



REVIEW ARTICLE

A REVIEW ON THE BOTANICAL SOURCES AND REMEDIAL MEASURES FOR THE ADVERSE EFFECTS OF *BHALLATAKA (SEMICARPUS ANACARDIUM)* IN *KHAGENDRA MANI DARPANAM*

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ABSTRACT

Bhallataka is a famous plant with remarkable medicinal properties known to the Indians since ages. Of late, its popularity and importance is at stake. The main reason is the occurrence of adverse reaction during its use. The reaction is somewhat idiosyncratic and presents mainly with the blisters. Though, the *Ayurvedic* therapeutics have mentioned few remedial measures, yet, there is a need for an effective therapy. Better chance for developing an effective regimen is only possible, if the regional literature wherein *Bhallataka* is used for various purposes, is studied. *Khagendra mani darpanam*- a regional work describes various remedial measures to treat the poisonous effect of *Bhallataka*. This article reveals 22 remedial measures by using 23 plant sources.

Key words: *Bhallataka*, *Semicarpus anacardium*, Adverse effect, *Khagendra mani darpanam*, *Parpataka Palasha kashaya*

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INTRODUCTION

Bhallataka – a reputed plant included in the therapeutics from the Vedic period. The earliest references about *Bhallataka* are found in *Panini sootra* (Pa.Un.Bho 2/2/42) ^[1]. It is known for its penetrating qualities since a way back. *Acharya Charaka* has grouped it under *Mootra sangrahaniya*(anti diuretics), *Kusthaghna* (curative of dermatosis), *Deepaniya*(Stomachics and digestives) *gana*(class) ^[2]. He praised it as the best drug for treating all sort of *kaphaja vikara*(DIS,diseases of kapha) and *vibandha* (AAC-12.4, simple constipation) ^[3]. He considered it as *rasayana*(rejuvenative)^[4] as well. He mentioned 10 different types of formulations containing *Bhallataka* as its key ingredient ^[5]. While, *acharya Sushruta* placed it under *Mustadi* and *Nyagrodhadi gana* ^[6]. He regarded it as the drug of choice for *arsha* (EE-3, Haemorrhoids) ^[7]. The true botanical source of *Bhallataka* is *Semecarpus anacardium* L belongs to *Anacardiaceae*. *Bhallataka* is found in abundant in Bihar, West Bengal, Orissa, Assam, Karnataka and fairly common in hotter parts of India ^[8]. It is a moderate sized deciduous tree, reaching up to a height of 12-15 m and a girth of 1.25m. Bark- dark brown, rough, leaves large, simple 17.5-60.0 cm × 10-30 cm, obovate-oblong, flowers small, dull greenish yellow, deciduous, in terminal

panicles, drupes 2.5cm long, obliquely ovoid, smooth and shining, black when ripe, situated on a fleshy orange coloured receptacle. The fleshy orange cup (hypocarp) of the fruit is eaten when quite ripe; it is slightly astringent. The pericarp abounds in a black, oily, bitter and highly vesicant juice which has been traditionally used for marking linen. The vesicant juice in the trade known as Bhilawan shell liquid (BSL) is rich source of phenols ^[9]. The exudate acts as irritant and causes *daha* (ABB-24, burning sensation), *vrana*(K, wound) if it comes in contact with skin. Similarly, it causes *shotha* (KA, inflammatory swelling) and *visarpa* (ED-10, acute spreading eruptions) if it comes in contact with the face ^[10]. Its irritant nature is highlighted by the synonyms such as *arooshkara*(that which produces blisters) and *shophakrit*(that which causes inflammatory swelling- KA) ^[11]. *Acharya Charaka* considered its flower, fruit and juice as the etiological factors for *agantuja shotha* ^[12]. In spite of it, *Bhallataka* has never missed to gain the importance as a wonderful medicine in the literature of *Ayurveda*.

