



Pharmacological Profile of Calotropis Gigantea in various diseases: A Profound look

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Abstract

Plants are used by peoples for the basis for medical treatments from ancient time and are still in routinely used as traditional medicine in practiced today. There are a huge number of plants having ultimate pharmacological action. In modernization and advancement in research new drug entities came into and play a role in management of any disorder and ailments. The modern allopathic medicine having serious complication at therapeutic dose. Traditional herbal medicines play a significant role in management and treatment of diseases and are getting noteworthy attention in worldwide health debates. Traditional systems of medicine persistently in practiced in many countries around the globe. There is a lot of reason that the people used herbal based medicine. Population augments, inadequate supply of drugs, cost of the treatment, and complicated reaction with the synthetic drugs and weakens of immunity system for infectious diseases have accent on the use of plant based medicines for the treatment of various ailments. There is large hierarchy of medicinal plant, calotropis gigantea having tremendous and ultimate pharmacological profile and used from ancient time in the treatment of various diseases.

Keywords: Calotropis gigantea, disorder, immunity, herbal

1. INTRODUCTION

Recent exploration of research in molecular biology and physiological chemistry has significantly altered our understanding and treatment of various disease and disorder. There are various new molecules introduced in last two decades for the treatment of the diseases. But along their desirable effect they have some serious complication on human body. The advancement in new era of docking studies of molecule, molecular signaling studies, and target oriented drugs were introduced in market for well-being of human which have the therapeutic efficacy as well as some chronic adverse effect. In 2017 FDA introduced Bevyxxa (betrixaban) which is a potent inhibitor of factor Xa (FXa) with an adverse effect of bleeding and spinal hematomas (Jessica et al. 2018, Pandian et al. 2012). Same in 2017 Qtern combines two potent antihyperglycemic drugs, dapagliflozin (a sodium-glucose cotransporter 2, (SGLT-2) inhibitor) and saxagliptin (a dipeptidyl peptidase-4 (DPP-4) inhibitor) for their prominent anti-diabetic potential (Kitagawa et al. 2007, Karly and Garnock-Jones 2017). The serious complication associated with this combination was dyslipidemia and urinary tract infection. Moreover, in 2018 another molecule Yupelri (revefenacin) is a muscarinic antagonist (long-acting) used for the management of patients having chronic obstructive pulmonary disease. In the airways, it blocks M3 (muscarinic) receptor at the smooth muscle leading to bronchodilation. The complications are back pain, nasopharyngitis and upper respiratory tract infection (Heo and YA. 2018, Bulani et al. 2011, Mayee et al. 2011, Benzie and Galor. 2011).

Meanwhile, the traditional medicines are considered as most consistent sources for the discovery of new drugs. There is a rising trend of herbal medicines in all over the world. The use of herbal medicines alone or alongside prescription drugs for the treatment of disease management is very frequent now days (Benzie and Galor. 2011). Traditionally plants have always been used as an imperative source for development of medicine against various diseases. Herbal plants are used to preserve and encourage well existence, prevention and cure ailments. WHO recommended and supported the use traditional medicine provided they are demonstrated to be effectual and secure. Most of the population (80%) globally relies by using traditional medicines for primary health care, most of which engage the use extracts of medicinal plant. Ancient medicines are the primary and basic component of alternative health care systems used globally. An ancient time herbal was used based on skill, knowledge and experience of the

practitioners while in modern drug therapy based upon efficacy and safety. Plants are being recognized as remarkable and potential source of drug discovery in modern era. Most of drug molecule is derived directly from natural sources (Tilburt and Kaptchuk, 2008). The recent studies and researches are focused on the herbal based medicine system for example Shrubs, undershrub, herbs, seeds, whole plant is being used for the well being of human being and treatment of the disease. There are a lot of examples in recent studies in which herbal medicine is used to cure the disease. From primeval times to recent modern era on global platform including India shows that, Plants and other natural origin objects have intense power on ethnicity and civilization of human beings. From civilization, human beings have respect and worshiped plants, and these plants preserved as a hereditary resource and used the reserve resources as food, manure, fibre, fuel and in each supplementary way (Sen and Chakraborty, 2016), *Calotropis gigantea* is one of such category plant. *Calotropis* is the preeminent shrubs used in management of various diseases.

