

A comprehensive Review of *Musta* (*Cyperus rotundus* L.): Historical, Ayurvedic, and Pharmacological Insights

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Abstract:

Background: *Musta* (*Cyperus rotundus* L.), commonly known as Nut Grass, is a perennial herb of the Cyperaceae family extensively used in Ayurvedic medicine for its aromatic and medicinal rhizomes. **Objective:** This review aims to synthesize historical and Ayurvedic perspectives along with contemporary pharmacological data. **Materials & Methods:** A systematic literature search was conducted across Vedic, Puranic, and classical Ayurvedic texts (Samhitas and Nighantus), as well as modern scientific databases and pharmacopeial publications. **Observations/Results:** *Musta* is classified as the *Agrya* (best) drug for *Sangrahi* (absorptive), *Deepana* (digestion and metabolism enhancing), and *Pachana* (enhancing digestion) actions. Its pharmacodynamics are characterized by *Tikta-Katu-Kashaya Rasa* (bitter, pungent, astringent tastes) and *Shita Virya* (cold potency), making it effective in pacifying *Kapha* and *Pitta dosha*. Modern research corroborates these classical indications, demonstrating its antimicrobial, anti-inflammatory, antibacterial, and antidiarrheal activities. **Conclusion:** The multidisciplinary evidence confirms *Musta* as a polyvalent drug with deep historical roots in Ayurvedic practice, supported by modern pharmacological evidence.

Keywords: *Deepana*, *Pachana*, *Sangrahi*, *Krumighna*, *Trimada*, Antibacterial.

Introduction:

Musta (*Cyperus rotundus* L.) is a widely distributed perennial herb found in warm regions globally and belongs to the family Cyperaceae. It is one of the most widely distributed weeds worldwide. It occurs up to an elevation of 1800 m⁽¹⁾. It is known as Nut Grass in English and *Nagarmotha* in Hindi. The plant is characterized by underground, creeping, tuberous rhizomes that are firm and fragrant and are the primary source of its medicinal properties.

Although *Cyperus rotundus* has long been utilized in traditional practices, including commercial applications such as cloth dyeing and perfumery through its volatile oils, a systematic analysis of its classical evidence remains essential for contemporary scientific validation.

This review aims to comprehensively document the historical & Ayurvedic information, and established pharmacological profiles of *Musta* as defined in classical Ayurvedic texts, i.e., *Samhitas* & *Nighantus*, and other contemporary literature.

Materials & Methods:

This article presents a comprehensive literature review encompassing Vedic, Puranic, and Sanskrit literature⁽²⁻⁷⁾, classical Ayurvedic texts (including the *Bruhatrayi*, other *Samhita*, *Laghutrayi*, and *Nighantu/Kosha*) and modern pharmacological studies on *Musta* (*Cyperus rotundus*).

Historical references of *Musta* were collected from Vedic, Puranic, and Sanskrit literature. Data regarding its Synonyms, Varieties, Classification, *Rasa Panchaka* (five attributes of *dravya* beginning with *rasa*), *Karma* (properties & actions), and *Rogaghnata* (Therapeutic indications) were extracted from the various sources such as *B ruhatrayi i* (Three principal texts of Ayurveda viz., *Charaka Samhita* (CS)⁽⁸⁾, *Sushruta Samhita* (SS)⁽⁹⁾, *Ashtanga Sangraha* (AS)⁽¹⁰⁾, *Ashtanga Hrudaya* (AH)⁽¹¹⁾; other *Samhitas* like *Kashyapa Samhita* (KS)⁽¹²⁾, *Harita Samhita* (HS)⁽¹³⁾, *Bhela Samhita* (BS)⁽¹⁴⁾; identified texts from *Laghutrayi* viz., *Sharangdhara Samhita* (SHS)⁽¹⁵⁾ & *Bhavaprakasha* (BH)⁽¹⁶⁾ along with *Nighantus* (Medicinal lexicons)/ *Kosha* (Encyclopaedias) viz., *Amarakosha*⁽¹⁷⁾ (AK), *Saushrutanighantu* (SN)⁽¹⁸⁾, *Ashtanganighantu*⁽¹⁹⁾, *Paryayaratnamala* (PRM)⁽²⁰⁾, *Dhanvantarinighantu* (DN)⁽²¹⁾, *Madanadi Nighantu* (MN)⁽²²⁾, *Siddhasaranighantu* (SSN)⁽²³⁾, *Shabdachandrika* (SC)⁽²⁴⁾, *Abhidhanaratnamala* (ARM)⁽²⁵⁾, *Chakradatta*⁽²⁶⁾, *Nighantushesha* (NS)⁽²⁷⁾, *Sodhalanighantu* (SO)⁽²⁸⁾, *Madhavadravyaguna* (MD)⁽²⁹⁾, *Hrudayadipakanighantu* (HDN)⁽³⁰⁾, *Siddhamantra* (SM)⁽³¹⁾, *Madanapalanighantu* (MP)⁽³²⁾, *Rajanighantu* (RJ)⁽³³⁾, *Sarasvatinihantu* (SVN)⁽³⁴⁾, *Kaiyadevanighantu* (KN)⁽³⁵⁾, *Bhavaprakasha Nighantu* (BP)⁽³⁶⁾, *Rajavallabha Nighantu* (RV)⁽³⁷⁾, *Nighanturatnakara* (NR)⁽³⁸⁾, *Abhidhanamanjiri* (AM)⁽³⁹⁾, *Shaligramanighantu*

(SLN)⁽⁴⁰⁾, *Laghu Nighantu* (LN)⁽⁴¹⁾, *Priyanighantu* (PN)⁽⁴²⁾ and other contemporary texts of Ayurveda such as *Dravyaguna Vijnana*, *Nighantu Adarsha* etc⁽⁴³⁻⁵¹⁾.

