Review Article

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THERAPEUTIC SIGNIFICANCE OF *ARKA (CALOTROPIS PROCERA*) AND ITS RECENT ADVANCES: A REVIEW

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ABSTRACT

Ayurveda is mainly based on herbal medicine. Medicinal plants are considered as new resources for producing agents that could act as alternative to antibiotics. *Calotropis procera* a widely growing plant has antimicrobial property against various bacteria and has been reported to possess number of medicinal properties and other purposes. It is used in traditional medicine as a purgative, antihelminthic, anticoagulant, anticancer, anti-inflammatory, antipyretic, analgesic and antimicrobial and to treat leprosy, leucoderma, ulcers, tumors, piles and diseases of the spleen, liver and abdomen. Various *in vivo* and *in vitro* studies have been done to prove medicinal property of *Calotropis procera* against various bacteria such as *Enterobactercloacae, Escherichia coli, Staphylococcus aureus*, *Streptococcus faecalis* etc. Its active principles are uscharin, calotoxin, calactin, calotropin, calotropagenin and uscharin. In Ayurvedic text it is described as krimighna (antihelminthic), kandughna (reduces itching) vranashodhan (wound healing), jantughna (antimicrobial), kushthaghna (treat leprosy), shothhar (reduces edema), vednasthapan (analgesic). So, this study is designed to elaborate all medicinal properties and recent advances in *Calotropis procera*.

Keywords: Arka, *Calotropis procera*, therapeutic uses and recent advances.

INTRODUCTION

Arka (Calotropis procera) is sthawar vanaspatik visha. In high dose it is act as poison but in proper dose it acts as medicine. It should be used after shodhan *karma* (detoxification) otherwise it is (will be) harmful to the human body. According to its properties such as *Rasa, guna, virya, vipaka*, it is used in various diseases as single drug or as Ayurvedic formulation. In India it is commonly found in the compounds of temples. Its leaf is one of the contained of *panch pallava*. *Calotropis procera* is used as a traditional medicinal plant with unique properties. According to Ayurveda *Calotropis procera* is used alone or with other medicines as Ayurvedic formulations to treat common diseases such as jwara (fever), Amvata (rheumatism), Aam (indigestion), kas (cough), pratishyay (cold), vicharchika (eczema), shwas (asthma), shlipad (elephantiasis), chardi (nausea and vomiting), Atisar (diarrhea). *Calotropis procera* improves moisture binding and helps to increase soil nutrients in crop land in India hence it is planted before real crop is sown. It grows as a weed in many areas of India, but because of its uses it is also purposefully planted. *Calotropis* yields a durable fiber useful for ropes, carpets, fishing nets and sewing thread. It is use in production of leather which is used in expensive book binding

This article is based on a therapeutic uses and recent advances of *Calotropis procera*. Related Literature has been collected from *Samhita* and textbooks related to the subject. The properties of *Calotropis procera* according to different Ayurvedic text have been presented in tabulated form. The main Ayurveda texts Charak Samhita, Sushruta Samhita, Astang hrudaya, Dhanwantari Nighantu, Bhavaprakash Nighantu, Raj Nighantu, Shaligram Nighantu, Adarsh Nighantu, Kaiyadev Nighantu and available commentaries on these are used in this study. Information related recent advances have been collected from different article available on internet.

Therapeutic dose

Root bark powder (*mool twak churna*): 0.5 to 1 g, *Kshir* (latex): 0.25to 0.75, *pushpa* (flower): 1 to 3 g

Chemical constituents

Phytochemical studies on *Calotropis procera* showed that it contains several types of compounds;

Leaves: Leaves contains mainly the amyrin, amyrin acetate, β-sitosterol, ursolic acid, cardenolides, calotropin, calotropagenin.
Latex: Latex contains calotropin, calotoxin 0.15%, calactin 0.15%, uscharin 0.45%, trypsin, voruscharin, uzarigenin, syriogenin and proceroside.

