

**A REVIEW: PHARMACOGNOSTIC & PHARMACOLOGICAL STUDIES ON CALOTROPIS
GIGANTEA.**

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Fabtech College of Pharmacy Sangola- 413307 India**Corresponding author Mail ID: onkarbpansare9011@gmail.com****ABSTRACT:**

This review discusses various aspects of carob, including its general characteristics, current and potential uses, and invasiveness. The purpose of this review is to a) collect the information available in the literature on carob so that it can be used in future research and b) bring together the resources learned in different fields. Cape melon is one such plant. This article discusses the status, reputation, nutritional value, ecology and distribution, phytochemistry and commercial value of the horn melon. cape melon (L.) Dryand (giant milkweed; Ascariceae) has traditionally been used to treat bronchitis, asthma, leprosy, eczema, and leprosy. C.gigantea were collected through electronic searches of major scientific databases. Scientific data show that the main chemicals of giant flower are glycosides, flavonoids, terpenes, glycosides, steroids and non-protein amino acids It is an important herb widely used in Ayurveda to control various ailments. Current research is to identify the phytoconstituents found in the plant.

Keywords: *Calotropis gigantea, Cardenolides, Milkweed, crown flower.*

INTRODUCTION:

A family called Calotropis was first described in 1810. This flower belongs to the Apocynaceae (Apocyna) family. Its origin is South Asia and North Africa. These plants are often referred to as milkweed because they produce plastic. Herbs and plant have been used as healing agents in modern medical systems since the beginning of time. There is always a need to develop new antibiotics due to the emergence of new infections and drug resistance. Recently, researchers have developed supplements that can be used to treat a number of serious problems with the herbs C. gigantea. Traditional medicine utilizes the milk plant's roots, stems, blooms, and leaves to treat a broad spectrum of disorders. Calotropis gigantea flowers contain analgesic, anti-asthmatic, and stomachic properties that make these useful as medicines.^{[2][3]} The roots are used to treat lupus erythematosus, tuberculous leprosy and syphilis ulcers. The roots affect the brain, cytotoxic effects, the activity of antibiotics and the effects of pregnancy also occur. The leaves and tops of the plants are used to treat inflammation and diarrhea, as the latex has procoagulant activity, laxative properties and wound healing properties. There is a big tree that can reach a height of four meters (13 feet). It includes cluster grows with white or lavender colours.^[4]

Classification:**Table No.1: Taxonomical Classification**

Kingdom	Plantae
Division	Magnoliophyta
Order	Gentianales
Family	Apocynaceae
Sub-family	Asclepiadoideae
Genus	Calotropis
Species	Calotropis gigantean

Calotropis Gigantea Plant :-(crown flower)

- **Synonyms:** -Asclepias gigantea.
- **Family** :-Apocynaceae.

**Fig.No.1:-Calotropis Gigantea**

- ❖ **Morphological characteristics:** -Small tree, 3–4 m high, glabrous or old, known as latex bush or gigantic hornwort; also known as milkweed or swallowtail. The semi-sessile, greatly elliptical to oblong-ovate leaves were 9 to 20 cm x 6 to 12.5 cm in size.. Measures between 5 and 12.7 inches across. The length of the stems separating individual flowers is 2.5–4 cm, while the stems of flower clusters are 5–12 cm. The sepals measure 4 to 6 mm by 2 to 3 mm, or around the size of an egg. A petal's diameter varies between 2.5 to 4 cm. It develops clusters of wax white or lavender-colored flowers. Each flower has five pointed petals joined by a tube. Semi-sessile leaves vary in size from 6 to 12.5 cm x 9 to 20 cm and in create from widely elliptical to rectangular–obovate. The sizes were 5-12.5 inch. Each bloom stems are 2.5 to 4 cm long, while inflorescence stalk are 5 to 12 long.^[9]The leaves size 4 to 6 millimeters x 2 to 3 millimeters and approximate an egg in form. A petal's diameter varies between 2.5 to 4 cm It develops clusters of wax white or lavender-colored flowers. Between

the stamens and the five-foot-tall interconnecting petals that make up each flower, a little but exquisite "crown" grows from the center of each one. [1]

- ❖ **Microscopic Features:-**Thick striped cuticle that surrounds the upper and lower layers of the epidermis externally, seen in the sections obtained from the midrib. There are a small number of epidermal cells of equal diameter around the thin-walled parenchyma cells in the upper and lower parts of the epidermis. Crescent The stele consists of vascular bundles opening on both sides and there is an intercellular space in the underlying tissue. [4]The dorsoventral plate and mesophyll can be seen to differentiate into fence-like and spongy tissue. The thick, striated stratum corneum covers the upper and outer epidermis. Beneath the epidermis are three long, tightly packed layers of palisade parenchyma. In spongy parenchymal tissue, the intercellular space may be radially long.