Pharmacopeial publications of the Government of India, such as Ayurvedic Pharmacopoeia of India (API) Part 1, Vol. 3, and Ayurvedic Formulary of India (AFI) Parts I to III⁽⁵²⁻⁵⁴⁾, were consulted to gather relevant information. Apart from this, several authoritative floras and Materia medica texts, such as Vegetable Materia Medica of India and Ceylon by Emmanuel Roberts⁽⁵⁵⁾, Indian Materia Medica by Dr. K. M. Nadkarni⁽⁵⁶⁾, Flora of the Upper Gangetic Plain and of the Adjacent Siwalik and Sub Himalayan Tract by Dr. J. F. Duthie⁽⁵⁷⁾, A Dictionary of Economic Products of India by George Watt⁽⁵⁸⁾, and Materia Medica of India and Their Therapeutics by Rustamji Khory⁽⁵⁹⁾, were also referred to document the diverse uses & actions of *Cyperus rotundus*.

The observations/ results of this textual analysis are presented in the subsequent section, documenting the extensive use and detailed understanding of *Musta* throughout Ayurveda & contemporary literature.

Observations/ Results:

Historical perspective:⁽²⁻⁷⁾

Although direct references to *Musta* are not found in Vedic literature, its use dates back to the *Atharvaveda Parishishta*⁽²⁾, where it is cited for use in fumigation alongside other drugs. Its uses are detailed extensively in Puranic scriptures like *Agni Purana*⁽³⁾ and *Garuda Purana*⁽⁴⁾, noting applications in *Kushtha* (skin diseases), *Madatyaya* (Alcoholism/Alcohol intoxication), *Trushna* (thirst), *Jwara* (fever), *Shotha* (oedema), and *Jeerna Atisara* (chronic diarrhea). Sanskrit literature, such as *Rutusamhara*⁽⁵⁾, *Raghuvansha Mahakavya*⁽⁶⁾, and *Abhidnyana Shankutala*⁽⁷⁾, also mentions *Mustaka* and its varieties.

Classification of *Musta* in Ayurvedic classics:⁽⁸⁻¹¹⁾

Classical Ayurvedic texts have their own unique style of classification based on predominant *Rasa* (taste)/ *Karma* (properties & actions), similar morphological features/ similar *prayojoyanga* (parts used), and intended use in specific diseases/conditions, etc. In classical Ayurvedic texts such as CS, SS, AS & AH, *Musta* has been classified under various groups such as *Mahakashaya*, *Gana*, *Varga*, *Skandha*, as depicted under **Table 1**

Table 1 Classification of *Musta* in Ayurveda classical texts:

Name of Text	Mahakashaya/Skandha/Gana/Varga	Total number of groups containing <i>Musta</i>
Charaka Samhita	Lekhaniya Mahakashaya	6
	Truptighna Mahakashaya	
	Kandughna Mahakashaya	
	Stanyashodhana Mahakashaya	
	Trushnanigrahana Mahakashaya	
Sushruta Samhita	Tikta Skandha	3
	Vachadi Gana	
	Mustadi Gana	
Ashtanga Sangraha	Katuka Varga	11
	Tikta Skandha	
	Lekhaniya Varga	
	Truptighna Gana	
	Kandughna Gana	
	Stanyashuddhikara Varga	
	Trushnanigrahana Gana	
	Virataradi Varga	
	Vachadi Gana	
	Lodhradi Gana	
	Mustadi Gana	
Pippalyadi Gana		
Ashtanga Hrudaya	Tikta Skandha	4
	Rodhradi Gana	
	Vachadi Gana	
	Mustadi Gana	

Classification in various *Nighantus* (Medicinal lexicons):⁽¹⁷⁻⁴²⁾

The *Nighantus* are specialized medicinal lexicons that provide comprehensive information about medicinal plants,

including their synonyms, properties, and actions. The classifications given by various identified *Nighantus* were systematically compiled & presented in **Table 2**

Table 2 Classification of *Musta* in various *Nighantus*:

Sl. No.	Name of <i>Nighantu</i> /Kosha	Name of <i>Varga</i> / <i>Gana</i> / <i>Prakarana</i>
1.	Amarakosha	Vanaushadhi <i>Varga</i>
2.	Saushruta <i>Nighantu</i>	Vachadi <i>Gana</i>
3.	Ashtanga <i>Nighantu</i>	Vachadi <i>Gana</i> ; Mustadi <i>Gana</i>
4.	Dhanvantari <i>Nighantu</i>	Guduchyadi <i>varga</i>
5.	Madanadi <i>Nighantu</i>	Vachadi <i>Gana</i> ; Mustadi <i>Gana</i>
6.	Shabdachandrika	Vrikshadi <i>Varga</i> , Triphaladi <i>Varga</i>
7.	Abidhanaratnamala	Kashaya Skandha
8.	<i>Nighantushesha</i>	Trunakanda
9.	Sodhala <i>Nighantu</i>	Guduchyadi <i>Varga</i>
10.	Madhavadravyaguna	Vividhaushadhi <i>Varga</i>
11.	Hrudayadipaka <i>Nighantu</i>	Dwipada <i>Varga</i>
12.	Siddhamantra	Kaphapittaghna <i>Varga</i>
13.	Madanapala <i>Nighantu</i>	Abhayadi <i>Varga</i>
14.	Kaiyadeva <i>Nighantu</i>	Aushadhi <i>Varga</i>
15.	Bhavaprakasha <i>Nighantu</i>	Karpuradi <i>Varga</i>
16.	Raja <i>Nighantu</i>	Pippalyadi <i>Varga</i>
17.	Rajavallabha <i>Nighantu</i>	Nanaushadhi <i>Varga</i>
18.	Sarasvati <i>Nighantu</i>	Chandanadi <i>Varga</i>
19.	Abhidhanamanjari	Madanadi <i>Gana</i> , Vachadi <i>Varga</i> , Haridradi <i>Varga</i> , Vividhaushadhi <i>Varga</i>
20.	<i>Nighanta Ratnakara</i>	Gunadoshaprakarana
21.	Shaligrama <i>Nighantu</i>	Karpuradi <i>Varga</i>
22.	Priya <i>Nighantu</i>	Shatapushpadi <i>Varga</i>

