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Patalaparibhadradi Agada - An Unexplored Formulation for Water Purification from Ayurveda

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ABSTRACT

Water resources are the water sources which are potentially useful for the humans. Water is necessary because it is needed for the life to exist. Water pollution has become a global issue today. Unsafe or inadequate water consumption causes a variety of health problems and even death. Increased industrialization and globalization have contributed to the deterioration of the water quality. Almost all the natural water resources have been contaminated up to varying degrees. Now, it became a necessity to purify water before consuming. Ayurveda is the science of life and it has solutions to all our problems. *Patalaparibhadradi Agada* is a formulation mentioned in *Astanga Samgraha*, in the context of purification of water. It has become the need of the hour to explore the classical water purificatory formulations and to validate them under the modern scientific settings.

Key Words: *Patalaparibhadradi Agada, Anthardhuma,Kshara, Astanga Sangraha*

INTRODUCTION

Water resources are the water sources which are potentially useful for the humans. Water is necessary because it is needed for the life to exist. Right from the beginning of life on Earth onwards, water is the inevitable and un-avoidable basic need of all living beings[1]. Ancient classics, from the *Rigveda* itself, the importance of water has been mentioned clearly. After that the *puranas, Upanishads* etc had mentioned the samskaras related with water, treatments related with water, methods of drinking and consuming water etc[2]. Afterwards, in the *Samhita* period we saw the qualities of pure water along with the qualities of impure water also. This marked the starting of pollution, the most important threat that we are facing today. *Charaka Acharya* mentioned in detail about the features of impure and non-consumable water in the aspect of *Janapadodwasa* chapter of the *Charaka Samhita*[3]. All the classical textbooks of the *Samhita* period has a clear-cut reference of the method of purification of water[5]. At that scenario itself, it became a necessity that one should have to purify water before consuming[4]. Now the condition is most adverse, the world is going behind the new technologies. Industrialization and Robotics have over-ruled the humans, as a result of that the naturality or *swabhava* of everything including water has been lost. We cannot even think of consuming

something without cleaning it priorly. Unfortunately, our drinking water has also been included in this group.

Current issues related with water

The uses of water include agricultural, industrial, household, recreational and environmental activities. Virtually. For all these requirements fresh water is needed. But, only 2.5% of water on the Earth is fresh water, and over two thirds of this percentage are frozen in glaciers and polar ice caps. Water demand exceeds water supply in many parts of the world, and many areas of the world are expected to face this imbalance in the near future. Climate change is having a significant impact on the water resources, as it has the close connections between the climate and hydrologic cycle[7]. Due to the expanding human population the competition for water is also growing so that many of the world's major aquifers are being depleted. Some pollutants threaten supply of water, but the most noticeable, is the underdeveloped countries, which discharges raw sewage into natural waters[8].

Ayurvedic solution for water pollution

The most challenging threat we are facing today is the shortage of pure and safe water. Now, it became a necessity to purify water before consumption. Many modern sophisticated techniques are available for the water purification today. Various chemicals are also being used for the purification purpose. But all these techniques and the chemicals are having some demerits, as the odour is altered in case of chlorine treatment, essential mineral loss in case of RO water etc. So, this is the need of the hour to bring back our old classical water purificatory formulations for a better healthy life. Various group of drugs like *sapta jala kalushasya prasadanani dravyani* (seven methods of water purification) of *Acharya Susruta* has been explored and many researches have been conducted yet. The main drugs being *kataka beeja(clearing nut), bisagranthi(lotus root)*which are easily available and do not pose much add on problems like odour, variation on colour of water etc. In many rural areas, it is being practising also[3]. Charaka Samhita also mentions about qualities of jala and its various purification measures in detail[5]. Acharya Vridha Vagbhata mentions about *Patala paribhadradi Agada* for the purification of impure water[3]. It contains only 5 easily available drugs and the method of preparation is also not too risky. It is an un-explored drug of choice in purification of water. This article highlights about the classical references, drug profile, chemical constitution, Ayurvedic pharmacology, method of preparation etc of the drug *Patala paribhadradi Agada*[10].

