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DRUG REVIEW OF ARKADI VARTI: AN AYURVEDIC FORMULATION FOR KAPHAJ YONIVYAPAD

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ABSTRACT

In Ayurveda gynecological disorders have found its immense importance in the field of medicine due to the fact that woman have that unique ability of giving birth. In Ayurveda different health condition of females are described in separate section under the name of yonivyapada, including majority of gynecological disorders. The complaints of kaphaj yonivyapad are yonigat strav, kandu, picchila strav, aplavedana, avedana. It is most commonly seen gynecological disorder in woman of reproductive age. The ayurvedic treatment not only cures pathology in reproductive organs but also treats the woman as a whole with holistic approach, thereby improving her general health also. *Acharya Charak* has mentioned *Arkadi varti* in *Charak Chikitsa* 30 in the treatment of *Kaphaj Yoni vyapad*. Arkadi varti contains Arka latex, Yava churna, Saindhava lavan. In Dhanvantari Nighantu, Arka is described as *Vataghan, Deepana, Sophahara, Vranahara, Kandughna, Kusthaghna, Pleehaghna, Kramihara*. Arka "*Calotropis procera"* is mentioned as upavisha in different ayurvedic texts. It contains many biologically active chemical compounds like cardenolides, phenols, alkaloids, steroids, terpenoids, saponins, tannins, glycosides, flavonoids (Quercetin-3-O-rutinoside), sugar etc. Due to this chemical constitution of Arka, it exhibits many pharmacological properties such as antimicrobial, antibacterial, antiprotozoal, antimycoses (antifungal), antioxidant etc.

KEYWORDS: Arka, Yonivyapad.

DRUG REVIEW[5]

Arkadi varti is a mentioned as vaginal suppository in kaphaj yonivyapad by acharya Charak in chikitsasthana 30.

भावितं पयसाऽर्कस्य यवचूर्णं ससैन्धवम् ॥ ७१ ॥

वर्तिः कृता मुहुर्भार्या ततः सेच्या सुखाम्बुना ॥ (च.चि.३०/७१)

INTRODUCTION[1]

Arka consists of dried leaves of Calotropis procera (Ait.) R.Br. (Fam. Asclepiadaceae), found wild more or less throughout India.

Etymologically "Arka term means- to be worshiped". Krsnayajurvediyas believe that Arka is born- "when saint Angrasa`s sweat drops have fallen on a goat while the great saint was travelling for heavens. The griedy goat touched some leaves which turned to be Arka". In Taittarya Samhita it is indicated that arka does possess usna & tiksna properties. Atharva Sounakiya Samhita described Arkamani as Vajkarana.

In Brahmana granthas it is equated to Agni & Anna. In Satpada brahmana equation is made between Arka human parts.

Arka parna- Karna (ears)

Arkapuspi- Aksi (eye)

Arkakes- Nasika(nose)

Arka mundga- Ostha(lips)

Arkadhana-Teeth

Arkasthla- Tongue

Arkamula- Tongue

Arkamula- Antra (intestine)

Caraka described Arka among the Ksri dravyas in the first chapter of the Shamhita purpose of Vamana as well as Virecana. Susruta and Vägbhata have mentioned a group with its name (Arkadigana). Apart from Virecana it is used extensively in Ayurvedic formulations for the treatment of Kestha, Arsas, Udara, Gulma etc. All the nighantus have described two varieties of Arka (except Raja Nighatu).

Arka and Räjärka of Dhanvantari Nighantu appears to be Raktärka and Svetärka of Sodhala respectively. Kaiyadeva mentioned the two varieties as Arka and Rajarka. Bhavamisra`s Svetarka and Raktärka are identified with C. gigantae and C. procera respectively.

Some doubt is possible in this identification since several scholars have debated their correct identity. We come across both white and purplish-red tinged flowers of C. gigantae in the wild. On the other hand C. procera always appears red coloured and its flowers are clearly distinguishable for those of C. gigantae. The height of the confusion is apparent since the recently published data-base of CCRAS shows these plants.

With this back ground it will be interesting to note that Raja Narahari described four varieties viz, Arka, Räjärka, Šuklärka and Sveta Mandaraka. Probably he followed the morphological variations as the basis for his classification. The possible explanation for his approach may be as following.

Arka=C. procera

Räjärka= C. gigantne or C. procera growing to greater height

Šuklärka= C. gigantae with pure white flowers

Sveta Madaraka= C. gigantae with purple tinged flowers

BOTANICAL DESCRIPTION[2]

1. C. gigantea- A shrub up to 3 m high, young shoots, infloresence and under side of leaves covered with soft, wooly-tomentum. Leaves 10-15 cm long, sessile or subsessile, obovate or obovate-oblong, base cardate. Flowers-in axillary pedunculate corymos, purplish-lilac or white. Fruits-follicles, 8-10 cm long, recurved targid. Seeds numerous with silky hari.

