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A Bird Eye On Apamarga

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Abstract *- Apamarga is a sacred plant as its flowers were used to worship the gods. It is a herb and is found throughout India. It is having so many synonyms which signifies its morphology and action. The plant is useful in eye and liver complaints, rheumatism, scabies and other skin diseases. It is used to treat bleeding piles, fistula in ano, diarrhoea etc. In addition to therapeutic uses the drug is having non therapeutical use also. i.e. the drug is useful for the marana purpose in case of Naga, Vanga and Yashada.As it is useful in multipurpose so here an detail study on apamarga is done according to its origin,varieties,habitat ,rasapanchakas its history in Vedas etc.To throw a lime light on morphology etc this article have been written. . Among all the medicines Apamarga is considered as the first and also considered as the Lord (eesha) of all the medicines.This drug is used to cure many diseases. One special character of this plant is 'Kshudhamar' which is also known to the people of samhita period. It cures the symptoms caused by the hunger. This Apamarga tandula was used to appetize the hunger for soldiers during war, when there was delay in food supply.*
Key words*-Apamarga, habitat, rasapanchaka, rigveda.*

INTRODUCTION-

In the Rigveda, we do not find the reference about Apamarga while Yajurvedic texts quote its saktu (powder) for antimicrobial (rakshoghna) property. It is claimed to remove the excessive water from the body on administration.Atharvaveda extensively quoted Apamarga and according to the etymology provided by Sayana, this plant drives away the vitiated doshas from the body. Apamarga was used for the following therepeutical purposes.

Oushadhartha prayoga

1. Duswapnaprabhava nashanartha
2. Krimi nashanartha
3. Kshudhamara nashanartha
4. Trishnamara nashanartha
5. Mukhashodhanarth

Apamarga alone is the swamy of all the other medicines. This can be given to any patient and it definitely cures his disease.[4]

Pippalada School describes it as Dourbhagyanashana and Anapathyatanashana. It also described with another synonym "Pratichinaphala" indicating that the flowers/fruits are oppositely faced to each other.

It appears that the root of Apamarga was more utilized during the Vedic period. This plant is considered as an anti-dote for snake bite and scorpion sting.

Charaka considered Apamarga as the best among the drugs used for Nasya/Sirovirechana. For this purpose the seeds which are famous as 'Apamarga Tandula' are used. Owing to their importance, Charaka denoted a chapter as "Apamarga tanduleeya". (C.Su. 2chapt.)

Twigs of sacrificial plants such as Arka, Palasha, Khadira, Apamarga, Udumbara, Shami, blades of Darba and Kusha soaked with curd, honey, clarified butter should be repeatedly cast into the sacrificial fire, in the Homa ceremonies which are celebrated for the propitiation of the planets such as Sun.

Just as most Gods and Goddesses in India are associated with some tree, shrub or creeper, similarly all the nine planets which are believed to control the destiny of man are associated with plants. Planet Budha (Mercury), Budhawara or Wednesday has Apamarga as its sacred plant.

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DISCUSSION-

VARIETIES

The classical texts of materia medica (Nighantus) include another variety of Apamarga known as Raktapamaraga.In Bhavaprakasha nighantu, 2 varieties -Apamarga (sveta)Raktapamarga have been described. In Kaiyadeva nighantu, 3 varieties – Apamarga,Vashira,Ramatha or Jalapamarga have been described.Here Jalapamarga has the synonyms like Samasthila, Toyavrutti, Toyamanjari, Ulaka, Shoshaha, Toyapamarga and Mayuraka. It is katu and it destroys shopha, kapha and vata rogas.

In Raja nighantu, 2 varieties – Apamarga,Raktapamarga have been described.

In Madanapala nighantu, 2 varieties - Apamarga .Raktapamarga have been described.

In hanwantari nighantu, 2 varieties - Apamarga ,Raktapuspah (Raktapamarga) have been described.

Priya nighantu does not mention any variety of Apamarga.

