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A critical study of medicinal plants in the texts of *Bṛhattrayī and Mādhava Cikitsā treatises of Āyurveda* for the treatment of hair disorders

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Abstract

Hair growth disorders, as perceived by legendary Ayurvedic trinity i.e. Caraka Saṃhitā, Suśruta Saṃhitā and Aṣṭāṅga Hṛdayam, referred to as Bṛhattrayī are caused mainly due to Vāta imbalance factors. Mādhava Cikitsā (a limitedly studied treatise), another Sanskrit medical compilation by Acharya Mādhava, who is considered to be the epitome of Ayurvedic patho-physiology (Roga Nidāna) also had emphasized treatments to hair problems under Kshudrarog Cikitsā like in Bṛhattrayī. A critical study was undertaken to find out and assign the correct botanical identification of each medicinal plant described in Sanskrit names in these treatises for the treatments of hair disorders such as Palita and Khalita along with Iṅdrabidda /Iṅdralupta (alopecia areata, totalis universalis) under Kshudrarog Cikitsā. This study of the Sanskrit texts of Bṛhattrayi and Mādhava Cikitsā as made independently and in comparison, compiled a list that contains a maximum 43 identified plant species belonging to 31 families of ethnomedicinal interest. There are 05 different plants identified from the description of Mādhava Cikitsā only, which are not mentioned in the Bṛhattrayi. For Khalita treatment, there are 11 different plants identified from the verses of Bṛhattrayi, and those are not mentioned in Mādhava Cikitsā. A local market survey of hair oils prepared by different Ayurvedic Pharma companies found using a maximum of 84 numbers of plants in different proportions as listed in the treatises. Effort was also made in assigning the most probable botanical identifications to the plant names, and representing the plant names expressed in Sanskrit with Unicode diacritical marks in this scientific publication for universal understanding and correct pronunciation. The findings and representations in this paper will be of significant use for the Pharma companies to identify and use correct plant species for better efficacies.

Keywords: Hair loss, Alopecia, *Palita*, *Khalita*, Medicinal plants, *Kshudraroga*, *Bṛhattrayi.*

Introduction

Medicinal plants are listed in various indigenous medical/health care systems, such as Siddha (600 plants), Ayurveda (700 plants), Amchi (600) (“Tibetan medicine”), also known as the *Amchi System of Medicine* in Ladakh and commonly known as *Sowa-Rigpa*, has similarities with Ayurvedic medicine in India and it is the traditional medicine in many parts of the Himalayas), Unani (700 plants) and even in Allopathy (30 plant species) for dealing with various ailments[1].

The holistic aims are to heal the sick and prevent disease, sustain quality and length of life. Ayurveda is one of the most ancient medical traditions practiced in India, Sri Lanka and other south Asian countries. It has a sound philosophical and experiential basis[2].

Caraka Saṃhitā, Suśruta Saṃhitā and Aṣṭāṅga Hṛdayam (*Bṛhattrayi*) are its main classics, giving detailed descriptions of uses of over 700 herbs for various treatments of diseases. Its literature describes over 200 herbs, Minerals and fats to maintain and enhance the health and beauty of the skin[3].

Like authors of *Bṛhattrayi,* Mādhava [belonged to Ca 7th - 8th century CE[4], popularly known as Mādhavacārya, has also been acknowledged as one of the finest Ayurvedic physicians even today. He was the author of a text on medical diagnostics (*Rogavinischaya*), known as ‘*Mādhavanidānam*’. His other classical text was *Mādhav Cikitsā*. These classical medicinal texts have made invaluable services to human and animal lives from ancient time to modern days in India.

In Ayurveda, hair diseases are described and treated under three types as *Khalita* (loss of hairs), *Palita* (premature hair graying), and *Iṅdrabidda*/*Iṅdralupta* (white patches of hair fall on scalp - as alopecia areata, totalis universalis)[5]. These are counted as *Kshudraroga*. According to the American Hair Loss Association, hair loss in women affects roughly 50% population. 40% of men have noticeable hair loss by age 35; 65% by age 60 and 80% by age 80. Male pattern baldness and female pattern hair loss are the most common conditions in the present population[6].

