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Medicinal Plants in Bhakti and Ritikal Poetry: A Theoretical and Conceptual Study

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ABSTRACT: This paper approaches the presence of medicinal plants in Bhakti and Ritikal Hindi poetry through a theoretical and conceptual lens rather than through numerical data. Drawing on the poetic traditions of Tulsidas, Kabir, Surdas, Jayasi, Rahim and Raskhan, it asks in what form plant knowledge enters poetry and how that knowledge should be read as a knowledge tradition. The study joins three theoretical streams: ethnobotany, ecocriticism, and the conceptual debate on the Bhakti movement. On this basis it proposes four forms of plant knowledge in poetry: symbolic, practical, ecological and medicinal. It also sets out a five-level model of pharmacological verification, which makes explicit the sequence from a literary hint to modern clinical evidence. Section 6 then offers illustrative verses from Tulsidas, Rahim, Raskhan and Bihari, with English renderings, to show how medicinal plant knowledge actually hides in wordplay, moral exempla, sacred landscape and narrative. The paper argues that a poetic hint is not proof but a source of hypotheses, and that its scientific value can be settled only through multi-level verification. It closes with suggestions for conservation, policy and interdisciplinary research.

1. INTRODUCTION

The relationship between humans and plants is as old as human civilisation itself. In food, healing, shelter and ritual, plants have shaped community life at every level. The World Health Organization has recognised traditional medicine as an important basis of health care for millions of people and has stressed the need to understand it systematically (World Health Organization, 2013). Most studies collect this knowledge directly from farmers, healers (*vaidyas*) or communities. But Indian society holds a second, less discussed archive of this knowledge: poetry.

In the Bhakti and Ritikal periods of Hindi poetry (roughly the fifteenth to the eighteenth centuries), poets repeatedly used trees and plants such as neem, tulsi, sandalwood, mango and lotus as similes, metaphors, illustrations and maxims. The natural question is whether these uses are merely figures of speech, or whether a social memory of plant knowledge is also hidden behind them. The question cannot be answered with a plain yes or no, because poetry is not a textbook of botany; it is a composition of language, rhythm and ideology.

The first argument of this paper is that the mention of a plant in poetry stands on a rung between symbol and use. The second is that this ladder cannot be read through literary criticism alone or botany alone; it needs an interdisciplinary outlook (Albuquerque et al., 2014). The third is that regarding Bhakti only as a spiritual movement is incomplete, because Bhakti poetry builds its language from the everyday things of community life (Hawley, 2015).

The significance of the study lies at three levels. Theoretically, it widens the range of sources available to ethnobotany. Practically, it indicates the order in which clues drawn from poetry should be tested. Culturally, it helps identify the knowledge stored in our own language and tradition. The scope of the study is limited to six poetic traditions (Tulsidas, Kabir, Surdas, Jayasi, Rahim and Raskhan), with Bihari added in Section 6 as a supplementary Ritikal illustration, and no clinical claims are made about any specific plant. The limits and cautions of verification are stated separately (Heinrich et al., 2018).

2. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

Ethnobotany is, at root, the study of how human communities recognise, classify and use the plants of their surroundings. Its traditional methods are interviews, surveys and field observation, but historical and documentary sources are also accepted alongside them (Albuquerque et al., 2014). Poetry is one such documentary source, with the peculiarity that it is written with feeling rather than as fact. It therefore cannot be trusted like a scientific inventory.

A complementary direction is pharmacognosy, which studies the source, identification and chemical composition of drugs obtained from plants. Heinrich et al. (2018) give a broad framework for this field and point out that not every traditional claim stands up to scientific evidence. Jamshidi-Kia et al. (2018) view the history of medicinal plants as a continuous flow, with many stages from ancient experience to modern drug development. Newman and Cragg (2020) show that natural products have been the source of a large share of new drugs, and Atanasov et al. (2021) underline both the promise and the challenges of these products.

The third stream is ecocriticism. According to Garrard (2012), nature in literature should be treated as an active interlocutor rather than a background, which makes it possible to re-read the role of plants in a text. Krishna and Amirthalingam (2014) place India's tradition of sacred plants in its cultural context, which helps explain why some plants return again and again in poetry.

The fourth stream concerns the concept of the Bhakti movement. Hawley (2015) has argued that the "Bhakti movement" is a retrospective construction, which later historiography strung onto a single thread. This means that Tulsi, Kabir, Sur and Jayasi should not be poured into one mould. Behl's (2012) study is useful for understanding the Indian Islamic romance (*premakhyan*) tradition to which poets such as Jayasi belong.