During prehistoric time Ayurvedic medicine, *Calotropis gigantea* is known as “Sweta Arka” and *Calotropis procera* as “Raktha Arka”. *Calotropis gigantea* R.Br. (Apocynaceae-Family, Asclepiadaceae-Subfamily) is a perennial potential herb found predominantly in barren and wastelands throughout India. The systematic classification and synonyms of the plant are given in Table 1 and 2 respectively. Conventionally *Calotropis gigantea* is used individual or in combination with other herbal plants to treat various widespread diseases. The plant is described to have analgesic (Pandian et al. 2013) free radical scavenging activities (Rathod et al. 2009) and anti-diarrhoeal activity (Chitme et al. 2004). Fresh juice (from young buds) of the plant cures earache and toothache (Pathak and Argal. 2007, Mushir et al. 2016) and is also reported to decrease inflammatory disorders (Adak and Gupta. 2006, Das et al. 2009) the plant also reported to be used as anti-anxiety, in convulsions (Argal and Pathak. 2006, Kaur et al. 2014, Khan et al. 2014, Lima et al. 2012) and in central nervous system disorders (Argal and Pathak. 2006, Ghule et al. 2014). The plant also reported as antimalarial (Satish et al. 2017, Kaushik et al. 2015, Kovendan et al. 2012) as well as anticancer (Habib and Karim. 2011, Bhat and Sharma. 2013, Mutiah et al. 2018) and other common disorder and ailments such as such as rheumatism (Timilsina et al. 2020, Saratha and Subramanian. 2011, Patil et al. 2007) fevers, elephantiasis (Chitme et al. 2005) wound healing (Deshmukha et al. 2009), asthma (Mayee et al. 2011), diabetes (Rathod et al. 2011, Jatin et al. 2014, Manivannan and Shopna. 2017). Active Phytoconstituents in plant parts including triterpenoids (Gupta and Ali. 2000), flavonoids (Seniya et al. 2011, Kori and Alawa. 2014) glycosides and proteases (Rajagopalan et al. 2019) volatile long chain fatty acids (Singh et al. 2014) have been isolated from the various parts of the plant *Calotropis gigantea*.

2. GEOGRAPHICAL

2.1 Geographical distribution and Natural habitat

Calotropis Gigantea (Madar) is drought resistant, perennial shrub mostly found in wastelands throughout the India. It is large indigenous shrub native to high temperature province of Asia, including India, China, Bangladesh, Pakistan, and Srilanka. It is salt tolerant, preferred distributed in sandy soils with annual rainfall is 350-450 mm (low rainfall). The seeds of plant are dispersed through air and animals. The temperature effect was noticed on the pH of *Calotropis Gigantea* was found to be remain constant at 25°C- 45°C. It is unspecified to be a sign of over cultivation. It is peculiar plant not devour by grazing animals. The plant having extensively thick and broad leaves with waxy layer is xerophytic adaption and adapted pronged root system (Pandian et al. 2013).

2.2 MORPHOLOGY OF PLANT (macroscopic and microscopic evaluation):

2.2.1 Macroscopic characteristics:

Calotropis gigantea is one of the most useful shrubs in herbal medicine. *Calotropis gigantea* is a straight shrub and well branched. Height of plant is approximately 1-6 meter. Grown well in dry, drought and difficult soils with average rain. The plant having well furnished root system woody at base, the roots are cylindrical, round, circuitous and repetitively branched. Root system is covered with fissured and corky yellowish bark. Internally root system is stoneware white with a diameter of 3-10cm. Bark of the root system is short, curved and peeled off at a regular interval and having 2-4mm thick with particularly mucilaginous nature and having a bitter taste. *Calotropis gigantea* is bulky shrub; grow like a small tree with clusters of waxy flowers whitish in color. Flowers are actinomorphic, bisexual, pentamerous (five pointed petals) and bracteates in nature. Flowers having no fragrance. Flowers of *Calotropis gigantea* having a graceful crown in the centre of each flower that holds the stamens. *Calotropis gigantea* is multi-flowered, peduncled cymes arises from nodes and appear at the terminal. Calyx having polysepalous, glabrescent, shortly united at the base side. Corolla is gamopetalous and warped aestivation. In India flowers are Crown flower and its garland are used in temples of Lord Shiva (Also known as Shiv Aak) for accord, peace, wealth and stability in society.

