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# A RECENT REVIEW ON- PHYTOCHEMISTRY AND PHARMACOLOGICAL IMPORTANCE OF *CALOTROPIS GIGANTEA* PLANT

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## ABSTRACT

Since the dawn of civilization, people have revered plants, and these plants have been genetically preserved. Resource and used in a variety of ways, such as food, fibre, fuel, fertiliser, and febrifuge. Among them is the *Calotropis gigantea* plant. The systematic position, common names, vegetative characteristics, ecology, and distribution, as well as *Calotropis gigantea* phytochemistry and economic benefits are examined. Asclepiadaceae perennial herb *Calotropis gigantea* has a long history of usage in folk medicine. This plant has yielded a wide variety of chemical substances, including cardiac glycosides, flavonoids, terpenoids, alkaloids, tannins, and resins. The plant has been used to treat a number of illnesses, such as leprosy, ulcers, tumours, and piles. Analgesic activity, antipyretic activity, pregnancy prevention, CNS activity, anti-inflammatory activity, procoagulant activity, anti-diarrheal activity, free radical scavenging activity, antimicrobial activity, anti-tumor, antifungal, antitussive, and antifeedant activity are just a few of the reported pharmacological activities.

**Keywords / Key Points:- *Calotropis gigantea*, Pharmacological activity, Traditional uses**

## INTRODUCTION:

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 **[1]**.

In ancient ayurvedic medicine the plant *Calotropis gigantea* is known as "Sweta Arka" and *Caotropis procera* as "Raktha Arka". Both of them are often similar in their botanical aspects and also have similar pharmacological effects **[2]**. The systematic position, of the plant is given in the following **Table 1**.

**Table 1: Systematic position of the selected plant [3]**

| | |
|---|---|
| **Kingdom** | **Planatae** |
| **Kingdom** | **Planatae** |
| **Subkingdom** | **Tracheobionta** |
| **Superdivision** | **Spermatophyta** |
| **Division** | **Magnoliophyta** |
| **Class** | ***Dicotyledones*** |
| **Sub class** | **Asteridae** |
| **Series** | **Bicarpellatae** |
| **Order** | **Gentianales** |
| **Family** | **Apocynaceae** |
| **Subfamily** | **Asclepidiaceae** |
| **Common name** | **Madar** |

The plants *Calotropis gigantean* are referred to as "Sweta Arka" and "Raktha Arka," respectively, in traditional ayurvedic medicine. Both of them frequently share botanical characteristics and pharmacological effects **[3]**.

The plants *Calotropis gigantea* and *Caotropis procera* are referred to as "Sweta Arka" and "Raktha Arka," respectively, in traditional ayurvedic medicine. Both of them frequently share botanical characteristics and pharmacological effects **[4]**.

All over India, this plant is found. In Hindi, it is commonly known as arka. India, a tropical nation, has access to the richest natural resources and the knowledge from antiquity to use them wisely. To be accepted by modern medicine, these therapies must first undergo a scientific evaluation to determine their active principles and comprehend how they work pharmacologically **[5]**.

Many clinically relevant medications were discovered as a result of the hunt for novel pharmacologically active substances from natural resources like plants, animals, and microorganisms **[6]**.

Common wasteland weed *C. gigantea* is also referred to as giant milk weed. Bangladesh, Burma, China, India, Indonesia, Malaysia, Pakistan, Philippines, Thailand, and Sri Lanka are the original home countries of this plant. *C. gigantea* is widely accessible in India and

utilized for a variety of medical conditions in the country's traditional medical system **[7]**.

**Literature Review:**

**1. Gupta.A. *et al* (2000)**

Rare chemical constituents from Calotropis gigentea roots Indian Journal of Pharmaceutical Sciences. Vol. 62, No. 1, PP:29-32: The anti-diarrhoeal effect of hydro alcoholic (50:50) extract of aerial part of *Calotropis gigantea* was studied against castor oil induced diarrhoeal model in rats.

**2. Chitme, H. *et al* (2004)**

Studies on anti-diarrhoeal activities of *Calotropis gigantea* Root bark in Experimental animals. Journal of pharmacy & pharmaceutical sciences. Vol. 07, No. 01, PP:70-75: The anti-diarrhoeal effect of hydro alcoholic (50:50) extract of aerial part of *Calotropis gigantea* was studied against castor oil induced diarrhoeal model in rats.

**3. Srafulalam.*et al* (2008)**

Antimicrobials activity of *Calotropis gigantea* on some phathogenic bacteria. Bangladesh journal of scientific & industrial research.; Vol. 43, No. 03, PP:397- 404: The extracts of *Calotropis gigantea* (stem and root extracts) were tested against clinical isolates The agar well diffusion assay method was used to access the activities of plant extract against the isolated organisms.

