

The Brief Review on Calotropis Gigantea

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Submitted: 10-01-2024

Accepted: 20-01-2024

ABSTRACT: Calotropis gigantea is one such plant. In this review the systematic position, vernacular names, distribution, phytochemistry and the economical values and their pharmacology morphology of the Calotropis gigantea are discussed. C. gigantea is extensively studied for its medicinal properties by advanced scientific techniques and a variety of bioactive compounds have been isolated from the different parts of the plant and were analysed pharmacologically. The plant is reported for analgesic activity, antimicrobial activity, antioxidant activity, anti-pyretic activity, insecticidal activity, cytotoxicity activity, hepatoprotective activity

Keywords: Calotropis, morphology, gigantea, calotropis, anti-inflammatory, herbal

I. INTRODUCTION:

C. gigantea is a common wasteland weed and commonly known as giant milk weed. This plant is a native of Bangladesh, Burma, China, India, Indonesia, Malaysia, Pakistan, Philippines, Thailand and Sri Lanka. The plant has oval, light green leaves, milky stem and clusters of waxy flowers that are either white or lavender in colour. C. gigantea is frequently available in India and used for several medication purposes in traditional medicinal system. Most recently C. gigantea is scientifically reported for several medicinal properties[1]

From pre-historic times to the modern era in many parts of the world and India, plants, animals and other natural objects have profound influence on culture and civilization of man. Since the beginning of civilization, human beings have worshiped plants and such plants are conserved as a genetic resource and used as food, fodder, fibre, fertilizer, fuel, febrifuge and in every other way Calotropis gigantea is one such plant, ancient ayurvedic medicine the plant Calotropis gigantea is known as “Sweta Arka” and Calotropis procera as “Raktha Arka”. Both of them are often similar in

their botanical aspects and also have similar pharmacological effects [2]

Medicinal plants are major source of the traditional medicine in India. India is considered as “Botanical Garden of World”. A large segment of Indian population use medicinal plants for their health security. India has 15 agroclimatic zones and 17000-18000 species of flowering plants of which 6000-7000 are estimated to have medicinal usage in traditional systems of medicines (Anonymous, 2015). The Medicinal and Aromatic Plants contain a large number of chemical constituents which are the major source of therapeutic agents to cure human discomfort. The World Health Organization has also recognized the role of traditional systems of medicine, which depend largely upon the medicinal plants. The use of Medicinal and Aromatic Plants throughout the world has been increasing by the rate of 7-15 % annually. Calotropis gigantea (L.) Dry and is one of such plants, which has long tradition of use in various systems of medicine. Thus, a review has been compiled on ethnopharmacological uses, chemical constituents and pharmacology of C. gigantea [4]



Fig .1: Calotropis Gigantea plant [15].

Table 1: Taxonomical classification of *Calotropis gigantea* Linn. [13]

Kingdom	Plantae
Order	Gentianales
Family	Apocynaceae
Subfamily	Asclepiadaceae
Genus	Calotropis
Species	<i>C.gigantea</i>

Table 2: Vernacular names of *Calotropis gigantea* Linn. [13]

Common names	Giant Milkweed, Crown Flower, Swallow Wort.
Hindi	Safed aak, Aak, Alarkh, Madar, Sveta Arka, Akanda, Bara Akand.
Marathi	Ruiee
Gujarati	Aakando
English	Crown flower, giant Indian milkweed. Bowstring hemp, crownplant, MadarMalaysia: Remiga, rembega, kemengu
Indonesia	Bidhuri (Sundanese, Madurese), sidaguri (Javanese), rubik (Aceh).
Philippines	Kapal-kapal (Tagalog).
Thailand	Po thuean, paan thuean (northern), rak(central)
French	Faux arbre de soie, mercure vegetal

