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Medicinal plants for the treatment of *Mūtrakṛcchra* in the *Bṛhatrayī* and *Mādhava Cikitsā* treatises of *Āyurveda*

AK Thorat and DN Mishra

Abstract

Mādhava is one of the *Āyurvedic* practitioners (ca 9th Century CE) after the Caraka – Suśruta era, who had made a great compilation called *Mādhava Nidāna*. In a later stage, another unique treatise was composed by the same author Mādhava, named *Mādhava Cikitsā* in the line of diseases referred to in *Mādhava Nidāna*. *Mādhava Cikitsā* composition is not well known to the world due to the absence of a proper critical edition on the basis of available manuscripts. A study of the medicinal plants used for the treatment of *Mūtrakṛcchra* disease (painful urination) given in *Mādhava Cikitsā* was compared to that of the *Bṛhatrayī* (*Caraka Samhitā*, *Suśruta Samhitā* and *Aṣṭāṅgahṛdayam*) texts. It is found in the study that a single Sanskrit name of a plant has also been described for other plant species having different botanical identity in the literature. The ambiguity in plant names and botanical identity has been assigned to non-availability of suitable ancient taxonomic or pharmacognostic records for the correct botanical identifications of the Sanskrit as well as the vernacular names of medicinal plants of the same period. An attempt is made here to find the most probable correct botanical identification of each plant described for *Mūtrakṛcchra Cikitsā* in the texts, through a critical survey of the literature and by analysing and comparing all possible identifications. The study of the texts and matching of the medicinal plant names made the list to contain 38 identified plant species for the treatment of *Mūtrakṛcchra* as common in these four treatises of *Āyurveda*. There are 09 different plants identified in the description of *Mādhava Cikitsā* only which are not mentioned in the *Bṛhatrayī*. However, a majority of the plant species (43%) belong to herbaceous habit and to family Poaceae, Zingiberaceae (4-4 plants each) followed by family Apiaceae, Fabaceae, Solanaceae (2-2 Plants each) and one-one plants are represented by family Cucurbitaceae, Cyperaceae, Marsileaceae, Musaceae, Saxifragaceae, Zygophyllaceae. The present discussion of the taxonomically most appropriate plant names contributes to the relevant domain of knowledge about these medicinal plants and their variations, which turn contributes to the exploration of their curative and therapeutic value in *Mūtrakṛcchra Cikitsā*.

Keywords: *Āyurveda*, Medicinal plants, *Bṛhatrayī*, *Mādhava Cikitsā*, *Mūtrakṛcchra*.

1. Introduction

India has a rich intellectual and textual heritage that dates back to several hundreds of years. India is also being distinguished for its largest collections of manuscripts of any civilization in the world. There are more than five million manuscripts collected, which consist of several valuable medical texts [1]. *Āyurveda*, the Indian indigenous system of medicine, dating back to the Vedic period (ca 4500-1600 BC) has been an integral part of Indian culture [2]. Plants have been used as a rich source of effective and safe medicines due to their natural healing properties [3-6]. According to WHO estimate, about 80% of the world populations depend on traditional medicines, mostly on plant drugs to treat various ailments [3, 4, 5, 7].

Three major Sanskrit texts on *Āyurveda* viz. *Caraka Samhitā*, *Suśrut Samhitā* and *Aṣṭāṅgahṛdayam* were written by the ancient *Āyurvedic* practitioner's *Ācārya Caraka*, *Ācārya Suśruta* and *Ācārya Vagbhatta* respectively and these three *Āyurvedic* treatises are collectively known as *Bṛhatrayī* [8, 9]. *Suśruta* and *Caraka* are regarded as the oldest medicinal authorities and are held in great esteem in India till today [10]. *Mādhava* is one of the *Āyurvedic* practitioners of the middle age (ca 9th century CE), who also contributed immensely to *Āyurvedic* work. He had written (perhaps) about 11 Sanskrit texts on *Āyurveda*. The most famous volumes out of these are *Mādhava Nidāna* and *Mādhava Cikitsā* [9].

Mūtrakṛcchra is the condition of painful urination or incontinence of urine. In modern terminology, it is called as Dysuria [12-15]. In the classical *Āyurvedic* Sanskrit texts, urinary tract disorder is described as *Mūtrakṛcchra* [2]. *Bṛhatrayī* and *Mādhava Cikitsā* texts have given the

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treatment of *Mūtrakṛcchra* and described many herbal plant preparations to cure this disorder. But rapid modernization, urbanization, deforestation and extinction of many plant species resulted in adulteration and substitution of incorrect raw drugs in the alternative healthcare approaches [16, 17]. At present, the adulteration and substitution of the herbal drugs are the burning problems in herbal medicinal industries. In many developing countries, medicinal plants have not been correctly studied or documented. The extent of knowledge on traditional medicines should be documented with correct botanical identification of plants through study of manuscripts and botanical surveys before such rich heritage are lost due to various anthropogenic and other causes [18].

An attempt has been made by the authors to list out all the plants (Sanskrit names) given in *Mādhava Cikitsā* for the treatment of *Mūtrakṛcchra* in the chapter (No. 30) and compare the list with that of *Bṛhatrayī*. The most probable and correct botanical identification of each plant (including synonyms) was also determined through literature survey. The final list will expectedly help *Āyurvedic* practitioners and herbal companies to understand the correct plant species for the treatment as well as it will help to enrich plant database regarding medicinal plants for the treatment of renal disorder.

2. Methodology of the study

The text of the *Mādhava Cikitsā*, Ācārya-Mādhavakar-viracita, was studied from its only edition in Sanskrit with Hindi commentary edited by Vaidya Sohanlal Dhadhica and Principal Shri Bhanvarlal Dugad. So also the texts of *Bṛhatrayī* (*Caraka Samhitā*, *Suśrut Samhitā*, *Aṣṭāṅghṛdayam*) were studied from their 2007, 2008 and 2011 editions [12, 13, 14]. All Sanskrit plant names given in the *Mādhava Cikitsā* for the treatment of *Mūtrakṛcchra* were listed and scrutinized for their *Āyurvedic*, Vernacular and Botanical nomenclature with available literature. The Sanskrit texts, different manuscripts and plant taxonomic literature (Glossaries, Nighantus, Flora, etc) including the official API & AFI were referred to have a basis for the most probable identifications of these plants as per the maximum agreement of names by the authors in references and by adhering to the latest taxonomic principles of nomenclature of ICBN.

The comparative study of medicinal plants listed from *Bṛhatrayī* and *Mādhava Cikitsā* is explained in the table below:

CS = *Caraka Samhitā*, SS= *Suśrut Samhitā*, AH= *Aṣṭāṅghṛdayam*, MC= *Mādhava Cikitsā*

Table 1: Plants for *Mūtrakṛcchra* treatment common in *Mādhava Cikitsā* and *Bṛhatrayī*