Flower: The flower contains the flavonoids, querentin-3-ratinoside, sterol, calactin, calotoxin, calotrpagenin, calotropin, polysaccharides with D-arabinose, glucose, glucosamine and L-rhamnose. Flowers also contain enzymes 3-proteinase and calotropain (protease). Other chemical constituents of *Calotropis procera* flowers are lupeol, uscharin, proceroside, proceragenin (cardenolide), syriogenin, taraxast-20(30)-en-3-(4-methyl-3-pentenoate), 3-thiazoline cardenolide, gigantin, giganteol, isogigateol, uscharidin, uzarigenin voruscharin a-calotropeol, 3-epimoretenol, a-lactuceryl acetate and a-lactuceryl isovalerate.

Bark: Root bark of *Calotropis procera* contains triterpenes, a new norditepenyl ester, named calotropterpenyl ester and two unknown pentacyclic triterpenoids, namely calotropursenyl acetate, akundarol isovalerate, mundarol isovalerate and quercetin-3-rutinoside.[8,9]

Biological description

There are three main species as

Calotropis aciac Buch
Calotropis gigantean (L) Dry land- China Indian subcontinent, south East Asia
Calotropis procera Dry land- China Indian sub-continent, south east Asia, middle east north Africa.

Calotropis gigantia and *Calotropis procera* are the two most common species in the genus. *Calotropis gigantia* grows to height of 8-10 ft. while *Calotropis procera* grows to about 3-6 ft. The leaves are sessile and sub sessile, opposite, ovate, cordate at the base. The flowers are about 3.8-5.1 cm in size, with umbellate lateral cyme and colored white to pink and are fragrant in case of *Calotropis procera* while the flowers of *Calotropis gigantea* are constituents without fragrance and are white to purple colour, but in rare cases are also light green or white. The seeds are compressed broadly ovoid with a tufted.[8,9]

Table 1: Properties of *(Arka)* *Calotropis procera* according to various scriptures of *Ayurveda*

Characters	Dhanwantari Nighantu	Bhavprakash Nighantu	Raj Nighantu	Shaligram Nighantu	Adarsh Nighantu
Guna		Snigdha, Laghu			
Rasa (taste)	Rajark- pungent and bitter Shwetark- Pungent and bitter	Arkdugdha- Tikta, Lavan ras Multwak- Katu, Tikta	Katu Rajark-Katu, Tikta ras, Shwetark- Katu, Tikta ras	Katu Arka kshir-Tikta Rajark-Katu, Tikta	Tikta, Katu
Veeryya (Potency)	Ushna virya	Ushna virya	Ushna virya	Ushna virya	Ushna virya
Krama (action)	Agnideepana (improves digestive secretion)	Agnideepan (improves digestive secretion) pachan (helps to digest), Rasayan, Balya	Agnideepana (improves digestive secretion)	Deepan (improves digestive secretion), pachan (helps to digest)	
Rogaghnata	Vrana (wounds), Skin diseases, Ulcers, worms (Helminthiasis), Dysuria, Raktashopha (inflammation)	Kushta (leprosy), Updansh, Skin diseases, Shleepad (filariasis), Gandmala (lymphnodes), Pratishyay (sinusitis), tamakshwas (asthma) shwasnikabhistirnata (Bronchiectesis), Udar (Ascites), Jirna jwar (fever), Jirna Aamvat (chronic rheumatic arthritis), Sandhishoth (osteoporosis).	Vrana (wound), Kandu (pruritus), Kushthagna (leprosy), Krimirog (antihelmintic) Rakta vicar (Blood disorders), shotha (oedema), Visarpa (Erysipelas). Shvetmandarah- Mutrakrucha (difficulty in urination)	Kandu (Itching), Kushtha (leprosy), krimirog (Antihelminth), Gulma, Udarrog (ascites), kas (cough), shwas (Asthma), Aruchi (tasteless), prasek (excessive salivation). Mutrakrucha (difficulty in urination), vrana (wound), shopha (Inflammation), kandu (itching), Visarp (Erysepelas)	Vrana (wounds)

