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Integrating Vrksayurveda with Biopesticides for Sustainable Pest Management

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ABSTRACT

Vṛkṣayurveda represents an important traditional Indian knowledge system that provides comprehensive principles for plant cultivation, nutrition, irrigation, disease management, pest control, and conservation of natural resources. In the context of increasing environmental degradation, soil deterioration, and ecological risks associated with excessive use of synthetic agrochemicals, traditional plant-based approaches offer valuable perspectives for developing sustainable crop protection strategies. This review explores the principles of Vṛkṣāyurveda and related Sanskrit agricultural literature, with particular emphasis on traditional methods of plant nourishment and pest management. Practices such as Kunapajala, botanical preparations, fumigation, plant extracts, organic formulations, and natural treatments documented in traditional texts are examined for their potential relevance to contemporary biopesticide research. Plant-derived materials including Azadirachta indica, Pongamia pinnata, Embelia ribes, Curcuma longa, Cyperus rotundus, and other botanicals have been identified as potential sources of bioactive compounds for pest and pathogen management. The review further highlights the opportunity to integrate traditional phytochemical knowledge with modern plant–microbe interactions, microbial biocontrol agents, and biotechnological approaches to improve the efficacy and sustainability of biological pest management. Such integration may contribute to reduced dependence on synthetic pesticides, improved soil and plant health, and environmentally compatible agricultural production. However, systematic scientific validation, including phytochemical characterization, toxicity assessment, dose optimization, microbial compatibility studies, and field-level evaluation, is essential before large-scale application. Integrating Vṛkṣāyurveda with modern microbiology, phytochemistry, and agricultural science therefore offers a promising interdisciplinary pathway toward sustainable pest management and climate-resilient agriculture.

KEYWORDS
Vṛkṣāyurveda; Indian Knowledge System (IKS); Sustainable Agriculture; Biopesticides; Plant–Microbe Interactions; Botanical Pesticides; Traditional Pest Management; Organic Manures; Kunapajala; Plant Health.

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Introduction

Vṛkṣayurveda, an established classical Indian system of botanical knowledge, serves as a significant historical reference for maintaining ecological equilibrium by prioritizing holistic crop health through conventional pest management approaches (Ghatule & Chavre, 2026). Through the combination of these conventional methodologies with contemporary plant–microbe interaction research, scholars can bridge historical

indigenous knowledge with modern Integrated Pest Management practices (Balasubramanian et al., 2008; Ghatule & Chavre, 2026). Specifically, the application of conventional botanical preparations documented in sources such as the Sharangdhar Padhdhati offers a valuable foundation for recognizing plant secondary metabolites that serve as efficient, ecologically sound substitutes for artificial chemical substances (Kumar et al., 2026; Singh et al., 2024). Furthermore, by merging these conventional phytochemical understandings with advanced biotechnological innovations, including microbial-derived biopesticides, the effectiveness of naturally sourced pest management can be strengthened through cooperative bio-activators (Fenibo et al., 2022; Fenibo & Matambo, 2025; Kumar et al., 2026). This comprehensive methodology aligns with the operational principles of contemporary microbial bio-agents, which employ antibiosis and stimulated plant immunity to manage pathogens while decreasing reliance on chemical inputs (Rai et al., 2024). The growing attention to these conventional approaches reflects the environmental degradation and soil exhaustion resulting from excessive reliance on artificial agrochemicals (Das, 2025). By employing methodologies including Kunapajala and Panchgavya, which strengthen soil microbial populations, this combination delivers a viable strategy for enhancing agricultural output while fostering ecological stability (Thakur et al., 2025). This cross-disciplinary synthesis corresponds with contemporary developments in "One-Health" agricultural methodologies, wherein the preservation of botanical and microbial variety is vital for sustaining ecosystem health (Kumar & Jigeesh, 2024). Furthermore, the historical acknowledgment of phytochemicals as contributors to crop resilience finds contemporary validation in recent research, which demonstrates how the synergistic combination of beneficial microbes and plant-derived compounds delivers enhanced protection against pathogens (Danesh et al., 2025). This scientific approach overcomes the constraints of standalone biopesticide strategies by harnessing the phytochemical diversity inherent in traditional formulations to strengthen host plant immune responses (Biswas et al., 2025; Thakur et al., 2025). The Indian Knowledge System (IKS) constitutes a comprehensive collection of traditional wisdom, methodologies, and philosophical frameworks that have developed progressively across centuries within the Indian subcontinent (Kumar et al., 2019). The fusion of empirical understanding with moral and spiritual dimensions through classical texts including the Vedas, Upanishads, and Puranas, alongside transmitted oral knowledge, is facilitated through the IKS framework within NEP (2020), which holds relevance for contemporary higher education. The significance of IKS is demonstrated through its effectiveness in tackling present-day issues by delivering sustainable approaches across multiple domains, including health through Ayurveda, psychological wellness through Yoga, ecological sustainability via Vaastu Shastra, and analytical thinking through Nyaya (Singh and Bharadwaj, 2024). Consequently, its cross-disciplinary methodology integrates conventional knowledge with contemporary requirements, offering meaningful perspectives for sustainable advancement, psychological health, and worldwide educational frameworks. This suggests that through safeguarding and implementing IKS principles in higher education, we strengthen comprehension of our profound cultural inheritance and establish pathways for equitable advancement and long-term prosperity (Joshi et al., 2026). Beyond elucidating diverse agricultural and cultivation methodologies for cultivating vigorous plants, the Ayurvedic perspective on plant biology equally emphasizes the judicious management of ecological resources.

