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## An Overview of *Arka* (*Calotropis procera* (Ait) R.Br.)

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### ABSTRACT

The *Arka* (*Calotropis procera* (Ait) R.Br.) commonly known as *Raktarka* in Hindi is commonly described in *Ayurveda* text. The all parts of *Arka*(*Calotropis procera* (Ait) R.Br.) like leaf, flower, rootbark and latex are useful in treatment of several diseases. Important phytoconstituents are found in the *Arka* and its pharmacological actions are purgative, emetic, expectorant, antispasmodic, digestive, antihelminthic, analgesic. The knowledge of *Vrana Ropana* (wound healing) is important in *Ayurveda* as well as in modern medical science. All parts of this herb are useful for its *Vrana ropana karma* (wound healing property). The *Arka ksheer*(latex) is also used with other ingredients.

### KEYWORDS

*Ayurveda, Arka Ksheer, Vrana ropana*



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## INTRODUCTION

*Arka* is an imperative medicinal plant in Indian traditional system of medicine. The *Arka* is botanically identified in two types; first is *Calotropis gigantean* Linn. R. Br. (*Sweta Arka*) and second is *Calotropis procera* Ait, R.Br. (*Raktarka*). The family of *Calotropis procera* Ait, R.Br. is *Asclepiadaceae*. An erect shrub, usually grows 1.8 to 2.4 m high; Fresh parts clad with white cottony tomentum; bark soft, corky, spongy. Leaves subsessile, usually 5.7 – 15 cm by 4.5 – 8.2 cm. (exceptionally 23 by 15 cm.), broadly ovate, ovate - oblong, elliptic or obovate, with short abrupt acumination, cottony. Flowers in umbellate cymes, which are first tomentose, but nearly glabrous. Peduncles 2.5 – 7.5 cm. long, lateral; pedicles 6 mm. long; buds globose. Calyx divided to the base, glabrous, sepals 5-2.5 mm. ovate, acute. Corolla glabrous, about 2.5 cm. across, divided about 2/3 of the way down. Seeds 6 by 4 mm, broadly ovate acute flattened, narrowly marginal, light brown. The Latex colour is milky white. Latex causes burning sensation. Distribution: More or less; throughout India in warm dry places, Persia, Arabia, Egypt, Tropical Africa<sup>1</sup>. The all parts of *Arka* like leaf, root bark, leaves, and latex are useful in treatment of several diseases. The Chemical Constituents of

*Calotropis procera* Ait, R.Br. have afforded several types of compounds such as benzoyllineolone, benzoylisolineolone and  $\beta$ -amyrin, three oleanane type, triterpenes, namely calotropoleanyl ester (olean-13 (18)-ene $3\beta$ -yl acetate), proceroleanol A and (olean-13(18)-ene-9 $\alpha$ -ol and proceroleanol B(olean-5,13(18)-diene-3 $\alpha$ -ol) (root bark); evanidin 3-rhamnoglucoside and cyanidin 3-rhamnoglucoside(flowers); voruscharin (0.45%), calactin (0.15%), calactin composed of calotropagenin and hexose, uzarigenin, syriogenin proceroside, calotropin, calactinic acid, uscharin,  $\alpha$ -amyrin,  $\beta$ -amyrin,  $\beta$ -sitosterol and calotoxin (0.15%) (latex); d- and  $\beta$ -calotropeols  $\beta$ -amyrin, giganteol, a colourless wax, small amount of tetracyclic terpene and traces of sterols (stem bark); esters of  $\beta$ -calotropeols,  $\beta$ -amyrin, volatile and long chain fatty acids, esters waxy acids, evanidin-3-rhamnoglucosides and alcohols(flowers);  $\beta$ -amyrin, cardenolides, calotropin, calotropagenin (leaves)<sup>2</sup>. The all parts of plant *Arka* used in traditionally in many diseases. These properties are effective in the anticipation and treatment of several diseases. Current study was aimed to find out the earliest therapeutic uses of the plant *Arka Ksheer* (latex) in various *Ayurveda* transcripts.



