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REVIEW ARTICLE

ENCYCLOPEDIC SCANNING OF GAMBHARI (*GMELINA ARBOREA LINN.*)

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Abstract

Gambhari (*Gmelina arborea* Linn.) is one of the most useful classical medicinal plants. It is a fast growing deciduous tree occurring naturally throughout greater part of India at altitudes up to 1,500 meters. It is a drug of potential importance predominantly used for *Shayvathuhar karma* and also *Rasayana* therapy. It is a part of many important formulations like *Chayawanprash, Brahmrasayana* etc. It is also included in *Agraya dravyas* of *Charaka*. *Root bark* of *Gambhari* is one of the ten ingredients of *Dashmula* and in particular *Brihatpanchmula*. *Dashmulrishta* is one of those *Ayurvedic* formulations which is most commonly used in India. Not only root bark other useful parts of *Gambhari* are fruits, leaves, flowers and stem bark, seeds and petioles. It has been indicated for external as well internal use in *Shyavathu, Pravahika, Masurika, Vrana, Sarpa visha, Parikartika, Raktapitta* etc. in *Ayurvedic* clasics. *Gambhari* is a drug of high ethno-medicinal importance and had been in use by tribal people in piles, hair problems, decreased sperm count, stomach disorders, septic wounds, vomiting, diarrhea, gonorrhea, snakebite etc. Modern researches prove it to be Anti-inflammatory, Anti-oxidant, Anti-pyretic, Anti-microbial, cardioprotective, Anti-helminthic, immunity enhancer, Anti-diabetic and gastroprotective. All *Ayurvedic* classics have elaborately described *Gambhari* in terms of its synonyms, properties, therapeutic actions etc. which are of immense importance to research community. Hence, an effort has been made to bring down literature related to *Gambhari* under one roof to help researchers in their work.

KEY WORDS: *Gambhari, Gmelina arborea, Ayurveda,* Pharmacology

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INTRODUCTION

Gambhari (*Gmelina arborrea* Linn.), commonly known as *Candhar Tree* is a member of Verbenaceae family. *Gambhari* embraces in itself miraculous therapeutic activities. It is present in *dahaprashmak, virechanopag, shyawathuhar mahakashaya* and among *rasayan dravyas*. Its fruits are *raktasangrahik, raktapitta prashamak, keshya and medhya.* It is a part of many important formulations like *Chayawanprash, Brahmrasayana* etc. It is also included in *Agraya dravyas* of *Charaka*. Root bark of *Gambhari* is one of the ten ingredients of *Dashmula* and in particular *Brihatpanchmula. Dashmulrishta* is one of those *Ayurvedic* formulation which is most commonly used in India. Modern researches prove it to be Anti-inflammatory, Anti-oxidant, immunity enhancer, Anti-diabetic etc. It is also in prevalent use among tribal people as remedy for piles, hair problems, decreased sperm count, stomach disorders, septic wounds, vomiting, diarrhea, gonorrhea, snake bite etc. *Ayurvedic* system of medicine is gaining popularity worldwide mainly because of the realization that it is not only effective but also relatively free from harmful side effects. It is high time to make world know the various aspects of each herb as described in *Ayurvedic* classics in correlation with modern literature. *Vedas, Samhitas, nighantus* and modern day texts of *Dravyaguna* have elaborately described *Gambhari* in terms of its synonyms, properties, therapeutic actions etc. which are of immense importance to research community.

AYUTVEDIC REVIEW

HISTORY

In *Vedas*, for the first time the name *Rohini* was mentioned in *Atharvaveda* (4/3/12), where it has been considered as *vranaaropak* (wound healer) & *raktastambhak* (styptic) [1]. However the synonyms like *Arundhati* etc. doesn't seem to be of *Gambhari*. Similarly the *guna - karma* described for *Gambhari* does not match completely. In *Sathapatha Brahaman* (7/4/1/7), *Kashmarya* word has come and it has been explained as *Rakshoghna* (disinfectant) but the properties of which do not correlate with *Gambhari* [2].

CLASSIFICATION

Ayurvedic classics have classified *Gambhari* in various groups called as *varga/gana* on the basis of *guna- karma*, useful parts etc. Table: 1 exhibits the various classes in which *Gambhari* has been kept.

