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Research Article

A COMPARATIVE ANALYTICAL STUDY OF *KRISHNA MUSALI CHOORNA* AND *KRISHNA MUSALI KSHARA*

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ABSTRACT

Krishna Musali (*Curculigo orchioides*) is among the *Dashapushpa*, a group of ten herbs which is culturally and medically important to the people of Southern India, especially in Kerala. *Krishna Musali* is mentioned in various context in the names of *Krishna Musali, Talapatri, Talamooli* etc. and it is having *Madhuratikta rasa, Ushna virya* and it is *Vatapittahara* and *Rasayana* properties. In classics references about this drug can be seen in the context of *Dhoomapana yoga, Kshara vidhi, Ekangasopha chikitisa* etc and the *Acharyas* were categorized in to specific *Gana* or *Varga* based on its mode of action. *Krishna Musali Choorna* and *Kshara* prepared based on the method of preparation mentioned in *Sharangadhara Samhita*. Analytical study was carried out for the purpose of standardization. For the qualitative assurance of the raw material analytical study provides the objective parameters for the standardization leading to a reproducible quality. These tests were done for evaluating the anticancer activity of *Krishna Musali Choorna* and *Kshara* in cervical cancer cell lines. The preliminary phytochemical study shows high alkalinity of *Krishna Musali Kshara* compared to *Choorna*, it supports the definition of alkali of being caustic and corrosive in nature. So, it will be helpful in the treatment of early stages of Cervical carcinoma.

INTRODUCTION

Dashapushpa constitute a group of ten potential herbs which are culturally and medically significant to the people of Kerala. *Krishna Musali, Badra, Viparita lajjalu, Durva, Bhringaraja, Aakhuparni, Harikrantha, Lakshmana* and *Sahadevi* are the ten drugs which are used as ingredients in various Ayurvedic formulations [1]. *Krishna Musali* (Curculigo orchioides) is considered as black variety of *Musali* and *Shwetha Musali* (*Chlorophytum borivilianum*) identified as tuberous root of white variety. These are considered as the two varieties by the lexicon writers [2]. It occurs in the subtropical part of Himalayas and many parts of India. References of *Krishna musali* can be seen in various classics with its therapeutic utility.

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It is a perennial herb with long tuberous roots and yellow flowers.

Scientific name -Curculigo Orchioides Gaertn

Family- Amaryllidaceae

Figure 1: *Krishna Musali*

History

In Caraka Samhita reference of *Krishna Musali* is available in *Chikitsa sthana*. It is one of the ingredients in *Dhoomapana yoga* in *Kasa Chikitsa* [3].

Acharya Sushruta mentioned *Krishna Musali* as one of the *Pralepa yoga* in *Vataja granthi chikitsa* as well as one of the *Prativapa dravya* in *Kshara vidhi*[4]. Vagbhata Acharya mentioned in *Ekangasopha*[5]. *Krishna Musali* (*Curculigo orchioides*) is having *Madhuratikta rasa, Ushna virya* and it is *Vatapittahara* and *Rasayana* [6].

Gana and *Varga*

Different *Acharyas* have mentioned *Krishna Musali* in different *Gana* or *Varga* as follows.

- *Madanapala Nighantu - Abhayadi Varga*
- *Raja Nighantu- Moolakadi Varga*
- *Kayyadeva Nighantu-Aushadhi Varga*
- *Bhavaprakasha Nighantu- Guduchyadi Varga*
- *Shaligrama Nighantu- Guduchyadi Varga*
- *Hridaya Deepika – Vatagna Varga*
- *Nighantu adrasha – Musali kandadi Varga*
- *Priya Nighantu- Shatapushpadi Varga*
- *Shodala Nighantu- Lakshmanadi Varga*

Nomenclature of Curculigo Orchioides Gaertn

- Kingdom- Plantae
- Division- Spermatophyte
- Subdivision- Angiospermae
- Class- Monocotyledon
- Order- Asparagales
- Family- Hypoxidaceae
- Genus- Curculigo
- Species- Orchioides Gaertn

Synonyms

Taalamuli, Mushali, Suvaha, Krushnamusali, Talapatri, Khalani, Kharjoori, Bhootali, Godhaadi, Hemapushpi, Deerghakandika.