2. C. procera- A shrub upto 2.5 m high. Young leaves hoary, glabrous when fully grown. Leaves-10-18 cm long, ovate-obovate or obovato-oblong, acute, infloresence covered with white wooly-tomentum. Flowers in terminal and axillary corymbose cymes, purplish-red. Frutis-follicles, 10-14 cm long, recurved, Seeds pumerus with silk hair.

SYNONYMS OF ARKADRAVYA[1]

अर्क सूर्याह्वयः क्षीरी मन्दारो सदापुष्पों विकिरणः |

मंदारो वसुकोअलर्को राजाह्वो दीर्घपत्रकः ||

Arka, süryähva, ksiri, sadäpuspa and vikirana are the synonyms for red variety of arka.

Mandara, vasuka, alarka, räjähva and dirghapatraka are the synonyms for white variety of arka.

Sanskrit: Bh¡nu, Ravi, Tapana, Alarka

Assamese: Akan, Akand

Bengali: Akanda, Akone

English: Madar Tree

Gujrati: Aakado

Hindi: Aak, Akavana, Madar, Safed-Ak

Kannada: Ekka, Ekkadagida, Ekkegida

Kashmiri: Acka

Malayalam: Erikku

Marathi: Rui Oriya : Arakha, Mandara

Punjabi: Ak, Shakar-al-lighal

Tamil: Erukku, Vellerukku

Telugu: Jilledu

Urdu: Aak, Madar

Sind: Ak, Spalwakka

Indian Languages: Spulmei; Spalmak; Pashkand.

HABITAT[3]

North. Western and Central India, from Sind, and the Punjab, Upper Bengal, Bihar and Bombay, and the drier climate of the Deccan. This is the smaller white-flowered variety.

DESCRIPTION[3]

a) Macroscopic Sub-sessile, 6-15 cm by 4.5-8 cm, broadly ovate, ovate-oblong, elliptic or obovate acute, pubescent when young and glabrous on both sides on maturity.

b) Microscopic Midrib - transverse section through midrib shows an upper and lower single layered epidermis externally covered with thick, striated cuticle, few epidermal cells on both surfaces of leaf elongated to form un i-seriate, 2-3 celled trichomes, epidermal cells 18 cubical and radially elongated, epidermis followed by 3-8 layered collenchyma on both lower and upper surfaces, parenchymatous cells thin-walled, isodiametric to circular with intercellular spaces present in ground tissue, stele crescent shaped composed of bicollateral and open vascular bundle, xylem consists mostly of vessels and tracheids, a strip of cambium present between xylem and phloem tissues, laticifers also present in the phloem and parenchymatous zone. Lamina - dorsiventral with mesophyll differentiated into a palisade and spongy tissue, upper and lower epidermis covered externally with a thick, striated cuticle,

below upper epidermis three rows of elongated, closely arranged palisade parenchyma present, spongy parenchyma tissues almost radially elongated with intercellular spaces, central cells irregular in shape, laticifers and vascular bundles also present scattered in this region IDENTITY, PURITY AND STRENGTH Foreign matter Not more than 2 per cent, Appendix 2.2.2. Total Ash Not more than 21 per cent, Appendix 2.2.3. Acid-insoluble ash Not more than 5 per cent, Appendix 2.2.4. Alcohol-soluble extractive Not less than 5 per cent, Appendix 2.2.6. Water-soluble extractive Not less than 24 per cent, Appendix 2.2.7.

CONSTITUENTS[1]

C. gigantes- laurane, saccharose, b-amyrin, a & b-calotro- peols, holarrihetine, cyanidin 3-rhamnoglucoside, toraxasterol isovalerate, giganteol, calotroposide, calactin, calotoxin, calotropis DI & DII, gigantin etc.

C. procera-Beta and alpha-Amyrins, cyanidin-3-rhamnogl-ucoside, procesterol, beta-sitosterol, calactin, calotoxin, calotro-pagenin, calotropin, calotropain, proceroside, proceragenin etc.

PROPERTIES AND ACTION[1]

Rasa	Katu, Tikta
Guna	Laghu, Sara, Snigdha
V¢rya	Ushna
Vip¡ka	Katu
Karma	Vaatghan, Deepana, Sophahara, Vranahara, Kandughna, Kusthaghna, Pleehaghna, Krami hara.

PROPERTIES OF ARKADVAYA[2]

अर्कद्वयं शंखवातकुष्ठकण्डू विषव्रणान।

निहन्ति प्लीहगुल्माशोंषकुच्छ्लेष्मीदरक्रिमीन्॥ ३२३॥

Both varieties of arka will be useful in the management of sankhavata, kustha, kandu, visaroga, vraṇa, pliharoga, gulma, aras, yakrtodar, kapharoga, udara & krmi.