The plant has oval, light yellowish green (pale green) leaves and milky stem. Leaves are simple, sessile, opposite decussate, exstipulate, sharp-quadrilateral elliptic to broadly elliptic, 5-30X2.5-16 cm. Apex of the leaf is shortly edged to apiculate and mucronate (cordate) at the base side. Entire leaf of *Calotropis gigantea* having margins and having white short tomentose petioles. The plant having five stamens and pistil united in one column (gynandrous), anther is consistent and dithecous. Styles are uniting at the apex. Anther appends to the stigma form a gynostegium. Fruit of *Calotropis gigantea* is plain, flabby, extravagant, inflated and subglobose. Seeds of *Calotropis gigantea* numerous in number, small in size, flat, obovate and having white silky

pappus hair on one side, length is approximately 3-4 cm long. Seeds of *Calotropis gigantea* are freely float with air. The plant having extremely widespread natural revival capacity.

2.2.2 Microscopic characteristics:

In root system cork is present as the upper circular outermost layer with 15-20 rectangular cell arrangement in compact manner without any intracellular space in Transverse section. Large numbers of starch grains are present in cells of cortex section. Parenchymatic cells having asymmetrical and irregular in shape and having laticiferous tubes and badge of calcium oxalate. In intersecting (transverse) section of leaves shows epidermal cells on both sides of the leaves covered with a thick striated hard outer covering cuticle. In xylem largely consists of vessels and trachieds. This plant plays host to a variety of insects and butterflies (Pandian et al. 2013).

Table 1: Systematic Classification of Plant

Kingdom	Plantae
Order	Gentianales (Angiosperms)
Family	Apocynaceae
Subfamily	Asclepiadaceae
Genus	Calotropis
Species	C.Gigantea

Table 2: Synonyms (Vernacular Names) of Calotropis Gigantea

India	Aak, Madar, Shiv Aak, Sweta Aak (Hindi), Dhola Akara (Haryanvi), Aakda, Vasuka (Sanakrit), Ekka (Kannada), Rui (Marathi), Aakonda (Bengali),	(Pandian et al. 2012, Chaudhary et al. 2017)
English	Milkweed, Swallowwort, (1) Crown Flower (10)	
French	Mercure vegetal	
Thailand	Rak	

3. ACTIVE CONSTITUENTS OF CALOTROPIS GIGANTEA:

In preceding studies reported countless phytochemical profile of all parts of *Calotropis gigantea* particularly in the leaves, flowers, bark and latex. Phytochemical Study (Identification Test) of *Calotropis Gigantea* by using plant extract shows that plant having rich source of Sterols, Resin, Alkaloids, Glycosides, Carbohydrates, Tannins, Flavonoids, Saponins, Peroxide Table 3. Beta-amyrin, fatty acids (both saturated and unsaturated), acetates, Usharin, a mixture of tetracyclic triterpene compounds, giganteol, terols are also considered as the important phytoconstituents (Gupta and Ali. 2000). Gigantin, Cardenolide calotropin, calcium oxalate, alpha and beta-calotropeolhydrocarbons (Chaudhary et al. 2017), α and β -amyrin, taraxasterol, β - sitosterol, α -amyrin and β -methylbutazone, α -amyrin and β -amyrin acetate, taraxasteryl acetate, lupeol acetate B, gigantursenyl acetate A, gigantursenyl acetate B (Seniya et al. 2011, Kori and Alawa. 2014) akundarol, uscharidin, flavonol glycoside, calotropin, calotroposides A to G, phlobataninns and steroids (Kitagawa et al. 2007). Stigmasterol and sitosterol and pregnanone (Bulani et al. 2011) are responsible for many of its Pharmacological actions. The succeeding cardenolides are reported in the previous studies: calactin, calotropagenin calotoxin, proceroside, syriogenine, uscharidin, voruscharin, uzarigenin and uscharin and lavonol glycosides (Mushir et al. 2016, Gupta and Ali. 2000, Seniya et al. 2011, Kori and Alawa. 2014, Srivastava et al. 2007, Thitima and Somyot. 2006). Other compounds found are benzoyllineolone and benzoylisolineolon (Srivastava et al. 2007). Steroids, saponins, alkaloids, terpenes, enzymes, alcohol, resin, fatty acids and esters of calotropeols (Pandian et al. 2013, Rajagopalan et al. 2019) triterpenoids (Khan et al. 2014) Flavonoids (Mushir et al. 2016) volatile long chain fatty acids, glycosides and proteases (Ghule et al. 2014) have been extracted from the various parts of the plant *Calotropis gigantea*.