Table 1: Theoretical frameworks of this study and their use

Theoretical stream	Core proposition	Use in this study	Source
Ethnobotany	Community relationship with plants and the knowledge built on it	Reading poetry as a documentary source	Albuquerque et al. (2014)
Pharmacognosy	Scientific testing of traditional claims is necessary	Fixing the order of verification	Heinrich et al. (2018)
Ecocriticism	Nature has an active role in the text	Understanding the role of plants in poetry	Garrard (2012)
Concept of the Bhakti movement	The movement is a later theoretical construction	Reading each poetic tradition separately	Hawley (2015)
Premakhyan tradition	Indian Islamic poetry has its own literary tradition	Understanding Jayasi's distinctive tradition	Behl (2012)
Tradition of sacred plants	Religious-cultural relationship with plants	Recognising the symbolic value of plants	Krishna & Amirthalingam (2014)

The combination of these six streams forms the theoretical basis of this study. Taken separately, each is incomplete: literary criticism does not see the medicinal side of a plant, and pharmacology does not see the linguistic nature of poetry.

3. RESEARCH METHODOLOGY AND CONCEPTUAL BASIS

This is a theoretical study of a descriptive and interpretive kind. No survey, experiment or statistical analysis is used. The basis of the study is a conceptual review of the published research literature, and its aim is to present a reading framework that later researchers can apply to poetic texts.

3.1 Research questions

Three questions guide this research. First, what is the role of nature and plants in the Bhakti and Ritikal poetic traditions? Second, in what forms does plant knowledge appear in poetry? Third, how should the pharmacological value of such hints be assessed?

3.2 Nature of the source material

The source material has three layers. At the first layer are the poetic works of the six traditions, which differ from one another in genre and language. At the second layer are theoretical studies of the history of Hindi literature and of the Bhakti movement. At the third layer are published review articles and policy papers on medicinal plants. The three are kept at separate levels so that poetic evidence and scientific evidence do not blur into each other.

3.3 Steps of analysis

1. Gathering the three theoretical streams from the literature review (Section 2).
2. Comparative description of the distinctive nature-consciousness of the poetic traditions (Section 4).
3. A classification scheme for the forms of plant knowledge (Section 5).
4. Textual illustration of medicinal plants in selected verses, with English renderings (Section 6).
5. Fixing the levels of verification (Section 7).
6. Discussion in the context of conservation, policy and research directions (Section 8).

3.4 Conceptual cautions

Three cautions are an integral part of the study. First, the appearance of a plant's name in a poetic text will not be taken as proof of its medicinal property. Second, popular lines and line-collections often carry textual variants and uncertainty of authorship; every example must therefore be checked against a standard text. Third, the study of medicinal knowledge is in no way advice on self-medication; special care is needed with poisonous or insufficiently studied plants (Heinrich et al., 2018; Jamshidi-Kia et al., 2018).

4. NATURE AND PLANT CONSCIOUSNESS IN THE POETIC TRADITIONS

Nature does not appear in the same way in Bhakti and Ritikal poetry. Sometimes it is the setting of an ideal life, sometimes a source of worldly illustration, sometimes the witness of love and separation. Following Hawley's (2015) argument, it is necessary to read these traditions apart from one another; only then does it become clear to which poetic purpose a hint of plant knowledge is tied.

4.1 Comparison of six traditions

In Tulsidas, nature appears as a narrative background, where forest and trees create an atmosphere of propriety (*maryada*) and austerity. In Kabir's tradition of Sant poetry, images of plants and farming are a ladder from ordinary life to spiritual truth. In the Krishna poetry of Surdas and Raskhan, the groves, trees and creepers of Braj are part of the environment of love. In Jayasi's romance, gardens, flowers and seasonal change deepen the feeling of separation and union (Behl, 2012). In Rahim's maxim-couplets, trees, ponds and fruit are illustrations of benevolence and humility.

