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A Review on Controversial Drug *Kampillaka*

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ABSTRACT

INTRODUCTION: *Kampillaka* is classified under *Sadharana Rasa* of *Rasashashtra* texts. It is an important drug that is mainly used in the treatment of worms and wound Healing. It is used both externally and internally as a medicine. Its external applications are explained most useful in Ayurveda classics.

MATERIAL AND METHODS: *Kampillaka*, (*Malotous philippinensis*), has been well documented in Ayurveda. This paper provides collective information regarding the external therapeutic application of this herb generated through a thorough literary study of Samhita (treatise), and Chikitsa grantha (compendia of Ayurveda). Online available open access peer-reviewed journals research papers regarding external applications of *Malotous philippinensis* were also reviewed to support the classical claims.

RESULTS AND DISCUSSION: In Ayurveda formulations, *Kampillaka* is indicated in many diseased conditions inclusive of *Vrana* (wounds), *Kandu* (Itching), *Pama*, *Kushtha* (skin disorders), *Khalitya* (hair fall), *Shoola* (pain reliever), *Visha* (toxins), *Shotha* (inflammation), *Udara-Gulma-Vibandha-Adhmana* (digestive disorders), *Krimi* (worms), *Raktavikara* (blood disorders), *Raktapitta* (haemorrhage), *Kasa* (Cough), *Ashmari* (renal stone), *Prameha* (hypoglycemic activity).

CONCLUSION: This review may enrich biography research and may provide collective and detailed information about *Kampillaka's* external as well as internal application as presented in Ayurvedic classical texts. As it is indicated in more than 100 diseased conditions, this reveals the wide range of its clinical use. Moreover, this tree is found abundantly all over India. Collection of Its useful part is not harmful and difficult so clinically its use can be promoted.

Key Words *External Application, Kampillaka, Wound Healing*

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INTRODUCTION

The first *Sadharana rasa* among eight, explained in *Rasa* classics is a controversial drug in *Rasa Shastra*. It belongs to herbal origin and so far, no mineralogical identification has been made. *Rasa* classics describe the best variety of *Kampillaka* as the sample that appears like *Ishtika Churna* (brick powder) and with *Chandrikaadhyam* (increased lustre). The pharmacological activity

is *Ati Rechanam* (drastic purgative)¹. *Mallotus philippensis* is a plant belongs to Euphorbiaceae family. It is known as *Red Kamala*, due to the fruit covering, which produces a red dye.

MATERIAL AND METHODS

In this review, the concerned classics were thoroughly studied and the compilation was analysed and elaborated to understand the herb

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very well. *Kampillaka*, as a single drug or as an important constituent in formulations in the classical texts were critically analysed concerning formulations, parts used, their dosage form, and indications. Due to the considerable data collected, tables were prepared to present. The Sanskrit terms are expressed in the appropriate English correlates using acknowledged wordlists. English equivalents of various disease conditions were referred from AFI (Ayurvedic Formulary of India).

OBSERVATION AND RESULTS

Botanical Name: *Mallotus philippensis* (Lamk.) Muell. -Arg.

Natural Order: Euphorbiaceae

Classical Names: *Kampillaka*, *Karkasha*, *Raktanga*, *Rechi*,

Kampilla, *Raktaphala*.

Vernacular Names:

English: Kamala tree.

Hindi : *Kamala*, *Sindur*, *Rohini*.

Assamese : *Gangai*, *Puddum*, *Lochan*.

Bengali : *Kamala*, *Kamalagundi*.

Gujarati : *Kapilo*.

Kannada : *Kampillaka*, *Kunkumadamara*.

Malayalam : *Sinduri*, *Manjana*, *Kampipala*, *Ponnagam*.

Marathi: *Shindur*, *Shendri*, *Kapila*.

Oriya: *Bosonto-gundi*, *Sundragundi*, *Kamalagundi*.

Punjabi: *Kumila*, *Kamal*, *Kambal*, *Kamela*.

Tamil : *Kapli*, *Kurangumanjanatti*, *Kunkumam*, *Kamala*.

Telugu : *Kunkuma*, *Chendra-sinduri*, *Vasanta*.

Classification of *Kampillaka*: As mentioned in Table No. 1.

Table 1 Classification of the drug in different Ayurvedic classics

| Sr.No. | Name of the Samhita | Classification |
|--------|------------------------------------|---|
| 1. | Charaka Samhita ² | <i>Virechana</i> , <i>Phalini</i> |
| 2. | Susruta Samhita ³ | <i>Adhobhagahara</i> , <i>Syamadigana</i> |
| 3. | Bhavaprakasha ⁴ | <i>Haritakyadi Varga</i> |
| 4. | Dhanvantari Nighantu | <i>Chandanadi Varga</i> |
| 5. | Anandakanda | <i>Sadharana Rasa</i> |
| 6. | Rasa Ratna Samucchaya ⁵ | <i>Sadharana Rasa</i> |
| 7. | Brhada Rasaraja Sundara | <i>Sadharana Rasa</i> |
| 8. | Ayurveda Prakasha | <i>Sadharana Rasa</i> |

Botanical Description⁶

A much branched, small tree, 5-6 m tall. Leaves alternate, ovate-lanceolate, 8-22 x 3-8 cm, 3-nerved at base, glabrous above, pubescent and with numerous red glands beneath; petiole bearing two small glands near apex. Flowers

small; males in erect terminal spikes forming elongated panicle racemes; females solitary in short spikes, ovary covered with red glands. Fruits globose, 3-lobed, 8-10 mm in diameter, covered with bright red powder. Seeds subglobose, black, 3-4 mm across.