Loss of previously existing scalp hair is termed as alopecia. This is of two types, permanent and temporary. Androgenetic alopecia (male pattern baldness), which is common, has

androgen and genetic background as the cause for developing alopecia[7]. It is transmitted as an autosomal dominant trait. It occurs in appropriate age. Thus, scalp hair is normal in childhood and adolescence. Universally this is an extremely common disorder that roughly 50% men and perhaps as many women older than 40 years are involved. Almost all_patients have an onset prior to age 40 yrs, although many of the patients (both male and female) show evidence of the disorder by age 30 yrs[8].

Hence, hair disorder has become a major concern of doctors for restoring normalcy in the patients. The correct study, analysis and identification of medicinal plants from Ayurvedic texts have been showing many good results for the treatments of other chronic disorders. In a similar prospect, treatment for hair disorders (*Khalita, Palita* and *Iṅdrabidda/Iṅdralupta*) as described in the *Bṛhattrayi* and *Mādhav Cikitsā* need a coordinated study/research and attention of researchers, doctors and pharma companies.

But unfortunately, many ambiguities are found over the correct botanical identification of Sanskrit names of plants described in the Ayurvedic texts due to many reasons, which has caused adulteration and no effect of the herbal drugs[9]. World Health Organization also currently encourages, recommends and promotes traditional herbal medicines in national health care programmes; as such drugs are easily available at low cost and inherently safer than the potent synthetic drugs[10].

The present study would help all concerns for the findings and correct botanical identification of Sanskrit plant names as per latest world order.

Methodology

Ancient medical texts - Caraka Saṃhitā (CS), Suśruta Saṃhitā (SS) and Aṣṭāṅga Hṛdayam (AH) (*Bṛhattrayi*) and *Mādhav Cikitsā* (MC) were studied from their recently published hard copy editions[11-14] to enlist and identify correct botanical names of plants from the chapters under *Kshudraroga* and from the verses on *Khalita, Palita* and *Iṅdrabidda/Iṅdralupta*. Sanskrit medical glossaries, dictionaries and commentaries were studied for correct understanding of the Sanskrit names of plants indicated in the complex verses. Similarly, Indian pharmacopoeia, Ayurvedic Pharmacopoeia of India (API)[15],

Ayurvedic Formulary of India (AFI)[16], publications from AYUSH, CSIR[17], and current taxonomic guidelines based on ICBN are referred to justify the correct botanical identifications of the listed plant species. In the table information of the plants, scientific name, family, vernacular name and Sanskrit name have been described for each species. The figures in the parentheses represent the authors in references who agree with this identification of the plant. Ayurvedic practitioners were in continuous interaction for the coordinated analysis of the texts and identification of drug parts.

Result and discussion

This study has attempted to highlight medicinal plants described for the treatments of *Kshudraroga* in the classical Sanskrit medical texts. The knowledge of medicinal plants used by the common people from ancient times is well known due to the culture and traditions in India apart from the Ayurvedic practioners. It was interesting to note that some of the plants as listed in *Bṛhattrayī* are not mentioned in *Mādhav cikitsā* and vice versa (Table 1-4). The comparative study of medicinal plants given in *Mādhava Cikitsā* and *Bṛhattrayī* shows that there are total 43 plant species belonging to 31 families, which were considered independently and has only one plant group (Table-4).

The results also show that 27 species (63%) were used for *Palita* treatment; 13 species (30%) for both *Palita* and *Khalita* treatment and 21 species (49%) for *Iṅdralupta* treatment. There appears a great deal of uses of medicinal plants in the treatment of *Kshudraroga. However, Mādhava Cikitsā* quoted verses treating of hair problems like *Palita* and *Iṅdralupta* rather than *Khalita.* (Table-2). Similarly, eleven plants are separately given in *Bṛhattrayī* only (Table-3) for the hair disorder treatment. The habit diversity of these medicinal plants shows 12% climbers, 16% shrubs, 37% trees and 35% herbs.

The most probable and correct botanical identification of each plant (along with its synonyms) was also determined through literature survey and study of Ayurvedic formulary[16]. The official Sanskrit names of the medicinal plants used in *Kshudraroga* as given in the tables are as per API / AFI to avoid ambiguity. Hair disorders are effectively corrected with Ayurveda therapies – say pharma companies[31,35] and have mentioned 30 Number of plants in their products, which are mentioned in the Sanskrit Medical texts studied. At the same time, new plant names (about 84) are added to the oil preparations for hair disorders by pharma companies, which are not mentioned in the classical texts. Further study could establish the reasons of new inclusions. However, the Ayurvedic medicinal market products show many discrepancies with respect to plant taxonomic identities, correct representations of Sanskrit and botanical names, parts used, quantity and forms of the components, etc. (Table-5). There is no mention of the texts from which the preparations are made for reference too.

