

EMERGENCE OF VṚKṢĀYURVEDA

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Vṛkṣāyurveda is a science characteristic of Indian tradition. On the line of āyurveda for human beings, a science was developed for the treatment of plants. But, it covered allied aspects of plants like soil, seed, manure and irrigation also. It is mentioned in the *Kāmasūtra* and *Vasudevahinḍī*. The earliest reference to it is to be found in the *Arthaśāstra* of Kauṭilya. It is mentioned as an auxiliary science of agriculture. The reference shows that this science was established around 500 BC. The *Arthaśāstra* gives some idea of the nature of this science. The *Bṛhatsamhitā* of Varāhamihira devotes one full chapter to it. Within the limitations of the space, it shows that the nature of the science had been fixed before the composition of the *Arthaśāstra*. Among the texts, which were composed earlier but have been lost, there was one composed by Kāśyapa.

Key Word: *Ārāma, Kāṇḍaropya, Kṛṣitantra, Śulba, Vallari, Vallikaraṇa, Vṛkṣāyurveda.*

Ancient Indian texts refer to *Vṛkṣāyurveda* as a distinct discipline. The term has been variously interpreted by scholars. G.P. Majumdar takes it to be the science of plants and plant-life, of which *upavanavinoda* or the science of arbori-horticulture was a distinct branch as *Vṛkṣāyurvedaphalam* (applied Botany). A.K. Ghosh and S.N. Sen describe *Vṛkṣāyurveda*, *gulmavṛkṣāyurveda* and *bheṣajavidyā* and explain them respectively as science of life of trees, science of plant life, and science of medicinal plants. S.S. Mishra mentions a number of terms, *Vṛkṣabheṣajavidyā*, *vṛkṣāyurveda*, *gulmavṛkṣāyurveda* and *vṛkṣāyurvedayoga*. He suggests that *vṛkṣāyurveda* (along with possibly *vṛkṣabheṣajavidyā* and *gulmavṛkṣāyurveda* also) means pure Botany, whereas *vṛkṣāyurvedayoga* means applied Botany.

It is to be noted that the form *gulmavṛkṣāyurveda* is based on the reading of a passage in the *Arthaśāstra* of Kauṭilya as originally suggested by Shamasastri. The reading in the critical edition by R.P. Kangle has three separate words *kṛṣitantra*, *śulba* and *vṛkṣāyurveda* as parts of a compound. Here *śulba* (or *gulma*) does not qualify *vṛkṣāyurveda*. Thus, the term mentioned by Kauṭilya is merely *vṛkṣāyurveda*. *Vṛkṣa-bheṣaja-vidyā* would seem to be only a paraphrase of the term *vṛkṣāyurveda*. *Bheṣaja-vidyā*, as signifying the science of medicinal plant, if not a shorter form of the fuller expression *vṛkṣabheṣajavidyā*, is apparently a wrong interpretation of

a reference made in the *Dhanvantari-nighaṇṭu*. Thus, we see that there was only one name of the science, *vr̥kṣāyurveda*.

Those who interpret the term *vr̥kṣāyurveda* to mean plant science or the science of plant seem to split the expression into *vr̥kṣāyuh* and *veda*. It is the *veda* (science) of *vr̥kṣāyuh* (life or longevity of plants). The derivative meaning of Āyurveda is the science of life or longevity. It was not used in the restricted sense of medicine of treatment of diseases, but covered all aspects of health and longevity. However, when the concept of Āyurveda as having eight divisions (*aṣṭāṅga*) developed, Āyurveda came to signify the treatment of diseases. Thus, the expression *vr̥kṣāyurveda* has to be split into *vr̥kṣa* and *āyurveda*. It was the *āyurveda* of *vr̥kṣas*. *Vr̥kṣāyurveda* was the science for the treatment of plants. R.P. Kangle translates *vr̥kṣāyurveda* as the science of rearing plants. As in the case of *āyurveda* for human beings, it included many topics concerning plants and their life, besides its main concern for the diseases of the plants and their healthy growth.

Thus, *Vr̥kṣāyurveda* as a science resulted from the application of *āyurveda* to the phenomenon of plant. But the *āyurveda* of human life could not totally cover all aspects of plant life. The principle of three humours (*doṣas*) was applied to describe the character of the plants, the nature of their diseases and their treatment. But, mostly it was a case of analogy and not total application.

Vr̥kṣāyurveda was nearest to the *Kṛṣitantra* in ancient times. The scope of the two at times overlapped. But, there was a basic difference on account of the objects of the two. The *Kṛṣitantra* dealt with crops, whereas *vr̥kṣāyurveda* was concerned with plants. The first was associated with fields; the latter was centred in gardens. There was a marked difference in the approach of the two, their problems, and the nature of their remedies. What an agriculturist could not afford to undertake was implemented in the case of plants.

In modern terms *vr̥kṣāyurveda* partook of agriculture and botany. It was a combination of the two, but different from both in its emphasis and characteristics. The discipline of arbori-horticulture came nearer to it, but again there was a difference in their approach. Actually in India, arbori-horticulture, under the name of *upavanavinoda*, issued out of *vr̥kṣāyurveda* as its transformation.