Sr. No.	Botanical name and Family	Vernacular Name (s)	Sanskrit name (s)	Text (s)
1.	<i>Abutilon indicum</i> L. Sweet. [3, 7, 11, 19, 25, 28, 29, 30] Syn. <i>A. indicum</i> G. Don. [11, 24] Malvaceae [3, 7, 11, 19, 24, 25, 28, 29, 30]	Kākhi, Kākhīyā [28], Kaṅgahi [25, 28, 29]	<i>Kaṅgahi</i> [28], <i>Ṛṣyaprōktā</i> [11], <i>Kaṅkatika</i> [11, 25], <i>Atībalā</i> [11, 25, 28, 30]	SS and MC
2.	<i>Alstonia scholaris</i> L. R. Br. [11, 19, 20, 25, 28, 30, 32] Apocynaceae [11, 19, 20, 25, 28, 30]	Sataunā, Sattivanna [28] Chativan, Sattavaṅṅa [25, 28, 32]	<i>Vīśaltvak</i> , <i>Ṣārd</i> , <i>Vīṣamcchad</i> [11, 28], <i>Saptacchada</i> , <i>Saptāhvā</i> [11, 25], <i>Saptaparṇa</i> [11, 20, 25, 28, 30, 32]	AH, CS and MC
3.	<i>Amomum subulatum</i> Roxb. [11, 18, 23, 25, 28, 27] Zingiberaceae [11, 18, 25, 28]	Purvi Ilāyacī, Lāl Ilāyacī [28], Baḍī ilāyacī [23, 25, 28]	<i>Elā</i> , <i>Sathula</i> , <i>Brūhdelā</i> , <i>Cāndrabala</i> , <i>Nīśakuti</i> [28], <i>Bahulā</i> , <i>Prūthavīkā</i> , <i>Tṛiputa</i> [11, 28], <i>Sthūlailā</i> [11, 27, 28], <i>Bhadraīlā</i> [10, 11, 25, 28]	AH, CS and MC
4.	<i>Anogeissus latifolia</i> Wall. ex. Bedd. [3, 11, 19, 28, 32] Combretaceae [11, 19, 28]	Dhaurā, Dhau, Dhau-vṛukṣā [28], Dhavā [25, 28]	<i>Dhat</i> , <i>Naṅdītaru</i> , <i>Gaura</i> [28], <i>Bahaupuṣapi</i> , <i>Tāmrapuṣapi</i> , <i>Vanījavālā</i> [25], <i>Dhuraṅgharā</i> [11, 28], <i>Dhava</i> [11, 28, 32]	CS and MC
5.	<i>Arundo donax</i> L. Trin. ex Steud. [11, 28, 30] Poaceae [11, 28, 30]	Narasal, Nal [28]	<i>Poṭgala</i> , <i>Śunayāmadhayā</i> , <i>Dhaman</i> [28], <i>Devanala</i> [11], <i>Nala</i> [11, 28, 30]	CS, SS and MC
6.	<i>Asparagus racemosus</i> Willd. [3, 4, 5, 7, 11, 19, 25, 28, 29, 30, 32, 33] Liliaceae [3, 4, 5, 7, 19, 25, 28, 29, 30]	Śarnō [28], Śatāvri [3, 4, 5, 28], Satāvar, Śatāmūli [25, 28]	<i>Śatāmūli</i> [11], <i>Abhīru</i> [25], <i>Pīvari</i> [28], <i>Bahusutā</i> , <i>Śatpadi</i> , <i>Śatavīryā</i> , <i>Īndivari</i> , <i>Bhīrua</i> [3, 28], <i>Atīrasā</i> [11, 25], <i>Nārāyaṇi</i> , <i>Vār i</i> [11, 25, 28], <i>Śatāvri</i> [11, 28, 30, 32, 33]	CS, SS and MC
7.	<i>Berberis aristata</i> DC. [4, 5, 8, 11, 25, 28, 32] Berberidaceae [4, 5, 8, 11, 25, 28]	Dāru hardī [28], Dārhalad [25, 28], Dāru haldī [4, 25, 28]	<i>Parjānyā</i> , <i>Parjani</i> , <i>Pīta</i> , <i>Kāliyāk</i> , <i>Kāleyak</i> , <i>Pīdāru</i> , <i>Haridru</i> , <i>Pītak</i> [11], <i>Dāruharidrā</i> [4, 5, 11, 32], <i>Dārvi</i> [8, 11, 25, 32]	CS and MC
8.	<i>Cassia fistula</i> L. [3, 7, 11, 16, 18, 19, 20, 25, 27, 28, 30, 32] Caesalpinaceae [7, 16, 11, 19, 30]	Sonhali [28], Girimālā [25], Āmaltās [16, 25, 28]	<i>Ārvet</i> , <i>Dīrghfalā</i> , <i>Suvarṇafala</i> [28], <i>Karnīkāra</i> , <i>Rājvrūkṣā</i> , <i>Vyādhīghātā</i> , <i>Śvaernak</i> [11, 25, 28], <i>Āragvādha</i> [11, 30, 27, 32, 20, 28], <i>Śampaka</i> , <i>Kṛtamāla</i> [11, 16, 25, 28], <i>Rājvrūkṣa</i> [11, 25, 28, 32]	AH, CS and MC
9.	<i>Cedrus deodara</i> (Roxb.) Loud [4, 11, 16, 25, 28] Pinaceae [8, 11, 25, 28]	Debdār [16, 25, 28]	<i>Dēvakāṣṭha</i> , <i>Dārūka</i> , <i>Dēvadruma</i> , <i>Saptapatṛika</i> [11], <i>Dārūbhadrā</i> , <i>Īndradāru</i> , <i>Mastadāru</i> , <i>Drukīlīm</i> , <i>Kīlīm</i> , <i>Śurbhurūha</i> [28], <i>Suradāru</i> [11, 16], <i>Bhadradāru</i> , <i>Āmartaru</i> [4, 11, 25], <i>Dāru</i> , <i>Devadāru</i> [4, 11, 16, 25, 28]	CS and MC
10.	<i>Cucumis melo</i> L. var. <i>utilissimus</i> Duthie & Fuller Syn. <i>Cucumis utilissimus</i> Roxb. [11, 25, 28] Cucurbitaceae [11, 25, 28]	Kākdi [25, 28]	<i>Ervārūka</i> , <i>Urvāru</i> [11], <i>Bṛhatphala</i> , <i>Hastipani</i> [25], <i>Bahukaṅda</i> [11, 25], <i>Ervāru</i> , <i>Karkaṭi</i> [11, 25, 28]	CS and MC
11.	<i>Cucumis sativus</i> L. [7, 11, 18, 25, 28, 33] Cucurbitaceae [7, 11, 18, 25, 28, 33]	Khīrā [25, 28] Kākdi [33]	<i>Suśītal</i> [28], <i>Trapusa</i> , <i>Trpūṣhī</i> , <i>Tīktakarkatikā</i> [11], <i>Śvetakarahaṭakaṃ</i> , <i>Mutralaṃ</i> [25], <i>Sudhāvāsah</i> , <i>Kaṅṭakiphalaṃ</i> [25, 28], <i>Trapusa</i> [11, 25, 28]	CS and MC