The 'Akond mul' root of *Calotropis gigantea* having cardenoloids glycosides, sucrose, and calotropin D1 and D2 frugoside was found to be cytotoxic principles. Calcium, aluminum, lead, nickel, magnesium, cadmium, cobalt, copper, iron, chromium, zinc are the micronutrients present in leaves and bark (Kovendan et al. 2012, Deshmukha et al. 2009, Singh et al. 2014). The laticifer fluid of *Calotropis gigantea* having enzyme aspartic proteinase and cysteine proteinase and they shows strapping proteolytic activity (Rajagopalan et al. 2019). Water- and water-soluble substance is 85-95%. 3'-methyl butanoates of alpha amyrin and sigma taraxasterol are the new triterpene ester isolated from latex (Lima et al. 2012, Saratha and Subramanian. 2011, Pandian SK. 2013). Di-(2-ethylhexyl) phthalate and anhydrosophoradiol-3-acetate are isolated from flower of the plant (Habib and Karim. 2009). *Calotropis gigantea* is resistant to phytopathogen and various insect due to presence of these proteolytic activities (Alam et al. 2009). In white milky latex presence of latex proteins and other constituents are in calotropin, lupeol, calotoxin, and uscharidin. Calotroposide A and B are Glycosides Terpenoids also obtained from roots of *Calotropis gigantea* (Kitagawa et al. 2007). The active constituents of plant are shown in Table 4. The pharmacological properties of the plant are shown in Fig. 1.

Table 3: Phytochemical Study (Identification Test) of Calotropis Gigantea by using plant extract

Sr. no.	Chemical Component	Identification Test	(Pandian et al. 2012, Kitagawa et al. 2007, Chaudhary et al. 2017)
1	Sterols	Liebermann-Burchard Test.	
2	Resin	With acetone and conc. HCL	
3	Alkaloids	Dragendorff's Test, Mayer's Test	
4	Glycosides	Keller-killiani Test	
5	Carbohydrates	Molish Test, Fehling Test	
7	Tannins	FeCl ₃ Test	
8	Flavanoids	Ammonia Test	
9	Saponins	By using Na ₂ CO ₃	
10	Peroxides	By Potassium Iodide Test	

Table 4: Active constituents of calotropis gigantea

Sr. No	Plant Part	Active constituents
1	Root	Calotropnaphthlene, calotropinsespenol
2	Root bark	B-amyirin, two isomeric crystalline alcohols, giganteol, isogiganteol, and cardenolides.
3	Stembark	β-calatropeol, βamyirin, giganteol.
4	Leaves	Alkaloids, glycosides, mudarine.
5	Latex	Proteinase, cysteine, 3'-methyl butanoates of alpha amyirin and sigma taraxasterol, triterpine ester, akundarin, latex contains, uscharin, calotoxin, calactin, latex also contains acalatropeol, β- calatropeol, β-amyirin and calcium oxalate.
6	Flower	bitter resins akundarin, α-calatropeol, β-calatropeol, amyirin, cardioactive glycosides, mudarine, asclepin, calotropin

4. MECHANISTIC INSIGHT OG CALOTROPIS GIGANTEA:

1. Antidiabetic activity: *Calotropis gigantea* shows Antidiabetic activity by reducing elevated blood glucose level that reported in various studies (Rathod et al. 2011). Extracts of *Calotropis gigantea* plant shows hypoglycemic effect. *Calotropis gigantea* prevent reduction of body weight in case of diabetes mellitus. *Calotropis gigantea* increases cellular population (granulated cell and normal beta cells) in pancreatic islet. The extract of plant is reported as very effective in reducing elevated serum glucose level in experimental animal (Jatin et al. 2014, Manivannan and Shopna. 2017).

2. Anti-oxidant activity: Reactive oxygen species (ROS) having all highly reactive oxygen bearing molecule including free radicals. Examples are Free radicals are the singlet oxygen, nitric oxide radical, super oxide anion radical, hypochlorite radical, hydrogen peroxide, various lipid peroxides continuously generated in body as the normal byproduct of basic metabolic processes and they interfere with normal cellular mechanism. All these ROS react with membrane phospholipids, proteins, nucleic acids and other cellular components; that may further lead to cellular damage. ROS plays a key role in complication of various diseases. In Type-II diabetes mellitus oxidative stress is increased due to presence of free radicals. Increased blood sugar level damages the various tissues and further leads to generation of tissue damaging reactive oxygen species. *Calotropis gigantea* was reported to reduce oxidative stress due to presence of free radical in Type-II diabetes mellitus (Rathod et al. 2009, Singh et al. 2010).