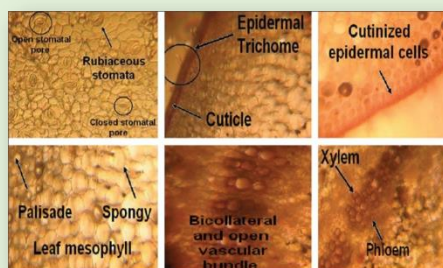


Fig.No.2: -Microscopy of Calotropis Gigantea leaf

➤ T.S OF CALOTROPIS LEAF AND FLOWER:-

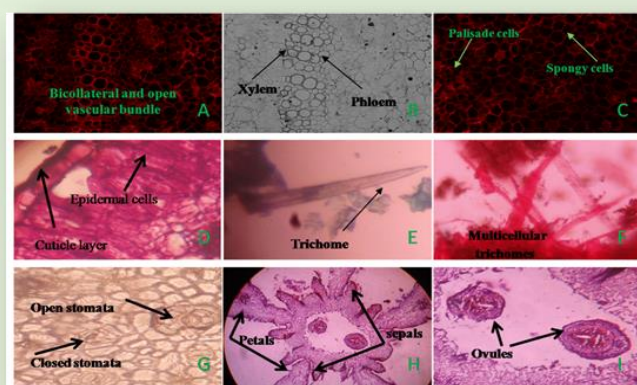


Fig.N0.3: -T.S OF CALOTROPIS LEAF AND FLOWER

Pharmacological Activities:

1)Wound healing activity:-There are many medical studies using animal models. Horn melon latex was first used in albino mice using cut models and incisions. Diseases of animals treated with latex were reduced by 83.42% compared to the control group, which used 76.22% neomycin sulfate cream (1%) as standard. [5][6]Applying an excision, cutting, and death wound healing model, Deshamukh P.T. investigated the effect of *C. gigantea* root and bark on mouse wound healing. The results of the research indicated that horny melon promotes wound healing. affects the healing of wounds in mouse. [3]

2)Anti-inflammatory activity:-

The protective activity of *Calotropis gigantea* has been evaluated with various experimental animal models. Antibacterial activities of chloroform, n-butanol, ethanol and distilled water extracts of *Calotropis gigantea* leaves were analyzed. Comparison of these activities with the paracetamol model in carrageenan-induced paw swelling in rats. After oral treatment of 400 mg/kg *C. gigantea*, significant anti-inflammatory action was observed; this effect was higher than that of 100 milligrams per kilogram of Ibuprofen. [8][9]

3)Antimicrobial Activity:-

A 10 to 16 mm diameter region located on the roots of *C. gigantea* was effective in inhibiting the test disease. Compared with hexane and benzene extracts, benzene extracts have only a minor inhibitory effect on *E. coli*. [3] An Ethanolic extract of *C. gigantea* has been used in our examination, and it proved to be more effective than alternate extracts. This is possible since, while extraction anti-bacterial actives from carob, ethanol, is a polar solvent, causes more active elements to leak out than similar solvents. [2]

4)Anti-malarial:-

Calotropis gigantea extract has antibacterial properties against *Plasmodium berghei* and *Plasmodium falciparum*. This plant has excellent antibacterial properties due to its antiplasmodial activity against chloroquine-sensitive *Plasmodium falciparum*. *Calotropis gigantea* extract can be used as an alternative to insecticides to control mosquitoes. In addition, toxicological tests of flower essences show that they are safe to use and do not harm human skin. [1]

5)Anti-DiarrhoealActivity :-

In a rat model of castor oil-induced diarrhea, the anti-diarrheal activities of a hydroalcoholic 50:50 extraction of the aerial portion of *Calotropis gigantea* were evaluated. By dividing the proportion of the biggest length the charcoal traveled by the whole length of the gut, the intestinal tract was estimated. [15] The Intestinal Method is used to determine both the weight and the volume of the intestinal content that comes from castor oil. [16]

6)Analgesic Activity:-

Rats were given an alcohol-based extract of horn melon blossoms orally, and the analgesic effects were assessed using chemical and temperature models. At doses of 250 milligrams per kilogram and 500 milligrams per kilogram, respectively, the number of writhings in the Acetic Acid induced Writhing Test reduced by 20.97% & 43%. Analgesic activity characteristics for horn melon flower alcoholic extract have been demonstrated by several preclinical research. Oral administration of alcohol showed a reduction in the elicitation of the writhing reflex and paw licking time. Study the activity of acetic acid using the hot plate method and the acid writhing model. [17][18]