**4. Karim,M. *et al*. (2009)**

Antimicrobial and Cytotoxic Activity of Di-(2-ethylhexyl) Phthalate and Anhydrosophoradiol-3-acetate Isolated from *Calotropis gigantea* (Linn.) Flower. The Korean Society of Mycology Vol. 37 | Issue 1 PP.31-36:Ethyl acetate extract and compound 1 presented better results than compound 2. The minimum inhibitory concentrations (MICs) of the extract and compounds were found to be in the range of 16~128 μg/ml. The cytotoxicity (LC50) against brine shrimp nauplii (Artemia salina) were also evaluated.

**5. Jayakumar, D. *et al* (2010)**

Evaluation of antioxidant potential and antibacterial activity of *Calotropis gigantea* andVinca rosea using invitro model. Indian Journal of Science and Technology. Vol. 3 No. 7 PP 720-723: The different parts of *Calotropis gigantea* and Vinca rosea belonging to the families of Asclepiadaceae and Apocynaceaewere studied for their antioxidant and antimicrobial activities against selected bacterial strains. *Escherichia coli, Salmonella typhi and Shigella sonnei* when compared to *Vinca rosea*. Hence, the present study supports the view, that these medicinal plants might be useful as antioxidant and antimicrobial agents.

**6. Khirsagar.*et al* (2010)**

Acute and subacute toxicity study of the ethanolic extract from *Calotropis gigantea*

r.br. in rodents. International Journal of Pharma and Bio Sciences Vol. 1| Issue 2 PP. 1-9: Ethanolic extract from *Calotropis gigantea* R.Br. flower was investigated. In acute toxicity study oral dose of 2000 mg/kg of the ethanolic extract did not produce mortality or changes in the general behavior and gross appearance of internal organs of mice and rats. In subacute toxicity study, ethanolic extract was evaluated.

**7. Mathur, R. *et al* (2011)**

Evaluation of antifertility potential of *Calotropis gigantea* linn. in female albino rats Journal of pharmaceutical research and opinion. Vol. 1| Issue 3 PP.92-93: The findings suggest that the extracts are strong antiestrogenic and antiprogestagenic.Though the extracts are highly toxic at higher doses yet they exhibit potential to be elucidated asfemale antifertility agents with proper control of toxicity.

**8. Chandrabhan, S. *et al* (2011)**

Antibacterial efficacy and Phytochemical analysis of organic solvent extracts of *Calotropis gigantea*n. Journal of Chemical and Pharmaceutical Research Vol 3, Issue 6, PP 330- 336: Aqueous leaves extract showed weak antibacterial activity. A small portion of the dry extract was used for the phytochemical tests for compounds which include alkaloids, cardic glycoside, anthraquinone, tannins, saponins, flavnoid, steriods, terpeniods, reducing sugars and resins in accordance with the methods.

**9. Harikesh., *et al*., (2011)**

Cytotoxic activity of Ethanolic root extract of *Calotropis gigantea* Linn. International Journal of Drug Development & Research Vol. 3 | Issue 4 PP. 101 - 108: Extract produced dose and time dependent growth inhibition. The ethanolic root extract of *C. gigantea* exhibits potent cytotoxic property comparable to that of standard drug. Therefore, this might be utilized for the development of novel anticancer drug leads.

**10. Ragasa.*et al* (2011)**

Cytotoxic Cardenolide and Sterols from *Calotropis gigantea*n Natural Product Communications. Vol. 6 | Issue 6 PP. 803 - 806: The results of in-vitro cytotoxic activity suggested that the n-butanol extract had most pronounced cytotoxicity against the Hep-2. Further investigations are required to obtain the clinically important lead molecules for the drug development.

**11. Moronkola, D, *et al* (2011)**

Chemical compositions of leaf and stem essential oils of Calotropis procera Ait R. Br [Asclepiadaceae]. Pelagia Research Library. Vol. 2, No. 2, PP:255-260: Both leaf and stem volatile oils contain octadecenamide and its saturated form inappreciable amounts. Also

characteristic of these oils are the presence of long chain fatty acids and amides, sulfurate, halogen compounds and carbonyls like ketones. Chemical composition of Calotropis procera essential oil is reported for the first time in literature.

