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The relevance of *Vrikshayurveda* for organic cultivation of medicinal plants

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ABSTRACT

Ayurveda was theorized few thousand years back and is practised upto this day. So as like the medical science for humans (Ayurveda) similar science *Vrikshayurveda* was also developed for plants. *Vrikshayurveda* mainly deals with various aspects of trees regarding procuring, preserving, treatment of seeds and planting materials, method of irrigation, selection of soil, bio fertilizers and techniques for healthy growth and productivity of plant and plant disease etc. Today, we are facing lot of health hazards due to chemical fertilizers and pesticides in human beings like Digestive ailments, Cancer, Physical and Mental ailments, Reproductive abnormalities, Immune suppression, Hormone disruption etc. It does because of our traditional practices of farming have been more or less replaced by modern techniques, which are mainly dependent on chemicals for disease free and vigorous plants. Not only human health, these are causing destructive effects on environment like contamination of air, soil, ground water and declining of beneficial soil micro-organisms. It is necessary to validate effectivity of several ancient practices in the organic production and managing medicinal plant diseases. An effort is made here to review *Vrikshayurveda* literature related to agro techniques which can be used in the development of effective medicinal plants. It also highlights the current status of research and recent trends in the field of *Vrikshayurveda* related to organic production.

Key words: Traditional Agriculture, Agro techniques, *Vrikshayurveda*, Research trends.

INTRODUCTION

Since long back Indians have wakefulness about health and longevity. For the interest of good health they have affinity towards the healthy diet and their resources. Our ancestors have curiosity in the jungle to get such sources of plant origin. Our sages made immense efforts in getting the knowledge of plants and assessed their medicinal value. It includes their identification,

variety, properties, procurement and use. They have strong relationship with plant and animal resources.

Ayurveda is practised up to this day, even though it was theorized few thousand years back. So as like the medical science for humans (Ayurveda) similar science *Vrikshayurveda* was also developed for plants.^[1] Ancient India recognised the importance of cultivation, conservation, collection methods of plant bio-resources and their rational use for therapeutic purpose and health promotion.^[2]

Vrikshayurveda is a Sanskrit term which means the science of Plant life (*Vriksha* = tree). It is an ancient Indian science of plants. It is explained in various ancient texts. Vedas like *Rigveda* and *Atharveda* has lots of references regarding plants and environment. Ayurveda is the knowledge of life, diseases, their prevention and treatment. In *Vrikshayurveda* these concepts are applicable to plants. It has been completed in the form of Sanskrit *Shlokas* (325 in no) in a text *Vrikshayurveda* by *Surapala* (around 1000

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years ago). He explained the importance of plants in human life. It explains procuring, preserving, treatment of seed and planting techniques. This text, deals with various topic like planting a garden, importance of various plants, selection of land, characteristic of soil, planting pits, different methods of irrigation, nutrition for plants, fertilizers, diseases of trees and their treatment.^[3]

Today, we are facing lot of health hazards due to chemical fertilizers and pesticides in human beings like Digestive ailments, Cancer, Physical and Mental ailments, Reproductive abnormalities, Immune suppression, Hormone disruption etc. It does because of our traditional practices of farming have been more or less replaced by modern techniques, which are dependent on chemicals (fertilizers) for disease free and vigorous plants. Not only human health, these are causing destructive effects on environment like contamination of air, soil, ground water and declining of beneficial soil micro-organisms. It is the need of the hour to validate effectively of several ancient practices in the organic production and managing medicinal plant diseases.^[4]

An effort is made here to review *Vrikshayurveda* literature related to agro techniques which can be used in the development of effective medicinal plants. It also highlights the current status of research and recent trends in the field of *Vrikshayurveda* related to organic production.

Vrikshayurveda in Ancient Literature

The literature of *Vrikshayurveda* found from various texts like *Agni Purana*, *Brihatsamhita*, *Sharangdhara Paddhati* of *Sharangdhara*. The term '*Vrikshayurveda*' was first mentioned in *Koutilya Arthashastra* but details are explained in *Brihatsamhita* and *Agni Purana*. Text such as *Vishvavallabha*, *Krishi Parashara*, *Manasollas*, *Shivatatvaratnakara* and *Lokopkara* also contain the information related to the art of plantation. *Vrikshayurveda* is a text written by *Surpala* (1000AD) highlighting the importance of agriculture practices. It is an Independent Ancient Sanskrit Text (325 *Shlokas*) on Plants. Mr Y. L. Nene (Chairman Asian Agri-History Foundation) procured a manuscript of

Vrikshayurveda of *Surapala* from Bodlein Library, Oxford, UK. Dr Nalini Sadhale did the English translation of the manuscript.^[5]

Variety of information regarding nursery and agro techniques such as selection of soil, method of irrigation, pre sowing treatment of seeds and planting materials, bio fertilizers, techniques for healthy growth and management of pest control etc. ^[6-10]

- 1. Soil selection:** An ancient text related to *Vrikshayurveda* has given comprehensive information on selection of soil for varieties of plants.