Furthermore, it encompasses guidelines for sustainable natural resource management, groundwater assessment, water storage infrastructure development, rainwater collection systems, soil evaluation and site preparation, cultivation layouts, plant density optimization, pest and disease management, organic matter selection and processing, and the integration of Vastu principles in horticultural design, among numerous other topics. Consequently, much like Ayurveda represents the medical science for human health, Vṛkṣāyurveda constitutes the equivalent botanical science developed for plant cultivation and care. Ancient Indian civilization recognized the significance of cultivating, safeguarding,

and harvesting plant biological resources, alongside their judicious application for therapeutic purposes and overall wellness improvement. This comprehensive literature addresses garden establishment, plant classification and selection, land assessment, soil composition analysis, pit construction, diverse water management approaches, plant nutrition requirements, soil amendments, arboreal pathology, and therapeutic interventions for plant ailments, among other essential topics. Functioning as an expansive repository of horticultural wisdom,

2. Vṛkṣāyurveda: Traditional Principles Of Plant Health

Vṛkṣāyurveda presents an extensive array of cultivation and farming methodologies. A selection of these established practices is presented below (Sadhale, 1996) as given in Table 1.

It provides a detailed description 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:

Arid land (Jangala Desa): This land type consists of gravels that create mirages and thin, gritty, dry sand. Khejdi (Prosopis cineraria) and Palash (Butea monosperma) are abundant in this type of soil.

Marshy land (Anupa Desa): This soil category occurs along riverbanks and is encircled by deep forests, including Hintala, Kamal, and Kadli.

Ordinary land (Sadharan Desa): A wide range of trees may grow in this type of soil, and it works well for both dry and swampy trees.

Table 1. Traditional Vṛkṣāyurveda approaches for maintaining plant health

Traditional approach	Primary purpose	Key practice/strategy	Relevance to sustainable agriculture
Bhoomi-niroopana	Assessment of growing conditions	Evaluation of soil and land suitability	Supports site-specific cultivation
Beejotpatti and beejaropana	Seed establishment	Traditional approaches to seed production and sowing	Promotes healthy crop establishment
Secana-vidhi	Plant water management	Appropriate irrigation practices	Supports efficient water use
Poshanavidhi	Plant nutrition	Use of natural/organic materials for plant nourishment	Reduces dependence on synthetic inputs
Druma-raksha	Plant protection	Preventive and protective measures for trees	Encourages plant health management
Tarucikitsa	Disease and pest management	Diagnosis, natural treatments and plant-care practices	Provides a basis for botanical and biological pest management
Kunapajala-based practices	Plant nourishment/protection	Application of traditionally prepared organic preparations	Potential source of inputs for sustainable crop production

Source basis: Surapala's Vṛkṣāyurveda.