➤ **Botanical Description:** A tall shrub reaching 2.4- 3m high; back yellowish white, furrowed; branches stout, terete, more or less covered (especially the younger ones) with fine appressed cottony pubescence. Leaves 1-20 by 3.8-10 cm, sessile or nearly so, elliptic-oblong or obovate-oblong, acute, thick, glaucous-green, clothed beneath and more or less above with fine cottony tomentum; base narrow, cordate. Flowers inodorous, purplish or white. Calyx divided to the base; sepals 6 by 4 mm, ovate, acute, cottony. Corolla 2 cm long or more; lobes 1.3-1.6 cm long, deltoid-ovate, subacute, revolute and twisted in age; lobes of the coronal 3cm long by 5 mm

pubescent on the slightly thickened margin, the apex rounded with 2 obtuse auricles just below it. Follicles 9-10 cm Long, broad, thick, fleshy, ventricose, green. Seeds numerous, 6 by 5 mm, broadly ovate, flattened narrowly margined, minutely tomentose, brown coma 2.5-3.2 cm long [3]

➤ **Phytochemistry**

The chemical constituents of *C. gigantea* and *C. procera* have been extensively investigated, leading to the isolation of many oxypregnanes, terpenoids, sterols, cardenolides and flavonoids (Table 1). Of these classes of compounds, the cardenolides are outstanding in that many have anticancer properties by being cytotoxic to human cancer cells. Afroside, calactin, calotoxin, calotropagenin, calotropin, frugoside, 15 β -hydroxycalactin, 12 β -hydroxycoroglaucigenin, 15 β -hydroxyuscharin, uscharidin, uscharin and uzarigenin are cardenolides reported in both species

Cardenolides are C23 steroids consisting of an unsaturated five-membered lactone ring with a double bond, which is attached to a steroid nucleus at C-17 and a sugar moiety at C-3 (Figure 2) [57]. The biosynthetic pathway of cardenolides involves cholesterol \rightarrow 20 α -hydroxycholesterol \rightarrow pregnenolone \rightarrow progesterone \rightarrow cardenolide [58]. They are a large group of compounds with considerable structural diversity and have long been used as drugs for treating congestive heart failures [59,60]. Recently, their roles in the treatment of cancer have been established as they can induce apoptosis and inhibit the growth of cancer cell lines. At low concentrations, cardenolides have cytoprotective effects by stimulating proliferation and inhibiting cell death in normal cells [59]. Phytochemical studies have revealed that cardenolides are involved in complex cell-signal transduction mechanisms, resulting in the selective control of human tumour but not the proliferation of normal cells [60]. Therefore, cardenolides are promising agents for targeted cancer chemotherapy.[11]

➤ **Geographic distributionof**

It is a native of India, China and Malaysia and distributed in the following countries: Afghanistan, Algeria, Burkina Faso, Cameroon, Chad, Cote d'Ivoire, Democratic Republic of Congo, India, Iran. Iraq, Israel, Kenya, Kuwait, Lebanon, Libyan, Arab Jamahiriya, Mali, Mauritania, morocco, Mozambique, Myanmar, Nepal, Niger, Nigeria, Oman, Pakistan, Saudi

Arabia, Senegal, sierra Leone, Somalia, Sudan, Syrian Arab Republic, Paraguay, Peru, Puerto Rico, St Kitts and Nevis, St Lucia, St Vincent, and the Grenadines, Surinam, Trinidad and Tobago, Uruguay, Venezuela and Virgin Islands Tanzania, Thailand, Uganda, United Arab emirates, Vietnam, Yemen, Republic of Zimbabwe, Exotic: Antigua and Barbuda, Argentina, Australia, Bahmas, Barbados, Bolivia, Brazil, chile, ColombiaEgypt, Eritrea, Ethiopia, Gambia, Ghana, guinea-Bissau, , Cuba, Dominica, Dominican Republic, Ecuador, French Guina, Grenada, Guadeloupe, Guatemala, Guyana, Haiti, Honduras, Jamaica, Martinique, Mexico, Montserrat, Netherlands Antilles, Nicaragua, Panama, (US)

➤ **The features of *Calotropis gigantea***

a. The plant grows very well in a variety of soils and different environmental conditions