The first occurrence of the term *vr̥kṣāyurveda* is found in the *Arthaśāstra* of Kauṭilya (II. 24.1). It says that the Director of Agriculture, himself conversant with *Kṛṣitantra* (practice of agriculture), *śulba* (water-divining) and *vr̥kṣāyurveda*, or assisted by experts in these, should collect seeds of all kinds in the proper season. The regular use of the science *vr̥kṣāyurveda* for the purposes of agriculture around 320 BC suggests that it was an established discipline and presupposes at least a

century or two for its first formulation as a science. Kauṭilya says that, in composing his treatise, he used all the *arthaśāstras* available to him and prepared by earlier scholars. The concerned chapter does not refer to any text or authority on *vrkṣāyurveda*, but the systematic presentation of the material implies some source, either a regular text or information orally circulated.

In any case, the very form of the name of the discipline suggests that its formulation as a discipline must have been sometime after the usage of the term *āyurveda* had been established. It is to be noted that the term does not occur in the Vedic literature. Two *sūtras* (IV. 2.60; IV. 4.102) in the *Aṣṭādhyāyī* of Pāṇini imply the formation of the term. Besides the *saṃhitās* of Āyurveda themselves, the *Mahābhārata* (II. 11.25) refers to Āyurveda and its eight branches. In a Jātaka story (I. 5) the medicinal science is mentioned as *tikicchā*, though the *Dīghanikāya* mentions by name almost all the branches recognised in Āyurveda.

In view of all this, we may postulate that *vrkṣāyurveda* as a distinct discipline was established possibly by 550 BC.

Besides the *Arthaśāstra*, two early texts mentioning *vrkṣāyurveda* are the *Kāmasūtra* (I. 3.16) of Vātsyāyana and the *Vasudevahiṇḍī* (p. 50). Chapters entitled *vrkṣāyurveda* are to be found in the *Brhatsaṃhitā* (Ch. 54) of Varāhamihira, the *Viṣṇudharmottara-purāṇa* (II. 20) and the *Agnipurāṇa* (Ch. 281). In the absence of any regular text of this science, scholars have formulated their views about the nature of this discipline on the basis of the scattered references in these works¹. Scholars have not been aware of any regular work on *vrkṣāyurveda* written in ancient India².

On the basis of these sources R.C. Majumdar³ mentions the topics included in the *vrkṣāyurveda* as being selection and procurement of viable seeds, choice of proper soil, irrigation, manuring, sowing and germination of seeds, planting, grafting, pruning, layering, seasonal care, cultivation, rotation of crops, climatic conditions in relation to proper growth, classification and identification of plants, aesthetic and hygienic values of gardens, construction of herbariums and the treatment of plants in healthy and diseased conditions. A.K. Ghosh and S.N. Sen⁴ list the topics as being collection and selection of seeds, germination, grafting, cutting, sowing, planting and nursing, soil selection, manuring, meteorological conditions favourable for plant growth, location of plants for improving the aesthetic and hygienic surroundings of the homestead etc.

In the chapter (II. 24) dealing with agriculture in the *Arthaśāstra* which refers to *vrkṣāyurveda* the material relating to *vrkṣāyurveda*, agriculture and water divining are so mixed up that it is difficult to extricate passages dealing with *vrkṣāyurveda*

alone. Evidently there has been a conscious effort to present the *vrkṣāyurveda* material so as to be relevant to agriculture. If we leave aside portions dealing with seeds, crops, rainfall and irrigation, we can say that II. 24.22-25 was based on *vrkṣāyurveda*. The passages say that a region where the foam strikes the banks is suited for creeper fruits, regions on the outskirts of overflows, for long pepper, grapes and sugarcane, those on the borders of wells for vegetables and roots, those on the borders of moist beds of lakes, for green grasses, ridges for plants reaped by cutting, such as perfume plants, medicinal herbs, *uśīra*-grass, *hribera*, *piṅḍāluka* and others. On lands suitable for them, plants that grow on dry lands and that grow in wet lands are to be raised. Stalks that serve as seeds are to be smeared at the cut with honey, ghee and pig's fat, mixed with cowdung. Bulbous roots are to be smeared with honey and ghee. Stone-like seeds are to be smeared with cowdung. Trees are to be burnt in the pit and cow-bones and cowdung are to be supplied at the proper time. When they have sprouted, they are to be fed with fresh acrid fish along with the milk of the *snuhi*-plant.

The *Kāmasūtra* does not throw any light on the nature and scope of *vrkṣāyurveda*. It includes *vrkṣāyurveda* in a list of sixty-four arts which cultured ladies were required to cultivate. It seems that the text envisages only the practical application of the science to plants by way of their plantation, treatment of seeds, watering them, applying manures and other devices to increase their fertility, to treat them of their defects and to bring about marvels in fruits and flowers. Clearly the text does not imply that the ladies were expected to learn the theoretical details of the science with the help of any text, though the possibility of the subject being covered by some text cannot be ruled out.

