

RESEARCH ARTICLE PHYTO-COGNOSTICAL EVALUATION OF THE EUPHORBIA TITHYMALOIDES STEM IN EAST U.P (INDIA) REGION

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ABSTRACT

The knowledge of medicinal plants must have been accumulated in the course of many centuries. Herbal medicine prepare different part of plant are used. It is an important source of Indian system of medicine. Herbal plants are huge sources of secondary metabolites. Secondary metabolites are responsible for different pharmacological activity. Euphorbia Tithymaloides, stem (Family Euphorbiaceae) common name is Ladys Slipper Flower Plant, Vitali Khasani, Devils Backbone, Naagdon is one of the common succulent plant throughout different part of India(Assam, Bihar, Gujarat, Madhya Pradesh, Maharashtra, Odisha, and Uttar Pradesh). It is widely available in native to tropical and subtropical, North America and Central America and some areas of South Asia. The study of diseases and their treatment are important part of our ancient time worldwide. Its leaves, roots, stem, have beneficiary actions for medicinal purposes such as anti protozoal, mitogenic, anti-inflammatory, anti-plasmodic, anti-microbacterial, anthelmintic and antimicrobial activities. The main aims of this research are phyto-cognostical evaluation of the stem parts. The current study deals with the characterization of morphological features, determination of physical constant such as the Total ash value 5.66%, Loss of weight drying was 12.09%, swelling index were 0.7cm, the percent yield for methanol 10.01%, and aqueous 15.5%.

Keywords: EuphorbiaTithymaloides, Euphorbiaceae, Devil's-Backbone, Swelling Index

I. INTRODUCTION

Herbal medicines include herbs, herbal materials, herbal preparations and finished herbal products that contain active ingredients obtain from different parts of plants used especially for the prevention and treatment of diseases. In contemporary times, herbal medicines remain a major component of the primary healthcare in many rural African, Asian communities and developing countries. It also constitutes an integral part of the culture of many societies of the world. Many herbs and herbal recipes have a long traditional history of folk uses and claims of health benefits. Scientific research has shown that Herbal medicines contain complex chemical compounds that are responsible for the pharmacological activities, which corresponds to health benefits. Also used as prophylaxes for the passive maintenance of health as well as for radical treatment of varieties of mild to serious diseases. India has number of approved indigenous systems of medicine viz-Ayurveda, Siddha, Unani, Homeopathy is applied for the health care of mankind [1]. This helps to getting increase knowledge of medicinal plants. Herbal plants are economical and more acceptable worldwide. Even in many of the modern medicines & different traditional system of medicine the basic composition is derived from medicinal plants and has become acceptable for easy availability, least side effects, and low prices, environmental friendlily and lasting curative property compared to allopathic medicine [2-3]. In one of the studies of the World Health Organization, it is estimated that 80 per cent of the population of developing countries relief on traditional plant-based medicines for their health requirements [4-7]. There are several factors for the continued popularity of traditional drugs and one is their ready availability as compared to the modern medicines besides the adverse effects of synthetic drugs [8]. Euphorbia Tithymaloides plant under the Family Euphorbiaceae common succulent plant throughout different part of India. Euphorbiaceae is a large family with three hundred genera and around eight thousand species [9]. The genus Euphorbia is a major genus in the family including about two thousand species ranging from annuals to trees [10]. It is commonly known as Ladies Slipper Flower Plant. It Euphorbia Tithymaloides is erect shrub that grows up to 0.4 to 3 m tall and 40-60 cm wide plant in