Therapeutic Uses

In Bruhatrayee

1. Charak Samhita – Out of fifty mahakashaya in sutra sthana *Calotropis procera* (Arka) is described in Bhedaniya mahakashay. In chikitsas it is use in kushtha chikitsa (leprosy).
2. In sushrut samhita uttartantra arka use as nadisweda in Karngatrog (ear diseases), kwatha (decoction) of Arka leaves and flowers with honey is use in shwasrog (asthma), it is one of the ingredients of Mahaneel ghrut use in kushtha chikitsa (leprosy), also use in vajrak tail and mahavajrak tail. It is also use in Bhagandarhar trivrudadi tail, syandan tail.
3. In Ashtang hrudaya Arka kshir (root bark of arka) is used in vataj galgand, Arka leaves mixed water is used in shvayathu chikitsa (oedema) for bath, in Kushtachikitsa adhyay it is used in vicharchikahar lepa (eczema), it is one of ingredient of vajrak tail and mahavjrak tail.[1-7]

In Nighantu

Shleepad (Filariasis) - The white Arka is grind with kanji and its lepa is prepared and is useful in shleepad (Filariasis) and badhmal (constipation).
Udar (Ascitis) - Ash of Arka leaves with Saindhava is given with takra in udar rog (ascites).
Jeerna Amvaat (rheumatic arthritis) - Arkadi churn is given with sunth churn at night which act as painkiller.
Jwaraghna (fever) - Arka is very useful in jwar (fever) and jeerna jwar.
Kushtha (leprosy) - Arka is useful in all types of Kushtha (leprosy) and many skin diseases. Arka is main ingredient in kalpa like Mahaneel ghrut, vajrak tail, mahavajrak tail.
Vrana (wound) - Arka leaves are shothhar (reduces oedema), vranshodhak (cleans wound), vranropak. Arka churn is use in wound healing.
Arsha (piles) - Arka is useful in Arsha (piles) in the form of lepa and arka kshir is useful in ksharkarma.
Bhagandara (fistula) - Arka is use in preparation of Bhagandarhar trivrudadi tail and syandan tail.

Rogaghnata

Dhanwantari Nighantu

Stimulates digestive capacity, laxative, reduces inflammation and wounds, it is useful in pruritus, disorders of skin spleen and worms.
Rajark (*Calotropis procera*) - It decreases meda and useful in poisons, skin disorders, ulcers, oedema, pruritus and erysipelas.
Shvetarkah (*Calotropis gigantea*) - Purifactory action on malas, useful in dysuria pains due to raktasopha and decreases dosas from ulcers.

Shvetmandarah - Dysuria, ulcers and severe infestation by worms.[14]

Bhavaprakasa Nighantu

Kushta (leprosy), Updansh, or any type of skin diseases, shleepad (filariasis), gandmala (lymph nodes), pratishyay (sinusitis), tamak shwas (asthma), shwasnikabhistirnata (Bronchiectesis), diseases related with yakrut (liver) and pliha (spleen), Udar (Ascites), Jirna jwar (fever), Jirna Aamvat (chronic rheumatic arthritis), Sandhishoth (osteoporosis), kshudhanash (loss of appetite).[11]

Raj Nighantu

Vranaghna (wound healing property), Kandu (pruritus), Kushthagna (leprosy), Krimirog (antihelmintic).
Shvetarkah (*Calotropis gigantea*) – Mutrakrucha (difficulty in micturation), Rakta vicar (Blood disorders), shotha (oedema), peeda (pain), vran vicar (wound healing).
Rajark (*Calotropis procera*) – Kushtha (leprosy), Vrana (wound healing), Kandu (pruritus), visarpa (Erysipelas).
Shvetmandarah – Mutrakrucha (difficulty in urination), Vrana (wound healing), krumi (wormicidal).[15]

Aadarsha Nighantu

Vrana (wound healing property).[13]

