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PUSHKARAMOOLA: A REVIEW-BASED APPROACH TO RESOLVING DIVERGENT VIEWS

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ABSTRACT

Pushkaramoola, a controversial herb, that has been widely mentioned in the classics for respiratory disorders such as Swasa, Kasa and Parshvashula. The botanical identity of Pushkaramoola has been a subject of debate largely due to its name being used as a synonym for multiple plants species in classical texts and unavailability of the raw material. This article explores the historical context and therapeutic properties of Pushkaramoola and critically reviews several plants proposed as its botanical source, including *Nelumbo nucifera, Iris germanica, Costus speciosus, Coffea travencorensis* and *Inula racemosa*. This article also discusses commonly used the substitutes such as *Saussurea lappa* and *Ricinus communis.* Based on the comparative morphological and phytochemical properties, *Inula racemosa* emerges as most widely accepted botanical identification.

Keywords: *Inula racemosa*, Pushkaramoola, Sandhigdha Dravya

INTRODUCTION

Ayurveda, the oldest Indian system of medicine and medicinal plants, form the backbone of ayurvedic pharmacology. It had developed over time through observations, experimentations and logical deductions. This science, unlike modern botany, developed its own methods of classifying and grouping medicinal plants based on their pharmacological actions and morphological characteristics. However, India's diverse geography, languages and cultures and non-standardised nomenclature rule resulted in confusions regarding its botanical identity. A major source of confusion was the attribution of identical synonym to multiple drugs as well as existence of numerous synonyms for single medical identity. Overtime additional challenges such as lack of documentation, non-availability of raw materials, dependency on substitutes, have emerged. In Ayurveda such controversial drug is called as Sandhigdha Dravya. Pushkaramoola is such a Sandhigdha Dravya, which is extensively told among Samhitas for the treatment of Swasa, Kasa and Parshvashula. The main controversy of Pushkaramoola lies on its morphological identity, unavailability of the raw material and overlapping of synonym. This drug is often confused with Kushta, *Saussurea lappa* which has similar morphological and phytochemical properties and it is classically mentioned as the Abhava Dravya (substitutes) of Pushkaramoola. Erandamoola, *Ricinus communis* is also classically mentioned as the substitutes by its phytochemical properties. *Nelumbo nucifera, Iris germanica, Costus speciosus, Coffea travencorensis* are some other drugs identified as Pushkaramoola [1]. This article aims to find resolution for divergent opinion on botanical identity of Pushkaramoola by exploring the details of drug Pushkaramoola in various Samhitas and the various plants which is being identified as Pushkaramoola

Details of Pushkaramoola from various Samhitas

According to Shabdakalpadruma, Pushkaramoola is a drug with its root resembles the root of Pushkara (lotus flower). The plant is named Pushkaramoola because its fresh root has aromatic strong odour resembling Pushakara. The dried root has camphor-like smell. Pushkaramoola is a drug that does Poshana (nourishment). Acharya Charaka has described Pushkaramoola in Hikkanigrahana Mahakashaya (decoction for hiccups), Shwasahara Mahakashaya (decoction for respiratory disorders and Madhuraskandha Dravya. The Moola (root) and Bija (seed) are taken as Prayojyanga (part used) of Pushkaramoola. It is also described as beneficial drug for Hikka, Swasa, Kasa (respiratory disorders) and specifically for Parshvashula (pain in flanks).