Distribution:

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It is found throughout India, occasionally ascending to 1500 m in the outer Himalayas.

Parts Used: Glandular hair of the fruit

Ayurvedic properties

Rasa: *Katu*

Guna: *Laghu, Ruksha, Teekshna*

Veerya: *Ushna*

Vipaka: *Katu*

Doshagnata: *Kaphavatashamaka*

Rogagnata: *Kandu, Pama, Kushtha, Khalitya, Vrana, Shoola, Visha, Shotha, Udara, Gulma, Vibandha, Adhmana, Krimi,*

Raktavikara, Raktapitta, Kasa, Ashmari, Prameha

Karma: *Kushthaghna, Vranashodhana,*

Vranaropana, Rechana,

Deepana, Krimighna, Raktashodhaka,

Twakdoshahara,

Ashmaribhedana, Garbhanirodhaka

Dose: 1 - 3 gm.

Pharmacognosy

The red powder covering the fruit is fine, granular, mobile, dull red or madder red colored, floating on water. The powder under microscope shows glands and hairs. The glands are depressed and globular, containing deep red colored resin, secreted by many club shaped cells radiating from a common centre. They are 40- 100 μm in diameter. The hairs are thick walled, curved, yellow colored, unicellular and arranged in small radiating groups, walls lignified.

Physical constituents

Total ash- Not more than 6 %; Acid insoluble

ash- Not more than 4 %; Alcohol soluble

extractive- Not less than 50 %; Water soluble extractive- Not less than 1.0 %.

Chemical Constituents

Betulin-3-acetate, lupeol, lupeol acetate, berginin, - sitosterol (heartwood); acetylaleuritic acid, -amyrin, sitosterol, - sitosterol glucoside and bergenin (bark); rottlerin, resin, solid hydroxy acid, kamlolenic acid alongwith other fatty acids viz., conjugated dienoic, linoleic, oleic, lauric, myristic, palmitic and stearic (*Kamala* oil); bergenin, corotoxigenin and its rhamnoside, coroglucigenin and its rhamnoside, octacosanol, isorottlerin (seeds); 18-hydroxy stearic acid (seed oil); 3-hydroxy-rottlerin, 4-hydroxy rottlerin and 3, 4-dihydroxyrottlerin, rottlerin, isorottlerin, kamalins I and II, C-methylated cinnamoylchromene and flavanone chromene, 3-prenylrubranine, 2, 2, 6-trihydroxy-2, 2-dimethylpyrano-6, 5, 4, 5-chalcone, 5,7-dihydroxy-6-prenyl-8- (3-acetyl-2,4,6-trihydroxy-5-methylbenzyl) flavanone, 2,4-dihydroxy-6-methoxy-3-prenylchalcone and 5,7-dihydroxy-6-methyl-8-prenyl flavanone (fruit); rottlerin, iso allorottlerin, the red and the yellow compound kamalin-1 & 2, phorbic acid, bergenin, tannins and protein (leaves); C-methylated cinnamoyl chromene, rottlerin, isorottlerin, wax, methylene-bismethylphloroacetophenone, 5-hydroxy-6-methoxy chromene, acylphloroglucinols, homorottlerin, gum, tannins, citric and oxalic acids and traces of volatile oil (plant).

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Pharmacological Activities

Anti-filarial, anti-fertility, anthelmintic, anti-bacterial, hypo-glycaemic, anticancer, antispasmodic, purgative, haemostatic, anti-lithotropic, anti-inflammatory, wound healing, cardiac-depressant, anti-fungal, stimulant, antimicrobial.

Actions and Uses

The glandular hairs are bitter, anthelmintic, cathartic, lithontriptic, styptic, vermifuge, alexipharmic and depurative. They are useful in treatment of intestinal worms, constipation, flatulence, wounds, ulcers, cough, renal and vesical calculi, haemorrhages, poisonous affections, scabies, ringworm, herpes and other parasitic skin affections.

Charaka, Susruta, and Vagbhata have used *Kampillaka* in a compound form to treat diseases like *dadru*, *pama*, *vicharcika*, *krimi*, *vipadika*, *gulma*, *vrana*, *sotha*, *prameha*, *pandu*, *switra*, *vidradhi*, *ashmari*, *charmakustha* etc.

Kampillaka in Charaka Samhita

Charaka used *Kampillaka* for both internal and external purposes. A single term '*Kampillaka*' has been used throughout the classic to refer this drug, while Chakrapani has mentioned another name '*Gundarochanica*' for this drug⁷⁻⁹. Below table focuses on the utilities of the drug as mentioned in Charaka samhita.

