Original Research

PHARMACOGNOSTICAL CHARACTERIZATION ON THE LEAVES OF *EUPHORBIA HIRTA (FAMILY: - EUPHORBIACEAE)*

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ABSTRACT:

Objective: Nature has provided a complete storehouse of remedies to cure ailments of mankind. About 80% of the world's population depends wholly or partially on traditional medicine for its primary health care needs. Pharmacognosy is mainly concerned with naturally occurring substances having a medicinal action. The aim of the present study was to investigate the morphological Microscopical characters of *Euphorbia hirta* L. leaves.

Method: The pharmacognostical investigations carried out in terms of organoleptic, macroscopic, microscopic, and fluorescence analysis parameters. The Physicochemical properties such as loss on drying, total ash value,acid insoluble ash value, Water soluble ash value, pH, solubility and Extractive values of *Euphorbia hirta* L. leaves belongs to the family Euphorbiaceae.

Result: Preliminary phytochemical analysis revealed the presence of secondary metabolites such as steroids, proteins, saponin glycosides, taxerol, frieldelin, P-sitosterol, myricyl alcohol and ellergic acid, The leaves are opposite, elliptical, oblong or oblong-lanceolate, with a faintly toothed margin and darker on the upper surface. The flowers are small, numerous and about 1 cm in diameter.

Conclusion: In the present investigation, microscopical characters are evaluated and different parameters are applied for the physico-chemical studies include evaluation of colour, consistency of different extracts, extractive value, ash value, moisture content, fluorescence analysis and also qualitative phytochemial screening was performed

KEY WORDS: *Euphorbia hirta* L. leaf, physicochemical properties, pharmacognostical study and Phytochemical study.

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INTRODUCTION

Herbal Medicine sometimes referred to as Herbalism or Botanical medicine is the use of herbs for their therapeutic or medicinal value. Many familiar medications of the twenty century were developed from ancient healing traditions that treated health problems with specific plants. Folk medicine is significant source of Ayurvedic, Unani, Taditional Chinese Medicine and Medical herbalism.It incorporates crude medicinal herbs, decoctions and infusions and syrups. Folk medicine is still practiced by some vendors, hakims and vaids in remote areas and some folk preparations are of surprising high curative value. The WHO estimates that up to 80% of the world's population use traditional medicines as their primary form of healthcare. The use of herbal medicine, the dominant form of medicinal treatment in developing countries, has been increasing in developed countries in recent years. WHO notes that of 119 plants derived pharmaceuticals medicines, about 74% are used in modern medicine in ways that correlated directly with their traditional uses as plant medicines by native cultures. Major pharmaceutical companies are currently conducting extensive research on plant materials gathered from the rain forests and other places for their potential medicinal value[1].

Euphorbia hirta Linn. of the family Euphorbiaceae is a medicinal, rhizomatous herb distributed in South Western Ghats of India and North East Coast of Tamil Nadu [2]. The plant is native to India but is a pan tropical weed. A small, erect or ascending annual herb reaching up to 50 cm, with hairy stem. The leaves are opposite, elliptical, oblong or oblong-lanceolate, with a faintly toothed margin and darker on the upper surface. The flowers are small, numerous and crowded together in dense cymes of about 1 cm in diameter. The fruits are yellow, three-celled, hairy, keeled capsules, 1-2 mm in diameter, containing three brown, four-sided, and angular, wrinkled seeds [3]. Leaves stem and flowers are used for treating respiratory ailments especially cough, coryza, bronchitis and asthma. Worm infestations, dysentery, gonorrhea, jaundice, pimples and digestive problems are also treated with Euphorbia hirta.[4]

E. hirta is a very popular herb amongst practitioners of traditional medicine, widely used as a decoction or infusion to treat various ailments including intestinal parasites, diarrhoea, peptic ulcers,

heartburn, vomiting, amoebic dysentery, asthma, bronchitis, hay fever, laryngeal spasms, emphysema, coughs, colds, kidney stones, menstrual problems, sterility and venereal diseases. Moreover, the plant is also used to treat affections of the skin and mucous membranes, including warts, scabies, tinea, thrush, aphthae, fungal afflictions, measles, Guinea-worm and as an antiseptic to treat wounds, sores and conjunctivitis. The plant has a reputation as an analgesic to treat severe headache, toothache, rheumatism, colic and pains during pregnancy. It is used as an antidote and pain relief of scorpion stings and snakebites. The use of the latex to facilitate removal of thorns from the skin is common[6].The sedative, anxiolytic, analgesic, antipyretic and anti-inflammatory properties of *E. hirta* have beenreported in the literature[7]. Leaf extract of *E. hirta* increased urine output and electrolytes in rats [8]. Furthermore, studies revealed that *E. hirta* posses galactogenic, anti-anaphylactic, antimicrobial, antioxidant, anticancer, antifeedant, anti-platelet aggregation and anti-inflammatory, aflatoxin inhibition, antifertility, anthelmintic, antiplasmodial, antiamoebic, antimalarial, larvicidal, and repellent and antifeedant activities against *Plutella xylostella*[5].

