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REVITALIZING TURMERIC CULTIVATION IN HIMALAYAN HILL STATES: POLICY IMPLICATIONS OF THE NATIONAL TURMERIC BOARD AND REGIONAL *CURCUMA* DIVERSITY

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ABSTRACT

Background: Turmeric (*Curcuma longa* Linn.) is a globally valued medicinal and culinary spice, deeply rooted in Indian tradition and Ayurveda. Recognizing its increasing economic, therapeutic, and strategic significance, the Government of India established the **National Turmeric Board** in October 2023 followed by establishment of its Headquarter at **Telangana** recently; to promote turmeric cultivation, research, export, and farmer welfare. While much attention has been given to turmeric-producing states like Telangana and Tamil Nadu, Himachal Pradesh possesses a rich but underexplored biodiversity of *Curcuma* species with significant agro-climatic advantages. **Aim:** To assess the role of the National Turmeric Board in promoting turmeric cultivation and biodiversity conservation in Himachal Pradesh, with a focus on the agro-economic potential of local *Curcuma* species. **Objectives:** This study aims to document the diversity of *Curcuma* species found in Himachal Pradesh and evaluate the potential impact of the National Turmeric Board in fostering regional development, conservation, and value chain integration.

Methods: A qualitative field-based approach was adopted, including botanical surveys in selected districts of Himachal Pradesh, ethnobotanical interviews with local cultivators and traditional healers, and policy analysis of government documents related to the Turmeric Board. **Results:** Four key *Curcuma* species were identified in the region: *C. longa*, *C. aromatica*, *C. caesia*, and *C. zedoaria*, each with distinct medicinal and ecological

significance. The state's mid-hill agro-climatic zones offer optimal conditions for organic turmeric cultivation and biodiversity conservation. The Turmeric Board's initiatives can enhance local livelihoods through branding, GI tagging, organic certification, and export support.

KEYWORDS: National Turmeric Board, *Curcuma* species, Himachal Pradesh, biodiversity, agro-economy, medicinal plants.

INTRODUCTION

In Ayurvedic, Siddha, and Indian traditional medicine, turmeric also referred to as the "Golden Spice of India"- has enormous importance.[1,2] In several parts of India, notably the hilly districts of Himachal Pradesh, the Curcuma genus – in particular, *Curcuma longa* Linn. (*Haridra*), *Curcuma aromatic* Salisb. (*vana haridra*), *Curcuma caesia* Roxb. (*Kali haldi*), *Curcuma angustifolia* Roxb. (*Tikhur*) is extensively grown. These Curcuma species' therapeutic qualities are well documented in the ancient Ayurvedic classics *charaka Samhita*[3], *sushruta Samhita*[4], *Ashtanga Hridya*[5], *Ashtanga Sangraha*[6], *Bhavprakash Nighantu*[7] *and Dhanvantari Nighantu*[8], which emphasize their anti-inflammatory, antioxidant, antibacterial, and digestive qualities. These texts have been a reliable source of information about the traditional usage of Turmeric to treat a range of illness, such as digestive issues, joint discomfort, and skin conditions. Even though Himachal Pradesh's Curcuma species have a wealth of biodiversity and therapeutic promise, their international reputation has been hampered by lack of study, marketing, and protection from biopiracy. By successfully revoking the U.S. patent on turmeric's ability to cure wounds in 1997, the Indian government's Traditional Knowledge Digital Library (TKDL) made a significant contribution to the preservation of India's traditional knowledge system. This action established a precedent for safeguarding traditional medicinal plants and stopped foreigners from exploiting indigenous knowledge. In this context, the National Turmeric Board (NTB) headquartered in Nizamabad, Telangana, was established as a strategic move to advance research, improve production, and increase turmeric product exports worldwide. Around 30 varieties of curcuma are grown in India and being a major exporter plays a role in increasing the economy. Supporting farmers, maintaining quality control, and promoting value added turmeric products are the NTB's main objectives, particularly in places like Himachal Pradesh that have distinctive medicinal value. As stated in Samhitas, the current study intends to investigate explore the biodiversity of *Curcuma* species in Himachal Pradesh, assess their