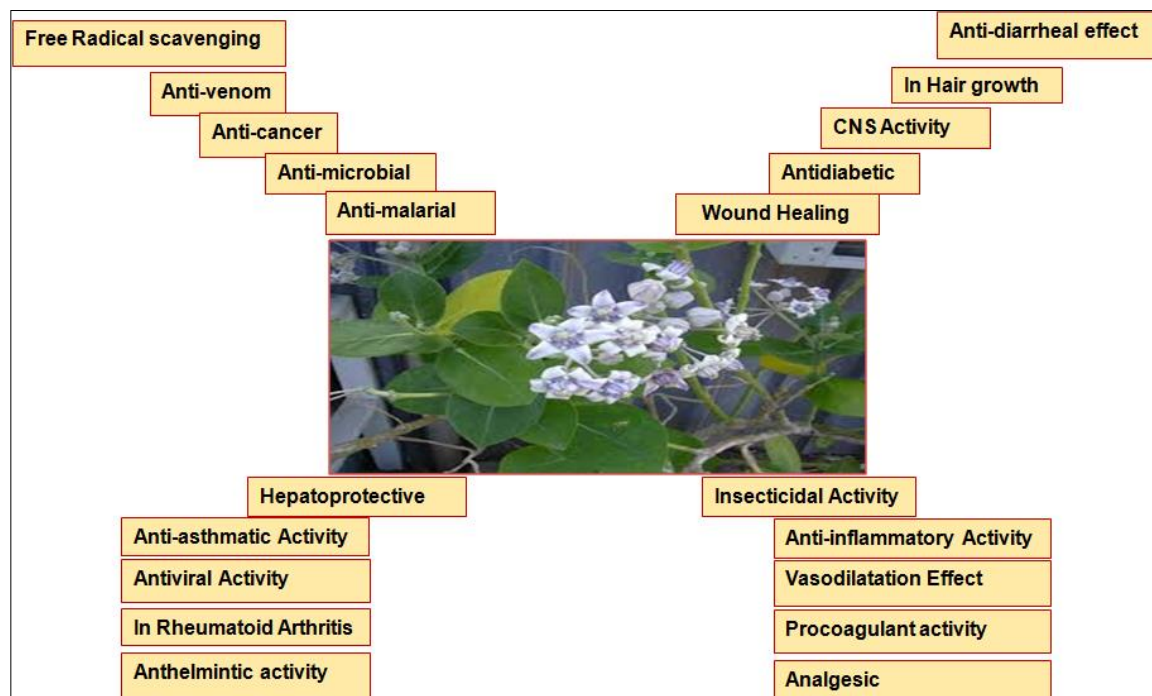


Fig. 1 Pharmacological activities of *calotropis gigantea*

3. Wound Healing: Wound healing is complex mechanism that having various steps including granulation, collagenization, collagen maturation, scar maturation and formation. These are separate ongoing processes in wound healing and independent to each other. It has been reported that *Calotropis gigantea* having prohealing action. *Calotropis gigantea* increase the process of epithelization and increase in collagen concentration that further helps in wound healing. *Calotropis gigantea* increases the amount of hydroxyproline that further help in synthesis of collagen. Latex *Calotropis gigantea* shows tremendous wound healing activity (Biswas TK and Mukherjee B. 2003).

In preliminary phytochemical studies of the plant reported that the presence of triterpinoids, tannins and alkaloids are the responsible for the wound healing mechanisms. In comparative study with framycetin sulphate cream (1% w/w), the reduction in wound area was reported in *Calotropis gigantea* was greater than framycetin sulphate (Deshmukha et al. 2009).

4. CNS Activity: Extract of *Calotropis gigantea* promoted development of neuron in early stage. *Calotropis gigantea* improves in collateral branching, and augmentation in axonal and dendritic lengths, numbers and branching orders. *Calotropis gigantea* shows neuropharmacological activity such as antidepressant, sedative and hypnotic, antianxiety, anticonvulsant, analgesic, and neuritogenesis due to presence of flavonoids chrysin, apigenin (Argal and Pathak. 2006, Kaur et al. 2014, Khan et al. 2014, Lima et al. 2012, Ghule et al. 2014).