2.1 Seed Treatment and Preservation (Bījoptividhi)

It describes methods for treating 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.

2.2 Concept of Plant Life (Padapavivakṣa)

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

2.3 Plantation Practices (Ropaṇa Vidhana)

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

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

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

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

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

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.

- Some important Vṛkṣāyurveda planting guidelines:
- Seed size determines how many seeds should be sown; large seeds should be sown alone, while smaller seeds should be slanted in multiples.
- The stalk should be eighteen angulas long, with half of it coated with cow manure and the other half buried in the ground.

2.4 Seasonal Irrigation Practices

Vrkshayurveda describes seasonal irrigation practices. 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).

2.5 Plant Nourishment and Organic Manures (Poṣaṇavidhi)

The use of manures and fertilizers as nutrient supplements is described in this section of Vrkshayurveda. In fact a unique class of liquid manure is described in Vṛkṣāyurveda (Nene, 2012). 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. 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.

2.6 Protection of Trees (Drumarakṣā)

It provides detailed 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.

2.7 Plant Disease Management (Taru Cikitsā)

In Vṛkṣāyurvedaplant diseases have been classified into two categories:

a) Internal Diseases:

Similar to Ayurveda, Vṛkṣāyurveda 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.

1. **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.
2. **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.
3. **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 conditions are characterized 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.

2.8 Garden Management (Upavanakriyā)

Guidelines for establishing and maintaining gardens, including how to use Latagrha, Kridaparvata and Kadaligrha, are included in this section. It also offers other ideas for enhancing the garden aesthetics.

2.9 Significance of Plants and Water Conservation (Taru Mahimā)

This section 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.

2.10 Plant Improvement and Variegation (Citrīkaraṇa)

This aspect of Vṛkṣāyurveda may be related to scientific approaches 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 Vṛkṣāyurveda is a way to interact with the environment to increase yield and provide extra organic manure support to prevent illness. Several cultivation practices for improving yield are described in Vṛkṣāyurveda like sprinkling of ghee with cold milk.

- Panasa (jackfruit) produces large fruits when watered with a Triphala decoction and promptly covered with husk.
- Orange trees produce high-quality fruit when handled with water, meat, jaggery and milk.
- 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.

2.11 Traditional Pest-Control Practices

Traditional methods of pest control 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.

Modern agriculture has traditionally depended on chemical fertilizers and pesticides to boost crop yields. However, their excessive application has resulted in several environmental and health issues, including declining soil fertility, contamination of groundwater, and the accumulation of toxic residues. Notably, heavy metals such as lead (Pb), arsenic (As), and mercury (Hg) can accumulate in plants, posing serious health risks through bioaccumulation and contributing to ecosystem imbalance. Conventional chemical inputs are often non-selective, adversely affecting both harmful pests and beneficial soil organisms. Their prolonged application depletes soil quality, disrupts microbial communities, and introduces persistent pollutants into water systems. Moreover, the industrial production of these chemicals releases harmful emissions, further exacerbating air and water pollution. By contrast, biofertilizers and biopesticides provide selective action, are biodegradable, and present minimal ecological risk, making them sustainable alternatives. Global demand for these biological agents is growing rapidly, supported by increased governmental and international promotion of organic farming practices (Sadhale, 1996; Kogan, 1998; Ota, 2013). Amid these challenges, plant-based biofertilizers and biopesticides have emerged as potential solutions due to their natural origin and environmental compatibility. Traditional Ayurvedic literature—particularly Vṛkṣāyurveda—documents the use of specific plant extracts to enhance plant growth and protect crops from pests. Building on this traditional knowledge as given in Table 2, the present study explores the potential of *Ocimum tenuiflorum* (Tulsi), *Azadirachta indica* (Neem), *Curcuma longa* (Turmeric), and *Zingiber officinale* (Ginger) as natural fertilizers and pest control agents. This research investigates the effects of these plant extracts on seed germination, plant growth, soil microbial activity, and pest suppression (Table 3). The expected outcomes are intended to support the development of environmentally safe, accessible, and cost-effective alternatives to synthetic agrochemicals, promoting sustainable agricultural practices.