Table 2: Main tendencies of nature-consciousness in the poetic traditions (conceptual comparison)

Poetic tradition	Poetic stream and language	Tendency of nature-consciousness	General use of plants
Tulsidas	Rama devotion; Awadhi	Environment of propriety and ideal	Forest description and hints of service

Poetic tradition	Poetic stream and language	Tendency of nature-consciousness	General use of plants
Kabir	Nirguna Sant path; *sadhukkadi*	Spiritual insight from everyday conduct	Plants in illustrations and *ulatbansi* (inverted speech)
Surdas	Krishna devotion; Braj	Depiction of parental love and the erotic	Groves, trees and creepers
Jayasi	Sufi romance; Awadhi	Cyclic seasons with separation and reasoning	Gardens, flowers, fruit and seasonal description
Rahim	Maxim and devotional couplets; Awadhi-Braj	Worldly wisdom and experiential insight	Illustrations of benevolence and humility
Raskhan	Krishna devotion (*ritimukt*); Braj	Love and intimacy with the land of Braj	Emotional mention of groves and trees

This comparison indicates tendencies; it is neither a count nor a proportion. Within a single poet, tendencies may change from one work to another.

4.2 Three cultural sources

Three sources of plants entering these poetic traditions can be understood. The first is folk experience: plants that farmers, cowherds and healers saw every day descended into similes. The second is religious-cultural memory: some plants are linked to worship and fasting and therefore return repeatedly in poetry (Krishna & Amirthalingam, 2014). The third is medical practice: general knowledge of treating ailments with plants at household level was passed down the generations and is dissolved into poetic language. Identifying these three sources separately is not in itself sufficient, but it is the first condition of a sound reading.

4.3 The ecocritical view

Seen through Garrard's (2012) framework, the nature-vision of each poetic tradition reflects the environmental understanding of its society. The plant that a poet gives space in a poem also indicates its use and esteem in that society. In this light poetry can also be read as evidence of human sensibility towards nature, and this reading becomes the basis for further study.

5. FORMS OF PLANT KNOWLEDGE IN POETRY

The mention of a plant in poetry does not do just one job. Sometimes it becomes a symbol of meaning, sometimes a hint of use, sometimes a picture of the setting, and sometimes a memory of healing. It is necessary to separate these roles because each form requires a different method of verification. This paper proposes four forms.

5.1 The symbolic form

In this form the plant enters because of its cultural meaning: tulsi has been regarded as a symbol of purity, the lotus of non-attachment, and sandalwood of coolness and good company. Here the cultural image of the plant matters more than its actual properties (Krishna & Amirthalingam, 2014).

5.2 The practical form

Here the plant enters because of its use: timber, food, shade, the toothbrush twig (*datun*) and fragrance. In poetry it often appears as a glimpse of everyday life, and it gives an idea of which plants were part of a society's daily routine.

5.3 The ecological form

In this form the plant is part of the setting. The description of forests, groves, vegetation at the edge of a pond and seasonal change shows the poet's ecological understanding (Garrard, 2012).

5.4 The medicinal form

In this form the plant is mentioned as a hint of treatment, dietary restraint or recovery. This is the form whose verification is both the most necessary and the most difficult, because in poetry it often comes within the short compass of a line and its context remains incomplete. Newman and Cragg (2020) show that the tradition of drug discovery from natural products is long; folk hints therefore cannot be dismissed, but neither can they be taken as proof.

Table 3: Four forms of plant knowledge in poetry and their methods of verification

Form	Why the plant appears in the poem	Nature of example	Method of verification
Symbolic	Cultural meaning	Tulsi = purity; lotus = non-attachment	Matching with cultural and religious context
Practical	Daily use	Timber, shade, fruit	Ethnobotanical study and matching with the community
Ecological	Part of the setting	Garden, forest, pond-side	Textual analysis based on ecocriticism
Medicinal	Hint of treatment	Reference to colds, digestion, etc.	Traditional medical texts and laboratory studies

The benefit of this classification is that several forms of a single plant can be recognised at once. For example, tulsi is both a symbol and a medicine. Recognising this duality avoids the misunderstanding that every plant in poetry is a prescription. In the case of tulsi, Cohen's (2014) review is an example of this duality: it looks at both the plant's traditional place and its medicinal study.

6. MEDICINAL PLANTS IN VERSE: ILLUSTRATIVE TEXTUAL READINGS

6.1 Purpose and scope

The preceding sections argued at the level of theory. This section descends to the text. It presents verse-readings from Tulsidas, Rahim and Raskhan, three of the six traditions studied, and from Bihari, whose *Satsai* is the central text of the Ritikal period. Bihari is added as a supplementary voice because his couplets work through exactly the kind of plant wordplay (*shlesha* and *yamaka*, punning on one word with two meanings) that the framework must be able to handle. For each verse the original is given, then a transliteration, an English rendering and a note on the plant or plants involved. The renderings are the author's own and aim at fidelity to sense rather than to metre. Verse texts follow widely circulated anthology versions; as Section 3.4 warns, variants exist, and each line should be collated with a critical edition before it is cited as evidence.

