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PHARMACOGNOSTIC AND PHYTOCHEMICAL STUDY OF EUPHORBIA HIRTA L.

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ABSTRACT

Euphorbia hirta L. is commonly called as Dhdhani or MothiDhudi belongs to family Euphorbiaceae. The plant is used by people to treat cough, dysentery, bronchitis, gonorrhea, snake bites, diarrhea asthma and increase breast milk. The plant has played an important role in the Ayurvedic and natural herbal medicine. This work aimed to study the Medicinal properties, Pharmacognosy and Phytochemical analysis of plant. The pharmacognostic studies of plant drug is carried out for evaluation of drug and to detect the adulteration.It includes dermal characters like type of stomata, trichomes and anatomy of leaf and stem. The plant was analyzed for its preliminary screening of phytochemicals. Phytochemical evaluation revealed the presence of alkaloids, glycosides, flavonoids, saponins, terpenoids, anthraquinones, Tannins, and cardiac glycosides. The present study helpful to standardize of drugs.

Keywards: *Euphorbia hirta* L., Pharmacognostic studies, Phytochemicals analysis and Drug

INITRODUCTION

In India different medicinal plants are utilize for preparation of herbal medicine to cure different aliment has been in vogue form ancient time (Sunil kumar, 2010). In India rich knowledge about medicinal uses of plant is available, this knowledge is utilizing in the preparation of drug and such drugs are used in the treatment of diseases (Sandhya Ganeshan, *et al.*, 2018). Plants are the essential and integral part in complementary and alternative medicine and due to this they develop the ability for the formation of secondary metabolites like proteins, flavonoids, alkaloids, steroids and phenolic substance which are in turn used to restore health and heal many diseases (Chakraborthy,2009). Plants serve as basic of traditional medicine systems for thousands of years in Nigeria, India, China, Indonesia etc. (Hammer, 1999).

Euphorbia hirta L. is annual herb, stem is long, green or red colour. Leaves are opposite lanceolate, cordate at base with serriate margin, dark green, some leaves are reddish brown colour. Flowers are small, many and crowded together in dense cyme. Fruit is globose, hispid. Seeds are ovoid trigonous, reddish brown colour(Fig.). The plant *E. hirta* possesses medicinal properties that are effective for the treatment of cough, dysentery, bronchitis, gonorrhea, snake bites, diarrhea asthma and increase breast milk (MahbuburRahman,2014; Reddy, *et al.*, 2019; Mahbubur Rahman, 2015; Das *et.al.*, 2009; Prabu et.al.,2014; Morshed and Nandni, 2012; Emmanuel Noumi,2010). Therefore, the preliminary phytochemical investigation is necessary to prove proclaimed ethnomedicinal uses.

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MATERIAL AND METHODS

a) Plant material:

The whole plant of *E. hirta* (Fig. 1) was collected from College campus of Nutan Mahavidyalaya Sailu, Dist. Parbhani, Maharashtra. The collected plant material was taxonomically identified by using renowned floras (Naik 1979, Naik*et al* 1998., Chetty*et al*; 2008 and Yadav and Sirdesai 2002). The voucher specimen of plant was preserved in Department of Botany, Nutan Mahavidyalaya Sailu, Dist. Parbhani, Maharashtra. Plant were shade dried and powdered. The powdered plant was successively extracted with different solvent. The fresh leaves and stem were used for the study of macroscopic and microscopic characters.

b) Preliminary phytochemical Screening:

Phytochemical screening of plant extracts(aerial parts) of *E. hirta* different solvents were undertaken by using standard methods for the analysis secondary phytoconstituents like alkaloids, glycosides, flavonoids, tannins, saponins, terpenoids and cardiac glycosides(Harborne, 1984).

c) Prepearation of extract:

Plant powder (aerial parts) was subjected to soxhlet extraction with petroleum ether (60-80°c), Methanol (64.5-65.5°c) and water for 3-4 hrs in the order of increasing polarity of solvents (Daniel, 1991). The extracted solvent is evaporated to make the final volume one fourth of its original volume. Yield of extracts are 4.2, 09.7 and 11.30 % respectively. The extracts are stored at 4°c in airtight bottles for further study.

