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Pharmacognostical and Physicochemical Study of *Shitivarak* (*Celosia argentea* Var. *Spicata*) Beej Churna

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ABSTRACT

Aim: To standardize seeds of Shitivarak (*Celosia argentea* var. *Spicata*).

Materials & Methods: It is a pharmacognostical and physico-chemical study that includes collection, procurement, authentication, *panchabhautikparikshan*, preparation of sample, foreign matter, moisture content, total ash, extractive study (aqueous and solvent), TLC etc.

Results: The standardization of Shitivarak (*Celosia argentea* var. *Spicata*) Beej Churna was performed by pharmacognostical and physico-chemical study. No standardization work of *Celosia argentea* seeds present in API, therefore standard values are not available to compare. These values of standardization can be used for further studies.

Conclusion: According to classical text, morphological characters and organoleptic examination, plant shows the correct taxonomy. But there are not references to compare so these observations and result will be useful for the correct botanical identification and authentication of the drug.

KEYWORDS

Celosia argentea var. *Spicata*, (*kurudu*) shitivarak.



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INTRODUCTION

यतश्चायुष्यानायुष्याणि च द्रव्यगुणकर्माणि
वेदयत्यतो अपि आयुर्वेदः। च.सु.30/23

While defining the term Ayurveda, Acharya Charkacharya has given the importance to Dravya. While explaining sapta Padharth, Charkacharya has given importance to Dravya firstly and stated that every substance on earth is Aushadhi dravya when it is used in proper doses and formulations.

अनेनोपदेशेन नानौषधिभुतं जगति किंचिद
द्रव्यमुपलभ्यते तां तां युक्तिमर्थं च तं
तमभिप्रेत्य । च. सु. 26./12

Charakacharya has also mentioned that all species available on earth are medicinal plants by using diplomatically. Charakacharya has classified dravyas in special manner according to its Karma and also classified them in various ganas, while Sushrutacharya classified them according to names of dravya. In Nighantus new drugs were added and divided them in various vargas. In modern era various new dravya has been added by various authors. These days when all aspects of dravyas are studied, it is necessary to research according to modern medicine. Therefore when any drug is used in kalpa or remedy, it must be standard. Government of India has published

Ayurvedic Pharmacopoea of India (API) in 9 volumes, but some plants, described in classical text, are not mentioned in API. That's why standardization of all drugs should be carried out.

Celosia argentia a genus of annual, ornamental herbs commonly known as cockscomb or woolflower distributed throughout the tropical and temperate region of Asia, Africa And America, Celosia argentia is a drug of amaranths family which is erect, glabrous, annual, 1-3 ft high, with spikes of feathered type, conical to long- oblong commonly found on riverbanks and open places as a weed throughout India. Farmers destroy it as a weed. Some people use this plant for diet, leaves, tender stems and young flower spikes are eaten boiled, or cooked in sauce or stew with other ingredients. Recent research on *C.argentea* shows some health values as, β -carotene: extremely high in leaves; vitamin E, folic acid, Ascorbic acid, calcium, iron, protein 4.7%. Leaves contain also amaranthine (betacyanin), oxalic acid and phytic acid. Seeds are considered as nutritious and used in pyrexia and Renal disorders.

In classical text *Shitivar* is known as *suchipatra*, *shrivaraka*, *swastika* etc in Sanskrit, and locally as *Survalli* or *Safed*



Murga in Hindi, *kurudu* in Maharashtra. It is also widely used as traditional medicine. There are no references regarding Shitivar in vedic period but we found the references from Samhita period. In Brahutrayi shitivar seeds are advised for management of Mutrakricha, in Nighantus it is used on Basti Vikar, Hrudrog, Pliharog, Gulma, Arsha, etc. In Ayurvedic Pharmacopoeia of India, there is no reference regarding standardization of *Celosia argentia* seeds, therefore there is need to do work on standardization.

DRUG REVIVEW

- 1) तत्रेण युक्तं शीतिवारकस्यबीजं पिबेत्
कृच्छ्रं विनाशहेतोः | च.चि.26/56
- 2) शितिवारः सुचिपत्रः सुच्यान्ह
सुनिषण्णकः । श्रीवारकःशितिवरः स्वस्तिकः
कुक्कुटः शिखी ॥
शितिवारस्तु संग्राही कषायः सर्वदोषजित ।
हृद्रोगप्लीहगुल्मार्शो बस्तिशुद्धिकरः परः
॥ध.नि.॥
- 3) कुरण्टिका क्षेत्रभुषा कुरण्टी शीर्षमंजरी
॥660
श्रीहस्तिनी सिंहकेशीचुबुकः क्षेत्रनाशिनी ।
कृष्णसुकुम्भफला ज्ञेया सितवारस्तु कुर्कटी ॥