Synonyms

Kashmira- The plant grows in high altitude and is native to Kashmir
Padmapatra- Its leaves resemble lotus leaves
Poushkara- Habitat is cold regions/ well known in the region of Pushkara (Ajmer-Rajasthan)
Kushta bheda-Considered as variety of Kushta (*Saussurea lappa*) [2]

Its classical categorisation is shown in Table 1[3–6].
Rasa Panchaka of the drug is shown as in Table 2. [2,4–7]

Table 1: Classical categorisation of Pushkaramoola

Classical text	Category
Sushrutha samhita	Phala Varga
Charaka samhita	Swasahara, Hikkanigrahana
Ashtanga sangraha	Hikkanigrahana
Bhavaprakasha nigantu	Haritakyadi Varga
Dhanvantri nigantu	Guduchyadi Varga
Kaiyadev nigantu	Oushadi Varga
Raj nigantu	Pippalyadi Varga

Table 2: Rasa Panchaka of Pushkaramoola

Rasa	Tikta, Katu
Guna	Laghu, Tikshna
Virya	Ushna
Vipaka	Katu
Karma	Shotagna, Hikkanigrahana, Swasagna, Jwaragna, Jantughna, Pandunashanam, Deepana Pachana, Mutrajanana, Rasayana
Doshakarma	Kapha Vatahara

Figure 1: *Nelumbo nucifera*

Table 3: Comparative analysis of *Nelumbo nucifera* for identity of Pushkaramoola

Botanical source	Reasons supporting identification	Reasons against identification
Nelumbo nucifera	Synonym of Padma: Pushkaram, Ambujam, Aravinda. Synonym of Pushkaramoola: Padmapatra. 'Pushkaram' literally means lotus and moola means root. Therefore, Pushkaramoola can be root of Nelumbo nucifera. Studies of *Nelumbo nucifera* shows effect in inhibiting airway smooth muscle contraction, antiallergic activities[9–11]	The natural habitat is lake and ponds rather than high altitudes. Drug is Kaphapittahara, and sheeta veerya while Pushkaramoola is Kaphavatahara and Ushna Veerya.

Figure 2: *Costus speciosus*

Table 4: Comparative analysis *Costus speciosus* of for identity of Pushkaramoola

Botanical source	Reasons supporting identification	Reasons against identification
Costus speciosus	Synonyms of Kebuka: Kashmira, Kushta, Padmapatramula, Pushkara, Pushkarajata. Root of *Costus speciosus* is aromatic. There are few *in vitro*-studies that shows effect of *Costus speciosus* as anti-inflammatory.	The drug grows in cool, shady places with plenty of water and soil rather than high altitudes. This drug is Vata Vardaka and Sheeta veerya, while Pushkaramoola is Kaphavatahara and Ushna Veerya.

Table 5: Comparative analysis *Iris germanica* of for identity of Pushkaramoola

Botanical source	Reasons supporting identification	Reasons against identification
Iris germanica	Synonyms include Padmapushkara Root of the herb is strong aromatic and used in folklore respiratory diseases. This drug is abundant in high altitude region. Researches have established it efficacy on Swasa and Kasa.	*Iris germanica* is native to southern central Europe and was introduced to India later by 18 to 19th century as an ornamental plant, whereas Pushkaramoola is indigenous to India and has been described in classical text much earlier.[12] Other synonyms of Pushkaramoola, such as Padmapatra and Kusthabheda, cannot be correlated with the morphological characteristics of *Iris germanica*

Figure 3: *Iris germanica*
Photo courtesy: Thingnam Girija, flowers of India

Table 6: Comparative analysis *Coffea travencorensis* of for identity of Pushkaramoola

Botanical source	Reasons supporting identification	Reasons against identification
Coffea travencorensis	Vernacular name of the drug is Pushkaramulla. The root of this plant is widely used by ayurvedic practitioners and folklores practices for Vatakaphaja Vikaras	The drug is grown in parts of south India rather than north. It is only identified in late 19th century. The drug does not have any medicinal properties proved by phytochemical analysis [14].