Classical reference of the formulation

"Patala paribhadra aswakarna samyaka sidrakaan

Kalasa anthargathan dagdwa prakshipet savishe ambasi.[11]"

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Drug profile of the *Patalaparibhadradi Agada*

Table 1 Drug profile of the *Patalaparibhadradi Agada*

Drug name	Botanical name	Family	Parts used	Proportion
Paṭala	Steriospermum colais.D	Bignoniaceae	Root	1
Paribhadra	Azadiracta indica.V	Meliaceae	Bark	1

Asvakarṇa	Shorea robusta. G	Dipterocarpaceae	Bark	1
Samyaka	Cassia fistula.L	Fabaceae	Bark	1
Sidhraka	Vitex negundo.L.	Lamiaceae	bark	1

As mentioned Table-1 it describes Drug profile of the *Patalaparibhadradi Agada* [12]

Pharmacological properties of *Patalaparibhadradi Agada*

Table 2 Pharmacological properties of *Patalaparibhadradi Agada*

Dravya	Rasa	Guna	Vīrya	Vipāka	Karma
Patala	*Tikta ,kaṣāya*	*Laghu , Rūkṣa*	*Anuṣṇa*	*katu*	*Tridoṣaharam*
Paribhadra	*Tikta*	*Laghu, Rūkṣa*	*ṣita*	*Katu*	*kaphapitahara*
Asvakarṇa	*kaṣhya*	*Rukṣa*	*ṣita*	*Katu*	*Sthambhana, vedanāstāpana*
Samyaka	*Tikta, Katu*	*guru, mṛdu, snigdha*	*ṣita*	*Katu*	*Vraṇaśodhanam, krmighnam*
Sidhrak	*Tikta, Katu*	*Laghu, Rūkṣa*	*Uṣṇam*	*Katu*	*Krimighnam, vata-kaphaharam*

As mentioned Table-2 it describes Pharmacological properties of *Patalaparibhadradi Agada* [13]

Paṭala

Botanical Name - *Steriospermum sauvealens* DC

Family – BIGNONACEAE

Sanskrit - *paṭala*

Classical Categorization

Caraka - *Sothahara dasimani* (anti-inflammatory group of herbs)

Suśruta - *Aragvadadi gaṇa, Brihat pancamula, Adhobhagahara*

Vagbhata - *Aragvadadi gaṇa*

Chemical constituents: Bitter substances, sterols, glycosides and glyco alkaloids. Root bark contains bitter substance. Lapachol isolated which showed highly significant activity against walker 256 carcinoma. Lapachol, Scuttellarrein, Dehydrotectol, ceryl alcohol, oleic, Palmitic, Stearic acid.[14]

Useful part : Root bark, flowers, seeds, leaves, kshara (alkali)

Pharmacological action and uses

Patala is bitter, astringent, cardio tonic, cooling, tonic and diuretic. It overcomes anorexia, difficult breathing, ansarca, piles, vomiting, hiccups & thirst. It is constituent of *Daśamūla(*10 roots). Root is bitter, healing, useful in *kapha* and *vata* and for inflammations, eructations, vomiting, asthma, fevers, and diseases of blood. Roots are *sita virya*, *mutrala* and pacifies *vatakapha dosha.* Fruits and flowers are *vatapittaśāmaka*. Flowers are astringent, sweet, agreeable to heart, useful in bleeding diseases and diarrhea. They are *vājīkara*, *pauṣṭika* and *sītala* and are taken in the form of confection as aphrodisiac. Fruits useful in hiccough and blood diseases[15].

Paribhadra

Botanical name-*Azadirachta indica A. Juss*[14].

Sanskrit-*Ariṣṭa, Picumarda, nimba*

Synonyms - *Ariṣta, picumarda, picumanda, sarvatobhadra, hinguniryasa, yavanesta, sukapriya, neta, subhadra, prabhadra,sutika.*

Classical categorization

Caraka samhita-kaṇdughna dasaimani, tikta skanda

Suśruta samhita-*Aragwadadi gaṇa, gulucyadi gaṇa, lakṣadi gaṇa*

Chemical Constituents - Bitter principles Nimbin and Nimbiol

Therapeutic uses - *Daha, Jvara, Kṛmiroga, Kaṇḍu, kuṣṭa, prameha, raktapitta*, and *vraṇa*

DOSE - 2-4 g. of the drug in powder form. Decoction should be used externally.

AŚVAKARṆA

Botanical name -*Shorea robusta Gaertn*

Family -Diptocarpeae

Sanskrit -sal, dhupvruksh, kanakalodhbava, kalyana, kanta, rala niryasa, vriscakara, salaniryasa, sarjaniryasa, surabhi, sarjarasa.