12.	<i>Cyperus rotundus</i> L. [11, 16, 17, 18, 31, 32, 19, 23, 25, 28] Cyperaceae [11, 16, 31, 18, 19, 25, 28]	Mustaka [23], Mothā, Nāgar mothā [16, 32, 23, 25, 28]	Abdā, Āmbuda, Āmbhoda, Bhadrā, Bhadrāmūṣṭa, Bhadrāmūṣṭaka, Ghānā, Jaladā, Jaldhārā, Meghāhvā, Nīrada, Vārivāha, Payoda [11], Vāridnāmak, Kuruvīnd [28], Vārida, Āmbodhara [11, 25], Mustā, Mustaka [11, 8, 16, 17, 31, 32, 25, 28]	CS and MC
13.	<i>Desmodium gangeticum</i> DC. [4, 6, 11, 16, 31, 32, 25, 28] Fabaceae [4, 11, 16, 31, 25, 29]	Śālvan, Gauri, Śīr, Rauth, Dīnthā [28], Śālaparnī [4, 25], Śarivan [16, 25, 28, 29]	Śaumya [11], Śaumya, Pīvari, Dīrghapatra, [28], Guhā, Trīparnī [11, 28], Vidārigandhā, Aṃśumatī [11, 25, 28], Śālaparnī [4, 11, 16, 32, 28], Sthirā [11, 8, 25, 28]	CS and MC
14.	<i>Desmostachya bipinnata</i> Stapf. [3, 11, 17, 32, 23] Syn. <i>Eragrostis cynosuroides</i> Beauv. [11, 28] Poaceae [3, 11, 28]	Kuśa, Darbha [32, 23, 28]	Kṣurapatra [11], Barhī [28], Darbha [32, 28], Sūcyagra, Yagyabhūṣaṇa [11, 28, 25], Kuśa [11, 17, 32, 28]	CS, SS and MC
15.	<i>Elettaria cardamomum</i> L. Maton [7, 11, 18, 32, 23, 25, 28] Zingiberaceae [7, 11, 18, 25, 28]	Gujratī īlaicāi, Cauharā Elaicī, Safed Elaicī [28], Chautī Elācī [23, 25, 28]	Kṣudraelā, Bhraṅgaparnīka [11], Śukṣama [28], Upkunchikā, Dravidī, Tutthā, [11, 28], Truṭī [11, 25, 28], Sūkṣmailā [11, 32, 23, 25, 28], Elā [11, 32, 25, 28]	CS, SS and MC
16.	<i>Emblīca officinalis</i> Gaertn. [4, 5, 11, 16, 32, 19, 20, 25, 28, 29] Syn. <i>Phyllanthus emblica</i> L. [3, 5, 7, 9, 11, 24, 25, 28] Euphorbiaceae [3, 4, 5, 7, 16, 9, 11, 19, 20, 25, 28, 29]	Āṃvlā, Āṃvda, Āṃvra, Āuda, Āura, Dhātrī [28], Āṃla [16, 25, 28, 29]	Jātiphalraśa, Śrīphala [28], Kāyaśatha, Aṃoghā, Hatthā [11], Dhātrī [26, 28], Śīva, Vaiśya, Vruśā [11, 28], Dhātrīphala, Aṃrutaphala [11, 25, 28], Āmalakī [4, 5, 11, 16, 9, 32, 20, 28]	AH, CS, SS and MC
17.	<i>Glycyrrhiza glabra</i> L. [4, 5, 11, 16, 18, 10, 32, 25, 28, 29] Fabaceae [11, 5, 16, 18] / Leguminosae [4, 25, 28, 29]	Mīthī lakdī [28], Mulethi, Muletha, Jeṭīmad [25, 28], Mulhathī [4, 16, 32, 25, 28, 29]	Atīrasa, Yaśfī [7], Klītaṅak [11, 28], Yaśfīka, Madhyuśfī [11, 25], Yaśfīmadhūka [5, 11, 25, 28], Yaśfīmadhū [11, 8, 10, 28], Madhūka [11, 16, 25, 32]	CS, SS and MC
18.	<i>Holarrhena antidysenterica</i> (Roth) A. DC. [5, 25, 28] <i>Holarrhena antidysenterica</i> (Linn.) Wall. [11, 16, 31, 32, 19, 20] Apocynaceae [5, 11, 8, 31, 19, 20, 25, 28]	Kadwā [28], Kurcī, Kuraiya [25], Īndrayavā [8], Īndrajav [8, 25, 28]	Gūmallikā, Śakrahyā [7], Yāv, Bhadravav [28], Kuṭaja [5, 26, 31, 32, 28], Śakra, Vatsaka [11, 25], Kalinga, Īndrayav [11, 16, 20, 25, 28]	AH, CS and MC
19.	<i>Hordeum vulgare</i> L. [11, 16, 32, 25, 28, 29] Syn. <i>H. sativum</i> Pers. [25, 28] Poaceae [11, 16, 25, 29]	Jāv, Jo, Jāu [16, 32, 25, 28, 29]	Hayeśṭā, Hayapriyā [11], Dhānyarāja, Dīvyā [25], Tīkṣaśuka [11, 25], Yava [11, 16, 32, 25, 28]	AH, CS and MC
20.	<i>Imperata cylindrica</i> L. P. Beauv. [11, 12, 25, 28] Poaceae [7, 12, 25, 28]	Darbha [11, 12, 25, 28]	Yajñmūla, Ulu, Kutuka [25], Darbha, Śūcayagra, Yajñīka, Yagyabhūṣaṇa, Bahir [11, 25, 28]	CS, SS and MC
21.	<i>Musa paradisiaca</i> L. [4, 3, 11, 25] Syn. <i>Musa sapientum</i> L. [11, 32, 28] Musaceae [3, 4, 11, 25, 28]	Kadalī, Kerā [28], Kelā [4, 11, 32, 25, 28]	Rambhā [25], Aṅśumatīphala [11, 28], Āmbusārā, Mocā, Vārñā, [11, 25, 28], Kadalī [11, 32, 25, 28]	CS and MC
22.	<i>Oryza sativa</i> L. [11, 16, 18, 25, 28, 29] Poaceae [11, 16, 18, 25, 29]	Dhān, Cāval [16, 25, 28, 29]	Dhānya [25], Śālī, Nivara, vrīhi, Taṇḍula [11, 16]	AH, CS and MC
23.	<i>Piper nigrum</i> L. [3, 4, 11, 16, 9, 27, 32, 24, 25, 28] Piperaceae [3, 4, 9, 11, 16, 18, 25, 28]	Mīraca, Gol marīca, Kālmīrc, Dakṣhīni marīca, Gol Mīrca, Caokha Mīrca [28], Marīca [16, 28]	Uśaṇa, Vellaja [25], Marīca [11, 25], Kṛṣṇa [3, 4, 9, 11, 16, 18, 25, 28]	AH and MC
24.	<i>Pongamia pinnata</i> L. Merr [3, 4, 30, 33, 23, 25] Syn. <i>Pongamia glabra</i> Vent. [32, 25, 28] Fabaceae [11, 30, 33, 25]	Karañjwa, Kīrmāl, Pāpar, Dīthori [28], Karañja [23, 28]	Karañjaka, Naktāhvā, Ghrtakarañja [25], Udakīrya [28], Naktamāla [25, 28], Karañja [4, 32, 11, 30, 33, 28]	AH, CS and MC
25.	<i>Pueraria tuberosa</i> DC [3, 11, 16, 31, 32, 33, 19, 23, 25, 28, 29] Fabaceae [3, 11, 16, 31, 33, 19, 25]	Btīlaikānda [25], Bhuikumbhāda, Pātāl kohada [28], Surāl, [25, 28], Vidārī [23, 28], Vidārīkand [16, 32, 25, 28, 29]	Śwādukānda, Gajavājīpriyā, Kaṇḍapalāśa [11], Krośtri, Sīta, Kṣhīrvalī, Kṣhīrśukla, Payśvīni [28], Śwādukānda [11, 28], Ikṣugandhā, Vidārī [11, 16, 32, 33, 25, 28]	CS and MC
26.	<i>Ricinus communis</i> L. [3, 11, 16, 17, 18, 30, 32, 20, 23, 25, 28, 29] Euphorbiaceae [3, 11, 16, 18, 30, 20, 25, 28, 29]	Reṇḍ [25], Eraṇḍī [28], Raṇḍī [25, 28], Araṇḍ, [23, 25, 28], Eraṇḍ [16, 32, 23, 25, 28]	Vatari, Cañchu, Trīputi; Trībījā, Uruvaka [11], Urubu, Rubu [25], Āmaṇḍ, Vardhamān, Dīrghdaṇḍ, Vyādambak, Tarun, Ruvuk [28], Pañcāṅgula [11, 25], Gandharva-hasta, Vātāri, Citrā [11, 25, 28], Eraṇḍa [16, 17, 30, 32, 20, 25, 28]	CS and MC
27.	<i>Saccharum officinarum</i> L. [11, 16, 30, 10, 34, 23, 25, 28, 29] Poaceae [11, 16, 30, 25, 29]	Ikha [23, 25, 28], Gannā [4, 23, 25, 28, 29]	Puṇḍraka, Morata [11], Madhutrun [11, 28], Aśīpatra, Bhurīraśa, Dīrgha-chada, Gudamul [11, 25, 28], Ikṣu [11, 16, 30, 10, 34, 25, 28]	CS, SS and MC
28.	<i>Saccharum spontaneum</i> L. [11, 17, 32, 19, 23, 25, 28, 29] Poaceae [11, 30, 25, 29]	Kāśī [28], Kās [32, 23, 25, 28, 29]	Kāśīkṣu, Ikṣvalīka, Ikṣugandhā, Potgal [28], Kaṇḍaikṣu, Śvetacāmara [11], Kāśa [11, 17, 32, 25, 28]	CS, SS and MC
29.	<i>Saxifrage ligulata</i> wall. [7, 11, 28]	Śīlphara, Pakhānabhed,	Āśmabhedaka, Āśmghna, Śīlābhū [11], Āśmaghn,	CS, SS and

