

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

The Significance of *Vrikshayurveda* for Sustainable Cultivation of Potent Medicinal Plants

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ABSTRACT :

An all-encompassing and environmentally responsible method of growing plants is provided by *Vrikshayurveda*, an ancient Indian science with roots in *Ayurveda*. The main topics of *Vrikshayurveda* include buying, preserving, treating seeds and planting materials, irrigation methods, soil selection, biofertilizers, ways to prevent plant diseases, and other aspects of trees. Many health hazards, including cancer, digestive issues, physical and mental ailments, reproductive deviations immunological suppression, and hormone disruption, are being brought on by chemical pesticides and fertilizers. This is because current farming methods, which rely heavily on chemicals to produce robust and disease-free plants, have largely supplanted our old farming methods. Chemicals are not only detrimental to human health but also to the ecosystem, lowering the quantity of vital soil microbes and polluting the air, soil, and ground water. Verifying the efficacy of several conventional techniques for treating medicinal plant diseases and organic production is necessary. A survey of *Vrikshayurveda* literature on agricultural practices that can be used to produce potent medicinal plants is attempted here. Additionally, it highlights recent advancements and the current status of research in the fields of *Vrikshayurveda* and organic agriculture.

Keywords: Vrikshayurveda, medicinal plants, sustainable agriculture, traditional knowledge, organic farming.

Introduction

In addition to discussing various farming and planting techniques for producing healthy plants, the *Ayurvedic* approach to plant life also teaches the purposeful use of natural resources. Additionally, it offers guidelines for natural resource conservation, groundwater estimation, water reservoir construction, rainwater harvesting, soil selection and pre-planting preparations, planting patterns, plant spacing, managing various plant diseases, manure selection, preparation, and treatment, and applying *Vastu* knowledge to gardens, among many others.

Thus, just as *Ayurveda*, a medical science for humans, the one which was developed for plants is known as *Vrikshayurveda*.ⁱ 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.ⁱⁱ 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.ⁱⁱⁱ Comparable to a vast forest of knowledge, *Vrikshayurveda* provides various planting and agricultural techniques. A selection of the practices are listed below:^{iv,v}

Soil description (Bhuminirupana):

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 (Prosopis cineraria)* and *Palash (Butea monosperma)* 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.

Seed-planting technique (Bijoptividhi):

It relates to the understanding of how to treat seeds for planting and preservation; for example, it has been proposed that seeds should be exposed to medicinal smoke and ashes in order to achieve full plant growth.

Description of Plant's Life (Padapavivaksa)

In plants, padapavivaksa represents life and energy. In addition to explaining that plants have life and sensibility, it covers the full biology of plants.

Methods of Plantations (Ropana Vidhana)

The plantation's guidelines and practices are contained in this section of *Vrikshayurveda*. Plantation techniques based on the area utilized for the plantation, such as:

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

- b. Stalks: Tambuli (Kali Musli- Curculigo orchioides), Tagara (Valeriana wallichii) etc.
- c. Bulbs: Kumkuma (Autumn Crocus), Sinduvara (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 (pomegranate-Punica granatum) and Patala (Stereospermum suaveolens).

Planting techniques rely on the components that must be used in order for plants to grow as best they can. The following are a few of the *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 slanted in multiples.
- II. The stalk should be eighteen *angulas* long, with half of it coated with 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 packed with muck and thick sand.
- IV. Two bushes should be four to five forearms apart.

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 (prewinter) and Shishira (winter), and three times a day in Grishma (summer).

Method of Nourishment (PosanaVidhi):

The application of manures and fertilizers as nutrient supplements is covered in this section of *Vrikshayurveda*. In fact a unique class of liquid manure is described in *Vrikshayurveda*. The most common type of liquid manure that has been recommended for usage is "*Kunapajala*," which is made from biological components in either fully or partially fermented state. Other nutritious materials that have been mentioned include milk, manure, honey, and brick dust.