7)Antimicrobial Activity:-

The antimicrobial properties herbs *C. gigantea* is well-known for its several therapeutic uses. This study aims to identify melon leaf diseases and their Antibacterial characteristics. Resistance to bacteria such as *Staphylococcus aureus*, the yeast *Bacillus cereus*, *P. aeruginosa*, *Micrococcus in luteus*, and *Klebsiella pneumoniae*, among other bacteria, has been examined for in *gigantea*. [19][20] MHagar uses the best contamination method for in vitro vaccine. The bacteria tested responded positively to the extract.

8) Mosquito Repellent Activity:-*C. gigantea* The extract obtained from *gigantea* flowers is effective in the fight against the *C. quinquefasciatus* vector. Additionally, *C. gigantea* extract can be used as an alternative to

insecticides to control mosquitoes. In addition, toxicological tests of flower essences show that they are safe to use and do not harm human skin. The flowers of *C. gigantea* can be used alone or in combination with other mosquito-repellent plants to produce mosquito repellent. It can also prevent mosquitoes from breeding.^{[1][2]}

9) Insecticidal Activity:-On a variety of *Tribolium castaneum* larvae and adults, the fumigant toxicity, residual film toxicity, and repellent impact of a methanol extract of *Castanea castaneum*'s bark and root were assessed. Methanol extract was used after petroleum ether fraction and chloroform fraction in the application of pesticides against *Gibberellus*. There is no evidence of fumigation toxicity in the sample. ^[21]

10) Hepatoprotective activity:-Keropean melon root bark alcohol extract has been evaluated to have hepatoprotective activity. Alcoholic root bark extract obtained from *C. gigantea* was suspended in 0.6% carboxymethyl cellulose. Alcoholic extract of horn melon root bark has a strong protective effect in D-galactosamine-fed mice, restoring aspartate aminotransferase, alkaline phosphatase and alanine aminotransferase levels to baseline.^[2]

11) Hair growing activity:-The combination of carob with mallow (HRSF) and various herbs (HCF) showed its effect on the initiation and progression of hair growth in albino mice. Scientific Research and Scientific Research comparing Minoxidil. *Calotropis Gigantea* showed hair regrowth ability but was inferior to other treatments.^[34]

12) Anti-Venom Activity:-Crotrope melon plant extract was tested for anti-venom activity against Snake viper *Roschnerii* venom. Dissolve the freeze-dried Viper Roche venom in physiological saline and prepare the desired concentration. Lyophilized polyvalent snake venom antiserum was used as medicine. The methanol extract of Cape melon was tested for its ability to inhibit the effects of various poisons such as lethality, necrotic activity, edema formation, and hemorrhagic activity. This study confirmed the antibacterial properties of *C. gigantea* 1 liquor. ^[32]

V. Pharmacological Profile :

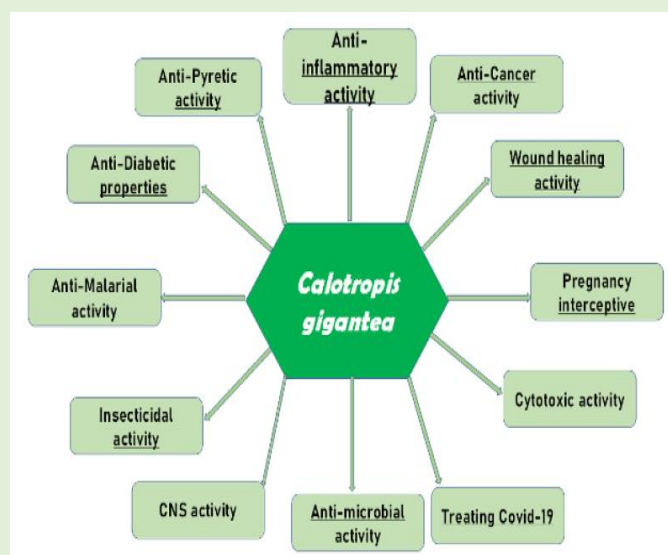


Fig.No.4: -Pharmacological Profile of Calotropis Gigantea

Phytochemical Activity:

- ❖ The plant extracts are filtered after the leaves and flowers are crushed in a variety of solvents, including ethanol, methanol, and distilled water.
- ❖ Treat skin disease.
- ❖ Anti-tussive Activity.
- ❖ Act as an antidote for snake poison.
- ❖ Good anti-inflammatory nature.^[31]