**12. Chaitanya, R. *et al* (2011)**

HRBC Membrane Stabilizing Property of Root, Stem and Leaf of *Glochidion velutinum*. International Journal of Research in Pharmaceutical and Biomedical Sciences. Vol. 2, No. 1, PP:256-259: HRBC membrane stabilizing potency was performed on human red blood cell suspension. The Chloroform extract of leaf and root, n-butanol extract of stem showed promising results when compared with standard hydrocortisone sodium. Amongst the three extracts chloroform extract of root was found to be the most potent.

**13. Moronkola, D. *et al* (2011)**

Chemical compositions of leaf and stem essential oils of Calotropis procera Ait R. Br [Asclepiadaceae] Vol. 2, No. 2, PP:255-260: Volatile oils from leaf and stem of *Calotropis procera* Ait, an Asclepiadeae were analyzed for their constituents by means of gas chromatography and gas chromatography coupled with mass spectrometry.

**14. David, M. *et al* (2011)**

Study of *Calotropis gigantea* R. Br. Extracts on Growthand Survival Dynamics of Selected Pathogenic Microorganisms. International Journal of Biological Engineering. Vol. 1, No. 1, PP:1-5: The aqueous, methanol and ethanol extracts of *Calotropis gigantea* leaves, apical buds and flowers were prepared and used to study the effect of *Calotropis gigantea* extracts on growth & survival dynamics of *Escherichia coli, Staphylococcus aureus, Candida albicans* and *Xanthomonas campestris*.

**15. Suresh,M.*et al*(2011):-**

*Calotropis gigantea* (L.) Dryand – A review update. Indian Journal of Research in Pharmacy and Biotechnology. Vol. 3, No. 3, PP:218-235: *Calotropis gigantea* (L.) has been traditionally used in the treatment of bronchitis, asthma, leprosy, eczema and elephantiasis. gigantea is a medicinally promising plant, which needs to be exploited systematically. The plant could provide therapeutically active constituents, which may be developed as clinically potential drugs.

**16. Kalpesh, I.*et al* (2012).**

Ishnava Antibacterial and phytochemical studies on *Calotropis gigantia* (L.) R. Br. Latex against selected cariogenic bacteria. Saudi Journal of Biological Sciences. Vol. 1, No. 19, PP:87-91: Abstract In vitro antibacterial potential of the chloroform, ethyl

acetate, hexane, methanol and aqueous extracts of *Calotropis gigantia* (L.) R. Br. was evaluated by using five cariogenic bacteria Qualitative investigation on structure elucidation of bioactive compound using IR, NMR and GC– MS techniques revealed the presence of methyl nonanoate.

**17. Mayee R. *et al* (2012).**

Evalution of antiasthmatic activity of *Calotropis gigantia* roots. Asian Journal of Pharmaceutical and Clinical Research. Vol. 4, No. 2, PP:33-35: The present study deals with the effect of ethanolic extract of roots *Calotropis gigantea* by using various in vivo and in vitro animal models. In vitro model like isolated guinea pig ileum preparation was studies to know basic mechanism by which extract shows relaxant activity.

**18. Anosike, C. *et al* (2012)**

Membrane stabilization as a mechanism of the antiinflammatory activity of methanol extract of garden egg (*Solanum aethiopicum*). DARU Journal of Pharmaceutical Sciences. Vol. 20, No. 1, PP:01-07: The methanol extracts of garden egg significantly and dose dependently reduced ($p \leq 0.05$) the acetic acid induced vascular permeability and agar induced leukocyte mobilization in rats. These results show that methanol extract of *Solanum aethiopicum* has anti-inflammatory properties and can reduce inflammatory injury and tissue damage.

**19. Murti. *et al* (2012).**

In-vitro anthelmintic & cytotoxic potential of different extracts of *Calotropis procera* leaves. Asian Journal of Pharmaceutical and Clinical Research. Vol. 6 | Issue 1 PP.14-16.: The results of in-vitro cytotoxic activity suggested that the nbutanol extract had most pronounced cytotoxicity against the Hep-2. Further investigations are required to obtain the clinically important lead molecules for the drug development.

**20. Elakkiya, P. et.al. (2012).**

A Study On Phytochemical Screening And invitro Antioxidant Activity Of *Calotropis gigantea* L. Vol.4, No.4, pp 1428-1431: The invitro antioxidant activity of root was investigated by DPPH and FRAP method. In both method, plant extract possess high antioxidant activity when compared with standard ascorbic acid due to presence of high content of various phytochemicals.