English - Saltree, Common Sal, Indian Dammer, Canon Ball tree

Classical classification

Charaka - Vedanastapana, Kaṣayayoni, Asavayoni dasaimani

Susruta - Salasaradi gaṇa, Rodhradi gaṇa

Vagbhata - Asanadi gaṇa

Chemical constituents

The *sala* fruit pulp contains sugar, gum, malic acid, citric acid and tartaric acids.

l part *niryasa*

ams powder*(churṇam)*

Pharmacological action and usage

The bark and leaves are stringent, acrid, cooling, anthelminthic, alexiteric, anodyne, constipating and urinary, astringent, union promoter, depurative and tonic. They are useful in vitiated condition of kapha and pita, ulcers, wounds, otalgia, bacterial affections, diarrhea, dysentery, gonorrhea, leucorrhoea, pruritis, leprosy, cough, hyperhydrosis, haemorrhoids and anemia. The resin is astringent, sweet, acrid, cooling, anodyne, vulnerary, antibacterial, deodorant, constipating, detergent, carminative, stomachic, aphrodiastic, expectorant, ophthalmic and tonic. It is useful in hyperhydrosis, vitiated condition of pita, wounds, ulcers, neuralgia, burns, pruritis, fractures, fever, diarrhea, dysentery, hemorrhoids, gonorrhea, menorrhea, splenomegaly, obesity, cephalalgia, odontalgia, burning of eyes and ophthalmodynia[17].

SAMYAKA

Botanical name - *Cassia fistula Linn*

Family - Caesalpiniacae

Sanskrit -Rajavrukṣa, arevata, krutamāla, āragvada

English - Yellow shower, Indian laburnum

Classical categorization

Charaka - Kuṣṭaghna, kaṇdughna dasaimani, virecana, tiktaskanda

Susruta- Aragvadadi, syamadi, adhobhagahara gaṇa

Chemical constitution

Seeds - proteins, carbohydrates, fats

Flowers - ceryl alcohol, kaemferol, rhein, bianthroquinone

Leaves - rhein, rheinglucoside and sennoside.

Fruit pulp - anthraquinone, glucose, alkaloids, pectin, calcium. Fruit pulp - anthraquinone, glucose, alkaloids, pectin

Stem bark - lupeol, beta sitasterol and hexacosanol.

Root bark - flovefin and anthraquinone

Leaves and flowers - glycosides.

Useful part - Fruit pulp, root bark, flower, leaves Fruit pulp

Dose - 5-10 g

For purgation - 10- 20 gm

Decoction - 50-100 ml

Flowers - 5-10 gm

Pharmacological action and uses

Roots are astringent, cooling, purgative, febrifuge, and tonic. Useful in the manifestation of skin diseases, tuberculous glands, syphilis and burning sensation. The bark is laxative, antihelmenthic, emetic, febrifuge, diuretic and depurative, it is useful in boils, pustules, leprosy, ringworm, colic, dyspepsia, constipation, fever, diabetes, strangury and cardiopathy. *Aragvadha* is described as useful in diseases like *vatarakta* (gout),*amavata* (rheumatoid arthritis), *kuṣṭa* (skin diseases), *kaṇḍu* (purities), *kamala* (jaundice), *hridroga* (cardiac diseases), *raktapitta* (blood disorders), and *mutrakrucra* (dysuria) etc[17].

SIDHAKA

Botanical Name - *Vitex Negundo.Linn* [18]

Family - verbinaceae

English - Five Leaved Chaste

Classical Categorization

Caraka - Viṣaghna , Krimighna dasaimāni

Susruta and Vagbhata -Surasādi gaṇa

Parts used : Leaf, root, seeds

Dose: Leaf juice- 10-20 m

Root bark powder :3-6 g: Seed powder: 3-6 g

Chemical Constituents: Phenol, Dulcitol, Alkaloid-Vitricine, B-sitosterol, And B- Pinenes, Angoside, Acunbin, etc.

All the drugs in the formulation are having *tikta rasa* (bitter taste), and the *rasa* of the formulation is assuming to be the *tikta rasa.* This may be responsible for the cleaning action of the drug as a water purificant[19].

Mode of preparation

All the 5 drugs have to be collected initially. Dry the drugs separately in the shade. After drying, all the drugs have to be crushed into small pieces. An earthen pot is taken together with the lid and mud for *sandhibandhana* or sealing of the pot. All the crushed drugs will be put inside the pot and then it should be put over the burning charcoal heap. Proper aeration to the charcoal should be provided for the proper burning of the drugs inside the pot. The process involving here will be *Anthardhuma* method of *kshara* preparation as mentioned in *Rasasastra* textbooks. After proper preparation of the *kshara*, it can be applied in standard quantity for the purpose of water purification[17].

CONCLUSION

The world is facing such a crucial and un-avoidable problem now-a-days, that is the un-availability of safe and accessible water. Water is such an essential element that we cannot re-place with anything. Even though water is available also, it cannot be fit for drinking purpose. Many physio-chemical and microbiological impurities have to be corrected before use. The modern water purification methods are better and can be used without much difficulty. But, the experiments with classical knowledge, its use and has been a curiosity for researchers. This formulation is a

need of time for the extreme problem of current water issues. The economic, efficient and safe methods are needed for healthy living, Ayurveda ensures that guarantee.

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