economic and ethnopharmacological significance. Also to analyze the potential role of the newly established National Turmeric Board in enhancing the region's contribution to the national turmeric economy the types of curcuma grown in Himachal Pradesh and evaluate the contribution of NTB to advancement of research and commercialization of these cultivars. By integrating botanical survey data, policy review, and field-level insights, the paper highlights opportunities for biodiversity conservation, agro-industrial development, and sustainable livelihoods in the Himalayan context.

MATERIAL AND METHODS

1. Study area

The study was conducted in selected districts of **Himachal Pradesh**, including **Mandi, Kangra, Bilaspur, Solan, and Chamba**, which are known for diverse agro-climatic conditions supporting medicinal and aromatic plant growth. These regions range in altitude from 400 to 2,000 meters above sea level and have moderate to high rainfall with temperate to sub-tropical climates, ideal for the growth of *Curcuma* species.

2. Collection of Data

Various research articles, Ayurvedic texts such as *Charaka Samhita, Sushruta Samhita, Ashtanga Hridya, Ashtanga Sangraha, Bhavprakash Nighantu* etc. were explored to study properties and key bioactive components in different varieties of Curcuma. To guarantee the accuracy of historical references and safeguard against biopiracy, the data was verified using records from the Traditional Knowledge Digital Library (TKDL).

3. Field Survey and Farmer Interviews

In order to collect ethnobotanical data from regional farmers and vaidyas, a field survey was carried out in the Himachal Pradesh regions that produce Turmeric. To learn more about traditional farming methods, cultivation techniques, and therapeutic uses of Curcuma species, questionnaire based surveys and structured interviews were carried out.

4. Role of National Turmeric Board (NTB) and TKDL Database

The National Turmeric Board’s (NTB) contribution to market growth, research, and farmer welfare was examined using: Ministry of Commerce and Industry official reports. NTB initiatives for export promotion, research financing, and price stabilization. Information from TKDL for IPR management and patent protection, such as 1997 successful revocation of the US patent on Turmeric.

5. Species Identification and Analysis

Species were identified based on morphological traits (rhizome color, aroma, leaf structure, flowering pattern) and verified through herbarium matching. Economic potential, usage patterns, and local names were documented and analyzed.

RESULTS

Varieties of curcuma in Himachal Pradesh

In Himachal Pradesh, four main Curcuma species were found in Himachal Pradesh, according to a field survey and an examination of traditional Ayurvedic manuscripts. These species are categorized in depth in classical Ayurvedic literature such as *Charaka Samhita, Sushrut Samhita*, *Ashtanga Hridya, Ashtanga Sangraha Bhavprakash Nighantu, Dhanvantari nighantu* and many other according to their morphology, size, color, regional names, traditional applications.

1. Species Distribution and Identification

The field survey confirmed the presence of four major *Curcuma* species in different agro-climatic zones of Himachal Pradesh:

Mapping of geo-tagged points revealed clustered cultivation in Kangra and Sirmaur, while wild or semi-wild varieties were noted in forested belts of Chamba and Kullu. **(Table 1)**

2. Ethnobotanical Use and Traditional Knowledge

Informants (n = 42) included farmers, herbal practitioners, and tribal elders. The survey recorded diverse uses:More than 70% of respondents were aware of at least two species and their differentiated uses. Vaidyas emphasized *Vana Haridra* for external applications and *C. longa* for internal use, consistent with *Bhavprakasha Nighantu* descriptions. **(Table 1)**

3. Cultivation Practices, traditional uses and Yield (Table 1)

- Most farmers cultivating *C. longa* reported an average yield of 8–10 quintals/acre alongwith their traditional uses.
- Cultivation of *C. aromatica* and *C. caesia* remains limited due to low market awareness despite higher therapeutic value.
- Farmers highlighted issues such as limited access to quality rhizomes, absence of organized procurement, and lack of storage support.