PHARMACOGNOSTIC STUDIES

Macroscopic study:

Morphological studies were done using simple microscope. The shape, apex, base, margin, taste and odour of plant powder were observed.

Microscopic studies:

The free hand transections of leaves and stem were taken and stained by using double stained differential staining technique and mounted in DPX (Johanson, 1940). Photograph were taken with the help of digital camera.

The leaf is peeled off for the study of stomata and the trichomes of upper and lower epidermis. For the study of vessels, the stem is macerated by using Jeffery's fluid and stained with aqueous 1% saffranin and mounted in glycerine and made semi permanant by ringing with DPX mountant.

The plant powder was treated with phloroglucinol and HCl for the detection of lignin. Glycerine and iodine solution were used to determine calcium oxalate crystal and starch grains respectively. (Kokate, 1997).

OBSERVATIONS

T. S. Of STEM

Transverse section of stem is wavy in out line. The epidermis is single layered, with thick cuticle. Stomata are present on epidermis. Below the epidermis 3-4 layered collenchymatous thick hypodermis is present. Beneath the hypodermis multilayered parenchymatous cortex is present, cells of cortex are loosely arranged with intercellular spaces. Endodermis and pericycle is not clearly visible. Vascular bundles are conjoint collateral and open arranged in ring. Parenchymatous pith present in center (Fig. 2)

T. S. Of LEAF

The epidermis is single layered with cuticle. The mesophyll tissue is differentiate, spongy parenchyma present towards lower epidermis where as palisade parenchyma present toward upper epidermis. The vascular bundle is conjoint, collateral and closed. The entire bundle is enclosed by parenchymatous bundle sheath (Fig.3)

STOMATA

The leaf is simple and rough, leaf lamina entire with serriate margin, reticulate pattern of venation, the leaf is amphistomatic. The stomaties are present on both surfaces. The stomaties of both the surfaces are anomocytic, the guard cells are surrounded by four subsidiaries (Fig.4A and B)

TRICHOMES

The trichomes are reported on both the surfaces of leaf and on stem. The trichomes of both the surfaces are simple uniseriate, multicellular, nonglandular, the foot is embedded into epidermal cell and tip of trichome is sharp. The trichomes of upper leaf surface are more than lower surface (Fig.5)

VESSELS

The vessel elements of the secondary xylem show variation where, 50% of vessels are reticulate thickening. Both the end walls plates transverse, having size 50 mμ diameters and 285 mμ length. In 50 % of vessels lateral wall thickening is scalariform, having size 90 mμ diameters and 300 mμ length (Fig.6).

PHYTOCHEMICAL CONSTITUENTS

The preliminary phytochemical analysis of plant powder shows the presence of alkaloids, glycosides, flavonoids, saponins, terpenoids, anthraquinones, Tannins, and cardiac glycosides. The Phlobatannins is absent (Table. 1).

POWDER ANALYSIS

The plant powder was characterized by its morphological features like Grayish Green colour; odourless and bitter taste. Microscopic study of powder reveals the presence of yellow-pigmented endodermal layer, Hemicellulose in endodermis and hemicellulosic cells with oil globules. (Table. 2&3)

DISCUSSION AND CONCLUSION

The present study reveals that the plant *E. hirta* is used by tribal and local people of different state of India to cure many diseases. Medicinal uses, phytochemical, pharmacological, morphological information are provided in this study. The extract obtained from *E. hirta* contain alkaloids, glycosides, flavonoids, saponins, terpenoids, anthraquinones, Tannins, and cardiac glycosides. If the plant contains phytochemicals, such plant is used in the treatment of diseases. Therefore, *E. hirta* is medicinal potential due to presence of phytochemicals. The phytochemical analysis of *E. hirta* used for the study revealed presence of active content in them to be used for the treatment of diarrheal diseases (Arun, 2019). The *E. hirta* show antibacterial, anti-inflammatory, anticancer, antioxidant, antifungal activity (Kumar, 2010). It is very essential to isolate the bioactive component form plant so that it can be used further designing specific drug (Krishnamoorthy *et.al., 2014*). The pharmacognostic characters and phytochemical values used as the diagnostic tool for the standardization of this medicinal plant (Raveendra and John,2007). The pharmaceutical and antimicrobial studies could be done that will further elucidate and characterize the active components and authenticate its folkloric efficacy.