Ayurvedic medical practitioners, Pharmaceutical researchers and other researchers interested in herbal drugs have been studying various medicinal plants described in different post classical ayurvedic literature. Some of their publications[27,33,34,36] have thrown light on herbal preparations in rejuvenating hair growth etc. This present study will certainly benefit to Ayurvedic practitioners and pharmaceutical companies in selecting proper plant species for drug formulation and biotechnological methods of harvest, which will improve the efficacy of the marketed oil products or plant extracts dealing different hair problems.

Table-1: Plants for *Kshudrarog Cikitsā* common in *Bṛhattrayi* and *Mādhava Cikitsā.*

Botanical Name	Sanskrit name	Vernacular names	Name as AFI/API
Abrus precatorius (Linn.)[18,19] (Leguminosae)[19]	*Guñjā, Kākananti*[19]	*Gaungci, Gunci, Gunja(M) Ratti, Chirsi, Ghuṇgci(H)*	*Guñjā*
Albizia lebbeck (Benth.)[9,19] (Mimosaceae)[9, 19]	*Śiriṣa*[9,19]	*Siris(M), Śiris, Siriṣa(H)*	*Śiriṣa*
*Azardica indica (*A.Juss.) [1,14,15,18,19,20,21] (Meliaceae)[9,15,19,20,21,22,23]	*Ariṣṭa, Nīṃba*[15]	*Kadunimb, Nimb, Balantnimba, Līṃba, Bakayan(M) Neem, Nim(H)*	*Nīm*
Cyperus rotundus (Linn.) [1,9,15,16,18,19,21,24] (Cyperaceae)[15,16,18,19,21,25,26]	*Mustā*[10]*, Mustaka*[19]*, Payodhara*[9]	*Mothā(M) Nāgarmothā, Mustaka(H)*	*Mustā*
Eclipta alba (Linn.)[9,14,19,21,27] (Asteraceae)[9,19,27,28,29]	*Bhṛṅgraja*[9,21,27] *Bhāṅgarā*[9]*, Bhṛṅga*[19,27] *Mārkava*[19]	*Bhaṇgra, Maka(M), Bhāṅgarā, Bhaṇgaraiya(H)*	*Bhṛṅgarāja*
Emblica officinalis (Gaertn.)[9,10,19,20,21,27,28,29] Syn. *Phyllanthus emblica* (Linn.) (Euphorbiaceae)[1,8,19,21,23,27,30]	*Āmalak*[20,21] *Dhātrīphala*[19] *Dhātrī*[19]	*Anvala, Avalkathi(M) Āṃla, Āuda, Āura, Āṃvra, Āṃvda, Āonla, Āmvalā(H)*	*Āmalakī*
Euphorbia prostrate (W. Ait)[9,16] (Euphorbiaceae)[9,15,16]	*Dugdhikā*[9,15,19] *Gorakkṣadugdhī*[15,19]	*Lahān nāytee, Lahāndudhi(M) Duddhi, Dugdhikā, Chotidudhi(H)*	*Dugdhikā*
Glycyrrhiza glabra (Linn.)[1,9,19,21,25,26] (Leguminosae/ Fabaceae) [1,9,19,20,21,25,26]	*Yaṣṭimadhū*[19,25] *Madhuyaṣṭī*[15,16] *Madhuk*[19,] *Yaṣṭīvāy*[19]	*Jestamadh(M) Mulethi, Mulathi, Muleti, Mīṭhīlakdī Jethimadhu, Jethimadh, Mulhaṭhī(H)*	*Yaṣṭī*
Hemidesmus indicus (R. Br.)[9,19,21] (Asclepiadaceae)[9,19,21]	*Sārivā*[9,21]*,sari*[15]	*Upˉarsal, Upˉalsari(M) Anantmool(H)*	*Śvetasārivā*
Indigofera tinctoria (Linn.)[9,19,21,30] (Fabaceae/Leguminosae)[9,19,21,30]	*Nīlī*[20]*,Nīlīnī*[15,16]	*Nili, Neel(M) Neela(H)*	*Nīlī*
Mongifera indica (Linn.)[14,16,21] (Anacarsdiaceae)[15,16,27]	*Āmra*[15,21,27]*,Chūta*[12]	*Aamba, Amba(M) Aam, Ama(H)*	*Āmra*
Nardostachys jatamansi (DC.)[9,18,19,28,29] (Valerianaceae)[1,9,18,19,21,28,29]	*Keśi, Māṁsī*[9]	*Jaṭāmansi(M) Balchhaḍ, Jaṭāmānsi, Balchara(H)*	*Jaṭāmāṃsī*
Nelumbo nucifera (Gaertn.) [9,18,23,24,27] (Nymphaeaceae)[9,19,23,27]	*Utˉphal, Mṛṇālīn*[9]	*Padma Kesar Kamal(M) Kamala Kanwal(H)*	*Mṛṇālīn*
Nerium indicum (Mill.)[19,23] Syn. *Nerium odorum*(Soland) (Apocynaceae)[19,23,24]	*Karavīra*[19,23]	*Kanher(M) Kaner(H)*	*Karavīra*
Nymphae nouchali (Burm.)[19,23] (Nymphaeaceae)[19,23]	*Nīlotphal*[23]	*Neelkamal(M) Kui, Koi(H)*	*Neelapadma*
Piper longum (Linn.)[1,9,18,21,23,24,27] (Piperaceae)[9,18,19,21,23,27,31,32]	*Pippalī*[9,26,31,32]	*Pimplimula(M), Pippalī, Pippalamūla Piparamula(H)*	*Pippalīmūla*
Piper nigrum (Linn.)[1,9,19,23,27,31] (Piperaceae)[1,9,19,23,27,31]	*Ūṣaṇa*[9] *Marich*[21,31]	*Miri, Kalimiri(M) Kālīmirc, Golmirc,Mirich(H)*	*Marica*
Pongamia pinnata (Linn.)[18,19,23,27] (Leguminosae/Fabaceae)[19,23,25,27]	*Naktamālā*[19,23]	*Karanja(M) Karanj, Dithouri, karuaini(H)*	*Karañja*

