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DRONAPUSHPI [Leucas aspera(willd)Link.] – A Review Article

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Abstract: About 3,35000 species of plants are known all over the globe to be used by man in one way or the other but a very small number of them are actively used as a medicine. The demand for herbal products is increasing all over the world, because of increasing adverse effects of synthetic products. Increasing population, health awareness and increasing side effects of modern medicine are the other factors which have increased the demand of Ayurvedic medicine all over the world. This has created a great stress over our natural herbal depots. But systemic documentation is lacking for most of the drugs in India. One of the plant is Dronapushpi [Leucas aspera (willd) Link.] which is a weed plant, abundantly seen in waste lands. This plant is being used as medicine by traditional Ayurvedic physicians for many liver disorders. This review article deals with Historical review, synonyms, Vernacular names, Ayurvedic properties research works and therapeutic uses of Dronapuspi.

Keywords: Dronapushpi, [Leucas aspera(willd)Link.]

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Introduction:

In ancient time the collection of drugs was done with some strict scientific and holistic parameters. Before collection of a drug the season time, Grehas and Nakshtras etc. were properly taken care of and also the precious drugs were worshiped.This helped to prevent the over exploitation of herbal resources and as a result of this there was no threat to the life cycle of drugs. But in recent times the commercialization of drug industry has exploited the herbal resources in such a way that many precious herbs have become extinct and many are at the verge of extinction. To meet this challenge it is very necessary to save our existing drugs and introduce new drugs in our pharmacopeia. Dronapuspi one of the plant mentioned for the treatment of diseases like Kamala, Shopha, Jwara, Tamaka-shavasa,Visham jwara, Vrana shodhaka [1,2,3]

Historical Background

The Vedas are considered to be the oldest scriptures, the most important and highest written authority. In vedic literature there is no description or reference regarding the drug Dronapushpi. After Vedic period the drug Dronapushpi is also not described in all the Brihat-Trayi. But in Caraka samhita one synonym 'Kutumbaka'[4] is mentioned and Acharya Cakrapani described it as Dronapushpi. Acharya Dalhana also correlates the the synonym Kutumbaka[5] mentioned in Susruta samhita as Dronapushpi. In Astanga Sangraha a plant 'Drona'[6] is mentioned. In Astanga Hrudaya a plant 'Kutumbaka'[7] is taken as Dronapushpi. After samahita period the drug is mentioned in almost all Nighantus and various synonyms are given.

Classification

In Bhavaprakash Nighantu and Shaligram Nighantu Bhushan it is coming under Guduchyadi varga. In Kayyadeva Nighantu it is in Oushadhi varga. In Abhidhan ratanmala it is described in Katudravya skanda and in Raj Nighantu its comes under Parpatadi varga.

Synonyms[1-3, 9-10]

Synonyms are descriptive terms of drugs used by the authors of Nighantus. It indicates the origin, morphological features, properties etc of a drug. Various synonyms of Dronapushpi with their probable interpretations are given below

Interpretation of Synonyms:

Interpretation of some important synonyms according to their derivations is given below.

Chitrpatrika – The leaves are some what spoted

Derghapatra – The leaves are linear and sharp

Chtrakshupa - The plants is bright colour

Drona- - Look like a vessel

Dronapushpi, Dronapushpah - The flowers have cup shape

Kusumbhaka – The flowers are white in color and are of cup shaped

Kumbhayoni – The flowers are cup shaped

Kumbhayonika – The flowers are cup shaped

Kharbusha, Kharbhusha, Kharapatra – The leaves are rough in nature

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Mahodrona – The flowers are look like a vessel

Phalpushpa - The flowers will be on the fruit

Phalepushpa – The flowers will be on the fruit

Sheetapuspo – The flowers are white in color

Sugandhi - Plants having some characteristic fragrant

Supushpa – The flowers appears beautiful

Suksham beeja – The seeds are very small

Plant source of Dronapushpi according to various authorities

The synonyms are not helpful in identifying the plant conclusively. Most of the other equate the drug with different species of leucas belonging to lamiaceae. Some consider Leucas cephalotes Spreng. as the drug source- Nadakarni (1954:739), Chopra et al. (1956:153), Chunekar (1982:463), Sharma (1983:707).While others accept Leucas lamifolia (Now Leucas indica (Linn.) R. Br. ex Vatke) as Dronapushpi, Kritikar & Basu (1918:1046), Vaidya (1936:296), Nadkarni (1954:740), Chopara et. al (1956:153).