6.2 Bihari: the opening couplet of the Satsai and a herbal reading

मेरी भव-बाधा हरौ, राधा नागरि सोइ।

जा तन की झाँईं परैं, स्यामु हरित-दुति होइ॥

Merī bhava-bādhā harau, Rādhā nāgari soi.

Jā tana kī jhāṁī parai, syāmu harita-duti hoi.

Devotional rendering: May that clever Radha remove the obstacles of my worldly existence, the reflection of whose body, falling on dark Krishna, turns his dusky hue to a fresh, green lustre.

The standard textbook commentaries consulted gloss *bhava-badha* as worldly affliction, *nagari* as clever, *jhaiN* as reflection or shadow, and *harit* as either green or delighted. In this reading the couplet is a prayer to Radha, and the colour play is that of Krishna's blue-dark body taking on the yellow-gold glow of Radha's body and so appearing green.

A second, folk-herbal reading takes the three words of the first line as plant names: *Radha* as *sonth* (dry ginger, *Zingiber officinale*), *Nagari* as *nagarmotha* (nutgrass, *Cyperus rotundus*), and *Soi* as *soya* (Indian dill, *Anethum graveolens* var. *sowa*). The three are said to be pounded into a powder and applied to the face, whereupon even a dark complexion becomes fair. The second line then supports the reading by a pun: *syamu harit-duti hoi* ("the dark turns bright") describes exactly the cosmetic outcome claimed. The reading belongs to a folk tradition of exegesis and is not the one found in the commentaries consulted. It is nevertheless a good example of the medicinal form (Section 5.4): the plant knowledge is not stated but concealed in a pun, and could never be found by counting plant names.

What can be said of these plants at the levels of the verification model (Section 7)? Ginger has a large body of laboratory and clinical literature on antioxidant, anti-inflammatory and anti-nausea activity (Mao et al., 2019). Nutgrass is a recognised Ayurvedic plant with reported anti-inflammatory, antioxidant and many other activities, though its reviewers state that clinical activity and safety remain to be confirmed (Peerzada et al., 2015). Dill is an old Indian medicinal herb and spice, used chiefly as a carminative, stomachic and diuretic (Jana & Shekhawat, 2010). None of these reviews reports evidence for lightening of skin colour. The cosmetic claim therefore stays at the first two levels (documentary and traditional), and even the plant identification at the first level is contested, because it rests on an interpretation of the pun rather than on the text.

6.3 Bihari: the two senses of *kanak*

> कनक कनक ते सौ गुनी, मादकता अधिकाय।
>
> वा खाये बौराय नर, वा पाये बौराय॥
>
> *Kanaka kanaka te sau gunī, mādakatā adhikāya.*
>
> *Vā khāye baurāya nara, vā pāye baurāya.*
>
> *Rendering:* "Kanak" is a hundred times more intoxicating than "kanak": one drives a man mad when eaten, the other when obtained.

Here *kanak* means both gold and datura, a plant of the genus *Datura*. The couplet is a widely taught example of *yamaka*. It is also an example of textual caution (Section 3.4): the second line circulates in several variants, and a reference source consulted ascribes the couplet to Rahim, although textbooks attribute it to Bihari. For this paper, the importance of the couplet is that it records common knowledge of a plant that is at once medicinal and poisonous. *Datura* contains tropane alkaloids such as atropine, scopolamine and hyoscyamine, is credited with both toxic and medicinal properties, and its consumption may produce severe anticholinergic toxicity (Sharma et al., 2021). The poet's "madness from eating" thus matches a chemical fact (Level 3), but the couplet gives no therapeutic hint at all. It illustrates why the model forbids reading a plant's mention as a recommendation.

6.4 Rahim: sandalwood and the snake

> जो रहीम उत्तम प्रकृति, का करि सकत कुसंग।
>
> चंदन विष व्यापत नहीं, लिपटे रहत भुजंग॥
>
> *Jo Rahīma uttama prakṛti, kā kari sakata kusaṅga.*
>
> *Candana viṣa vyāpata nahīṁ, lipaṭe rahata bhujaṅga.*
>
> *Rendering:* Says Rahim, what can bad company do to one of noble nature? Poison does not spread in the sandalwood, though snakes stay coiled around it.