CLASSICAL CATEGORIZATION[2]

Caraka- Bhedaniya, Vamonopaga, Svedopaga

Susruta- Arkadi, Adhobhagahara

Vagbhata- Arkadi

PART USED[2]-Root bark, flower, leaf, latex, seeds.

DOSAGE[2]-Root bark powder 0.5-1 g, flower power 1-3 g. Tincture 1½ to fluid drachm. Powder 5 to 10 gm As an alternative the powder may be used in doses of less than grs; it is an emetic in doses of 30 to 60 grains.

IMPORTANT PREPARATIONS[2]-Arka tailam, Arka lavana, Arka vat, Ravimüladi vat.

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 it is used in 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 *Kushta* chikitsa adhyay it is used in *Vicharchikahar* lepa (eczema), it is one of ingredient of vajrak tail and mahavjrak tail.[1-7]

IN NIGHANTU

1. *Shleepad* (Filariasis) - The white Arka is grind with kanji and its lepa is prepared and is useful in *Shleepad* (Filariasis) and *Badhmal* (constipation).
2. Udar (Ascitis) - Ash of Arka leaves with saindhava is given with takra in udar rog (ascites).
3. Piharoga-Arka leaves and salt are burnt by closed beating. This is given with curd water (B.P.)
4. Netra Roga-Seeds of Arka processed in milk is useful (Vai. Ma.)
5. Arsas-Fumigation with root of Arka and Sami will be beneficial (C.S.C_1.14)
6. Gandmälä-Paste made out of Arka Ksira, Japa puspa, oil and Laksärasa may be applied externally for a week (R.M.)

IN INDIAN MATERIA MEDICA[3]

1. If the root of this white-flowered variety, viz. C procera, is taken with black pepper, it will destroy the poison of snake-bite in doses of 5 to 10 grains. The medicinal properties of this plant are similar to those of C. gigantea.
2. The fresh root is used as a tooth-brush and is considered by Pathans to cure toothache. (Watt).
3. Flowers are used in cases of cholera. (Dr. Thompson, in Watt's Dictionary). "In mild cases of dysentery the crude powder of the dried root (which grew abundantly in the Khyber Pass) certainly appeared to do good, and cases got well on it, but that it was certainly not a specific in all cases and had much the same tendency as Ipeca cuanha, to produce vomiting and depression. The evacuations become bilious after use of this powder, much the same as they do after Ipeca- cuanha." (Col. G. F. A. Haris, M. D., F. R. C. P.). "Useful in mild sub-acute cases of dysentery, but recovery is slow" (Capt W. M. Anderson). In Indigenous medicines the powdered root-bark is in considerable use. "Minimum doses of tincture were found useful in acute and sub-acute dysentery, but in cases of chronic diarrhoea no good effects" (Capt. Childe). "The powder is a good substitute for Ipecacuanha in dysentery, and the tincture is not so efficacious as the powder" (Capt. K. Prasad).
4. Tincture and powder were used in bronchitis and dysentery and were found efficacious" (Asst. Surgeon, Ganga Singh). "Tincture prescribed as a tonic and stomachic for debility and impaired appetite in doses of 20 m. had given satisfactory results" (Major Powell). "The pulvis should be given in at first in small doses and gradually increased, and the tincture to be started in 20 m. doses and gradually increased, so that no violent vomiting and purging result" (Civil Surgeon Maddox). Dr. L. Lewin, of Berlin Arch. Exp. Path. Pharm. of 71, 142-56, declares this as "a new Heart-Drug acting like Digitalis. N. B--C. gigantea and C. procera: both these plants have a white milky acid juice.

INDIAN PREPARATION & THEIR USES[3]

(1) An oily preparation (Arka taila) made by boiling together 8 parts Sesamum oil. 16 parts Calotropis juice, and one part turmeric, is useful in eczema and eruptive skin diseases. In scorpion and insect bites it relieves the pain and burning. As a depilatory it is used by women for removing hair from parts of body. It is a useful local application for the relief of painful joints and swellings, and for ringworm of the scalp. In combination with the wood of Berberis asiatica it is used as a caustic for closing sinuses and fistula in ano.

(2) Dried flowering tops 2 to 4 grains pounded and boiled with molasses, are given every morning as a remedy for asthma. Fine powder of root-bark is prescribed in cases of syphilis, lepra, hectic lever, etc. Dose from 3 to 5 grains three times in the day, gradually increased.[2] drachms dried root-bark are to be infused in half a seer of warm water. In syphilis and lepra it is taken in dose of half-a- chattak (1 oz.)