SYNONYMS OF RAKTAPAMARGA ACCORDING TO DIFFERENT AUTHORS

Table No.1

Synonyms	B.N	K.N	R.N	D.N	M.N
Vashira	+	-	-	+	+
Vruttaphala	+	+	-	-	+
Dhamargava	+	-	-	-	-
Pratyakparni	+	-	-	-	-
Keshaparni	+	-	-	-	-
Kapipippali	+	+	-	+	+
Raktabinduka	-	+	+	-	-
Markati	-	+	-	-	-
Kuntha	-	+	-	-	-
Pratyakshreeni	-	+	-	-	-
Kharaschada	-	+	-	-	-
Aghattaka	-	-	+	-	-
Dugdanika	-	-	+	-	-
Alapatrika	-	-	+	-	-
Kshudrapamarga	-	-	-	+	-

Raktapamarga

It is a herb similar to that of white variety. Leaves and stem have red spots on it, hence the name. The branches are thin and quadrangular. Seeds are thin.

It can be compared with Achyranthes bidentata Blume. But it may not be red variety. Some authors mentioned another variety ie. Achyranthes rubro-fusca.

These kinds in classical texts of materia medica (nighantus) include Raktapamarga also as Kshudrapamarga (small and red variety) and in classical texts (compendium or samhitas) another variety as Daurdandapamarga (a sub variety with whitish stem or danda by Vagbhata, sutra 1-39).

Guna-Karma

It is vata vistambhi, kapha nashaka, sheeta veerya, rooksha. It has the less therapeutic value than the other variety. Vrana, kandu, vishanashaka. It is sangrahi and vamaka.

Phala-It has madhura rasa, madhura vipaka, vistambaka, vatajanaka, rooksha, raktapittanashaka.

From the above descriptions it may be seen that Rakta Apamarga has sheeta veerya where as sveta Apamarga has ushna veerya. Sveta Apamarga is considered as Apamarga which has more therapeutic values than the other variety and botanically identified as Achyranthes aspera linn.

BOTANICAL CLASSIFICATION

Kingdom	Plantae

Table No

Division	Spermatophyta
Sub-Division	Angiospermae
Class	Dicotyledoneae
Sub-Class	Archichlamydeae
Order	Caryophyllales
Family	Amaranthaceae
Genus	Achyranthes
Species	Aspera

CLASSICAL CLASSIFICATION

Table No.3

Charaka	Sirovirechanopaga Krimighna Vamanopaga
Sushruta	Arkadi gana
Vagbhata	Arkadi gana
Raja Nighantu	Shatahwadi gana
Bhavaparkasha Nighantu	Guduchyadi varga
Kaiyadeva Nighantu	Oushadhi varga
Madanapala Nighantu	Abhayadi varga
Dhanvantari Nighantu	Guduchyadi varga
Priya Nighantu	Shatapuspadi varga

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SYNONYMS ACCORDING TO DIFFERENT AUTHORS
Table No.4

SYNONYMS	B.N	K.N	M.N	P.N	D.N	R.N
Shikhari	+	+	+	-	+	+
Kinihi	+	+	+	-	+	+
Kharamanjari	+	+	+	-	+	+
Durgraha	+	+	-	-	+	+
Adhashalya	+	+	+	+	+	+
Pratyakpuspi	-	+	+	+	+	+
Mayuraka	+	+	+	-	+	+
Kanda kanta	-	-	-	-	-	+
Shaikharika	-	+	+	-	+	+
Markati	+	-	-	-	+	+
Durabhigraha	-	+	-	-	+	+
Vashira	-	-	-	-	+	+
Parakpuspi	-	-	-	-	+	+
Kanti	-	-	-	-	+	+
Markatapippali	-	-	-	-	+	+
Manjarika	-	-	-	-	-	+
Nandi	-	-	-	-	-	+
Kshavaka	-	-	-	-	-	+
Pankti kantaka	-	-	-	-	-	+
Malakanta	-	-	-	-	-	+
Katu	-	-	-	-	-	+
Kubja	-	-	-	-	-	+
Ksharamadhya	-	+	-	-	-	-
Aghata	-	+	-	-	-	-
Marga	-	+	-	-	-	-