The plant is sandalwood (*Santalum album*). The couplet is a moral exemplum and belongs to the symbolic form: it draws on the cultural image of sandalwood as cool, fragrant and unspoiled. That image rests on a body of everyday knowledge, since sandalwood paste has long been applied to the skin to cool it, and sandalwood oil has since been reviewed as a botanical therapeutic in dermatology (Moy & Levenson, 2017). But the review validates only the dermatological use of the oil, at the clinical level; it does not validate the poet's belief about poison and the snake, which is figurative. This is the duality of Section 5 in its clearest form: one plant, one couplet, a symbolic function in the poem and a separate medicinal literature outside it.

6.5 Raskhan: *karil* and *kadamb*

या लकुटी अरु कामरिया पर राज तिहूँ पुर को तजि डारौं।

आठहुँ सिद्धि नवौ निधि के सुख नंद की गाइ चराइ बिसारौं॥

रसखान कबौं इन आँखिन सौं, ब्रज के बन बाग तड़ाग निहारौं।

कोटिक ए कलधौत के धाम करील के कुंजन ऊपर वारौं॥

Yā lakuṭī aru kāmariyā para rāja tihuṁ pura ko taji ḍāroṁ.

Āṭhahuṁ siddhi navauṁ nidhi ke sukha Naṁda kī gāi carāi bisāroṁ.

Rasakhāna kabauṁ ina āṁkhinha sauṁ, Braja ke bana bāga taṛāga nihāroṁ.

Koṭika e kaladhauta ke dhāma karīla ke kuñjana ūpara vāroṁ.

Rendering: For this staff and this little blanket I would give up the kingdom of the three worlds; grazing Nand's cows, I would forget the joys of the eight powers and nine treasures. Raskhan says: when shall I behold with these eyes the woods, gardens and ponds of Braj? Ten million palaces of gold I would sacrifice for the thickets of *karil*.

जौ खग हौं तो बसेरो करौं मिलि कालिंदी-कूल-कदंब की डारन॥

Jau khaga hauṁ to basero karauṁ mili Kāliṁdī-kūla-kadaṁba kī ḍārana.

Rendering: If I am to be a bird, let me make my nest among the branches of the *kadamb* on the bank of the Kalindi.

Raskhan names no remedy. His two trees are chosen for the sacred landscape of Braj, and in the framework they belong to the ecological and symbolic forms. Yet both are plants with a medicinal literature. *Karil* is *Capparis decidua*, a desert shrub whose traditional uses are reviewed as expectorant, carminative, digestive and anthelmintic, among others, and for which many pharmacological activities have been reported (Nazar et al., 2020). *Kadamb* is *Neolamarckia cadamba*, a tree used in folk medicine for fever, skin disease, diarrhoea and eye inflammation, whose reviewers say that toxicity and pharmacology need further study to confirm the ethnomedicinal claims (Pandey & Negi, 2016). The case is instructive in a different way from the others. The medicinal dimension is here latent, not intended: it is discovered only when the poetic plant is identified and laid beside the scientific literature, which is precisely the ladder of verification proposed in Section 7.

6.6 Tulsidas: *sanjivan*, the life-restoring herb

लाय सजीवन लखन जियाए।

श्रीरघुबीर हरषि उर लाए॥

Lāya sajīvana Lakhana jiyāe.

Śrī Raghubīra haraṣi ura lāe.

Rendering: Bringing the life-restoring herb, you revived Lakshman; and Raghubir, delighted, clasped you to his heart.

This couplet from the *Hanuman Chalisa*, traditionally ascribed to Tulsidas, recalls the episode in which Lakshman falls senseless in battle and Hanuman fetches the herb named by the physician Sushena. Tulsidas treats the episode in the *Kavitavali* as well, where the arrival of Hanuman with the *sanjivani* herb turns lament into martial vigour. The episode is one of the best-known medicinal moments in Hindi poetry. It also shows the limit of the method. Retellings of the story differ on the name of the herb and the mountain, and no particular plant has been established as the *sanjivani*. At the first level of the model (documentary identification) the case therefore fails, because no plant can be identified. What the episode preserves is a social memory of the *vaidya* (physician) and of the belief that a single herb can restore life: a cultural fact about medicine, not a pharmacological one.