**21. Sayeed, M. *et al* (2012).**

Antimicrobial Screening and Brine Shrimp Lethality Bioassay of *Calotropis gigantea* (Fam: Asclepiadaceae). Scholars Research Library Vol. 2| Issue 1 PP.49-59: The antimicrobial activities were compared with standard antimicrobial doxycycline (30µg/ disc) which showed an average zone of

inhibition of 40 mm. In the cytotoxic assay the extracts were tested for Brine Shrimp Lethality Bioassay using Brine shrimp nauplii. The administration of the crude extract induced significant cytotoxic.

**22. Rahman, M.*et al* (2013).**

Antimicrobial, cytotoxic and antioxidant activity of the exudate of *Calotropis gigantean*. International Journal of Pharmaceutical science and research. Vol. 4| Issue 2 PP.745-753: To test of antimicrobial activity, disc diffusion method has been followed. The exudate of the plant has shown antimicrobial activity against four microorganisms such as *Escherichia coli* (15mm), *Vibrio mimicus* (15mm), *Vibrio parahemolytics* (15mm) and *Staphylococcus aureus* (9mm). The exudates of the plant have shown cytotoxic activity which was done by following the brine shrimp lethality bioassay method.

**23. Kumar, S. *et al* (2013).**

Review on a potential herb *Calotropis gigantea* (L.) R. Br. Scholars Academic Journal of Pharmacy. Vol. 2, No. 2, PP:135-143: The present study reports the phytochemical property of *Calotropis gigantea*, Acetone, Methyl alcohol and Chloroform extracts of the plant were reviewed by using GC-MS. The numbers of compounds are greatly varies one solvent to another solvent.

**24.Verma, V. (2014).**

The Chemical Study of Calotropis International Letters of Chemistry, Physics and Astronomy. Vol. 20, No. 2, PP:74-90: *Calotropis* (Asclepiadaceae) commonly known as “madar” is a useful medicinal plant. The pH of latex of these two species has been found different in the present study. The atomic absorption spectrophotometer was used to investigate the metals which were measured in the order of ppm.

**25. Vedha,B. *et al* (2014)**

Antibacterial and phytochemical analysis of stem and root extracts of *Calotropis gigantea* against selected pathogens. Malaya Journal of Biosciences 2014, 1(1): PP 49-55: The extracts of *Caliotropis gigantea* (stem and root extracts) were tested against clinical isolates of *E. coli*, *Pseudomonas aeruginosa, Salmonella typhi, Vibrio chloerae* and *Staphylococcus aureus*. The agar well diffusion assay method was used to access the activities of plant extract against the isolated organisms.

**26. Kori, P. *et al*. (2014)**

Antimicrobial activity and phytochemical analysis of *Calotropis gigantean* root, latex extracts. IOSR Journal Of Pharmacy. Volume 4, Issue 6 PP. 07- 11. The root and latex of

*Calotropis gigantea* were screened for its antimicrobial and phytochemical activities. The solvents used for the roots and latex extraction were n- hexane, benzene, acetone, ethanol, aqueous. The extract was tested against infectious disease causing bacterial such as *Escherichia coli, Pseudomonas aeruginosa, Staphylococcus aureus* using the well diffusion method.

**27.Shakya, A. (2014)**

Preliminary Phytochemical Analysis of *Calotropis gigantea* R. Br Flowers. International Journal of chemical and pharmaceutical analysis Volume 1, Issue 3 PP 93-95. *Calotropis gigantea* (*C.gigntea*) are widely used traditional medicinal plants to treat various aliments. It is an erect, perennial shrub luxuriantly thriving in wasteland. Plants are the richest sources of bioactive organic chemicals on earth. They are the store house of secondary metabolites such as alkaloids, terpenoids, steroids and flavonoids etc.

**28. Singh, S. *et al* (2014).**

Preliminary Phytochemical Screening of *Calotropis gigantea* Leaf. International Journal of Scientific and Research Publications, Volume 4, Issue 2 PP 1-3: Phytochemical properties of leaf of *Calotropis gigantea* obtained from methanol and petroleum ether extracts were investigated. The results suggest that the Phytochemical properties of the leaf for using various ailments.

**29. Alluri, N. *et al*. (2014).**

Phytochemical analysis and in vitro antimicrobial activity of *Calotropis gigantea, lawsonia inermis* and *Trigonella foecum-graecum*, International Journal of Pharmacy and Pharmaceutical Sciences. Vol 6, Issue 4, PP 523-527: Aim of study was to screen phytochemicals and antimicrobial activities of the extracts of three medicinal plants viz. *Calotropis gigantea, Lawsonia inermis and Trigonella foenumgraecum*. The results of present study indicated that flavonoids and tannins are the major bioactive compounds which show potent antimicrobial activity against pathogenic microorganisms.