TABLE- 1.

Feature	*Curcuma longa* Linn. (haridra)	*Curcuma aromatica* Salisb. (vana haridra/kasturi haridra)	*Curcuma caesia* Roxb. (kali Haldi)	*Curcuma angustifolia* Roxb. (Tikhur)
Reference	Bhavprakash[9], PV Sharma Vol.2[10]	Bhavprakash[11], PV Sharma Vol.2[12]	Bhavprakash[13]	Bhavprakash[14], PV Sharma Vol.2[15]
Common name	Haldi(Turmeric)	Wild turmeric/kasturi haldi	Black turmeric	Tikhur
Scientific name	*Curcuma longa* Linn.	*Curcuma aromatica* Salisb.	*Curcuma caesia* Roxb.	*Curcuma angustifolia* Roxb.
Morphology	Perennial herb with tufted leaves. Height-60-90 cm.	Herb Leaves-lanceolate Height-60-90 cm.	Perennial medium sized herb. Leaves-Broad lanceolate. Height-1.5 metres.	Perennial herb with long, narrow lanceolate leaves with sheathing at base.
Aroma	Mild	Camphor like	Earthy pungent	Mild, slightly earthy
Rhizome colour	Yellowish-orange	Yellow	Purplish-black	Pale brown
Principle ayurvedic characteristic	**Rasa**- Tikta, katu **Guna**-Laghu, Ruksha **Virya**- ushna **Vipaka**- katu	**Rasa**- Tikta, katu **Guna**-Laghu, Ruksha **Virya**- ushna **Vipaka**- katu	**Rasa**- Tikta, katu **Guna**-Laghu, Ruksha **Virya**- Ushna **Vipaka**- katu	**Rasa**- Madhura **Guna**- Guru, Snigdha **Virya**- Shita **Vipaka**- Madhura
Therapeutic applications	Anti-inflammatory[16,17,18], ***rakta-pitta nashini*** (blood purifier**),** ***varnya*** (improves complexion)[19], ***vrana ropaka*** (wound healing).[20]	***Tvaka vikara***(skin diseases)[21], antimicrobial[22], ***vrana ropaka*** (wound healing), detanning.	Tantric uses, ***vedna shamak***(pain relief)[23], muscle relaxant[24], anti-cancerous.[25]	*Balya* (Nutritional supplement in paediatric and geriatric care)[26], ***daha*** (burning sensation)[27], ***raktapitta*** (bleeding disorders).[28]
Favourable areas for growth in Himachal Pradesh	Mid to lower altitudes (solan, sirmaur, kangra).	Mid-Altitude (Shimla, chamba).	Higher altitude (kangra, kullu).	Lower to mid-hill regions (Sirmaur, Solan, Una, Hamirpur).
Curcumin	High (3-5%)	Moderate (1-2%)	Very low	Negligible

content			(≤0.5%)	
Principle essential oil components	α-turmerone, β-turmerone, ar-turmerone	Camphor, curzerenone	Xanthorrhizol, Camphor, curzerenone	Turmerone, germacrone, eucalyptol
Conventional uses	Utilized in medicine, rituals, Cooking.	Used as a face pack and in cosmetics and antiseptic.	Used to relieve pain and in tantric practices.	Edible starch used for infants, as a coolant and restorative herb.
Modern research	Antioxidant, Anticancerous.	Antimicobial, skin brightening.	Pain relief, Neurological benefits.	Mild anti-inflammatory potential, hypoallergenic properties.

4. Market and Policy Awareness

- Only 15% of surveyed individuals were aware of the **National Turmeric Board** and its potential benefits.
- There is growing interest in organic certification, value addition, and cooperative marketing.