Figure 4*: Coffea travencorensis*

Figure 5: Dry root of *Inula racemosa*

Figure 6: *Inula racemosa*

Table 7: Rasa Panchaka of *Saussurea lappa*

Rasa	Tikta, Katu, Madhura
Guna	Laghu,
Virya	Ushna
Vipaka	Katu
Karma	Swasagna, Jwaragna, Jantughna, Mutrajanana, Rasayana, Shukrashodana, Rakthashodaka
Doshakarma	Vatakaphahara

Figure 7: *Saussurea lappa*

Figure 8: Dried root of *Saussurea lappa*

Photo courtesy: Thingnam Girija, Flowers of India

Table 8: Rasa Panchaka of Pushkaramoola

Rasa	Kashaya,Madhura
Guna	Snigdha, Tikshna, Guru
Virya	Ushna
Vipaka	Madhura
Karma	Vatavyadhi, Pliharoga, Katishula, Swasa Kasa nashanam.
Doshakarma	Vatakaphahara

Figure 9: *Ricinus communis*
Photo courtesy: Tabish, flowers of India

Controversial botanical sources identified/used as Pushkaramoola

The controversy started about this drug with the concept of substitutes that was introduced by Bhavamisra and Yogaratnakara. It is described that either Kustha or Erandamula [8] may be used as the substitute of Pushkaramoola due the phytochemical similarities. Other botanical identities identified are; *Nelumbo nucifera, Costus speciosus, Iris germanica* and *Inula racemosa* due to its overlapping synonyms. *Coffea travencorensis* is a drug identified as Pushkaramoola by folklore practitioners in Kerala due to confusions in its vernacular names.

i) *Nelumbo nucifera*

Nelumbo nucifera is an aquatic herb with rose or white coloured flower, belonging to family Nelumbonaceae. Comparative analysis of *Nelumbo nucifera* for identity of Pushkaramoola is described in Table 3. The image of fresh drug is given in Figure 1.

ii) *Costus speciosus* (crepe ginger)

Costus speciosus is an herb from family Zingiberaceae called as Kebuka in Sanskrit. In Kerela it is known as Channakoova, Aanakoova or Venkottam. Due to its morphological and nomenclatural similarities, it is currently used as the substitute for Pushkaramoola. Comparative analysis *Costus speciosus* of for identity of Pushkaramoola is described in Table 4. The image of fresh drug is given in Figure 2.

iii) *Iris germanica*

Iris germanica is a species of aromatic ornamental plants in the family Iridaceae. It is also identified as Shveta Vacha or Haimavati by various scholars. It resembles to *Acorus calamus* with white red and blue flowers. Comparative analysis *Iris germanica* of for identity of Pushkaramoola is given in Table 5. The image of fresh drug is given in Figure 3.

iv) *Coffea travencorensis*

Coffea travencorensis [13] is a wild coffee verity an undershrub native to certain regions of Kerala, Karnataka and Tamilnadu. It belongs to the family of Rubiaceae. Formerly abundant herb in its habitat the specious has become rare due to its extensive cultivation of other coffee specious like *Coffea arabica*. Comparative analysis *Coffea travencorensis* of for identity of Pushkaramoola is described in Table 6. The image of fresh drug is given in Figure 4.

v) *Inula racemosa*

Inula racemosa is the most accepted botanical identity of Pushkaramoola by its habitat morphological and pharmacological features. It is a flowering plant from the family of Asteraceae. It is most accepted identity of Pushkaramoola due to its characteristic odour, and medicinal properties. [15]

Habitat and distribution of *Inula racemosa*

It is distributed across the Himalayan regions, China, Europe, and parts of North America. It thrives predominantly in the alpine vegetation of cold deserts. However, this perennial herb is classified as critically endangered due to the extensive exploitation of its natural habitat.

Morphological characteristics

It is a tall stout herb (0.3-1.5M). Stem is rough, grooved and tomentose.

Leaves: they are simple alternate, crenate, leathery, rough above and densely tomentose below, radical or cauline. Upper leaves are lanceolate and stem clasping. Radical leaves ae broad and elliptical shaped. The cauline leaves are smaller oblong and semi amplexicaule.

Flowers: yellow, very large 3.8 to 5cm in diameter many heads and grows on apical spike like cluster.
Fruit: reddish slender, hairless.
Roots: Root stock are branched. Fresh root is irregularly fusiform, brownish externally and yellowish white internally. Dry roots are dark brown, irregularly wrinkled, camphor like odour and bitter in taste.