6.7 What the readings show

Table 4 summarises the five readings. They bear out the central argument of this paper in three ways. First, medicinal plant knowledge in this poetry is rarely stated; it hides in wordplay (Bihari), in the moral exemplum (Rahim), in sacred landscape (Raskhan) and in narrative (Tulsidas). A simple count of plant names would miss most of it, and it takes close reading, the kind that ecocriticism and ethnobotany practise together, to find it. Second, in none of the cases does the poem itself supply the evidence. Where the plant can be identified, the evidence lies in the pharmacological literature; where it cannot, as with the *sanjivani*, the poem remains cultural testimony only. Third, the readings show the range of hazards the model must guard against: contested interpretation (the herbal reading of the Satsai couplet), poisonous plants (*Datura*), figurative belief (sandalwood and poison), and unidentifiable plants (*sanjivani*). These are examples chosen to illustrate the framework, not a survey; a corpus-based study of each poet's whole work remains the next step (Section 9).

Table 4: Selected verses, plants and the highest defensible level of verification

Poet and verse	Plant(s) named or implied	Main form (Section 5)	Highest defensible level (Section 7)
Bihari, *Satsai* 1 ("*Meri bhav-badha haran*")	Dry ginger, nutgrass, dill (folk-herbal reading only)	Medicinal, concealed in a pun	Levels 1–2, and contested; skin-lightening claim has no support in the reviews consulted
Bihari, "*Kanak kanak te sau guni*"	Datura (*kanak*)	Medicinal and toxic	Level 3 (alkaloid content); the verse gives no therapeutic hint
Rahim, "*Jo Rahim uttam prakriti*"	Sandalwood (*chandan*)	Symbolic	Level 1; dermatological oil studied separately (Level 5), but the poet's belief is figurative
Raskhan, *karil* and *kadamb* savaiyas	*Karil* (*Capparis decidua*), *kadamb* (*Neolamarckia cadamba*)	Ecological and symbolic, with latent medicinal dimension	Levels 1–4 through reviews of each plant; none tied to the verse
Tulsidas, *Hanuman Chalisa* and *Kavitavali*	*Sanjivani* herb	Medicinal (narrative)	Level 1 not met: no plant identified

7. A THEORETICAL MODEL OF PHARMACOLOGICAL VERIFICATION

The scientific value of a poetic hint is not settled in a single stroke. According to Heinrich et al. (2018), a traditional claim must pass through several stages: first its identification, then chemical composition, followed by laboratory and clinical trials. Adapting this sequence to poetry, a model of five levels can be built.

7.1 The five-level model

The first level is documentary: the correct identification of which plant and what hint a line of poetry contains. The second level is matching with traditional medical texts. The third level is chemical identification, that is, whether the plant has constituents that could plausibly have an effect. The fourth level is laboratory study, where the effect on cells or organisms is observed. The fifth and most difficult level is clinical trial on humans. The more levels a claim passes, the more its credibility rises.

Table 5: The five levels of verification, with examples from the review literature

Level	Nature of verification	Example from review literature	Main limitation
1. Documentary	Correct identification of the plant in the poem	Krishna & Amirthalingam (2014)	A poetic hint does not prove treatment
2. Traditional medicine	Matching with Ayurveda and similar texts	Ayyanar & Subash-Babu (2012), jamun	The evidential level of the texts is itself limited
3. Chemical	Identification of active constituents	Imran et al. (2017), mango; Sharma et al. (2017), lotus; Mukherjee et al. (2013), cucumber	Presence of a constituent does not prove an effect
4. Laboratory (preclinical)	Effect on cells and organisms	Alzohairy (2016), neem; Haro-González et al. (2021), clove; Muhammad et al. (2015), Alhagi	Direct applicability to humans is uncertain
5. Clinical	Studies on humans	Cohen (2014), tulsi; Moy & Levenson (2017), sandalwood oil	Studies are often small and limited

7.2 Review literature as examples

The reviews listed in Table 5 are examples of levels of verification, not verifications of poetic hints. Ayyanar and Subash-Babu (2012) set the chemical constituents of jamun beside its traditional uses, which is characteristic of the second level. Imran et al.'s (2017) article on mangiferin discusses an active compound of the mango and forms a bridge between the third and fourth levels. The articles of Alzohairy (2016), Haro-González et al. (2021) and Muhammad et al. (2015) summarise laboratory studies of neem, clove and Alhagi respectively. Sharma et al. (2017) write on the chemical profiling of the lotus and Mukherjee et al. (2013) on the phytochemicals of cucumber. Cohen (2014) discusses studies on tulsi and Moy and Levenson (2017) studies on the dermatological use of sandalwood oil.

