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A review on *Vrikshayurveda - Upavanavinoda*: Unlocking the potential of sustainable agriculture and environmental health

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ABSTRACT

The domestication of diverse plant species to meet human needs has been an integral aspect of human society throughout history. The ancient practice of domestication and cultivation is deeply rooted. *Ayurveda*, recognized as a holistic health science, has devoted attention to the well-being of plant under the topic '*Vrikshayurveda*'. Various texts have been expounded dealing with *Vrikshayurveda*. *Sharangdhar Padhdhati*, a text of thirteenth century deals with the topic of cultivation and other factors affecting plant health. The description becomes more important in present day scenario with many health issues originating due to non-judicious use of chemical fertilizers, weedicides and pesticides. The chapter *Vrikshayurveda: Upvanvinoda* of *Sharangdhar Padhdhati* offers valuable insights into ancient agricultural practices. This chapter focuses on tree and plant care, provides a remarkable treasure of wisdom, detailing various techniques, principles, and holistic approaches to cultivating and nurturing plants. As modern agriculture is struggling with sustainability challenges, the revival of such traditional agricultural knowledge is quite relevant. This review provides a comprehensive analysis of the chapter's content, delving into various aspects, including soil health, plant propagation, pest control, and significance of trees. Furthermore, it explores the potential applications of this ancient wisdom in modern agriculture, such as biodiversity conservation, organic farming, permaculture, crop improvement, and innovative pest management. By bridging the gap between traditional knowledge and contemporary agricultural practices, this review envisions a more sustainable and harmonious future for cultivation of herbal drugs and the environment.

Key words: *Vrikshayurveda, Upavanvinoda, Permaculture, Organic farming, Agriculture.*

INTRODUCTION

Agriculture has been an integral part of human civilization, and ancient cultures around the world have contributed rich knowledge systems to the practice. Among these, *Ayurveda*, the traditional Bharatiya system of medicine, offers a unique perspective on agricultural practices through the sub-discipline known as "*Vrikshayurveda*." This sub-discipline, which translates

to the "science of plant life," encompasses a holistic approach to plant care and cultivation.

In the thirteenth century, Sharangdhar, a renowned scholar and practitioner of *Ayurveda*, authored the book, "*Sharangdhar Padhdhati*." The text carries a chapter of particular interest to scholars and practitioners of agriculture and *Ayurveda* - the "*Vrikshayurveda: Upavanvinoda*." This chapter presents an intricate tapestry of knowledge, combining insights from *Ayurveda* and traditional farming practices, with a profound understanding of the harmonious relationship between plants and their environment.

The "*Upavanvinoda*" chapter provides a vivid picture of ancient agricultural practices, addressing topics ranging from soil enrichment and water management to plant health and pest control. It offers a window into the innovative techniques employed by ancient agriculturists to optimize plant growth and crop yield, often with minimal environmental impact.

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In a world grappling with issues of soil degradation, and climate change, revisiting such ancient wisdom holds great promise. The study of this chapter not only contributes to the preservation of traditional knowledge but also raises important questions about the relevance of these time-tested practices in contemporary agriculture. This review embarks on a journey to unearth the hidden gems of "Vrikshayurveda: Upavanavinoda" offering a comprehensive analysis of its content, historical context, and potential applications in modern agriculture. In doing so, it seeks to bridge the gap between age-old wisdom and cutting-edge agricultural science, promoting a more sustainable and holistic approach to cultivation.

Historical Background^[1]

The Author: Sharangdhar

In the beginning of the text, the author has detailed his genealogy. He was the grandson of Raghavdev, mentor of King Hammir Dev of Shakambhari. Raghavdeva had three sons named as Gopal, Damodar and Devdas. Damodar had three sons, with Sharangdhar being the eldest among them. The middle son was named Lakshmandhar, and the youngest was named Krishna.

The name Sharangdhar is also associated with the *Sharangdhar Samhita*, a comprehensive text that serves as a valuable resource in the field of *Ayurveda* and deals with various aspects of herbal medicine, diagnosis, and treatment. His contributions have left an indelible mark on the development of Ayurvedic knowledge and practices. This create the unsureness whether these two texts were authored by the same person.

