Tannins and Phenolic compounds:				
	5% $FeCl_3$ solution	-	-	+	+
	Lead acetate solution	-	-	+	-
	Gelatin solution	-	-	+	+
	Bromine water	-	-	+	+
	Acetic acid solution	-	-	-	+
	Dilute iodine solution	-	-	+	+
	Dilute HNO_3	-	-	+	+
	Dilute potassium permanganate solution	-	-	+	+
11	Tests for Saponins:				
	Foam test	-	-	-	+
	Raymonds test	-	-	+	-
	Hemolysis test	-	-	-	+
	Bromine water test	-	-	-	+
	Legal's test	-	-	+	+
12	Test for Lipids	-	-	-	-

+ Present - Absent PEE-Petroleum ether extract, ETAE-Ethyl acetate extract, ALCE-Alcoholic extract, AQE-Aqueous extract.

CONCLUSION: The morphological studies, microscopy, physicochemical parameters are the tools for the standardization of the crude drug. The results of this work support the importance of *Cynodon dactylon* in various aspects. The present work confirms that various extracts of leaves of *Cynodon dactylon* show the presence of various chemical constituents such as carbohydrates, proteins, flavonoids, tannins, and saponins. These phytochemical and physiochemical values are useful for determining the quality and purity of the drug.

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CONFLICT OF INTEREST: Nil

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