	<i>Bergenia ciliata</i> (Haw.) Sternb. [7, 25, 28] Syn. <i>Bergenia ligulata</i> (Wall.) Engl. [7, 27, 11, 25, 28] Saxifragaceae [7, 25, 28]	Śilpbhedā [25], Pāṣāṅbheda, Vhatpatribhed [28], Pākhanabheda Patherchur [25, 28]	<i>Gīribhīd</i> , <i>Bhīnyojini</i> [28], <i>Śilābheda</i> [11, 25], <i>Pāṣāṅbheda</i> [7, 27, 11, 28]	MC
30.	<i>Scirpus kysoor</i> Roxb. [11, 25, 28, 29] Cyperaceae [11, 25, 28, 29]	Kaṣeru [25, 28, 29]	Kaṣeruka [11, 25, 28]	CS and MC
31.	<i>Sida cordifolia</i> Linn. [3, 4, 11, 16, 19, 28] Malvaceae [3, 11, 16, 17, 19, 28]	Khareṅṭi, Balā [3, 4, 16, 28]	Sumaṅganā, Balīni, Bhadrabalā, Vātyālikā [11, 28], Balā [11, 16, 17, 28]	CS, SS and MC
32.	<i>Solanum indicum</i> L. [3, 11, 16, 31, 32, 20, 25, 28] Solanaceae [3, 11, 16, 31, 20, 25, 28]	Banbhaṅṭā, Barhaṅṭā, Baḍi kataī, Barhanta, Aṅjad [28], Baḍi kateri [16, 32, 25, 28]	<i>Kateri</i> [11], <i>Śanhika</i> [25], <i>Vāntarki</i> , <i>Mahati</i> , <i>Kuli</i> , <i>Raṣatrīka</i> , <i>Siṃhī</i> , <i>Mahaṣatrī</i> , <i>Duṣapagharsimnī</i> [28], <i>Śthul phala</i> [32], <i>Kṣhudra-bhaṅṭaki</i> [11, 28], <i>Brhatī</i> [11, 16, 31, 32, 20, 25, 28]	AH, CS, SS and MC
33.	<i>Solanum xanthocarpum</i> Schrad & Wendl [11, 16, 17, 31, 32, 23, 24, 25, 28] Solanaceae [11, 16, 24, 31, 25, 28]	Laghukataī, Choṭi kataī, Bhaṭkateya, Riṅhani, Remganī, Kaṭelī, Katyālī [28], Choṭi kateri [16, 32], Kateri [16, 28], Kaṅṭakārī [23, 28]	<i>Śukṣamaphala</i> [5], <i>Kaṅṭakārī</i> [28], <i>Duṣparśā</i> [7, 28], <i>Nidigdā</i> [11, 25], <i>Dhāvni</i> [11, 25, 28], <i>Kaṅṭakārī</i> , <i>Kaṅṭālīka</i> [11, 16, 17, 31, 28], <i>Kaṅṭakārīkā</i> [11, 32, 25], <i>Vyāghrī</i> , <i>Nidigdā</i> , <i>Kṣudrā</i> [7, 16, 25, 28]	AH, CS, SS and MC
34.	<i>Terminalia chebula</i> Retz. [3, 9, 11, 16, 18, 27, 32, 19, 20, 25, 28, 29] Combretaceae [3, 11, 16, 9, 18, 19, 20, 25, 28, 29]	Harā, Had, Hard [28], Harre, Harhar [25, 28], Haraḍ, Hirda [16, 32, 28, 29]	<i>Amṛtā</i> , <i>Hemvati</i> , <i>Avyathā</i> , <i>Vaystha</i> , <i>Vijayā</i> , <i>Jīvanti</i> , [28], <i>Putana</i> , <i>Rohini</i> , <i>Caetki</i> , <i>Śreyasi</i> [11, 28], <i>Kāyasthā</i> , <i>Śiva</i> , [11, 25, 28], <i>Pathyā</i> [7, 16, 28], <i>Harūtakī</i> [11, 26, 9, 27, 20, 28], <i>Abhayā</i> [11, 16, 32, 25, 28]	SS and MC
35.	<i>Tinospora cordifolia</i> (willd.) Miersex Hook. f. & Thoms. [3, 5, 7, 16, 30, 27, 11, 31, 32, 20, 25, 28, 29] Menispermaceae [3, 5, 7, 16, 30, 11, 31, 20, 25, 28, 29]	Guḍūca [28], Gūruca, Gīloy [11, 16, 32, 25, 28, 29]	<i>Madhuparnī</i> , <i>Tantrikā</i> [11], <i>Cainnā</i> , <i>Jīvanti</i> , <i>Tantrīka</i> , <i>Saoma</i> , <i>Saomvallī</i> , <i>Kuṅḍali</i> , <i>Cakralakṣanika</i> , <i>Ghira</i> , <i>Viśālyā</i> , <i>Rasayani</i> , <i>Candrasaha</i> , <i>Vayastha</i> , <i>Maṅḍali</i> , <i>Devnīrmitā</i> [28], <i>Vatsadani</i> [11, 28], <i>Amuṛtavallī</i> , <i>Madhuparnī</i> [11, 25, 28], <i>Amṛtā</i> [11, 30, 31, 25, 28], <i>Caināruuha</i> [11, 16, 32, 28], <i>Guḍūcī</i> [5, 11, 16, 27, 32, 20, 28]	AH, CS, SS and MC
36.	<i>Tribulus terrestris</i> L. [3, 7, 16, 17, 18, 11, 31, 32, 33, 23, 25, 28] Zygophyllaceae [3, 6, 7, 11, 16, 17, 18, 31, 33, 23, 25, 28, 29]	Hāthicaikār [28], Gokharu [26, 23, 25, 28, 29]	<i>Kṣhudra</i> [11], <i>Gokṣura</i> , <i>Kṣurak</i> , <i>Swadukāntak</i> , <i>Gokāntak</i> , <i>Ikṣhugāṅdhika</i> [28], <i>Traikaṅṭaka</i> [11, 32, 25], <i>Traikaṅṭa</i> [11, 25, 28], <i>Śvadamṣṭrā</i> , <i>Gokṣuraka</i> [11, 16, 17, 31, 32, 33, 25, 28]	AH, CS, SS and MC
37.	<i>Vitis vinifera</i> L. [11, 16, 32, 34, 21, 22, 23, 25, 29] Vitaceae [11, 16, 21, 22, 25, 29]	Manukā [4, 25, 29], Drakṣā [16, 23, 29]	Dehydrated - <i>Dākh</i> , <i>Manukā</i> , <i>Kiṣmiś</i> [7], <i>Gostani</i> [11, 25], <i>Mṛdvikā</i> [11, 16, 25, 32], <i>Drākṣā</i> [11, 16, 32, 34]	CS, SS and MC
38.	<i>Zingiber officinale</i> Roxb. [3, 16, 11, 32, 25, 28] <i>Zingiber officinale</i> Rosc. [7, 18, 30, 27, 29] Zingiberaceae [3, 7, 11, 16, 18, 30, 25, 28, 29]	Saurītha, Sīṅghi [28], Sontha [4, 25, 28]	<i>Auśadha</i> , <i>Viśvauśadha</i> , <i>Uśana</i> , <i>Katubhadra</i> [11, 28], <i>Suṅṭhī</i> [4, 11, 27, 32, 28], <i>Mahaśadha</i> , <i>Nāgara</i> , <i>Viśva</i> , <i>Viśvabheṣaja</i> [4, 11, 25, 28]	AH, CS, SS and MC