- b. It does not require cultivation practices
- c. It is one of the few plants not consumed by grazing animals
- d. It thrives on poor soils particularly where overgrazing has removed competition from native grasses
- e. Sometimes this plant is the only survivor in some areas, where nothing else grows
- f. It is drought tolerant and the pioneer vegetation in desert soil
- g. Presence of latex, extensively branched root system and thick leaves with waxy coverage are the xerophytic adaptations.
- h. Hence, it is distributed in tropical and subtropical area of the world and throughout India. [2]
- i. **Inflorescence:** A thick, multi-bloomed, umbellate, peduncled cymes, emerging from the hubs and seeming axillary or terminal. [12]

Table no 3: Various chemical constituents isolated from *C. gigantea* Linn

Class of Chemical Constituent	Name of Chemical Constituent	Plant Part Used	Extract Taken
Triterpenoids	Di-(2-ethylhexyl) Phthalate	Flowers	Ethyl acetate extract
	Anhydrosophoradiol-3-acetate		
	Lupeol	Aerial parts	Latex
	α -Taraxerol	Root bark	Ethyl acetate extract
Triterpene esters	γ -Taraxasterol	Aerial parts	Hexane and methanol soluble extract
	Lupenyl-1-acetate	Root bark	Petroleum ether extract
Flavonol	Isorhamnetin	Aerial parts	Methanol extract
Cardiac glycosides	Calotropone	Roots	Ethanol extract
	Gofruside		
Steroids	Stigmasterol	Root bark	Methanol extract
	β -Sitosterol		
	β -Sitosterolacetate		Ethyl acetate extract
Resin	β -Amyrin	Root bark	95 % Alcohol extract
	β -Amyrin acetate		
Fatty acids	Isovaleric acid	Root bark	95 % Alcohol extract
Miscellaneous	Asclepin	Roots	Latex