Rubia cardifolia (Linn.)[1,9,15,21,23,27] (Rubiaceae)[1,9,15,21,23,27]	*Mañjiṣṭhā*[9,15,21,23]	*Majistha,Manjistha(M)* *Majith, Manjiṣṭhā (H)*	*Mañjiṣṭhā*
Santalum album (*Linn.)*[9,19,21,23,27] (Santalaceae)[9,19,21,23,27]	*Candana*[15,18,21] *Malaya*[9]	*Candana(M)* *Sandal, Candana(H)*	*Candana*
Semecarpus anacardium (Linn.)[15, 18, 23] (Anacardiaceae)[15,18,23]	*Bhallāta*[19,23]	*Bibba(M),* *Bhilawa(H)*	*Bhallātaka*
Sesamum indicum (Linn.)[18,19,23] (Pedaliaceae)[18,19,21,23]	*Tila*[18,21,23]	*Tila(M)* *Tila,Teel,* *Tili(H)*	*Tila*
Solanum indicum (Linn.)[9,18,23,27] (Solanaceae)[9,18,23,27]	*Bṛhatī*[9,21,23]	*Ḍaorlī,Dorale,Chichuriti(M)* *BaḍiKateri, Banbhanta,* *Vanābhārta(H)*	*Bṛhatī*
Terminalia arjuna (Roxb.) [1,18,21,23,27,30] (Combreteaceae)[1,18,21,23,27,30]	*Arjuna*[18,21,23]	*Arjuna, Sadada(M)* *Arjuna(H)*	*Arjuna*
Tinospora cordifolia (Willd.) [1,21,23,25,27] (Menispermaceae)[18,21,23,25,27]	*Gudūcikā,Amṛtā,* *Chhinnaruhā*[15,18,] *Gudūcī*[21] *Cīnnobhavā*[18,23]	*Guluchi , Guduchi(M)* *Giloyâ, Gurcha(H)*	*Gudūcī*
Tribulus terrestris (Linn.) [1,9,15,19,24,21,25] (Zygophyllaceae)[9,15,19,21,24,25]	*Gokṣura*[9,21] *Traikaṇṭaka*[15,18]	*Sarate, Gokharu(M)* *Gokhru(H)*	*Gokṣura*
Valeriana wallichii (DC.)[1,15,19,24] (Valerianaceae)[1,17,19,21,24]	*Kutṇta*[15,18]	*Tagar, Ganthode(M)* *Muṣkhabala, Sugaṇdhabala,* *Tagar(H)*	*Tagara*