Table: 1 CLASSIFICATION OF *GAMBHARI* IN VARIOUS GROUPS

Grantha	*Varga/ Gana*
Amarkosha	*Vanaushadhivarga* [3]
Soshruta nighantu	*Lodhradi* [4]

Ashtang nighantu	*Sarivadi* [5]
Dhanvantri nighantu	*Guduchyadi varga* [6]
Sodhala nighantu	*Guduchyadi varga* [7]
Abhidhan Ratnamala	*Chaturtha skandha / Tikta dravya skandha* [8]
Madhav Dravyaguna	*Vividhoshadhi varga, Phala varga* [9]
Siddhamantra Prakasha	*Vata pitaghana, kapha pitaghana, Kaph vataghana, Doshaghana varga* [10]
Hridaydipaka nighantu	*Tripada varga* [10]
Madanpal nighantu	*Abhyadi varga* [11]
Kaidev nighantu	*Oshadhi varga* [12]
Bhavprakash nighantu	*Guduchyadi varga* [13]
Raj nighantu	*Prabharadi varga* [14]
Rajvallabh nighantu	*Phala varga* [15]
Abhinav nighantu	*Guduchyadi varga* [16]
Shaligram nighantu	Guduchyadi varga [17]
Mahaushadh nighantu	*Bilvadi varga* [18]
Priya nighantu	*Haritakyadi varga* [19]
Dravyaguna sangraha	*Phala varga* [20]
Nighantu adarsh	*Nirgundyadi varga* [21]
Nighantu kalpdrum	*Sarivadi gana* [22]
Rasendrasara sangraha	*Kinshukadi gana* [23]
Abhidhan manjari	*Madanadigana varga* [24]
Gunaratna mala	*Amradi varga* [25]

SYNONYMS

Synonyms are the alternative names which are based on habitat, morphological peculiarities, properties, actions etc. of a plant which help in its identification. Synonyms of *Gambahri* are enlisted in table: 2 while the probable meanings of some important synonyms of *Gambhari* are given in table no. 3

Table: 2 IMPORTANT SYNONYMS IN *NIGHANTUS*

Sodhal nighantu	*Kashmarya, Kashmari, Kashmiri, Madhuparni, Shriparni, Sarvatobhadra, Gambhari, Krishnavrintaka, Kumuda, Bhadraparni,*

	Sadabhadra, Katphala, Shweta, Sthultwacha, Snigdha, Pavitra, Vatahrida, Dridha, Rohini, Saphala, Bhadra, Gopbhadra, Vidarika, Mahakumudika, Grishti, Mahi, Madhumati, Mudi [7]
Madanpal nighantu	*Kaashmari, Sarvatobhadra, Shriparni, Krishnavrintika, Kashmari, Heera, Kashmaryaa, Bhadraparni* [11]
Kaidev nighantu	*Shriparni, Sarvatobhadra, Kaashmiri, Kaashmari, Muda, Gambhari, Katphala, Heera, Kaashmaryaa, Madhuparnika, Krishnavrinta, Bhadraparni, Kumbhari, Saphala, Mahi* [12]
Dhanvantri nighantu	*Kaashmaryaa, Kaashmari, Heera, Madhuparni, Shriparni, Sarvatobhadra, Gambhari, Krishnavrintaka* [6]
Bhavprakash nighantu	*Gambhari, Bhadraparni, Shriparni, Madhuparnika, Kaashmiri, Kaashmari, Heera, Kashmarya, Peetrohini, Krishnavrinta,Madhurasa, Mahakusumika* [13]
Raj nighantu	*Kashmarya, Kashmari, Krishnavrinta,Heera, Bhadra, Sarvatobhadrika, Shriparni, Sindhuparni, Subhadra, Kambhari, Katpahala, Bhadraparni, Kumuda, Gopbhadra, Vidarini, Chirini, Mahabhadra, Madhuparni, Swabhadra, Krishna, Shweta, Rohini, Grishti, Sthultwacha, Madhumati, Suphala, Medini, Mahakumuda* [14]
Priya nighantu	*Kashmarya, Kashmari, Gambhari* [19]

Table: 3 PROBABLE MEANINGS OF IMPORTANT SYNONYMS [26]

SYNONYMS	INTERPRETATION
Gambhari	It grows very fast
Kashmiri	It is found in *Kashmir* etc.
Kashmari	It is a beautiful tree
Mahakumbhi	The tree is big like *kumbhi* (pitcher)
Sthultwacha	Bark is thick
Pitrohini	Bark is yellowish in colour
Bhadraparni, Shriparni	Leaves are beautiful
Madhuparni	Leaves are sweet as honey or leaves are glabrous, shinning like honey