Classification of *Musta* under *Mishrakavarga*/*Mishrakagana* (Mixed classification groups):^(21,24,26,35,39,49)

Mishrakavarga, or *Mishrakagana*, refers to a mixed group of plants characterized by performing specific actions,

possessing peculiar parts, or being defined by equivalent measurements. *Musta* has been classified under various *Mishrakavarga*/*Mishrakagana* as mentioned in **Table 3**

Table 3 Classification under *Mishrakavarga*/*Mishrakagana* (Mixed classification groups):

Sl. No.	Name of <i>Mishrakavarga</i> / <i>Mishrakagana</i>	Name of <i>Nighantu</i> / <i>Kosha</i> / <i>Text</i>	Ingredients of <i>Varga</i> / <i>Gana</i>
1.	Trikarshika	Kaiyadeva <i>Nighantu</i> Abhidhanamanjari	Nagara (<i>Zingiber officinale</i> Roscoe), Ativisha (<i>Aconitum heterophyllum</i> Wall. ex Royle), Musta
2.	Chaturbhadra/Chaturthaka/ Chaturbhadrika	Kaiyadeva <i>Nighantu</i> Shabdachandrika Abhidhanamanjari	Nagara, Ativisha, Musta , Guduchi (<i>Tinospora cordifolia</i> (Willd.) Hook.f. & Thomson)
3.	Bala Chaturbhadrika	ChakradattaBhaishajya Ratnavali	Musta , Pippali (<i>Piper longum</i> L.), Ativisha, Karkatashrunji (<i>Pistacia integerrima</i> J.Koenig ex J.F.Gmel.)

Cont...

4.	Sarvaushadhika	Dhanvantari Nighantu	Kushtha (<i>Saussurea lappa</i> C.B.Clarke), Mamsi (<i>Nardostachys jatamansi</i> DC.), Haridradvaya Curcuma longa L. & Berberis aristata DC., Mura (<i>Salinium tenuifolium</i> Wall.ex C.B.Clarke), Shaileya (<i>Parmelia perlata</i> Ach.), Champaka (<i>Michelia champaca</i> L.), Vacha (<i>Acorus calamus</i> L.), Karpura (<i>Cinnamomum camphora</i> (L.) Nees & Eberm.), Musta
5.	Sarvaushadhika	Kaiyadeva Nighantu	Mamsi, Mura, Shathi (<i>Hedychium spicatum</i> Buch.-Ham. ex Sm.), Musta , Nisha, Ela (<i>Elettaria cardamomum</i> (L.) Maton), Kushtha, Champaka Varanga (<i>Cinnamomum zeylanicum</i> Blume), Nata (<i>Valeriana wallichii</i> DC.), Shaileya
6.	Sugandhamalaka	Dhanvantari Nighantu Kaiyadeva Nighantu	Plants of Sarvaushadhika along with Dhatri (<i>Phyllanthus emblica</i> L.)
7.	Sarvaushadhi Gana	Shabdachandrika	Mura, Mamsi, Vacha, Kushtha, Shaileya, Rajanidvaya, Shati, Champaka, Musta
8.	Trimada	Shabdachandrika Bhaishajya Ratnavali	Vidanga (<i>Embelia ribes</i> Burm.f.), Musta , Chitraka (<i>Plumbago zeylanica</i> L.)

Rasapanchaka (five attributes of dravya beginning with rasa) of Musta: ^(1,47,48)

In Ayurveda, *Rasapanchaka* denotes the five fundamental determinants of pharmacodynamics viz., *Rasa*, *Guna*, *Virya*, *Vipaka* and *Prabhava* (inconceivable potency/specific action). These are important in understanding the actions of *Musta* as mentioned below:

- **Rasa** (Taste): *Tikta* (Bitter), *Katu* (Pungent), and *Kashaya* (Astringent).

- **Guna** (property/ quality/ attribute): *Laghu* (Light), *Ruksha* (Dry)
- **Virya** (Potency): *Shita* (Cold).
- **Vipaka** (Bio-transformed rasa): *Katu* (Pungent).
- **Doshakarma** (Action on *Dosha*): *Kapha-Pitta Shamaka/ Kaphapittaghna* (pacifies *Kapha* and *Pitta dosha*).

The *Rasa & Doshakarma* of *Musta*, as per different *Nighantu*, is given in **Table 4 & 5**

Table 4 Rasa of Musta in various Nighantu

Rasa	DH	KN	MP	SO	RJ	BP	NR	SLN	RV	MN	MD	PN
<i>Tikta</i>	+	+	+	+	+	+	+	+	+	+	+	+
<i>Katu</i>		+	+	+		+	+	+	+	+	+	+
<i>Kashaya</i>	+	+	+		+	+	+	+				

Table 5 Doshakarma (Action on dosha) in different Nighantu

Karma	DH	MN	KN	MP	SO	SM	RJ	RV	NR	BP	SLN
<i>Kaphaghna</i>	+	+	+	+	+	+	+		+	+	+
<i>Pittaghna</i>	+		+	+			+		+	+	+
<i>Vataghna</i>								+			

Bheda (Varieties) of Musta: ^(47,48)

Ayurvedic texts described several varieties of *Musta*, which include:

1. **Mustaka/Bhadramustaka** (*Cyperus rotundus* L.): It is accepted as the standard *Musta*, often referred to as the one that takes care of human health.
2. **Nagaramustaka** (*Cyperus esculentus* L.): It is found in or around townships. This variety, grown in Anupdesha (aquatic area), is highly regarded as the best.
3. **Jalamustaka / Kaivartamustaka or Kshudramustaka**: It is accepted taxonomically as *Cyperus platistylis* Br. or *Cyperus amabilis* Vahl.
4. **Krantamustaka**: This variety is mentioned in Bruhat Dravyagunadarsha (BD) ⁽⁵⁰⁾

The comparative types of *Musta*, as mentioned in various texts/Nighantu, are summarized in **Table 6**

Table 6 Bheda (Types) in different Nighantu

Types	Dh	KN	MP	RJ	NR	BP	SLN	BD
Bhadramustaka/Mustaka	+	+		+	+	+	+	+
Nagaramustaka	+		+	+	+	+	+	+
Jalamustaka/Kaivartamustaka(Kshudramusta)	+	+	+		+	+	+	+
Krantamustaka								+

Paryaya (Synonyms) of *Musta* in Ayurveda classical texts & Nighantus:⁽⁸⁻⁴⁹⁾

Synonyms hold particular significance in *Dravyaguna Vidnyana* (Ayurveda Materia medica), as they play an important role in understanding plants taxonomically and in providing information about their place of origin,

pharmacological actions, and distinctive characteristics, etc. The classical Ayurvedic texts, including various Nighantus, have mentioned various synonyms of *Musta*, which are detailed in **Table 7 & 8**. Further, synonyms of *Musta*, based on various criteria, are presented in **Table 9** along with their interpretations.

Table 7 Paryaya (Synonyms) of *Musta* in Ayurveda classical texts

Sl.No.	Synonyms	CS	SS	KS	HS	BS	AS	AH	SHS	BH
1.	Abda		+				+	+	+	+
2.	Ambuda	+	+					+	+	+
3.	Ambhoda		+					+		+
4.	Ambhodhara		+							+
5.	Bhadramusta	+	+	+	+				+	+
6.	Bhadramustaa	+					+	+		+
7.	Bhadramustaka								+	+
8.	Ghana	+	+	+	+		+	+	+	+
9.	Gangeya		+							
10.	Gangeyi						+	+		
11.	Jalada						+	+		+
12.	Jaladhara								+	+
13.	Kuruvinda		+							+
14.	Kutannata	+	+					+		
15.	Megha				+					
16.	Meghahva									+
17.	Musta	+	+	+	+	+	+	+	+	+
18.	Mustaa	+	+	+			+	+		+
19.	Mustaka			+	+				+	+
20.	Nadeyi			+						
21.	Nagara	+								
22.	Nirada									+
23.	Paripelava	+	+					+		
24.	Plava	+					+	+		
25.	Toyada						+	+		
26.	Vanya	+						+		
27.	Varida		+							+
28.	Varivaha									+
29.	Vitunnaka	+						+		

Table 8 Paryaya (Synonyms) of *Musta* in *Nighantus*:

Sl.No	Paryaya	SN	DN	MN	KN	NS	MP	RJ	ARM	PRM	SO	HDN	BP	SSN	SLN	AMJ	LN	SVN	PN
1.	Abda	+			+		+	+	+	+		+				+			+
2.	Abhra							+		+									
3.	Ambhoda				+			+				+							
4.	Ambuda								+			+							
5.	Ambudahvaya						+												
6.	Ambudhara	+		+															+
7.	Bhadraa							+								+			
8.	Bhadrahansa				+														
9.	Bhadrakasi							+											
10.	Bhadramusta	+		+	+	+	+	+	+	+		+	+	+	+	+			+
11.	Bhadramustaka								+		+								
12.	Chudala														+				
13.	Dasapura								+						+				
14.	Dvirada																	+	
15.	Gangeya	+		+	+	+	+	+	+	+		+	+	+	+	+			+
16.	Gangeyi																		
17.	Ghana	+		+	+	+	+	+	+	+		+	+						
18.	Granthi							+											
19.	Granthila							+											
20.	Gunja							+											
21.	Gundra													+					
22.	Himaa							+											
23.	Jalada			+												+			+
24.	Jalavaha			+															+
25.	Jimuta			+				+											+

Cont..

SI.No	Paryaya	SN	DN	MN	KN	NS	MP	RJ	ARM	PRM	SO	HDN	BP	SSN	SLN	AMJ	LN	SVN	PN
26.	Jimaparna								+										
27.	Kacchotha							+											
28.	Kaccharuha														+				
29.	Kalapini														+				
30.	Kaseru							+											
31.	Kroda									+							+		
32.	Krodakaseruka												+						
33.	Krodeshta							+											
34.	Kuruvinnda										+								
35.	Kuruvindaka																		+
36.	Kuruvindakhya																		
37.	Kutannata									+									
38.	Megha																		+
39.	Meghakhya																		
40.	Meghanama																		+
41.	Musta																		+
42.	Mustaa																		
43.	Mustaka																		+
44.	Mustakatankana																		
45.	Nadeya																		+
46.	Nagara																		+
47.	Nagarmustaka																		+
48.	Nirada																		
49.	Paripelava																		+
50.	Pindamusta																		+

Cont..