References of *Kampillaka* in Charaka Samhita

Reference Formulation Therapeutic Uses

Utilization in therapeutics: Internal Administration (As Per Table No.2)

Utilization in therapeutics: External Application (As Per Table No.3)

Table 2 Therapeutic Uses (Internal)

| Sr. No. | Disease | Formulation | Reference |
|---------|-------------------------|-------------------------|-------------------------------------|
| 1. | <i>Gulma</i> | <i>Nilinyadi Ghrita</i> | <i>Chikitsasthana</i> |
| 2. | <i>Gulma</i> | <i>Leha Yoga</i> | <i>Chikitsasthana</i> |
| 3. | <i>Kapha Pitta Meha</i> | <i>Leha Yoga</i> | <i>Chikitsasthana</i> ¹⁰ |
| 4. | <i>Udara Roga</i> | <i>Pana Yoga</i> | <i>Chikitsasthana</i> ¹¹ |
| 5. | <i>Gulma, Ashmari</i> | <i>Pana Yoga</i> | <i>Chikitsasthana</i> ¹² |
| 6. | <i>Virechana</i> | <i>Pana Yoga</i> | <i>Kalpasthan</i> |
| 7. | <i>Virechana</i> | <i>Leha Yoga</i> | <i>Kalpasthan</i> ¹³ |
| 8. | <i>Virechana</i> | <i>Leha Yoga</i> | <i>Kalpasthan</i> ¹⁴ |

Table 3 Therapeutic Uses (External)

| Sr. No. | Disease | Formulation | Reference |
|---------|---------------------|--------------------------|------------------------------------|
| 1. | <i>Kusta</i> | <i>Lepa Yoga</i> | <i>Sutrasthan</i> ¹⁵ |
| 2. | <i>Kusta</i> | <i>Taila Yoga</i> | <i>Chikitsasthan</i> ¹⁶ |
| 3. | <i>Kusta</i> | <i>Kanakaksiri Taila</i> | <i>Chikitsasthan</i> ¹⁷ |
| 4. | <i>Vipadika</i> | <i>Yamaka Yoga</i> | <i>Chikitsasthan</i> ¹⁸ |
| 5. | <i>Vrana</i> | <i>Taila Yoga</i> | <i>Chikitsasthan</i> ¹⁹ |
| 6. | <i>Vrana Ropana</i> | <i>Taila Yoga</i> | <i>Chikitsasthan</i> ²⁰ |
| 7. | <i>Vrana Ropana</i> | <i>Taila Yoga</i> | <i>Chikitsasthan</i> ²¹ |
| 8. | <i>Malabandha</i> | <i>Varti Yoga</i> | <i>Chikitsasthan</i> ²² |

Identification of *Kampillaka*

The best variety of *Kampillaka* should appear like *Ishtika Churna* (brick powder) with *Chandrikaadhyam* (increased lustre). In general, it should be

1. Red in colour,
2. Gritty powder,
3. Float on water and
4. On rubbing should yield a red streak on paper.

Shodhana of *Kampillaka*

Ten parts of potable water was taken into a stainless-steel vessel and allowed it to settle

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down. One part of *Ashuddha Kampillaka* was slowly sprinkled into the stable water and allowed to stable. The contents were kept standstill for fifteen minutes and the floating part of the drug was separated and collected into a stainless-steel tray. The collected contents were allowed to dry and stored in containers as *Kampillaka*. When *Kampillaka* was sprinkled on the surface of water, it was floating. The *shodhita* sample was dark red in colour and soft to touch. The sediment was found to be rough and gritty to touch.

Substitutes and Adulterants

Mallotus philippensis is commonly adulterated with Annato dye (*Bixa orellana* Linn.), ferric oxide, brick dust and ferruginous sand. *Casearia tomentosa* (stem bark powder), *Carthamus tinctorius* (flower powder).

Ficus benghalensis (fruit powder) and *Flemingia macrophylla* (hairs of fruits) are also reported to be used as adulterant or substitute of *Kampillaka*.

Toxicology

The approximate lethal dose of rottlerin in rat was 750 mg/kg. The plant extract was found lethal, alcoholic extract being most effective *in vitro* and *in vivo*. Death of worms commenced 60 and 90 min after addition of alcoholic extract (1:100 concentration) and aqueous extract (1:25 concentration) respectively.

As per text it is one of the herbal drugs generally found in Saurashtra region (Gujarat state). It is Phala raja of plant *Mallotus Phillipinesis* Muell. As per the literature survey of *Kampillaka*, it has katu rasa, Laghu, ruksha and Tikshana Guna, Ushna virya, Katu vipaka, and Kapha nashaka action, Rechana, Grahi, actions. Due to its wound cleaning and healing property, it is widely used in wound healing.

CONCLUSION

This review may enrich biography research and may provide collective and detailed information about *Kampillaka*'s external as well as internal application as presented in Ayurvedic classical texts. As it is indicated in many diseased conditions such as wounds, Skin disease, Worm infestation etc. as mentioned in Table No.2 and 3. This reveals the wide range of its clinical use. Moreover, this tree is found abundantly all over India. Collection of Its useful part is not harmful and difficult so clinically its use can be highlighted.

DISCUSSION

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