IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Review Article on Calotropis Gigantea

Name – Shantanu Pradeep Pophale[1] Ms. Bhagyashree A. Mokle[2]

Dr. Gajanan Sanap[3]

Student Department of Pharmacy[1]

Assistant Professor, Department of Pharmaceutical Chemistry[2]

Principal, Department of Pharmacy[3]

Late Bhagirathi Yashwantrao Pathrikar College of Pharmacy, Pathri, Ch. Sambhajinagar (Aurangabad) Maharashtra India-431111.

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.

Key Words / Key Points:- Calotropis gigantea, Pharmacological activity, Phytochemistry, Milkweed, Sweta Arka, Giant Milkweed, CNS activity, Antidiarrheal activity, Potential herb, Crown flower.

Introduction:

In many places of the world, including India, from ancient times to the current age, plants, animals, and other natural items have had a significant impact on human culture and civilization. Since the dawn of civilization, people have revered plants, which are now protected as genetic resources and used for food, fibre, fuel, fertiliser, febrifuges, and a variety of other purposes.[1] 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. [2,3]

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]

There is evidence that the plant's leaves and aerial portions have anti-diarrheal properties.[8]

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 sonneiwhen 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 thegeneralbehavior 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 gigantean. 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. Harikeshet 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 gigantean 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 Glochidionvelutinum. 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 Xanthomonascampestris.

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).

IshnavaAntibacterial 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 gigantea 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 wasinvestigated 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 scherichia coli (15mm), Vibrio mimicus (15mm), Vibrio parahemolytics (15mm) and Staphylococcus aureus (9mm). The exudates of the plant has 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 Chloroformextracts 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 andphytochemical 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 pharmaceuticalanalysis 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, lawsoniainermis and trigonellafoecum- 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, Lawsoniainermis 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 66-6Calotropis 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 etherextracts were investigated

.The results suggest that the Phytochemical properties of the leaf for using various ailments.

34. MahfuzurA. 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 byreduction 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.

(Figure No. 1 Calotropis Gigantea Plant)

DESCRIPTION OF THE PLANT

Taxonomical classification:-

.

Kingdom : Planatae

- Subkingdom : Tracheobionta
- Class : Dicotyledones
- Sub class : Asteridae
- Order : Gentianales
- Family : Apocynaceae
- Subfamily : Asclepidiaceae
- Genus : Calotropis
- Species : Calotropis gigantea

Table 1: Vernacular Names

India	(Sanskrit) Arka, Mandara, Vasuka, Svetapushpa, Sadapushpa,, (Hindi) Aak, Madar, (Malayalam) Erukku, (Telugu) Jilledi Puvvu
Thailand	Po thuean, paan thuean (northern), rak (central).
Vietnam	B[oot]ng b[oot]ng, l[as] hen, nam t[it] b[at].
Indonesia	Bidhuri (Sundanese, Madurese), sidaguri (Javanese), rubik (Aceh)

PHYTOCHEMICAL ACTIVITY OF PLANT *CALOTROPIS GIGANTEA*

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

Biological source/Geological source/Natural habitat: -

Calotropis grows untamed up to 900 meters (msl) throughout the nation and is drought- resistant and salt-tolerant to a fair extent. It loves disturbed sandy soils with mean annual rainfall of 300–400 mm[9].It readily establishes as a weed along deteriorated roadways, lagoon edges, and in overgrazed native grasslands by its wind and animal spread seeds. It prefers abandoned agriculture sites and frequently predominates there, especially in places with disturbed sandy soils and little rainfall. It is believed to be a sign of over cultivation [10].

The wide habitat with low competition is preferred for C. gigantea. The plant of this species can be found in areas with excessively drained soil where yearly precipitation can reach up to 2000 mm and in arid habitats where rainfall is restricted to 150 to 1000 mm. It can also be found in typical habitats including roadside sand dunes, seashore dunes, and heavily populated urban areas. As high as 1,000 meters above sea level, C. gigantea can also be found there. In dry or coastal places, the plant is occasionally planted as an ornamental since it is simple to handle, reproduce, and may thrive in xerophytic conditions [11-12].

