



A LITERARY REVIEW ON THE NOOTROPIC POTENTIAL OF THE DRUG GAMBHARI – A POTENTIAL MEDHYA DRUG?

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ABSTRACT

Medicinal plants have been the source of various miracle remedies that astonished the field of medical science with the therapeutic potential of their secondary metabolites which in turn attributed to their wide range of action and properties. One such action and property exhibited include the nootropic property or *Medhya* action of the drug. The nootropic property or the *Medhya* action of the drug mainly refers to the enhancement of cognition and memory and that which facilitates learning potential. Throughout the classics, various drugs that possess *Medhya* action have been described. Looking into the classics of ayurveda, single drugs as well as compound ayurvedic formulations can be seen described as having *Medhya* action. *Acharya Vagbhata* has mentioned the properties and actions of *Gambhari* drug while dealing with *Phala varga in Annaswaropa vijnaneeya adhyaya, Astanga hridaya, sutrasthana*, 6th chapter. The mental health of an individual plays a major role in the wellbeing of the person. Various psychological factors like *Medha, smriti, and dhi* can be seen mentioned throughout various classical texts also laying their role in *jnanotpatti*. This article is aimed to provide a literary insight into the drug *Gambhari* in terms of its *Medhya* potential.

Keywords: Nootropic, *Medhya*, *Gambhari*, cognition, *Gmelina arborea*,

INTRODUCTION

The traditional herbal medicine system of Ayurveda has its roots in the ancient Vedic period dating back almost 5000 years making it the oldest recorded book on health and wisdom. Ayurveda has advocated not only regarding the medicines but in detail about the day-to-day regimens, and protocols to be followed to lead a healthy disease-free life. Stressing on the point of a disease-free life, modern medicine always has relied on a symptomatic level of treatment, while on the other hand, ayurveda has always taken into consideration both healthy and diseased alike have focused on the preventive and curative aspects also along with the treatment.

Ayurveda has very elaborately explained the concept of health and a healthy individual taking into consideration the dosha, dhatu, and Agni and satisfactory evacuation of bowel urine and sweat. Apart from the physical aspect ayurveda has also laid great importance on having a pleasant or satisfactory mental status and well-functioning senses. Ayurvedic approaches towards the treatment of diseases include establishing equilibrium on various elements of the human body including body, mind, soul, and the senses. Ayurvedic approach towards the prevention of diseases includes the concept of regimens and protocols that are to be followed in day-to-day lives as well as in respective seasons of the year, Apart from these protocols are regimens ayurveda also has advised various therapies and medicines that help to delay/arrest aging and rejuvenating the whole functional dynamics of the human body. This method of revitalization and rejuvenative approach to maintaining the equilibrium of the body and its functional dynamics is termed *Rasayana chikitsa*. The main aim of *Rasayana chikitsa* itself is to nourish the blood, lymph, flesh, adipose tissue, semen and ultimately increasing the immunity of the self and preventing the onset of any chronic diseases.

According to ayurveda, *Rasayana* drugs are considered to promote nutrition via direct enrichment of the nutritional quality of *rasa*, promoting nutrition by acting on the *agni* of the individual, promoting the competence of *srotas*(1). Based on the achievable

outcome of the therapy, *Rasayana* drugs can be classified into 3 (i) *Naimittika rasayana* (ii) *Ajasrika rasayana* (iii) *Kamya rasayana*, and *Medhya rasayana* as well as the drugs with *Medhya* property are included under the *Kamya rasayana* group(2). Neurological psychiatric disorders are generally associated with the loss of memory, cognitive deficits, impaired mental functions, etc. *Medhya rasayana* as well as drugs with *Medhya* action are aimed to improve intellectual and are mainly indicated in the treatment and prevention of psychiatric and mental disorders of all age groups.

Gambhari (*Gmelina arborea*) belonging to the family Verbenaceae, is a well-known plant having references in various classics and almost all *Acharyas* have included the drug under Phala varga/ group of fruits. *Acharya Vagbhata* has mentioned the drug in *Astanga Hridaya Sutrasthana*, 6th chapter *Anna Swaroopa vijnaneeya adhyaya in Phala varga*(3). While mentioning the property of the drug, *Acharya* has specifically included the property of *Medhya* among other actions exhibited by the drug.

Aim of the Study

The aim of the study is mainly to lay an insight into the *Medhya* property of the drug *Gambhari* with respect to the references available in the classical texts.

Materials and Methods

The relevant section of all ayurveda classics including various Samhita and Nighantu was referred to collect the ayurvedic literature on the action/property *Medhya* and the drug *Gambhari* (*Gmelina arborea*). Information regarding the *Medhya* action in general, pharmacological evaluation, and study on the phytochemical constituents of the drug was also collected through the internet and other reliable sources.