Even though, it is always used in therapeutics after being subjected to the process of purification, yet, there are some reports suggesting the adverse effect of *Bhallataka*. This, itself defines the idiosyncratic nature of the adverse reaction. Some reports even reveal that the adverse reactions occur during

handling the fruit of *Bhallataka* while procuring. This has led to a sort of hindrance in the utility of *Bhallataka*. Few measures are explained to treat the adverse effect of *Bhallataka* in *Ayurveda*. Nevertheless, ayurvedic practitioners seldom use it.

Surprisingly, hair oil prepared from *Bhallataka* was used by people of some part of Karnataka as a grandmother recipe to promote thick and dark hair. This gives an idea about the liberal usage of *Bhallataka*.

Revisiting one of the old literature of Karnataka- *Khagendra mani darpanam*, opens a new way towards a number of remedial measures for treating the adverse effect of *Bhallataka*.

Khagendra mani darpanam- a work on toxicology by a Jain king *Mangarasa-1* who wholeheartedly authored it for the welfare of mankind. The book was written in 1350 AD in Kannada language. It appears to be a well organised, neatly classified and very useful oldest text on toxicology in Kannada literature. It represents the deep knowledge on various poisons that cause misery in the land of *Karunadu* (Karnataka).

This article is an earnest attempt to reveal the different plant sources and the remedial

measures to treat the adverse effect of *Bhallataka* mentioned in a regional book of India written 668 years ago.

Materials and Methods

Material

Khagendra mani darpanam (*Visha Vaidya*) available in print version being edited by B.S.Sannayya, published by Kannada sahitya parishat, Bangalore, first edition 2004 was considered for this study

Methods

Names of the plants written in old Kannada verse were sorted.

The names of the plants written in new Kannada by the editor were matched.

True botanical source of the plants were collected from the plant list (www.theplantlist.com).

The morbidity codes for certain conditions were mentioned as per national ayush morbidity and standardized terminologies portal [NAMSTP]

Their habit and botanicals were tabulated by consulting the books of *Dravyaguna*

The properties of the plants were tabulated

The remedial measures for the toxicity of *Bhallataka* were compiled and tabulated.

Table 1: Vernacular names, botanical source and family of drugs mentioned in the remedial measures

S.no	Drugs in KMD	Sanskrit name	Botanical source	Family
01	<i>Parpaṭaka</i>	<i>Parpataka</i>	<i>Fumeria indica</i> (Hauskn.) Pugsley	Fumeriaceae

02	<i>Mutta</i>	<i>Palasha</i>	<i>Butea monosperma</i> (Lam)Taub.	Leguminosae
03	<i>Triphala</i>	<i>Haritaki</i>	<i>Terminalia chebula</i> Retz	Combretaceae
		<i>Bibhitak</i>	<i>Terminalia bellirica</i> (Gaertn.)Roxb	Combretaceae
		<i>Amalaki</i>	<i>Phyllanthus emblica</i> L.	Phyllanthaceae
04	<i>Palmara</i>	<i>Vaṭa</i>	<i>Ficus benghalensis</i> L.	Moraceae
05	<i>Tumbura</i>	<i>Tejovati</i>	<i>Zanthoxylum armatum</i> DC	Rutaceae
06	<i>Sogade</i>	<i>Sariva</i>	<i>Hemidesmus indicus</i> (L.)R.Br.ex Schult	Apocynaceae
07	<i>Neeli</i>	<i>Neeli</i>	<i>Indigofera tinctoria</i> L.	Leguminosae
08	<i>Karkotaki</i>	<i>Karkotaki</i>	<i>Momordica dioica</i> Roxb exWilld	Cucurbitaceae
09	<i>Tavare</i>	<i>Kamala</i>	<i>Nelumbo nucifera</i> Gaertn	Nelumbonaceae
10	<i>Lodhra</i>	<i>Lodhra</i>	<i>Symplocos racemosa</i> Roxb	Symplocaceae
11	<i>Eḷlu</i>	<i>Tila</i>	<i>Sesamum indicum</i> L.	Pedaliaceae
12	<i>Meghanada</i>	<i>Tanḍuliya</i>	<i>Amaranthus spinosus</i> L.	Amaranthaceae
13	<i>Veelyedele</i>	<i>Nagavalli</i>	<i>Piper betle</i> L.	Piperaceae
14	<i>Beṭṭa mallige</i>	<i>Kuṭaja</i>	<i>Holarrhena pubescens</i> Wall.ex-G.Don.	Apocyanaceae
15	<i>Ghananadi</i>	<i>Bhadramusta</i>	<i>Cyperus rotundus</i> L.	Cyperaceae
16	<i>Doorva</i>	<i>Doorva</i>	<i>Cynodon dactylon</i> (L.)Pers	Poaceae
17	<i>Nellakki</i>	<i>Shali</i>	<i>Oryza sativa</i> L.	Poaceae
18	<i>Atimadhura</i>	<i>Yaṣṭhimadhu</i>	<i>Glycyrrhiza glabra</i> L.	Leguminosae
19	<i>Arishina</i>	<i>Haridra</i>	<i>Curcuma longa</i> L.	Zingiberaceae