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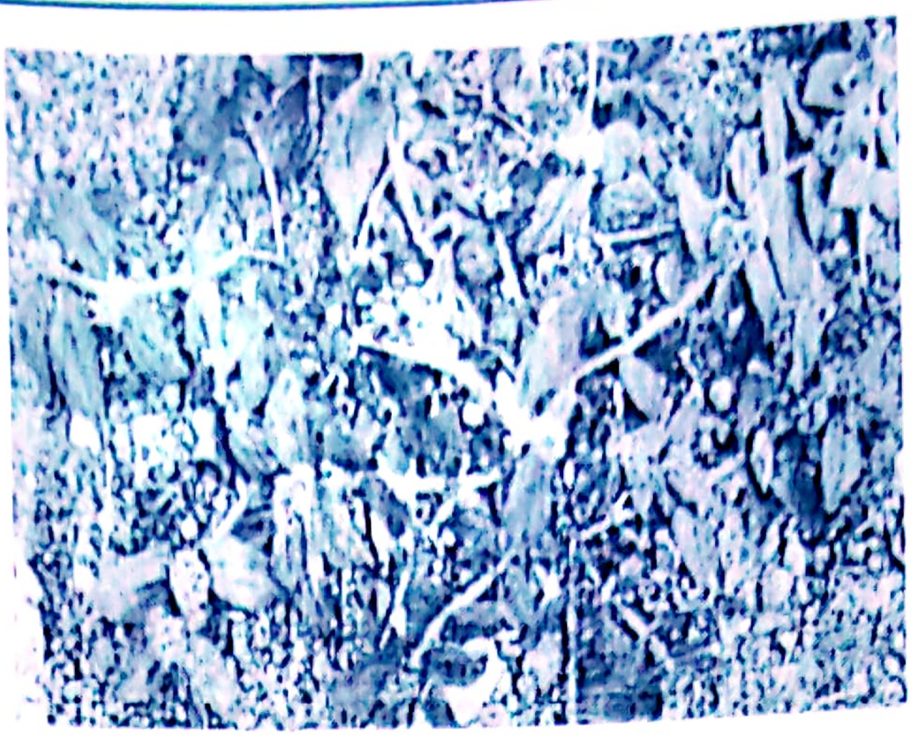


Fig.1. *Euphorbia hirta* L.