Sl.No	Paryaya	SN	DN	MN	KN	NS	MP	RJ	ARM	PRM	SO	HDN	BP	SSN	SLN	AMJ	LN	SVN	PN	
51.	Pindamustaka				+						+									
52.	Pivara				+															
53.	Plava								+											
54.	Prachya				+															
55.	Purnakoshtha				+															
56.	Rajakaseru							+	+											
57.	Rajakaseruka		+	+	+	+	+				+									+
58.	Sugandhi							+												
59.	Valeya													+						
60.	Vanya							+	+	+										
61.	Varaha		+	+	+	+	+				+									+
62.	Varahi							+												
63.	Varida							+												
64.	Varidanama												+							+
65.	Varidanamaka												+							
66.	Varidhara													+						
67.	Varivaha													+						
68.	Varivahaka																			+
69.	Vishadhvansi							+												
70.	Vitunna								+											
71.	Vrushabhaksha										+									+
72.	Vrushadvankshi/ Vrushadvankshi											+			+					+

Table 9 Categorization of Synonyms & their interpretation:

S.No.	Synonyms	Interpretation
Based on the Habitat/Geographical location		
1.	Musta/Mustaa/ Mustaka Pindamusta/Pindamustaka	It grows gregariously
2.	Kachchothh/Kaccharuha; Gangeyi/ Gangeya/ Nadeya Paripelava/Plava	It mostly occurs in aquatic & subaquatic regions
3.	Prachya	It mostly occurs in aquatic regions, particularly in the East
4.	Vanya, Valeya	It occurs in uncultivated fields commonly
Based on Pharmacognostical characters		
5.	Granthila/ Granthi/Kutannata, Vitunnaka/ Vitunna, Chudala, Pivara	It has nodular rhizomes
6.	Kaseru, Rajakaseru, Rajakaseruka, Rajakasheruka	It has rhizomes similar to those of Kaseruka (Scirpus kysoor Roxb.)
Based on Pharmacological actions		
7.	Bhadra, Bhadrahansa, Bhadamusta, Bhadrakasi, Bhadamustaka	It is beneficial for a variety of diseases.
8.	Himaa	It has Shita virya
9.	Vishadhvasi	It is antitoxic
10.	Sugandhi	It has aromatic rhizomes
Based on the Synonyms of the other entity		
11.	Abda, Abhra, Ambhoda, Ambhodhara, Ambuda, Ambudahvaya, Ambudhara, Ghana, Jalada, Jaladhara, Jalavaha, Jimuta, Megha, Meghahva, Meghakhya, Meghanama, Nirada, Toyada, Varida, Varidanama, Varidanamaka, Varidhara, Varivaha, Varivahaka	All the synonyms of Megha (cloud) are applicable to this plant
Other		
12.	Krodeshta/ Krodakaseruka/ Kroda/ Varaha/ Varahi/ Dvirada	Rhizomes are liked by Wild boars

Uses & Action from various Floras & Materia medica: ⁽⁵⁵⁻⁵⁹⁾

The identified floras and texts, as mentioned earlier, were used to document the diverse uses of *Cyperus rotundus* across

various disease conditions. These sources explicitly describe multifaceted uses and actions, as summarized in **Table 10 & 11**

Table 10 Uses of *C. rotundus* from various floras

Sl. No	Uses	Roberts	Nadkarni	Duthie	Watt	Khory
1.	Acne	+				
2.	Anorexia	+				
3.	Dyspepsia	+	+			
4.	Diarrhoea	+	+		+	+
5.	Dysentery	+	+		+	
6.	Liver congestion	+				
7.	Laryngitis	+				
8.	Bronchitis	+				

Cont...

9.	Pneumonia	+			
10.	Fever	+	+	+	+
11.	Haematuria	+			
12.	Melina	+			
13.	Bleeding piles	+			
14.	Vomiting			+	
15.	Cholera				+
16.	Scorpion sting			+	+
17.	Urinary calculus				+
18.	Amenorrhea				+
19.	Pig food			+	
20.	Horse food				+
21.	Perfumery			+	
22.	Cloth dying			+	

Table 11 Actions of *C. rotundus* from various floras

Sl. No	Actions	Roberts	Nadkarni	Duthie	Watt	Khory
1.	Astringent	+	+		+	
2.	Antiseptic	+				
3.	Aromatic	+		+	+	
4.	Stomachic	+			+	
5.	Carminative	+				
6.	Cholagogue	+				
7.	Diaphoretic	+			+	+
8.	Expectorant	+				
9.	Diuretic	+	+		+	+
10.	Antipyretic	+				
11.	Tonic		+			
12.	Vermifuge				+	+
13.	Galactagogue				+	
14.	Demulcent					+
15.	Stimulant					+

Musta in *Agrya Sangraha* (collection of the best substances) of Ayurveda classical texts:^(8,10,11)

The *Agrya Sangraha* is a classical compilation that enumerates the “best among” various categories of substances, serving as a guide to their foremost clinical applications. It highlights superior drugs, foods, and practices considered most effective in specific therapeutic contexts.

CS & AS designates *Mustaka* as the *Agrya dravya* (best drug) acting as *Sangrahi* (absorptive), *Deepana* (digestion and metabolism enhancing), and *Pachana* (enhancing digestion). (मुस्तं साङ्ग्राहिकदीपनीयपाचनीयानाम् श्रेष्ठम्।) (Ch.Su.25/40); मुस्तं सङ्ग्रहणीयदीपनीयपाचनीयानाम् श्रेष्ठम्। (As.Su.13/2)]; while AH mentioned it as *Agrya* for treatment of *Jwara* (fever). [मुस्तापर्पटकं ज्वरे।(Ah.U.40/48)]

Karma (properties/actions) and Rogagnata (Therapeutic indications):⁽⁸⁻⁴⁹⁾

Apart from *Agrya karma* like *Sangrahi*, *Deepana*, and *Pachana* as mentioned above, some other important *karma*, such as *Krumighna* (anthelmintic), *Lekhana* (therapeutic

scraping), *Vishaghna* (anti-toxic), etc., and therapeutic indications in various disease conditions other than *Jwara* like *Atisara*, *Kushtha*, *Shotha*, *Yonivyapat*, etc., are also cited in the *Samhita* and *Nighantu* literature, as summarized in **Table 12 to 15**

Table 12 Important Karma cited in Ayurveda classical texts:

Karma	CS	SS	AS	AH	KS	HS	BS
Dipana	+		+	+	+		
Kandughna	+		+	+			
Krumighna	+	+	+	+			
Lekhana	+	+	+	+	+		
Pachana	+		+	+		+	+
Rasayana	+		+	+			
Sangrahana	+		+	+	+		
Stanyashodhana	+	+	+	+	+		
Truptighna	+		+	+			
Trushnanigrahana	+		+	+			
Vajikarana			+				
Vishaghna	+	+	+	+		+	

Table 13 Important Karma cited in different Nighantu:

Karma	DN	KN	MP	MN	RJ	NR	SO	MD	BP	SLN	RV	PN
<i>Deepana</i>		+	+			+			+	+	+	+
<i>Grahi</i>		+	+			+	+	+	+	+	+	+
<i>Jantujit/ Jantuhrut/ Krumighna</i>	+	+	+			+			+	+		
<i>Pachana</i>		+	+	+	+	+	+	+	+	+		+
<i>Sangrahana</i>				+	+			+		+		

Table 14 Important Therapeutic Indications cited in Samhitas:

Sl. No.	Therapeutic Indication	CS	SS	AS	AH	KS	HS	BS
1.	Amlapitta (Acid dyspepsia / Hyperacidity)					+		
2.	Apasmara (Epilepsy)	+	+	+			+	+
3.	Arochaka (Anorexia / Loss of appetite)		+					
4.	Arsha (Haemorrhoids / Piles)	+		+	+		+	+
5.	Ashmari (Urinary calculi / Stones)			+	+			
6.	Atisara (Diarrhea)	+	+	+	+	+	+	
7.	Balagraha (Pediatric diseases due to possession)		+	+	+	+		
8.	Balashosha (Pediatric malnutrition/ emaciation)			+	+			
9.	Chardi (Vomiting)	+		+			+	
10.	Charmadala (Skin eruptions / Dermatitis)					+		

Table 15 Important Therapeutic Indications cited in *Nighantu*:

Sl. No	Therapeutic indications	DN	KN	MN	MP	RJ	BP	SL	NR	PN
1.	Amlapitta								+	
2.	Aruchi		+				+	+	+	+
3.	Atisara	+		+					+	
4.	Daha			+					+	+
5.	Grahani									+
6.	Jvara	+	+	+	+	+	+	+	+	+
7.	Kushtha				+					
8.	Raktadosha	+	+		+		+	+	+	
9.	Trushna	+	+	+	+		+	+	+	

Classical Formulations: ^(43-48; 52-54)

Musta has been mentioned as an ingredient in numerous classical formulations across various dosage forms. Dosage

form-wise categorization of formulations from Ayurveda classical texts, including those listed in AFI Parts I to III, is mentioned in **Table 16**

Table 16 Dosage form-wise categorization of formulations containing *Musta* as an ingredient:

Sl.No.	Dosage Form	Name of Formulation
1.	Asava and Arishta	Amrutarishta, Aravindasava, Ashokarishta, Ashvagandhadyarishta, Ahiphenasava, Karpurasava, Chandanasava, Jirakadyarishta, Dashamularishta, Devadarvarishta, Pippalyadyasava, Mustakarishtha, Mrutasanjivani Sura, Lohasava, Shrikhandasava, Sarivadyasava, Panchatiktarishta, Yogarajasava, Lakshmanarishta, Kumari Asava, Guggulvasava, Kanakarishtha, Kanakabindvarishta
2.	Arka	Karpuradyarka
3.	Avaleha or Leha/ Khanda and Paka	Ardraka Khanda Avaleha, Kantakaryavaleha, Shri Bahushala Guda, Chyavanaprasha, Pugakhanda, Bilvadi Leha, Brahma Rasayana, Shiva Gutika, Saubhagyashunthi, Haridrakhanda, Abhayadi Modaka, Chandravaleha, Jirakadi Rasayana, Bruhad Vasavaleha, Bruhad Haridrakhanda, Methi Modaka, Vasa-kushmanda Khanda, Shatavari Modaka, Triphala Modaka, Mustadi Leha
4.	Churna	Avipattikara Churna, Katphaladi Churna, Eladi Churna, Dashana Samskara Churna, Chandanadi Churna, Drakshadi Churna, Navayasa Churna, Nimbadi Churna, Pushyanuga Churna, Balachaturbhadrika Churna, Bruhat Gangadhara Churna, Laghu Gangadhara Churna, Sudarshana Churna, Ashvagandhadi Churna, Krushnadi Churna, Tejohvadi Manjana, Bruhad Agnimukha Churna, Mahakhandava Churna, Methikadi Churna, Lavangadi Churna, Vishaladi Churna, Shatapatryadi Churna, Shunthyadi Churna-1, Shodashanga Churna, Kachchuradi Churna, Rasnadi Churna (Lepa), Vatsakadi Churna, Mustakadi Churna
5.	Ghruta	Bruhachchagaladya Ghruta, Tiktaka Ghruta, Patoladi Ghruta, Pippalyadi Ghruta, Bruhat Phala Ghruta, Mahatiktaka Ghruta, Vastyamayantaka Ghruta, Kasisadi Ghruta, Panchagavya Ghruta.
6.	Guggulu	Yogaraja Guggulu, Vyoshadi Guggulu, Saptavimshatika Guggulu, Yogottama Gutika, Samasharkara Guggulu
7.	Hima/Shita kashaya	Shadanga Paneeya, Chandanadi Hima