Krishnvrinta	Petioles are blackish in colour
Mahakusuma	Long inflorescence
Katphala	Fruits are like *Kataphala* (*Myrica esculenta*)
Suphala	Fruits are wholesome
Heera	It grows very fast or fruits are useful as rasayana
Sarvatobhadra	It is useful in many ways
Vatahrita	It is a good remedy for *vatik* disorders

PHARMACOLOGICAL PROPERTIES

Ayurveda describes the pharmacological properties of a drug on the basis of *rasa, guna, virya, vipaka* and *prabhava* collectively called as *rasa panchak*. Table: 4 highlight *rasa panchak* of *Gambhari* as per various *nighantus*.

Table: 4 *RASA PANCHAKA* ACCORDING TO DIFFERENT AUTHORS

Text	*Rasa*	*Guna*	*Veerya*	*Vipaka*	*Prabhava*
Mahoushadhi Nighantu [18]	*Kashaya, Tikta, Madhura*	*Guru*	*Ushna*	-	-
Madanpal Nighantu [11]	*Madhura*	*Guru*	*Ushna*	-	-
Kaidev Nighantu [12]	*Madhura, Tikta, Kashaya*	*Guru*	*Ushna*	-	-
Raj Nighantu [14]	*Katu, Tikta*	*Guru*	*Ushna*	-	-
Dhanvantri Nighantu [6]	*Tikta*	*Guru*	*Ushna*	-	-
Bhavprakasha Nighantu [13]	*Madhura, Kashaya, Tikta*	*Guru*	*Ushna*	-	-
Adarsha Nighantu [21]	*Madhura, Kashaya, Katu, Tikta*	-	*Ushna*	*Madhura*	-
Abhinava Nighantu [16]	*Madhura, Kashaya, Tikta*	*Guru*	*Ushna*	-	-
Priya Nighantu [19]	*Tikta, Kashaya*	-	*Ushna*	-	-
Madhav dravyaguna [9]	*Kashaya, Madhura,Tikta*	-	-	-	-
Abhidhanratnamala [8]	*Tikta*	-	-	-	-

Therapeutic indications of *Gambhari*

All the parts of *Gambhari* are useful in various diseases. Table: 5 enlist the usage of each part of *Gambhari* according to different texts.

Table: 5 THERAPEUTIC INDICATIONS OF DIFFERENT PARTS OF *GAMBHARI* ACCORDING TO DIFFERENT AUTHORS

STEM BARK	Paste of *Kashmarya* bark, *Trivrita* root & *Yavagu siddhadadhimanda* mixed with *ghrita* is prescribed for *Garbhini pravhahika* [27]
ROOT BARK	*Ghrit* mixed in *yavagu* made by paste of *Kashmarya* root bark &*Dadhi manda* of *Trivrit* root is prescribed for dysentry in pregnancy [28]
ROOT	Its roots are a part of *Singhamrita ghrita* internally used in Diabetes etc. [29]
FRUITS	*Kashmarya* fruits & *Kshirmorat siddha shritsheet*, sugar and *Laja yukta* in useful in *Pittaj Masurika*. [30]
FLOWERS	Paste of flowers of *Kashmarya*, *Kapitha*, *Shirish* &*Dhatri* are prescribed in snake bite. [31]
	Anjan made by its flowers, *Madhuk, Darvi*, *Lodhra*, *Rasanjan* powder is applied in eye disease of *Pittaj* origin. [32]
LEAVES	Decoction made by *Kashmarya patra*, *Vasa, Arka,Karanj*, *Shigru*, &*Arjak*for bathing in odema [33]
	To cover *Raktapitta* infected wound [34]
	For covering *Shyonak kalka* in *putpaka kalpana* for diarrhoea [35]
	7 soft leaves of *Gambhari* are tied on finger as remedy of *Anguliveshtak* [36]
PETIOLES	*Basti* of *Shriparni* &*Kovidar vrint siddh dugdha basti* is given in *Parikartika* [37]
SEEDS	*Pathya* in *Raktapitta* [38]

MODERN REVIEW

Botanical name – *Gmelina arborea* Linn. *Gmelina* word has been given on the name of the research scientist (J. C. Melin, a German botanist) and *arborea* means tree like. *Gmelina arborea* Linn. is a member of Verbenaceae family. [39]

SYNONYMS [40]

Gmelina rheedii Hook

Premna arborea Roth.

Premna tomentosa Miq.