5. Visual Representations (Figure 1, 2 & 3)

- A **distribution map** of *Curcuma* species across districts was created.
- A **pie chart** illustrated the proportional occurrence of species, indicating *C. longa* as the most commonly cultivated (40%).
- Different types of Haridra commonly cultivated.

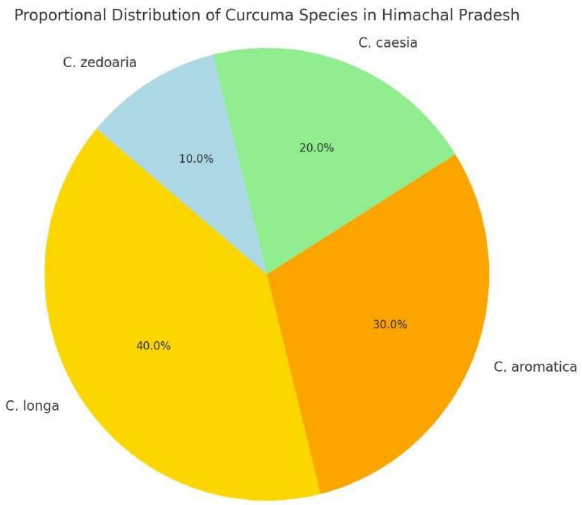

FIG 1

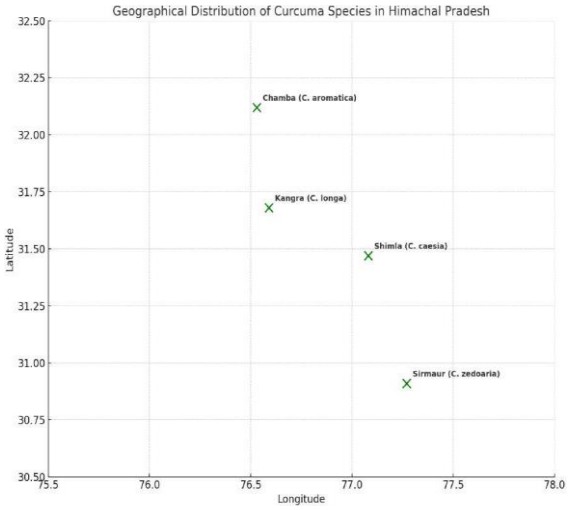

FIG 2

3a) *Curcuma longa* Linn. (*Haridra*)

3b)* Curcuma aromatica *Salisb*. *(*Vana haridra/Kasturi haridra*)

3c) *Curcuma angustifolia* Roxb. (*Tikhur*)

3d) *Curcuma caesia* Roxb. (*kali Haldi*)

FIG 3

Opportunities under the National Turmeric Board

The newly formed Board offers avenues for:

- **Market expansion** through branding and export facilitation.
- **GI Tagging** and promotion of organic turmeric.
- **Research grants** for phytochemical analysis.
- **Farmer training and value addition centers**.
- **Herbal cluster development** integrated with Ayurveda and wellness industries.

DISCUSSION

Four main Curcuma species were found in Himachal Pradesh, according to a field survey and an examination of traditional Ayurvedic manuscripts. Because of its high Curcumin content, *Curcuma longa* Linn. (haridra) is primarily grown in lower locations such as Kangra and Mandi. *Curcuma aromatica* Salisb., (*vana haridra*) known for its anti-inflammatory and fragrant qualities, it can be found in wooden areas of Chamba and Solan. A rare type of *Curcuma caesia* Roxb, also known as *Kali haldi*, is produced in isolated regions of Kullu and Sirmaur and is valued in Ayurveda for its therapeutic and spiritual properties, *Curcuma*

angustifolia Roxb. (*Tikhur*) with negligible curcumin content known for its use as nutritive supplement for children is grown in lower locations such as Una, Hamirpur. These species' documentation supports the traditional knowledge of local farmers and vaidyas and is consistent with descriptions found in ancient books. The Himalayan belt, particularly Himachal Pradesh, holds significant potential for emerging as a niche source of high-quality turmeric and *Curcuma* biodiversity. Compared to the commercial turmeric belts of Telangana and Tamil Nadu, Himachal offers advantages such as:

- **Low pesticide use** due to traditional and organic practices.
- **High curcumin content** in select *C. longa* strains.
- **Ecological diversity**, supporting rare *Curcuma* species not commonly cultivated elsewhere.