C. gigantea is a native of Southern Asia and Indo-China, as well as Madagascar, the Arabian Peninsula, West Africa, North and East Africa, Macaronesia, and South Asia. Australia, Central America, North America, South America, and the West Indies all have the plant as a native species. Today, numerous nations, including those in Mexico, Central and South America, the Pacific Islands, Australia, and the Caribbean, accept and cultivate the plant [13].

The chief features: -

- The plant thrives in a variety of soil types and climatic environments.
- It does not require cultivation practices
- It is one of the few plants that grazing animals do not eat [14].
- Particularly where overgrazing has eliminated competition from natural grasses, it thrives on poor soils [15].
- Consequently, it is found in tropical and
- the world's subtropical regions, including everywhere
- India [16].

The following nations also have populations of it: Afghanistan, Algeria, Burkina Faso, Cameroon, Chad, Cote d'Ivoire, Democratic Republic of the Congo, Egypt, Eritrea, Ethiopia, Gambia, Ghana, Guinea-Bissau, India, and Iran. It is indigenous to India, China, and Malaysia.Senegal, Sierra Leone, Somalia, Sudan, Syrian Arab Republic, Tanzania, Thailand, Uganda, United Arab Emirates, Vietnam, Yemen, Iraq, Israel, Kenya, Kuwait, Lebanon, Libyan, Arab Jamahiriya, Mali, Mauritania, morocco, Myanmar, Nepal, Niger, Nigeria, Oman, Pakistan, Saudi Arabia, Senegal, Somalia, Sudan, Syrian Arab Republic, United Arab Emirates, Exotic: Argentina, Antigua and Barbuda [17].

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 [18-19].

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.

Traditional use of Calotropis Gigantea :-

1. In Ayurveda :-

The **leaves** of the C. gigantea plant are used to treat **paralysis, swellings, and sporadic fevers**.**Asthma, catarrh, anorexia, helminthic infections, inflammations, and fever** can all be **treated with flowers**.

The plant's **root bark** is utilised for **ascites, intestinal worms, helminth infections, and skin infections.**

2. In Siddha: -

The **leaves** of *C. gigantea* are used for the **treatment of poisonous snake bites, periodic fever, vatha diseases, intestinal worms and ulcers.**This plant's **roots** are thoroughly crushed and applied by vigorously rubbing over the bite region.

Dental issues, rat bites, swellings, gonococcal arthritis, and other rheumatic ailments can all be treated using this plant's latex. The treatment of bronchial asthma with flowers.

3. In Unani: -

The root bark powder is long time used in unani system for getting relief in diarrhoea and dysentery. The root of plant is carminative and useful in indigestion.

Chemical Constituent: -

Studies on Calotropis' phytochemistry have revealed a variety of different chemicals, including Cardenolide, triterpinoids, alkaloids, resins, anthocyanins, and proteolytic enzymes in the latex. Multiflorenol, cyclisadol, and -terpenes are found in flowers [20].

1. Leaves:-

Amyrin, amyrin acetate, ß-sitosterol, urosolic acid, cardenolides, calotropin, and calotropagenin are the primary compounds found in the leaves.

(Figure No. 2 Leaves Of C. Gigantea)

2. Latex:-

The latex contains caoutchouc, calotropin, calotoxin, calactin, uscharin, trypsin, voruscharin, uzarigenin, syriogenin, and proceroside in amounts ranging from 0.15 to 0.45% [21].

(Figure No. 3 Latex of C. Gigantea)

3. Flower:-

The flower contains polysaccharides containing D-arabinose, glucose, glucosamine, and L- rhamnose, as well as flavonoids, queretin-3-ratinoside, sterol, calactin, calotoxin, calotropagenin, and calotropin. The enzymes 3-proteinase and calotropain are also present in flowers (protease).

Other chemical components of C. gigantea flowers include gigantin, giganteol, isogiganteol, uscharidin, uzarigeninvoruscharin, proceroside, proceragenin (cardenolide), syriogenin, taraxast-20(30)-en-3-(4-methyl-3-pentenoate), 3-thiazoline cardenolide, a- calotropeol, 3- epimoreteno [22].

(Figure No. 4 Flower of C. Gigantea)

Bark:-

Triterpenes, a novel norditerpenyl ester called Calotropterpenyl ester, two unidentified pentacyclic triterpinoids called calotropursenyl acetate and calotropfriedelenyl acetate, akundarol isovalerate, mundarol isovalerate, and quercetin -3- rutinoside are all present in the root bark of Calotropis [23-24].