Bhumi (Type of Land)	Plants to be grown
<i>Anupa Bhumi</i> (Marshy land)	<i>Panasa, Narikela, Jambu, Tala, Vamsha, Jambheera, Vata, Kadamba, Kadali, Ketaki, etc.</i>
<i>Jangala Bhumi</i> (Arid land)	<i>Ashoka, Shami, Bilwa, Shigru, Saptaparna, Shaka, Nimba, Karira etc.</i>
<i>Sadharana Bhumi</i> (Ordinary land)	<i>Amra, Dadima, Champaka, Bijapuraka, Priyangu etc.</i>

- 2. Method of irrigation:** Irrigation according to season is mentioned in *Vrikshayurveda*. In *Vasanta* (spring) irrigation should be done daily, in *Hemant* (pre winter) and *Shishira* (winter) every alternate day and in *Grishma* (summer) it should be done thrice in a day.
- 3. Pre sowing treatment of seeds (Bijopti Vidhi):** Certain pre sowing treatment of seeds are mentioned which are beneficial for seed sowing purpose.
 - Seeds are extracted from dried fruit, is then sprinkled with milk and dried for five days. It is then smoked with mustard seeds mixed with *Vidanga* (*Emblia ribes* Burm. f).
 - Seeds sprinkled with milk rubbed with cow dung, dried and profusely smeared with *Vidanga Choorna* and *Madhu* will definitely sprout.

- c. Seeds soaked in milk, dried well in shade and rolled in the powder of *Brihati* (*Solanum indicum* L.), *Tila* (*Sesamum indicum* L.) and mixed with mustard are excellent for sowing.

4. Specific planting months

Plants	Specific planting month
<i>Dadima</i> (<i>Punica granatum</i> L.), <i>Bakula</i> (<i>Mimusops elengi</i> L.)	<i>Shravana</i> (Rainy)
<i>Amra</i> (<i>Mangifera indica</i> L.), <i>Lakucha</i> (<i>Artocarpus lakoocha</i> ROXB.)	<i>Bhadrapada</i> (when rains are receding)
<i>Saptaparna</i> (<i>Alstonia scholaris</i> L.)	<i>Kartika</i> (Start of dry season)
<i>Patola</i> (<i>Trichosanthes cucumerina</i> L.)	<i>Phalguna</i> (beginning of spring)
<i>Kadali</i> (<i>Musa paradisiaca</i> L.)	<i>Vaishakha</i> (beginning of summer)

5. **Bio fertilizers** in the name of *Kunapa Jala* which is special liquid manure is mentioned in *Surapala's Vrikshayurveda* which enhances growth and development of plants.

6. Preparation of *Kunapa Jala* (*Surapala*): The excreta, flesh, brain, bone marrow, head of boar, mixed with water and stored underground called as *Kunapa*. It is then boiled after mixing with water and mixture should be stored in oiled pot after adding sufficient quantity of husk, after roasting it in an Iron pot. Sesame oil cake, honey and soaked black gram also added. A little ghee should be poured.

7. **Various cultivation techniques:** to increase yield is mentioned in *Vrikshayurveda* like sprinkling of ghee with cold milk.

- a. *Panasa* (jack fruit) when watered with *Triphala* decoction and covered immediately with husk, bears big sized fruits.
- b. Orange tree bears good quality of fruit when treated with water mixed with flesh, jaggery and milk.

- c. Trees that don't bear flowers and fruit should be treated with cold mixture of sesame, barley, *Kulattha* (*Dolichos biflorus* L.), green gram and black gram.

- d. In *Vrikshayurveda Panchmoola* is combination of five plants mainly *Bilva* (*Aegle marmalos* L.), *Agnimanth* (*Clerodendrum phlomides* L.), *Shonak* (*Oroxylum indicum* Benth.), *Patala* (*Stereospermum suaveolens* Roxb.), *Gambhari* (*Gmelina arboria* Roxb.) are used in various forms to treat different diseases in plants. It is also used for pest control and as a bio fertilizer to enhance plant yield.

8. **Pest control** in trees was followed in those days like fumigation with *Sarshapa*, *Hingu*, *Vidanga* (*Embelia ribes*), *Vacha* (*Achorus calamus*) and water and mixed with powder of *Bhallataka* (*Semicarpus anacardium*).