8.	Kwatha Churna	Kutajashtaka Kwatha Churna, Chinnodbhavadi Churna, Darvyadi Kwatha Churna, Darunagaradi Kwatha Churna, Drakshadi Kwatha Churna, Pachanamruta Kwatha Churna, Punarnavadi Kwatha Churna, Balajirakadi Kwatha Churna, Bruhanmanjishthadi Churna, Bharngyadi Kwatha Churna, Stanyashodhana Kashaya Churna, Mustakaranjadi Kwatha Churna, Rasnadi Kwatha Churna, Maha Rasnadi Kwatha Churna, Rasnairandadi Kwatha Churna, Shadanga Kwatha Churna, Abhayadi Kwatha Churna, Amrutashtaka Kwatha Churna, Kamaladi Phanta Churna, Kiratadi Kwatha Churna, Kiratadi Kwatha Churna-2, Ghanachandanadi Kwatha Churna, Chaturdashanga Kwatha Churna, Tagaradi Kwatha Churna, Navanga Kwatha Churna, Parpatadi Kwatha Churna, Bhunimbadi Ashtadashanga Kwatha Churna, Bhunimbadi Kwatha Churna, Madhukadi Kwatha Churna, Mustakadi Kashaya Churna
9.	Kwatha	Katphaladi Kwatha, Shunthyadi Kwatha, Amritastaka Kwatha, Abhayadi Kwatha, Devadarvyadi Kwatha, Kshudradi Kwatha, Patoladi Kwatha, Br. Guduchyadi Kwatha, Nagaradi Kwatha, Vatsakadi Kwatha, Hviberadi Kwatha, Guduchyadi Kwatha, Darvyadi Kwatha, Aragvadhadi Kwatha, Astadasanga Kwatha, Mustadi Kwatha, Guduchyadi Kwatha, Triphaladi Kwatha, Maharasnadi Kwatha, Kutajastaka Kwatha, Varari Kwatha, Bruhat Manjishthadi Kwatha, Kanadi Kwatha, Bhunimbadi Kwatha, Parpatadi Kwatha, Drakshadya Ashtadashanga Kwatha, Mustakadi Kwatha, Kutajashtaka Kwatha, Darvyadi Kwatha, Dhanyapanchaka Kwatha
10.	Pramathya	Mustakadi Pramathya
11.	Mandura	Punarnavadi Mandura, Mandura Vataka, Tryushanadi Mandura, Vajravataka Mandura
12.	Rasa/Lauha	Gulma Kalanala Rasa, Nrupativallabha Rasa, Piyushavalli Rasa, Bruhat Vidyadharabhra Rasa, Bruhachchrungarabhra Rasa, Guduchi Lauha, Shatamulyadi Lauha, Karpura Rasa, Bruhat Kasturibhairava Rasa, Bruhat Nrupavallabha Rasa, Shri Nrupativallabha Rasa, Chandanadi Lauha, Pradarari Lauha, Rohitaka Lauha, Vidangadi Lauha, Sarvajvarahara Lauha, Tapyadi Lauha, Yakrudari Lauha, Shularaja Lauha, Navayas Lauha, Grahani KapataRasa, Grahani VajrakapataRasa, Kandarpa-Sundara Rasa
13.	Taila	Arimedadi Taila, Marichadya Taila, Mahalakshadi Taila, Grahanimihira Taila, Chandanadi Taila, Chandanabalalakshadi Taila, Triphaladi Taila, Prameha Mihira Taila, Bala Taila, Baladhatryadi Taila, Bruhatmasha Taila, Manjishthadi Taila, Mahanarayana Taila, Maha Vishagarbha Taila, Durvadi Taila, Priyangvadi Taila, Rudra Taila, Irimedadya Taila, Gandha Taila
14.	Vati / Gutika	Chandraprabha Vati, Khadiradi Gutika, Marma Gutika, Kshara gudika, Shivala Gutika
15.	Vartti	Kayasthadya Vartti, Mustadya Varti, Anjana Varti
16.	Lavana	Pippaladya lavana
17.	Phanta	Vishalaadi Phanta
18.	Dhooma	Manahshiladi Dhooma
19.	Anjana	Ksharanjana
20.	Kshara	Haridradi Kshara, Panchama Kshara
21.	Rasakriya	Siddharthaka Rasakriya

Apart from these formulations, it has been used in Kritkana/Ahariya Kalpana (medicinal dietary preparations) such as Peya, Yavagu, and Shukta. It is used in various medicinal preparations such as Siddha jala, Shitodaka, and Tandulodaka. It is also employed externally in procedures like Udvardhana, Udgharshana, Avachurnana, Pratisarana, Upanaha, Lepa (Shirolepa, Stanalepa). Further, it is used for Gandusha, Kavala, and Dhoopa.

Matra (Dosage):^[1]

Musta is commonly used in clinical practice in dosage forms such as Churna (powder) and Kwatha (decoction). According

to the API, the recommended dose of Musta is 3-6 g for Churna and 50-100 ml for Kwatha.

Pharmacological activities of *Cyperus rotundus*:^[60-74]

Various previous research studies have investigated the effects of *Cyperus rotundus* & it has been found to possess various pharmacological activities, including antioxidant, antifungal, anti-inflammatory, antidiabetic, antidiarrheal, antimutagenic, antimicrobial, antibacterial, analgesic, antipyretic, cytotoxic, cytoprotective, and anticonvulsant activities.

Discussion:

Although *Musta* is an important drug in Ayurveda, its direct references are not traced in the Veda; however, Atharvaveda Parishishtha, Agni Purana & Garuda Purana mention it in various contexts.

Charaka Samhita systematically classified *Musta* as an important ingredient of the five Mahakashaya viz., Lekhaniya (scarifying), Truptighna (anti-satiative), Kandughna (anti-pruritic), Stanyashodhana (galacto depurant), and Trushnanigrahana (anti-dyspic). Ashtanga Sangraha followed Charaka's classification style based on the Karma & included the above-mentioned five Gana. CS, AS & AH classified *Musta* under Tikta skandha, while Sushruta mentioned it in Katuka varga. Charaka, in the eighth chapter of Vimana Sthana, mentions the Paripelava variety of *musta* under Kashaya Skandha.