Toxicity:-

(Figure No. 5 Bark of C. Gigantea)

The plant has been shown to be harmful, and grazing animals avoid eating it. The tribal people have made poison arrows for use in hunting with the latex from the plant. The latex is extremely harmful to human eyes, causing ocular toxicity that results in vision loss and photophobia.

Rat pedal edoema and air pouch models of inflammation were utilised to study the anti-inflammatory effects of C. gigantea latex, which may be used to assess anti- inflammatory medication. When latex is mistakenly administered to the eye, it can also cause toxic iridocyclitis, keratoconjunctivitis, corneal endothelial cytotoxicity, and keratitis.

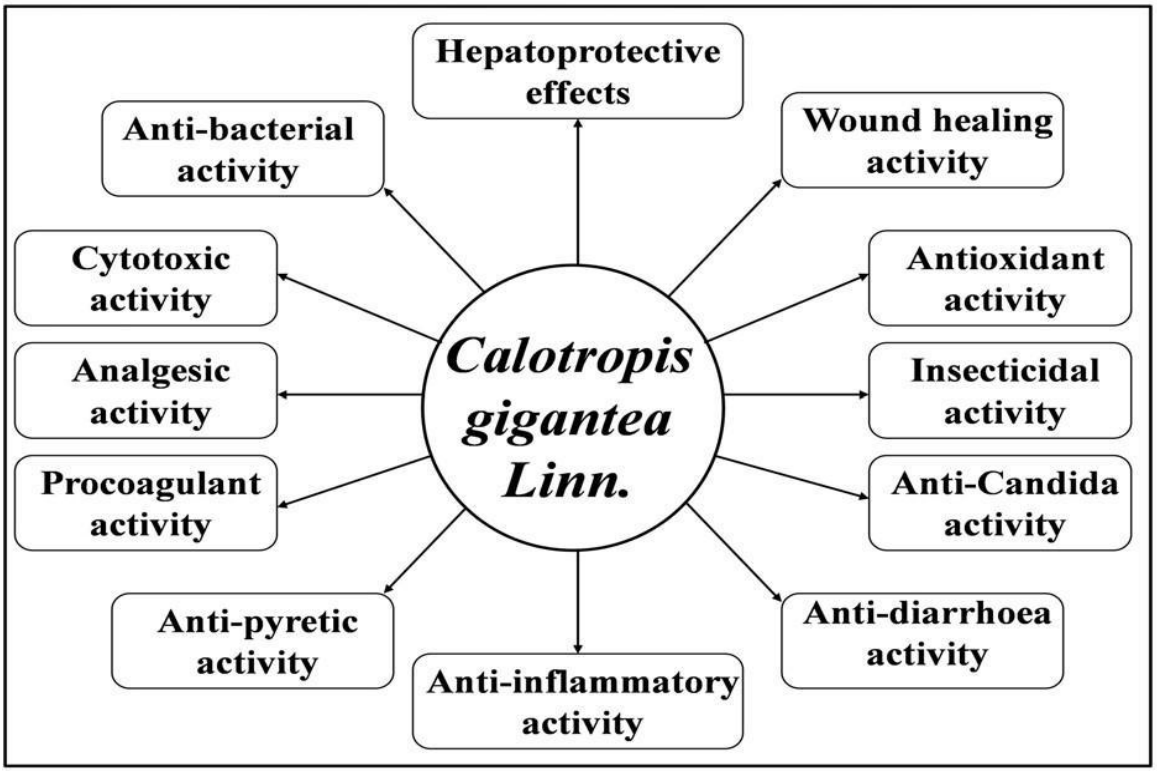
In order to ascertain the inhibitory effects of test chemicals on cell development in vitro, MCF-7 and HeLa cell line cultures were tested against DL, flowers, and ethanolic extracts of C. procera. DL and floral ethanolic extract shown cytotoxic activities against both MCF-7 and HeLa cells in a dose-dependent mannequin experiment, in contrast to the typical medication tamoxifen, which suppresses breast cancer (MCF-7) cells by 60.46%[25-26-27].