Table 1: Vernacular names of *Krishna Musali* [7]

Hindi	Musalikand, Syah musali
English	Golden Eye Grass, Black musali
Bengali	Talamuli
Kannad	Neltal, Nelatale
Malayalam	Nilapana, Nilappana
Marathi	Mushli
Oriya	Talmuli, Talamulika
Tamil	Nilappanai
Telugu	Nel tadigadda
Gujrati	Kali Musali
Punjabi	Syah Musali
Assamese	Talmuli, Tailmuli
Marathi	Kali musali, Bhuimaddi
Urdu	Musali Siyah, Kali Musali

Table 2: *Rasapanchaka* of *Krishnamusali* According to Different Authors [8]

S.No	*Rasapanchaka*		*M.N*	*R. N*	*K. N*	*Bp. N*	*N. A*	*P. N*
1	*Rasa*	*Madhura*	+	+	+	+	+	+
		Tikta	+	_	+	+	+	+
2	*Guna*	*Guru*	+	_	+	+	+	_
		Snigdha	+	_	_	_	+	_
		Picchila		+	+	_	+	_
		Sheeta	_	+	_	_	+	_
3	*Veerya*	*Sheeta*	_	+	_	_	_	_
		Ushna	+	_	+	+	+	+
4	*Vipaka*	*Madhur*	+	+	+	+	+	+

Karma

Vrushya, Rasayana, Brumhana, Shukrala, Pushtikara, Balya, Agnivardhaka, Sthairyakaraka.

Major Chemical Constituents[6]

Flavone, glycoside-5, 7 dhydromyricetin-3-0-L xylopyranosyl (4-1), tannins, resins, sapogeninsitosterol, stigmasterol, and alkaloid, mucilage, fat, starch, and ash containing oxalate of calcium etc. Root contains a good deal of mucilage.

AIMS AND OBJECTIVES

- To prepare *Krishna Musali Choorna* and *Krishna Musali Kshara* according to the general method of preparation explained in *Sharangdhara Samhita.*
- To carry out Analytical study of *Krishna Musali Choorna and Krishna Musali Kshara.*

MATERIALS AND METHODS

Pharmaceutical Study

Preparation of *Krishna Musali choorna* [9]

- Dried roots of *Krishna Musali* roots taken in small quantity and subjected to pounding in *Ulukhala yantra.*
- Procedure should repeat till get whole roots in to fine powder.
- After proper pounding, it should be filtered through sieve of proper size.
- The beige color powder obtained was collected, weighed, and stored in an airtight container.

Table 3: *Krishna Musali Choorna*

Initial quantity of *Krishna Musali*	1 Kg
Krishna Musali Choorna obtained	950 grams
Loss	50 grams

Figure 2: *Krishna Musali Choorna* Preparation

Pounding in *Ulukhala yantra*

Krishna Musali Choorna

Preparation of *Krishna Musali Kshara* [10]

- Little quantity of *Krishna Musali moola* was taken and placed in an iron vessel in an open environment devoid of strong breeze and lit up. As it started to burn, remaining *Moola* was added at regular intervals until all the *Krishna Musali* was burnt and reduced to ash. It was allowed to self-cool.
- After self-cooling the ash was carefully collected and weighed and was later transferred to a clean and dry vessel. To this, four parts of water was added and stirred and was left undisturbed for overnight.
- Next day the supernatant water was collected carefully without disturbing the sediment and it was filtered using a four layered cloth. The filtrate was collected and heated until all the water content was evaporated.
- The greyish white powder present at the bottom of the vessel was collected, weighed, and stored in an airtight container.

Table 4: *Krishna Musali Kshara*

Initial quantity of *Krishna Musali*	9 Kg
Total quantity of ash obtained	370 grams
Krishna Musali Kshara obtained	16 grams

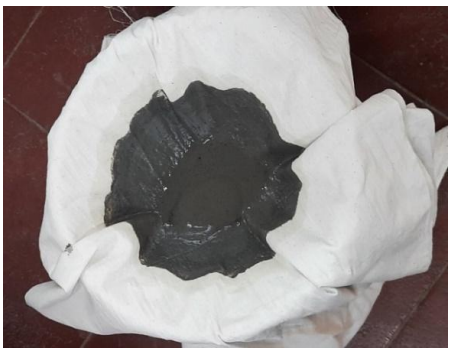
Figure 3: *Krishna Musali Kshara* Preparation