Chemical constituents

Essential oil from root contain- Sesquiterpenes, Heptadeca-1,8,11,14-Tetraene (Aplotaxene), Phenylacetonitrile, Alantolactone, Isoalantolactone, Neo-Alantolactone, Root also contain Inunol, Inuloids, Beta-Sitosterol, Gallic Acid.

Phytochemical properties

The oil obtained from the roots contain Alantolactone (ALT) and Isoalantolactone (IALT) show promising potential as anti-cancer agents in invitro studies. ALT and helenin possessed a pronounced inhibitory effect against pathogenic bacteria S. aureus and Mycobacterium tuberculosis. IALT protect against mast cell degranulation and its anti-histaminic activity makes the drug anti-asthmatic and anti-allergic. Recent studies prove the hepatoprotective activity by decreasing the Serum glutamate oxaloacetate transaminase (SGOT), serum glutamate pyruvate transaminase (SGPT), alkaline phosphatase (ALP) and bilirubin levels. [16,17]

Sesquiterpene lactones displayed a wide range of biological properties including antifungal, anti-inflammatory, and antibacterial activities also it shows analgesic, hepatoprotective, antiallergic, antioxidant, anti-asthmatic, adaptogenic, adrenal beta blocking and hypoglycemic action.

Inulin and roylene which helps in decreasing the lipid and cholesterol of blood samples and stimulates the peristaltic movement of intestine. The dried root together with the foliage is used as an anti-spasmodic, hypersensitive and curing heart and liver diseases and respiratory tract disorders. It enhances insulin sensitivity. The image of fresh drug is given in Figure 5,6.

Due to habitat destruction, the availability of *Inula racemosa* is limited. Kushta and Erandamoola are mentioned as the substitutes of Pushkaramoola by Yogaratnakara. These drugs have a close similarity to the phytochemical properties and Rasapanchaka of Pushkaramoola. In disease conditions where Vata predominance is marked with marked Apana Vayu Dushti, Erandamoola can be the suitable substitute. Conversely, in conditions charactersied by greater Kapha Dushi and need more Lekhana (scraping) action Kushta can be the substitute.

A) *Saussurea lappa* C B Clarke/ Kushta

Kushta is used as substitute for Pushkaramoola due to resemblance in its properties and its morphology. Synonyms of this drug includes Kashmiraja since its natural habitat is Kashmir. Charaka had categorised it in Lekhaniya, Asthapanopaga Gana (drug that has scraping nature) while Sushrutha mention it in Eladi Varga (group of drugs with aroma it reduces the vata and Kapha). Its Karma closely resembles with those of Pushkaramoola. Rasa Panchaka of the drug is mentioned in Table 7. [18,19]

Saussurea costus/ Saussurea lappa C B Clarke of family Asteraceae, is widely accepted as Kushta. It is a critically endangered herb due to habitat destruction and indiscriminate collection for its root. Its trade is strictly prohibited under foreign trade development act 1992. Following are the morphological and phytochemical properties of *Saussurea lappa*. The phytochemical properties have a close resemblance with properties of *Inula racemosa*.

Habitat and Morphological similarities

It is an erect herb endemic to valley of Kashmir and other northern mountain region at altitude of 2500-4000m of Pakistan and India. It has robust, erect perennial with stout stem up to 2 m height. Its roots are stout, it can grow up to 60cm long, have penetrating characteristic odour, that renders differentiation between inula and saussurea roots challenging. Their morphological resemblance further complicates the identification. [18]

Chemical constituents

Sesquiterpenes, flavonoids, phytosterol alkaloids, terpenes, antraquinones are the major active components. The major sesquiterpenes are dehydrocostuslactone, dihydrodehydrocostus lactone, isodehydrocostuslactone, costunolide and saussurealdehyde.