**30. Ezhilarasu, A. *et al,* 2014).**

Screening of Preliminary Phytochemical Analysis and Antibacterial Activity of (*Calotropis gigantea* L. And *Datura metel* L.) Against Selected Pathogenic Microorganisms. Journal of Pharmaceutical Research & Clinical Practice, Research Vol 4, Issue 1, PP 37-41: The phytochemical and antibacterial activity of *Calotropis gigantea* and *Datura metel*. Synergism between plant extract and synthetic antibiotics can develop standardization of herbal medicine for treatment and prevention of infectious diseases.

**31. Kuldeep, S.*et al* (2014)**

Evaluation of in-vitro cytotoxicity of extract/fractions of *Calotropis gigantea* leaves against L-6 cell line. Journal of Medicinal Plants Studies. Volume: 1, Issue: 6 First page: (58) Last page: (61).:The goal of this research work was to evaluate the in vitro cytotoxic potential of the extract of Calotriois gigantea. The extract was screened for in vitro cytotoxicity by means of SRB assay against L-6 cell line.

**32.Katre, L. *et al*, (2015).**

Preliminary Phytochemical Analysis of *Calotropis gigantea* (Linn.) R. Br. From Nagpur District Mahrashtra: India Journal of Innovation in Sciences (JIIS) Vol - II, (1), PP 66-6*Calotropis gigantea* (Linn.) R. Br. belonging to family Asclepiadaceae which includes latex containing plants. The plant was investigated for phytochemical analysis. The results suggest that the phytochemical analysis would be useful in the management of various diseases.

**33. Sivagurunathan N. *et al* (2015).**

Methanolic Root Extract of *Calotropis gigantea* Induces Apoptosis in Human Hepatocellular Carcinoma by Altering Bax/Bcl-2 Expression. American Journal of Pharmacological Sciences, Vol. 3, No. 1, PP:13-17: Phytochemical properties of leaf of *Calotropis gigantea* obtained from methanol and petroleum ether extracts were investigated. The results suggest that the Phytochemical properties of the leaf for using various ailments.

**34. Mahfuzur A. *et al,* (2015).**

Evaluation of membrane stabilizing, cytotoxic and antidiarrheal activities of leaves of *Calotropis gigantea* R.BR. World Journal of Pharmaceutical Sciences. Vol. 3, No. 12, PP:2364-2367: In its radical form, DPPH• shows an absorbance maximum at 515 nm which disappears upon reduction by an antiradical compound. BHT, a synthetic antioxidant, slowly reacts with DPPH reaching a steady state within 5 h. This 2.8-stoichiometric complete reaction follows a 1.5-order with respect to DPPH and 0.5 to BHT.

**35. Berset, C. *et al*, (2015).**

Kinetics and Mechanisms of Antioxidant Activity using the DPPH• Free Radical Method. Lebensm.-Wiss. u.-Technol Vol. 30, No. 06, PP: 609-615: Different partitionates of leaves of *Calotropis gigantea* were evaluated for membrane stabilizing activity by reduction of hemolysis in hypotonic solution and heated solution along with cytotoxic and anti-diarrheal activities. The anti-diarrheal activity of the crude methanol extract was determined on mice using loperamide as standard.

**36. Md. Ashrafudoulla *et. al.* (2016)**

Phytochemical and Pharmacological investigation of *Calotropis gigantea* JMPS 2016; 4(4): 245-255: The n-hexane, carbon tetrachloride, dichloromethane soluble fraction of the ethanolic extract and crude ethanolic extract exhibited antimicrobial activity against most of the test organisms. The zones of inhibition produced by carbon tetrachloride, n-hexane soluble fraction of the ethanolic extract showed average zones of inhibition (9.5mm), (7mm), and (8.25mm) respectively at a concentration of 400 µg/disc.