Calotropis gigantea is thought to be even more dangerous than cobra venom and is the more toxic of the two. Both of these plants are members of the Asclepiadaceae family and exhibit similar chemical and physiological responses[28].

Uscharin, Calotoxin, Calactin, Calotropin, and Calotropage are the toxic principles. Due to its irritating, neurotoxic, and anticholinergic effects, milk can be poisonous and present in a number of lethal ways. A extremely poisonous substance, gigantin, is present in serum at 3% concentrations[29].

Madar juice and latex produce an acrid, bitter taste and a burning discomfort in the mouth, throat, and stomach when consumed internally in significant concentrations. Salivation, stomatitis, vomiting, diarrhoea, dilated pupils, tetanic convulsion, collapse, and death follow these. Delirium may occasionally occur. The dose that will cause death cannot be identified. The lethal window ranges from 30 minutes to 8 hours[30].

Pharmacological Profile:-



(Figure No. 6 Pharmacological Profile of C. Gigantea)

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[31]

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[32].

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 writhings 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[33].

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[34-35].

4. Anti-inflammatory activity of Calotropis gigantea: -

Carrageenin-induced kaolin-induced rat paw edoema 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[36].

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.

C. 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 extract administration sped up rat wound healing[37].

Need of the study / Scope of the work: -

1. Good anti-inflammatory nature.

This study also proved the greater anti-inflammatory action due to the combined effect of
C. gigantea and T. procumbens with Ibuprofen than Ibuprofen alone The activity was carried out by using the

yeast induced pyrosis method

2. Antibacterial activity

The leaves extract of Calotropis gigantea were screened for its antibacterial and phytochemical activities

3. Antitumor activity

The methanol extract (ME) of C. gigantea root bark and its chloroform soluble fraction (CF) possesses significant antitumor activity

The Calotropis gigantea flower has a potent inhibitory effect against EAC cells in a dose- dependent manner

4. Cytotoxic Activity

c.gigantea and investigate preferential cytotoxicity of the insect extract, if any, on human cancer cell lines. Comparative chemical characterization by HPTLC, UV and IR studies revealed the presence of cardenolides in both the extracts and biotransformation of some of the ingested cardenolides in the insect extract

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

5. Mosquito repellent activity

These results suggest that the leaves of C. gigantea have the potential to be used as a natural source for the development of new, safe, potential and eco-friendly insecticide for the control of C. gelidus and C. tritaeniorhynchus mosquitoes

- Good anti-inflammatory nature.
- Rid Blemishes of the skin.
- Treat ear pain.
- Cures diarrhea.
- Hypoglycemic effect.
- Spasmogenic property.
- Good antifungal property.
- Act as an antidote for snake poison.
- Treat skin disease.
- Hepatoprotective Activity
- Anticancer Activity
- Antivenom Activity
- Antipyretic Activity
- Procoagulant Activity
- Antitussive Activity
- Antifeedant Activity

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.

References: -

1. Sureshkumar P, Chezhian A, Senthil Raja P andSathiyapriya J; Computational selections ofterpenespresent in the plant Calotropis gigantea as mosquitolarvicide's by blocking the sterol carrying protein,Bangladesh J Pharmacol, 2012, 7: 1-5.(sajp).

2. Gamble J S; Flora of the Presidency of Madras, Vol. I,II, III, Botanical survey of India, Calcutta, 1935. (sajp).

3. 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.

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

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

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

7. Yelne MB, Sharma PC, Dennis TJ. Database onmedicinal plants used in ayurveda, central council for research in ayurveda and siddha,New Delhi; Vol. 2,69-73(2000).

8. Chitme HR, Chandra R, Kaushik S, Studies onanti-diarrhoeal activity of *Calotropis.*

9. Sharma AP and Tripathi BD; Assessment ofatmospheric PAHs profile through Calotropis giganteaR.Br. leaves in the vicinity of an Indian coal-firedpower plant, Environ Monit Assess., 2009, 149: 477 –482.

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

11. Ahmed KK, Rana AC, Dixit VK. *Calotropis* species (Ascelpediaceae): A comprehensive review. Pharmacogn Mag 2005;1:48-52.