VERNACULAR NAMES		
Arabic	-	Atkumah
Assam	-	Apang, chik-kai-rek, Non-phak-pe, soh-bycthied
Bengal	-	Apang
Bombay	-	Aghada
Burma	-	Kivalamom, Kunelamon
Chinese	-	Nieou si
English	-	Prickly chaff-flower
French	-	Cadelari
Gujarati	-	Agheda, Aghedi, Adhedo, Anghedo
Gwalior	-	Adharajhada
Hindi	-	Apang, Chichra, Chirchira,Chirchitta, Latjira, Chichiri,Chichada
Himachala Pradesh	-	Puthkanda
Kannada	-	Uttarani
Konkani	-	Kantmogro

Latin	-	Achyranthes aspera
Malayalam	-	Katalati, Vankatalati, Kadaladi, Valiyakatalati
Marathi	-	Aghada, Aghara
Madhya Pradesh	-	Agya, Chirchita, Korrochi
Orissa	-	Apamaranga, Apamargo
Persian	-	Kharevazhun
Punjab	-	Kutri, Puthkanda
Rajasthani	-	Andhijalo, Andhijaro, Katiobhuratio, Undokanto, Untaghada
Sinhalese	-	Gaskaralheba, Karalsebo
Tamil	-	Nayurivi
Telagu	-	Apamargamu, Uttareni
Unani	-	Chirchita
Urdu	-	Chirchita
Zulu	-	Isi Nama

FAMILY

Amaranthacae

Diagnostic features:

Plants mostly herbs, a few shrubs, leaves exstipulate and simple; opposite or alternate, hairy; flowers small, inconspicuous and usually with bracts and bracteoles, actinomorphic, arranged in spikes or recems; perianth 2-5, uniseriate, green or coloured, free or united; stamens 3-5 free, dithecous, antiphyllous (opposite the perianth segments); gynoecium bi or tri – carpillary, unilocular with a single basal ovule; fruit one seeded nutlet.

Distribution

The family Amaranthacae is commonly called 'Amaranth family'. It is a small family comprising 65 genera and 850 species which are chiefly represented in tropical and temperate regions. In India it is represented by 50 species.

Vegetative characters

Habit – Mostly herbs, rarely shrubs or under shrubs, annular or perennial.
Root –A branched tap root.
Stem – Aerial, herbaceous or woody, erect or straggling, cylindrical or angular, branched, solid, hairy, green or striped green.
Leaves –Simple, alternate or opposite, petiolate, exstipulate, reddish in colour, unicostate, reticulate venation.

Floral characters

Inflorescence –Axillary or terminal spikes. Some times in cymose panicles.
Flower –Bracteate, sessile or sub sessile, bracteolate, bracteoles two, actinomorphic, hermaphrodite or unisexual hypogynous, small inconspicuous, green or variously coloured.
Perianth –Usually five tepals, free or united, some times two or three, dry membranous, valvate or twisted, some time hairy, green or coloured, persistent, inferior.
Androecium –Stamens 5 or 3, free or united, staminodes some times present, introrse, dithecous or monothecous. In Achyranthes 5 fimbriated scales alternate with 5 fertile stamens.

Gynoecium– Bicarpellary or tricarpellary, syncarpous, ovary superior, unilocular, usually one campylotropous ovule; basal placentation; style short or filiform; stigma 2 or 3.
Fruit – Dry one seeded achene or several seeded capsules or one to several seeded berry.
Pollination –Mostly anemophilous and in some plants entomophilous. [1]

HABITAT

Achyranthes aspera commonly found as a weed of way sides and waste places throughout India up to an altitude of 2100 m and in South Andaman islands.[2]