Table No.2: Pharmacological activity Of Different Parts of the plants

Sr. No.	Activity	Plant Part	Year
1	Gastric cancer,	Roots	2008
2	Vasodilatation Effect	Latex	2009
3	Diabetes mellitus, bronchial asthma, rheumatoid arthritis, and nervous disorders	Leaf and Flower	2009
4	Anti-inflammatory	Whole plants	2009
5	Anthelmintic	Latex	2009
6	Antitumor activity	Flower	2009
7	Antihistaminic	Flowers	2010
8	Cytotoxicity	Whole plant	2010
13	Antimicrobial activity	Leaves	2011
14	Diabetes; Antidiabetic	Leaves and Flowers	2011
15	Antibacterial activity	Leaves	2011

ETANO PHARMACOLOGICAL IMPORTANT OF CALOTROPIS SPECIES:**Table No.3: Pharmacological Importance**

Sr no.	Pharmacological importance	Plant and part used
1	Antiviral activity	leaves & whole plant
2	Anti-inflammatory activity	leaves & latex
3	Anti tumor activity	leaves, Flowers, Roots, Latex or Whole plant
4	Anti cancer activity	leaves, Flowers, Roots
5	Asthma	Flower
6	Anxiety and pain	leaves, Flowers, Roots
7	CNS activity	leaves
8	Diabetes mellitus	leaves, Flowers, Roots
9	Expectorant	leaves, Flowers
10	Jaundice	leaves
11	Leprosy	Latex
12	Liver injuries	leaves, Flowers, Roots,
13	Mental disorders	Flowers
14	Piles	Latex
15	Pregnancy interceptive activity	leaves, Flowers, Roots, Latex or Whole plant
16	Removing anemia	leaves, Flowers, Roots, Latex or Whole plants
17	Ringworm of the scalp	leaves, Flowers, Roots, Latex
18	Skin diseases	leaves, Flowers, Roots, Latex
19	TB	leaves, flowers, roots
20	Wound healing	leaves, flowers, roots
21	Indigestion	leaves
22	Fever	leaves, Flowers, Roots, Latex OR Whole plants
23	Analgesic and Antinociceptive activity	leaves, Roots
24	Antibacterial activity	leaves, Flowers, Roots or Whole plants
25	Cytostatic activity	Flowers, Roots
26	Cytotoxic activity	leaves, Flowers, Roots

❖ Antibacterial activity:-

- I. Wash the leaves of the plant to remove dust. Remove the middle of the leaves and cut into small pieces.
- II. Five grams of leaves were crushed in a mortar and pestle by adding five milliliters of distilled water and five milliliters of ethanol. After that, the extract was filtered.
- III. Several varieties of subpar food are covered by bacterial suspensions (E. Coli, Bacillus subtilis, Staphylococcus aureus, Salmonella typhii)
- IV. Use gel punch to create a hole. The hole took the essence.
- V. For twenty-four hours, the plates were incubated at 37°C.
- VI. Check the inhibition zone of the plate. ^[39]

VII. Traditional uses of Calotropis Gigantea :-

1] **In Ayurveda :-** In the tradition of Ayurveda, the plant known as Calotropis gigantea is used to treat paralysis, edema, and fever. Fever, inflammatory conditions, parasitic organisms, viral infections,

anorexia, and asthma all may be treated with flowers.^[29] The plant's barks & root is used to treat diseases of the skin, infections caused by worms, reflux of acid, and intestinal infections.^[41]

2] In Siddha :- Calotropis gigantea is used in Siddha to treat digestive disorders, ulcers, fever, vata illness, and snake bites. Cut the roots of this plant cleanly and apply it by rubbing the bite area thoroughly. Dental problems, mouse bites, inflammations, gonococcal arthritis and other rheumatic diseases can be treated by using the latex of this plant. Use the flowers to treat bronchial asthma.^[38]

3] In Unani :- In the Unani medical tradition, powdered roots and bark has long been used to cure dysentery and diarrhea. The plant's root relieves dyspepsia and has carminative characteristics.^[28]

IX. Chemical Constituent :-

Research into the phytochemistry of Calotropis gigantea has revealed the presence of many different chemicals in the latex, including cardenolides, triterpenoids, alkaloids, resins, anthocyanins, and proteolytic enzymes. Flowers contain polyphyllol, cyclosanol and terpenes.^[36]

• Leaves :-

Alesinol, alesinol acetate, β -sitosterol, uric acid, cardolactone, calotropin and chaltroppanin are the main components in the leaves.^[37]



Fig.No.5:-Leaves

• Latex :-

Latex contains 0.15 to 0.45% levels of gum, calotropin, calotoxin, calactin, uscarin, trypsin, voruscarin, uzarigenin.