कुरण्टिका हिमास्वाद्दी स्वादुपाका कटुः पटुः ।
तिक्ता रुक्षा सरा वृष्या गुर्वी मारुत पित्तला ॥
बस्तिमारुतकृच्छ्राशमकफरक्तं नियच्छति ॥
कै.नि. 660-663॥

References found from Samhita and Nighantu are as in Table No. 1

Table 1 Classification in Classical Text

Sr. No.	Samhita/ Nighantu	Adhyaya/ Gana
1	Charak samhita	Trimarmiyachikitsa adhyaya
2	Sushrut Samhita	Virtarvadi gana (Dravyasangrahnaya Adhyaya) Annapanvidhi Adhyaya
3	Ashtang hridaya	Shodhanadi Gana Sangraha
4	Shodhal Nighantu	Guduchyadi varga
5	Dhanvantari Nighantu	
6	Madanpal Nighantu	Shakvarga
7	Kaiydev Nighantu	Aushadhi Varga

Synonyms:-

There are no synonyms found regarding shitivaraka in samhita period but there are many synonyms available from Nighantu period as *Shitivar*, *Suchipatra*, *Suchyanhya*, *Sunnishannak*, *Shrivaraka*, *Shitivar*, *Swastik*, *Kukkuta*, *Shikhi*, *Kurantika*, *Kshetrabhusha*, *Kuranti*, *Shirshamanjiri*, *Shrihastini*, *simhakeshi*, *Chubuka*, *Kshetranashini*, *Krushnasuksmaphala*, *Kurkati*.

Rasapanchak :-

**Table 2** Rasapanchak of Drug

Sr. No	Rasapanchak	Guna
1	Rasa	Madhur, Tikta, Katu, Lavan
2	Vipak	Madhur
3	Virya	Shit
4	Guna	Ruksha, Sara, Laghu
5	Doshagnata	Vatta Pitaghna

According to Susharutacharya and Dhanvantari Nighantu, Rasa of shitivar is Kashaya where as Kaiyadev Nighntu has described four rasa as Madhur, Tikta, Katu, Lavan. So guna of Shitivarak.

Guna Karma :-

Shitivarak has astringent effect. It commands on tridoshas i.e. Vatta Pitta Kapha. It acts on cardiovascular system as good as cardiac tonic, and effectively works on bladder disorders. In classical text, beej churna is used in Mutrakriccha. It mainly acts on calculi (renal, etc) and also possesses activity on anorectal disorders. It is used for the treatment of fatigue, atherosclerosis, leucorrhoea and osteoporosis.

Botanical Description:-

Celosia argentia var. *spicata* belongs to Amaranthaceae family. It is a shrub of erect stem, leaves of various size 2.5 to 10 by 0.6 to 3.2 linear, acute entire, glabrous base much tapering into a short petiole or leaves sessile. Flowers are first pinkish and afterword glistening white, crowded and imbricate enclosed, cylindrical blunt or

acuminate terminal spike. Perianth 8mm long or more sepals linear lanceolate acute scarious with three close parallel slender sriae on back stamens, short filaments connate into a cup. Style filiform from elongated after flowering sometimes exereted in fruit. Capsule 3.4mm long ellipsoid tapering at apex into style, circumscissile about the middle. Seeds 4.8 subreniform, compressed 1.5 diameter, black, polished and shining.

MATERIALS AND METHODS

- 1) Collection of sample - Shitivarak beej procured from market.
- 2) Identification of drug:- Drug was identified at Botany Department, Science College Nanded.
- 3) Procurement of sample:- Sample containing impurities like clay, tiny stones and remnants were separated manually. Dust and clay filtered by using minute mesh. Then drug was placed in grinder for preparation of powder. Fineness is differentiated and expressed by using mesh no. 85.

METHODOLOGY

1) Organoleptic tests of *shitivarak* beej:

Table 3 Organoleptic tests of *shitivarak* beej

Sr. No	Panchabhautik Parikshan	Guna
1	Shabda	----



2	Sprsha	Smooth
3	Roopa	Black , tiny, round
4	Rasa	Avishesh
5	Gandha	Avishesh

2) Standerdization of shitivarak beej churn:

All the procedures of standardization were carried out. These are as follows—

1) Ash value: 1 gm of beej churn was taken in a platinum crucible and incinerated till it was free from carbon. Then ash was cooled and measured till constant weight and ash value was 5.27%.

2) Acid insoluble and soluble ash: Ash of beej churn in total ash was boiled for 5 min with 25 ml of dilute HCL. The insoluble matter in gooch crucible with an ashless filter paper were collected then washed with hot water and ignited to constant weight, acid insoluble ash value was 1.9%.