HABIT

Achyranthes aspera is a wild perennial herb of waste places, 30-90 cm high.
Root –Much branched tap root.
Stem –Herbaceous above and woody below, aerial, erect, quadrangular, rough, branched, solid, hairy, green.
Leaves –Opposite, simple, petiolate, exstipulate, obovate, repand, acuminate, both surfaces hairy, unicostate, reticulate.
Inflorescence –Spike; flowers arranged along a pubescent axis that becomes rigid and much elongated during fruiting as much as 60cm.
Flower –Bracteate, bracts persistent, acuminate, ending in a spine, bracteolate, sessile, complete, hermaphrodite, actinomorphic, hypogynous, small, green.
Perianth –Tepals 5, pollyphylous, ovate, persistent, green, glabrous, twisted, inferior.
Androecium -5 fertile stamens alternating with 5 sterile and fimbricated scale-like staminodes; fertile stamens, antiphyllous, anthers dithecous, basifixed, introrse.
Gynoecium –Bicarpellary, syncarpous, ovary superior, unilocular, one ovuled, basal placentation, style filiform, stigma capitate.
Fruit –An indehiscent achene enclosed within persistent perianth.
Seed –Endospermic.[3]

NATURALLY GROWN APAMARGA

Plate No.1


PHENOLOGY

Flowering in winter
Fruiting in summer
[J.L.N.Shashtry]

HISTOLOGY
MACROSCOPIC:
Root – Cylindrical tap root, slightly ribbed, 0.1 – 1.0 cm in thickness, gradually tapering, rough due to presence of some root scares secondary and tertiary roots present, yellowish brown; odour, not distinct.
Stem – 0.3 – 0.5 cm in cut pieces, yellowish-brown, erect, branched, cylindrical, hairy, solid, hollow when dry.
Leaf – Simple, sub sessile, exstipulate, opposite, decussate, wavy margin, obovate, slightly acuminate and pubescent due to the presence of thick coat of long simple hairs.
Flowers – Arranged in inflorescence of long spikes, greenish white, numerous, sessile, bracteate with two bracteoles, one spine lipped, bisexual, actinomorphic, hypogynous; perianth segments 5, free, membranous, contorted or quincuncial, stamens 5, opposite, the perianth lobes, connate forming a membranous tube-like structure, alternating with truncate and fimbriate staminodes, filament short; anther, two celled dorsifixed; gynoecium bicarpellary, syncarpous; ovary superior, unilocular with single ovule; style, single; stigma, capitate.
Fruit – An indehiscent dry utricle enclosed within persistent, perianth and bracteoles.
Seed – Sub-cylindric, truncate at the apex, round at the base, endospermic, brown.

MICROSCOPIC:
Root – Mature root shows 3-9 layered, rectangular tangentially elongated, thin walled cork cells; secondary cortex consisting of 6-9 layers, oval to rectangular, thin walled, parenchymatous cells having a few scattered single or groups of stone cells; followed by 4-6 discontinuous rings of anomalous secondary thickening composed of vascular tissues; small patches of sieve tubes distinct in phloem parenchyma demarcating the xylem rings; xylem composed of usual element; vessels simple pitted; medullary rays 1-3 cells wide; small prismatic crystals of calcium oxalate present in cortical region and numerous in medullary rays.
Stem – Young stem shows 6-10 prominent ridges, which diminish downwards up to the base where it becomes almost cylindrical; epidermis single layered, covered by thick cuticle having uniseriate, 2-5 celled, covering trichomes and glandular with globular head, 3-4 celled stalk; cortex 6-10 layered, composed of parenchymatous cells, most of them containing rosette crystals of calcium oxalate; in the ridges cortex collenchymatous; vascular bundles lie facing each ridge capped by pericyclic fibres; transverse section of mature stem shows lignified, thin-walled cork cells; pericycle a discontinuous ring of lignified fibres; vascular tissue show anomalous secondary growth having 4-6 incomplete rings of xylem and phloem; secondary phloem consisting of usual elements from incomplete rings; cambial strip present between secondary xylem and phloem; secondary xylem consisting of usual elements, fibres being absent; vessels annular, spiral,

scalariform and pitted, fibres pitted, elongated, lignified; pith wide consisting of oval to polygonal, parenchymatous cells; two medullary bundles, either separate throughout or found in some cases, present in pith; microsphenoidal silica crystals present in some epidermal cortical and pith cells.