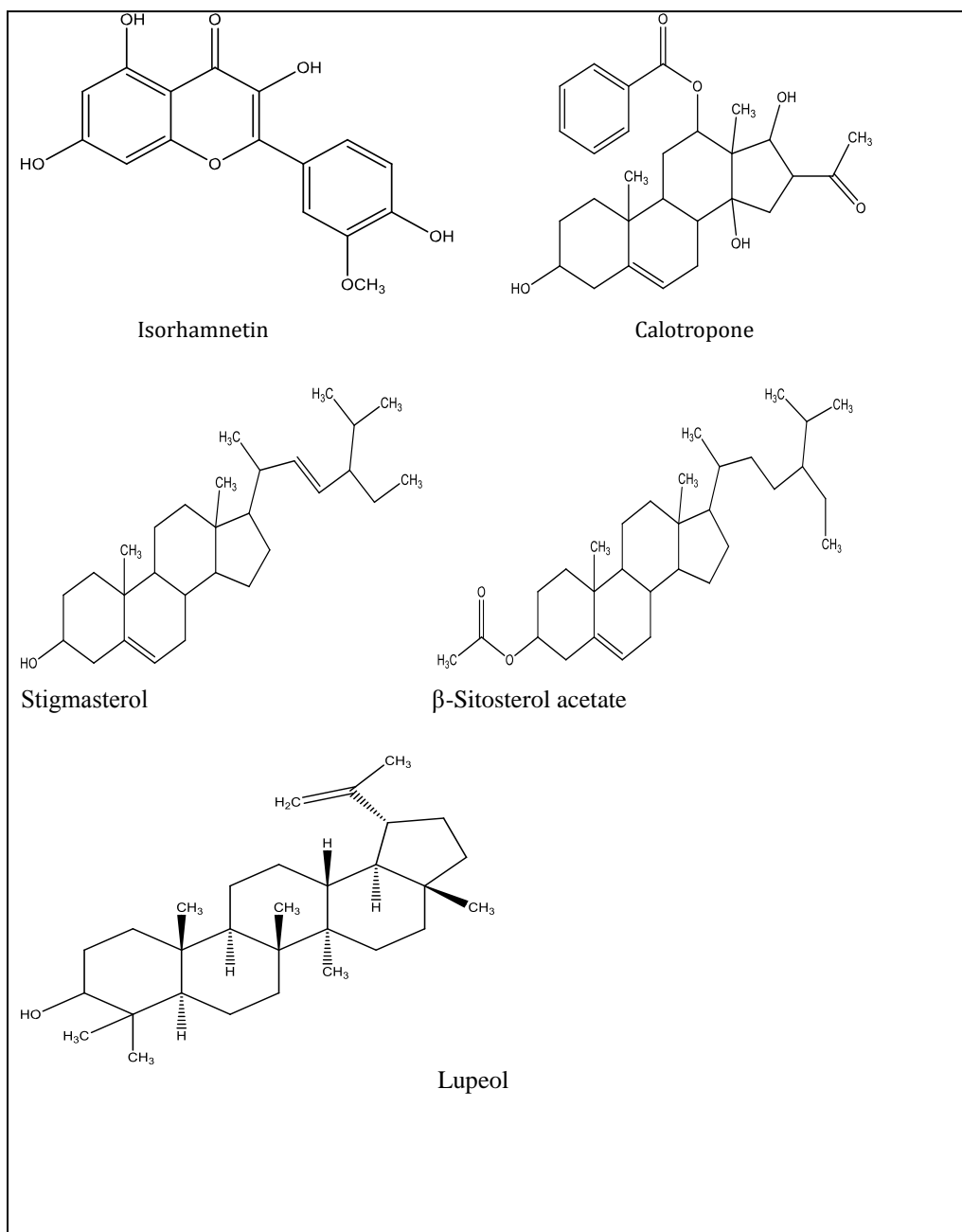


Fig no. 2: Chemical structures of various chemical constituents isolated from *C. gigantea* [13]

Table no 4.: medicinal properties of *calotropis gigantea* [2]

Sl.No	Medicinal properties	References
1.	Asthma	[2]
2.	Abortifacient	[2]
3.	Analgesic and Antinociceptive activity	[2]
4.	Antifertility and emmenagogue	[2]
5.	Anti-inflammatory activity	[2]



6.	Anthelmintic activity	[2]
7.	Anti cancer activity	[2]
8.	Anti dote for Scorpion stings and insect bites	[2]
9.	Anti tumor activity	[2]
10.	Anti-diarrheal and anti dysentery activities	[2]
11.	Antimicrobial activity	[2]
12.	Antiviral activity	[2]
13.	Anxiety and pain	[2]
14.	CNS activity	[2]
15.	Cold	[2]
16.	Expectorant	[2]
17.	Cytostatic activity	[2]
18.	Cytotoxic activity	[2]
19.	Dyspepsia	[2]
20.	Eczema	[2]
21.	Elephantiasis	[2]
22.	Epilepsy	[2]
23.	Elephantiasis of the legs and scrotum	[2]
24.	Expectorant	[2]
25.	Fever	[2]
26.	Fibrinolytic activities	[2]
27.	Free radical Scavenging activity	[2]
28.	Healing the ulcers and blotches	[2]
29.	(Goat) Motility of mature Haemonchus contortus of goat origin	[2]
30.	Indigestion	[2]
31.	kesarayer disease	[2]
32.	Leprosy	[2]
33.	Liver injuries as well as on oxidative stress, Hepatoprotective	[2]
34.	Mental disorders	[2]
35.	Migrine	[2]
36.	Nasal ulcer, laxative, rheumatoid arthritis, bronchial asthma, diabetes mellitus, nervous disorders	[2]
37.	Piles	[2]
38.	Pregnancy interceptive activity	[2]

39.	Purgative	[2]
40.	Removing anemia	[2]
41.	Rheumatism	[2]
42.	Ringworm of the scalp	[2]
43.	secondary syphilis, gonorrhoea, ascites, helminthiasis, and jaundice	[2]
44.	Skin diseases	[2]
45.	Spleen disorder	[2]
46.	Swelling and inflammation in sprain	[2]
47.	TB and leprosy	[2]
48.	Uterus stimulant	[2]
49.	Vermicidal activity	[2]
50.	(Vertenery) Camel diseases treatment	[2]
51.	Worms	[2]
52.	Wounds and ulcers	[2]
53.	Wound healing activity	[2]

