



A REVIEW OF UPAVANAVINODA: INSIGHTS INTO VRIKSHAYURVEDA FOR SUSTAINABLE AGRICULTURE AND ENVIRONMENTAL HEALTH

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ABSTRACT

The domestication and cultivation of plants have been integral to human civilization since ancient times. In Ayurveda, *Vrikshayurveda* represents the traditional science of plant health and sustainable cultivation. Among its classical texts, *Sharangadhara Paddhati* (13th century CE) includes the chapter *Upavanavinoda*, which describes principles of horticulture, plant care, soil management, propagation, and pest control. These concepts are increasingly relevant today as modern agriculture faces challenges arising from the excessive use of synthetic fertilizers and pesticides, leading to environmental degradation and health concerns. This review highlights the key concepts of *Upavanavinoda* and evaluates their significance in contemporary agriculture. It emphasizes the text's holistic approach to sustainable farming through practices such as organic cultivation, biodiversity conservation, permaculture, medicinal plant cultivation, crop improvement, and eco-friendly pest management. By integrating the traditional knowledge of *Vrikshayurveda* with modern agricultural practices, *Upavanavinoda* offers valuable insights for promoting sustainable agriculture, environmental conservation, and the scientific cultivation of medicinal plants.

KEYWORDS: *Vrikshayurveda*, *Upavanavinoda*, Sustainable Agriculture, Organic Farming, Permaculture, Medicinal Plant Cultivation, Environmental Conservation.

INTRODUCTION

Agriculture has been a cornerstone of human civilization, with ancient knowledge systems providing valuable guidance for sustainable cultivation. In Ayurveda, a medical science for humans, the one which was developed for plants is known as *Vrikshayurveda*.^[1] Ancient India understood the value of growing, protecting, and gathering plant bio-resources, as well as their sensible application for medical treatment and health enhancement.^[2] Planting a garden, the value of different plants, choosing a plot of land, soil properties, planting pits, various irrigation techniques, plant nutrition, fertilizers, tree diseases, and how to cure them are just a few of the topics covered in this literature.^[3] Comparable to a vast forest of knowledge, *Vrikshayurveda* provides various planting and agricultural techniques.

Among the important classical works, *Sharangadhara Paddhati* (13th century CE) contains the chapter *Upavanavinoda*, which outlines principles of horticulture, including soil improvement, irrigation, plant propagation, nutrition, and eco-friendly pest management.

The concepts described in *Upavanavinoda* reflect a holistic and environmentally sustainable approach to agriculture that remains relevant today. As modern farming faces challenges such as soil degradation, biodiversity loss, climate change, and the overuse of chemical fertilizers and pesticides, these traditional practices offer valuable insights for sustainable crop production. This review summarizes the major concepts presented in *Upavanavinoda* and explores their potential applications in organic farming, medicinal plant cultivation, biodiversity conservation, and integrated pest

management. By integrating the principles of *Vrikshayurveda* with contemporary agricultural science, the review highlights the significance of ancient knowledge in promoting environmentally sustainable and resilient agricultural systems.

Decoding Upavanavinoda in *Vrikshayurveda*^[4,5,6,7,8]

The text of *Sharangdhar Padhdhati* chapter 82 named as *Vrikshayurveda: Upavanvinoda* 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*, *Koopatha Bhoomi-Pariksha*, *Poshan-Vidhi*, *Kunapajalam*, *Taru-Chikitsa*, *Vichitra-Karanam* and *Annadi-Nishpatti-Gyanm*.