Table 2. Plant-derived materials described in Vṛkṣāyurveda for pest management

Plant/material	Traditional application	Reported pest-management relevance	Potential modern research application
Neem (*Azadirachta*	External	Pest and pathogen suppression	Botanical pesticide and bioactive

***indica*)**	application/fumigation		compound screening
Karanja (*Pongamia pinnata*)	Root or plant application	Insecticidal and repellent activity	Plant-based biopesticide development
Vidanga (*Embelia ribes*)	Application and fumigation	Insecticidal and anthelmintic properties	Phytochemical and insecticidal screening
Mustard (*Brassica alba*)	Application/fumigation	Activity against plant-parasitic nematodes and insects	Botanical nematicide/biopesticide research
Musta (*Cyperus rotundus*)	Used in traditional pest-control preparations	Included in formulations for pest management	Screening for bioactive pesticidal compounds
Vaca (*Acorus calamus*)	Mainly fumigation	Traditional fumigant for pest control	Evaluation of volatile bioactive compounds
Turmeric (*Curcuma longa*)	Included in traditional preparations	Potential antimicrobial/insecticidal relevance	Phytochemical and formulation studies
Saptaparna (*Alstonia scholaris*)	Included in pest-control applications	Traditional pest-control use	Screening for botanical pesticide activity

Table 3. Traditional pest-management practices and their scope for modern biopesticide research

Traditional practice	**Mode of application**	**Target/use indicated traditionally**	**Possible scientific validation**
Botanical paste/coating	Direct application to plant/root	Protection of pest-affected plant parts	In-vitro/in-vivo insecticidal and antimicrobial assays
Plant-based fumigation	Smoke/volatile exposure	Management of pests and pathogens	Evaluation of volatile compounds and fumigant toxicity
Botanical sprinkling	Aqueous preparation applied to plants	Pest suppression	Dose-response and field-efficacy studies
Organic preparation application	Soil/plant application	Plant protection and nourishment	Microbial, biochemical and plant-growth assessment
Wound treatment	Application to damaged plant tissues	Prevention of pest entry and secondary infection	Antimicrobial and wound-healing assays
Plant–animal-derived preparations	Mixed formulations	Traditional pest suppression	Phytochemical, toxicological and compatibility studies
Single-plant extracts	Extract/formulation	Insect or pathogen management	Identification of active compounds and mechanism studies
Plant combinations	Multi-component formulations	Broader pest-management action	Synergy, compatibility and formulation studies

3. Historical and Cultural Context of Agriculture in Sanskrit Literature

Agriculture has long been a foundation of Indian civilization since ancient times, with texts like the Kṛṣiparāśara serving as repositories of traditional knowledge. Attributed to Sage Parāśara, this text is a seminal work on agricultural science, offering a holistic approach to farming that integrates ecological, spiritual, and practical dimensions (Qian *et al.,* 2020). In an era marked by environmental degradation, climate change, and unsustainable farming practices, the Kṛṣiparāśara offers valuable insights that resonate with modern sustainable agriculture. Kṛṣiparāśara is not merely a manual of agricultural techniques; it is a philosophical treatise that underscores the ethical and spiritual dimensions of farming. The text emphasizes the importance of living in harmony with nature and recognizing the interdependence of all living beings. This review aims to examine the agricultural principles outlined in the Kṛṣiparāśara, with emphasis on their relevance to contemporary farming challenges. By examining its teachings on soil management, crop selection, irrigation, and pest control, the study seeks to bridge the gap between ancient wisdom and modern agronomy (Awad *et al.,* 2018). Furthermore, it emphasizes the socio-cultural and ecological significance of agriculture in ancient India, as reflected in the text. OF AGRICULTURE IN SANSKRIT LITERATURE Agriculture has been an integral part of

