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A REVIEW ARTICLE ON ARKA: A POTENT DRUG OF INDIAN MATERIA MEDICA

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ABSTRACT

Herbal medicines have been used since ancient times and continue to be used now. Ethnobotanical pharmacy dates back to the dawn of time. Herbal medications have a wide range of medicinal applications. Calotropis procera Linn. is an Ayurvedic plant that is used to cure a variety of ailments in traditional Ayurvedic therapy. The medicinal efficacy of extracts from various areas of the plant is significant. When dried, the entire plant has tonic, antihelmintic, and expectorant properties. The roots have comparable properties and can also be used as a laxative. The latex is used to cure vertigo, baldness, hair loss, toothache, intermittent fevers, rheumatoid/joint swellings, and paralysis, while the powdered rot is used to treat bronchitis, asthma, leprosy, dermatitis, and elephantiasis. The leaves are used to decrease edoema and cure joint discomfort. Calotropis is also utilised as a homoeopathic treatment in addition to its Ayurvedic application. Calotropis procera was called as "Rakta arka" in ancient Ayurvedic medicine. The pungent latex derived from Calotropis procera's leaves and flowers is processed and utilised in the commercial manufacture of eye tonics.

KEYWORDS: Ayurveda, *Calotropis procera* (Aiton) W. T. Aiton, *Calotropis gigantea* (L.) Dryand, Arka.

INTRODUCTION

Arka plant is worshiped as it's auspicious, sharp like the sun and flowers resemble the color of rising sun. The ark plant with white flowers is a superior variety and is referred to as *arka.* It grows abundantly in desert Rajasthan. It is found in waste lands and grows as a weed in cultivated areas. It also grows well on rubbish heaps, waste and fallow land, by the roadside and waste land around. Common names of this plant are Sodom apple, Dead Sea Apple, king's crown and rubber tree.

Calotropis procera Linn, belonging to the Asclepiadaecae family, is an Ayurvedic herb having significant medicinal potential. Swallow wort in English, madar in Hindi, and Alarka in Sanskrit are some of the common names for it. It grows in dry, sandy, and alkaline soils in most parts of the world with a warm temperature. Calotropis is gathered largely for its unique therapeutic benefits. It's also known as ark, swallow-wart, or milkweed, and it's a common wasteland weed in Indonesia, Malaysia, China, and the Indian subcontinent. Calotropis procera is a superior variation of the ark plant, which has red flowers. It can be found in India from Punjab and Rajasthan through Assam and Kanyakumari, up to a height of 1050 metres. Rajasthan has an abundance of it. It grows as a weed in farmed areas and is found in wastelands. It also thrives on garbage dumps, waste and barren ground, beside highways, and in sand dunes.[1] Calotropis inner bark is used to generate strong fibres known as madar, which are used to make weave carpets, ropes, sewing thread, and fishing nets. Calotropis procera is a species of Calotropis. Linn is an erect, tall, big, densely branched, perennial shrub or small tree with milky latex that grows to a height of 5.4 m. The branches are sturdy, terete, and have fi ne appressed cottony pubescence, and the bark is soft and corky (especially on young). Sub-sessile, opposite, decussate, wide ovateoblong, elliptic or obovate, acute, thick, glaucous, green, covered with thin cottony pubescent hair on young but glabrous later, base cordate. Calyx glabrous, ovate, and acute, flowers in umbellate-cymes and tomentose on young. The corolla is glabrous, with erect, elliptical, sharp lobes and coronal scales 5-6, which are laterally compressed and equal in size to the staminal column.

Vernacular names[2]

- Sanskrit:- Ravi, Bhanu, Tapana
- Assamese:- Akand, Akan
- Bengali:- Akanda, Akone
- English:- Madar Tree

- Gujrati:- Aakado
- Hindi:- Aak, Madar, Akavana
- Malayalam:- Erikku
- Marathi:- Rui
- Oriya:- Arakha
- Punjabi:- Ak
- Tamil:- Vellerukku, Erukku
- Telugu:- Jilledu
- Urdu:- Madar, Aak
- Kannada:- Ekka, Ekkadagida, Ekkegida
- Kashmiri:- Acka

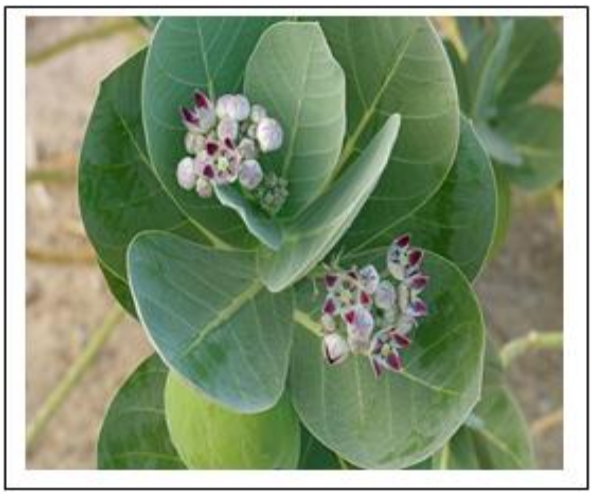

Fig. 1*: Raktarka* - *Calotropis procera* (Aiton) W. T. Aiton.