Table-2: Plants for *Palita* and *Iṅdralupta* treatment recorded only in *Mādhava Cikitsā* and not in *Bṛhattrayi*

Botanical Name	Sanskrit name	Vernacular names	Name as AFI/API
Achyranthes aspera (Linn.) [1,9,18,19,21,27,30] (Amaranthaceae)[9,15,18,19,21,27,30]	*Aaghāt*[19,] *Śīkharī*[23]	*Aghada(M)* *Chirchita, Latjira(H)*	*Apāmārga*
Ficus bengalensis (Linn.) [15,18,21,23,32,33] (Moraceae)[12,13,26,31,32,33]	*Vaṭa*[15,18] *Vaṭaṛoha*[18,23]	*Vaḍa(M)* *Bad,Bargād(H)*	*Bargād*
Hibiscus rosa-sinensis (Linn.) [15,18,23,32,34,35] (Malvaceae)[15,18,23,28,29,32,34,35]	*Japapuśpa*[15,16]	*Jāṣvaṇd(M) Auḍhul,Guḍhul,* *Java(H)*	*Japā*
Jasminum officinale (Linn.)[19,27,32] (Oleaceae)[18,19,27,31,32]	*Jāti*[14,15]	*Chameli(M)* *Jasmine, Chamelee(H)*	*Jāti*
Schleichera trijuga (Willd)[32] (Sapindaceae)[15,19,32]	*Lakśa*[32]	*Koṣṃb(M)* *Kusum(H)*	*Kośamṛ*

Table 3: Plants for *Palita, Khalita* and *Iṅdralupta* treatment recorded only in *Bṛhattrayi* and not in *Mādhava Cikitsā*

Botanical Name	Sanskrit name	Vernacular names	Name as AFI/API
Asparagus recemosus (Willd.) [19,21,25,27,31,32] (Liliaceae)[1,19,21,25,27,31,32]	*Vāri*[15,25]	*Śatāvari(M)* *Śarnoī, Satāvar, Satamūli(H)*	*Śtāvari*
Boerhavia diffusa (Linn.)[9,15,18,21,23,32] (Nyctaginaceae)[9,15,18,21,23,27,32]	*Punaranavā*[9,32]	*Ghetuli, Vasuchimuli,* *Khaparkhuti(M)* *Gadapurna, Lalpunarnava(H)*	*Punaranavā*
Cedrus deodara (Roxb.)[9,18,19,25,32] (Pinaceae)[9,18,19,25,32]	*Dāru,* *Devadāru*[9,25]	*Devdar, Telya Dedaroo(M)* *Devdar, Devdaroo(H)*	*Devadāru*
Datura metel (Linn.)[15,18,19,24] Syn. *D. fastuosa* (Linn.); *D. alba* (Ramph); *D. Cornucopaea (*Hort.)[18,23,32] (Solanaceae)[15,19,32]	*Dhustuuraka*[18]	*Dhatra(M)* *Dhatura(H)*	*Dhattūra*
Ocium sanctum (Linn.)[1,19,24,27,31,32,34] (Lamiaceae)[19,24,27,31,32,34]	*Surasā*[19,32]	*Tulas(M)* *Tulasi(H)*	*Tulasī*

Plumbago zeylanica (Linn.)[1,9,19,24,27] (Plumbaginaceae)[9,15,19,24,27]	*Agnī, Cītrāk*[15,21,23]	*Cītraka(M)* *Cīra, Cītrā*(H)	*Citraka*
Solanum surattense (Burm.f.) [19,21,23,27,32] Syn.*Solanum xanthocarpum* (Schrad & Wendl)[9,21,25,27,32] (Solanaceae)[9,21,25,27,32]	*Kṣudrāvartak*[9,19] *Kanṭakārika*[9,21,23]	*Bhauringani, Riṅghani, Bhaṭkaṭeya, Kataringani(M) Laghukataī, Katali, Reṃganī, Bhatakataiya, Laghukataī, Choṭi kaṭeri, Kaṭelī(H)*	*Kaṅtakārī*
Symplocos racemosa (Roxb.)[9,16,19,21] (Symplocaceae)[9,19,21]	*Tilvaka*[9], *Lodhra*[9,19,21]	*Lodha, Lodhra(M)* *Lodha(H)*	*Lodhra*
Syzygium cuminii (Linn.)[32] Syn. *Eugenia Jambolana* (Lam.); *E. cuminii* (Druce.) (Myrtaceae)[15,19,27,32]	*Jambū*[19]	*Jambul(M)* *Jamuna(H)*	*Jambū*
Terminalia chebula (Retz.) [1,9,18,19,20,21,22,25,27,31,32,32] (Combretaceae)[1,9,18,19,20,21,22,27,28,32]	*Pathyā*[9] *Harītakī*[9,21,25]	*Hirda, Harītakī, Harda, Hireda, Hirda(M), Harre, Harar, Harā, Hard, Harre(H)*	*Harītakī*
Terminalia belerica (Roxb.) [1,9,21,25,28,29,30] (Combretaceae)[9,18,19,20,21,25,28,29]	*Akṣa*[15,32] *Bibhītaka*[9,15,21] *Vibhītka*[15,25,26,31]	*Baheḍa(M)* *Bherā,* *Baheḍā* *Bhairā, Fīnas(H)*	*Bibhītaka*

