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AN ANTITOXIC REVIEW OF ARK (*CALOTROPIS PROCERA* LINN) AS VISHGHNA DRAVYA IN AYURVED AND FOLK MEDICINES

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ABSTRACT

Medicines in the form of herbs share a major constituent worldwide over synthetic medicines. Calotropis which is mentioned as Arka in Ayurveda is categorized as Upvisha (Mild poison) in Agadtantra. Even being in group of toxins itself, Arka shows medicinal properties as texted in botanical books of Ayurveda and Nighantus. It is mentioned as Vishaghna (antitoxic) in therapautical literature in Ayurvedic samhitas. Calotropis comes under Apocynacoeae family and Asclepiadaceae as subfamily which is widely used in folk practices as a remedy in snake bite, insect bites and scorpion bite. Used in the form of Lepa, Pana, Abhyang, Anjana it has a wide range of properties like anti-arthritic, anti-oxidant, anti-inflammatory, analgesic, anti-helminthic, cytotoxic, hepatoprotective etc. This review article emphasizes on information reported on use of Ark as an antitoxin in Ayurved and folk culture. This may promote research of herbal medicines in all aspects for well-being of human.

KEYWORDS: Ark, Calotropis, Upvisha, Agadtantra, Antitoxin, Vishaghna, Folk medicines.

INTRODUCTION

Ayurveda considers every natural substance to possess inherent medicinal value. Even poisonous materials can serve as medicine when administered appropriately in a controlled manner.[1] Arka (*Calotropis procera* Linn) is classified under Upavisha (semi-poisonous drugs) in Agada Tantra. It is Ayurvedic discipline concerned with toxicology. It has been extensively utilized for medicinal purposes since ancient times. This plant has repeated inclusion across major Ayurvedic texts. It has been grouped under various pharmacological categories, including Bhedaniya Gana by Vagbhata, Vamanopaga and Svedopaga Gana by Charaka, Arkadi Gana and Adhobhagahara Gana by Sushruta, and Guduchyadi Oshadhi Varga in Bhavaprakasha.[2] The use of Arka in toxicological disorders is also documented in specialized Agada Tantra texts. Traditional references, including *Vishavidya Jyotsnika*, mention its application in the treatment of poisoning caused by snakes and rodents. Depending on the clinical requirement, Arka has been administered through various dosage forms such as Nasya (nasal therapy), Anjana (ocular preparation), Dhoopana (medicated fumigation), Pana (oral administration), and Lepa (external paste application).[3] Apart from its classical Ayurvedic usage, Arka has maintained a prominent place in indigenous healthcare systems. Several tribal and rural communities have traditionally relied on this plant for treating venomous bites and other toxic conditions. For example, the Jaunsari tribe inhabiting the Jaunsar-Bawar region employs Arka as a component of its traditional practices.[4] Owing to its long-standing use in such traditions, the plant is widely acknowledged as a natural antidote remedy in folk medicine.[5] In recent years, the popularity of herbal medicines has increased globally due to factors such as accessibility, affordability, cultural acceptance, and their perceived compatibility with human physiology.[6] Against this background, Arka continues to attract attention for its therapeutic potential. This review focuses on the Vishaghna (antitoxic) activity of Arka by critically examining descriptions available in classical Ayurvedic texts, traditional medicinal practices, and contemporary scientific studies. The objective is to provide a comprehensive understanding of its role in poison management and to highlight its potential relevance in modern healthcare and toxicological research.

TAXONOMICAL CLASSIFICATION[7]

Family – Apocynaceae

Subfamily – Asclepidaceae

- Kingdom - Plantae

- Sub Kingdom - Tracheobionta- Vascular Pants
- Super division - Spermatophyta - Seed plants
- Division - Magnoliophyta - Flowering plants.