20	<i>Hatti</i>	<i>Karpasa</i>	<i>Gossypium herbaceum</i> L.	Malvaceae
21	<i>Abhranadi</i>	<i>Musta</i>	<i>Cyperus scariosus</i> R.Br	Cyperaceae

* KMD-Khagendra mani darpanam

Table 2: Habit and botanicals of the plants

S.No	Sanskrit name	Habit	Botanical
01	<i>Parpataka</i>	Herb	Whole plant
02	<i>Palasha</i>	Tree	Bark
03	<i>Haritaki</i>	Tree	Fruit
04	<i>Bibhitak</i>	Tree	Fruit
05	<i>Amalaki</i>	Tree	Fruit
06	<i>Vata</i>	Tree	Bark
07	<i>Tejovati</i>	Tree	Root,Fruit
08	<i>Sariva</i>	Climber	Root
09	<i>Neeli</i>	Herb	Whole plant
10	<i>Karkotaki</i>	Climber	Fruit
11	<i>Kamala</i>	Hydrophyte	Stamen
12	<i>Lodhra</i>	Tree	Bark
13	<i>Tila</i>	Herb	Seed oil
14	<i>Tanduliya</i>	Herb	Leaf
15	<i>Nagavalli</i>	Climber	Leaf
16	<i>Kutaja</i>	Tree	Flower
17	<i>Bhadramusta</i>	Herb	Tuber
18	<i>Doorva</i>	Herb	Whole plant
19	<i>Shali</i>	Herb	Root
20	<i>Yaṣṭhimadhu</i>	Herb	Root
21	<i>Haridra</i>	Herb	Rhizome
22	<i>Karpasa</i>	Herb	Leaf
23	<i>Musta</i>	Herb	Tuber

Table 3: Rasa, vipaka, veerya and guna of the botanical sources

S.No	Sanskrit name	Rasa	Vipaka	Veerya	Guna
01	<i>Parpataka</i>	T	K	Sh	L,R
02	<i>Palasha</i>	K,T,Ka	K	U	L,R
03	<i>Haritaki</i>	Ka,T,K,A,M	M	U	L,R
04	<i>Bibhitak</i>	Ka	M	U	L,R
05	<i>Amalaki</i>	A,M,K,Ka,T	M	Sh	G,R,Sh
06	<i>Vata</i>	Ka	K	Sh	G,R
07	<i>Tejovati</i>	K,T	K	U	L,R,Te
08	<i>Sariva</i>	M	M	Sh	G,S
09	<i>Neeli</i>	T	K	U	L,R
10	<i>Karkotaki</i>	T	K	-	L
11	<i>Kamala</i>	Ka,M,T	M	Sh	L,S,P
12	<i>Lodhra</i>	Ka	K	Sh	L,R
13	<i>Tila</i>	M,K,T	M	U	G,S
14	<i>Tanduliya</i>	M	M	Sh	L,R
15	<i>Nagavalli</i>	K,T	K	U	V,L,R,Te
16	<i>Kutaja</i>	T,Ka	K	Sh	L,R
17	<i>Bhadramusta</i>	T	K	Sh	L,R
18	<i>Doorva</i>	Ka,M	M	Sh	G,R
19	<i>Shali</i>	M	M	Sh	S
20	<i>Yaṣṭhimadhu</i>	M	M	Sh	G,S
21	<i>Haridra</i>	K,T	K	U	L,R
22	<i>Karpasa</i>	K,Ka	K	kU	L,Te
23	<i>Musta</i>	T	K	Sh	L,R