5. Anticancer: *Calotropis gigantea* was reported as anticancer shrub. The plant having cardiac glycosides that having cytotoxic effect. Cardiac glycosides (calactin) normally induce growth inhibition in neoplastic cell by damaging the DNA of leukemia cell in breast cancer (Bhat and Sharma. 2013). Calotroposides A, and cardinolides shows anticancer activity. The active constituents (anhydrosophoradiol-3-acetate) extracted from *Calotropis gigantea* flower is reported for improving cancer induced complications (in vivo) (Habib and Karim. 2011, Bhat and Sharma. 2013, Mutiah et al. 2018).

6. Anti-diarrheal effect: *Calotropis gigantea* inhibits the release of prostaglandins from intestinal mucosa that increases intestinal motility and secretion. *Calotropis gigantea* significantly reduce severity and frequency of diarrhea. *Calotropis gigantea* reverse the mechanism in secretory diarrhea due to activation of Chloride ion channel results in efflux of Chloride ion from the cell results in enormous secretion of water into lumen of intestine. *Calotropis gigantea* have ability to decrease intestinal motility and reabsorb water and sodium chloride (Chitme et al. 2004).

7. Anti-malarial: Malaria is lethal parasitic disease leads to mortality. *Calotropis gigantea* exhibited antimalarial activity against plasmodium falciparum and plasmodium berghei. *Calotropis gigantea* shows excellent antiplasmodial activity result against chloroquine sensitive plasmodium falciparum (Satish et al. 2017, Kaushik et al. 2015, Kovendan et al. 2012).

8. Antimicrobial: There are various types of pathogenic microorganisms that become are resistant to most of antibiotic. Microorganism becomes sensitive and resistant due to the unsystematic use of antimicrobial drugs. This may lead to various clinical issues in treatment of infectious diseases. Antibiotics are used in treatment of infectious disease having associated adverse effect including allergic reaction, hypersensitivity and immunosuppression. Plants having some active constituents, which are naturally toxic to fungi and bacteria. *Calotropis gigantea* reported as antimicrobial, antibacterial and cytotoxic effect (Timilsina et al. 2020, Kori and Alawa. 2014).

9. Anti-inflammatory Activity: inflammation is due to release of various chemical mediators. Major cause of inflammation is prostaglandins. *Calotropis gigantea* was reported that it reduces the inflammation causing mediators and prostaglandins. The reported anti-inflammatory profile of plant was proving against albumin denaturation study method (Benzie and Galor. 2011, Adak and Gupta. 2006, Das et al. 2009, Saratha and Subramanian. 2011).

10. Anti-arthritis: Rheumatoid arthritis is a persistent inflammatory autoimmune disease characterize by increase joint pain, joint stiffness, joint swelling, loss of joint function that affects 1% of the adult population globally. The level of pro-inflammatory cytokines such as TNF- α , IL-1 β , IL-6 and IL-10 were increased. *Calotropis gigantea* reported as anti-inflammatory and anti-arthritis activity due to presence of lupeol (Patil et al. 2007).

11. Hepatoprotective: Various studies reported that extract of *Calotropis gigantea* is Hepatoprotective. Level of SGOT and SGPT was significantly reduced in studies. Methanolic and chloroform extract of leaf show admirable hepatoprotective activity (Tenpe et al. 2007, Lodhi et al. 2009).

12. Anti-alopecia: In many reported studies shows the prominent effect of *Calotropis gigantea* in hair growth activity in comparison to other herbs. In various research studies shows that use of herbs like Hibiscus rosa-sinensis, *Calotropis* spp., and their polyherbal formulation with the potential of preventing hair loss in complication of some other disorder like stress induced alopecia (Singh et al. 2017).

13. Anti-asthmatic Activity: Bronchial asthma is a hyper responsiveness of tracheobronchioles smooth muscle. It is chronic inflammatory disease; leads to broncho-constriction, airway inflammation and obstruction due to various noxious stimuli, in which different cells play a key role, important cells are that release chemical mediators are mast cells, eosinophils and T- lymphocytes that cause broncho-constriction. Histamine is principal inflammatory mediators in the instant phase of asthmatic attack, causing airway hyper responsiveness and bronchial constrictions. *Calotropis gigantea* shows potential effect in inhibition of eosinophiles, neutrophiloes, lymphocytes in bronchoalveolar lavage fluis (p<0.05). *Calotropis gigantea* shows broncho-relaxation effect. Root of *calotropis gigantea* contains α -and β -amyryn are reported to having anti-lipoxygenase activity (Bulani et al. 2011, Mayee et al. 2011).