height. It is mostly used as an ornamental plant and for making fencing in garden. The common vernacular names are redbird flower, devil's-backbone, buckthorn, cimora misha, christmas candle, fiddle flower, Jacob's ladder, Japanese poinsettia, Jew's slipper, Jewbush, milk-hedge, myrtle-leaved spurge, Padus-leaved clipper plant, red slipper spurge, redbird cactus, slipper flower, slipper plant, slipper spurge, timora misha, ginryu (Japan); pokok lipan, penawar lipan (Indonesia); airi, baire, agia (India); aperejo (Yoruba); sapatinho do diabo (Brazil); itamo real (Puerto Rico); pantoufle (France) and zapatilla del diablo (Mexico). *Euphorbia tithymaloides* distributed in various states of India (Assam, Bihar, Gujarat, Madhya Pradesh, Maharashtra, Odisha, Uttar Pradesh). This plant is known as naagfani in Uttar Pradesh and naagdon in Madya Pradesh. It grows well in variety of soils, sandy, well-drained, nutrient-rich, particularly with higher concentrations of boron, copper, iron, manganese, molybdenum, and zinc, relatively intolerant of high soil salinity levels, but exhibits saline tolerance if well fertilized. The flower bracts resemble a slipper. The color of flowers varies from bright white to pink, leaves bright green in color, sessile, about 1.4 to 3 inches (3.6 to 7.6 cm) in length, glabrous or smooth with acuminate apex and entire edges or margin. Each cyathia (flower structures containing separate male and female parts) supported by a peduncle of 3-8 mm long, red, green below and enclosed in bright red involucre, bracts, ovate and irregularly acuminate in shape (e.g., like a slipper) 4-12 mm long, 2-5 mm wide. Fruits are capsule, cuboid with truncated ends, deeply 3-lobed which have 3-4.5 mm long ovoid seeds. Medicinally, this plant has powerful emetic, irritant and caustic properties. *Euphorbia tithymaloides* L. (syn. *Pedilanthus tithymaloides* (L.) Poit.); devil's-backbone or redbird flower is a persistent juicy spurge, the shrub is native to tropical, Northern and Central Americas [11-12]. Its fresh leaves are used for treating cuts, wounds and reported to have anthelmintic [13], anti-diabetic [14-15], anticancer [16], anti-filarial [17] and analgesic activities [18]. Phytochemical study on *E. tithymaloides* reported the isolation of long-chain alcohols, sterols, terpenes as cycloartenol triterpenes [19] flavonoids as Kaempferol and isoquercitrin; flavonoid glycosides as quercetin; phenols as gallic acid; resins and coumarins as scopoletin [20]. The extract of leaves used for treating asthma, mouth ulcers, venereal troubles, ringworms and insect stings. This plant is also known to possess anti protozoal, mitogenic, anti-inflammatory, anti-plasmodic, anti-microbial, anthelmintic and antimicrobial activities. Herbal plants have ability for the formation of secondary metabolites such as steroids, phenolic substances, flavonoids, alkaloids, glycoside etc. These secondary metabolites are used to treatment of many diseases. The secondary metabolites provide a rich biogenic source for novel drug discovery. The metabolites produced by different plants vary from each other. No proper report was found regarding and phyto-cognostical evaluation *Euphorbia Tithymaloides*, stem till the date. Standardization of herbal drugs is difficult because generally mixture of constituents and the active constituent in most cases is unknown. Now the present study deal the standardize stem of *Euphorbia Tithymaloides*. Keeping this view the aim of the current study deal the phyto-cognostical evaluation of the stem parts of *Euphorbia Tithymaloides*.

II. MATERIALS AND METHODS

Euphorbia Tithymaloides stem were collected from fields of Itaura, district of Azamgarh, Uttar Pradesh, India in the month of mid January and authenticated by Prof Dr. Anil Kumar, Pharmacognosist, Uttar Pradesh, India. A voucher specimen has been preserved in Department of Pharmacognosy, Pharmacy college Azamgarh, Uttar Pradesh, India for future reference (Voucher specimen no. PCA-012/01). The stem parts were dried under shade and powdered (40 mesh size) and stored in airtight containers.

Macroscopical studies



The stem of the plant were studied for their macroscopic characters such as color, odour, taste, shape and size of the stem. The macroscopic characters were studied as per given procedure in WHO guidelines on quality control methods for medicinal plants materials [21].

Phyto-cognostical studies

The loss on drying[22-23], ash value [24-25], foaming index[26], swelling index[21,27], microscopy[28-29], extractive value(methanol and water), foreign matter were determined according to the official methods of Ayurvedic Pharmacopoeia of India.[22,30-33], Indian Herbal Pharmacopoeia[34]. and the WHO guidelines [21].