In *Sharangdhar Padhdhati*, Acharya Sharangdhar does not introduce himself as a Vaidya (physician), and the writing style of both texts is different. There is a Hindi poetry composition called "Hammir-Raso" attributed to Sharangdhar.

In a catalog by Aufrecht, various scholars with the name Sharangdhar are mentioned, including the expounders of *Chandmaal*, philosophers, astrologists, drama writers, and the expounders of both

Sharangdhar Padhdhati and *Sharangdhar Samhita*. This suggests that Aufrecht considered these two expounders to be the same person.

Historical evidence places Allaudin Khilzi's attack on Rana Hammir Dev in 1299-1301 AD, and Nayanachandra Suri's "Hammir Mahakavya" is based on this event. The expounder of *Sharangdhar Padhdhati* is believed to be the grandson of Guru Raghavdeva, who was associated with King Hammir. This would place the expounder of *Sharangdhar Padhdhati* in the 14th Century.

The time-period of *Sharangdhar Samhita* appears to be different (13th century AD) based on following facts

- Bopdeva has commented on *Sharangdhar Samhita* (13th-14th century AD).
- Hemadri has referred *Sharangdhar Samhita* (13th-14th century AD).
- The text is based on *Gadnigrah* of Shodhal (12th century AD).
- Description of *Nadivigyana*, opium and mercurial preparations was the feature of texts of that time-period.

Based on these points, we can argue that the expounders of *Sharangdhar Padhdhati* and *Sharangdhar Samhita* were likely different individuals, with the former belonging to the 14th Century and the latter to the 13th century.

Thus, the text *Sharangdhar Samhita* cannot be taken beyond first half of 13th century AD whereas *Sharangdhar Padhdhati* belongs to 14th century AD and therefore expounders of these two texts cannot be same person.

A comprehensive view on Vrikshayurveda: Upavanavinoda^[2,3]

The text of *Sharangdhar Padhdhati* chapter 82 named as *Vrikshayurveda: Upavanavinoda* comprises of many sub-sections namely *Taru-Mahima*, *Nivasasann-Taru-Shubh-Ashubh-Lakshdani*, *Bhumi-Nirupanam*, *Padap-Vivaksha*, *Bija-Utapatti-Vidhi*, *Ropana-Vidhanam*, *Nishechan-Vidhi*, *Drum-Raksha*, *Upavan-Prakriya*, *Kooparthe Bhoomi-Pariksha*, *Poshan-Vidhi*,

Kunapajalam, Taru-Chikitsa, Vichitra-Karanam and Annadi-Nishpatti-Gyanm.

1. *Taru-Mahima (Importance of Trees)*

Trees are highly valued and deemed as treasures, with one tree considered as valuable as ten sons. They are seen as essential for acquiring *Dharma* (virtue), *Artha* (wealth), *Kama* (pleasure), and *Moksha* (emancipation), the fourfold aims of human life. Trees, when planted with devotion and according to prescribed rites, is associated with unique merits and blessings. The planting of specific trees, such as *Tulsi, Bilva, Dhatri, Nimba, Vata, Plaksha, Madhuka, Ashvattha* and others, is associated with diverse merits, ranging from heavenly abodes and goddess blessings to liberation of generations and the avoidance of hellish realms. Collectively, these teachings emphasize the profound significance of trees in enriching human existence, spirituality, and ecological balance.

2. *Nivasasann-Taru-Shubh-Ashubh-Lakshdani (Pros and Cons of Trees Near Residence)*

It suggests planting specific trees around house in designated directions for auspicious results like *Nyagrodha* to the east, *Udumbara* to the south, *Pippala* to the west, and *Plaksha* to the north, while cautioning against planting others in inappropriate directions like *Ashvattha* to the east, *Plaksha* to the south, *Nyagrodha* to the west, and *Udumbara* to the north. The text emphasizes the spiritual significance of trees, discourages shading the house or obstructing its entrance, and warns against specific trees that may hinder prosperity. It also advises removing *Nili* and *Haridra*, thorny trees, tress with a milky sap to avoid loss of progeny and wealth. The text also recommends planning gardens to the west, north, and east of the house for auspicious outcomes, while discouraging gardens in the south, southwest, and northeast directions to prevent conflicts and disturbances.

