



# Preliminary Phytochemical Studies On Different Extracts Of *Euphorbia Thymifolia* Linn

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**Abstract:** This work has been undertaken for the preliminary phytochemical studies on different extracts of *Euphorbia thymifolia* Linn belongs to family *Euphorbiaceae* reveals the presence of steroids, glycosides, carbohydrates, flavanoids, triterpenoids, gums, fats & oils, tannins & phenolic compounds. Where as alkaloids, proteins and amino acids were totally absent in this plant.

**Keywords:** *Euphorbia thymifolia* Linn, Euphorbiaceae, phytochemical studies, steroids and alkaloids

## INTRODUCTION

**Herbal Medicinal Plant :-** Herbal medicine is the oldest and still the most widely used system of medicine in the world today. They are made exclusively from plants.<sup>[1]</sup> The term of medicinal plants include a various types of plants used in herbalism and some of these plants have a medicinal activities. These medicinal plants consider as a rich resources of ingredients which can be used in drug development and synthesis. Besides that these plants play a critical role in the development of human cultures around the whole world.<sup>[2]</sup> According to the World Health Organization, over 80% of the world's population, or 4.3 billion people, rely upon traditional plant-based systems of medicine to provide them with primary health care. Several pharmacological activities including the treatment of cancer, immunomodulation, nervous system activation, antipyretic, analgesic, hepatoprotection, antidiabetic nature etc have been possessed by plants and their products.<sup>[3]</sup> Herbal medicine or phytomedicine is the use of plants for medicinal and therapeutic purpose for curing of diseases and improve human health. Plants have secondary metabolites called phytochemicals ('Phyto from Greek - meaning 'plant'). These compounds protect plants against microbial infections or infestations by pests. Phytochemicals are active ingredients which possess therapeutic properties that are considered as a medicine or drug.<sup>[4]</sup>

**Plants in traditional medicines :-** Ayurveda is an ancient health care system which evolved in India dates back to about 5000 years ago. As per the ancient literatures on Ayurveda, it was practiced during Vedic period of INDIA. About 700 plants were described in Charaka Samhita and Sushruta Samhita during the 1st millennium BC. This medical system is widely practiced in other parts of the world as a form of complementary medicine. Ayurvedic System of INDIA aims to preserve, promote and sustain good health and preventing diseases through healthy lifestyle practices. The literal meaning of Ayurveda is the "Science of life". It is estimated that about 7,500 plants are used in local health traditions in most rural and tribal villages in India. Herbal treatments are the most popular form of Traditional Medical System. The plant-based traditional medicine systems continue to play a crucial role in the health care system. The demand of herbal based medicine, health products, pharmaceuticals, food supplements, nutraceuticals, cosmetics are increasing worldwide. In the 21st century, natural products represent more than 50% of all drugs in clinical use. Up to

50% the approved herbal drugs during the last 3 decades are from either directly or indirectly from natural products including plants, microorganisms, fungi and animals. As per the records of the National Medicinal Plant Board (NMPB), the Indian herbal industry may like to increase in order of Rs. 80 to 90 billion by 2020. However, India is moving forward in popularising of the Traditional Medical System of AYUSH (Ayurveda, Yoga, Unani, Siddha and Homeopathy) in health care sector through global networks.<sup>[4]</sup>

**Traditional knowledge and uses :-** In order to understand the extent to which medicinal plants are used at the local community level, a useful distinction can be employed related to the type of medicinal practice. Allopathic, generally understood as modern medicine and based predominantly on the principles of Western post-Enlightenment Science which has dominated the last three centuries. Classical traditional, referring to the documented and standardized great tradition systems of medicines including Ayurveda, siddha Unani Amchi and Homeopathy with different epistemological bases to that of Western Science. Traditional uses of medicinal plants may also decline due to increasing commercialization of the medicinal plant sector and diversion of raw materials for sale in markets. One study conducted in Arunachal Pradesh examined the use of Mishitita, a better root that is found at altitudes of between 2000 meters and 3000 meters in the districts of Dibang and Lohit. Over the last decade, local people have been selling the species for a very remunerative price of Rs.1000 per kilogram locally, after which it is exported via Calcutta to Japan and Switzerland. Though this plant was traditionally used by tribal for the treatment of fever, backche and dysentery, it is now being substituted but opium for local use due to the fact that all available supplies are for export. The fact that other locally available species such as Kutaya (*Hollarrhenaantisysenterica*) and Berberis are not being substituted is an indication of the locally specific nature of traditional knowledge.<sup>[5]</sup>

**Future of medicinal plant:-** There is a promising future of medicinal plants as there are about half a million of plants around the world, and most of them are not investigated yet for their medical activities and the hidden potential of medical activities could be decisive in the treatment of present and future studies. Herbal medicine is effective, has lesser side effects, and affordable than the allopathic medicines. Herbal medicines include herbs, herbal materials, herbal preparations, and herbal products that contain different parts of plants or other plant materials as active ingredients . It has been well documented that herbal plants and their derivatives play critical roles in modern drug development. Medicinal plants are the natural resources for developing new drugs . Medicinal plants are used as a medical resource in almost all cultures. Nowadays many people are using herbal medicines as a substitute to synthetic drugs but there are still some concerns about the safety of using them.<sup>[6]</sup>