In Varāhamihira's *Bṛhatsaṃhitā* (C 505-580 AD) Chapter 54 is entitled *vrkṣāyurveda*. It has only thirty-one verses. We cannot expect fuller details of any one topic, nor can we hope that all the different aspects of the science have been covered. Verse 1 advises the establishment of *ārāmas* (gardens) in the precincts of reservoirs. Verse 2 deals with the preparation of soil (*bhū*). Verse 3 lists the auspicious (*māṅgalya*) trees. Verses 4-5 mention the method of planting trees that grow from scion (*kāṅḍaropya*). Verse 6 mentions the proper time for transplantation (*praropayet*). The method of transplantation and watering of these trees is described in verses 7-9. Sixteen trees that grow in the wet soil (*anūpaja*) are enumerated in verses 10-11. Verses 12-13 prescribe the spacing that is to be observed in planting trees. Diseases (*roga*) such as searing of leaves, arrest of the growth of leaves, drying up of the branches and excessive exudation of the sap are caused by exposure to cold, wind and heat (verse 14). Their treatment (*cikitsitam*) lies in clearing the affected parts with weapons, smearing them with *viḍaṅga*, ghee and mud and then nurturing them with water mixed with milk (verse 15). Verses 16-18 prescribe remedies in the case of sterility or premature falling of fruits (*phalanāśa*) and

treatment for increasing fruits and flowers (*phalapuspasamṛddhi*). The treatment of seeds before sowing is laid down in verses 19-20. The special care for sowing and nurturing the Tintiḍī (tamarind) tree (verse 21) and Kapittha (wood-apple) tree (verses 22-26) has been laid with meticulous details⁵. Verses 27-28 give another method for treating seeds before sowing. The special method in the case of the seeds of Śleṣmātaka is described in verses 29-30. The concluding verse (31) lists the constellations auspicious for planting trees (*pādasamṛopana*) as declared by astrologers.

When we compare this account with the detailed description in the full text on *vrkṣāyurveda* which was written by Surapāla in his text (AD 1050-1150), we find that Varāhamihira in his text presents a summarised account within the limits of a chapter which a full text naturally will give in greater details. He has covered the important topics only and has mentioned only some of the important practices and methods. This would imply that possibly there was a separate text on the subject which Varāhamihira adopted as the model for his account. The text seems to have been lost, possibly because it was outclassed by a later classic composed by Surapāla. Bhaṭṭa Utpala's commentary on the *Brhatsamhitā*, in elucidating some of the points, reproduces verses from earlier texts. Most of these verses are ascribed to Kāśyapa, but for some the name of the original authority has not been given. We may take these verses also to be derived from Kāśyapa. If they originally appeared in another source, we will have to postulate more than one text on *vrkṣāyurveda*. Bhaṭṭa Utpala seems to have been proficient in the traditional information and texts on topics covered by Varāhamihira. Thus, we can conclude that before Varāhamihira there were some other texts on the *vrkṣāyurveda* discipline. Kāśyapa was one such authority, whose text was, in any case, available upto the times of Bhaṭṭa Utpala in the ninth century.

REFERENCES AND NOTES

1. Majumdar R.C. in D.M. Bose, S.N. Sen and B. Subbarayappa, *A Concise History of Science in India*, p. 256.
2. Mishra, S.S. *Fine Arts and Technical Sciences in Ancient India*, p. 120.
3. *Op. cit.*
4. Bose D.M., S.N. Sen and B. Subbarayappa, *op. cit.*, p. 379.
5. B.S., LIV. 21 refers to a tamarind seed producing a *vallārī* (*karoti vallārīm*) and B.S. LIV. 22-26 to producing a *vallī* (*vallīkaraṇa*) of wood - apple seeds. Bhaṭṭa Utpala interprets *vallārīm karoti* to mean 'a sprout is produced' (*abhinavāṅkurā sampadyate*); he paraphrases *vallīkaraṇa* as *vallījanana*. V.S. Apte, *Students Sanskrit-English Dictionary*, p. 496, column 2 gives two meanings of *vallārī*: (1) a creeping plant and (2) a branching foot - stalk of which the second suits the present context. The original meaning of the other expression *vallīkaraṇa*, which possibly was not appreciated by Bhaṭṭa Utpala, the commentator, would seem to refer to a technique like dwarfening

which transformed the tree into a climber. This appears to receive support from the second line of verse 26 saying that soon (*āśu*) there will be a *vallī* with excellent sprouts (*pravāla*), and the wonderful (*vismāpanī*) *vallī* will cover the flower (*vallī bhavatyāśu śubhapravāla vismāpanī maṇḍapamāvṛṇoti*). The production of botanical marvels will be implied by this reference. The reference to *apin tintiḍītyapi* (even the tamarind) *BS*, LIV. 21 shows that, because of its hardness, the tamarind seed is difficult to sprout. This would seem to be the case with wood – apple also. It is to be noted that the *vallikāraṇa* technique is not applied to many other plants which will have a greater desirability. *Vallikāraṇa*, here, possibly refers to the appearance of tendrils even in cases of seeds of trees difficult to sprout.