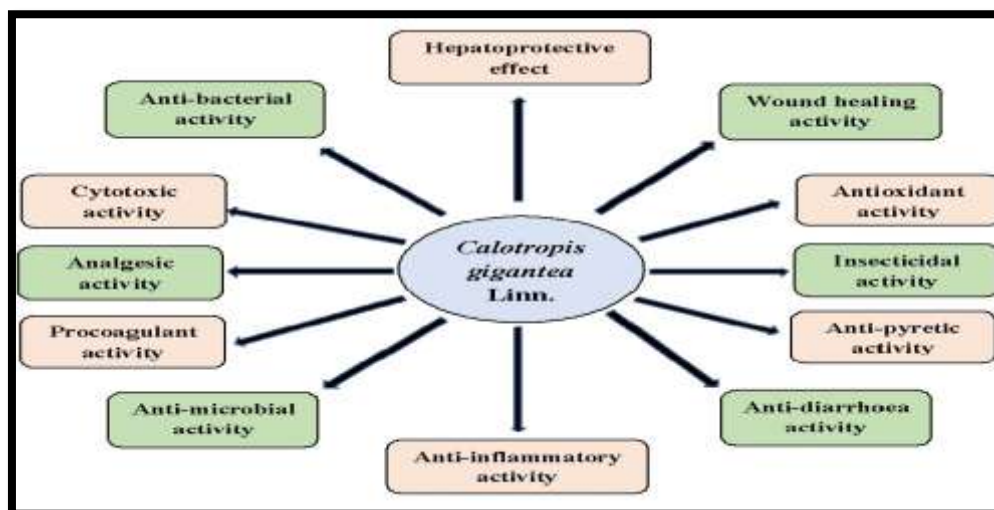


Fig no.3: Medicinal properties of *C. gigantea* Linn[13]

Table.5.Traditional uses of *Calotropis gigantea* [4]

Plant part	Traditional use	Reference
Whole plant	Treatment of bronchial asthma	Shankara, 1979
	Treatment of cholera	Jain and Tarafder, 1970
	Treatment of convulsions	
	Treatment of pneumonia	
	Treatment of ringworm infection	
	Treatment of small pox infection	

	Treatment of toothache	
	Treatment of epilepsy	
	Treatment of fever	Pal et al., 1999; Kumar et al., 2003
	Treatment of leprosy	Iyengar et al., 1986
	As purgative	Deka et al., 1984
	Treatment of rheumatism	Subramaniam, 1999; Katiyar and Kolhe, 2000-2001
	As wound healer	Singh and Pandey, 1980
Flower	As antirabic	Mishra and Naquvi, 1995
	Treatment of asthma	Jha, 2001
	Treatment of catarrh	Yoganarasimhan et al., 1982
	Treatment of cold	Ahluwalia, 1968; Raj and Patel, 1978; Kapoor and Kapoor, 1980; Singh et al., 1998
	Treatment of cough	Suresh et al., 1995; Verma et al., 1995; Kothari and Londhe, 1999
	As digestive	Banerjee and Banerjee, 1986
	Treatment of dog bite infection	Girach et al., 1998
	Treatment of inflammation and tumours	Tiwari and Majumder, 1996
	Treatment of mental disorder	Upadhye et al., 1994, 1997; Borthakur et al., 1996; Katewa et al., 2003
	Treatment of snake bite infection	Natarajan et al., 1999
	Treatment of tuberculosis	Topno and Ghosh, 1999
	As wound healer	Reddy et al., 1988; Rao et al., 2000
	Fruit	Treatment of leucoderma
Seed	Treatment of earache	Banerjee, 1999
	Treatment of cold, cough and chest pain	
	Treatment of blood clots	Chelvan, 1998
	Treatment of body pain and fractures	Rao and Jamir, 1990
	Treatment of eye inflammation	Sudhakar and Rao, 1985; Singh and Maheshwari, 1994; Singh, 2000-2001
	Treatment of tonsillitis	Basak, 1997
	Treatment of insect bite infection	Rosakutty et al., 1999
	Treatment of malaria	Maikhuri and Gangwar, 1993
Leave	Treatment of pneumonia	Girach et al., 1997
	Treatment of stomach pain	Brahma and Boissya, 1996
	As vermicide	Tarafder, 1984
Aerial part	Treatment of congestion and asthma	Kshirsagar et al., 2003
	Treatment of toothache, cold, cough and chest pain	Banerjee, 1999
Latex	Treatment of abortion	Natarajan et al., 1999
	As anthelmintic	Iyengar et al., 1986
	As irritant	Kapoor and Kapoor, 1980
Wood	Treatment of asthma	Shah, 1982
	Treatment of bleeding	Dash and Mishra, 1999
	Treatment of enlargement of liver	Gogoi and Borthakur, 2001