Table-4: Group names

Group Name	Botanical Name	Family	Sanskrit Name
Triphalā	*Emblica officinalis* (Gaertn.) *Terminalia bellirica* Roxb. *Terminalia chebula* Retz.	Euphorbiaceae Combretaceae Combretaceae	*Triphalā Amalakī, Bibhītaki, Harītakī*

Table-5: Plant contents in the marketed hair oils

Sr. No.	Name of Oil and Company	Names of the plants(Major)	Botanical Name	Parts used and form	Quantity/ 100ml
For Khalita					
1.	Keshayam Oil (AVS)	Svetakutuja	*Wrightia tinctoria*	Lf. Pst.	5.00 gm
		Kaidarya	*Murraya koenigii*	Lf. Pst.	4.00 gm
		Amalaki	*Emblica officinalis*	Dr.Fr. Pst.	3.00 gm
		Bringaraja	*Eclipta alba*	Pl. Pst.	3.00 gm
		Guduci	*Tinospora cordifolia*	St. Pst.	0.30 gm
		Nimba	*Azadirachta indica*	Lf. Pst.	3.00 gm
		Brahmi	*Bacopa monnieri*	Pl. Pst.	3.00 gm
		Yasti	*Glycyrrhiza glabra*	Rt. Pst.	1.00 gm
2.	Nilibhringadi Keratailam (AVS Kottakkal, Kerala)	Nili	*Indigofera tinctoria*	Lf. Jce.	100 ml
		Bhringarja	*Eclipta prostrata*	Pl. Jce.	100 ml
		Satakratulata	*Cardiospermum halicacabum*	Pl. Juc.	100 ml
		Dhatriphala	*Phyllanthus emblica*	Fr. Jce.	100 ml
		Yashti	*Glycyrrhiza glabra*	Rt. Pst.	2.08 gm
		Gunja	*Abrus precatorius*	Sd. Pst.	2.08 gm
3.	Hairich Oil (Capro labs, Banglore)	Japakusum	Hibiscus rosa sinensis	Fl.	4.40 gm
		Bringaraja	Eclipta alba	Lf.	2.00 gm
		Tulasi	Ocimum Sanctum	Hrb.	2.00 gm
		Neela	Indigofera tinctoria	Lf.	1.20 gm
		Bhoomyamalaki	Phyllanthus niruri	Hrb.	1.20 gm
		Kunduru	Boswellia wahru	Rsn.	1.20 gm
		Jyothishmathi	Celastrus paniculata	Sd.	1.20 gm
		Jathiphala	Myristica fragrans	Fr.	2.00 gm

