

## TOXICOLOGICAL REVIEW OF ARKA (AN UPVISHA IN AYURVEDA)

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Article Received on 08/03/2019

Article Revised on 31/03/2019

Article Accepted on 21/04/2019

## ABSTRACT

In classical text two varieties of *Arka* is described *Shwetaarka* and *Raktarka*, both varieties having therapeutic values. Various part of the drug is used in different diseases to combat and got relief from the diseases. This review is an attempt for information about the *upvisha* (Semi Poisonous drugs) described in Classical texts with Special reference to their literary, pharmacological activity, their toxicological effect, fatal period, fatal dose, treatment, postmortem appearance and medico legal aspects.

**KEYWORDS:** *Upvisha*, Semi poisonous drug, medico legal aspects.

## INTRODUCTION

It's well known that the *Ayurveda* is a science of life. "Ayurvedo Amrutanam" because it is God's gift *Dharma*, *Artha*, *Kama*, *Moksa* that should be practiced by ancient *Acharyas* which is based on *Atharveda*, one of the oldest scripture of *Hindus*. In *samhita*, *Acharyas* have mentioned *Ashtanga ayurveda* (eight branches) i.e. *Kaya*, *Bala*, *Graha*, *Urdhvanga*, *Shalya*, *Dramstra*, *Jara*, *Vrasha*.<sup>[1]</sup>

*Aacharya Sushruta* has described *Agada tantra* in a separate part which known as *Kalpasthan*. Among the eight branches of *Ayurveda*, *Agada tantra* stands separate in its concepts, clinical approach, management and results. *Agada tantra* is the branch of *Ayurveda*, which deals with every kind of toxicity, whether of animal origin, vegetable origin, mineral or individual toxicity. *Ayurvedic* toxicology has developed various concepts regarding acute poisoning, environmental pollution, incompatibilities of food and allergy. According to ancient view *Ayurveda* have considered *Visha* as the most important cause of *Aagantuja roga* (extrinsic disease). The term *Agada* has got several meaning, the word *gada* is one of the synonyms of disease and in the context it means the overall effect of poison observed in the body. The counter measures which are taken against these manifestations are collectively known as *Agada* and the part of *Ayurveda* which deals with it is known as *Agadatantra*. *Agada* means that which removes *gada* is termed as *Agada*.<sup>[2]</sup> It denotes medicine or drug antidote for poison. It is also referred as a healthy stage free from disease. Here *Tantra* means science. *Agadatantra* is the branch of *Ayurveda*

deals with the bite of snakes, insects, spider, scorpion, rats etc. their characteristics symptoms, the sign and symptoms of accidental or purposeful poisoning including *kritima visha*, *gara* and *dooshi visha*.<sup>[3]</sup>

In *Ayurvedic* Literature it is told that if poison are used after detoxification (*Shodhana*) in prescribed dose then that poison may become a medicine.<sup>[4]</sup>

**Upavisha**

In classical text Eleven number of *Upvisha* described are as follow.<sup>[5]</sup>

'*Vishatindikabeejamcha twahipenascha rechakam | Dhaturbeejam vijaya gunja bhallatakahyah || Arkaksheeram snuhiksheeram langali karavirakam | Samakhyato ganoayam tu budhairupavisharbhidh: || Vishatindikabeeja(Kuchla), ahiphena(Afim), rechaka, dhaturbeeja, vijaya, gunja, bhallataka, Arkaksheera, snuhiksheera, langali, karavirakam* are the *Upavisha* described in the literature. The above described *Upvisha* may become a good medicine if administration is done properly.

From above described *Upvisha*, *Arka* is here to review.

**Arka**

*Arkastu katurushnascha vatjiddipaniyaka | shothvranahar kandukushthakramivinashnah || (Rajnighantu)*

**Varieties of Ark in different classical text**

According to <i>Aacharya Sushrutha</i>	: 02 ( <i>Ark &amp; Alarka</i> )
According to <i>Aacharya Bhavprakash</i>	: 02 ( <i>Shwetarka &amp; Raktarka</i> )
According to <i>Dhanvantari Nighantu</i>	: 02 ( <i>Ark &amp; Rajaarka</i> )
According to <i>Raj Nighantu</i>	: 04 ( <i>Ark, Rajaarka, Shuklarka, &amp; Shwetamandaraka</i> )

**Habitat:** The plant grow wild throughout India.

**Pharmacognostical Profile<sup>[6]</sup>**

Botanical Source	: <i>Calotropis procera</i> ( <i>Raktarka</i> ) <i>Calotropis gigantean</i> ( <i>Shwetarka</i> )
Natural Order	: Asclepiadaceae
English Name	: <i>Madar</i>
<i>Gana</i>	: <i>Swedopag, Vamanopag, Bhedniya, Shatshodhanvrakshya</i> ( <i>Ch.</i> )
Part used	: Root bark ( <i>Mula Twak</i> ), milk ( <i>Chhir</i> ), flowers, Leaves.