3. *Bhumi-Nirupanam (Soil Health)*

Soil is classified into three primary types: arid, watery and ordinary, further refined based on colour (gray, whitish, dark, red, white, yellow) and taste (sweet,

sour, salty, hot, bitter, astringent). Ideal soil for tree planting is described as bluish, soft as a parrot's feathers, and resembling with conch, *Kumuda* or the Moon. It is stressed that even, well-watered land with green vegetation is favourable for tree growth, while neither excessively arid nor watery soil is suitable. All kind of trees grow well on ordinary land. Specific tree species are recommended for different soil types. *Panasa, Lakucha, Tali, Vamsha, Jambira, Jambu, Vata, Kadamba, Kharjur, Puga, Kadali, Nalikera* etc. usually grow better in watery soil. In ordinary soil trees like *Bijapura, Punnaga, Champaka, Amra, Atimuktaka, Dadima* etc. do well.

4. *Padap-Vivaksha (Propagation of Trees)*

In this section different methods of propagating trees, including seeds, stalks, and bulbs, are outlined. *Vanaspati* (big trees), *Druma* (trees), *Lata* (creepers), and *Gulma* (bushes) are the four categories of plants. The classification distinguishes *Vanaspati*, which produce fruits without flowering, from *Druma*, which produce both flowers and fruits. *Lata*, which spread through shoots, and *Gulma*, characterized by multiple stems and branches. Trees like *Jambu, Champaka, Punnaga, Chinchini, Kumbhakari* and others are propagated through seeds, while *Tambuli, Sindhuvara, and Tagara* grow from stalks. Some trees, such as *Patala, Dadim, Plaksha, Karavira, Vata, Mallika, Udumbara, and Kunda*, can be cultivated from both seeds and stalks. Additionally, certain species, including *Kumkuma, Rasona, and Alukanda* are grown from bulbs, while others like *Ela, Padma, and Utpala* can be propagated from both seeds and bulbs.

5. *Bija-Utapatti-Vidhi (Sowing the Seed)*

Detailed guidelines for seed sowing, including soil preparation, seed treatment and auspicious times for planting are provided. The land should be well-prepared and even, with initial crops like *Masha* and *Tila* sown and harvested before sowing other seeds. Seeds must be extracted from fruits ripened in their natural season, soaked in milk, dried and smoked with *Sarpi* mixed with *Vidanga*. Specific tree seeds like *Jambu, Panasa, Sarala, Lakucha* have their unique preparations involving soaking in milk and smear them with *Ghrit, cow dung, and Bidanga*.

6. *Ropana-Vidhanam* (Plantation of Trees)

This sub-section provides guidance on the methodical planting of trees, as per the wisdom of ancient sages. It emphasizes the selection of auspicious stars (*Nakshatra*) for tree plantation and recommends transplanting saplings with their original soil, along with specific treatments with *Sarpi*, *Madhu*, *Ushira*, *Vidanga*. The depth and preparation of planting pits are detailed. The ideal months for sowing seeds and planting saplings are *Ashadha* and *Shravana* (July-August). The layout of trees in gardens is advised in various patterns, with specific recommended distances. Certain trees like *Phalini*, *Ashoka*, *Shirisha*, *Nimba* etc, are considered auspicious while *Matulunga*, *Rajani*, *Kimshuka*, *Girikarnika*, *Viphalaksha*, *Nilika* and others are viewed as indicating fear. It also includes directional guidance for planting specific tree varieties.

7. *Nishechan-Vidhi* (Watering)

Guidelines for proper watering of trees, considering seasons and individual tree needs, are provided. The importance of weed removal is emphasized. Newly planted trees should be watered both in the morning and evening while protecting them from extreme cold, heat, and strong winds. During the summers (*Grishma*), plants require watering every alternate day in the morning and evening. In the rainy season (*Varsha* and *Sharat*) experts should sprinkle water in shallow depressions around the trees when chances of rain are low. Observing the evaporation of water from the depressions around trees serves as an indicator of their need for hydration. Additionally, knowledgeable individuals should regularly remove weeds, bushes, and creepers growing near the plants to ensure their proper growth.