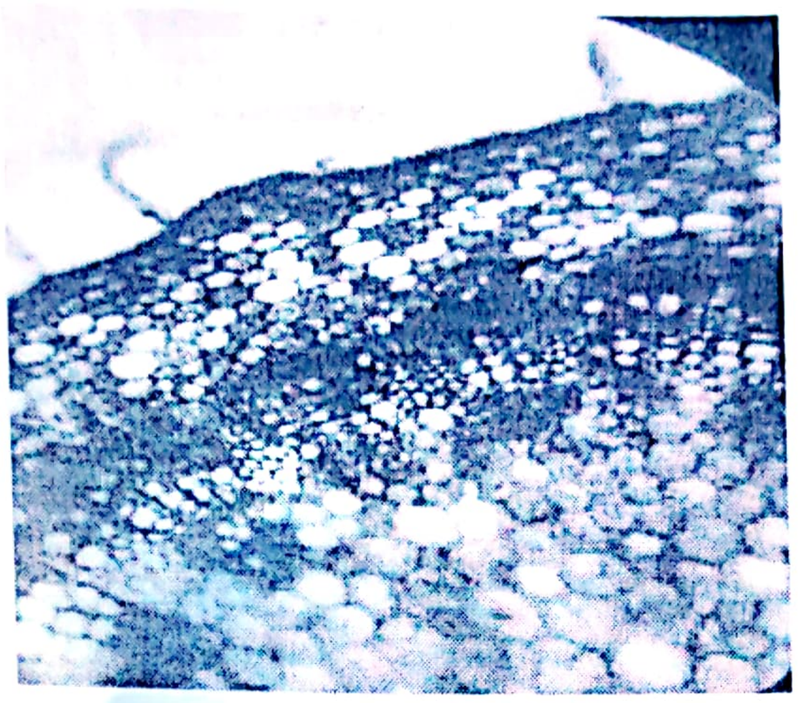


Fig.2. T. S. Of Stem

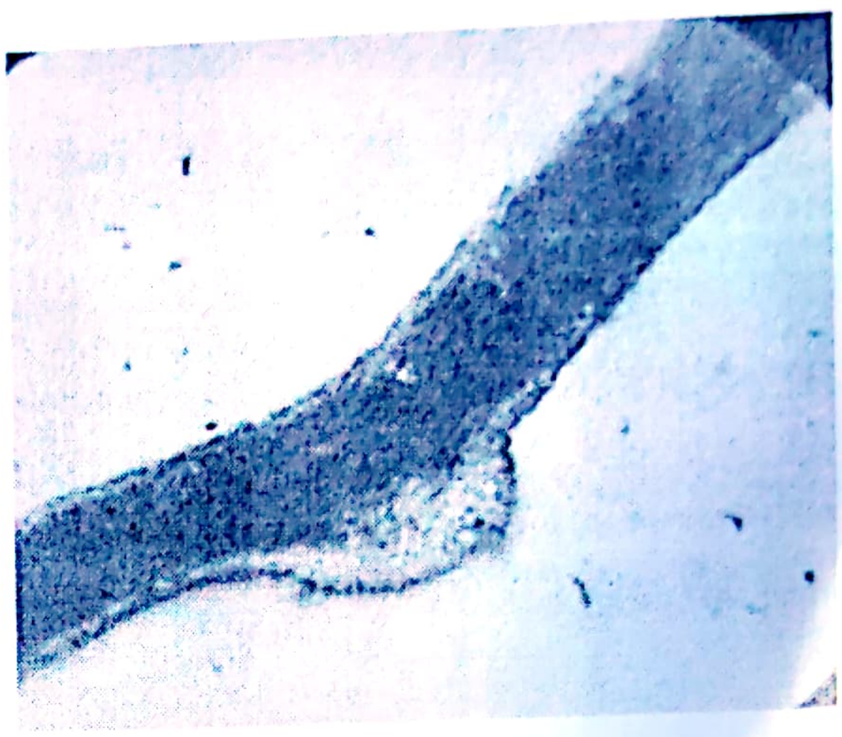


Fig.3. T. S. Of Leaf

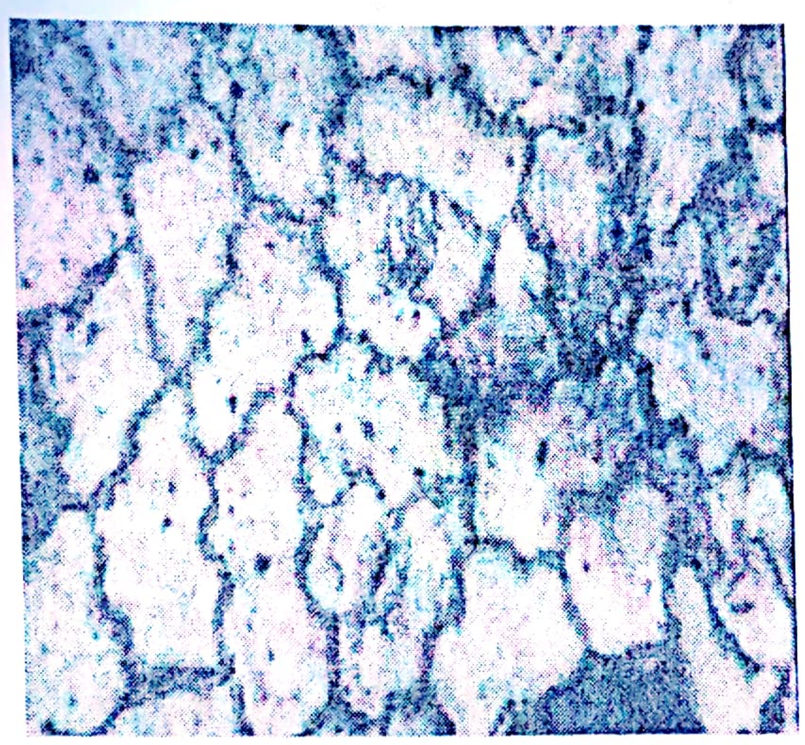