## MATERIAL AND METHODS

The review of literature regarding *Arka* is accumulated from *Vedas*, *Brihatrayees*, *Laghutrayees*, *Nighantus*, and *Chikitsa Grantha*. The word *Arka* and its related synonyms as per *Ayurveda* literature have been search in various classical text and discussion was made accordingly. In *Vedas* description regarding *Arka* is mentioned in *Atharvaveda*. Many references of *Arka* found in *Brihatrayees*, *Nighantus* and *Chikitsa Grantha* has described *Arka* use for treatment in single form or in form of formulations. And various pharmacological activities related to *Arka* are compiled from current research articles.

### CLASSICAL USES OF ARKA IN AYURVEDA:

**Loss of appetite** – *Sauvarchala*, *Narasaara*, *Arka* flower and *maricha* in equal parts should be pounded together and pills be made 125 mg. each .this (*arkavati*) stimulates digestion.

**Vishuchika (cholera)** – Rootbark of *Arka* dried in shade is pounded with *Nimba* juice and pills are made of the size of Bengal gram. This (*ravimuladi vati*) alleviates *vishuchika* caused by *kapha* and *vata*.

**Cough** – In the morning sugar is soaked with 2-3 drops of *Arka* latex and swallowed in the evening – the diet being sweet and unctuous<sup>3</sup>.

### Piles –

- 1- Fumigation with root of *Arka* and *Sami* is beneficial for piles.
- 2- Latex of *Arka* and *Snuhi* , tender leaves of *Katukalabu*, *Karanja* and goat's urine- this paste is one of the best remedies for piles<sup>4</sup>.

**Splenomegaly** – *Arka* leaves mixed with salts are burnt by closed heating. This alkali should be taken with curd water in severe splenomegaly<sup>5, 6</sup>.

### Wounds –

- 1- It is the constituents of *Sanshodhana Ghrita*<sup>7</sup>.
- 2- Leaves of *Arka* are used for covering wound<sup>8</sup>.
- 3- Oil prepared with latex of *Snuhi* and *Arka* along with bee-wax heals chronic ulcers<sup>9</sup>.

### Leprosy and skin diseases –

- 1- Mustard oil cooked in juice of *Arka* leaves with the paste of *Haridra* destroys scabies and eczema<sup>10</sup>.
- 2- In leprosy when maggots appear one should take decoction of *Nimba* or that *Arka*, *Alarka* and *Saptaparna*<sup>11</sup>.
- 3- Mustard oil mixed with realgar, orpiment, *Maricha*, and *Arka* latex should be applied externally to the part in leprosy<sup>12</sup>.

**Filaria** – Root bark of *Arka* pounded with sour gruel is pasted on the affected part, it alleviates filaria<sup>13</sup>.



## PHARMACOTHERAPEUTIC

### ACTION OF ARKA:

#### Antioxidant Activity –

In current phytochemical research shows that the antioxidant properties found in leaves and flowers of *Calotropis procera*. This properties indicate the therapeutically uses of leaves and flower in folklore<sup>14</sup>.

#### Antipyretic Activity –

In animal models, aqueous solution of the dry latex of *Calotropis procera* showed significant antipyretic activity as comparable to aspirin<sup>15</sup>.

#### Anti-inflammatory Activity –

Latex of *Calotropis procera* shows potent anti-inflammatory activity in several animal models that is comparable to standard anti-inflammatory drug<sup>16</sup>. The ethanolic extract of the flowers of *Calotropis procera* is learnt to have anti-inflammatory activity while latex administration in animal models induce peritonitis, paw edema, hemorrhagic cystitis<sup>17</sup>. Hence, the latex is a prevailing phlogistic agent, therefore can be used for evaluation of new anti-inflammatory drugs.

#### Antiulcer Activity -

The root of *Calotropis Procera* chloroform extract used in many experimental ulcer models evaluated the antiulcer activity<sup>18</sup>.

#### Analgesic Activity –

Basu A evaluated the analgesic activity of different parts of *Calotropis procera* like latex, aerial parts, roots. Significant result showed in the analgesic activity. The ethanol extract of above ground parts, chloroform extracts of roots and the aqueous solution of dried latex were tested in acetic acid induced writhing model<sup>19</sup>.

#### Antimalarial Activity -

The latex is indigenously used in treatment of malarial and low frantic fevers<sup>20</sup>. Sharma and Sharma partitioned the ethanolic extracts of all parts of *Calotropis procera* like flower buds, flowers, leaves, stems, roots, for their in vitro antimalarial activity<sup>21,22</sup>.