MATERIALS AND METHOD

Collection and preparation of Plant Extract

The *Euphorbia hirta* Linn.leaves were collected in the month of Octeber from the local market of Etawah, Uttar Pradesh state, India, and authenticated by by Dr. SP Agrawal Narain College, Sheikhabad,Uttar Pradesh, India. A voucher specimen was submitted at Institute's herbarium department for future reference (pcog 1022). The fresh leaves are washed with tap water, shade dried homogenized to fine powder and stored in air tight bottle. For physicochemical investigation, 10 g of dried powder was extracted by individual cold percolation method using different solvents with different polarities. The solvent was evaporated to dryness and the dried crude extracts were stored in air tight bottle at 4°C.

Macroscopic and microscopic studies

Macroscopic studies were carried out by simple determination, technique like the shape, size, colour, odour, margin and apex. Free hand sections

of the fixed leaf material were taken and boiled with Diluted HNO3 (1:3, 60% HNO3: Water) for 2-3 minutes to remove the coloring matter, washed with distilled water. Further it was kept in alkaline KOH solution for 2-3 minutes. Then almost transparent peel of leaf was treated with 0.5 % safranin solution for staining purpose and mounted on a clean glass slide with glycerin and covered with cover slip. The sections were then viewed under low power (10 X) and subsequently under high power (40 X) microscope [5]. The microphotographs were taken using Nikon Phase Contrast microscope attached with Nikon Eclipse E600 camera**.** The powder leaves was also examined for its microscopic characters. The powders were passed through sieve no. 60 and studied for their organoleptic and microscopic characteristics[6].

Determination of Physicochemical Parameters

Various physicochemical constants like Total ash value, water and acid, soluble and insoluble ash value, and moisture content were determined as per Indian pharmacopoeia[7, 8].

Preliminary phytochemical analysis

The preliminary phytochemical analysis of the methanol extract was carried out using standard methods. The presence and absence of the secondary phytoconstituents were noted[10].

RESULTS -

The Organoleptic characters such as shape, size, colour, odour, taste of stem were determined is a slender stemmed, annual hairy plant with many branches from the base to top, spreading upto 40 cm in height, reddish or purplish in color , Leaves are opposite, elliptic - oblong to oblonglanceolate, acute or subacute, dark green above pale beneath, 1- 2.5 cm long, blotched with purple in the middle, and toothed at the edge. The fruits are yellow, three- celled, hairy, keeled capsules, 1-2 mm in diameter,containing three brown, four-sided, angular,wrinkled seeds. Macroscopic characters of Euphorbia hirta leaves shows composition of leaf is simple with dark green color about 2-6cm. long in size is in fig 1 and 2.

Microscopic studies were carried out in fig-3, 4, 5 and 6. by preparing thin hand section of leaf with Iodine , KOH, Fecl3 & also decolourise with Ethanol and mounted in glycerine.

The T.S of leaf consists of following character

1. Collenchyma: - The cells of this tissue have thinkned wall which present just below the epidermis.

2. Palisade layer:-a.Palisade layer is present in this plant and present just below the upper epidermis.
3. Cuticle:-Cuticle covers the epidermis and outer primary part of leaf and Cuticle helps in the transpiration.

4. Vascular bundle:-It consists of xylem & phloem which are present in middle part of leaf. The Xylem is a complex tissue which is mainly responsible for conduction of water and minerals and the Phloem provide mechanical power to the plant.

5. Trichome:-Trichome is also present in this plant and this is shown in the figure 4 and they are found on almost all plant parts and may be temporary & permanent features.

6. Epidermis:-It consists of upper epidermis and lower epidermis,the Epidermis is in direct contect of with the external environment.eg.-Protection, Absorption, Excretipon, secration & control the Transformation.

The various diagnostic characteristic of leaf powder was coarse, dark green, which revealed the presence of lignified xylem vessel, Anomocytic type of stomata, Moisture content, total ash, acid-insoluble ash, alcohol and water-soluble extractive values were carried out as described in Indian Pharmacopoeia. The value of loss on drying at 1100 C showed the presence of moisture content in the sample, which is 8.5 %.The total ash, acid insoluble ash and water soluble ash were found to be 8.58 %,

1.53% and 6.52% respectively. The ash contents showed in table no-2, the amount of inorganic matter present in the sample and the acid insoluble ash almost within 1.5 % which expresses low siliceous matter present in the sample.

Preliminary phytochemical Screening: The ethanolic and aqueous extract of *Euphorbia hirta* Linn. Was subjected to tests for the presence or absence of the major class of compounds by standard methods Preliminary phytochemical analysis indicated the presence of Alkaloids, Flavonoids & Gums and Mucilages in table no 2.