Phytochemical similarities

Inula racemosa and *Saussurea lappa* contain many similar phytochemicals. They both contain sesquiterpene lactones which are involved in the anti-inflammatory, bronchodilation and anti-asthmatic activities. Both has flavonoids that are responsible for the antioxidant and anti-microbial activity. The polyphenols of both drug ae linked to the antidiabetic property. [19,20] It also improves bronchodilation making it anti asthmatic. Image of fresh drug and dried root of *Saussurea lappa* is given in Figure 7, 8.

B) *Ricinus communis Linn./*Erandamoola

Erandamoola is used as substitute for Pushkaramoola due to its resemblance in the Rasapanchaka and other pharmacological properties. It does not share any common morphological feature. *Ricinus communis* of family Euphorbiacea is the botanical identity of Erandamoola. [20] Rasa Panchaka of Erandamoola are described below in Table 8. [21]

Chemical constituents

Major chemical constituents are flavones (Kaemferol-3-o-beta-Rutinoside, quercetin, glucopyranoside), alkaloids (ricinine, N-Demethylricinine), Glycosides (ricinoleic, Isoricinoleic, lipases), Phenolic compounds (Gallic acid, ellagic acid, rutin) sesquiterpenoid (linoleic, oleic, stearic) and many fatty acids. [22]

Phytochemical similarities

Both *Inula racemosa* and *Ricinus communis* share several flavonoids, glycosides, alkaloids, steroids and saponins, which are known for its antioxidant, anti-inflammatory activity. It also contributes to the smooth muscle relaxation and bronchodilation activity. [22,23] The phenoilic and glycosides attributed to their respective antifungal and antimicrobial activity. Image of fresh drug of *Ricinus communis* is given in Figure 9.

CONCLUSION

Plant species like *Nelumbo nucifera, Iris germanica, Costus speciosus, Coffea travencorensis* exhibit morphological characteristic and therapeutic properties that differ markedly from those attributed to Pushkaramoola. Therefore, they cannot be considered as its potential identity. In contrast, species like as *Saussurea lappa* and *Ricinus communis* can be considered as its substitutes as they share some comparable phytochemical properties and therapeutics attributes. Among the various plants proposed as Pushkaramoola, *Inula racemosa* is the most accepted identification, supported by its characteristic odour, distinct morphological feature, specific habitat and well documented therapeutic properties, all of which closely matches to the classical descriptions and therapeutic effects of Pushkaramoola.

REFERENCES

1. R Vasudevan Nair, 1st edition, Controversial Drug Plants, Hyderabad; universities press private limited; p 182 .
2. Prof. K.R.Srikanta Murthy, 2nd edition, Bhavaprakasa of Bhavamisra; Krishnadas Academy, Varanasi; Purvakhanda, Guduchyadi Varga shloka 60-66 ; p 236.
3. Bhavamisra, Bhavaprakasha Nighantu. reprint 2004. Varanasi; Chaukhamba Bharati Academy; p 64