### ***Euphorbia thymifolia* linn. :-**

**Introduction:-** *Euphorbia thymifolia* Linn; (Euphorbiaceae) in ayurveda is called as Chhoti dudhi, laghudugdhikaa, in English -chicken weed, red caustic creeper, asthma plant, in unani- Dudhi khurdi. This species is globally distributed in Pantropics with in India, it occurs throughout the plains and low hills, ascending to 2600pts in the hills. This is common in waste places, hedges & road sides. It is a small annual herb, more or less hispidly pubescent; stems prostrate, divaricately branched, slender, cylindrical, more or less hairy. Leaves opposite, very small, numerous, 3-6 by 2.5-4mm., obliquely oblong or elliptic-oblong, rounded at apex, crenulate, glabrous above, glaucous and usually slightly pubescent beneath, base rounded, very unequal-sided; petioles very short; stipules fimbriate. Involucres axillary, solitary or 2-3 in an axil, campanulate, 0.8mm. long, obtusely keeled, pubescent; styles short, 2-fid. Seeds 1.25mm. long, quadrangular, bluntly pointed, with 5 or 6 transverse furrows . Charaka prescribed Dudhika as an ingredient of vegetable soup for diarrhoeal and painful bleeding piles . It is believed to possess Diuretic, Laxative, and Detumescent, antimalarial, anti-diarrheic, anti-rash, anti-dysentery, anticarbuncle detoxification and anti-hemorrhoidal activity. *Euphorbia thymifolia* possess anti-oxidant and antiviral activities. The plant is also used to treat eye

swelling and discharge. Present study aims at exploring the details of phytochemical investigation of *Euphorbia thymifolia*.<sup>[19]</sup> Over half a century after launching therapy for treatments, phytochemicals have become an important part of drugs. Actually, 70% of drugs approved between 1940 and 2002 are either natural products or have been developed based on knowledge gained from natural products. Depending on the primary information available on this plant, further studies such as phytochemical and pharmacological standardization of extracts, isolation and identification of active constituents, pharmacological studies on isolated compounds, mode of action, formulation development, clinical and toxicological efficacy etc. are still remain to be explored so far.<sup>[20]</sup> *Euphorbia thymifolia* is found usually two ecotypes as green and red forms. These two forms interbreed among themselves and results in forming three intermediates. These are categorized into two major ecological groups like obligate calcifuges and facultative calcicoles.<sup>[21]</sup> *Euphorbia thymifolia* belong genus euphorbia which has many medicinal uses. The plant is bitter, acrid, sweet, thermo genic, laxative and diuretic. The plant is used from ancient times as antibacterial to treat ringworms, in snakebite, to treat dermatitis, eczema and skin inflammation. The leaves and seeds are given in bowel affection of children and are considered stimulant laxative. *Euphorbia thymifolia linn* have been reported to exhibit antiviral and antimicrobial activity. the plant is reported to contain quercetin, essential oil, tannin and different phyto sterols there is no substantial work done on the therapeutic potential of the plant.so far therefore, the present study has been designed to explore the CNS activity profile of isolated phytosterol fraction.<sup>[22, 23]</sup>



Figure No. 1 :- Leaves of *Euphorbia thymifolia linn*.<sup>[23]</sup>

**Plant Profile:- Botanical name:-** *Euphorbia thymifolia linn*.

Scientific classification	
Kingdom	Plantae
Division	Tracheophyta
Class	Magnoliopsida
Order	Malpighiales
Family	Euphorbiaceae
Genus	Euphorbia L.
Species	Euphorbia thymifolia Linn.

Table No.1:-Taxonomical status of *Euphorbia thymifolia* linn<sup>[24]</sup>

<b>Botanical synonyms</b>	<i>Euphorbia hirta</i> , <i>euphorbia Microphylla</i> , <i>euphorbia hypericifolia</i>
<b>Sanskrit name</b>	Dugdika, Swaduparni, Dugdunika
<b>Hindi name</b>	Dudhi, Dudhiya, Dudhee
<b>Marathi Name</b>	Nayeti, Moti Nayeti
<b>Bengali Name</b>	Kharui, Kerai, Bara
<b>Tamil Name</b>	Nanabaala
<b>English Name</b>	Asthma plant, Garden spurge.

Table No. 2:- Botanical classification and Native name<sup>[25]</sup>

**Geographical source:-**It occurs throughout India in plains and low hills, ascending to 5,500 ft. in Kashmir but also distributed throughout tropics except North Australia. *Euphorbia thymifolia* is frequently found in waste lands, along road-sides and wall sides under humid conditions, gravel walks, grasslands, abandoned fields, etc.<sup>[20]</sup>

#### Parts of Plant:-

**Leaves:-**simple, opposite, elliptic, ovate leaves that are 4 to 8 mm wide, with a rounded apex and oblique base.

**Stem:-**The stem produces white latex and slender, smooth, reddish in color and hairy. Profuse branches emerge from it and the length of the stem is about 10-20 cm and the diameter is 1-3 mm.