		Katuka	Picrorrhiza kurroa	Rt. / St.	1.20 gm
		Saka	Tectona grandis	Lf.	1.20 gm
		Sahadevi	Vernonia cineria	Hrb.	1.20 gm
4.	Bhrungamalakadi thailam (Vaidyaratnam Oushadhasala)	NM	*Eclipta alba*	Pl.	100 ml
		NM	*Phyllanthus emblica*	Pl.	100 ml
		NM	*Glycyrrhiza glabra*	Rt.	5.5 gm
5.	Khadi Herbal Oil [Gramodaya Ashram U.P] (Pure Amla)	Amla	Emblica officinalis	NM	NM
		Bringraj	Eclipta alba	NM	NM
		Brahmi	Bacopa monneria	NM	NM
		Nagarmotha	Cyperus rotundus	NM	NM
		Lodhra	Symplocos racemosa	NM	NM
		Tulsi	Ocimum sanctum	NM	NM
		Neem	Azadirachta indica	NM	NM
6.	Mahabhringaraj Oil (Ramkrishna Vidyut Ayu.Pharmacy, Pune)	Maka	Eclipta alba	NM	20 gm
		Brahmi	Centella asiatica	NM	10 gm
		Hirda	Terminalia Chebula	NM	1 gm
		Behda	Terminalia belerica	NM	1 gm
		Amla	Emblica officinalis	NM	1 gm
		Nagarmotha	Cyperus rotundus	NM	1 gm
		Jatamansi	Nardostachys jatamansi	NM	2.5 gm
7.	Sukesha Tail (Sri Sri Ayurveda Trust)	Tila taila	Sesamum indicum	Sd. Oil	22.9 gm
		Amlaki	Phyllanthus officinalis	Fr. Pulp	54.0 gm
		Brahmi	Bacopa monnieri	WP. Pwd.	27.02 gm
		Bhringraj	Eclipta alba	WP. Pwd.	27.02 gm
		Hibiscus flower	Hibiscus rosa-sinesis	Fl. Pwd.	1.88 gm
8.	Bhringamlakadi Taila (Sri Sri Ayurveda Trust)	Bhringraj	Eclipta alba	Pl. Pwd.	24.96 gm
		Amlaki	Phyllanthus officinalis	Fr.Pulp Pwd	24.96 gm
		Tila taila	Sesamum indicum	Sd. Oil	100 ml
		Yashtimadhu	Glycyrrhiza glabra	Rt. Pwd.	6.24 gm
9.	Kesh Kanti oil (Patanjali)	Brahmi	*Bacopa monnieri*	NM	2.0 gm
		Bhringraj	*Eclipta alba*	NM	2.0 gm
		Neem	*Azadirachta indica*	NM	1.0 gm
		Baheda	*Terminalia belerica*	NM	1.0 gm
		Hirda	*Terminalia chebula*	NM	1.0 gm
		Giloy	*Tinospora cordifolia*	NM	1.0 gm
		Gurhal pusp	*Hibiscus rosa-sinensis*	NM	1.0 gm
		Amla	*Emblica officinalis*	NM	1.0 gm
		Nagkesar	*Mesua ferrea*	NM	0.5 gm
		Yashti Madhu	*Glycyrrhiza glabra*	NM	0.5 gm
		Jatamansi	*Nardostachys jatamansi*	NM	0.5 gm
10.	Keratex (Dabur India Ltd. Rajasthan)	Jyotishmati	Celastrus paniculatus	Sd. Ol.	4.97 ml
		Brahmi	Bacopa monnierri	Pl. Pdr.	2.40 gm
		Jatamansi	Nardostachys jatamansi	Rz. Pdr.	0.32 gm
		Manjistha	Rubia cordifolia	St. Pdr.	0.12 gm
		Tila taila	Sesamum indicum	Sd. Ol.	94.50 ml
11.	Kach Mohini Hair Oil (Bluemax Pharma)	Awala	NM	NM	20 gm
		Bhringraj	NM	NM	30 gm
		Jasvand	NM	NM	50 gm
		Brahmi	NM	NM	15 gm
		Korphad	NM	NM	30 gm
		Methi	NM	NM	20 gm
		Mehandi	NM	NM	10 gm
12.	Trichup (Vasu Health Care,Vadodara)	Til Taila	Sesamum indicam	Oil	80 gm
		Yashtimadhu	Glycyrrhiza Glabra	Rt	16 gm
		Jati	Jasminum Officinale	Lvs	1.6 gm