* T-Tikta, K-Katu, M-Madhura, Ka-Kashya, Te-teekṣṇa, L-Laghu,R-Rookṣa

* G-Guru,S-Snigdha,U-Ushṇa, Sh-Sheeta,A-Amla,V-vishada,P-picchila, kU-kincit ushṇa

Table 4: Animal source mentioned in remedial measures

S.No	Animal source	Equivalent terms
01	<i>Nara mootra</i>	Human urine
02	<i>Go dugdha</i>	Cow milk

03	<i>Navaneeta</i>	Butter
04	<i>Mayana</i>	Bee wax
05	<i>Go ghrita</i>	Ghee

Table-5: Remedial measures for the adverse effect of *Bhallataka*

S.No	Remedial measures
01	Internal administration of <i>Parpataka kashaya</i>
02	Internal administration of <i>Palasha kashaya</i>
03	Internal administration of <i>Triphala kashaya</i> and <i>Vata kashaya</i>
04	Internal administration of <i>Sariva, Sharkara</i> and root decoction of <i>Tejovati</i>
05	<i>Neeli, Karkotaki</i> and <i>Kamala keshara</i>
06	Washing with human urine/gruel followed by the application of <i>divyaushada</i>
07	<i>Tila taila</i> application
08	External application of <i>Meghanada</i> and <i>Tejovati</i>
09	External application of <i>Nagavalli</i> and <i>Parpataka</i> along with water
10	External application of <i>Kutaja pushpa</i>
11	External application <i>ghrita</i> with <i>Bhadramusta</i>
12	Application of <i>Tila, Doorva,</i> and <i>Sariva</i>
13	External application of <i>Shali</i> and <i>Tanduliya</i>
14	External application of <i>Tila taila</i> with wax
15	External application of <i>Yashtimadhu</i> along with <i>ghrita</i>
16	Application of <i>shata dhauta ghrita</i>
17	External application <i>ghrita</i> prepared by <i>Doorva</i>
18	<i>Krishna tila, Navaneeta</i> and <i>Haridra</i> for external application
19	<i>Tila taila, Karpasa patra</i> and <i>Haridra</i> for external application
20	<i>Krishna tila</i> triturated with <i>go dugdha</i> should be applied with <i>Navaneeta</i>
21	<i>Navaneeta, Haridra</i> and <i>Musta</i> should be applied externally
22	Seeds of <i>Tejovati, Sharkara, Nagavalli</i> along with <i>Tila taila</i> internally

DISCUSSION

Khagendra mani darpanam- a great work of *Mangarasa* -1, a king who had a great concern

over his subjects. He took interest in treating the poisonous afflictions with his enormous knowledge and humility. He described various

therapeutic measures for treating *sthavara*, *Jangama* and *krittria visha*. He categorically explained the effects of poisons and remedial measures. The content has been classified mainly in 16 chapters (*adhikaram*), among which therapeutic measures for *sthavara visha* is explained in the second chapter (*dvitiya adhikara*) – *Sthavara visha prakarana*. He described the remedial measures for *Bhallataka* poison from verse no101 to 113(13 verses). This proves the gravity of the adverse effect of *Bhallataka*. None of the *Ayurvedic* classics has given that much of importance to the adverse effect of *Bhallataka*

On the Botanical source

Khagendra mani darpanam mentioned a total of 23 botanical sources for treating the adverse effect of *Bhallataka*. These include 11 herbs, 8 trees, 3 climbers and a hydrophyte. The classical literature on *Ayurveda* did not explain so many plant species to treat the adverse effect of *Bhallataka*.