**Roots:-**Roots are thin, delicate, and contain fibers.

**Flowers:-**The flowering season for the plant is June to November. Flowers are individual or intensely clustered at the axils of the leaves.

**Fruits:-**Fruit capsules have three valves that contain tiny red seed.<sup>[25]</sup>

**Medicinal uses:-** *Euphorbia thymifolia* is traditionally used as a blood purifier, sedative, haemostatic aromatic, stimulant, astringent indiarrhea and dysentery, anthelmintic, demulcent, laxative, and also in caes of atulence, constipation, in chronic cough, as an intiviral in bronchial asthma and paronychia. The dried leaves and seeds are given along with buer-milk to children in bowel complaints.<sup>[20]</sup>

## MATERIALS AND METHODS

### Sample collection and preparation

*Euphorbia thymifolia* collected from local areas of Mandleshwar city and was identified by The plant was authenticated by Dr. S.K. Mahajan, Head of Department of Botany, P.G. College, Khargone, M.P. The plant material was shade dried and powdered and passed through sieve no. 40 ; and stored in a well closed air tight container.

### Extraction

The powdered material was subjected to hot continuous extraction in a soxhlet extractor, successively with petroleum ether (40-60°C), chloroform, ethanol. Finally the powdered material was macerated with chloroform water for 24hrs to obtain aqueous extract. Each time before extracting with next solvent, the powdered material was dried in hot air oven below 50°C. Each extract was then concentrated by distilling off the solvent by evaporation to dryness on a water bath. All the extracts were stored in refrigerator for qualitative analysis and pharmacological studies.



### Phytochemical Screening

**Test for Tannins:-** About 200 mg of the plant extract was boiled with 10 mL of distilled water; and 0.1% Ferric chloride was added to the mixture; which was then observed for blue-black coloration indicating the presence of tannins.

**Test for Alkaloids:-** The plant extract was dissolved in 100 mL of water, filtered, and cooked in steam with 2 mL of the filtrate and three drops of 1% HCl. Then, 1 mL of the heated mixture was combined with 6 mL of the Mayer-Wagner reagent. The appearance of a cream or brown-red colored precipitate indicated the presence of alkaloids.

**Test for Saponins:-** About 0.5 milliliters of the extract and 5 mL of distilled water were combined and agitated. Then, the formation of foam confirmed the presence of saponins.

**Test for Flavonoids and Glycosides:-** 200 mg of the plant extract was mixed with 10 mL of ethanol and filtrated. Two mL of the filtrate, concentrated HCl, and magnesium ribbon were mixed. The formation of a pink or red color indicates the presence of flavonoids. Adding 1 mL of distilled water and NaOH to 0.5 mL of crude extract, the formation of a yellowish color indicated the presence of glycosides.

**Test for Steroids:-** About 1 mL of the crude extract was combined with 10 mL of chloroform and 10 mL of sulfuric acid, and the formation of the bilayer (red top layer and greenish bottom layer) reveals the presence of steroids.

**Test for Terpenoids:-** The presence of terpenoids was determined by the formation of a reddish-brown color in the test for terpenoids, which included mixing of 0.5 mL of crude extract with 2 mL of chloroform and 3 mL of sulfuric acid.

**Test for Phenols:-** About 1 mL of the extract was combined with three drops of FeCl<sub>3</sub>, and 1 mL of K<sub>2</sub>Fe (CN)<sub>6</sub>. The formation of greenish-blue forms confirmed the presence of phenols.

**Results And Discussion:-** The result of phytochemical tests carried out for plant extracts of *Euphorbia thymifolia* Linn are presented in table-3. It has been found that pet.ether (40-60°C) extract contain hexose sugars, fats and oils, steroids, triterpenoids and cardiac glycosides. Chloroform extract contains gums, fats and oils, tannins and phenolic compounds. Alcohol extract contains carbohydrates, fats and oils, steroids, saponin glycosides, flavanoids, triterpenoids, tannins and phenolic compounds. Aqueous extract contains steroids, saponin glycosides, flavanoids, triterpenoids, tannins and phenolic compounds. But alkaloids, proteins and amino acids are absent in all the four extracts. Further activity and isolation are in progress.

**Table no. 3- Result of Preliminary Phytochemical Investigation of *Euphorbia Thymifolia* Linn**

S. No.	Phytoconstituents	petroleum ether extract	chloroform extract	alcohol extract	aqueous extract
1	Carbohydrates	+	-	+	-
2	Proteins	-	-	-	-
3	Amino acids	-	-	-	-
4	Steroids	+	-	+	+
5	Triterpenoids	+	-	+	+
6	Glycosides	+	-	+	+
7	Flavanoids	-	-	+	+
8	Alkaloids	-	-	-	-
9	Tannins & phenolic	-	+	+	+

**Note:** '+' = Present; '-' = Absent

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