Fig.No.6:- Latex

• Flower :-

In addition to calactin, flavonoids, sterols, calotoxin, queretin-3-ratinoside, calotropagenin, and calotropin, the flowers also contain polysaccharides such as L-Rhamnose, Glucose, Glucosamine and D-Arabinose. Flowers also contain chaltropain, or protease, and enzyme 3. C. Gigantin, giganteol, isogiganteol, uscharidin, uzarigenin, voruscharin, syriogenin, proceragenin, proceroside, Taraxast-

20[30]en-3-(4,pentenoate), 3-Thiazoline Cardenolide, α -calotropeol, and 3-epimoreteno are some of the other biological components of gigantea flowers. ^[15]



Fig.No.7:- Flower




- **Bark :-**

Triterpenes which includes two pentacyclic triterpenoids that are not yet discovered: mundarol isovalerate, akundarolisovalerate, and quercetin-3-rutinoside of the base, which is known as Chalotropursenylacetate and Chalotropfriedelenylacetate. ^[13]



Fig.No.8:-Bark of C.Gigantea

Table No.4:-Systemic Classification of *Calotropis gigantea*

Characteristic	Leaf	Root	Flower
			
Colour	Green	White grey	White or lavender
Shape	Sessile a sub-sessile, opposite, ovate, cordate at the base	Cubical	Five pointed petals and a small "crown" rising from the center
Size	6-15 cm by 4.5-8 cm	Depending on size of plant	3.8 to 5.1 cm
Odor	Unpleasant	No Fragrance	No Fragrance
Uses	Anti-diarrhoeal activity	Anti-pyretic activity And cytotoxic activity	antimicrobial and cytotoxic activity

Toxicity:-

This plant is considered harmful and herbivores do not eat it. Tribal people used the latex of this plant as poison to kill animals. Although latex is less damaging to human eyes it can still produce ocular poisoning which can lead to photophobia and impaired vision. using models of air sac swelling and mouse paw edema to investigate latex's anti-inflammatory properties. Anti-inflammatory medication may be measured using *gigantea* latex. When combined with the eye, latex can also result in keratoconjunctivitis, keratitis, toxicity and iridocyclitis, to the corneal cell layer. ^[23]Michigan Cancer Foundation-7 and HeLa cell cultures were tested against ethanolic extracts of DL, C. Procela to ascertain the inhibitory effect of the tested chemicals on in vitro cell growth. In dose-dependent human model experiments, DL and flower ethanol extracts demonstrated cytotoxic activity against MCF-7 and HeLa cell were compared tamoxifen, a medication potentially avoided breast cancer (MCF-7) by >60.46%. Both cobra venom and *Calotropis gigantea* are more toxic, but the former is thought to be more hazardous. Both plants are members of the Aspergillus family and have similar chemical and physiological responses. ^[21]Uscharin, Kalotoxin, Kalactin, Kalotropin and Kalotropageare toxic components. Due to its irritating, neurotoxic and anticholinergic effects, milk can be toxic and cause many deaths. Gigantin, a highly toxic substance, is found in the blood at a rate of 3%. ^[29]High doses of Madar water with latex can cause searing pain in the throat, mouth and stomach in addition to a strong, bitter taste. There are several side effects such as stomatitis, mydriasis,

vomiting, diarrhea and deaths. There may be delirium. The dosage that is lethal is unknown. The lethal window is between 30 min. and 8 hrs.^[30]

Mother Tincture:-*Calotropis gigantea* mother tincture (homeopathic medicine). *Calotropis gigantea* nippo Mother Tincture is a homeopathic medicine used to treat many health problems, including skin and lung diseases. It is also used to treat joint pain and swelling. It is also effective in the treatment of syphilis.



Fig.No.9:- Mother Tincture

CONCLUSION:

Knowledge of medicinal plants plays an important role in healthcare and has great potential in discovering new medicinal plants. *Calotropis gigantea* is widely distributed throughout India and is used as medicine, oil, ornamental plant, fiber, auxiliary plant, mosquito repellent, etc. It is used as. Phytochemicals found in Cape Melon's leaves indicate its potential as a natural herb. It may form the basis for new drugs. *Calotropis gigantea* is an ethnomedicine, various plant elements, including stems, leaf, root, flower and latex are utilized for the treatment of a range from human illnesses. This review attempts to summarize the morphological description of this plant, its therapeutic uses described in Unani medicine, ethnopharmacological data, all pharmacological studies and phytochemical studies conducted on it.

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