Shaligram Nighantu

Kandu (Itching), Kushtha (leprosy), krimirog (Antihelminth).
Shvetarkah and Raktarkah – Rechak (purgative), pleeha (spleen diseases), Gulma Bavasir (constipation), Udarrog (ascites), yakrut (liver diseases), pachak (digestive), kas (cough), shwas (Asthma), Aruchi (tasteless), prasek (excessive salivation).
Shvet mandar – Mutrakrucha (difficulty in urination), vrana (wound), krumirog (worms).
Rajark- Kushtha (leprosy), vrana (wound), shoph (Inflammation), kandu (itching), Visarp (Erysepelas).[12]

Kaiyadev Nighantu

Kushtha (leprosy), krimirog (Antihelminth), raktapitta (haemophillia), shoth (oedema), gulma, aruchi, kasa (cough), shwas (asthma), lalaprasek (excessive salivation).[17]

Recent advances

Anti-inflammatory activity

Inflammation is body defense mechanism in order to eliminate injurious agent from body. It is local response of living mammalian tissue to injury. Study has been carried out to find inflammatory activity of methanolic extract of root of *Calotropis procera* in rodents. This activity was evaluated using acute inflammatory model like carrageenan induced paw oedema and chronic model like cotton pillet induced granuloma. The root bark contains alpha-amyrin, beta- amyrin, beta-sitosterol, lupeol and flavanol. These phytochemicals proved effective in chronic model of cotton pillet induced granuloma, there was significant reduction in granular tissue. The methanolic fraction of root of *Calotropis procera* proved effective in carrageenan induced paw oedema. Thus, extracts shows anti-inflammatory activity on various acute phases of inflammation and on formation of granular tissue.[18]

Anti-fungal Activity

The toxic effect of synthetic chemicals can be overcome by search of new pesticides, which are eco-friendly and effective. Natural fungicides from plant sources would definitely be a better alternative to these hazardous chemicals. Aqueous and ethanol extracts of leaf and latex of *Calatropis procera* was tested for their antifungal activity against seed borne dominant fungi *Culvularia lunata, Alternaria Alternata, Rhizoctonia solani, Fusarium solani, Penicillium chrysogenum, Aspergillus niger, A-flavus, A-terrus, A-fumigatus* and *Rhizopus sp.* were determined using agar well defusion method. The results revealed that ethanolic extracts of both leaf and latex showed inhibition of growth in the test fungi with the widest zone of inhibition. Latex of *Calotropis procera* has been found quite effective in controlling seed – borne mycoflora of wheat.[19]

Antioxidant Activity

Free radicals are chemical entities that can exist separately with one or more unpaired electrons. The generation of free radicals can bring about thousands of reactions and thus cause extensive tissue damage. Lipids, proteins and DNA are all susceptible to attack by free radicals. Antioxidants may offer resistance against oxidative stress by scavenging the free radicals. Free radical scavenging activity was estimated using *in vitro* models like 1,1,diphenyl-- picryl hydrazyl (DPPH), hydroxyl radical, hydrogenperoxide radical, reducing power and ferric thiocyanate method. Cytotoxicity was analyzed following MTT assay using Hep2 and Vero cell lines and polyphenols were estimated using standard methods. The results of the study showed that the methanolic extract of *Calotropis procera* flowers exhibited the high radical scavenging property and cytotoxic activity. The effectiveness of the flowers might be due to the hydroxyl groups existing in the phenolic compounds chemical structure that can provide the necessary component as a radical scavenger. A potent scavenger of free radicals may serve as a possible preventive intervention for the diseases. The present study suggests that the flowers of *Calotropis procera* is potential source of natural antioxidants.[20]