Despite this, challenges remain

- Limited awareness among farmers regarding the Turmeric Board's schemes.
- Poor value addition infrastructure and market linkages.
- Lack of research on phytochemical content in local *Curcuma* variants.

The National Turmeric Board provides a timely intervention that could catalyze the integration of traditional knowledge with scientific innovation. Conservation strategies, ethnobotanical documentation, and cooperative-based farming models are crucial to unlocking the value of Himalayan turmeric.

Comparative Note: Other states like Meghalaya and Odisha have recently documented high curcumin wild turmeric. Himachal has similar ecological potential but needs coordinated scientific validation and marketing efforts.

CONCLUSION

The convergence of traditional Ayurvedic wisdom and contemporary policy initiatives offers a promising pathway for the sustainable development of *Curcuma* species in Himachal Pradesh. Classical texts like *Charaka Samhita*, *Sushruta Samhita*, and *Bhavaprakasha Nighantu* provide invaluable insights into the therapeutic versatility of turmeric, emphasizing its relevance in managing inflammatory conditions, skin disorders, neurological ailments, and enhancing overall vitality. These time-tested applications gain new relevance when integrated with modern scientific validation and cultivation practices.

The formation of the National Turmeric Board represents a transformative step in recognizing turmeric not only as a medicinal plant but also as a driver of rural economic growth, biodiversity conservation, and global wellness markets. Himachal Pradesh, with its rich diversity of *Curcuma* species and favorable agro-climatic conditions, is uniquely positioned to lead this movement.

To unlock the full potential of turmeric, a holistic strategy that includes traditional knowledge documentation, farmer education, scientific research, value chain integration, and strong policy support is essential. By doing so, Himachal Pradesh can emerge as a model state for sustainable herbal resource management and position India as a global leader in turmeric innovation, production, and trade.

REFERENCES

1. Baruah S. Insights into the relevance of turmeric and the initiatives by the National Turmeric Board (NTB) [Internet]. 2024 [accessed 2025 Jun 24].
2. Ansari MS. Importance of TKDL in conserving India's indigenous medicinal practices. In: Singh VK, Yadav A, Yadav SS, editors. *Herbal Medicine in India: Traditional Knowledge, Innovation and Application*. Singapore: Springer, 2019; 609–620.
3. Charaka. *Charaka Samhita*. Edited by Shastri RD. 2nd ed. Varanasi: Chaukhambha Bharati Academy, 2011.
4. Sushruta. *Sushruta Samhita*. Volumes I & II. Edited by Shastri AD. 2nd ed. Varanasi: Chaukhambha Sanskrit Sansthan, 2012.
5. Vagbhata. *Astanga Hridaya*. Gupta A, ed. 2nd ed. Varanasi: Chaukhambha Prakashan, 2012.
6. Vagbhata. *Astanga Sangraha*. Vols. I & II. Gupta A, ed. Varanasi: Chaukhambha Prakashan, 2012.
7. Bhavamishra. *Bhavaprakasha Nighantu (Materia Medica of Ayurveda)*. Commentary by Chunekar KC, edited by Pandey GS. Varanasi: Chaukhambha Bharati Academy, c1500–1600.
8. Dhanvantari. *Dhanvantari Nighantu*. Edited by Diwedi BK. Guducyādi varga section. Varanasi: Chaukhamba Krishnadas Academy, 2008; 25.
9. Bhavamishra. *Bhavaprakasha Nighantu*. Commentary by Chunekar KC, edited by Pandey GS. Varanasi: Chaukhambha Bharati Academy, c1500–1600: 111.