(3) Take equal parts of the branches, leaves, milky juice and flowers. Press them well and make pills (of the size) dry them in the sun. One pill given every morning in various kinds of skin diseases.

(4) For want of virility: Take 125 flowers, dry and powder them, then mix with one tola each of cloves, nutmegs, mace and pelli. tory root, and make into pills of 6 massas each. One pill may be taken daily dissolved in milk. (Dymock).

RECENT ADVANCES

Anti-inflammatory activity[14]

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.

Anti-fungal Activity[15]

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, Aflavus, 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.

Antioxidant Activity[16]

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.

Anti diarrheal activity[17]

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. 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.

Anticancer activity[18]

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.

Hepatoprotective activity[19]

Hepatoprotection property of Calotropis procera is because 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.

Anti-HIV-1 and Anti-Microbial activity[20]

A crude leaf extract of Calotropis procera was examined for antimicrobial activity against salmonella typhi, salmonella paratyphi, vibrio cholera and klebsiella pneumoniae 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.

Anti- hyperbilirubinemic and wound healing Activity[21]

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 ofsutured skin, increased percentage of wound healing with decreased epithelization period in incision and excision model, respectively.

Anti-ulcer activity[22]

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.

RESEARCHES[2]

1. The milky juice of C. gigantea exhibited marked stimulant action on the spontaneous activity of isolated non-gravid rat uterus (Dhawan & Saxena. 1958).
2. The alcoholic extract of root and leaves of C. gingantea and procera were found to have anti-cancer activity against human epidermal carcinoma of the nasopharymx in the tissue culture (Dhar et al, 1968 & Bakal 1969)
3. The crude latex of C. procera and it protein fraction were found to possess high fibrinolytic activity and anti-coagulant activity both in rabbit and human plasma (Sriavastava et.al., 1962)
4. The aqueous and alcoholic extracts of root of C. procera (0.2 ml dose) produced slight depression followed by stimulation of the rate and force of myocardial contraction in isolated frogs heart (Derasari & Shuk, 1965).
5. The 50% ethanolic extracts from the leaves of C. gigantea and C. procera have 20.6% and 20% anti-implantation activity when administered at a dose of 200 mg and 50mg/kg b.w. respectively (Prakash et al., 1978).
6. Calotropin (from C. procera) showed digitalis-like action on the heart, but its action was not cumulative and was less harmful (Bull. Fac. Pharm. Cairo Univ. 1971, 10, 1).

7. Powdered bark of C. procera showed antidiarrhocal effect in cases of 'Atisara' & 'Pravāhikā' at a dose of 250 mcg thrice daily for 7 and 15 days seperately. It increased bile secretions and showed sedative action on muscles allaying all pain and irritation of intestine. It cured 67.1% patients of Atisara and Pravāhikā (J. Res. Ay. & Siddha 1985, 6, 88).

DISCUSSION

Calotropis procera is categorised under organic irritant poisons. It is widely available all over India. After going through literature & ayurvedic text it is observed that it has many medicinal uses. For Vishaghana yogas, calotropis procera is commonly used by traditional Visha Vaidyas of Kerala. It is used in various disease conditions both internally & externally. Maximum formulations containing Arka are indicated in *Kaphagata rogas*, *Twak vikaras* and *Visha danshas*. Many trial proved that it shows anti-inflammatory, anti fungal, antioxidant, anti diarrhoeal, anti cancer, hepatoprotective, anti HIV-1, anti microbial, anti hyperbilirubinemic, wound healing & anti ulcer activity.[24,25] All parts are effective in various disorders. Kerala Visha Vaidya Granthas have wide range of therapeutic applications with arka. Due to *Teekshnan UsnaVirya, Katu Tikta Rasa & Katu Vipaka* it exhibits great role on kaphaja roga. In Dhanvantari Nighantu, Arka is described as *Vataghan, Deepana, Sophahara, Vranahara, Kandughna, Kusthaghna, Pleehaghna, Kramihara*. As it is easily available plant we can use it on large scale in a day today life & also there is scope for new researches in future about its medicinal uses.

CONCLUSION

The World Health Organisation has estimated more than 80% of the world population in Developing countries depends primarily on herbal medicine for their basic healthcare needs. Calotropis procera is highly liked remedy among ethnic groups as well as Ayurvedic & traditional practioners, for the treatment of a number of illness. Plants belonging to the Upavisha group can give quick relief from various diseases & other toxicological conditions when used both externally & internally. Indian Acharya have called Arka Ksheera as “Vanaspatya parada”. Arka is not practically in use in clinical practice & there remain a scope for research in this area. Researchers are exploring the therapeutic potential of this plant as it is likely to have more therapeutic properties than are currently known.

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