**37. Ratibha Mishra, *et al,* (2017)**

An updated Review on Phytochemistry, Pharmacological activity and Medicinal uses of *Calotropis gigantea* R.Br. Research Journal of Pharmacognosy and Phytochemistry; 9(2): 135-135: *Calotropis gigantea*, R.Br. is a plant with clusters of flowers of white or lavender colour. They grow widely in Singapore, China, Thailand, Malay Islands and Sri Lanka. In India, the shrubs are very common and grow widely in compounds of temples and other waste lands. It is called as Madar. Large shrub or small tree up to 4-10 m tall, much-branched at base, stems erect, up to 20 cm in diameter; bark pale grey, longitudinally cracked; young shoots woolly hairy; latex in all parts. The White Madar plants are very slow growing but are fleshy in nature especially the leaves and stems. The latex, leaves, flowers, barks and roots of this plant are used as potential remedy for the treatment of a range of ailments. *C. gigantea* contain chemical constituents are cardenolides, flavonoids, terpenes, pregnanes and a non-protein amino acid. The plant has been used for various disease condition including leprosy, ulcers, tumours and piles. Various pharmacological activities reported like Analgesic activity, Antipyretic activity, Pregnancy interceptive activity, CNS activity, Anti-inflammatory activity, Procoagulant activity, Anti-diarrhoeal activity, free redical scavenging activity, Antimicrobial Activity, Anti-tumor activity, Antifungal activity, Antitussive activity, and Antifeedent activity. In view of this the present study was investigated to review the phytochemistry, pharmacological activity, medicinal properties and biological properties of *Calotropis gigantea*.

**38. Partha PratimMaiti *et.al,* (2017)**

Evaluation of anti-inflammatory and antinociceptive activity of methanol extract of *Calotropis gigantea* root International Journal of Green Pharmacy, Jul-Sep 2017 11 (3) | 202: For the vehicle treated group, volume of the posterior intraplantar left paw progressively increased after being injected with 0.1 ml of 1.0% carrageenan, reaching the peak of edema

at the 4th h (1.08 ± 0.03 mL). Administration of MECG at 50, 100 and 200 mg/kg caused a reduction of the edema. The effect of MECG was dose-dependent from the 4th to the 6th h with peak effect produced at the dose of 200 mg/kg at the 6th h ($P < 0.001$). The effect of MECG at 200 mg/kg and indomethacin (10 mg/kg) was equivalent at the 6th h ($P > 0.05$). The results are shown in Table 3. The acute anti-inflammatory activity of MECG was evaluated in this study using the carrageenan induced paw edema. Carrageenan is a phlogistic agent, and when injected locally into the rat paw, produces a severe inflammatory reaction.

**39. Waseem Ahmada *et.al.* (2019)**

Assay of anti-bacterial activity of leaf extract of *Calotropis gigantean* was done by Disc Diffusion method. In this method 20 mL of sterilized Mueller Hinton Agar was poured into sterile petri plates, after solidification, 120 µL of bacterial culture poured on the plates and the culture was spread on plates using spreader. Then, the Whatmans filter paper discs (6 mm in diameter) were kept over the agar plates using sterile forceps at various concentrations. Concentrated solvent was used as negative control. The anti-bacterial assay plates were kept incubator, where all the plates were incubated at 37 ºC for 24 h. The diameter of inhibition zone was noted down.

**40. Snehal K Bhavsar *et.al.* (2020)**

A review on its Phytochemical & Pharmacological Profile International Journal Parmocology; 1(1):1-8: Free redical scavenging activity [30] The free radical scavenging activity studied on Leaf ethanolic extract or latex 1,1DipthenylPicrylhydrazyl radicals The latex extracts *C. gigeantea* shows better ability to scavenge DPPH radicals whereas leaf extract showed reasonable free radical scavenging activity.

**41. Harish Kumar *et al* (2021)**

Antioxidant, antimicrobial and cytotoxic potential of silver nanoparticles synthesized using flavonoid rich alcoholic leaves extract of *Reinwardtia indica* IJPS; 10 (1): 144-155 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. Plant having some active constituents, which are naturally toxic to fungi and bacteria. *Calotropis gigantea* reported as antimicrobial, antibacterial and cytotoxic effect**).**

**42. Anshu Kumar Singh *et al*. (2022)**

Antibacterial activity of ethanol extract of *Calotropis giganatea* leaves against *Staphylococcus aureus*, *Streptococcus pyogens*, *Salmonella typhi*, and *Pseudomonas aeruginosa* JMPS 2022; 10(1): 171-174**:** Preliminary phytochemical, antimicrobial and photochemical study of *Calotropis gigantean* leaf extracts Current Chemistry Letters 9 (2020) 105–112: Antibacterial assay Antimicrobial hobby of the crude extracts turned into determined through the agar well diffusion approach. All take a look at organisms have been inoculated in Mueller Hinton broth (pH 7. four.) for eight hours. The awareness of the suspensions became adjusted to zero.5 (optical density) by the use of a spectrophotometer. Isolates were seeded on Mueller Hinton agar plates with the aid of the use of sterilized cotton swabs. Agar surface become bored with the aid of the use of sterilized gel borer to make wells (7 mm diameter). One hundred µl of the test extract and a hundred µl of sterilized distilled water (bad control) were poured in to split wells. The usual antibiotic disc become located on the agar floor as advantageous manipulate. Plates have been incubated at 37 °C for 48 hours. Triplicate plates have been maintained for each organism.