Botanical source with *sheeta veerya*(cold potency)

13 botanical sources viz, *Parpataka* (*Fumeria indica* (Hauskn.)Pugsley), *Amalaki*(*Phyllanthus emblica* L), *Vata*(*Ficus benghalensis* L.)*Sārivā* (*Hemidesmus indicus*(L.) R.Br.ex Schult), *Kamala* (*Nelumbo nucifera* Gaertn), *Lodhra*(*Symplocos racemosa* Roxb), *Tanduliya* (*Amaranthus spinosus* L), *Kutaja*(*Holarrhena pubescens* Wall.ex-

G.Don),*Bhadramusta* (*Cyperus rotundus* L.) *Musta* (*Cyperus scariosus* R.Br), *Yashtimadhu* (*Glycyrrhiza glabra* L) and *Doorva*(*Cynodon dactylon*(L.)Pers) possess *sheeta veerya*. These plants can be further grouped as

Dominant in *tikta rasa* (bitter taste)

Dominant in *madhura rasa* (sweet taste)

Dominant in *kashaya rasa* (astringent taste)

Dominant in *amla rasa* (sour taste)

On Botanical source dominant in *tiikta rasa* (bitter taste)

: The botanical source such as *Parpataka* (*Fumeria indica* (Hauskn.)Pugsley)), *Bhadramusta* (*Cyperus rotundus* L.) *Musta*(*Cyperus scariosus* R.Br) and *Kutaja* (*Holarrhena pubescens* Wall.ex-G.Don.) act as *vishaghna*(anti-dote) by pacifying *pitta* and acting as *rakta prasdana* (blood purifier)

On Botanical source dominant in *madhura rasa* (sweet taste):

Sariva (*Hemidesmus indicus* (L.) R.Br.ex Schult), *Yashtimadhu* (*Glycyrrhiza glabra* L) *Tanduliya* (*Amaranthus spinosus* L.) and *Shali* (*Oryza sativa* L) act as *vishahara* (anti-dote) by the virtue of *madhura rasa* which acts absolutely opposite to *visha*.

On Botanical source dominant in *kashaya rasa* (astringent taste):

Vata(*Ficus benghalensis* L), *Kamala*(*Nelumbo nucifera* Gaertn), *Lodhra*(*Symplo cos racemosa* Roxb), and *Doorva*(*Cynodon dactylon*(L.)Pers) act as *vranahara* by drying up

excessive *kleda* present in the wound and pacify *daha* as well as *srava* .

On Botanical source dominant in *amla rasa* (sour taste)

Amalaki(*Phyllanthus emblica* L) possesses *Panca rasa* with dominant in *amla rasa* and *sheeta veerya*. This is a perfect example of *amla rasa apavada*(exceptional). For the reason, *amla rasa dravya* possesses *ushna veerya* and acts as *pitta vardhaka*. But, *Amalaki* acts as *pitta shamaka*. It dries up *kleda* and brings about *twak prasadana*.

Botanical source with *ushna veerya* (hot potency)

09 botanical source viz *Palasha* (*Butea monosperma*(Lam)Taub) *Haritaki* (*Terminalia chebula* Retz), *Bibhitak* (*Terminalia bellerica* (Gaertn.) Roxb) *Tejovati* (*Zanthoxylum armatum* DC) *Neeli* (*Indigofera tinctoria* L.) , *Tila* (*Sesamum indicum* L.), *Nagavalli*(*Piper betle* L,) *Haridra*(*Curcuma longa* L), and *Karpasa* (*Gossypium herbaceum* L.) possess *ushna veerya*. These plants can be further grouped as
Dominant in *katu rasa* (pungent taste)

Dominant in *kashaya rasa* (astringent taste)

Dominant in *tikta rasa* (bitter taste)

Dominant in *madhura rasa* (sweet taste)

On the botanical source dominant in *katu rasa* (pungent taste):