Fig.4. A. Stomata upper epidermis

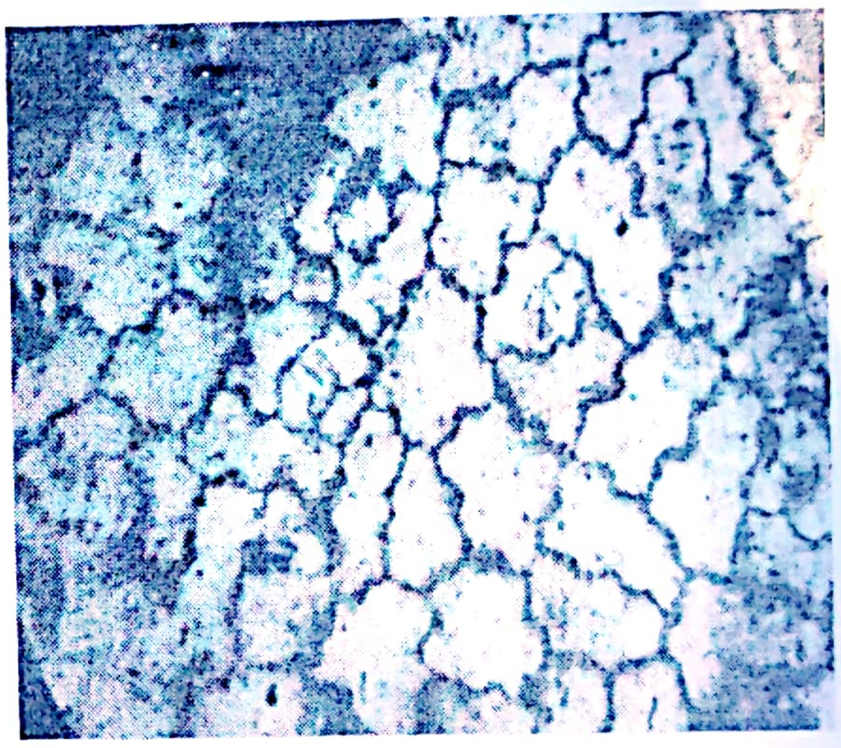
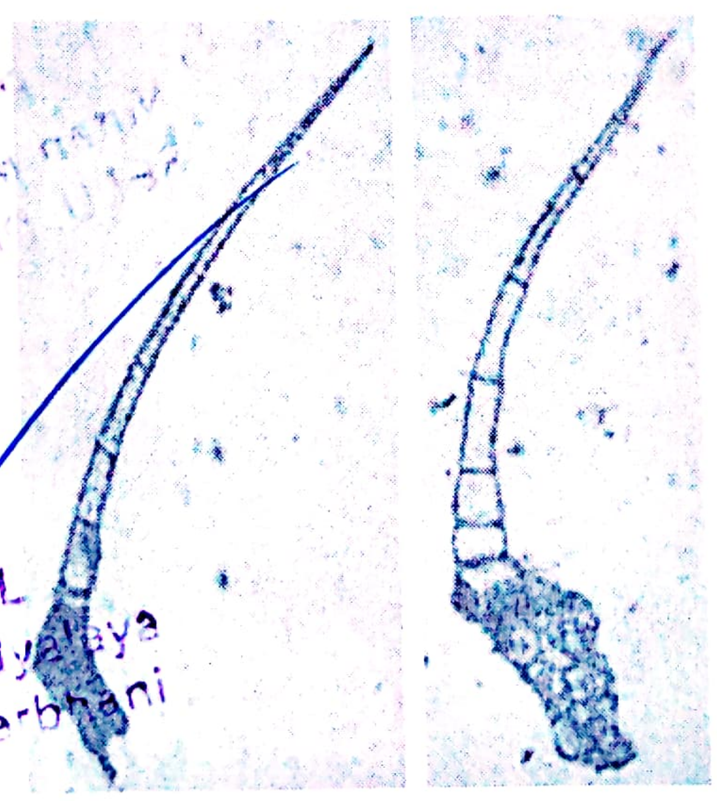
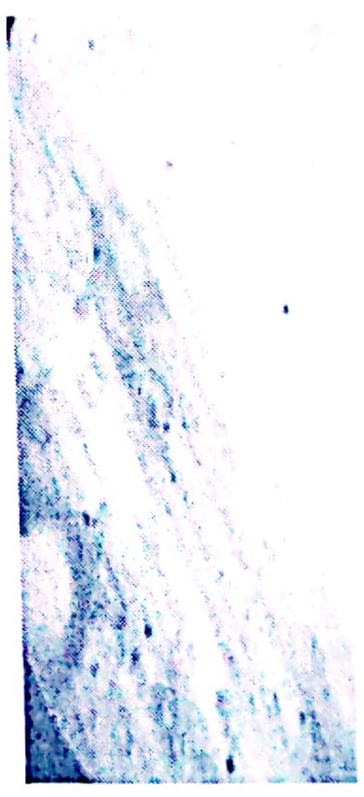
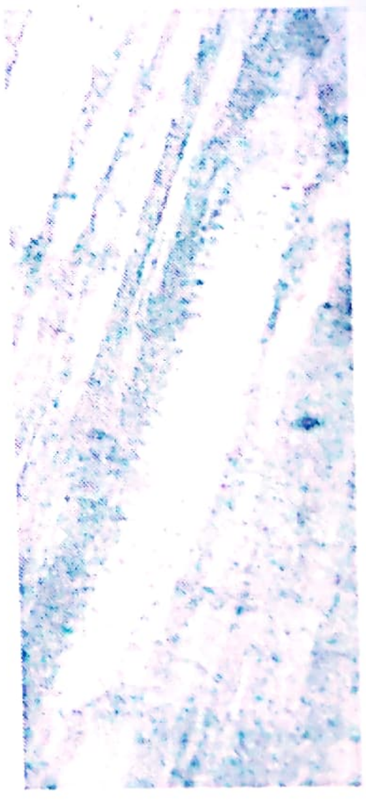