Anti diarrheal activity

In charaka samhita Arka is mentioned in Bhedneya Mahakasaya. Arkamula Tvaka (root bark of *Calotropis procera*) is used as an effective remedy in loose motions by Gujjar community of J and K state. In present study anti-diarrheal property of Arkamula tvaka (root bark of *Calotropis procera*) was studied on one hundred and eleven patients out of whom seventy-three patients suffered from atisara (diarrhea) while thirty eight patients complained of pravahika. The patients were administered one capsule of Arkamula tvaka churna (root bark of *Calotropis procera*) three times a day with Takra as anupana. It was observed that in cases of Atisara the character and consistency of dravamala (loose stools) changed into ardhabaddha (semi solid) within first day of treatment. In case of pravahika the Ama (mucus) in mala and pravahan (tenesmus) were relieved within first two or three days of treatment. The mucus in stools and tenesmus were relieved with this drug therapy. *Calotropis procera* evacuate bile by increasing secretions and has a sedative action on the muscular fibers of the intestine, especially the colon and the rectum reduces all pain, tenesmus and irritation and thus relieving all dysenteric symptoms. Powder of root bark is an excellent substitute for ipecacuanha in dysentery. The results of this study show that *Arka Mula Tvaka* (root bark of *Calotropis procera*) has anti diarrheal property. It is also effective in pravahika except in raktaj pravahika. The most possible mode of action of the drug is due to its katu tikta rasa, usna veerya and katu vipaka.[21]

Anticancer activity

Cytotoxicity is the potential of a compound to induce cell death. The present study was done to evaluate anticancer activity of aqueous extract of root barks of *Calotropis procera*. Study was carried out on caco-2 cells and neuro-2a cells (originating from mouse neuroblastoma). MTT and non-enzymatic Neutral Red assays were performed to evaluate cytotoxic effect of aqueous extract of root barks of *Calotropis procera.* MTT assay clearly shows aqueous extract of *Calotropis procera* alters mitochondrial metabolism and causes cytotoxicity. While neutral red assay shows *Calotropis procera* causes alteration of cell membrane and decreases cell viability. The result obtained was extract shows cytotoxic effect on caco-2 cells and lower cytotoxic effect on Neuro-2a cells with the help of MTT and neutral red cytotoxic test. This study shows that aqueous extract of *Calotropis procera* exhibit anticancer activity.[22]

Hepatoprotective activity

Liver is a vital organ of the body. It plays a vital role in metabolism, secretion and storage. Any type of injury or impairment of its functions may lead to many types of complications in body. In this study *Calotropis procera* was evaluated for its hepatoprotective and antioxidant property. Five groups of rats were use for study. Hepatoprotective activity of the methanol extract of the root bark was determined using carbon tetrachloride (CCl_4) induced liver injury in rats. Group I and II serve as control group. Group III animals were treated with silymarin. Group IV and V animals were treated with methanol extract of *Calotropis procera*. After 7 days blood was collected, and liver extract was send for histopathological examination. The result shows that after treating with methanol extract there was decrease in the values of serum transaminases, alkaline phosphatase and decrease in total and direct bilirubin level, cholesterol and increase in high density lipoprotein. It improves functional status of liver cells; there is increase in the level of total protein and albumin. Hepatoprotection property of *Calotropis procera* is due to it contains terpenoids and flavanoids which scavenged free radicals and helps in hepatoprotection. This study shows that methanol extract of *Calotropis procera* plays very important role in liver protection.[28]

Anti-HIV-1 and Anti-Microbial activity

Nowadays HIV is big challenge in field of medicine. Many antibiotics are available to cure HIV and other diseases, but antibiotics have many drawbacks such as drug resistance, drug allergy, high cost and drug sensitivity. Hence it is necessary to investigate more effective antibiotics in the field of medicine. This study was carried out to investigate the anti HIV-1 and antibacterial activities of the crude leaf extracts of *Calotropis procera*. In case of anti HIV study blood samples were collected from HIV positive individual and HIV uninfected individual. Hot water extract of *Calotropis procera* was added in both samples of blood. Results show that crude hot water extract has inhibition on p24 antigen and shows potent antiHIV-1 activity. Also, a crude leaf extract of *Calotropis procera* was examined for antimicrobial activity against *salmonella typhi, salmonella paratyphi, vibrio cholera* and *klebsiella phneumoniae* using agar well diffusion method. Crude extract in methanol, ethyl acetate, chloroform and hot water added to each well. Among all extracts ethyl acetate extract shows best antimicrobial activity. Hence from above results it is clear that crude leaf extract of *Calotropis procera* is best alternative for antibiotics. This study encourages us to search new antibiotics from various sources like plant source.[23]