Indian civilization since ancient times, as reflected in various Sanskrit texts, including the Vedas, Smṛtis, Purāṇas, and specialized treatises on farming. Early references to agriculture occur in the Ṛgveda, where agricultural practices such as plowing (kṛṣi), sowing, and irrigation are mentioned. Hymns dedicated to Indra and Varuṇa highlight the dependence of agriculture on rainfall and water management. The Atharvaveda further elaborates on soil fertility, crop protection, and rituals for bountiful harvests. In the post-Vedic period, Dharmaśāstra texts like Manusmṛti and Yājñavalkya Smṛti provided legal and ethical guidelines related to land ownership, taxation, and agricultural duties. The Arthaśāstra of Kauṭilya (4th century BCE) provides detailed accounts on agrarian policies, irrigation techniques, and state-sponsored agricultural projects, emphasizing the economic significance of farming. The Rāmāyaṇa and Mahābhārata also contain extensive references to agriculture, often linking it with governance and dharma. The Purāṇas, including the Matsya Purāṇa and Agni Purāṇa, describe agricultural deities, seasons (ṛtus), and traditional farming methods, reflecting the deep cultural connection between agriculture and religious practices. Specialized agrarian texts such as Kṛṣiparāśara (attributed to Sage Parāśara) and Kāśyapīya Kṛṣisūktam provide systematic knowledge on soil classification, crop rotation, water management, and organic fertilizers. Kṛṣiparāśara, in particular, stands as a seminal text in Sanskrit agricultural literature, offering insights into traditional farming wisdom that remained relevant for centuries. During the medieval period, Sanskrit treatises like Vṛkṣāyurveda by Sūrapāla focused on plant science and agricultural sustainability, highlighting early Indian knowledge of horticulture and botany. Various regional and vernacular texts built upon these Sanskrit foundations, ensuring the continuity of agrarian knowledge across generations. Overall, Sanskrit literature represents a rich repository of agricultural principles, integrating scientific, economic, and spiritual dimensions of farming. The study of Kṛṣiparāśara within this literary tradition offers valuable insights into the agronomic practices that shaped India's agricultural heritage. The Kṛṣiparāśara is part of a rich tradition of agricultural literature in ancient India, which includes texts like the Arthaśāstra and Vṛkṣāyurveda. These texts reflect the deep connection between agriculture and Indian culture, where farming was not merely an economic activity but a way of life imbued with spiritual and ethical values. The Kṛṣiparāśara stands out for its systematic and scientific approach to agriculture, offering practical guidance while emphasizing harmony with nature.

4. Cultural and Economic Importance of Agriculture

The text emphasizes that agriculture was given due importance in Vedic seers knew that agriculture was the only option for food security. Food, as everybody knows, is basic necessity of human being. Agriculture is helpful is attaining all the four goals of life. Human life is dependent on Anna and production of Anna is dependent of agriculture. Hence, agriculture is basic necessity of human life. Yajurveda says that one should make effort for producing abundant grains through agriculture. Men depend for their lives on agriculture " te kṛṣiṃ ca sasyaṃ ca manuṣyā upajīvani" (Dash and Mishra, 2025).

Speaking about the importance of agriculture, Vedic seer says

-O gambler, stop gambling, and engage yourself in agriculture, which is regarded as most valuable wealth, so that you will earn wealth, happiness, cattle and happy married life. You respect this wealth and are content with this wealth.