Medha- Medhya -Nootropic property

The term *Medha* is derived from the root “*Medha sangame*” which means to collect or meet or come together(4). According to *Shabdakalpadruma*, *Medha* is derived from the “*Medh*” root and “*ang*” *pratyaya*(5). *Medha* is the mental faculty by means of which a person is able to attain the knowledge of existing objects and become *Medhavi*(6). *Medha* is de-

defined as the ability to retain knowledge from a literary source(7). It is a variety of buddhi which acquires knowledge, which is complete, uninterrupted, minute, sound, and gathered from different sources(8). As per Hemadri, Medha is the retention power of an individual or it is the unobstructed or uninterrupted perception and retention of knowledge in all aspects of an object.

The term “Medhya” is derived from the root “Medha” and “vat” pratyaya which means beneficial for Medha(9). According to the text Shabdakalpadruma, Medhya action is defined as one which is beneficial for Medha(10). Some authors have considered Medha to be one among the faculty of buddhi, while some others have considered it as a synonym for buddhi(11).

The concept and definition of the term "Nootropics" were first proposed in 1972 by C. E. Guirgea. He coined the term “Nootropic” from the Italian words “Noos” meaning mind and “tropien” meaning to turn or enhance.

Nootropics are also referred to as smart drugs, memory enhancers, neuroenhancers, cognitive enhancers, and intelligence enhancers. They are drugs, drug supplements, nutraceuticals, and functional foods that purportedly improve mental functions such as cognition, memory, intelligence, motivation, attention, and concentration. Nootropics were proposed as a class of psychoactive drugs that selectively improves mental functions and claimed to have mild to moderate positive mental or physical effects(12).

The main features of a nootropic drug include(13).

- Enhancement of learning and memory acquisitions
- Protection of the brain against physical and chemical injuries
- Facilitation of interhemispheric flow of information and efficient tonic cortical/ subcortical mechanism
- Absence of usual negative pharmacologic effects of psychotropic drug.

Gambhari – Gmelina arborea

Gambhari (Gmelina arborea Roxb.) belonging to the family Verbenaceae is an unarmed moderate-sized deciduous tree growing up to 15-20 meters in height, most commonly found in the hilly regions of the Himalayas, the Nilgiris, and the eastern and the western coast of India.

Latin Name: Gmelina arborea Roxb.

Family: Verbenaceae

Part Used: Root, Leaves, Fruits

Dosage: Powder – 1 to 3 mgs, Decoction: 20 to 30 ml

Vernacular names(14)

English: Coomb tree, Cashmere tree, Kashmir teak, White teak

Hindi: *Gambhari*

Kannada : Kumbajamara, Shivani

Malayalam: Kumizhu,

Sanskrit: *Gambhari*, kashmari

Tamil: Perumkumbil

Table 01: Scientific Classification(15)

Kingdom	Plantae
Division	Tracheophyte
Subdivision	Spermatophytina
Class	Magnoliopsida
Order	Lamiales
Family	Verbenaceae
Genus	Gmelina
Species	Arborea

Table 02: Gana Vargeekarana / Classical categorization of the drug(16):

<i>Charka Samhita</i>	<i>Shothahara Varga, Dahaprashamana Varga, Virechanopaga Gana, Phala Varga, Madhura Skanda</i>
<i>Sushruta samhita</i>	<i>Sarivadi Varga, Dashamoola, Phala Varga, Madhu Gana, Brihat panchamoola</i>
<i>Astanga Hridaya</i>	<i>Sarivadi Varga, Madhu Gana, Brihat panchamoola</i>
<i>Bhavaprakasha Nighantu</i>	<i>Guduchyadi Varga</i>
<i>Dhanwantari Nighantu</i>	<i>Guduchyadi varga, Prathama varga</i>
<i>Priya Nighantu</i>	<i>Hareetakyadi varga</i>
<i>Raja Nighantu</i>	<i>Prabhadradi varga</i>
<i>Shaligrama Nighantu</i>	<i>Guduchyadi varga</i>
<i>Kaiyyadeva Nighantu</i>	<i>Aushadhi varga</i>

Synonyms interpreting the rasayana/ Medhya action of Gambhari (17):

Heera: The drug poses nourishes and rasayana properties.

Medini: The drug is Medhya action and is rasayana in nature.

Rasayani : The drug has rasayana property.

Table 03: Ayurvedic Pharmacological properties of Gambhari(18):