TABLES:

TABLE NO. 1 PHYSICAL EVALUATION PARAMETERS

S.No	Parameter	Value % (w/w)
1.Ash value		
a.	Total Ash	8.58%
b.	Acid insoluble Ash	1.53%
c.	Water soluble Ash	6.52%
2.Extractive value		
a.	Petrolium ether soluble extractive	2%
b.	Chloroform soluble extractive	4%
c.	Benzene soluble extractive	3%
d.	Ethenol soluble extractive	9%
e.	Water soluble extractive	15%
3.	Swelling Index	2.7%

TABLENO.2 PHYTOCHEMICALS SCREENING . *E. HIRTA LINN.*

Name of tests	Powder extract	Ethanolic extract	Aqueous extract
Carbohydrates: A.Molisch's Test B.Fehling's Test C.Benedict's Test	 – – –	 – + –	 – – –
Test for Gums and Mucilages:	+	+	–
Test for Proteins and Amino Acids: A. Ninhydrin Test B. Biuret Test C. Millon's Test D. Xanthoproteic Test	 – – + –	 + – – –	 – – – –
Test for Fixed Oils and Fats: A .Spot Test	 – –	 – –	 – –

B. Saponification Test			
Test for Alkaloids: A. Mayer's Test B. Dragendroff'sTest C .Wagner's Test D. Hager's Test	+ + – +	+ – – +	+ + – +
Test for Glycosides: A.Legal's Test B.Baljet's Test C.Borntrager's Test D.Keller-Killiani's	– – – –	– – – –	– – – –
Test for Phytosterols: A. Liebermann's Test B. Liebermann – Burchard's Test C. Salkowski's Test	– – –	+ + –	+ + –
Test for Flavonoids: A. Ferric Chl. Test B. Shinoda's Test C. Fluorescence Test	+ + +	– + –	– + +
Test for Saponins: A. Foam Test B .Haemolysis Test	– -	– +	– -
Test for Volatile Oil:	-	-	-

FIGURES:

Fig.1

Fig.2

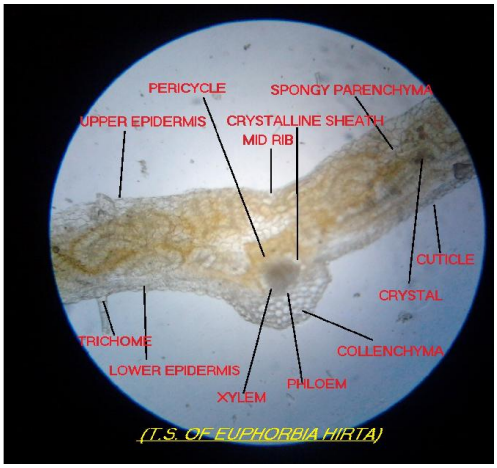

Fig.3T.S.WITH PHLOROGLYCINOLSOLUTION,

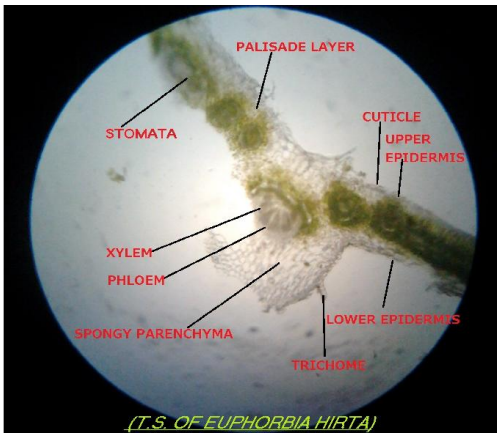

Fig.4 T.S.WITH FERIC CHLORIDE SOLUTION

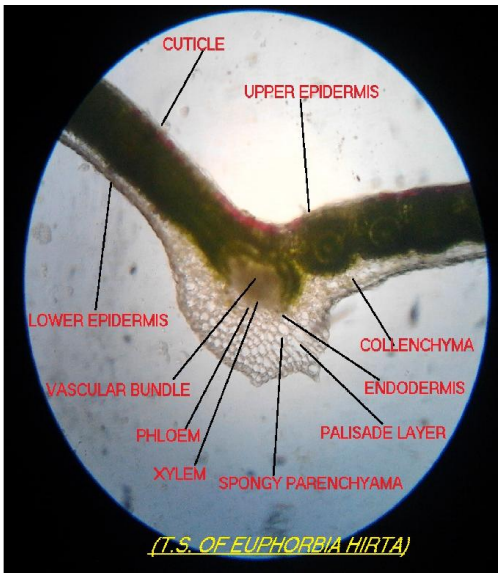

Fig.5 T.S.WITH IODINE SOLUTION

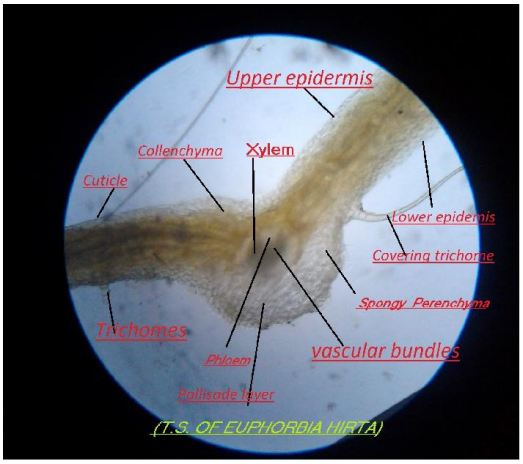

Fig.6 T.S.WITH KOH SOLUTION

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