9. Paste prepared by pounding the barks of *Karanja* (*Pongamia pinnata*), *Aragwadha* (*Cassia fistula*), *Vidanga* (*Embelia ribes*), *Musta* (*Cyperus rotundus*) with cows urine is applied to the roots of infected plant.

Research / Publications related to Vrikshayurveda

1. Mohan B. Evaluation of Organic growth promoters on yield of dry land vegetable crops in India. *J Org Sys.* 2008; 3: 23-26

This study recommends the use of *Panchagavya* as an organic growth promoter for small and marginally profitable vegetable crop farms.

2. Brageshwar, Joshi AK, Dey S. Effect of *Kunapa Jala* and fertilizers on *Senna* (*Cassia angustifolia*) Indian forester. 2007; 133:1235-1240

This study highlights the importance of *Kunapajala* with special emphasis on cultivation of medicinal plants like *senna* (*Cassia angustifolia*)

3. Ankad GM, Hiremath J, Patil RT, Pramod HJ, Hegade HV. Nutrient analysis of *Kunapa Jala* and *Panchgavya* and their evaluation on germination of *Ashwagandha* and *Kalamegha* seeds; a

comparative study. J Ayurveda Integr Med. 2017;9(1):13-19

This study emphasis on preparation of *Kunapa Jala*, *Panchagavya* and also its effect on germination of *Aswagandha* and *Kalamegha* seeds.

4. Shubhasree MN, Matapathi S, Dixit AK. Conservation and preservation of medicinal plants leads from Ayurveda and *Vrikshayurveda*. Int J Complement Alt Med. 2018;11(5):275-279

This paper emphasizes on the conservation of plants as per *Vrikshayurveda*. It mentions the concept of *Nakshatra Vana* and *Rashi Vana* and also the advantages of organic farming.

5. Vidyanath Ratnakaram. Antique cultivation and conservative techniques of Vegetation w.s.r. to *Vrikshayurveda*. ISSN 0976-0075 Ayurveda e-Journal Rasamritam, 5:36 Nov 2013

This paper focuses on the *Vrikshayurveda* techniques and hazards caused by chemical fertilizers and pesticides. It also tells about the treatment of diseased condition of plants mentioned in *Vrikshayurveda*.

6. Ramachandran CK. *Vrikshayurveda* (Arboreal medicine in Ancient India) Anc Sci Life.1984;4(2):110-1

This paper discusses the special branch of ancient Indian Sciences on plant life as mentioned by *Vrikshayurveda*.

7. Anjan Kumar Sinha, P. K. Mishra. Effect of liquid Biofertilizer(*Vrikshayurveda*) prepared from *Brassica alba* on the cultivation of Rice. Journal of Applied and Natural Science 5 (2): 427-429(2013).

This study clearly indicated that in comparison to urea, *Brassica alba* treated paddy plant performed higher plant height, higher yield production, higher husk production, larger number of grain per panicle, panicle length and higher grain weight.

8. A Gangadhar, Effects of Vrikhsayurveda and modern techniques on germination of Bakuchi (*Psoralea corylifolia* Linn.). A comparative study, KLEU's Shri BMK Ayurveda Mahavidyalaya, Belagavi, 2014

This study on the basis of germination parameters proves the method mentioned in *Vrikshayurveda* is beneficial alternative in terms of better and safe germination.

9. Shahane Prachi, Khobragade Pramod. Evaluation on the seed germination rate of Ashoka (*Saraca asoka* (Roxb.) De Wilde) w.s.r. to Vrikhsayurveda. International Journal of Ayurveda and Pharma Research. 2016;4 (10): 29-32

This paper emphasizes on the seed germination rate, which is increased by *Vrikshayurveda* method.

10. Ankita Patil, Meenal Lad. Comparative study of quantitative evaluation of alambu fruit (*Cucurbita maxima* Duch. Ex Lamk.) Grown by *Vrikshayurveda* cultivation method and conventional cultivation practice. IAMJ: Vol 7, issue 10, Oct-2019

This study on quantitative evaluation of *Alambu* fruit through *Vrikshayurveda* cultivation method showed good results than conventional cultivation practice.

CONCLUSION

By adoption of various *Vrikshayurveda* based agro techniques, we can have drugs free from harmful chemical, availability of potent drugs and more active principles, which can be easily accessed through modern parameters. It would certainly promote the sustainable management of medicinal plants with value addition which ultimately enhance the quality as well as production of raw material for the production of medicines. It is the need of the hour to procure healthy growth and productivity of plants and build eco friendly environment. So, the developments of *Vrikshayurveda* based techniques are beneficial to improve the viability of the seeds of endangered plant species for better germination and it also gives scope to integrate traditional medicine.

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 9. Upavana Vinodha with English translation by G.P. Mazumdar, The Indian Research centre, Calcutta, 1935
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