1. *Taru Mahima* (Importance of Trees)

It describes the significance of plants and water bodies as natural resources for human life as well as the need to conserve water. It also provides a mythological explanation of the significance of planting for life. *Upavanavinoda* regards trees as invaluable assets, equating the value of a single tree with that of many sons. They are considered instrumental in attaining the four *Purusharthas*—*Dharma* (righteousness), *Artha* (prosperity), *Kama* (fulfillment of desires) and *Moksha* (liberation). The text states that planting sacred trees such as *Tulsi*, *Bilva*, *Dhatri*, *Nimba*, *Vata*, *Plaksha*, *Madhuka* and *Ashvattha* with proper rituals and devotion brings spiritual merit, prosperity, and well-being. These teachings underscore the ecological, cultural, and spiritual importance of trees while encouraging their conservation for environmental sustainability and human welfare.

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

This section describes the selection and placement of trees around residential areas according to traditional *Vrikshayurveda* principles. It recommends planting *Nyagrodha* in the east, *Udumbara* in the south, *Pippala* in the west, and *Plaksha* in the north to promote prosperity and well-being, while advising against planting these species in unsuitable directions. The text highlights the cultural and spiritual significance of trees and recommends avoiding those that cast excessive shade over the house or obstruct the main entrance. It also discourages the cultivation of *Nili*, *Haridra*, thorny species and plants with milky latex near residences, as they are believed to adversely affect wealth and family welfare. Furthermore, it suggests establishing gardens on the eastern, northern, or western sides of the house while avoiding the southern, south western, and north eastern directions to maintain harmony and favourable living conditions.

3. *Bhuminirupana* (Soil description)

It provides a thorough explanation and classification of soil based on its fertility. Soil has been divided into the

following three types according to its water content and plantation-supporting characteristics:

a) Arid land (*Jangala Desa*): This terrain is made up of gravels that create mirages and thin, gritty, dry sand. *Khejdi* and *Palash* are abundant in this type of soil.

b) Marshy land (*Anupa Desa*): This type of soil is located along riverbanks and is encircled by deep forests, including *Hintala*, *Kamal* and *Kadli*.

c) Ordinary land (*Sadharan Desa*): Any type of tree may thrive in this type of soil, and it works well for both dry and swampy trees.

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

This section describes traditional methods of plant propagation based on the nature of different species. Plants are classified into four categories: *Vanaspati* (fruit-bearing plants without conspicuous flowers), *Druma* (flowering and fruit-bearing trees), *Lata* (climbers), and *Gulma* (shrubs with multiple stems). The text outlines propagation through seeds, stem cuttings, and bulbs. Species such as *Jambu*, *Champaka* and *Punnaga* are propagated by seeds; *Tambuli*, *Sindhuvara* and *Tagara* by stem cuttings; while *Patala*, *Dadima*, *Plaksha*, *Karavira*, *Vata* and *Udumbara* can be raised by both seeds and cuttings. Bulb propagation is recommended for *Kumkuma*, *Rasona* and *Alukanda*, whereas *Ela*, *Padma* and *Utpala* may be propagated through both seeds and bulbs. These methods reflect the systematic understanding of plant propagation in *Vrikshayurveda*.

5. *Bijotpatti-Vidhi* (Seed Sowing)

This section outlines traditional guidelines for successful seed sowing, emphasizing proper land preparation, seed treatment, and appropriate planting time. It recommends preparing a well-levelled field and initially cultivating crops such as *Masha* and *Tila* to improve soil quality before sowing other seeds. Seeds should be collected from naturally matured fruits, treated by soaking in milk, dried, and fumigated with *Sarpi* (ghee) mixed with *Vidanga*. Certain species, including *Jambu*, *Panasa*, *Sarala* and *Lakucha*, require additional treatments, such as coating with ghee, cow dung and *Vidanga*, to enhance seed viability and promote healthy germination.