Sushruta classified *Musta* under Vachadi and Mustadi Gana. Both AS & AH have adopted Sushruta's classification, placing it in Vachadi and Mustadi Gana. AS further included it in other gana like Virataradi, Rodhradi, and Pippalyadi; however, AH didn't include it under Virataradi gana.

Musta's classification across various Gana in the Samhitas underscores its multi-functional nature. For instance, its inclusion in Lekhaniya and Truptighna Gana emphasizes its role in metabolic regulation and weight management (Atisthaulya), while inclusion in Mustadi & Stanyashodhana Gana underscores women's health. In CS, at one point, the word 'Nagara' is used, which the commentator Chakrapani describes as '*Musta*'. However, words like Nagaramusta & Kaivartamusta are not used in Samhita literature.

Musta has been mentioned as an ingredient of various mishraka gana, such as Trikarshika, Chaturbhadra, Bala Chaturbhadra, and Trimada, which are useful in a variety of clinical conditions. Its Rasa has been mentioned as Tikta-Katu-Kashaya, Virya as Shita & Doshakarma as Kaphapittaghna in most of the Nighantu. Raja Vallabha Nighantu highlighted its Vataghna Karma.

Classical Ayurvedic texts mention 29 synonyms, while Nighantus quotes 72 different synonyms for *Musta*. According to many texts, *Musta* is described with synonyms of Megha (cloud). In this regard, 25 names that are also synonyms of Megha, such as Ghana, Ambuda, Jaladhara, Jimuta, etc., are used for *Musta*, as it grows during the season of cloud arrival (rainy season) and is especially abundant in water-rich regions. Some texts, such as Sodhala Nighantu & Laghu Nighantu mention its unique synonyms, such as vrushabhaksha and dvirada.

Analysis of the therapeutic uses of *C. rotundus* across the consulted floras & materia medica reveals strong consensus on its efficacy for gastrointestinal and febrile conditions, with

diarrhoea and fever as the most frequently documented uses. These clinical applications are supported by its primary pharmacological actions as a diuretic, an astringent, and a diaphoretic. Its extensive therapeutic versatility is further evidenced by its use in treating acute respiratory infections such as bronchitis and pneumonia, managing scorpion stings, and acting as a galactagogue to promote breast milk production. Beyond its medicinal roles as a stomachic and vermifuge, the floras highlight its diverse economic and agricultural utility, including its use in perfumery and cloth dyeing, and its role as a food source for pigs and horses.

Most of the classical texts mentioned various karma of *Musta*, such as Krumighna, Lekhana, Vishaghna, Stanyashodhana etc. CS, AS & AH have cited Rasayana (rejuvenation), while AS & BH highlighted the Vajikarana (aphrodisiac) karma. Apart from this, it has been mentioned in variety of disease conditions such as Balaroga (pediatric disorders), Balagraha (pediatric diseases due to possession), Balashosha (pediatric malnutrition/emaciation), Yonivyapat/Yonidosha (gynecological disorders), Guhyaroga (genital disorders), Vandhya (infertility), Sutikaroga (puerperal complications), Upadansha (venereal disease), Vatavyadhi (disorders due to Vata dosha), Urdhvajatrugata Vyadhi (diseases above the clavicle), such as Mukharoga (oral diseases), Dantaroga (dental diseases), Dantamulagata Roga (gum diseases/periodontal disorders), Nasaroga (nasal diseases), Netraroga (eye diseases), Kantharoga (throat diseases), Karnaroga (ear diseases), Manasavikara (psychological disorders), such as Apasmara (epilepsy), Unmada (psychosis/insanity). It is further indicated in various Srotogata Vikara (systemic disorders), viz., Pranavahasrotas Vikara (respiratory disorders), like Kasa (cough), Shvasa (dyspnoea/difficulty in breathing), Rajayakshma (consumption); Annavahasrotas Vikara (digestive disorders), like Amlapitta (acid dyspepsia/hyperacidity), Grahani (malabsorption disorder), Atisara (diarrhea), Arsha (haemorrhoids/piles), Raktavahasrotas Vikara (blood related disorders), such as Kushtha (skin diseases), Raktapitta (hematemesis/bleeding disorders), Visarpa (erysipelas), Pandu (anemia), Mutravahasrotas Vikara (urinary disorders), like Mutrakruchechra (dysuria/painful urination), Ashmari (urinary calculi/stones); and other conditions including Jwara (fever), Krumiroga (helminthiasis/worm infestation), Madatyaya (alcoholism/alcohol intoxication), Prameha (diabetes mellitus), Udara (abdominal disorders/ascites), and Vidradhi (abscess) etc.

In classical texts, *Musta* has been mentioned as an ingredient in a variety of formulations across various dosage forms, such as Asava and Arishta, Arka, Avaleha and Paka, Churna, Ghruta, Taila, Guggulu, Hima, Kwatha, Pramathya,

Mandura, Rasa/Lauha, Vati/Gutika, Vartti, Rasakriya, and Anjana, etc. Notable formulations include Shadangapaniya and Balachaturbhadrha Churna. Various types of Karma mentioned in the classics for Musta are also supported by its pharmacological activities, as demonstrated by various research studies.

Conclusion:

Musta (*Cyperus rotundus* L.) exhibits a wide spectrum of Karma, including Deepana, Pachana, Lekhana, and Sangrahi, for which classical texts deemed it as Agrya. It is an integral component of the Ayurvedic Materia medica, and its widespread use across a variety of ailments in nearly all major Ayurvedic classical texts demonstrates its multifaceted action in acute and chronic conditions affecting the body.

This review underscores the importance of further scientific exploration of the diverse pharmacological properties of Musta, as outlined across the Samhitas and Nighantus, and their correlation with contemporary research.

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