Leucas aspera (Willed) spr. is also equated with the drug by still others, Kurup et al.(1979:64). The eminent works like Indian Materia Medica by Dr. K.M.Nadkarni, The Wealth of India, D.EP. IV.632, III 317, Fl-Br, Ind.IV.690, Mukerjee, Ree.bot, Surv. India 1940, 14 (r) 166, Krit & Basu, PI- 775. has given detailed descriptions about the drug including its Habitat, Morphology etc. 'Pharmacographia Indica' have given detailed descriptions about the drug. In Kerala Leucas aspera (Willed) Link. is equated with the drug Dronapushpi by IMP, Vaidyaratanam P.S.Varier's and by Vanrheede's Hortus malabaricus. Plant Source of Dronapushpi is Leucas aspera (Willed.) Link of family Lamiaceae and synonyms are Leucas cephalotes. Spreng and Leucas indica.Linn

Vernacular names

Bengali – Hulkusha, Darunaphula

Bomay – Tamba

English- Tumbe

Gujarati – Kulannuphul

Hindi – Goma, Chota-Kalkusha

Kannada - Tumbe

Konkani – Tumbo

Malyalam – Tumba

Marathi – Bahuphul

Panjabi – Guldora

Sansakrit – Dronapushpi, Chitrapathrika, Chitrak-shupa

Tamil – Tumbai-cheddi

Telgu - Tammachettu

Taxonomy[8]

Distribution and Habitat - It is found throughout India as a weed on waste lands and road side upto 900 m.

Habit - An erect or diffuse much branched herb usually annual, 15-60 cm in height with hispid or quadrangular stems and branches, roots many long hairy fibrous, leaves 1-3 inches linear or oblong

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Root – Root is formed of many long hairy fibres.

Stem – Hispid or quadrangular, striated, knotted and much branched, green slightly rough and some what hairy.

Leaves – Sub-sessile, attached to the nodes of stalk in two or singly, linear or linear oblong or linear lanceolate, obtuse, entire, pubescent, upto 7.5 cm. long and 1.25 cm. broad.

Flowers – White sessile small, in dense terminal or axillary whorls. From flowers at random stand out four leaves, one of which is more long and plain the other more short, hood like downy on the outside.

Bracts – It is 6 mm long, linear, acute, bristle-tipped, ciliate with long slender hairs.

Calyx – Variable tubular, 8-13 mm long, tube curved, contracted above the nutlets, the lower half usually glabrous and membranous, the upper half ribbed and hispid; mouth small, very oblique,teeth small, triangular bristle tipped, ciliate, the upper tooth being the largest.

Corolla – It is 1 cm long, tube 5 mm long and pubescent above, annulate in the middle; upper lip 3 mm long, densely white, wooly; lower lip about twice as long, the middle lobe obviate rounded, lateral lobes small, subacute.

Androcium: Stamens - There are four stamens, short slender, filaments free from one another, white, the apices of which are round.

Anther- Two celled, often separated from one another cells by transverse connective.

Gynoecium: Disc- Prominent, hypogynous, thick flashy.

Ovary – Superior, Syncorpous, two celled, divided into four loculi by false partition.

Style – Simple, slender, inserted in the centre of the ovary between the lobes, thin and white, two cleft at apex.

Stigma- Minute, Ovule – Solitary in each cell.

Fruits – Nutlets. 2.5 mm long, oblong, brown, smooth, inner face angular and outer face rounded.

Seeds- Seeds oblong, three sided, two sided plain and even, the third rounded, very black in color.

Systematic position

Kingdom	– Plantae
Phyllum	– Tracheophyta
Subphyllum	– Euphyllophytina
Class	- Mangnoliopsida
Subclass	– Lamiidae
Order	– Lamiales
Family	– Laamiaceae
Genus	– Leucas
Species	– aspera (Willd.) Link

Pharmacological properties [3-5, 9- 10]

Acharyas have difference in opinion about the rasa and guna, while unanimous view about veerya and vipaka. In Shodhal and Raj Nighantu rasa is katu and veerya is usna. almost all Archaryas described its Guru and ruksha guna. Madanpal and Kaideao nighantu describes its Madhura vipaka.

THERAPEUTICAL ACTIONS

On Dosha it is kapittashamak but in Raj nighantu it is vatakaphajith. On dhatu its acts

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as a Artavajanana and Raktashodhak. On mala its action is Bhedana and rechana.

Parts used - Whole plant, leaves, flowers.

THERAPEUTICAL DOSES

Swarasam - 1/2 – 1 tola (BPN)

Juice - 5 – 10 ml

Powder - 1-3 gm (API)

CHEMICAL CONSTITUENTS

Roots – Sterols-stigmosterol and campesterol, triterneleucolactone, leucolactone.

Shoots – Long chain aliphatic compounds (1-3), dotriactontanol and 1-hydroxy tetratriacontan-4-one and 32-methyaltetratriacontan.

Seeds – Lenoleic acid and oleic acid.