14. Vasodilation Activity: The latex of *Calotropis gigantea* is a prominent fount of active constituents that having different biological properties including controlling the heart muscle. The plant having strong dilatory activity at a fix dose; due to presence of some protein in crude latex extracts that having strongly basic in nature. The existing data supports the role of latex in cardiovascular system involves alteration in the cation (Ca²⁺/Na⁺) permeability across the respective membrane (Sheelaa et al. 2010).

15. Analgesic Activity: The alcoholic extraction of *Calotropis gigantea* flowers was reported for the analgesic activity on various preclinical studies. Oral dose of alcoholic extract produced a significant decrease in the incidences of writhings reflexes and paw licking time. The activity is studied by using acetic acid writhing model and hot plate method (Pathak and Argal. 2007).

16. Procoagulant activity: The latex of *Calotropis gigantea* is reported as procoagulant activity due to presence of some proteins. The human fibrinogen, casein and crude fibrin are hydrolysed by latex extract of *Calotropis gigantea* in a dose dependent method. Latex extract hydrolyses the various subunits of fibrinogen vice versa. Fibrin clot is strongly hydrolysed as compared to papain and trypsin (Rajesh et al. 2005, Bindhu and Singh. 2014).

17. Anthelmintic activity: Anthelmintics or antihelminthics are drugs that remove or expel parasitic worms from the body by killing them. The mechanism of action either killing them or paralyze them. They may also be called vermifuges (paralysis. stunning) or vermicides (killing). Anthelmintics act either locally or systemically. Root extract of *Calotropis gigantea* shows Anthelmintics or antihelminthics activity. Due to cytotoxic effect *Calotropis gigantea* exhibits excellent anthelmintic activity. They exile worms from the GIT or destroy helminthes that attack on organs and tissues (Argal and Sachan. 2009).

18. Antiviral Activity: Influenza is viral infection. It is infectious disease caused by an influenza virus. Various novel active constituents are isolated from latex of *Calotropis gigantea* are lignan glycoside (+)-pinoresinol 4-*O*-[6''-*O*-vanilloyl]- β -d-glucopyranoside and two phenolic compound 6'-*O*-vanilloyltachioside and 6'-*O*-vanilloylisotachioside [39]. These compounds show antiviral activity of *Calotropis gigantea* (Kumar et al. 2010).

19. Insecticidal Activity: Various extract of *Calotropis gigantea* and extracts fraction of *Calotropis gigantea* were showed the insecticidal activity and repellent toxicity to adults and larvae of various species of insect *T. castanum*, *T. castaneum* (Kovendan et al. 2012).

20. Antivenom activity: Snake bite may lead to cause different pathophysiological alteration in human body such as edema, inflammation, haemorrhage, necrosis, alterations in blood coagulation process and finally leading to death. Due to presence of alkaloid, flavonoids, saponins, steroids, triterpenoids and tannins are responsible for the anti snake venom activity of *Calotropis gigantea*. The alcoholic extract of *Calotropis gigantea* was reported for its activity to neutralize noxious effects of the venom (*Vipera russelli*) like necrotizing activity, lethal-ity, edema and hemorrhagic activity (Chacko et al. 2012).

5. CONCLUSION AND FUTURE PRESPECTIVE:

The Plant *Calotropis Gigantea* shows a lot of tremendous therapeutic effect and having a large economic value. The plant having excellent features including: a perennial shrub, distributed in tropical and subtropical waste land areas. The plant can grow in all type of soil and in any tough environmental conditions; plant does not require any cultivation technique and procedure. The plant having hydrocarbons so that it needs to further analysis and research on facet of energy conversion. The quantity and quality aspect on active principle which are competent aliments are subjected to many factors including soil condition, climate, environment so that standardization of Phytochemical and active ingredients are investigated by these factor. These key factors are very significant to establish the uses of the plant more effectively and precisely. The plant needs further investigation for the precise mechanism and activity of phytochemical constituents.

In combination of past research and studies reports justify the use of *calotropis gigantea* by traditional health care for professional for the treatment of various pathological alterations. The plant having huge number of phytochemical ingredients and various active constituents. Plant having various organic and inorganic salts including macro and micronutrients.

Further study and investigation is needed to identify unknown compound and characterization of new potent molecule that suppress various pathological disorders and development of new class of drug therapies for the betterment of health of human beings.

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