Kingdom – Plantae

Subkingdom – Tracheobionta- vascular plant

Super division – Spermatophyta – Seed plant

Division – Magnoliophyta – Flowering plant

Class – Dicotyledons

MATERIALS AND METHODS

Review was done through Bruhatatrayi, Laghutrayi, various Nighantus, textbooks of Dravyaguna, available e- resources on google, pub-med e-scholar etc. Already published work in journal and on webpages is studied to review Vishaghna (antitoxic) view about Ark.

PLANT PROFILE[8][9][10]

Arka has botanical name *Calotropis procera* Linn and other variety as *Calotropis gigantea* Linn. These are evergreen perennial shrubs reaching height of 2.5-3 m. It has yellowish white, furrowed, rough corky bark. Branches are stout, terete and covered with cottony pubescence. Leaves are opposite, decussate, sessile, oblong, thick and pale in green. Those are Sar, Bhedan, Tikshna, Kaph -Vatshamak in guna. Flowers are regular, bisexual, purple or light greenish yellow with faint odor. Flowers are Madhur, Tikshna, Ruksha in guna. Follicles 9-10cm in length, wide, abundant, plump ventricose, green. Green color spongy fruits consist of light brown seeds 6*5cm. Roots are deep plump taprrot with less lateral near surface. Roots are Ushna in Guna. Swedkari, Svasa, Upadansh nashak. Bhavprakash Nighantu quoted use of root bark of Arka in Deepan, Pachan, Swedajanan, Pittasravi, Kaphaghna, Vamak, Virechak, Balya and Rasayan. It is widely used in regional practices and is known by different names as Madar tree in English, Aak in Hindi, Urdu and Punjabi, Rui in Marathi. It's Sanskrit names are Bhanu, Ravi, Tapana indicating the Sun.

Rasapanchak

Panchak	Description	Meaning	Effect on dosha
Rasa	Tikta, Katu	Bitter, Pungent	Kaphahar
Guna	Laghu, Snigdha, Sara	Light, Unctuous, Mobile/Flowing	Vatanulomana
Virya	Ushna	Hot Potency	Kapha-vatahar
Vipaka	Katu	Pungent post digestive effect	kaphahar
Karma	Deepana, Pachana, Bdedana, Krimighna, Shothahar	Appetizer, Digestive, Purgative, Anthelmintic, Anti-inflammatory	Kapha-vatahar

Fig. 1: Calotropis leaves.

Fig. 2: Calotropis fruit and flower.

Fig. 3: Calotropis seeds.

Source: Agropack.in

BRUHATATRAYI[11-16]

Ancient Ayurvedic texts document extensive therapeutic applications of *Calotropis procera* Linn (Arka). Charaka Samhita places it among the fifty mahakashayas mentioned in Sutra Sthana, specifically categorizing it under Bhedaniya mahakashaya, and recommends its clinical use in treating Kushtha (leprosy-like skin conditions). Sushruta Samhita describes a different application, where Arka is used for Nadi Sweda (a form of moxibustion) in managing Karnagata roga (diseases of the ear). The same text also mentions a kwatha (decoction) prepared from Arka's leaves and flowers, which, when mixed with honey, serves as a remedy for Shwasa roga (respiratory conditions like asthma). Beyond these direct uses, Arka appears as a key component in several classical formulations — it is included in Mahaneel Ghrita (used for Kushtha treatment), as well as in Vajraka Taila and Mahavajraka Taila. It further finds mention in Bhagandarahara Trivrutadi Taila and Syandana Taila. Ashtanga Hrudaya offers additional insights, noting that the Kshira (latex) obtained from Arka's root bark is specifically indicated for Vataja Galaganda, a condition involving swelling linked to vitiated Vata dosha. The same text describes a bathing therapy where water infused with Arka leaves is used to manage Shvayathu (edema). In its chapter dealing with Kushtha (Kushtha Chikitsa Adhyaya), Arka is also employed in the form of a Lepa (topical paste) for treating Vicharchika (eczema-like skin disorders).

According to Ayurvda sthavar visha is used to treat jangam visha and jangam visha is used to treat sthavar visha. In sarpa visha arka leaves are given to the snake bite patient for chewing.