Whole plant-α-sitosterol, β-sitosterol, triterpenes - oleanolic acid and ursolic acid.

THERAPEUTICAL PROPERTIES AND USES

The leaves and flowers are acrid, thermogenic, carminative, digestive, antihelminthic, anti-inflammatory, emmenagogue, sudorific, antipyretic, expectorant, antibacterial and depurative. They are useful in colic, dyspepsia, athralgia, chronic skin eruption, psoriasis, cough and catarrh in children, amenorrhoea, dysmenorrhoea, intermittent fever and ulcers.

1. The juice of the leaves as Anjana is very useful for the treatment in Kamala.

2. The juice of leaves is useful as nasal drop in catarrh and cephalalgia. (IMP, Kottakal)

3. Leaves useful in chronic rheumatism

4. The leaves juice is antiseptic, applied in psoriasis, scabies and chronic skin diseases.(Medicinal Plant and Raw Drugs of India)

5. Leaves juice is snuffed up as a remedy for colds, headaches and also in snake bites.

6. Bruished leaves are applied locally in snake bites, scabies etc (Indian Materia Medica)

7. The leaves juice are useful in painful swellings.

8. Tumba juice 1 part with 2 parts of honey and a few grains of borax is useful in cough and catarrh of children. (Pharmacographia Indica)

9. The leaves juice kills worms in ulcers.

10. The leaves juice with lime heals the bite of dog.

11. Roots paste is useful externally in headache.

12. Decoction of root removes leprosy.

13. The root chewed or also breath of chewed leaves removes dark spot.

14. Flowers are given with honey for coughs and colds in children.

15. From the foots of flowers a honey like liquid is extracted, boiled in oil, heals scabies.

(Hortusmalabaricus by K.S. Manilal)

DISCUSSION

REVIEW OF PHARMACOLOGICAL STUDIES

(A) In Vitro

1. The essential oils from L. aspera possessed bacteriostatic activity against Staphylococcus aureus, Vibrio cholerae, Salmonella typhi, Klebsiella aerogenes, Escherichia coli, Proteus vulgaris[11]

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2. Chloroform and ether extracts of *L. aspera* possess fungistatic and fungicidal activity against *Trichophyton* and *Microsporum gypseum*. The minimum inhibitory concentration was found to be 5mg/mL.[12]

3. Study on the methanol extract of *L. aspera* flowers, its fractions, the alkaloidal residue and the expressed flower juice showed good antibacterial activity for methanol extract and methanol fraction with maximum activity for the alkaloidal residue.[13]

4. in one study the membrane interaction of albino rat RBC with isolated *Leucas aspera* flavonoids against hypotonicity induced hemolysis It was effective in RBC membrane stabilization as non steroidal complex and anti inflammatory compounds.[14]

(B) In vivo

1. The alcoholic extract of Leucas aspera (ALA) was investigated for its antiulcer effect by two experimental models. A significant reduction in acid secretion and ulcer score was observed in rats after ALA treatment. The observed antiulcer effect of ALA may be due to a combination of antisecretary effect and a protective effect on gastric mucosa.[15]

2. The herbal smoke of leaves of *Vitex negundo* and *L. aspera* are more toxic to the filarial vector mosquito, Culex quinquefasciatus than the synthetic mosquito mats, which contain 4% d-allethrin.[16]

3. *Leucas aspera* was tested for its prostaglandin (PG) inhibitory and antioxidant activities. The ext. showed both activities, that is, inhibition at 3-4 g/mL against PGE1- and PGE2-induced contractions in guinea pig ileum and a 1,1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging effect. Phytochemical investigation suggested the presence of nectandrin B, meso-dihydroguaiaretic acid, macelignan, acacetin, apigenin 7-O-[6′-O-(p-coumaroyl)-3-D-glucoside] chrysoeriol, apigenin, erythro-2-(4-allyl-2,6-dimethoxyphenoxy)-1-(4-hydroxy-3-methoxyphenyl) propan-1-ol, myristargenol B and machilin C,(-)-chicanine, (7R,8R)- and (75,85)- licarin A [17]

4. *Leucas aspera* possessed significant anti-inflammatory activity against carrageenan-induced paw oedema[18]

5. The ethanolic extract of Leucas *aspera* root produced significant inhibition in acetic acid induced writhing in mice at the doses of 250 and 500 mg/kg. The extract showed a significant free radical scavenging activity with an IC50 of 8 µg/ml. The extract showed significant lethality to brine shrimp.

CONCLUSION

Leucas aspera (Wild.)Link, a weed plant commoly found in Kerela can also be considered as the botanical source of the drug Dronapusphi. This drug is described in nighantus and Samhitas. This drug is effective in preventing and curing hepatic diseases.

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Conflicts of interest

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