Table 2: Plants for Mūtrakṛcchra treatment recorded only in Mādhava Cikitsā and not in Brhatrayā

Sr. No.	Botanical name & Family	Vernacular Name (s)	Sanskrit name (s)
1.	<i>Alhagi pseudalhagi</i> (Bieb.) Desv. [11, 16, 23, 25, 26, 31, 34, 37, 38] Syn. <i>A. camelorum</i> Fisch. Ex DC. [11, 16, 25, 26, 31, 34, 37, 38] <i>A. maurorum</i> Medic. [11, 16, 18, 26, 34, 35, 36, 37, 38, 39, 40] Fabaceae [11, 16, 18, 25, 26, 31, 34, 35, 36, 37, 38, 39, 40]	Durālabhā [23], Yavasā, Javasā [16, 26, 25, 28, 39]	<i>Kunaśak</i> [28], <i>Dhanvayāsā</i> [11, 16, 25, 28], <i>Yavāsā</i> , <i>Yāsā</i> [11, 16, 26, 25, 28, 31]
2.	<i>Cissampelos pareira</i> L. var. <i>hirsute</i> (Buch-Ham. ex DC) [11, 16, 19, 20, 25, 28, 31, 32, 41, 42, 43, 44] Menispermaceae [11, 16, 19, 20, 25, 28, 31, 42, 43, 44]	Path, Pāṭhī, Purin padhī [28], Akaṅḍi [25, 42, 43], Pāṭhā, Pāṭh [16, 25, 28, 32, 43]	<i>Vriki</i> , <i>Piluphala</i> , <i>Śreyasi</i> [11], <i>Pracaina</i> , <i>Pāpcaelīka</i> , <i>Ekaśthika</i> , <i>Rasa</i> , <i>Pathika</i> [28], <i>Avaidhakarnī</i> [11, 32], <i>Ambaśtha</i> , <i>Vartikatika</i> , <i>Ambaśhṭaki</i> [25, 28], <i>Pāṭhā</i> [11, 16, 20, 28, 31, 32, 42]
3.	<i>Cuminum cyminum</i> L. [4, 10, 11, 18, 25, 28, 32, 45, 46, 48, 49, 50, 51] Umbelliferae [4, 11, 25, 28] / Apiaceae [11, 18, 45, 46, 47, 48, 49, 50, 51]	Sādā jīrā, Sādharana Jīrā [28], Saphedjīrā [25, 28], Jīrā [4, 25, 28, 46, 47, 51]	<i>Jaran</i> , <i>Kānā</i> , <i>Dīrghajīrak</i> [28], <i>Ajāji</i> , <i>Jīrakā</i> [7, 10, 32, 25, 28]
4.	<i>Curcuma longa</i> L. [3, 4, 5, 7, 11, 16, 18, 19, 23, 25, 27, 28, 32, 52, 53, 54, 55, 56] Zingiberaceae [3, 4, 5, 7, 11, 16, 18, 19, 25, 28, 52, 53, 54, 55, 56]	Hrrdī [28], Haldī, Hardī [4, 16, 23, 25, 28, 52, 53]	<i>Prīyānkā</i> , <i>Haridrūma</i> , <i>Kṣaṅḍā</i> , <i>Gauri</i> , <i>Kaṅcani</i> [11], <i>Pūtā</i> , <i>Nisakhya</i> , <i>Haldī</i> [28], <i>Nisā</i> , <i>Niśī</i> [4, 25], <i>Yośūprīya</i> , <i>Hattavilasini</i> , <i>Varavarṇinī</i> , <i>Krumighni</i> , [11, 28], <i>Rajñī</i> [5, 16, 25], <i>Haridrā</i> [5, 11, 16, 27, 25, 28, 53]
5.	<i>Ferula narthex</i> Boiss. [11, 32, 25, 28] <i>Ferula foetida</i> Regel. [4, 11, 18, 27, 32, 25, 28, 57] Syn. <i>F. assafoetida</i> L. [11, 58, 59, 60, 61] Umbelliferae [4, 11, 25, 28, 57, 58, 59] / Apiaceae [11, 18, 60, 61]	Himguda [25, 58], Himg [4, 32, 25, 28, 57, 58]	<i>Sahasravedhi</i> [25, 28, 57], <i>Bahikā</i> , <i>Jatuka</i> [11, 28], <i>Rāmātha</i> [11, 28, 57, 58], <i>Hiṅgu</i> [11, 27, 32, 28, 58]

6.	<i>Marsilea minuta</i> L. [19,24, 25, 28, 62, 63, 64, 65, 66, 67] Marsileaceae [19, 24, 25, 62, 63, 64, 65, 66, 67]	Caupatiyā, Sag [28], Sunsuniyā [28, 62]	<i>Susuniśāk, Caupaitra</i> [25], <i>Śitīvārak, Śitivar, Śrīvārak, Sucaipatra, Kukkut, Śīkhi</i> [28], <i>Suniṣaṇṇa, Parnaka, Swastik</i> [25, 28]
7.	<i>Punica granatum</i> L. [11, 16, 17, 18, 30, 32, 23, 25, 28, 29, 68, 69] Punicaceae [11, 16, 18, 25, 28, 29, 30, 68, 69]	Dādimba [23, 25, 28], Anār [16, 32, 23, 25, 28, 29, 68]	<i>Raktapuṣpa</i> [11], <i>Dādimacchada</i> [25], <i>Karak</i> [28], <i>Lohitpuṣpa, Dantbīja</i> [11, 25, 28], <i>Dādimā</i> [11, 16, 17, 30, 32, 25, 28]
8.	<i>Syzygium aromaticum</i> L. Merr & L.M. Perry [7, 27, 23, 24, 25, 28, 70, 71, 72, 73, 74, 75] Myrtaceae [7, 24, 25, 28, 70, 71, 72, 73, 74, 75]	Lavaṅg, Lauṅg [23, 25, 28, 72]	<i>Śriprasunāk, Śrisaṅgya</i> [7, 28], <i>Devakusuma</i> [11, 28, 72], <i>Devpuṣpa</i> [11, 25, 72], <i>Lavaṅga</i> [11, 27, 28, 72]
9.	<i>Terminalia bellirica</i> Roxb. [11, 16, 18, 19, 27, 32, 33, 25, 28, 76, 77] Combretaceae [11, 16, 18, 19, 25, 28, 33, 76, 77, 78]	Fīnas, Bherā [28], Bhairā [25, 28], Bahedā [16, 32, 25, 28, 77, 78]	<i>Bibhīta</i> [11], <i>Bhutwaśa, Kaliyugalay</i> [28], <i>Karśafala, Kalidru</i> [11, 28], <i>Bibhītaki</i> [11, 16, 27, 33, 77], <i>Vibhītaka, Akṣa</i> [7, 25, 28], <i>Bibhītaka</i> [11, 32, 25, 28]

Table 3: Group names of plants found in all treatises for *Mūtrakṛcchra*

Sr. No.	Group name	Botanical name	Family	Vernacular Name	Sanskrit name
1	Triphalā	<i>Emblica officinalis</i> Gaertn. <i>Terminalia bellirica</i> Roxb. <i>Terminalia chebula</i> Retz.	Euphorbiaceae Combretaceae Combretaceae	Āmvlā Bahedā Hirdā	<i>Triphala</i> a. <i>Āmalakī</i> b. <i>Bibhītaki</i> c. <i>Harūtakī</i>
2	Trun pañcamula	<i>Saccharum spontaneum</i> L. <i>Desmostachya bipinnata</i> Stapf. <i>Saccharum Officinarum</i> L. <i>Arundo donax</i> L. Trin. ex Steud <i>Imperata cylindrica</i> L. P. Beauv.	Poaceae Poaceae Poaceae Poaceae Poaceae	Kās Kuśa Gannā Nal Darbha	<i>Trun Pañcamula</i> a. <i>Kās</i> b. <i>Kuśa</i> c. <i>Ikṣu</i> d. <i>Nala</i> e. <i>Darbha</i>