In Luta visha Arka leaves are used with Shirish beej + Pimpalee. This combination is used for Paan, Lepa, Anjan and Nasya. In Vrushchika visha Shrish + Arka kshir is used for local application.

Ant-poisonous activity in text[17][18]

Name	Type	Indication	Part used
Aakhu vishahara Lepa	Lepa	Aakhu visha	ksheera
Ark-hingu Lepa	Lepa	Vrushchika Visha	ksheera
Bhalatakadi Dhupa	Churna	Mooshakadi Saranopay	Fala
Palandvadi lepa	Lepa	Alarka Visha	ksheera

FORMULATIONS OF ARKA[19]

Few formulations are made from Arka with Lavana Ras- Salty taste. These include Arka lavana, Kshara gulika, Shankha vati etc. These are regularly used in clinical practices. Other formulations include Arka vati, Arka tailam, Ravimuladi vati, Adraka ghrta, Mahavishagarbha tailam, Vajraka tailam, Prabhanjana vimardhana Tailam, Marichadi tailam, Kalyanaka lavana, Trailokya Chintamani.

ARKA PATRA SWEDAN IN SNAKEBITE[20]

Ark patra kizhi was commonly used in sarpa visha by Vishvaidyas. According to Vishvaidya Jyotsnika kizhi was made for swedan karma for sarpavisha chikitsa. A pottali made of Arka patra was used for swedana which was of 2 types- Pradeshika and Sarvangin specifically used for Madali sarpa visha.

NIGHANTUS[21-28]

The white Arka is traditionally used for various ailments: it is applied as a paste for filariasis (Shleepad) and constipation; ash from its leaves with saltwater and buttermilk helps manage ascites (Udar). Arka churna and decoctions are used to relieve rheumatic arthritis, fever, and leprosy, and it is a key ingredient in formulations like Mahaneel Ghrut and Vajrak Tail. Its leaves aid in wound healing by reducing swelling and cleansing wounds, while Arka kshir is used in piles and fistula treatments. It also supports wound healing and is used in Ksharkarma procedures.

Other medicinal properties include stimulating digestion, reducing inflammation, and managing skin disorders, worms, and pruritus. Calotropis procera (Rajark) decreases fat, treats poisons, ulcers, and skin issues, and alleviates edema and erysipelas. Calotropis gigantea (Shvetarkah) is used for urinary difficulties, blood disorders, and wound healing, as

well as worm infestations.

In various texts, Arka is indicated for leprosy, skin diseases, lymph node issues, sinusitis, asthma, liver and spleen ailments, fever, rheumatic arthritis, osteoporosis, and loss of appetite. Its properties include wound healing, anti-pruritic, anti-helminthic, and anti-inflammatory effects, making it valuable for a wide range of conditions like ulcers, difficulty in urination, digestive issues, cough, and skin infections.

VISHAGHNA ACTIVITY OF ARKA- CALOTROPIS IN SNAKE BITE[29]

Cobra venom is known to induce noticeable local oedema in both humans and experimental animals, leading to considerable fluid accumulation and loss. Administration of 7 µg of cobra venom resulted in localized skin ulceration, which contributed to the leakage of oedema fluid. Studies have demonstrated that extracts of *Calotropis* can effectively counteract venom-induced oedema. In a comparative evaluation with *Cassia fistula*, *Calotropis* exhibited superior anti-inflammatory activity. Significant oedema inhibition was observed at doses of 500 mg/kg and 750 mg/kg of *Calotropis* extract, whereas *Cassia fistula* showed noticeable effects only at a dose of 750 mg/kg. By the third hour after treatment, *Calotropis* achieved approximately 30% inhibition of oedema, corresponding to complete suppression of oedema progression, indicating a greater therapeutic potency compared to *Cassia fistula*.