4. Dr.S Kamat, 1st edition, Dhanvantari Nighantu, Varanasi; Chaukhamba Sanskrit Pratisthan. p 23.
5. Priyavrata Sharma, 1st edition, Kaiyadeva Nighantu; Varanasi; Chaukhamba Orientalia; p 244 .
6. Pandit Narahari,3rd edition Rajanighantu, Varanasi; Chaukhamba Krishnadas Academy; p 165
7. The Ayurvedic Pharmacopoeia of India. 1st edition; Part 1; vol.1; p 410
8. Vaidya Srilakshmipathi Shastri. 7th edition, Yogaratnakara, Varanasi; Chaukhamba Sanskrit Sansthan; p 271.
9. Sahana A, (Das) Sahana R. *Nelumbo nucifera* (Lotus): A Review on Ethnobotany, Phytochemistry and Pharmacology. Int J Pharm Res Appl [Internet]. 2025 Jan [cited 2025 Nov 11];10(1):630–42. Available from: https://ijprajournal.com/issue_dcp/Nelumbo%20Nucifera%20Lotus%20A%20Review%20on%20Ethnobotany,%20Phytochemistry%20and%20Pharmacology.pdf
10. Kaneyasu M, Nagata M, Ikeda H, Ohnuki K, Shimizu K. Anti-allergic activity of lotus root (*Nelumbo nucifera*) powder in TDI-sensitized nasal allergy model mice. Food Agric Immunol [Internet]. 2019 Jan 1 [cited 2025 Nov 11]; Available from: https://www.tandfonline.com/doi/abs/10.1080/09540105.2019.1651255
11. Yang X, Xue L, Zhao Q, Cai C, Liu QH, Shen J. *Nelumbo nucifera* leaves extracts inhibit mouse airway smooth muscle contraction. BMC Complement Altern Med [Internet]. 2017 Mar 20 [cited 2025 Nov 11];17:159. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC5359798/
12. Flowers of India [Internet]. [cited 2025 Oct 18]. Available from: https://www.flowersofindia.net/risearch/search.php?query=iris+germanica&stpos=0&stype=AND
13. Herbarium JCB [Internet]. [cited 2025 Aug 8]. Available from: https://indiaflora-ces.iisc.ac.in/FloraPeninsular/herbsheet.php?id=8369&cat=7
14. Jamna J, Balakrishnan R, Ramakrishnan P, Sarala S, Jolly CI. Comparative pharmacognostic study of *Inula racemosa* Hook. f. and its adulterant *Coffea travencorensis* Wight & Arn. 2012;3(3):386
15. Indian Medicinal Plants a compendium of 500 plants. reprint 2004. Vol. 3. Orient Longman; 214 p.
16. (PDF) Pushkaramoola in Ayurvedic Medicine-Bridging Tradition with Scientific Evidence. ResearchGate [Internet]. 2024 Oct 22 [cited 2025 Feb 24]; Available from: https://www.researchgate.net/publication/381202181_Pushkaramoola_in_Ayurvedic_Medicine-Bridging_Tradition_with_Scientific_Evidence
17. Thakur R, Dhiman D, Singh S, Chauhan R. Distribution, Challenges, and Conservation of an Industrially Important Medicinal Plant, Pushkarmool (*Inula racemosa* Hook. f.). In: Nandave M, Joshi R, Upadhyay J, editors. Ethnopharmacology and OMICS Advances in Medicinal Plants Volume 2: Revealing the Secrets of Medicinal Plants [Internet]. Singapore: Springer Nature; 2024 [cited 2025 Feb 24]. p. 93–115. Available from: https://doi.org/10.1007/978-981-97-4292-9_6
18. Indian Medicinal Plants a compendium of 500 plants. reprint 2004. Vol. 5; Orient Longman; 76 p.
19. Prof. K.R.Srikanta Murthy, 2nd edition, Bhavaprakasa of Bhavamisra, Vol. 1; Varanasi Krishnadas Academy; Purvakhanda, Haritakyadi Varga; shloka 172; p 186.
20. The Ayurvedic Pharmacopoeia of India; 1st edition. Part 1; vol. 1; p 34
21. Prof. K.R.Srikanta Murthy, 2nd edition, Bhavaprakasa of Bhavamisra. Vol. 1; Varanasi Krishnadas Academy; Purvakhanda; Guducyadi varga; shloka 60-66; p 236.
22. Abomughaid MM, Teibo JO, Akinfe OA, Adewolu AM, Teibo TKA, Afifi M, *et al.* A phytochemical and pharmacological review of *Ricinus communis* L. Discov Appl Sci [Internet]. 2024 June 8 [cited 2025 Oct 15];6(6):315. Available from: https://doi.org/10.1007/s42452-024-05964-5
23. Jln S, Nesari TM, Rajendra H. Pharmacognostic studies on the substitutes of Pushkaramula (*Inula racemosa*). 2014; 4(1):1-5

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