Figure



Fig 1: The habits of the reported plants is given in psi diagram above

3. Results & Discussion

The present study of *Mūtrakṛcchra* chapter (chapter no. 30) from *Mādhava Cikitsā* text has found a total of 47 medicinal plant names in Sanskrit and two medicinal plants group (*Trun Pañcamula* and *Triphala*). *Ācārya Mādhava* described these medicinal plants for the treatment of *Mūtrakṛcchra* through 20 verses (stanzas) in Sanskrit that covers *kaphaja, vātaja, paitika, tridosha Mūtrakṛcchra, mūtra* and *śukradoṣa Cikitsā, etc.* *Bṛhatrayī* mentions more than 168 plants for *Mūtrakṛcchra* including the 47 plant names given in *Mādhava Cikitsā* and about 121 plants different than *Mādhava Cikitsā*. The comparative study of medicinal plants given in *Mādhava Cikitsā* and *Bṛhatrayī* shows that there are total 38 plants (Table 1) described independently and two plant groups (Table 3) are described in all treatises (*Mādhava Cikitsā* and *Bṛhatrayī*). Nine plants are separately given in *Mādhava Cikitsā* only (Table 2). All these forty seven plants belong to twenty four families. Among these, 7 species are from the Poaceae family, 5 species from Fabaceae family, 4 from Zingiberaceae, 3 from Combretaceae, 2 species each from Malvaceae, Apocynaceae, Menispermaceae, Cucurbitaceae, Umbelliferae (Apiaceae), Solanaceae, Cyperaceae, and Euphorbiaceae. One plant each from family Liliaceae,

Berberidaceae, Caesalpiniaceae, Pinaceae, Marsileaceae, Musaceae, Piperaceae, Saxifragaceae, Zygophyllaceae, Punicaceae, Vitaceae and Myrtaceae. The habit diversity of these medicinal plants shows 43% as herbs, 13% climbers, 24% shrubs and 20% trees. The additional list of 9 plants (Table 3) given by *Mādhava* are described elsewhere for their properties related to anti-microbial activity, anti-inflammatory activity, diuretic activity, anti-oxidant activity, anti-mutagenic activity, anti-diabetic activity and also most of these plants are used for digestion as laxative, as tonic, in skin problems, gastro-intestinal problems and in fever too. 4 plants are used as spices (i.e. *Cumin cyminum* L., *Curcuma longa* L., *Ferula assafoetida* L., *Terminalia bellerica* Roxb) [35-78]. From these, it is assumed that these 9 extra plants given by *Mādhava* are having complementary role in reducing inflammation due to *Mūtrakṛcchra* as well as to maintain proper digestion with increasing urination, possibly also to reduce fever caused by *Mūtrakṛcchra*.

This research as documented in this paper has contributed significantly to the knowledge and most probable identification of plants pertaining to *Mūtrakṛcchra* according to the *Mādhava Cikitsā* and according to the *Bṛhatrayī*. There is still difficulty in correct identification of some Sanskrit names of plants like *Pāṣāṅbheda* [11], because there are differences in medico-botanical glossaries, commentaries and regional variations. This problem needs to be addressed in future research.

3. References

- Kundailia N, Amartya B, Saroch Vikas. Manuscripts in Indian system of medicine – A review. Int. J Ayur Pharma Research. 2014; 2(1):11-16.
- Rajashree D, Shelke Ashok D, Ramteke Rajani AP. Phytochemical study of Gokshur (*Trbulus Terrestris* L.) and evaluation of its antibacterial activity with special reference to Mutrakruchcha. Int. J Ayur Pharma Research. 2014; 2(3):63-68.
- Ajay Kumar Meena, Rao MM. Folk herbal medicines used by the Meena community in Rajasthan. Asian Journal of Traditional Medicines. 2010; 5(1):19-31.
- Ajay Kumar Meena, Parveen Bansal, Sanjiv Kumar.

- Plants-herbal wealth as a potential source of ayurvedic drug. *Asian Journal of Traditional Medicines*. 2009; 4(4):152-170.
5. Wungsem Rungsung, Sreya Dutta, Debajyoti Das, Jayram Hazra. A brief review on the Botanical Aspects and Therapeutic Potentials of Important Indian Medicinal Plants. *International Journal of Herbal Medicine*. 2013; 1(3):38-45.
 6. Umadevi M, Sampath Kumar KP, Debjit Bhowmik, Duraivel S. Traditionally used anticancer herbs in India. *Journal of Medicinal Plants Studies*. 2013; 1(3):56-74.
 7. Shashi Alok, Sanjay Kumar Jain, Amita Verma, Mayank Kumar, Monika Sabharwal. Pathophysiology of kidney, gallbladder and urinary stones treatment with herbal and allopathic medicine: A review. *Asian Pacific Journal of Tropical Disease*. 2013; 3(6):496-504.
 8. Sharma Reetu, Byadgi PS, Paliwal Murlidhar. Glimpse on roganidan by Vagbhata: A Bird's Eye view. *International Journal of Research in Ayurveda and Pharmacy*. 2011; 2(5):1402-1404.
 9. Prof Paranjape GR. Anmol Prakashan, Āyurveda ca Itihas, Prof Subash Ranade, Pune 2, Edition, 1998.
 10. Paliwal Murlidhar, Byadgi PS. Sushruta: A great surgeon and visionary of Ayurveda. *International Journal of Research in Ayurveda and Pharmacy*. 2012; 3(1):43-46.
 11. Khare CP. *Indian Medicinal Plants an Illustrative Dictionary*. New York USA, Spinger Publications, 2007.
 12. *Susruta Samhitā of Maharsi Suśruta, Uttartantar*, Edited with Suśrutavimarsinī Hindi commentary along with special deliberation etc., Edited by Dr. Anant Ram Sharma, forwarded by Acarya Priyavrat Sharma. Chaukhamba Surbharati Prakashan, Varanasi, 2008, 3.
 13. *Caraka Samhitā of Agniveśa*, Edited with Vaidyamanorama, Hindi commentary, along with special deliberation etc. Edited by Acarya Vidyasagar Shukla and Prof. Ravi Dutta Tripathi, Chaukhamba Sanskrit Pratishthan, Delhi, 2010, 2.
 14. *Aṣṭāṅghrdayam of Vagbhata*, by Kaviraj Atrideva Gupta, Edited with Vidyotini Hindi commentary, Edited by Vidya vadunahdana Upadhyaya, 2011.
 15. Bhavprakasa of Sri Bhamisra, Edited with vidyotini Hindi commentary, notes, introduction, index etc, Edited by Pandit Shi Brahma Sankara Misra, Chaukhamba Sanskrit Bhavan, Varanasi, 11th edition, 2012.
 16. Mishra DN. Medicinal plants for the treatment of fever (*Jvarachikitsa*) in the Madhavachikitsa tradition of India. *Indian Journal of Traditional Knowledge*, 2009; 8(3):352-361.
 17. Om Prakash, Jyoti, Amit Kumar, Pavan Kumar, Niranjan Kumar Manna. Adulteration and Substitution in Indian Medicinal Plants: An Overview. *Journal of Medicinal Plants Studies*. 2013; 1(4):127-132.
 18. Mohammad Sadegh Amiri, Mohammad Reza Joharchi. Ethnobotanical investigation of traditional medicinal plants commercialized in the markets of Mashhad, Iran. *Avicenna Journal of Phytomedicine*, Summer. 2013; 3(3):254-271.
 19. Kaushal Kumar, Abbas SG. Ethnomedicinal composition depends on floristic composition: A case studied in *Sal* forests of Jharkhand. *Int. J. of Pharm. & Life Sci.*, May 2012; 3(5):1710-1719.
 20. Thakare Poonam P, Kulkarni Yogini R, Jamdade Yogita A, Lad Meenam D. Analytical study of Kushthagha dravyas on the basis of rasadi properties and doshaghanta from Bhavprakash nighantu. *J Biol Sci Opin*. 2015; 3(2):73-80.
 21. El-Hawary S, El-Fouly K, El Gohary HM, Meselhy KM, Slem A, Talaat Z. Phytochemical and Biological Investigation of *Vitis vinifera* L.(Flame cultivar), Family Vitaceae Cultivated in Egypt. *Nature and Science*, 2012; 10(10):48-59.
 22. Surendra KR Sharma, Suman, Neeru Vasudeva. Hepatoprotective activity of *Vitis vinifera* root extract against carbon tetrachloride-induced liver damage in rats. *Acta Poloniae Pharmaceutica - Drug Research*. 2012; 69(5):933-937.
 23. Sagar Pawan Kumar. Adulteration and substitution in endangered ASU medicinal plants of India: A review. *Int. J Med Arom Plants*. 2014; 4(1):56-73.
 24. Natarajan A, Leelavinodh KS, Jayavelu A, Devi K, Senthil Kumar B. A study on ethnomedicinal plants of Kalavai, Vellore District, Tamil Nadu, India. *Journal of Applied Pharmaceutical Science*. 2013; 3(01):099-102.
 25. *The Ayurvedic Pharmacopoeia of India Part-I, Volume I to VI*. Dept. of AYUSH, Ministry of Health and Family Welfare, Govt. of India. Edition, 2008.
 26. Bhavana Srivastava, Himanshu Sharma, Yadu Nandan Dey, Manish M Wanjari, Ankush D Jadhav. *Alhagi pseudalhagi*: a review of its phyto-chemistry, pharmacology, folklore claims and Ayurvedic studies. *International Journal of Herbal Medicine*. 2014; 2(2):47-51.
 27. Choudhury Jyotirmay, Bora Devanjal, Baruah D, Borah T, Bharali BK. Portrayal of folk medicinal practices among the Indigenous peoples of North Tripura District of Tripura, India. *Int. J Res Ayurveda Pharm*. 2014; 5(4):480-488.
 28. Bhavprakasa of Sri Brahasankara Mishra and Sri Rupalalaji Vaisya, 1st part, Chaukhambha Sanskrit Bhawan.
 29. Nagendra Singh Chauhan, Vikas Sharma, Dixit VK, Mayank Thakur. A Review on Plants Used for Improvement of Sexual Performance and Virility. Hindawi Publishing Corporation, Bio Med Research International. 2014, 1-19. Article ID 868062.
 30. Shiddamallaya N, Azra Yasmeen, Gopakumar K. Hundred common forest medicinal plants of Karnataka in primary healthcare. *Indian Journal of Traditional Knowledge*. 2010; 9(1):90-95.
 31. Pravin R Joshi, Harisha CR, Bupesh R Patel. Regionally accepted popular source of Ayurvedic medicinal plants in Southern India. *Int. J of Pharm. & Life Sci*. 2011; 2(10):1123-1132.
 32. Maharsi Suśruta. *Suśrut Samhitā* edited by Dr. Anant Ram Sharma; Chaukhamba Surbharati Prakashan, Varanasi, 2010, I.
 33. Krutika Joshi, Nishteshwar K. A review of ethnoveterinary practices associated with animal healthcare in Barda Hills Gujarat, India. *Pharma Science Monitor*. 2014; 5(1):118-132.
 34. Mohhammad Kazem, Gharib Naseri, Seyyed Ali Mard. Gastroprotective effect of *Alhagi maurorum* on experimental gastric ulcer in rats. *Pak J Med Sci*. 2007; 23(4):570-573.
 35. Nisar Ahmad, Zabta Khan Shinwari, Javid Hussain, Razia Perveen. Phytochemicals, Antibacterial and Antioxidative Investigations of *Alhagi Maurorum* Medik. *Pak. J Bot*. 2015; 47(1):121-124.
 36. Kamran PF, Adelzadeh P. Pharmacology and Medicinal Aspects of Plants listed in Holey Quran; *Alhagi (Alhagi*