ANTI CANCEROUS ACTIVITY[30]

Calotropis procera dried latex (DL) was evaluated for its anticancer activity against hepatocellular carcinoma in a study conducted by Choedon and colleagues. Using the X15 Myc transgenic mouse model, the researchers found that oral administration of an aqueous suspension of dried latex provided substantial protection against the development of liver cancer. Mice treated with DL at a dose of 400 mg/kg, administered five days per week for a total of 15 days, showed a marked reduction in hepatocarcinogenesis. Furthermore, treatment with the extract significantly lowered serum levels of vascular endothelial growth factor (VEGF), a key mediator involved in tumor angiogenesis and progression

HEPATOPROTECTIVE ACTIVITY[31]

Researchers tested whether an alcohol-based extract from Calotropis root bark could protect the liver from damage. They used male Wistar rats and gave them a chemical called DEN (diethylnitrosamine) to cause liver injury. The rats were split into six groups of six each.

To check liver health, the team measured blood markers linked to liver function: ALT, AST, ALP, total protein, and albumin. They also looked at the liver's antioxidant defenses by measuring two enzymes, SOD and catalase, and a marker called MDA, which shows how much cell damage (lipid peroxidation) had occurred. On top of this, they examined liver tissue samples under a microscope and studied the chemical makeup of the extract.

Rats that were given the extract before DEN exposure showed much lower ALT, AST, and ALP levels than rats given DEN alone — a sign of less liver damage. Their total protein and albumin levels were also higher. The extract boosted SOD and catalase activity while lowering MDA levels, showing stronger antioxidant protection and less oxidative stress. Tissue samples confirmed this, showing less liver damage in treated rats. Chemical analysis of the extract revealed the presence of sterols, triterpenes, and phenolic compounds — natural plant substances known for their antioxidant effects.

Overall, the study suggests that the ethanolic extract of Calotropis root bark protects the liver, likely because of these active plant compounds.

ANTIBACTERIAL ACTIVITY[32]

Calotropis in other variety has demonstrated antimicrobial activity with Streptococcus mutans and lactobacilli. It is effective at a concentration as low as 1.25%. This naturally derived extract can be utilised for various dental applications, such as an antimicrobial root canal obturating material or an antiseptic mouthwash. As antibiotics have uncertainty in future there natural resources should be emphasised.

DISCUSSION

Ark (Calotropis spp.) has long been utilized in Ayurvedic toxicology (Vishachikitsa) for the treatment and management of various poisoning conditions.[33] Classical Ayurvedic texts, including Sushruta Samhita, describe Ark as an important medicinal plant employed in the management of toxic disorders and poison-related ailments.[34] Astanga Sangraha also highlights its therapeutic use in formulations indicated for diseases associated with toxic manifestations.[35] Similarly, Charaka Samhita recognizes Ark as a potent medicinal herb with broad therapeutic applications.[36]

The traditional use of Ark as a detoxifying agent is attributed to its pharmacological properties such as Tikshna, Ushna, and Kaphavatahara actions.[37] Modern experimental

studies have demonstrated the antitumor and cytoprotective activities of Calotropis procera, suggesting the presence of biologically active phytoconstituents with significant therapeutic potential.[38] Furthermore, its wound-healing properties support its role in the management of toxin-induced tissue injury and inflammatory conditions.[39]

Classical Ayurvedic literature also documents the inclusion of Ark in numerous therapeutic formulations owing to its diverse medicinal properties.[40] The cumulative evidence from both traditional Ayurvedic sources and contemporary scientific investigations indicates that Ark possesses considerable antitoxic potential; however, further rigorous scientific studies are necessary to validate its efficacy and establish its clinical applications.[33-40]

CONCLUSION

Arka, despite being classified as an Upavisha in Ayurveda, has demonstrated significant antitoxic and therapeutic potential in both traditional and modern medicine. Its diverse phytoconstituents contribute to detoxifying, anti-inflammatory, antioxidant, and immunomodulatory activities. Scientific studies support the medicinal value of various plant parts, including roots, leaves, and latex. Further research integrating Ayurvedic principles with modern scientific validation, standardization, and dose regulation is essential to establish its safe and effective clinical use. Such efforts can help promote affordable, evidence-based healthcare, particularly for populations relying on traditional medicine.

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