TAXONOMY

The taxonomic classification is given in table: 5. [41]

Table: 5 TAXONOMIC CLASSIFICATION

Kingdom	Plantae

Class	Angiosperms
Subclass	Eudicots
Superorder	Asterids
Order	Lamiales
Family	Verbenaceae
Genus	Gmelina
Species	Gmelina arborea Linn.

VERNACULAR NAMES

Table: 6 enlist various vernacular names. [42]

Table: 6 VERNACULAR NAMES

Sanskrit	*Kasmari, Kasmarya, Sriparni*
Bengali	*Gamar*
Gujarati	*Shivani hannu, Shewan*
Kannada	*Shivani, Shivanigida*
Marathi	*Shivan*
Punjabi	*Gumhar, Kumhar*
Telegu	*Peggumudu, Peggumaddi*
Assami	*Gamari*
English	*Candhar Tree*
Hindi	*Gambhar, Khambhari*
Malyalam	*Kumizhu, Kumbil, Kumpil, Kumizhin*
Oriya	*Gambhari*
Tamil	*Nilakumizh*

BOTANICAL DESCRIPTION

Figure no.1 TREE

Figure no.2 FLOWER

Figure no.3 STEM BARK

Figure no. 4 LEAVES

Figure no. 5 FRUITS

It is a moderately sized unarmed deciduous tree, reaching 18m. high (fig.1).

Bark- is greyish yellow, rather corky; branchlets and young parts clothed with fine white mealy pubescence (fig.3).

Leaves- 10-20 by 7.5- 15 cm., broadly ovate, acuminate, entire, glabrous above when mature, stellately fulvous- tomentose beneath, base cordate or sometimes truncate and shortly cuneate; petioles 5- 7.5 cm long,

cylindric, puberulous, glandular at the top (fig.4).

Flowers- appearing with or sometimes before the young leaves, usually in small cymes of about three flowers arranged along the branches of a densely fulvous- hairy panicle reaching 30cm. long; buds clavate, angular; bracts 8mm. long, linear- lanceolate Calyx 5mm. long, broadly campanulate, densely fulvous- hairy; teeth 5, small, triangular, acute. Corolla brownish yellow, densely hairy outside reaching 3.8cm long, 5- lobed, 2- lipped; upper lip rather more than 1cm long, deeply divided into 2 oblong, obtuse lobes; lower lip nearly 2.5cm long, 3- lobed, the middle lobe projecting forward, ovate, sub obtuse, with irregularly crenulate margin, much longer and broader than the obovate rounded lateral lobes (fig.2).

Fruits- Drupe, 2- 2.5cm long, ovoid or pyriform, smooth, orange yellow when ripe (fig.5). [43]

DISTRIBUTION

Gambhari is found throughout greater part of India at altitudes up to 1500 meters from foot of North-West Himalaya to Chittagong and throughout Deccan peninsula. [44]

CHEMICAL CONSTITUENTS [45]

A large number of phytochemicals have been isolated from *Gambhari*, which include lignans, flavanoids, coumarins, saponins, terpenes, fatty acids and glycosides.

Gmelo furan – a furanosesquiterpenoid, sesquiterpene, cerylalcohol, hentriacontanol – 1, β - sitosterol, n- octacosanol, gmelinol, apiosylskimmin – a apiofuranosyl – (1-6)-β - D glucopyranosyl (1.0.7)- umbelliferone.

Leaves – Luteolin, apigenin, quercitin, hentriacontanol and β-sitosterol.

Root – clutylferulate, n- octacosanol, gmelinol, arboreal, 2-0-methyl arboreal, 2-0-ethylarboreal, isoarboreal, gmelanone, β-sitosterol, paulownin, 6''-bromoisoarboreal, 4hydroxysesamin, 4,8-dihyroxysesamin, 1,4 dihydroxy-sesamin (gummadiol), 2-piperonyl-3 (hydroxymethyl)-4 (α –hydroxy-3-4-methylenrdioxy-benzyl)-4 hydroxy tetrahydro furan (1), 4- epigummadiol – 4-0-glucoside, 1,4-dihydroxy-2, 6-dipiperonyl-3, 7-dioxabicyclo [3,3,0]octane, gmelanone, palmitic, oleic and linoleic acids, stigmasterol, stibmastanol, campesterol, α-2-sitosterol, butulinol.