8. *Drum-Raksha* (Protection of Plants)

This sub-section emphasizes on the importance of safeguarding trees from environmental and pest-related threats. Measures include protecting trees from mist, strong winds, smoke, fire, and spiders. Strategic plantation is recommended, with trees expected to yield good fruits placed at the centre of rows, followed by progressively lower-ranking trees

towards the outside, and all trees encircled by a moat. To counteract potential threats like cold, soil from around a lightning-struck tree is spread across the farm. The ashes from a lightning-struck tree are believed to have fire-extinguishing properties. When faced with pests like grasshoppers, rats, moths, and ants, a protective mantra invoking Shri Hanuman is recited, written on a leaf, and buried in the field to deter these pests.

9. *Upavan-Prakriya* (Garden Building)

Recommendations for creating gardens that promote both aesthetic beauty and to nurture both physical and mental well-being are detailed in this sub-section. These gardens are designed to provide a harmonious blend of natural elements and human comfort. They include garden-houses adorned with young shoots and creepers of *Atimuktaka*, swings for couples, mounds with artificial features like valleys and caves, lotus ponds, and lakes. Peacocks are encouraged to inhabit the garden mounds, contributing to the serene ambiance and to scare snakes. A central house, white as the Himalaya peaks, serves as a refreshing retreat within the garden's greenery. Crystal-like canopies and resting places provide comfort, and a well, surrounded by various trees, offers clean and tasty drinking water. Regular water treatment with herbal powders of *Naga*, *Koshataka*, *Amalaka*, *Anjana*, *Musta*, *Ushira*, and *Kataka* fruits enhances water quality.

10. *Kooparthe Bhoomi-Pariksha* (Indication of Ground Water)

This sub-section serves as an instructive manual for individuals looking to locate underground water sources suitable for well construction, catering to a range of geographic conditions. It presents a wealth of natural cues and signs that can help in pinpointing water reservoirs beneath the surface. These indicators include the observation of specific plant growth patterns, the presence of certain animals like frogs and scorpions, distinctive soil qualities, and the positioning of anthills in relation to trees and shrubs. Moreover, the text places significance on the timing of well excavation, suggesting that *Nakshatras* (astronomical constellations) like *Hasta*, *Magha*, *Anuradha*, *Pushya*,

Rohini, etc. are more favourable for initiating this process. Additionally, it offers valuable advice on the placement of wells within villages or cities, cautioning against certain directions due to potential risks, such as fire hazards and accidents.

11. Poshan-Vidhi (Nourishment for Plants)

The provided text offers insights into the nurturing and care of various types of trees to promote healthy growth and abundant yields. It describes specific methods of nourishment, such as using white mustard and oilcake for *Kharjura*, *Bilva* and *Lakucha*, water-soaked chaff for *Amras*, and milk and water for young *Tinduka* plants. There is the mention of various natural substances like *Ghrita*, jaggery, and honey mixed with water to enhance tree growth and fruit quality. Additionally, it provides tips for ensuring fragrant flowers and disease resistance in trees by using a combination of aromatic substances and herbal decoctions.

12. Kunapajalam (Manure)

Kunapa is a potent liquid manure for trees. To prepare it, a mixture of flesh, fat, marrow from animals like antelope, hog, fish, ram, goat, or rhinoceros is collected. This mixture is then cooked with water over a fire. After cooking, it is transferred to a container, and milk is added. Additionally, pounded sesame oilcake, honey, fresh wetted *Masha*, and *Ghrit* are included. The mixture is preserved in a warm place for a fortnight, resulting in a highly nourishing liquid manure that promotes tree growth and health.

13. Taru-Chikitsa (Disease and Treatment)

Alike human, trees can also suffer from diseases related to *Vata*, *Pitta*, and *Kapha*. *Vata* makes a tree thin, tall, and unproductive, while *Pitta* causes intolerance to sunlight and off-season fruit ripening. *Kapha* manifests as glossy branches, proper blossoms, and fruits, often with surrounding creepers. Each type of ailment has specific symptoms and treatments. For instance, *Vata* may cause dryness, knots, and twisting in a tree, which can be treated with cow dung, *Lodhra*, marrow, and *Kunapajala*. Insects infesting the tree's roots can be physically removed and the roots treated

with a mixture of *Gomutra*, *Ghrita*, *Vidanga*, *Sarshapa*, and *Tila*. Scorched trees can recover by sprinkling *Kunapa* mixed with milk and smearing them with lotus bulbs. Trees broken by strong winds can regain health by being raised on supports, held by ropes, and treated with milk mixed with the paste of tree barks of *Plaksha*, *Arka*, *Udumbara*, *Ghrita* and *Madhu*. Lightning-struck trees can be healed by sprinkling a mixture of various ingredients in milk and water. Additionally, there are remedies for various other tree ailments, including unproductiveness, dryness, and oozing vital fluids. These treatments involve applying specific mixtures, pastes, or remedies to the affected trees.