Dried *Krishna Musali* Roots

Burning of *Krishna Musali*

After burning

Ash obtained after self-cooling



filtering through cloth after adding 4 times of water

Filtrate resembles Cow's Urine

Boiling of *Kshara Jala*

Krishna Musali Kshara

Analytical Study

Krishna Musali choorna and *Krishna Musali Kshara* prepared at Rasa shastra Practical Hall, Sri Dharmasthala Manjunatheshwara College of Ayurveda, Udupi and were subjected to analytical study at Sri Dharmasthala Manjunatheshwara Centre for Research and Allied Science, Udupi.

OBSERVATIONS

Table 5: Organoleptic characters of *Krishna Musali Choorna* and *Krishna Musali Kshara*

Parameters	***Krishna Musali Choorna***	***Krishna Musali Kshara***
Colour	Beige	Beige
Appearance	Fine powder	Fine powder
Taste	Astringent	Bitter, sharp
Touch	Fine	Fine
Odour	Characteristic	Putrid, unpleasant

Table 6: Physico-chemical analysis of *Krishna Musali Choorna* and *Krishna Musali Kshara*

Parameter	Results n = 3%w/w (Avg ± SD)	
	Krishna Musali Choorna	***Krishna Musali Kshara***
Loss on drying	11.53 ± 0.01	4.35 ± 0.01
Total Ash	7.52 ± 0.02	92.75 ± 0.43
Acid Insoluble Ash	2.39 ± 0.01	0.98 ± 0.01
Water soluble Ash	1.46 ± 0.01	89.96 ± 0.01
Alcohol soluble extractive value	0.73 ± 0.00	0.26 ± 0.01
Water soluble extractive value	13.73 ± 0.01	91.92 ± 0.00
pH	6	12

RESULTS AND DISCUSSION

Analytical study helps in standardizing the drug. Here authentic raw drug *Krishna Musali* was taken, *Choorna* and *Kshara* was prepared out of it. Later both were subjected to analytical parameters for standardization.

Organoleptic characters of *Krishna Musali Choorna* were beige color fine powder with astringent taste and characteristic odor. The *Kshara* obtained was beige in color with fine texture. It was sharp and bitter in taste with putrid unpleasant odor.

The loss on drying of *Choorna* was 11.53% and of *Kshara* was 4.35%. It indicates *Kshara* containing less moisture content. The total ash value of *Krishna Musali Choorna* and *Kshara* was 7.52% and 92.75% respectively, which indicates the presence of organic matter in it which could be the result of incomplete burning. Acid insoluble ash measures the amount of silica present as sand. 2.39% and 0.98% of acid insoluble ash was obtained for *Choorna* and *Kshara* respectively. Water soluble ash is the difference in the weight between the total ash and the residue after the treatment of total ash with water. The amount of water-soluble ash in *Krishna Musali choorna* and *Kshara* was 1.46% and 89.96% resp. It indicates the presence of water-soluble part in the samples. The alcohol soluble extractive in the *Krishna Musali choorna* and *Kshara* was 0.73% and 0.26% resp. which is totally negligible. It determines the number of chemical constituents extracted using polar solvents. The water-soluble extractive in the *Krishna Musali choorna* and *Kshara* was 13.73% and 91.92% respectively, which gives the idea about active constituents present in the samples. The pH of the *Krishna Musali choorna* was 6 which is slightly acidic and that of *Kshara* was 12 which is highly alkaline. Due to its high alkalinity, it supports the definition of Alkali of being caustic and corrosive in nature and thus it may prove efficacious in destruction of pre-cancerous cell phase of cervix.

CONCLUSION

Krishna Musali is one of the *Rasayana dravya* with the properties of *Madhuratikta rasa, Ushna virya* and it is *Vatapittahara. Krishna Musali Kshara* is sharp in comparison with *Choorna.* The preliminary phytochemical study shows high alkalinity of *Krishna Musali Kshara* compared to *Choorna*, it supports the definition of alkali of being caustic and corrosive in nature. So, it will be helpful in the treatment of early stages of Cervical carcinoma.

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