10. Sharma PV. *Dravya Guna Vijnana*, Vol. 2. Varanasi: Chaukhambha Bharati Academy, 1993; 162.
11. Bhavamishra. *Bhavaprakasha Nighantu*. Commentary by Chunekar KC, edited by Pandey GS. Varanasi: Chaukhambha Bharati Academy, c1500–1600: 114.
12. Sharma PV. *Dravya Guna Vijnana*, Vol. 2. Varanasi: Chaukhambha Bharati Academy, 1993; 165.
13. Ibid., 114.
14. Ibid., 803.
15. Sharma PV. *Dravya Guna Vijnana*, Vol. 2. Varanasi: Chaukhambha Bharati Academy, 1993; 165.
16. Peng Y, Ao M, Dong B, et al. Curcumin's role in inflammation control: mechanisms, limitations, and future directions. *Drug Des Devel Ther*., 2021; 15: 4503–25.
17. Jacob A, Wu R, Zhou M, Wang P. Curcumin's anti-inflammatory action via PPAR-γ activation. *PPAR Res*., 2007; 2007: 89369.
18. Memarzia A, Khazdair MR, Behrouz S, et al. A detailed review of anti-inflammatory, antioxidant, and immune-modulating effects of *Curcuma longa* and curcumin. *BioFactors.*, 2021; 47(3): 311–50.
19. Arct J, Ratz-Łyko A, Mieloch M, Witulska M. Investigating turmeric's natural skin tinting potential. *Indian J Pharm Sci*., 2014; 76(4): 374.
20. Akbik D, Ghadiri M, Chrzanowski W, Rohanizadeh R. Efficacy of curcumin in wound treatment. *Life Sci*., 2014; 116(1): 1–7.
21. Barbalho SM, de Sousa Gonzaga HF, et al. A review on dermatological actions of Curcuma species. *Clin Exp Dermatol*, 2021; 46(5): 825–33.
22. Negi PS, Jayaprakasha GK, et al. Antibacterial potential of turmeric essential oil, a curcumin industry byproduct. *J Agric Food Chem*., 1999; 47(10): 4297–300.
23. Hajimirzaei P, Eyni H, et al. Analgesic effects of curcumin and nano-formulations: clinical and preclinical meta-analysis. *Naunyn Schmiedebergs Arch Pharmacol*, 2025; 398(1): 393–416.
24. Arulmozhi DK, Sridhar N, et al. Relaxant properties of *Curcuma caesia* extract on smooth muscles. *J Herb Pharmacother,* 2006; 6(3–4): 117–24.
25. Sa G, Das T. Curcumin's anticancer impact: regulating cellular survival and apoptosis. *Cell Div*., 2008; 3: 14.
26. Vaughn AR, Pourang A, et al. Turmeric polyherbal formula's effect on facial redness: a pilot RCT. *J Integr Med*., 2019; 17(1): 20–3.

27. Cheppudira B, Fowler M, et al. Curcumin's novel use in managing burn-related pain and healing. *Exp Opin Investig Drugs*, 2013; 22(10): 1295–303.
28. Gronich N, Hurani H, et al. Spontaneous bleeding linked to curcumin: a rare case. *J Clin Images Med Case Rep*., 2022; 3: 2141.
29. Niranjan A, Prakash D. A review of the chemistry and biological activities of *Curcuma longa*. *J Food Sci Technol*, 2008; 45(2): 109–16.
30. Al-Reza SM, Rahman A, et al. *Curcuma aromatica* essential oils: composition and antioxidant attributes. *Food Chem Toxicol*., 2010; 48(7): 1757–60.
31. Borah A, Paw M, et al. Chemical makeup and pharmacological efficacy of *Curcuma caesia* essential oils. *Ind Crops Prod*., 2019; 129: 448–54.
32. Jena S, Ray A, et al. Essential oils of *Curcuma angustifolia*: constituents and antioxidant activities. *Nat Prod Res*., 2021; 35(6): 1013–6.