"akṣairmā dīvyaḥ kṛṣimit kṛṣasva vitte ramasva bahumanyamānaḥ । tatra gāvaḥ kitava tatra jāyā tanme vi caṣṭe savitāyamaryaḥ"

The Ṛgveda further adds that the cultivator is bound to get plentiful crops and immense wealth. The Atharvaveda also highlights the importance of agriculture. Agricultural work use to be practiced by skilled persons. Poets and scholars took this occupation and did farming for happiness. Agriculture was a delighted occupation which Gods like Indra and Puṣā were also engaged. Success in agriculture leads to success in life (Navalata, 2007). The person possessing abundant food grains is respected as a great man in the society. Through agriculture one can acquire vigour, energy and power. In the Yajurveda and Taittiriya Saṁhitā agriculture is regarded as the means of human welfare. It is the source of prosperity and

sustenance. It gives grain, strength and lustre. In Taittiriya Saṁhitā agriculture has been described as Chandas (metre).

Bṛhatpārāśara says that there is no other religion than agriculture and no profitable business other than agriculture – "kṛṣeranyatra no dharmo na lābhaḥ kṛṣito'nyataḥ".

It further adds that there is no other means than agriculture for obtaining happiness, food, clothing, respect etc. Kāśyapīyakṛṣisūkti mentions that production of grains and other vegetation are the sole purpose of highest fulfilment of the earth (Jugnu, 2021).

The rich earth full of vegetation is the cause of growth of living beings- "sasyādireva medinyāḥ parodharmaḥ paraṃ yaśaḥ ǀ sasyapūrṇā vasumatī prāṇināṃ prāṇavardhinī ǁ"

By practicing agriculture alone one is bound to be bhūpati (master of the earth). People even having surplus of gold, silver, jewels and garments have to solicit farmers as earnestly as a devotee would pray God. People in spite of having gold ornaments in their necks, ears and hands have to suffer from hunger in absence of food. Food is life, food is also the strength, and food is everything. The divines, the demons, and all human beings depend on food for their survival. Food, verily, comes from grains and grains cannot be without agriculture. Therefore, leaving everything else one should strive for farming. Blessed is agriculture, holy is agriculture, and agriculture is life of all living creatures-

A scholar may master the four sacred Vedas,
Be wise in scripture, learned and profound;
Yet without humility, he may still depend,
Seeking from others what he has not found.

But one who tills even a single field
Need not become a seeker at another's door;
Blessed is the one devoted to the soil—
Through agriculture, wealth and honour soar.

Kings may possess their gold and silver,
Gems and garments rich and bright;
Yet even they must turn to farmers
For the food that sustains their life.

Gold may adorn the neck and ears,
And jewels may glitter upon the hand;
Yet wealth cannot prevent hunger
When food is scarce across the land.

Food is life, and food is strength,
Food fulfils every earthly need;
Gods and humans, all living beings,
Live by the nourishment that food can feed.

Food arises from the precious grain,
And grain from agriculture is born;
Therefore, leaving all else aside,

Let farming be diligently performed.

Agriculture is noble, agriculture is sacred,
Agriculture sustains every living being;
Though imperfections may accompany its practice,
Its greatness lies in the life it keeps sustaining.

Thus, honour the farmer and cherish the field,
For from the soil comes life's daily bread;
Where agriculture flourishes with care

There prosperity, strength and life are spread.Various sūktas of Ṛgveda such as Kṣetrapati, Parjanya, Pṛthvī, Go, Āpaḥ, Akṣa, Viśvedeva and Araṇyanī have well described the importance of agriculture. Similarly various sūktas of Atharvaveda including Kṛṣi, Anna and Annasamṛddhi have talked about the significant of Agriculture (Pandey,, 1996).

5. Conclusion

Vṛkṣāyurveda represents a valuable traditional knowledge system covering plant health, cultivation, nutrition, irrigation, disease management, pest control, and resource conservation. Its principles, along with knowledge documented in texts such as Kṛṣiparāśara and Indigenous Technical Knowledge, provide useful foundations for sustainable agriculture. Integration of traditional plant-based practices with modern plant–microbe research can support the development of sustainable biopesticides and improve soil and plant health. However, systematic scientific validation is essential to establish their efficacy, safety, and practical application. Thus, combining Vṛkṣāyurveda with modern microbiology, phytochemistry, and agricultural science offers a promising approach to sustainable pest management and climate-resilient agriculture.

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