Fruit – Butyric and tartaric acids, saccharine substances and little tannin, β- sitosterol, ceryl alcohol, gmelinol, arbrone, arboreal, luteolin, apigenin, quercetin, hentriacontanol, quercetogenin

Stem – Lignans

Stem bark – Alkaloids in traces

PARMACOLOGICAL ACTIVITY

Anti-inflammatory & anti-nociceptive activity

Anti-inflammatory activity of aqueous extract (AE) and methanolic extract (ME) of stem bark

of *G. arborea* was determined in Wistar albino rats in a model of acute plantar inflammation induced by carrageenan. The anti-nociceptive activity was evaluated by using hot plates and writhing test in Swiss albino mice. Significant differences between the experimental groups were assessed by analysis of variance. AE showed maximum inhibition of writhing response (84.3%) as compared to ME (77.9%) in writhing test at a dose of 500mg/kg [46].

Anti-oxidant activity

The study of methanolic extracts of stem bark of *Gmelina arborea* Roxb. using various in vitro assays method showed its free radical scavenging activity 85.20%. [47].

Anti-pyretic and Analgesic activity

Gmelina arborea Roxb.bark extract was evaluated and the ethanolic and aqueous extract found to reduce the hyperthermia at the rate of 420mg/kg body weight 1hr after the administration and its effect is comparable to that of the standard antipyretic drug Paracetamol at the dose of 50mg/kg body weight. Whereas chloroform and benzene extract reduced the temperature 3hrs after their administration but have mild effects. However the analgesic activity of ethanolic and aqueous extract (test compounds) was found to be more significant on acetic acid induced test than tail flick test as compared to standard Diclofenac sodium at a dose of 25mg/kg and thus it appear that the test compounds inhibit predominantly the peripheral pain mechanism [47].

Cardioprotective activity

Ethanolic extract of *Gmelina arborea* Roxb.has shown potential protective effect against doxorubicin (DOX) induced cardiotoxicity by increasing cardiac markers activities in plasma. [47].

Anti-helminthic activity

Alcoholic and aqueous leaves extracts of *Gmelina arborea* Roxb. exhibited anthelmintic activity in dose dependent manner giving shortest time of paralysis and death compared to piperazine citrate, especially with 100mg/ml concentration for Pheretima posthuma and Ascardia galii worms by increasing chloride ion conduction of worm muscle membrane that produced hyper polarization and reduced excitability that lead to muscle relaxation and flaccid paralysis [47].

Immunomodulatory activity

Methanolic extract of *Gmelina arborea* Roxb.and ethyl acetate fraction of methanolic extract have been found to increase the total WBC count, which was lowered by cyclophosphamide, a cytotoxic drug. The drug is also capable of normalizing the levels of neutrophils and lymphocytes. The results indicates that the *Gmelina arborea* Roxb. can stimulate the bone marrow activity . As the drug is capable of reducing the

cyclophosphamide induced activity, it can be useful in cancer therapy also [47].

Anti-Microbial Activity

Aqueous extract of *G. arborea* (AEGA) was tested at the dose of 286 & 667mg/kg body weight. Cyclophosphamide 25mg/kg b. w. was used as positive control. The AEGA at doses of 286mg/kg & 667mg/kg, after 24, 48,72h significantly increased the micronucleated polychrometics % and also decreased the PCE/NCE ratio after 24, 48 and 72h as compared to the solvent control group [48].

Anti-diabetic activity

The study of aqueous extract (AE) of *Gmelina arborea* Roxb. bark on normoglycemic levels and Streptozotocin (STZ, at dose of 55mg/kg body weight) induced diabetes in rats showed that oral administration of AE lowers plasma glucose level in diabetic rats in acute case significantly ($p<0.001$) [49].

Gastro-protective activity

Pemiah et al (2014) investigated the dose ranging gastro-protective activity of G. arborea Roxb. extract using ethanol induced gastric lesions in rats. The Hydro-alcoholic extract of G. arborea Roxb. extract (250 mg/kg) showed significant ($p<0.01$) gastro-protective activity when compared with diseased control. The maximum percentage protective index (65.05%) was observed at 500 mg/kg b. wt. of test substance treated groups [50].