Anti- hyperbilirubinemic and wound healing Activity

The study was carried out to evaluate bilirubin lowering property of aqueous extract of *Calotropis procera*. In order to establish a scientific basis for utilization of *Calotropis procera* in the treatment of hyperbilirubinemia, the bilirubin lowering activity was evaluated in PHZ and paracetamol-induced hyperbilirubinemic rats. Silymarin a unique flavonoid complex has hepatoprotective property by its cell membrane stabilizing property. In *Calotropis procera* leaves there are number of flavonoid components, flavonolignans are present. Hence, the bilirubin lowering activity of aqueous extract of *Calotropis procera* was studied along with Silymarin and comparing both with jaundiced groups. In this study, results of both hyperbilirubinemic model viz., PHZ and paracetamol, revealed a significant decrease in the serum total bilirubin levels in PHZ and paracetamol treated animals with increase in Hb in PHZ treated animals and decrease in Serum ALT and AST levels when compared with standard group and also results were observed to be similarly effective as that of Silymarin treated groups. Wound healing property of *Calotropis procera* was studied using two different models viz., incision and excision wound model. The results of incision wound showed a significant increase in breaking strength of sutured skin. In excision study, the animals treated with aqueous extract of *Calotropis procera* showed a significant increase in wound contraction, increased percentage wound healing with a decrease in epithelization period. Results of this study revealed that Aqueous extract of *Calotropis procera* possess a marked bilirubin lowering property which resulted in decrease in serum concentration of total bilirubin in both models of hyperbilirubinemia and also possess a wound healing property which resulted in an increased tensile breaking strength of sutured skin, increased percentage of wound healing with decreased epithelization period in incision and excision model, respectively.[24,27]

Anti-ulcer activity

Antiulcer activity of methanolic extracts of the root *Calotropis procera* was tested in rats, in which gastric ulcerations were experimentally induced by aspirin, alcohol, and stress and pylorus ligation. Methanolic extract of the root of *Calotropis procera* was significantly effective in protecting gastric mucosa against aspirin induced ulcers at all the dose level studied. Ethanol induced gastric injury is associated with significant production of oxygen free radicals leading to increased lipid peroxidation, which causes damage to cell and cell membrane. The extract of the root of *Calotropis procera* was significantly effective in protecting ethanol induced gastric injury. The extract shows a cytoprotective effect against the gastric lesions induced by necrotizing agents, which suggests a direct, protective effect on the gastric mucosa. The anti-ulcer activity of *Calotropis procera* extract in pylorus ligation model is due to its significant reduction in gastric volume, total acidity, free acidity and increase in pH of gastric juice. It observed that *Calotropis procera* root extract can suppress gastric damage induced by aggressive factors. Thus, from this study it is clear that the *Calotropis procera* causing an increase in gastric mucosal resistance and shows antiulcer activity on gastric mucosa.[25]

Larvicidal activity

Latex of *Calotropis procera* shows larvicidal activity in mosquito control. The latex extract is dried and made into powdered form for application. larval bioassay have been undertaken as per standard protocol 3rd in star larvae of Aedes aegypti were collected from field. Batches of 20 larvae were suspended in water to lethal concentration of methanol extracted latex, water

extract and temephos as standard along with control in three replicates under the standard condition of temperature and humidity. Larval mortality was observed in 1, 8 and 24 hours in treated and control batches. The larvicidal efficacy of latex of *Calotropis procera* compared with that of temephos. The result shows that *Calotropis procera* is alternative to artificial larvicide and which and can be effective for many days in the breeding containers such as coolers and toilet water tanks, not getting cleaned up frequently. Moreover, the long term and sustainable effectiveness of latex will also take care of elimination of fresh larval batches emerging from the eggs laid on the wall of these containers. The result of study shows that methanol extracted latex of *Calotropis procera* is long term effective larvicide against dengue vectors.[26]