		Mandukaparni	Centelia asiatica	Panc.	1.6 gm
		Kamal	Nelumba Nucitera	Flw	1.2 gm
		Bhringaraj	Eclipta alba	Panc.	1.2 gm
		Neem	Azadirachta Indica	Lvs	1.2 gm
		Nagarmotha	Cyperus rotundus	Rt.	1.2 gm
		Amalaki	Emblica offinalis	Fr.	0.8 gm
		Dhattura	Datura metel	Lvs.	0.8 gm
		Japa	Hibiscus rosa-sinensis	Fl.	0.8 gm
		Patola	Trichosanthescucu merina	Panc.	0.8 gm
		Jatamansi	Nardastachys jatamansi	Rt.	0.8 gm
For Palita					
1.	Kuntalakanti Tailam (AVS)	Tila Tailam	*Sesamum indicum*	Sd. Ol.	100 ml
		Vibhitaka	*Terminalia bellirica*	Fr. /Rt. Dct.	100 gm
		Bhringarja	*Eclipta prostrata*	Pl. Jce.	100 gm
		Amalaka	*Phyllanthus emblica*	Fr. Jce.	100 gm
		Nili	*Indigofera tinctoria*	Lf. Jce.	100 gm
		Hribera	*Plectranthus vettiveroides*	Pl. Pst.	1.25 gm
		Usira	*Vetiveria zizanioides*	Rt. Pst.	1.25 gm
		Hima	*Santalum album*	Ht.Wd. Pst.	1.25 gm
		Mustha	*Cyperus rotundus*	Rt. Pst.	1.25 gm
2.	Indulekha Bringha oil	Nalikera	NM	NM	750 gm
		Svetakutuja	NM	NM	121.2 gm
		Bringharaja	NM	NM	11.8 gm
		Amrita	NM	NM	11.8 gm
		Amalaki	NM	NM	1.18 gm
		Yashti	NM	NM	0.187 gm
		Nimba	NM	NM	7.5 gm
		Brahmi	NM	NM	11.8 gm
3.	Kesh King (SBS Biotech.)	Amla	Emblica officinaalis	Dr.Fr.	20 gm
		Bhrungraj	Eclipta alba	WP.	20 gm
		Manjishta	Rubia cordifolia	St.	20 gm
		Raktachandan	Pterocarpus santalinus	Ht. wd.	20 gm
		Jatamansi	Nardostachys jatamansi	Rhz.	20 gm
		Nimba	Azadirachta indica	Lf.	20 gm
		Brahmee	Bacopa monnieri	Pl.	20 gm
		Haritaki	Terminalia chebula	Fr.	10 gm
		Bhibhitika	Terminalia bellirica	Fr.	10 gm
		Lodhra	Symplocos racemosa	St.	10 gm
		Nagkeshar	Mesua ferrea	Rt.	10 gm
		Yasti	Glycyrrhiza glabara	Rt.	10 gm
4.	Khadi Herbal Oil (Gramodaya Ashram U.P) (Pure Amla)	Amla	NM	NM	NM
		Bringraj	NM	NM	NM
		Brahmi	NM	NM	NM
		Nagarmotha	NM	NM	NM
		Lodhra	NM	NM	NM
		Tulsi	NM	NM	NM
		Neem	NM	NM	NM
5.	Krupa Hair Oil (Krupa Oushadhalay,Ratnagir)	Vargad	NM	NM	20 gm
		Behda	NM	NM	25 gm
		Hirda	NM	NM	25 gm
		Brahmee	NM	NM	20 gm
		Jaswand	NM	NM	10 gm
		Bhrungraj	NM	NM	10 gm
6.	Mahabhringaraj Oil (Ramkrishna Vidyut	Maka	Eclipta alba	NM	20 gm
		Brahmi	Centella asiatica	NM	10 gm

	Ayu.Pharmacy, Pune)	Hirda	Terminalia Chebula	NM	1 gm
		Behda	Terminalia belerica	NM	1 gm
		Amla	Emblica officinalis	NM	1 gm
		Nagarmotha	Cyperus rotundus	NM	1 gm
		Jatamansi	Nardostachys jatamansi	NM	2.5 gm
7.	Abhinav G3 Ayurvedic Kesh tail	Vata	*Ficus bengalensis*	NM	10 gm
		Amla	*Emblica officinalis*	NM	10 gm
		Brahmi	*Bacopa monnieri*	NM	10 gm
		Neem	*Melia azadirachta*	NM	5 gm
		Bhringraj	*Eclipta alba*	NM	5 gm
		Jatamansi	*Nardostachys jatamansi*	NM	5 gm
		Japa	*Hibiscus rosa sinensus*	NM	5 gm
		Methi	*Trigonella foenangra*	NM	2.5 gm

Conclusion

This study has conclusively emphasized the variations observed between the guided medicinal plants in the Sanskrit medical text and the marketed hair oils by pharma companies. The wrong narration of botanical identities of plant names are also been highlighted to create awareness on the real and adulterant crude drug samples.

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