**Phytochemical profile<sup>[7]</sup>**

The root bark of *Calotropis procera* contains:

- B- Amyrin
- Giganteol
- Calotropiol
- Benzoyllineolone
- Benzoylisolineolone
- Three oleanene type triterpenes namely calatropoleanyl ester (olean-13(18)-ine-3B-rL acetate), proceroleannenol B (olean-13(18)-diene-3a-ol)

**Physical parameters**

Total Ash	-	17.40%
Acid Insoluble ash	-	6.46%
Water soluble extractive	-	14.50%
Alcohol soluble extractive	-	20.00%
Alcohol extractive	-	12.25%
Water extractive	-	8.27%

The flower of *Calotropis procera* contains

- Evanidin 3- rhamnagluside and cyanidine 3- rhamnagluside,
- Esters of B- calotropeals.
- B-amyrin volatile and long chain fatty acids.
- Esters of waxy acids and alcohols.

The leaves of *Calotropis procera* contains:

- B-amyrin
- Cardenolide
- Calotropin
- Calotropagenin

The stem bark of *Calotropis procera* contains:

- B-amyrin
- Giganteol
- A colourless wax
- Small amount of tetracyclic terpene and traces of sterols

The Milk contain

- Trypsin
- Uscherin (it work on Heart)
- Calotropin
- Calotoxin

**Pharmacodynamic Profile<sup>[8]</sup>**

<i>Rasa</i>	: <i>Katu, Tikta</i> (Flower: <i>Tikta, Madhur</i> )
<i>Guna</i>	: <i>Laghu, Ruksha, Tikshna.</i>
<i>Virya</i>	: <i>Ushan</i>
<i>Vipaka</i>	: <i>Katu</i>
<i>Doshagnata</i>	: <i>Kaphavataj</i>

**Pharmacological Profile<sup>[9]</sup>**

- It is *Jwaraghan, Kandughan, Kushthagha, Deepan, Pachan, Rechan, Kramighana* and *Shothahar*.
- The 50% ethanolic extract of roots and leaves, in a preliminary biological screening showed effects on Respiration and CVS in dogs/cats and Anticancer activities against Human LD<sub>50</sub> of the extract was found to be 550 mg/kg i.p. in mice (**Bhakuni et al. 1969**).
- The aqueous extract of plant showed antifungal activities against *Penicillium chrysogenum*, *P.notatum*, *Aspergillus niger* Iso-1, *A.niger* Iso-2 and *Mucor* species (**Nanir and Kandu**).
- The ethanolic extract of root showed insecticidal activities against *Musca domestica* and *Tribolium castaneum* (**Atal et al.**).

**Toxicological profile<sup>[10]</sup>****Sign and symptoms**

External – Vesication and redness

Eyes – Conjunctivitis

Internal – Acts as GIT and cerebrospinal poison – bitter taste, burning pain in GIT, stomatitis, Vomiting, Diarrohea, dilated pupils, Convulsions, Collapse and death.

**Fatal Dose**

Uncertain

**Fatal Period**

12 hours

**Postmortem appearance**

Inflammation of GIT and congestion of Viscera.

**Medicolegal aspects**

- Used for infanticide (with milk or water)
- Used for Criminal abortion (orally or applied to genitals)
- Used as Cattle poison (with fodder or pushed in rectum)
- Used to produce artificial bruises.
- Used as arrow poison & rarely for suicide.

**DISCUSSION**

According to *Aacharya Charaka*, if we use even poison in right manner it works like a nector and nector too turn in a poison when it is used in a wrong way.

*Deham pravishayam yad dravyam dushyitva rasadikan / swasthyapranharm cha syat tad dravyam vishmuchyate* // (*Kashinath Shastri Cha. Sam. Chi. 23/1-2*)

A substance which enters in body contaminates to *Dhatus* and cause illness and death is called *visha* or poison. To diagnose this poison infestation by merely considering the objective signs is a very difficult process.

**CONCLUSION**

In *Ayurveda* mental and physical two types of diseases are described. *Agada Tantra* is one of the branch of *Ashtang Ayurveda*. *Upvisha* are described in *Agada Tantra* and *Rashsashttra* being used as medicine. *Ark* is one of the *upvisha*. Toxicological effect, fatal dose, fatal period, treatment, Postmortem appearance, pharmacological activities and medico legal aspects are the main features of this review. The information could be helpful to the forensic experts, researchers related to *Ayurvedic* research. More research is needed to this plant to get the claimed therapeutic potential.

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