	As expectorant	Iyengar et al., 1986
	Treatment of joint pain	Iman et al., 1997
	Increase breast milk	Saren et al., 1999
	Treatment of jaundice	Yadav and Patil, 2001
	Treatment of leprosy	Shah and Joshi, 1971
	Treatment of migraine	Hemadri and Rao, 1990
	Mother and child health care	Goel and Rajendran, 1999
	Treatment of piles	Nayak et al., 2004
	Treatment of swelling	Maheshwari et al., 1986
	Treatment of toothache	Shah, 1982
Root	Antidote in snake venom	Murthy et al., 1986
	Antidote to rat bite	Barua et al., 1999
	Treatment of cancer	Singh, 2000-2001
	Treatment of cuts and boils	Kumar et al., 2003
	As diaphoretic	Kapoor and Kapoor, 1980
	Treatment of diarrhoea	Nayak et al., 2004
	Treatment of dog bite infection	Topno and Ghosh, 1999; Rao and Jamir, 1990
	Treatment of dysentery	Shah and Gopal, 1982
	Treatment of joint pain	Iman et al., 1997
	Treatment of leprosy and eczema	Banerjee and Banerjee, 1986
	Treatment of malaria	Kshirsagar et al., 2003
	Treatment of menstrual disorders	Rao et al., 1999
	Treatment of skin diseases	Jamir, 1990
	Treatment of worms infection	Shah et al., 1983
	Treatment of ulcer	Deka et al., 1984
	As carminative	
Stem	Treatment of epilepsy	Jain and Sikarwar, 1998

➤ Pharmacological activity of *Calotropis gigantea*

1. Anti-inflammatory Activity of *Calotropis gigantea* Linn.

The ethanolic extract *Calotropis gigantea* showed significant anti-inflammatory activity, suggesting that it predominantly inhibits the release of inflammatory mediators. However, animal study and other studies are necessary to identify and isolate the active constituents responsible for its anti-inflammatory activity and also there is a need to elucidate its mechanism/s of anti-inflammatory action.[11]

2. Anticancer activity of *Calotropis gigantea*

Calotropis gigantea Cardenolides isolated from the root bark of *C. gigantea* exhibited cytotoxic activity against A549 and HeLa human cancer cells [30]. Results of this study indicated the following structure-activity relationships: i) Compounds with six-membered ring sugar groups (Figure 2) showed significantly stronger inhibitory

activity, notably, 19-dihydrocalactin (IC₅₀ = 0.03 and 0.05 μM), calactin (IC₅₀ = 0.02 and 0.03 μM), calotoxin (IC₅₀ = 0.07 and 0.09 μM), and calotropin (IC₅₀ = 0.03 and 0.05 μM). Compounds with five-membered ring sugar groups such as 15β-hydroxycalactinic acid methyl ester, 15β-hydroxycalactinic acid ethyl ester and calactinic acid ethyl ester were inactive (IC₅₀ > 10 μM). ii) A formyl (CHO) or methyl-hydroxyl (CH₂OH) group at C-10 enhanced cytotoxicity of the compounds. 15β-Hydroxycalactin with a CHO group was much more cytotoxic than afroside which has a CH₂ group. 19-Dihydrocalactin with a CH₂OH group displayed similar potency as calactin with a CHO group. iii) The presence of 4'-OH or 16-OH groups decreased toxicity. Calotoxin with an OH group at C-4' is three times less effective than calactin. 16α-Hydroxycalactin with an OH group at C-16 showed no cytotoxic activity.[12]

3. Analgesic activity

The alcoholic extract of the flowers of *C. gigantea* was reported for analgesic activity in

chemical and thermal models in mice. The analgesic activity was performed by acetic acid induced writhing test and hot plate method. Oral dose of ethanolic extract of *C. gigantea* flower produced a significant decrease in the number of writhings and delay in paw licking time.