Leaf –
Petiole – Shows crescent – shaped outline, having single layered epidermis with thick cuticle; ground tissues consisting of thin-walled, parenchymatous cells containing rosette crystals of calcium oxalate; 4-5 vascular bundle situated in mid region.
Midrib – Shows a single layered epidermis, on both surfaces; epidermis followed by 4-5 layered collenchyma on upper side and 2-3 layered on lowered side; ground tissue consisting of thin walled, parenchymatous cells having a number of vascular bundles; each vascular bundle shows below the xylem vessels, thin layers of cambium, followed by phloem and pericycle represented by 2-3 layers of thick walled, non lignified cells; rosette crystals of calcium oxalate found scattered in ground tissues.
Lamina – Shows single layered, tangentially elongated epidermis cells covered with thick cuticle having covering trichomes which are similar to those of stem found on both surfaces; mesophyll differentiated into palisade and spongy parenchyma; palisade 2-4 layered of thick parenchyma larger, slightly elongated in upper, while smaller and rectangular in lower surface; spongy parenchyma 3-5 layers thick more or less isodiametic parenchymatous cells; idioblast containing large rosette crystals of calcium oxalate distributed in palisade and spongy parenchyma cells; stomata anisocytic and anomoacytic in both surface; stomatal index 4.5-9.0 on upper surface, 9.0-20.0 on lower surface; palisade ratio 7.0-11; vein islet number 7-13 per sq.mm.[4]

PROPAGATION AND CULTIVATION
Commonly found in shady places of the cultivated fields and also as a weed. It also grows in drier situations but does not tolerate water logging. It can be propagated by seeds.[5]

SUBSTITUTES AND ADULTERANTS
The plant being a common weed, adulteration is seldom noticed. *Achyranthes bidentata* Blume. a closely allied species occurring wild at higher altitudes in Himalayan region is sometimes erroneously collected. This plant is distinguished by its shorter spikes, and almost glabrous leaves of comparatively large size.[6]The drug goes well with the name Apamarga but the nighantus mention a red variety also, called Raktapamarga and the latter is equated with Achyranthes bidentata. Bl., by some authors. The red variety possesses red pigments in the epidermis and outer cortex of the stem while in other respects the anatomical features are alike in both the forms. The nature of chemical constituents (steroids and triterpenoids) is also similar in both varieties. Another plant belonging to Amaranthaceae, Cyathula prostrata (Linn) Blume also gets substituted for Achyranthes aspera.[7]

CONTROVERSY
Vashira is found in the Charaka samhita only once as mutra virechaneeya (su.4/35). Sushruta has included it in Vrunadi and Viratarvadi ganas (su.38/719) and has described the fruit in phala varga (su.46/190) as sheeta, vistambi, durjara and raktapittashamaka.
Dalhana has interpreted it differently as Apamarga and Suryavarta. In the context of phalavarga he has said that it is fruit of Suryvarta which is known in other region. Chakrapani in his Bhanumati commentary has also said like this.
It is interesting to note that it is read often with Vasuka which grows in northern Himalayan region. Hence Vashira may also be some fruit grown in that region.[8]In Dhanwantari nighantu another type of Apamarga was described and named as Raktapuspa Apamarga. It has the synonyms Vashira, Kapipippali, Kshudrapamarga. It is sheeta veerya. In Bhavaprakash nighantu it is not mentioned. It has the less medicinal properties than the sveta Apamarga. In pittaghna varga of Siddha mantra there is the reference of 'Avashira phala'. Bopadeva mentions it as Suryavarta. In Kaiyadeva nighantuVashira has been described after Apamarga

and it has the synonyms Vruttaphala, Raktabinduka, Karaschada etc. Apart from this another variety Jalapamarga has been mentioned.[9]
To conclude Apamarga is identified as Achyranthes aspera Linn. Hence in this study, botanically identified Apamarga as *Achyranthes aspera* is considered throughout.

INFLORESCENCE OF APAMARGA

Plate No.1

Plate No.2

APAMARGA LEAVES

Plate No.3

Plate No.4

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