Extraction method

The powdered plant material was extracted with methanol, aqueous respectively using a maceration process. The extracts were concentrated to dryness in vacuum individually to get Methanol extract (MEET), Aqueous extract (AEET) respectively. The yield of methanol, aqueous extracts were 10.01, 15.5% w/w respectively. The extracts are stored in a desiccator.

III. RESULT AND DISCUSSION

The macroscopical study of the stem of *Euphorbia Tithymaloides* was done. The stem were spinal column due to zigzag structure. The fleshy tubular stems of this plant are thin pencil like which produce thick, dark-green fleshy, ovate leaves and peculiar beak shaped flowers. (Table-1). The values of the physical constant like ash values, foreign matter and loss on drying were determined. Extractive value and color of extract was investigated (Table-2). Swelling index contain powdered drug 0.7cm. The TS of stem were showed, epidermis layer, upper epidemic, phloem, xylem, cambium. pith, parenchyma, Collenchyma, palisade cells at upper side, vascular bundle, sclerenchymatys layer etc. All determination was carried out by using all micro compound microscope attached with camera.

Table-1: Macroscopical evaluation of *Euphorbia tithymaloides* stem

S.NO	Feature	Observation
1.	Color	light green/dark green
2.	Odour	Characteristic/ slightly aromatic
3.	Taste	Milky sap(latex)mucilaginous taste
4.	Shape	Non woody, cylindrical in shape,spinal column due to zigzag structure. The fleshy tubular stems of this plant are thin pencil like which produce thick, dark-green fleshy branch profusely from the base.
5.	Size	27.3cm and 1.5 to 3.3 cm thick

Table-2: Physicochemical analysis of Euphorbia tithymaloides stem

S.NO	Solvent	Weight of plant material (gm)	Percentage of yield(%)	Color of extract
3.	Methanol	4	10.01	Greenish
4.	Aqueous	4	15.5	Dark green

Table -3. Physicochemical parameters of Euphorbia tithymaloides stem

S. No	Physicochemical parameters	Observation
1.	Loss of drying	12.09%
2.	Total ash value	5.66%
3.	Foreign matter	Nil
4.	Swelling index	0.7cm
5.	Foaming index	Not significant

Microscopy of Euphorbia tithymaloides stem



Fig-1: Microscopy of Euphorbia tithymaloides stem

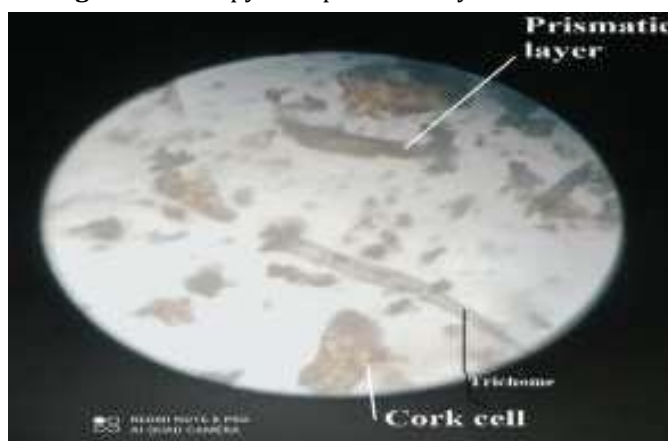


Fig-2: Powder microscopy of Euphorbia tithymaloides stem

IV. CONCLUSION

Preliminary physico-phytochemical study of the Euphorbia Tithymaloides stem were study concluded to macroscopic, other physical values and parameters will help to identify the species of plant, Microscopy is an important tool in the evaluation of crude drugs which is applicable at various levels such as the authentication of the crude drugs, study of powdered drugs, study of T.S. Euphorbia Tithymaloides stem were is known as wide range of medicinal value, it helps to identification, authentication and standardization. It also require to research on phytochemical and pharmacological aspect. However research going on it would be easier to develop new innovation.

Compliance with ethical standards**ACKNOWLEDGEMENT**

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V. CONFLICT OF INTEREST

All the authors hereby disclose no conflict of interest.

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