#### Antimicrobial Activity –

An aqueous and ethanolic extract of roots and leaves of *Calotropis procera* studied on disc method for the antimicrobial activity. The result showed by ethanolic extract of leaves and roots of *Calotropis Procera* was significantly more than that of the aqueous extract of leaves and roots<sup>23</sup>.

#### Wound Healing Activity –

The latex of *Calotropis Procera* significantly improved the healing process by distinctly increasing collagen, DNA and protein synthesis and epithelization foremost to reduction in wound area<sup>24</sup>.

#### Hepatoprotective Activity –

The hepatoprotective activity tested through an aqueous ethanolic extract of



flower of *Calotropis procera* against paracetamol-induced hepatitis in albino rats. Whereas treatment with an aqueous ethanolic extract of flower of *Calotropis procera* reinvented the changed levels of biochemical indications to nearly normal levels in a dose-dependent manner<sup>25</sup>.

An aqueous and ethanol extracts of *Calotropis procera* root inhibit with the estrous cycle and prevents ovulation in albino rats and thus, showed contraceptive effects<sup>26</sup>.

When the plant is affected by any mechanical damage, their tissues are broken and secrete the latex, which, in contact with air, undergoes a coagulation process and results in the formation of rubber. This property of *Calotropis procera* latex provisions the awareness that its production is involved in mechanisms of plant protection against microorganism incursion such as viral, fungal and insect's invasion. The latex has an adhesive feature, allowing it to restrain insects<sup>27</sup>.

## DISCUSSION

Virtually all parts of the plant *Arka* possess medicinal properties. Many references of *Arka* are present in *Vedas*, *Brihatrayi*, *Laghutrayi*, *Nighantu*, and *Chikitsa Grantha* and current research article. Different parts of plant *Arka* were used in

the form of powder (*Arka* root), oil (*Arka* leaves juice), juice, decoction, external application (*Arka* latex)<sup>28</sup>. The word *Arka* in the *Nighantus* is the synonyms of *Anna* and *Vajra* which shows nutritional, sharp and unshakable<sup>29</sup>. Therapeutic uses of different part of *Arka* are enumerated in many diseases like *Vrana*, *Sopha*, *Krimi*, *Gulma*, *Arsha*, *Kustha*, *Kasa*, *Twak Roga*, *Swasa*, *Gandmala* etc<sup>30</sup>. The *Rasapanchaka* of *Arka Ksheer* (latex) – *Rasa* – *Tikta*, *Lavan*, *Guna* – *Ushna*, *Snigdha*, *Vipaka* – *Katu*, *Virya* – *Ushna*, and *Karma* – *Kaphavata Shamak* . The drug performances its action by quality of its *Rasa*, *Guna*, *Veerya* and *Vipaka* , *Doshakarmita*<sup>31</sup>. *Tikta Rasa* which is known as bitter increases secretion of digestive juices right from the time it gets in touch with tongue<sup>32</sup>. This supports the clinical use of *Arka* in diseases like loss of appetite, cholera, piles etc. mentioned in different classics of Ayurveda. The anti-pyretic, anti-malarial which shows its action against parasitic infestations. *Filaria* is also a parasitical disease. Anti-inflammatory activity of *Arka* supports its use in diseases like *filaria*, *splenomegaly*, *wound inflammation*. Thus, again proving that Ayurvedic classics are based on extensive clinical research. *Arka ksheer* is *Kaphashamaka* because of *Ushna Virya*, *Katu-Tikta Rasa* and *Katu Vipaka*. It is *Vata*



*Shamaka* because of *Ushna Virya*. *Vaat* and *kapha* are the main *Doshas* involved in the pathogenesis of skin diseases along with *Pitta*. It pacifies *Vaat and Kapha* as well as expels the vitiated *Pitta* out of the body by its purgative action. This is the basis for its use in skin diseases as per Ayurveda which is well supported by modern researches.

## CONCLUSION

*Arka*(*Calotropis procera Ait.R.Br.*) is an important plant in many traditional system of treatment similar in *Ayurveda*. *Arka* is a very useful medicinal plant which is widely distributed. Wide application of *Arka ksheer* also owes to the easy availability of *Arka*. Many therapeutic uses of *Arka ksheer* are mentioned by extreme Ayurveda advisers. More and more researches should be conducted over the medicinal value of *Arka ksheer*. We should explore more and more therapeutic medicinal uses because it is easily available.



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