Fig. 2: *Swetarka* - *Calotropis gigantea* (L.) Dryand.

Classical synonyms[3]

1 गणरूपः– गणे समूहे रूप्यते शोभते इति

Plant grows in a gregarious nature.

2 क्षीरपर्णः– क्षीर पर्णेऽस्य

arka stem posseses latex.

3 रक्तपुष्पः– रक्तम् पुष्पमस्य

Flowers are red colored.

4 सदापुष्पः– सदा पुष्पाणि सन्ति यस्मिन्

Flowers are red coloured .

5 आस्फोटः– आ समन्तात् स्फुटति फलमस्य

Fruits are dehiscent in nature.

6 तुलफलः– तुलसहित फलमस्य

arka fruits have cottony hairs within.

7 विकीरणः– विकीर्यन्ते सतूलबीजान्यस्य

Seeds have comma of hairs which help in dispersal.

8 अर्कपर्णः– अर्कवतीक्ष्णानि पर्णान्यस्य

arka leaves are sharp as sun.

9 खर्जूघ्नः– खर्जू कण्डु हन्तीति

arka relieves kandu (itching).

10 प्रतापः– दाहजनकत्वात्

arka latex causes burning sensation.

Classical categorization

Charaka- *Bhedaniya mahakashaya, swedopaga mahakashaya, vamanopaga mahakashaya. Sukrasodhana varga*

Sushruta- *arkadi gana,*

Bhavaprakash nighantu- *guducyadi varga 67-72*

Types (Bheda)

Susruta - Arka

Alarka

Bh. Pra.Ni. – Sweta

Rakta

Dhan. Ni. - Arka

Rajarka

Raj Ni. - Arka

Rajarka

Suklarka

Sweta Mandara

Description[4]

Macroscopic

Arka is having 2-4 meter deep tap root system along with secondary root system with woody lateral roots. Lateral roots can regenerate when plant is injured. Roots cylindrical, tortuous, rough fissured longitudinally, corky and soft. Primary root diameter ranging from 1.2-6.7 cm is recorded. Rootlets are with varying diameter of 0.3 – 0.6 cm., taste bitter.

Microscopic

T.S. of root shows outermost cork tissue which is composed of 3-9 layers of tangentially elongated and radially arranged cells. beneath the cortex layer secondary cortex is present. Secondary cortex region having thick walled and irregularly arranged cells. cortex region composed of polyherdral parenchymatous cells containing starch grains, many laticiferous cells. phloem consist of phloem parenchyma and sieve tubes. Phloem region cells are having calcium oxalate crystals, starch grains, and some laticiferous cells in scattered manner. Xylem is present in the central region. Xylem is composed of xylem vessels, tracheids, xylem fibers and parenchyma cells. boardered pits are present on the walls of xylem vessels. Xylem fibers are long and lignified along with wide lumen. medullary rays are uni to tetra seseriate in outer region and cells of medullary rays are radially elongated and having starch grains.

Root powder microscopy

Root Powder microscopy shows presence of starch grain, cortex cells, group of stone cells, tracheids, prismatic calcium oxalate crystals, simple pitted xylem vessel, cork cells, fibres, rhomboid shape calcium oxalate crystals, single stone cell and fragment of vessels.

Fig.3: Root bark of *raktarka.*

Fig. 4: Root bark powder of *arka.*

- **Part used -** Moola twak (Root bark),
- **Properties and Action**
- ***Rasa panchaka***

Rasa- Katu, tikta

Guna – Laghu, Ruksha, tiksna.

Virya - Usna

Vipaka – Katu

- ***Doshaghnata***

Kaphavata samaka, kaphashamka because of *usna virya, katutikta rasa and katu vipaka. Vata samaka* because of *usna virya.*

- ***Karma* (Actions)**

Kusthaghna, kandughna, visaghna, vrnaropaka, krmighna, arsoghna, dipan, sophahara.