7.3 Limits of verification

Three limits should be kept in mind. First, support for a poetic hint at one level does not make it support at the next. Second, review articles are themselves based on studies of varying quality and should not be used without full scrutiny. Third, a plant may contain both beneficial and harmful constituents, so traditional use must not be converted directly into treatment (Jamshidi-Kia et al., 2018). The case of *Datura* in Section 6.3 shows the third limit at work.

8. DISCUSSION

Three things emerge from this study: the place of plants in poetry is multi-layered; reading their medicinal side requires an interdisciplinary method; and the value of this knowledge is not only scientific but cultural as well.

8.1 The dual role of poetry

Poetry is at once a record and a composition. As a record it tells which plants were familiar in which period and society. As a composition it turns them into figures and symbols. Reading the two roles apart protects the socio-historical value of poetry without disrespecting its literary nature. Following Hawley's (2015) argument that the uniformity produced by historiography needs to be broken, the meaning of the tulsi plant in Tulsidas cannot be read in the same way in the context of Kabir or Jayasi. The readings of Section 6 make the same point on a small scale: a plant works one way in Bihari's pun, another in Rahim's maxim and another in Raskhan's landscape.

8.2 Conservation and sustainable use

The presence of plants in poetry also matters for conservation. Chen et al. (2016) have underlined the challenges of over-harvesting and habitat loss for medicinal plants and have suggested policies for sustainable use. Poetry adds a cultural basis to

this discussion: for the plants that poets kept as symbols for generations, folk memory stands in favour of conservation. Karil and kadamb, named by Raskhan, are examples. But this argument is only suggestive; to turn it into policy, separate field study is needed.

8.3 Policy and drug development

The World Health Organization (2013) has set out a strategy to make traditional medicine safe, effective and reliable. For this goal it is useful to compile the various records of folk knowledge, in which poetry is a small but important source. In the context of drug development, Newman and Cragg (2020) and Atanasov et al. (2021) have shown that opportunities remain in natural products, but they also stress that opportunity does not mean accomplishment. The caution of Heinrich et al. (2018) is relevant here: the road from a folk hint to a drug has many hard steps.

8.4 Interdisciplinary cooperation

The literary scholar, the botanist, the *vaidya* and the pharmacologist speak different languages. Albuquerque et al. (2014) have stressed the need for a mixture of methods in ethnobotanical study. The model of this paper is an initial map of such cooperation, in which each discipline has a fixed place: literature at the first level, botany at the second, pharmacology and medicine at the later levels.

8.5 Limitations of the study

This study is theoretical and analyses no textual data or field evidence beyond the illustrative verses of Section 6. The comparison of the six poetic traditions is at the level of tendencies and does not apply to all the works of every poet. The review articles are examples, not verifications. The verse texts in Section 6 follow anthology versions and have not been collated with critical editions.

9. CONCLUSION AND FUTURE DIRECTIONS

This paper presents a theoretical framework for understanding medicinal plants in Bhakti and Ritikal poetry. It has three main conclusions.

1. **The gap from poetic hint to evidence:** The mention of a plant in poetry does not make it a medicine. The four forms of plant knowledge (symbolic, practical, ecological and medicinal) demand different kinds of proof.
2. **The difference between traditions:** The nature-consciousness of the six poetic traditions is not the same. Reading them in a single mould would be wrong, and each tradition needs its own way of reading. The illustrative verses of Section 6 show that medicinal plant knowledge appears in different guises in Bihari, Rahim, Raskhan and Tulsidas.
3. **Multi-level verification:** The scientific value of a poetic hint can be judged only through five levels (documentary, traditional medicine, chemical, laboratory and clinical).

The paper is written with three limitations: it is theoretical and does not give a close textual analysis of poetic works; review articles are used as examples; and it endorses no treatment claim for any plant.

Three directions are suggested for future research. First, apply this framework to the whole corpus of a single poet and carry out a text-based analysis, including a collation of the verses of Section 6 with critical editions. Second, carry out field studies to find out from communities in what form the plants of the poetry are used today. Third, create joint projects of researchers in literature, botany and pharmacology in which the five levels of verification follow in sequence. To understand and preserve this cultural treasure of poetry is to serve both our literature and our biodiversity.

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