Palasha (*Butea monosperma* (Lam) Taub), *Tejovati* (*Zanthoxylum armatum* DC) *Karpasa*

(*Gossypium herbaceum* L.), *Haridra*(*Curcuma longa* L) and *Nagavalli*(*Piper betle* L) bring about *vranavasada* by *mridu mamsa vilikhana* (scraping the elevated soft tissue)

On the botanical source dominant in *kashaya rasa* (astringent taste):

The plants like *Haritaki*(*Terminalia chebula* Retz) and *Bibhitaka* (*Terminalia bellerica* (Gaertn.) Roxb) are dominant in *kashaya rasa* but possess *ushna veerya*. These two drugs are *vichitra pratyayarabdha dravyas*. Hence, their activity might involve multiple facets of *rasa panchaka* such as *vipaka*, *veerya* etc, in addition to *rasa*. *Haritaki* brings about *shodhana* by *virechana* on internal administration. While, *Bibhitaka* is considered as a good remedy for *daha* (burning sensation), *arti*(pain) and *shotha*(inflammation)

On the botanical source dominant in *Tikta rasa* (bitter taste):

Neeli (*Indigofera tinctoria* L.) is also a *vicitra pratyayarabdha dravya*. Therefore, its actions are not as same as the action of drug with *tikta rasa* and *sheeta veerya*. Its *vishahara* (anti-dote) action is appreciated by various authors of *Ayurveda*.

On the botanical source dominant in *Madhura rasa* (sweet taste):

Tila(*Sesamum indicum* L.) acts as *vranahara*(wound healer) and *twachya* (beneficial to skin) when used externally.

Among the 23 botanical sources mentioned, a plant *Karkotaki* also finds place as one of the important source for the remedial measures of *Bhallataka* toxicity. Its properties are equated with *vartaka*. Hence, its *vipaka* is *katu* and *rasa* is *tikta*. It dries up excessive *kleda* (moisture).

On the remedial measures

A total of 22 remedial measures are described in *Khagendra mani darpanam* by utilizing 23 plant sources and 5 animal sources. Most of them are advised for topical administration. Many of them can be prepared with in no time. Few measures such as *Shata dhauta ghrita* and *Doorva ghrita* will consume time.

Botanicals used for the remedial measures

Root of 3 plant species (*Tejovati*, *Sariva* and *Shali*), Leaf of 3 plant species (*Tanduliya*, *Nagavalli*, *Karpasa*) Fruit of 5 plant species (*Triphala*, *Karkotaki* *Tejovati*), *panchanga* (whole plant) of 3 plant species (*Doorva*, *Neeli*, *Parpataka*), Bark of 3 plant species (*Palasha*, *Vata*, *Lodhra*), tuber of 2 plants (*Musta*, *Bhadra musta*), rhizome (*Haridra*) oil (*Tila*), stamen (*Kamala*) and seed (*Tila*) are used to prepare different remedial measures because they contain *veerya* (potency) to a greater extent in their respective plants. Hence they are their *prayojyanga* (useful parts)

It is really surprizing to witness the non-utility of *Narikela* (*Cocos nucifera* L), *Dhanyaka*

(*Coriandrum sativum* L) and *Shirisha* (*Albizia lebbbeck* (L). Benth) in the remedial measures of *Bhallataka* by *Khagendra mani darpanam* which are considered for the treatment of *Bhallataka* toxicity by ayurvedic literature.

CONCLUSION:

Khagendra mani darpanam is really a wonderful work of King *Mangarasa-1*, who emphasized the importance of knowledge on Poisons. *Bhallataka*- a plant of extraordinary medicinal properties can be put in to practice to treat various diseases without any hesitation if its adverse effects are effectively taken care of. This study reveals 22 remedial measures prepared from 23 botanical source and 5 animal sources. This review will help the researches to put effort to find out the best possible regimen to treat the adverse effect of *Bhallataka* and also a ray of hope for the practitioners to look up for new management strategy for the adverse effect of *Bhallataka*.

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