- maurorum*). Bull. Env. Pharmacol. Life Sci. 2013; 2(6):19-22.
37. Mohammad Kazem, Gharib Naseri, Seyyed Ali Mard. Gastroprotective Effect Of *Alhagi Maurorum* On Experimental Gastric Ulcer In Rats. Pak J Med Sci. 2007; 23(4):570-573.
 38. Ali Esmail Al-Snafi. *Alhagi Maurorum* as A Potential Medicinal Herb: An Overview. International Journal of Pharmacy Review & Research. 2015; 5(2):130-136.
 39. Allah Bakhsh Gulshan1, Altaf Ahmad Dasti, Sabir Hussain, Muhammad Imran Atta, Muhammad Amin -ud-Din. Indigenous Uses of Medicinal Plants in Rural Areas of Dera Ghazi Khan, Punjab, Pakistan. ARPN Journal of Agricultural and Biological Science. 2012; 7(9):750-762.
 40. Jalil Ur Rehman, Naveed Akhtar, Muhammad Younus Khan, Khalil Ahmad, Mukhtiar Ahmad, Sabira Sultana *et al.* Phytochemical Screening and Hepatoprotective Effect of *Alhagi maurorum* Boiss (Leguminosae) Against Paracetamol-Induced Hepatotoxicity in Rabbits. Tropical Journal of Pharmaceutical Research. 2015; 14(6):1029-1034.
 41. Vandana G Patel, Sangita H Shukla, Bhavika V Jogi, Hemali A Mistry. Pharmacognostical standardization and preliminary phytochemical screening of *Cissampelos pareira* Linn. var. *Hirsuta* Roots. Journal of Pharmacognosy and Phytochemistry. 2014; 2(5):27-31.
 42. Jain SK, Swadesh Kumar Ahirwar, Anurag Kumar. Review of *Cissampelos pareira* Linn. International Journal of Applied Research. 2015; 1(6):08-09.
 43. Arora Manu, Sharma Tanvi, Devi Anu, Bainsal Neeraj, Siddiqui Anees Ahmad. An Inside Review of *Cissampelos pareira* Linn: A Potential Medicinal Plant of India. International Research Journal of Pharmacy. 2012; 3(12):38-41.
 44. Nagarajan K, Nithish Chauhan, Ashu Mittal, Vijendar Singh, Ramesh B Bodla, Raj Kumar Tiwari. Phytochemical extraction, optimization and physico-chemical characterization of two bioactive isolates from the leaves and stem of *Cissampelos pareira*. Der Pharma Chemica. 2011; 3(1):327-337.
 45. Muna F Abushama, Hilmi Yasmin, Haidar Abdalgadir, Hassan Khalid. Chemical Composition, Antimicrobial and Brine Shrimp Lethality of the Essential Oil of *Cuminum cyminum* L. International Journal of Pharmaceutical and Chemical Sciences. 2013; 2(4):1666-172.
 46. Anita Dua, Garg Gaurav, Singh Balkar, Ritu Mahajan. Antimicrobial properties of methanolic extract of Cumin (*Cuminum cyminum*) seeds. Int. J Res Ayur Pharm. 2012; 4(1):104-107.
 47. Ahmad Rafiee Pour, Seyed Saeed Mirzargar, Mehdi Soltani, Hossein Ali Ebrahimzadeh Mousavi, Seyed Ali Mostafavi. The antibacterial effects of *Cuminum cyminum* L. and *Rosmarinus officinalis* extracts and essential oil against *Lactococcus garvieae* in laboratory conditions on rainbow trout. European Journal of Experimental Biology. 2014; 4(1):456-463.
 48. Dinesh Singh Bisht, Ramakrishna Menon K, Venugopal G. Trans-Anethole Based Detection of Adulteration of Fennel (*Foeniculum Vulgare* Mill.) Seeds in Cumin (*Cuminum Cyminum* L.) Seeds Using GC & GC-MS. International Journal of Innovative Research in Science & Engineering.
 49. Fanar Hashum Yousif Al-Hashemi. Chromatographic Separation and Identification of Some Volatile Oils, Organic Acids and Phenols From The Seeds Of *Cuminum cyminum* Growing In Iraq, International Journal of Research and Reviews in Applied Sciences. 2014; 19(1):80-90.
 50. Deepak. Importance of *Cuminum cyminum* L. and *Carum carvi* L. in traditional medicaments – a review. Indian Journal of Traditional Knowledge. 2013; 12(2):300-307.
 51. Daljeet Kaur, Ramica Sharma. An Update on Pharmacological Properties of Cumin. International Journal of Research in Pharmacy and Science. 2012; 2(4):14-27.
 52. Mehvish Saleem, Betty Daniel, Murli K. Antimicrobial Activity of Three Different Rhizomes of *Curcuma Longa* & *Curcuma Aromatica* on Uropathogens of Diabetic Patients. Int J Pharm Pharm Sci. 2011; 3(4):273-279.
 53. Krup V, Prakash LH, Harini. A Pharmacological Activities of Turmeric (*Curcuma longa* linn): A Review. J Homeop Ayurv Med. 2013, 2(4). doi:10.4172/2167-1206.1000133.
 54. Nadia Gul, Talat Y Mujahid, Nayyar Jehan, Samia Ahmad. Studies on the Antibacterial Effect of Different Fractions of *Curcuma longa* Against Urinary Tract Infection Isolates. Pakistan Journal of Biological Sciences. 2004; 7(12):2055-2060.
 55. Hamid Nasri, Najmeh Sahinfard, Mortaza Rafieian, Samira Rafieian, Maryam Shirzad, Mahmoud Rafieian-kopaei. Turmeric: A spice with multifunctional medicinal properties. Journal of HerbMed Pharmacology. 2014; 3(1):5-8.
 56. Julie S Jurenka. Anti-inflammatory Properties of Curcumin, a Major Constituent of *Curcuma longa*: A Review of Preclinical and Clinical Research. Alternative Medicine Review. 2009; 14(2):141-153.
 57. Kareparamban JA, Nikam PH, Jadhav AP, Kadam VJ. *Ferula foetida* Hing: A Review. Research Journal of Pharmaceutical, Biological and Chemical Sciences. 2012; 3(2):775-786.
 58. Arshiya Sultana, Asma K, Khaleequr Rahman, Shafeequr Rahman. Oleo-gum-resin of *Ferula asafoetida*: A traditional culinary spice with versatile pharmacological activities. Research Journal of Recent Sciences. 2015; 4(IVC-2015):16-22.
 59. Abbas Ali Dehpour, Mohammad Ali Ebrahimzadeh, Nabavi Seyed Fazel, Nabavi Seyed Mohammad. Antioxidant activity of the methanol extract of *Ferula assafoetida* and its essential oil composition. Grasas Y Aceites, Julio-Septiembre. 2009; 60(4):405-412.
 60. Otroshy M, Edrisi S, Enteshary S. Propagation of Medicinal Plant *Ferula assa foetida* L. Through Indirect Somatic Embryogenesis. Int. J Med Plants Res. 2013; 2(3):179-186.
 61. Mohammad Reza Khazdair, Mohammad Hossein Boskabady. The relaxant effect of *Ferula assafoetida* on smooth muscles and the possible mechanisms. J Herb Med Pharmacol. 2015; 4(2):40-44.
 62. Ranjan Padhy, Santosh Kumar Dash. Medico-Folklore Study on Some Pteridophytes from Kerandimal Hills of South Odisha with Emphasis on *Drynaria quercifolia* (Linn.). Research Journal of Pharmaceutical, Biological and Chemical Sciences. 2015; 6(4):2029-2035.
 63. Praneetha P, Swaroopa Rani V, Ravi Kumar B. Hepatoprotective Activity of Methanolic Extract of Leaves of *Marsilea minuta* Linn. Against CCl4 Induced Hepatic Damage in Rats. Global Journal of Pharmacology. 2011; 5(3):164-171.