Procedure of Subtraction from total ash to acid insoluble ash was carried out and acid soluble ash value was 2.99%.

3) Water insoluble and soluble ash: Ash of kurudu beej churn was boiled for 5 min with 25 ml of water. Then insoluble matter was collected in a gooch crucible with an ashless filter paper, washed with hot water and ignited to constant weight, water insoluble ash value was 2.9%.

Procedure of Subtraction from total ash to water insoluble ash was carried out and water soluble ash value was 1.29%.

4) pH value: It has carried out by using potentionetric meter, fitted with two electodes, one constructed of glass and sensitive to hydrogenation activity while other a calomel electrode. PH value recorded as 6.6%.

5) Alcohol soluble extractive: 2.5 gm of air dried beej churn coarsely powdered, with 100 ml of alcohol of the specified strength in a closed flask was macerated for 24 hrs. Shaking frequently during six hrs and allowed to stand for 18 hrs then filtered it, taking precaution against loss of solvent. Then filtrate was evaporated and weighted. Its value was 12.6% .

6) Water soluble extractive : Kurudubeej 2.5 gm, air dried and coarsely powdered was added to 100 ml of chloroform water in a closed flask was macerated for 24 hrs shaking frequently during six hr. and allowed to stand for 18hrs hrs then filtered it, taking precaution against loss of solvent. Then filtrate was evaporated and weighted. Its value was 4.82% .

7) Ultra violet spectrophotometry: 1 gm of beej churna was taken, 10 ml of water and 10ml of ethanol was added in it in separate test tube. Test tube was macerated for about



30-40 min then the solution was filtered and particle free filtrate was collected and taken for UV spectrum.

8) Thin layer chromatography: It was carried out using toluene : benzene solution of 9:1 concentration. Five spots were there and distance travelled by it is 1, 2, 3, 9, 14.5. R_f value was calculated. Mean R_f value was 0.34.

RESULTS

In Ayurvedic Pharmacopoeia of India, there is no reference about standardization of *Celosia argentia* seeds, therefore no standard values are available to compare. All the standardization was done in Drug Testing Laboratory, Government Ayurved College, Nanded. All the procedures repeated 3-4 times and then mean values were calculated. These values are as in table no 4.

Table 4 Results

Sr. No.	Test Performed	Values
1	Ash value	5.27%
2	Acid insoluble and soluble ash	1.9% ,2.99%
3	Water insoluble and soluble ash	2.9% ,1.29%
4	Ph value	6.6%
5	Alcohol soluble extractive	12.6%
6	Water soluble extractive	4.82%
7	Thin layer chromatography {RF value}	0.34

DISCUSSION AND CONCLUSION

Reference of *C. argentea* (*Shitivarak*) are present in *Charak Samhita* and in *Nighantus*. In *Charak Samhita* it is described in *Chikitsasthan* while describing management of *Mutrakrichya*. *Sushrutacharya* (*sutrasthan* 38, 45). and *Vagbhatacharya* (*sutrasthan* 15) has described *Shitivarak* as *kuruntika*. When all references are reviewed, there is controversy in its nomenclature. *Shitivarak* is described in *Dhanvantari Nighantu*, but in *Shodhal Nighantu*, the synonyms *sunnishannak* is used for *Shitivarak*. *Bhavaprakash Nighantu* has also described *sunnishannak* while explaining *shitivaraka* in *shakvarg*. Its leaves resembles with *changerisadrushha patra* which is different from *shitivarak*. *Sunnishannak* has latin name *Marsilea minuta* of *Rhizocarpaceae* family. So *Sunnishannak* and *Shitivarak* are the different plants. While elaborating properties of *shitivarak* according to *Sushrutacharya* and *Dhanvantari Nighantu*, *Rasa* of *shitivar* is *Kashaya* where as *Kaiyadev Nighantu* has described four *rasa* of *Shitivarak* as *Madhur*, *Tikta*, *Katu*, *Lavan*. *Dhanvantari Nighantu* has mentioned *shitivarak* as *tridosahar*.

Seeds are 4.8 subreniform, compressed 1.5 mm diameter, black, polished and shining.



Microscopic observation of the seeds could not be observed because seeds were very minute. In organoleptic test, when rasparikshan (taste) was done, no specific taste was identified. According to classical texts, morphological characters and Panchbhoutik Parikshan of plant shows the correct taxonomy. The morphological characters, percentage extractives, fluorescence study, ash analysis and the phytochemical screening of the seed are helpful for the standardization of drug. There are no references about standardization of *Celosia argentea* seeds present in API or other sources, therefore no standard values are available to compare. Results of the study of *Celosia argentea*, will be useful for authentication of the drug. These result values can be used for further studies.



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