**Plant Profile:**


**Figure 1: Plant of *Calotropis gigantea***


**Figure 2: Flower of *Calotropis gigantea***

**Therapeutic uses: -**

The juice of the plant is anthelmintic and leucoderma, tumours, ascites, and disorders of the abdomen; the plant is purgative, anthelmintic, alexipharmic, and treats leprosy, leucoderma, ulcers, tumours, piles, and diseases of the spleen, the liver, and the abdomen. The leaves are used to treat wounds

and paralysed or painful joints and swellings. When dealing with sporadic fevers, the tincture made from the leaves is utilised as an antiperiodic **[8-9]**.

Tumors, rat bites, inflammation, and good in ascites. The milk is laxative, purgative, bitter, and treats piles. The root bark is diaphoretic and treats syphilis and asthma. Sweet, bitter, anthelmintic, analgesic, astringent, and curative, the flower.

**Pharmacological Profile:-**

**1. Antidiarrheal activity of *Calotropis gigantea*: -**

*Calotropis gigantea* aerial part hydroalcoholic (50:50) extract was tested against a rat model of castor oil-induced diarrhoea for its anti-diarrheal effects.

The percentage of the longest distance the charcoal travelled divided by the entire length of the small intestine was used to calculate the gastrointestinal transit rate. Using the enteropooling method, the weight and volume of intestinal content induced by castor oil were measured **[10]**.

At doses of 200 and 400 mg/kg body weight, the extract showed a significant decrease in faecal production and dropping frequency (intraperitoneal dose). The weight and volume of intestinal content were significantly inhibited by the extract as well **[11]**.

**2. CNS activity of *Calotropis gigantea*:-**

Oral administration of an alcoholic extract of the peeled roots of *Calotropis gigantea* R.Br. (Asclepiadaceae) was studied for CNS activity in albino rats at doses of 250 and 500 mg/kg bodyweight. Both the Eddy's hot plate method and acetic acid-induced writhing showed considerable analgesic effect. The number of writings significantly decreased while the paw licking time was postponed. Both the onset and severity of pentylenetetrazole-induced convulsions were delayed, indicating significant anticonvulsant efficacy. Rats given the extract spent more time in the open arm of the EPM, demonstrating the extract's anti-anxiety properties. The activity of the locomotor system decreased. The motor coordination fall off period was also shortened. Due to the extract's sedative effect, it was shown that pentobarbitone-induced sleep was potentiated. No deaths were reported up to the dose of 1 g/kg. These findings demonstrate the extract's analgesic, anticonvulsant, anxiolytic, and sedative effects **[12]**.

**3. Analgesic activity of *Calotropis gigantea*: -**

*Calotropis gigantea* flower alcohol extract was taken orally and tested for analgesic efficacy in mice using chemical and thermal models. At dosages of 250 and 500 mg/kg, respectively, in the acetic acid-induced

writhing test, an inhibition of 20.97% and 43.0% in the number of writhes was seen.

The paw licking period was prolonged in the hot plate approach. The analgesic impact was noticed 30 minutes after the dose was administered, and it peaked 90 minutes later. This study assessed the analgesic potential of dry latex (DL) from *C. gigantea* . Compared to an oral dose of aspirin (100 mg/kg), the impact of DL at a dose of 415 mg/kg against acetic acid-induced writhing was more pronounced. In the tail-flick model, DL (830 mg/kg) caused negligible analgesia that was comparable to aspirin **[13-14]**.

**4. Anti-inflammatory activity of *Calotropis gigantea*: -**

Carrageen in-induced kaolin-induced rat paw edema and cotton-pellet granuloma, adjuvant-induced arthritic models were used to test the anti-inflammatory effect. Yeast- induced pyresis was used to measure antipyretic activity. The analgesic efficacy of phenylquinone was tested in mice using an induce writhing technique.

Variable anti-inflammatory efficacy was displayed by test substances, and their peak activity was attained after two hours. A somewhat high initial anti-inflammatory activity is present in the alkaloid fraction.

The residual anti-inflammatory activity of the *Calotropis gigantea* alkaloid fraction points to either a more potent malic enzyme or the filarial worm Setaria digitata: certain drug- and herbal-extract qualities and effects. A filarial worm named Setariadigitata's mitochondrial malate dehydrogenase (mMDH) and malic enzyme (mME) were investigated. However, it was shown that the leaf and flower extracts of Azadirachta indica, Lawsoniainermis, and *Calotropis gigantea*, as well as Ocimum sanctum, inhibited both mMDH and mME **[15]**.