6. *Ropana Vidhana* (Methods of Plantations)

Plantation guidelines and practices are contained in this section of *Vrikshayurveda*. Plantation techniques, which are based on the area utilized for the plantation, are discussed below:

a) Seeds include *Jambu* (*Syzygium cumini*), *Champaka* (*Magnolia champaca*), *Nagakesar* (*Mesua ferrea*) etc.

b) Stalks: *Tambuli* (*Kali Musli- Curculigo orchoides*), *Tagara* (*Valeriana wallichii*) etc.

c) Bulbs: *Kumkuma* (*Autumn Crocus*), *Sindhuvara* (*Vitex negundo*), *Tagara* (*Valeriana wallichii*) etc.

d) Both seeds and stems, such as *Ela* (*Elettaria cardamomum*).

e) Both seeds and bulbs, include *Plaksa* (*Ficus religiosa*), *Dadima* (*Punica granatum*) and *Patala* (*Stereospermum suaveolens*).

Planting techniques rely on the components that must be used in order to help plants grow as well as possible. The following are a few *Vrikshayurveda* planting guidelines:

I. The size of the seed determines how many seeds should be sown; large seeds should be sown alone, while smaller seeds should be sown in multiples.

II. The stalk should be eighteen *angulas* long, with half of it coated in cow manure and the other half buried in the ground.

III. The bulb needs to be planted in a pit that is one forearm wide, one forearm deep, and filled with muck and thick sand.

IV. Two bushes should be planted four to five forearms apart.

7. Nishechan-Vidhi (Method of irrigation)

The *Vrikshayurveda* mentions irrigation based on the season. Irrigation should be done every day in *Vasanta* (spring), every other day in *Hemant* (pre winter) and *Shishira* (winter) and three times a day in *Grishma* (summer).

8. Drumaraksa (Protection of Trees)

It provides comprehensive information on protecting entire plants from drying out or withering due to severe environmental conditions. Additionally, it describes the use of plants for treating wounds.

9. Upavanaprakriya (Garden Planning)

This section describes the creation of aesthetically pleasing and health-promoting gardens that support physical and mental well-being. Gardens are designed with creepers, flowering plants, swings, artificial hills and caves, lotus ponds, lakes, and a central resting house. Peacocks are maintained to create a peaceful environment and deter snakes. Clean drinking water is ensured through wells surrounded by trees, with water purified using herbal substances such as: *Naga*, *Koshataka*, *Amalaka*, *Anjana*, *Musta*, *Ushira* and *Kataka* fruits.

10. Kooparthe Bhumi Pariksha (Identification of Groundwater)

This section explains methods for locating underground water sources for well construction using natural indicators. Signs such as the growth of specific plants, the presence of animals like frogs and scorpions, soil characteristics, and the location of anthills near trees are used to identify groundwater. It also recommends auspicious *Nakshatras*, including *Hasta*, *Magha*, *Anuradha*, *Pushya* and *Rohini*, for commencing well excavation. Furthermore, it provides guidelines for selecting suitable well locations within villages and cities, while advising against certain directions to minimize risks such as fire and accidents.

11. Posana-Vidhi (Method of Nourishment)

This section describes traditional methods for promoting healthy plant growth and improving yield through natural nutrient formulations. It recommends crop-specific nourishment using substances such as white mustard, oilcake, milk, water-soaked chaff, ghee, jaggery, and honey. The text also suggests the use of aromatic and herbal preparations to enhance flower fragrance, improve fruit quality, and strengthen plant resistance against diseases.

12. Kunapajalam (Manure)

Kunapa is a potent liquid manure for trees. To prepare it, a mixture of flesh, fat, and marrow from animals such as 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, the following ingredients are included: pounded sesame oilcake, honey, freshly wetted Masha, and Ghrit. The mixture is preserved in a warm place for a fortnight, resulting in a highly nourishing liquid manure that promotes tree growth and health.