Reference text	<i>Rasa</i>	<i>Guna</i>	<i>Virya</i>	<i>Vipaka</i>	<i>Karma</i>
<i>Madanapala Nighantu</i>	<i>Kashaya, Madhura</i>		<i>Sheeta</i>	<i>Madhura</i>	<i>Tridoshahara Keshya Rasayana Bhedana <u>Medhya</u></i>
<i>Bhavaprakasha</i>	<i>Madhura Tikta</i>	<i>Guru</i>	<i>sheeta</i>	<i>Madhura</i>	<i>Medhya Bhedana Brahmana Vrishya Rasayana Vatapittahara</i>
<i>Dhanwantari Nighantu</i>	<i>Tikta</i>	<i>Guru</i>	<i>Ushna</i>		<i>Tridoshahara</i>
<i>Raja Nighantu</i>	<i>Katu, tikta</i>	<i>Guru</i>	<i>Ushna</i>	<i>Katu</i>	<i>Tridoshahara</i>
<i>Kaiyyadeva Nighantu</i>	<i>Madhura</i>	<i>Guru</i>	<i>Ushna</i>	<i>Madhura</i>	<i>Medhya Bhedana Kaphapittahara Rasayana brimhana</i>
<i>Nighantu rarnakara</i>	<i>Katu, tikta, Madhura</i>	<i>Guru</i>	<i>Sheeta</i>	<i>Madhura</i>	<i>Medhya</i> <i>Budhiprada Tridoshahara Hridya Rasayana Vrishya dhatuvridhikara</i>

<i>Sodhala Nighantu</i>	Madhura	<i>Guru Snigdha vishtambha</i>	Sheeta	<i>Madhura</i>	<i>Vatakaphahara Brahmana Medhya Rasayana</i>
<i>Madhanapala Nighantu</i>	Madhura	<i>Guru</i>	<i>Ushna</i>	<i>Madhura</i>	<i>Rasayana Brahmana Keshya Vatapittahara</i>
<i>Sushruta samhita</i>					Medhya Rasayana Hridya
<i>Astanga Hridaya</i>	Madhura	<i>Sara</i>	Sheeta	<i>Madhura</i>	<i>Keshya Medhya rasayana</i>
<i>Rajavallabha Nighantu</i>	Madhura Tikta	<i>Guru Grahi</i>	Sheeta		Medhya Rasayana Keshya

DISCUSSION

General Mode of Action of the drug on Medha

Budhi, Dhi, Dhriti, and smriti are regarded as the main functions associated with *Medha*. *Budhi* is the factor by which knowledge is obtained or in other terms, it is regarded as conclusive knowledge(19). *Dhi* is the factor that is responsible for the real perception of knowledge(20). *Dhriti* is the controlling factor, it controls the manas from indulging in *ahit Artha*(21). *Smriti* is the factor that helps in the recollection of facts that were seen, heard, or experienced(22). *Ahara -vihara shareerika nidana* vitiates the bodily doshas which in turn vitiates the *manasika doshas* namely *tamas*. The increased and vitiated *tamas* affect the *buddhi* and causes *buddhi avarana*. Once the *buddhi* is *avrta*, the channel of knowledge will break leading to a reduced perception of knowledge ultimately leading to *Medha hani*. Apart from the *nidana* factors described above, *pitta kshaya* as well as the vitiation of the *manasika bhavas* like *chinta, shoka* will also lead to the vitiation of *rajas* and *tamas* ultimately leading to *mano-avasthana and Budhi avarana*. In general, *Medhya* drugs or drugs have *Medhya* property increases *kapha* which in turn provides *dharana karma* (retention of cognition), *Ushna Virya* and *tikta rasa pradhana dravya* promotes *pitta* thereby enhancing *grahana and smarana*.

Medhya drugs also act by maintaining *Rajas* and *tamas* in turn promoting the function of *buddhi and manas*. They also act on the *manasika bhavas*. Most of the drugs having *Medhya* properties have *Madhura rasa, sheeta virya, and Madhura vipaka* which will maintain the normal functioning of *sadhaka pitta*(23). Going through the *Ayurvedic pharmacological* properties of *Gambhari* described across various *Samhita* and *Nighantus*, it is evident that the drug *Gambhari* is mainly *Tikta, Kashaya, Madhura in rasa, Guru in guna, Ushna in veerya and Madhura in Vipaka*. Across the collected literature from all the *Nighantus* and *Samhita*, it is evident that the drug clearly possesses *rasayana* property, and the majority of the *Nighantu, Sushruta samhita, and Astanga Hridaya* has also stated about the *Medhya* or *nootropic* potential of the drug. *Gambhari* (*Gmelina arborea*) is a drug that is one of the most commonly available fruits and has various applications in medical conditions. The applicability of *Gambhari* on *CNS* can be substantiated by the inclusion of the drug in various *ayurvedic classical formulations* specifically indicated in disorders associated with *CNS*. Some of the formulations include *Drakshadi kwatha* (*Su.sa. Ut. 39/179*) indicated in *Murcha, Maha mayura Ghrita* (*Ah. sa. Ut. 24/51*) indicated in *Indriya bhramsha*.

CONCLUSION

On comprehensive literary review of the drug *Gambhari* (*Gmelina arborea* Roxb.) through different *Nighantu and Samhitas*, it is found that the drug has been elaborately mentioned along with the synonyms, and pharmacological properties. Among the pharmacological properties mentioned in the *Samhita*, the *Medhya* karma of the drug has been explained by the majority of the *Nighantu and Samhita* authors. The histopathological changes brought about in CNS along with the phytochemical parameters of the drug have to be checked further in experimental and clinical trials.

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