64. A John De Britto, D Herin Sheeba Gracelin, P Benjamin Jeya Rathna Kumar. Qualitative and Quantitative Analysis of Phytochemicals in *Marsilea minuta* Linn. Int J Pharm Bio Sci. 2013; 4(1):800-805.
65. Madhu S, Kannabirran V, Mrugesan S, Charli M, Nithiyya K. Pharmacognostica studies on leaves of *Marsilea minuta* Linn. Int. Res. J Pharm. 2014; 5(3):215-219.
66. Madhuri D Bhujbal, Poonam Bangar, Dhanaji D Ghanwat. A Review on Medicinal Plant Exhibiting Anxiolytic Activity. International Journal of Universal Pharmacy and Bio Sciences. 2012; 1(1):26-38.
67. Pradeep Parihar, Leena Parihar. Some pteridopytes of medicinal importance from Rajasthan. Natural Product Radiance. 2006; 5(4):297-301.
68. Debjit Bhowmik, Harish Gopinath, B Pragati Kumar, Duraivel S, Aravind G, Sampath Kumar KP. Medicinal Uses of *Punica granatum* and Its Health Benefits, Journal of Pharmacognosy and Phytochemistry. 2013; 1(5):28-35.
69. El-Sayed M El-Habibi. Renoprotective Effects of *Punica granatum* (Pomegranate) Against Adenine-Induced Chronic Renal Failure in Male Rats. Life Science Journal. 2013; 10(4):2059-2069.
70. Debjit Bhowmik, KP Sampath Kumar, Akhilesh Yadav, Shweta Srivastava, Shravan Paswan, Amit Sankar Dutta. Recent Trends in Indian Traditional Herbs *Syzygium aromaticum* and its Health Benefits. Journal of Pharmacognosy and Phytochemistry, 2012; 1(1):13-22.
71. Keerti Shrivastava, Sherendra Sahu, Skand K Mishra, Kantishree De. *In vitro* Antimicrobial Activity and Phytochemical Screening of *Syzygium aromaticum*. Asian J Res Pharm Sci. 2014; 4(1):12-15.
72. Parle Milind, Khanna Deepa. Clove: A Champion Spice, International Journal of Research in Ayurveda & Pharmacy. 2011; 2(1):47-54.
73. Wankhede TB. Evaluation of antioxidant and antimicrobial activity of the Indian clove *Syzygium aromaticum* L. Merr. & Perr., Int. Res. J. of Science & Engineering. 2015; 3(4):166-172.
74. Monika Mittal, Nomita Gupta, Palak Parashar, Varsha Mehra, Manisha Khatri. Phytochemical Evaluation and Pharmacological Activity of *Syzygium aromaticum*: A Comprehensive Review. International Journal of Pharmacy and Pharmaceutical Sciences. 2014; 6(8):67-72.
75. Mayank Agrawal, Sonam Agrawal, Dr Radhika Rastogi, Dr Pallavi Singh, Dr Adyanthaya BR, Dr Gupta HL. A review on uses of clove in oral and general health, Indian Journal of Research in Pharmacy and Biotechnology. 2014; 2(4):1321-1324.
76. Renu Kadian, Milind Parle, Monu Yadav. Therapeutic Potential and Phytopharmacology of *Terminalia bellerica*. World Journal of Pharmacy and Pharmaceutical Sciences. 2014; 3(10):804-819.
77. Rajbir Kaur. Ethnobotanical studies of some of the traditionally important medicinal plants of Punjab (India), International Journal of Current Research and Academic Review. 2015; 3(5):262-271.
78. Uma Shankar Sharma, Umesh Kumar Sharma, Abhishek Singh, Niranjana Sutar, Puspak Jyoti Singh. Screening of *Terminalia bellirica* Fruits Extracts for its Analgesic and Antipyretic Activities. Jordan Journal of Biological Sciences. 2010; 3(3):121-124.
79. Mādhavacikitsā, Acarya-Mādhavkar viraccita Mādhavacikitsā Bharatī Bhaṣātīkā vimarśa, vibhuśa,

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