4. The CNS activity (analgesic activity) of alcoholic extract of peeled roots of *C. gigantea* was tested in albino rats. Analgesic activity was observed in Eddy's hot plate method and acetic acid induced writhings. Oral dose of the extract (250 and 500 mg/kg body weight) significantly delayed the paw licking time and the numbers of writhings were greatly reduced.

5. Wound healing activity Root bark extract of *C. gigantea* was investigated for wound healing activity in Wistar albino rats. The rats were topically treated with extract formulated in ointment for excision wound healing models and extract was given orally (100, 200 and 400 mg/kg dose) for incision wound healing models. The results indicate that extract treatment accelerated wound healing in rats. The crude latex of *C. gigantea* was evaluated for its wound healing activity in albino rats using excision and incision wound models. At a dose of 200 mg/kg/day *C. gigantea* latex showed the significant wound healing activity as treated animals exhibit 83.42 % reduction in wound area when compared to controls which was 76.22 %. The extract treated wounds are found to epithelize faster as compared to controls

6. Cytotoxic activity The cardenolide glycosides collected from the root *C. gigantea* were reported to carry cytotoxic activity against several human and mouse cell lines. Calotropin, frugoside and 4'-O- β -Dglucopyransylfrugoside was found as the active principles. Two compounds (compound 1 and 2) isolated from ethanol extract of the roots of *C. gigantea* were reported to display inhibitory effects towards chronic myelogenous leukemia K562 and human gastric cancer SGC-7901 cell lines. Crude ethyl acetate extract from the flower of *C. gigantea* was reported to inhibit the Ehrlich's ascites carcinoma in mice. Intraperitoneal injection (50, 100 and 200 mg/kg body weight) of the extract significantly decreases the viable tumour cells and body weight gain induced by the tumour burden and prolonged survival time. The extract also

restores the haematological and biochemical parameters (glucose, cholesterol, triglyceride, blood urea, ALP, SGPT and SGOT) that was altered during tumour progression, at 200 mg/kg body weight dose extract exhibits the best activity.

7. Anti-diarrhoeal activity The hydroalcoholic (50:50) extract of aerial part of *C. gigantea* was studied for anti-diarrhoeal activity against castor oil-induced-diarrhoea model in rats. The extract exhibited significant reductions in fecal output and frequency of droppings at the doses of 200 and 400 mg/kg body weight (intraperitoneal dose). The extract also showed significant inhibition in weight and volume of intestinal content.

8. Anti-pyretic activity Chitme et al. (2005) reported the anti-pyretic activity of the water:ethanol (50:50) extract of *C. gigantea* roots. Anti-pyretic activity was studied by using yeast and TAB (Typhoid) vaccine-induced pyrexia in Albino Swiss rats and rabbits. At the dose of 200 and 400 mg/kg body weight (intraperitoneal injection) extract significantly reduced the fever and body temperature was normalized.

9. Insecticidal activity Methanol extract of *C. gigantea* root bark and its chloroform and petroleum ether fractions were evaluated for residual film toxicity, fumigant toxicity and repellent effect against several instar of larvae and adult of *Tribolium castaneum*. Methanol extract showed high insecticidal activity against *T. castaneum* followed by petroleum ether fraction and chloroform fraction. None of the sample showed fumigant toxicity.

10. Anti-inflammatory Activity Ethanol extract of *C. gigantea* was reported for the anti-inflammatory activity against carrageenan induced paw edema in Wistar albino rats. The oral administration of 400mg/kg of *C. gigantea* showed significant anti-inflammatory activity, the activity was found more than that of 100mg/kg of Ibuprofen

11. Antioxidant activity Leaves of *C. gigantea* were reported to carry antioxidant activity. The study reports the DPPH radical scavenging activity, reducing power activity and nitric oxide scavenging activity of the hydroalcoholic extract of *C. gigantea* leaves. Extract exhibited the maximum DPPH radical scavenging activity (85.17%) at 400 μ g/ml concentration. At 100 μ g/ml concentration extract showed 54.55% nitric oxide scavenging activity.