12. Parrotta JA. Healing Plants of Peninsular India. Wallingford, UK and New York: CAB International; 2001. p. 944.

13. Smith NM. Weeds of the wet-dry tropics of Australia - A field guide. Environ Centre NT 2002;112:28-9.

14. Oudhia P, Kolhe SS and Tripathi RS, Legume Res.,1997, 20(2): 133 – 136.

15. Smith NM; Weeds of the wet/dry tropics of Australia -a field guide, Environment Centre NT, 2002: 112.

16. Sharma AP and Tripathi BD; Assessment ofatmospheric PAHs profile through Calotropis giganteaR.Br. leaves in the vicinity of an Indian coal-fired.

17. . Parrotta JA. Healing Plants of Peninsular India. Wallingford, UK and New York: CAB International; 2001. p. 944.

18. Kirtikar KR and Basu BD: Indian medicinal plants, Vol. III, 1995, National book distributors, Dehradun 1607-1609.

19. Anonymous: "The Wealth of India," Vol. III, Publications and Information Directorate, CSIR, Delhi 1998; 78 .

20. Al-Yahya MA, Al-Meshal IA, Mossa JS, Al-Badr AA, Tarig M. Saudi plants: A phytochemical and biological approach.Riyadh:King Saud university press, Page 31- 34 (1990).

21. Atef GH, Elgamal MHA, MorsyNAM,DuddeckH, Kovacs J, and Toth G. Two cardenolides from *Calotropis procera*. J MagnReson Chem, 17: 754-757, (1999).

22. Ansari SH, Ali M. New oleanene triterpenesfrom root bark of *Calotropis procera*.Medicinal and Aromatic Plant Sci, 21(4):978-981,(1999).

23. Ansari SH, Ali M. Norditerpenic ester andcpentacyclic triterpenoids from root bark of *Calotropis procera* (Ait) R. Br.Pharmazie,56(2):175-177, (2001).

24. Akhtar N, Malik, A. Proceragenin, anantibacterial cardenolide from *Calotropis procera*. Phytochemistry, 31(8): 2821-2824,(1998).

25. Ahmed KK, Rana AC, Dixit VK. *Calotropis* species (Ascelpediaceae): A comprehensive review. Pharmacogn Mag 2005;1:48-52.

26. Quazi S, Mathur K, Arora S. *Calotropis procera*: An overview of its phytochemistry and pharmacology. Indian J Drugs 2013;1:63-9.

27. Khairnar AK, Bhamare SR, Bhamare HP. *Calotropis procera*: An ethnopharmacological update. Adv Res Pharm Biol 2012;2:142-56..

28. Shanker avinash, Hand book of poisoning, bgalani publishing house, 2nd edition, 2005 pg no736.

29. . Ajay kumarmeena, ajayyadav, ayurvedic uses and pharmacological activities of calotropis procera linnm national institute of ayurvedic pharmaceutical research, Patiala 147001, Punjab, India Asian Journal of Traditional Medicines, 2011, 6 (2).

30. . Modi p jaising. Medical jurisprudence andtoxicology, 23 edition, first reprint, 2007,Dr. k mathiharan and Dr.amrit k patnaik, lexis nexis, new deihi 2006,pg no 234238.

31. Chitme HR, Ramesh R and Kaushik SJ: Pharm Pharm Sci 2004; 7(1): 70-5.

32. Chitme HR, Chandra R, Kaushik S, Studies on anti-diarrhoeal activity of *Calotropis gigantea* r. br. in experimental animals. J Pharm Pharmaceut Sci 2004;7(1):70-75.

33. Argal A and Pathak AK: J Ethnopharmacol 2006; 27: 16446065.

34. . Meena AK, Yadav AK, Niranjan US, Singh B, Nagariya AK, Sharma K, *et al*. A review on *Calotropis procera* Linn and its ethnobotany, phytochemical, pharmacological profile. Drug Invent Today 2010;2:185-90.

35. Quazi S, Mathur K, Arora S. *Calotropis procera*: An overview of its phytochemistry and pharmacology. Indian J Drugs 2013;1:63-9.

36. Banu MJ, Nellaiappa K and Dhandayuthapani S: Jpn J Med Sci Biol 1992; 45(3): 137- 50.

37. Deshmukh PT, Fernandes J, Aarte A, Toppo E, Wound healing activity of *Calotropis gigantea* root bark in rats. J. Ethnopharmacol. 2009;125(1):178-181.