Fig.4. B. Stomata Lower epidermis







Sr. No	Phytochemicals	Test
1	Glycoside	+
2	Terpenoids	+
3	Phlobatannins	-
4	Saponins	+
5	Flavonoids	+
6	Tannins	+
7	Alkaloids	+
8	Anthraquinones	+
9	Cardiacglycosides	+

Table. 1–Preliminary phytochemical screening of plant powder

Sr. No	Test	Observation	Inference
1	Colour	Grayish Green	Whole plant(Aerial Parts) of *E. hirta*
2	Odour	odorless	Aromatic crude drug
3	Taste	Bitter	Drug contain alkaloid

Table 2 Preliminary test

Sr.no.	Reagent	Observation	Characteristic
1	Powder +Phloroglucinol+conc. HCL	Greenish brown colour	Lignified cells
2	Powder +Ruthenium red	Brown colour	Muciligenous cells are absent in epidermis
3	Powder +Acetic acid	Insoluble	Calcium oxalate
4	Powder +Dil. Hydrochloric acid	Soluble with effervescence	Cystolith
5	Powder +Conc.Sulphuric acid.	Greenish yellow	Stone cells are present
6	Powder +Dil. Iodine sloution	blue colour	Starch is present
7	Powder +Dil. Iodine solution +Conc. Sulphuric acid	Blue colour	Hemicellulose in endodermis

Table No 3. Flurosence analysis of the powdered plant of *E. hirta*.

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