Reducing power of the extract was found to increase with increasing the concentration of extract.

- 12. Pregnancy interceptive properties** Different organic solvents of *C. gigantea* roots were reported to exhibit pregnancy interceptive activity in rats. The extract exhibited 100% pregnancy interceptive activity at a dose of 100 mg/kg. The extract also exhibited 100% efficacy at the dose of 12.5 mg/kg when administered in the Days 1-5 and 1-7 postcoitum schedules.
- 13. Procoagulant activity** The latex of *C. gigantea* is reported to carry procoagulant activity. The latex extract hydrolysed casein, human fibrinogen and crude fibrin clot in a dose dependent manner. Extract hydrolyses the subunits of fibrinogen, subunit Aa hydrolyzed first followed by Bb and g subunit. The crude extract hydrolysis crude fibrin clot strongly compared to trypsin and papain. Proteins present in the latex of *C. gigantea* are strongly

proteolytic and responsible for procoagulant activity of *C. gigantea*.

- 14. Hepatoprotective effects** Ethanol extract of stems of *C. gigantea* was reported for hepatoprotective activity in male Wistar rats against carbon tetrachloride induced liver damage. The extract resulted in significantly decreased of AST, ALT and lipid peroxide levels and showed effective protection of liver. The extract also protects the rats from oxidative damage [1]
- 15. Procoagulant activity:** The latex of *C. gigantea* is reported to carry procoagulant activity. The latex extract hydrolysed casein, human fibrinogen and crude fibrin clot in a dose dependent manner. Extract hydrolyses the subunits of fibrinogen, subunit Aa hydrolyzed first followed by Bb and g subunit. The crude extract hydrolysis crude fibrin clot strongly compared to trypsin and papain. Proteins present in the latex of *C. gigantea* are strongly proteolytic and responsible for procoagulant activity of *C. gigantea*

Table no.6 : Other uses of *Calotropis gigantea* [2]

S.No.	Activities	Parts Used
1.	Arrow poison	Latex
2.	Biocidal activity	Latex
3.	Biogas and substitute for petroleum products	Whole plant
4.	Brewing and to curdle milk	The bark and latex
5.	Cleansing water	Leaves and its Saps
6.	Energy plantation	Whole Plant
7.	(1) Fibers	Bark, and the silky hairs from its seeds
8.	Fodder	Young pods, Senescing leaves and flowers
9.	Fungicidal, insecticidal properties	Whole Plant
10.	Isomers Accumulation	Whole Plant
12.	Latex or rubber	Latex
13.	Leather tanning	Whole Plant
14.	Manna like sugar and liquor (bar)	Sap
15.	Manure, Pest repellent	Twigs and Leaves
16.	Molluscicidal activity	Whole plant
17.	Indicators of Heavy Metals	Leaf and Stem
18.	Mosquitocidal potential	Whole plant Petroleum ether- acetone extract,
19.	Poly aromatic hydrocarbon contamination	Leaves
21.	Reclaiming salt lands	Whole plant

22.	To cool the air around homes	Plantation of Calotropis
23.	Substitute for paper	Leaves

II. CONCLUSION:

This review has focused on the Pharmacological activity also *C. gigantea* has been traditionally used in the treatment of bronchitis, asthma, leprosy and eczema; pharmacologically reported to exhibit analgesic, antipyretic, larvicidal, antiarthritic, antidiabetic, antihyperlipidemic, antibacterial, anti-inflammatory and anticancer activities; phytochemically reported to contain about 4 major classes of chemical constituents such as cardenolides, oxypregnane -oligoglycosides, terpenoids and flavonoids. In recent years, ethnomedicinal studies received much attention as this brings to light the numerous little known and unknown medicinal virtues especially of plant origin. Pharmacological screenings of *C. gigantea* revealed its medicinal potential and represents as a valuable medicinal plant with several medicinal properties

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