Antipyretic activity

Calotropis procera posse's anti-inflammatory and analgesic properties. It also shows antipyretic activity. This study is carried out to test antipyretic effect of latex of *Calotropis procera* in the rat model. The latex was collected from the twigs of *Calotropis procera* growing in the wild and was air-dried under shade. The dry latex (DL) was triturated with gum acacia in water (1:1), filtered and used. Fever was induced in male albino rats weighting 150 g. Administration of yeast produced an increase in rectal temperature from 97.32 + 0.19ºF which reached to its maximum in 4 h (100.02 + 0.27ºF). There was no further rise in temperature at 6 h in the control group and the mean temperature remained at 99.74 + 0.150F. Administration of dry latex-250 mg/kg and 500 mg/kg at 4 h produced a significant ($P < 0.05$) decline in rectal temperature to 98.50 + 0.29ºF and 98.45 + 0.60ºF respectively. The antipyretic effect was compared with that of aspirin, which was found to be more potent and brought down the temperature to 96.9 + 0.38ºF ($P < 0.001$). This study along with earlier findings, on anti-inflammatory and analgesic effect of dry latex of *Calotropis procera*, suggests that *Calotropis procera* shows antipyretic property.[29]

DISCUSSION

Calotropis procera is categorized under organic irritant poisons. It is widely available all over India. After going through literature and Ayurvedic text it is observed that it has many medicinal uses. It is useful green manure and will be planted and plowed before real crop is sown. It improves soil nutrients and improves moisture binding in some of the more arid croplands of India. *Calotropis* yields a durable fiber useful for ropes, carpets, fishing nets and sewing thread. Fermented mixture of *calotropis* and salt is use in production of leather which is used in inexpensive book binding. As it is irritant poison it should use after proper shodhana (detoxification) process. It is valuable plant in Ayurvedic and modern medicine. In different Nighantu different properties of *Arka* have been described and according to these properties it is used in various diseases such as kushtha (leprosy), jeerna jwar (fever), pratishyay (cold), shotha (oedema), udar (ascites), pleeha (spleen diseases), raktavikara (blood disorders), mutrakrucha (difficulty in micturition), krumi (antimicrobial), gandmala (lymph nodes), tamak shwas (asthma), vrana (wound), kandu (itching), jirna amavata (rheumatic arthritis), sandhishotha (oedema on joint), kshudhanash (loss of appetite). In recent era many studies have been done in which *Calotropis procera* is proved useful in various diseases such as anti-inflammatory, anti fungal, HIV, antioxidant, hyperbilirubin, cytotoxic, ulcer, hepatotoxicity, antipyretic, larvicidal, wound healing. Arka is valuable plant in world of medicine because of its uses in various diseases and it is proved in animal experimental studies.

Modern drugs are also based on plant extracts. It is necessary to know world importance of herbal medicine. *Arka* is easily available in India but very few people are aware about its medicinal uses it is still considered as poisonous plant this article gives basic knowledge about plant *Calotropis procera (Arka)* and its traditional medicinal uses and its recent advances. As it is easily available plant we can use it on large scale in day today life and also there is scope for new researches in future about its medicinal uses.

CONCLUSION

This article elaborates therapeutic uses of *Calotropis procera (Arka*) in bunch. Due to its toxic nature, many physician and pharmaceutical units avoid using Arka preparation in practice. This article will help physicians, pharmaceutical companies and students to use *Arka* in day to day practice after proper shodhana (detoxification) process. Therapeutic significance of *Calotropis procera* would definitely help in developing herbal medicine and its uses will minimize the adverse effect of modern medicine and overcome drug resistance. This article will inspire and motivate researchers to work on medicinal properties of *Calotropis procera (Arka)* and to use plant resources in field of medicine.

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