- ***Amayik prayoga* (Therapeutic uses)[5]**

1. Arsha (Piles)

अर्कमूलं शमीपत्रमर्शोभ्यो धूपनं हितम्॥४९॥ (च.चि.14/49)

Fumigation with root of arka and leaves of sami is useful in arsas(piles)

2. *Twak roga (Skin diseases)*

मनःशिलाले मरिचानि तैलमार्कं पयः कुष्ठहरः प्रदेहः॥१२॥ (च.सु.3/12)

Application of oil prepared from arka(calotropis procera) manshila(realgar) and marica(piper nirum) is beneficial in skin affections .

3. Vrna (Wound)

व्रणप्रच्छादने विद्वान् पत्राण्यर्कस्य चादिशेत्॥९५॥ (च.चि.3/95)

Arka leaves are used to cover the wound.

4. Urustambha (Disease pertaining to thigh)

मूलैर्वाऽप्यश्वगन्धाया मूलैरर्कस्य वा भिषक्॥५०॥ (च.चि.27/51)

Powdered roots of arka and aswagandha are mixed and rubbed over the thigh in urustambha.

5- अर्कपत्रम् सलवणमन्त्रर्धूमम् विदाह्नोत । मस्तुना वा पिबेत क्षारम् प्लीहरोगम् व्यपोहति ।।

(भा.प्र.चि. 33/12)

Arka and salt are heated in closed heating to prepare alkali this alkali taken with mastu is efficacious in pliharoga (splenomegaly)

Dose:- mula twak churn (root bark powder)- 500mg to 750 mg

Table no. 1: Important formulations.

SI. No.	Name	Indication
1.	Arka lavana	Pliha vrddhi, gulma
2.	Arkeswara rasa	Raktapitta
3.	Arkamurti Rasa	Tridosaja Jwara
4.	Arkaksiradi lepa	Arsas
5.	Arka manasiladi taila	Pama kustha ,Kandu
6.	Arkapuspadi vatika	Udarasula ,Agnimandya

Ayurved classical references

Synonyms

Swetarka:- अलर्को गणरूपः स्यान्मन्दारो वसुकोऽपि च | श्वेतपुष्पः सदापुष्पः सबालार्कः प्रतीयसः ||५९|| *(भा. प्र. नि. गुडुच्यादि वर्ग .67)*

Raktarka:- *रक्तोऽपरोऽर्कनामा स्यादर्कपर्णो विकीरणः | रक्तपुष्पः शुक्लफलस्तथा स्फोटः प्रकीर्तितः* ||६०|| *(भा.प्र.नि. गुडुच्यादि वर्ग .68)*

Ayurvedic Properties and action

अर्कद्वयं सरं वातकुष्ठकण्डूविषव्रणान् | निहन्ति प्लीहगुल्मार्शःश्लेष्मोदरशकृत्कृमीन् ||६१||

(भा.प्र.नि. गुडुच्यादि वर्ग 69)

अलर्ककुसुमं वृष्यं लघु दीपनपाचनम् |अरोचकप्रसेकार्शःकासश्वासनिवारणम् ||६२||

रक्तार्कपुष्पं मधुरं सतिक्तं कुष्ठक्रिमिघ्नं कफनाशनं च |

अर्शो विषं हन्ति च रक्तपित्तं संग्राहि गुल्मे श्वयथौ हितं तत् || *(भा.प्र.नि. गुडुच्यादि वर्ग .70/71)*

क्षीरमर्कस्य तिक्तोष्णं स्निग्धं सलवणं लघु |

कुष्ठगुम्लोदरहरं श्रेष्ठमेतद्विरेचनम् ||६४|| *(भा.प्र.नि. गुडुच्यादि वर्ग–72)*

अर्कस्तु कटुरूष्णश्च वातहृद्दीपनः सरः |

शोफव्रणहरः कण्डूकुष्ठप्लीहकृमीञ्जयेत् ||१५|| *(ध.नि.करवीरादि वर्ग 13)*

राजार्कः कटुतिक्तोष्णो वीर्यमेदोविषापहः |

वातकुष्ठव्रणान्हन्ति शोफकण्डूविसर्पनुत् ||१७|| *(ध.नि. करवीरादि वर्ग .15)*

Toxicity

The plant is toxic and is one of the few plants not eaten by grazing animals. Due to its toxicity, the latex extracted from the stem has folk been used to make poison items. The latex is highly toxic to human eyes and produces sudden painless dimness of vision with photophobia Latex of *arka* was studied for its inflammatory effects using pedal odema and air pouch models of inflammation in rats. Produced by mepyramine and cyproheptadine. On the other hand, in the air pouch model, prednisolone was more effective than phenylbutazone in

inhibiting inflammation. Thus, dry latex-induced inflammation in different models could be used to evaluate anti-inflammatory drugs.

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