Literally meaning "filthy fluid" or "fermented filth," *Kunapajala*, sometimes called *Kunapambu*, is one of the oldest techniques for creating liquid manures from organic waste.^{vi} *Kunapajala* was the first attempt in agricultural history to create fermented organic fertilizer. Made from animal wastes like flesh, dung, urine, marrow, and skin, *Kunapajala* includes essential nutrients like sugar, fatty acids, keratins, amino acids, and macro and micronutrients that stimulate plant growth and development.

Protection of Trees (Drumaraksa):

It includes comprehensive information on how to protect entire plants from drying out or withering due to severe and damaging environmental conditions. Additionally, it mentions using plants to treat wounds.

Treatment of Plants (Taru Cikitsa):

In Vrikshayurvedaplant diseases have been classified into two categories: vii

a) Internal Diseases:

Similar to Ayurveda, Vrikshayurveda relies on three key elements: vataj, pittaj and kaphaj. If any of these are out of balance, it can cause illness in humans, animals, and plants.

i. *Vataj*: These conditions are caused by dry terrain and are identified by hard fruits, tumors and thin, weak, zigzag stems, among other symptoms. *Kunapjala*, which is liquid manure, is used to cure these illnesses. In cases of *Vataj* imbalance, burning animal fat can also be employed as a fumigation method.

ii. *Pitaj*: Yellow leaves with sickly blossoms and fruits are the signs that occur when plants are treated with acidic and salty water. Cold and sweet materials, such as honey and fruit decoction, are used to treat infected plants.

iii. *Kaphaj*: Late flowering and fruiting with small, pale leaves are signs of illness that develops when plants are treated with sweet and cold water for an extended period of time. To remedy *Kaphaj* imbalance, infected plants are treated with a bitter and powerful decoction. Mustard paste is occasionally used to cover roots.

b) External Diseases:

These illnesses are identified by the weakening of the affected area and are primarily brought on by outside variables, such as worms, insects, and unfavourable circumstances. In the event of an external infection, manual removal of insects and worms has been recommended. Ash and brick dust are typically used to treat external ailments by sprinkling them on the affected area.

Gardening (Upavanakriya):

Instructions for creating and caring for the gardens, including how to use *Latagrha, Kridaparvata* and *Kadaligrha*, are included in this section. It also offers other ideas for enhancing the garden aesthetics.

Plant's Significance (Taru Mahima):

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.

Variegation (Citrikarana):

This area of Vrikshayurveda can be related to scientific methods for giving plants new characteristics, such as pre-maturity of plants and fruits or the evolution of fragrance in non-fragrant flowers to make a plant bloom all year round.

Every technique outlined in the *Vrikshayurveda* is a way to interact with the environment to increase yield and provide extra organic manure support to prevent illness.

Various cultivation techniques^{viii} to increase yield is mentioned in Vrikshayurveda like sprinkling of ghee with cold milk.

A) Panasa (jackfruit) produces large fruits when watered with a Triphala decoction and promptly covered with husk.

B) Orange trees produce high-quality fruit when handled with water, meat, jaggery and milk.

C) Trees that do not bear flowers or fruit should be treated with a cold mixture of sesame, barley, *Kulattha* (*Dolichos biflorus*), green gram and black gram.

Pest control:

- During that time, methods of controlling pests in trees included fumigation with Sarshapa, Hingu, Vidanga (Embelia ribes), Vacha (Achorus calamus), and water combined with Bhallataka powder (Semicarpus anacardium).
- A paste made by grinding the barks of Karanja (Pongamia pinnata), Aragwadha (Cassia fistula), Vidanga (Embelia ribes) and Musta (Cyperus rotundus) with cow urine is applied to the roots of sick plants.

Conclusion

By implementing numerous *Vrikshayurveda* based agro approaches, we can have pharmaceuticals free of toxic chemicals, as well as more potent drugs and active principles that can be easily accessed using modern standards. It would undoubtedly encourage the sustainable management of medicinal plants through value addition, thereby improving both the quality and production of raw materials for the manufacturing of medicines. It is critical to ensure plant development and productivity while also creating an eco-friendly atmosphere. So, improvements in *Vrikshayurveda* based approaches are advantageous in improving the viability of endangered plant species seeds for better germination, as well as providing opportunities to incorporate traditional medicine.

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