Table 1: Formulation of kunapajala.^[9]

Items	Quantity
1. Animal flesh (fresh or stale, not rotting) or Eggs (fresh or old) or Soybean meal or nuggets plus Paneer or Fish meal or Paneer	2kg 25 1 kg + 1 kg 2 kg 2 kg
2. Marrow (crushed bones) or Tofu from soybean	0.5 kg / 1 kg
3. Rice husk or any grain husk	1 kg
4. Available oilcake	1 kg
5. Cattle dung	10 kg
6. Cattle urine	15 L
7. Black gram (optional)	0.5 kg
8. Honey	0.25 kg
9. Ghee	0.25 kg
10. Milk	1 L

13. Taru chikitsa (Treatment of plants)

Vrikshayurveda classifies plant diseases into internal and external disorders. Internal diseases are attributed to imbalances of *Vata*, *Pitta* and *Kapha*, similar to the *Ayurvedic* concept of *Tridosha*. *Vata* disorders, characterized by stunted growth, hard fruits, and weak stems, are treated with *Kunapajala* and fumigation using animal fat. *Pitta* disorders, marked by yellow leaves and unhealthy flowers and fruits, are managed with cooling and sweet substances such as honey and fruit decoctions. *Kapha* disorders, identified by delayed flowering, poor fruiting, and pale leaves, are treated with bitter herbal decoctions and, in some cases, mustard paste applied to the roots. External diseases, caused by insects, worms, and adverse environmental conditions, are managed through manual removal of pests and the application of ash or brick dust to the affected parts.

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

This section describes techniques for producing unique and unusual characteristics in plants through specific seed and plant treatments. These include imparting fragrance to odourless flowers, altering the colour of cotton and lotus flowers, inducing off-season fruiting, producing seedless fruits, and enhancing desirable plant traits. Various herbal and specialized formulations are recommended to stimulate plant growth and achieve these exceptional 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*, and *Jambu* are associated with positive prospects for *Yavaka*, *Shashtika*, and *Sthalmasha* respectively. Additionally, the presence of trees like *Hastikarna*, *Ashvakarna*, *Patala*, and *Kadali* can indicate favorable 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 a sign for various factors including security, fear, health, rainfall, and more.

Potential applications in Modern Agriculture

The principles described in *Vrikshayurveda: Upavanvinoda* by Sharangdhar remain relevant to modern agriculture by supporting sustainable, eco-friendly, and holistic farming practices. Its applications include:

1. **Biodiversity Conservation:** Encourages agroforestry, afforestation, ecosystem restoration, and carbon sequestration through the cultivation of diverse plant species.
2. **Organic Farming:** Promotes the use of natural formulations for plant nutrition, disease management, and pest control, reducing dependence on synthetic chemicals.
3. **Permaculture:** Supports integrated farming systems by cultivating plants for food, medicine, and ecological balance.
4. **Crop Improvement:** Traditional methods for modifying plant traits may inspire research on crop enhancement and breeding.
5. **Crop Management:** Recommendations on appropriate sowing and harvesting times complement modern crop rotation and soil conservation practices.
6. **Eco-friendly Pest Management:** Advocates natural pest control methods, minimizing reliance on chemical pesticides.
7. **Integration of Traditional and Modern Knowledge:** Combines ancient agricultural wisdom with scientific advancements to develop sustainable farming strategies.
8. **Community Participation:** Promotes tree planting and garden development to encourage public

involvement in environmental conservation and sustainable agriculture.

CONCLUSION

Upavanavinoda of *Sharangadhara Paddhati* presents a holistic approach to plant cultivation by integrating principles of soil management, plant propagation, irrigation, nutrition, disease control, and environmental conservation. Its emphasis on natural fertilizers, herbal formulations, biodiversity conservation, and eco-friendly pest management closely aligns with the objectives of modern sustainable and organic agriculture. Although some concepts reflect the traditional beliefs of their time, many practices are scientifically relevant and offer valuable insights for contemporary farming. Integrating the principles of *Vrikshayurveda* with modern agricultural science may contribute to the development of sustainable, climate-resilient, and environmentally friendly cultivation systems. Thus, *Upavanavinoda* remains an important source of indigenous agricultural knowledge, providing practical guidance for conserving natural resources, improving crop productivity, and promoting ecological balance.

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