TOXICOLOGY

Acute and sub-acute toxicity study of powder of fruits of *Gmelina arborea* Roxb. (test drug) was conducted in two schedules (Acute and sub-acute toxicity studies) with different doses of 300mg, 500mg and 1g/kg for 28 days. None of the doses of this test drug produced mortality or behavior changes. Thus the test drug at a dose of 2g/kg was proved to be non-toxic without causing any kind of variations among behavior, bio-chemistry, hematology and histology of vital organs. [51]

Kulkarni et al. (2013)., studied the analgesic activity & toxicity of alcoholic extract (AE) in female swiss albino mice and observed that alcoholic extract and its fractions are safe after oral administrations and also have significant analgesic activity. AE at 250 & 500 mg/kg showed a significant decrease in writhes -13.4 0.16 and 12.2 0.22, respectively when compared with control (19.2±0.58). ME of *Gmelina arborea* bark at 300-500mg/kg neither produce mortality nor significant changes in the clinical signs as well as found safe in acute and repeated dose toxicity studies in rats and mice [52].

ETHNOMEDICINAL USES

Stem bark of *Gmelina arborea* Linn. is used by *Gondu* tribes of *Adilabad* district (*Andhra Pradesh*, India) to increase sperm count. 100 gms of bark is grinded with 50 gms of sugar, 50ml of water and one spoon is given 4 times a day once in 3 days for 21 days. [53]

The *Paliyan* tribes inhabiting the *Sirumalai* hills (*Tamil Nadu*, India) uses stem bark of *Gmelina arborea* Roxb. in hair-cleaning and to prevent dandruff [54].

The tribal people of *Mayurbhanj* district, located in northern part of *Orissa*, India use the decoction of root for washing and healing of septic wounds [55].

Tribals of *Jalpaiguri* district of *West Bengal*, India use bark of *Gmelina arborea* Linn. to treat vomiting and diarrhea [56].

Folks of *Lohit* and *Dibang* valley districts of *Arunachal Pradesh* use root bark and leaves of *Gmelina arborea* Roxb. in gonorrhea [57]..

Garo tribe inhabiting North *Garo* Hills, *Meghalaya* use bark and leaves of *Gmelina arborea* Roxb in cough and snake bite [58].

Bajpai et al. (2015) documented that the *Tharu* Tribes living in the Himalayan Terai Region of India make use of root and bark of *Gmelina arborea* Roxb. in indigestion, hallucination, piles, abdominal pains, burning sensations, fevers, urinary discharge, snake bite and as galactogogue, The flowers were used in leprosy and blood diseases [59].

ADULTERANTS AND SUBSTITUTES

According to *Bapalalji* towards *Haridwar*, on the bank of the river *Ganges* bark of *Trewia nudiflora* (Euphobiaceae) is used by the local *Vaidyas* as *Shriparni* [60]. According to Database on medicinal plants used in *Ayurveda*, vol. III in South India roots of *G.asiatica* Linn. are sold on name of *Gambhari* [44]. The legitimacy of substitution of any drug can only be approved if it has similar bioactivity and bioequivalence. No substitutes have been proposed for *G. arborea* (*Gambhari*) by Ayurvedic pharmacopoeia of India.

PART USED

The useful parts of *Gambhari* are fruits [29], leaves [33], petiole [37], seeds [38], flowers [31], stem bark [27], root bark [28] and roots [29].

DOSAGE

Root bark decoction- 50-100ml [61]

Fruit powder- 1-3gm [61]

FORMULATIONS AND PREPARATIONS

Dashmularishta, Chandanasava, Tarunanad rasa, Nityodaya rasa, Kamdev ghrita, Arvindasava, Drakshadi kwatha churna, Shriparnyadi kwatha, Shriparni taila, Brihatpanchmuli kwatha, Kashmarya kwatha, Vidarighrita, Dashmula kwatha churna, Kumarkalpdrum, Naygrodh ghrita, Sheetkalyanak ghrita, Baladi churna, Amritaprashvaleha, Madhukadi hima, Lajodak. [62]

DISCUSSION

Gambhari is a drug which has been widely covered in almost all the classical texts. It has been indicated for external as well as for internal use. Modern research community is taking keen interest more for its anti-

inflammatory, anti-diabetic, immunity booster and even as anti-cancerous activity which can be correlated to its *rasayana* action. Many synonyms can be traced in classics however most of them are insufficient to reach to its correct identity. A complete botanical analysis is mandatory.

CONCLUSION

In the present study complete literature related to *Gambhari* i.e. classification, synonyms, their etymology, pharmacological properties, types, important therapeutic indications, taxonomy, vernaculars, botanical description, distribution, chemical constituents, pharmacological activities, ethnomedicinal uses, adulterant and substitutes, dosage and formulations have been arranged under one umbrella in comprehensive way. The study may prove useful for scholars, researchers and physicians as ready reference regarding *Gambhari*.

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