**5. Wound healing activity of *Calotropis gigantea*: -**

*C. gigantea* was chosen for study of its Guinea pig wound healing capacity based on its traditional use. In the animals, 20 l of a sterile 1.0% plant latex solution was applied topically. By greatly boosting collagen; DNA, and protein synthesis as well as epithelization, latex significantly accelerated the healing process. In rats with pyloric ligation, Tsala *et al* investigated, and considerable protection was seen in Guinea pigs with histamine-induced duodenal ulcers. *Calotropis gigantea* root bark extract was tested for its ability to speed up the healing of wounds in Wistar albino rats. For excision wound healing models, extract was applied topically to the rats; for incision wound healing models, extract was administered orally in doses of 100, 200, and 400 mg/kg. The findings show

that extracts administration sped up rat wound healing **[16]**.

## CONCLUSION

Studies on ethnomedicine have drawn a lot of interest recently since they highlight the many unknown and underutilised medical benefits, particularly those originating from plants. Pharmacological analyses of *C. gigantea* demonstrated its therapeutic potential and established it as a valuable medicinal plant with a number of therapeutic qualities. The creation of contemporary pharmaceuticals from *C. gigantea* can be highlighted for the control of numerous disorders, as pharmacologists are eager to generate novel medications from natural sources. For the protection of *C. gigantea* and the creation of products for its better economic and medicinal application, a comprehensive research and development effort should be made.

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**Conflicts of Interest**

None declared

**Ethics approval and consent to participate**

Not applicable

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We declare that we have no conflict of interest

## REFERENCES

**[1]** Suresh kumar P, Chezhian A, Senthil Raja P and Sathiyapriya J; Computational selections of terpenes present in the plant *Calotropis gigantea* as mosquito larvicide's by blocking the sterol carrying protein, Bangladesh J Pharmacol, 2012, 7: 1-5.

**[2]** *Calotropis gigantea*, R. Br., Bulletin of Miscellaneous Information, Royal Gardens, Kew, 1900;157/168: 8 – 12.

**[3]** Gamble J S; Flora of the Presidency of Madras, Vol. I, II, III, Botanical survey of India, Calcutta, 1935.

**[4]** Singh, U., A.M. Wadhwani, and B.M. Johri,1996. Dictionary of Economic Plants of India. Indian Council of Agricultural Research, NewDelhi. p. 38-39. Rastogi, Ram, 1991.

**[5]** Vaidya A: Pharm Res. India (Pharma Pulse – Suppl), 1998; 44-45.

**[6]** Haslam EJ and Nat: Prod. 59, 1996; 205-215.

**[7]** Kapoor V. K, Singh H. Isolation of betain from Achyranthes aspera Linn. Ind J Chem. 1966; 4; 461-463.

**[8]** Saini S. Review on Achyranthes aspera L. International Education and Research Journal. 2016;2(2):84-6.

**[9]** Krishnaveni A, Thaakur SR. Pharmacognostical and preliminary

phytochemical studies of achyranthes aspera linn. Ancient Science of Life. 2006 Jul;26(1-2):1.

**[10]** Kirtikar, K.R. and Basu. B.D.; "Indian Medicinal Plants"; Volume-III; International Book Distributors – Dehra Dun India.2nd Edition. 2065-2069; 1981.

**[11]** Kirtikar, K.R. and Basu. B.D.; "Indian Medicinal Plants"; Volume-III; International Book Distributors – Dehra Dun India.2nd Edition. 2065-2069; 1981.

**[12]** Dr. S. Vedavathy, V. Mrudula and A. Sudhakar; "Tribal Medicines of Chittoor District, A.P. (India)"; Herbal Folklore Research Centre, Tirupati.. 16, 17; 1997.

**[13]** "The Ayurvedic Pharmacopoeia of India"; The controller of Publications, New Delhi Volume II; 7-9; 1999.

**[14]** Bhatnagar L. S, Singh V. K, Pandey G. Medico-botanical studies on the flora of Ghaigaon forests, Gwalior, Madhya Pradesh. J Res Indian Med. 1973; 8; 67-100.

**[15]** Raj K. P. S, Patel M. R. Some medicinal plants of Cambay and its immediate vicinity and their uses in Indian indigenous system of medicine. Indian Drugs. 1978; 15; 145-152.

**[16]** Khanna K. K, Mudgal V, Shukla G, Srivastava P. K. Unreported ethno medicinal uses of plants as aphrodisiac from the folklores of Uttar Pradesh plains, India. Bull Bot Surv India. 1994; 36; 91-94.