14. Vichitra-Karanam (Imparting Special Character to Plants)

There is description of various methods for producing extraordinary and unusual results in plants, often achieved through the application of specific treatments to seeds or plants. Some examples include transforming odourless flowers into fragrant ones by providing scented soil and water, making cotton plants produce uniquely coloured cotton by using different treatments, and causing trees to bear fruit out of season. The text also includes methods for enhancing the growth and characteristics of various plants, such as producing seedless fruits, changing the colour of lotus flowers, and achieving specific results from seeds. Some treatments involve using unusual mixtures to stimulate plant growth and produce surprising outcomes.

15. Annadi-Nishpatti-Gyanm (Inference of Specific Conditions from Type of Seeds)

This sub-section underscores the significance of observing the natural growth of various trees and plants as indicators of good crop yields and other conditions. Specific trees like *Nyagrodha*, *Tinduka*, *Jambu* trees are associated with positive prospects for *Yavaka*, *Shashtika*, *Sthalmasha* respectively. Additionally, the presence of trees like *Hastikarna*, *Ashvakarna*, *Patala* and *Kadali* can indicate favourable habitats for animals such as elephants, horses, cows, sheep, and goats respectively. Moreover, the growth of trees like *Amra*, *Bhallataka*, *Pilu*, *Khadira*, and *Arjuna*

serves as signs for various factors including security, fear, health, rainfall, and more.

Potential applications in Modern Agriculture

The insights gleaned from the ancient text "*Vrikshayurveda: Upavanvinoda*" by Sharangdhar offer a rich reservoir of knowledge that can be applied to modern agriculture, addressing contemporary challenges while promoting sustainable and holistic farming practices. Below are some potential applications of the wisdom contained within this text in the context of modern agriculture -

- 1. Biodiversity Conservation:** The emphasis on planting specific tree varieties for various purposes aligns with modern agroforestry and afforestation practices, which contribute to biodiversity conservation, carbon sequestration, and ecosystem restoration.
- 2. Organic Farming:** The emphasis on natural remedies and organic treatments for plant health and pest control resonates with modern organic farming practices, promoting the reduction of synthetic chemicals in agriculture.
- 3. Permaculture:** The concept of planting trees for various purposes, including food, medicine, and ecological balance, aligns with permaculture principles, promoting sustainable and self-sustaining agricultural systems.
- 4. Crop Improvement:** The methods for enhancing the growth and characteristics of plants, such as producing seedless fruits or changing flower colours, may inspire modern agricultural research aimed at crop improvement and genetic modification.
- 5. Crop Rotation:** The text's guidance on the timing of seed sowing and crop harvesting aligns with modern crop rotation practices, which help prevent soil depletion and reduce the risk of pests and diseases.
- 6. Pest Management:** The text's recommendations for protecting plants from pests and diseases through natural means and mantras offer

alternative, eco-friendly pest management techniques, reducing the reliance on chemical pesticides.

- 7. Traditional Knowledge Integration:** Integrating the traditional knowledge from *Vrikshayurveda* with modern agricultural science can lead to innovative and sustainable farming practices that combine the best of both worlds.
- 8. Community Engagement:** The text's emphasis on tree planting and garden design can promote community engagement in agriculture, fostering a sense of collective responsibility for sustainable farming.

CONCLUSION

In conclusion, "*Vrikshayurveda: Upavanvinoda*" offers a treasure trove of ancient wisdom that, when integrated with modern agricultural practices, has the potential to address pressing issues such as soil degradation, chemical pollution, and biodiversity loss. By bridging the gap between traditional knowledge and contemporary agriculture, we can work toward a more sustainable and harmonious future for farming and the environment.

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