

14. VEGETABLE FARMING – FLORICULTURE – PERFUMES and MEDICINAL PLANTS

Vegetable farming

- The Indian sub continent, one of the Vavilovian centres of crop plant, is endowed with diversity in several vegetable crops.
- Egg plant, cucumber, ridge and sponge gourd have been identified native to this country.
- Around 80 species of major and minor vegetables occur here apart from several wild edible species.

Distribution of major vegetable crops variability in different agro ecological regions of India

Sl.No.	Agro Ecological region	Geographical Ranges	Variability in major crops
1.	Humid western Himalayan Region	J&K, H.P and Parts of UP	Cucurbits, radish carrot, turnip, cowpea, fenugreek, amaranthus
2.	Humid Bengal / Assam Basin	WB and Assam	Cucurbits, radish, cowpea, chillies, brinjal, Abelmoschus manihot Momordica chodinchinensis sechium edule

3.	Humid Eastern Himalayan Region and Bay islands	Arunachal Nagaland, Manipur Mizoram, Tripura and Meghalaya	Solanum torvum S.sisymbriifolium
4.	Sub-humid sutlej, Ganga alluvial plains	Punjab, UP and Bihar	Febugreek, onion garlic Solumum hispidum S.Surattense
5.	Humid Eastern and south eastern uplands	East Pradesh, Orissa and Andhra Pradesh	S.torvum Cucurbits, radish carrot, cowpea, chillies brinjal, okra, spinach
6.	Arid Western plains	Haryana, Rajasthan and Gujarat	Cucurbit, cauliflower, carrot, peas, fenugreek, onion, garlic, citrullus sp.
7.	Semi Arid Lava plateau and central highlands	Maharashtra and West Pradesh	Cucurbits, Cauliflower, radish, fenugreek Solanum torvum S.nigrum S.kharianum
8.	Humid to semiarid western Ghats and Karnataka plateau	Karnataka, Tamil Nadu, Kerala and lakshadweep	Cucurbits, chillies brinjal, okra, amaranthus, Solanum trilobatum S.indicum Luffa, acutaugula Basella Basella rubra

Floriculture in Ancient India

Plants were also featured in personal adornment and beautification of the home. Of the climbers, Madhaviyata (*Hiptage madhaviyata*) received frequent mention in Kalidasa's play (5th century) and among sweet scented shrubs the mask-mallow (*Hibiscus abelmoschus*) and the garland flower (*Hedichium coronarium*). Description of flowers and gardens and the garland flower (*Hedichium coronarium*). Description of flowers and gardens had been presented in ancient Sanskrit classics like Rig Veda (3000-2000 B.C), Ramayana (1200-1000 B.C) and Mahabharata (500 B.C). Other Sanskrit books of early days written by Shudraka (100 B.C.), (Asvaghosha (100 A.D) and Samghara (1283-1301 A.D) also mentioned about flowers and gardens.

Among the flowers the sacred lotus (*Nelumbo mucifera*) was the most important and numerous references to it occur in Sanskrit literature. In the days of Mohenjodaro, lotus blossoms were wreathed over the head of Sun-God.

During the Buddhist period gardens were laid out around the monasteries and stupas and there were beautiful gardens in Nalanada the Taxila.

The Hindus were so fond of ornamental plants that some of them were actually worshipped. **During the Mughal period (16th and 17th centuries AD) and the British period (18th and 19th centuries) several ornamental plants were introduced into India. Indian native flora has made significant contributions to the gardens of the world and also to the improvement of a few flowers like orchids and Rhododendrons.**

Mughal period

- ❖ The concept of developing a garden in an enclosed space was introduced by the Mughals in India during 16th and 17th centuries.
- ❖ Babur is credited with the introduction of scented Persian rose in India.
- ❖ Akbar the Great (1556-1605), the Mogul emperor of India was the garden lover.
- ❖ Abu-i- Fazi provided a list of 21 fragrant flowering plants along with flower colour and season of flowering in Ain-i-Akbari.
- ❖ He also gave another list of 29 plants with flowers notable for their beauty.
- ❖ From the Tuzuk-i-Jahangiri it appears that Jahangir was familiar with nearly all important fragrant plants of India like *Michelia champaca*, *Pendanus odoratissimum*, *Mimusops elengi*, *Jasminum officinale*. **Mughal gardens were developed in Agra, Delhi, Pinjore (near Shimla), Srinagar, Kashmir and a few places during the 16th and 17th centuries AD.**

European period

- ❖ Missionary priests, Englishmen, Portuguese, amateur and professional gardeners from Europe, Asia and Africa, introduced a large number of plants into Indian gardens.
- ❖ Several botanical gardens were established during 18th and 19th centuries in various parts of India, where indigenous and exotic plants were introduced and maintained.
- ❖ With the establishment of Government Botanic Gardens by the British rulers during 18th and 19th centuries such as Lalbagh Botanical Garden, Bangalore (1760); the government Botanic Garden, Saharanpur (1779); the Indian Botanic Garden, Sibpur

Calcutta (1783); the Lloyd Botanic Garden, Darjeeling (1878) and the Government Botanic Garden, Oatacamud (1884), numerous economic plants as well as ornamentals were introduced in these gardens.

PERFUMES

India has a perfumery tradition that dates back to over 5,000 years to Indus Valley civilization. The roots, flowers and leaves were used in perfumery. The Sanskrit Encyclopedia 'Manasollasa' composed by Someshwara in AD 1127 deals with the blending of perfumes which were used in royal baths and for the rituals and worship. The Ain -1- Akbari (17th century) provides a list of twenty one fragrant flowering plants along with season and colours.

Preparation of Perfumes (Brhat Samhita):

The word '*yukti*' means combination and composition. Perfumes and scents are manufactured for the benefit of royal personages and inmates of harems.

Medicinal plants and their relevance today

Medicinal plants in ancient India

- Medicinal and aromatic plants have been used for a long time for their medicinal properties.
- About 2000 native plants species have curative properties and 1300 species are known for their aroma and flavour.
- The Indian systems of medicines, popularly known as Ayurveda, unani and sidha drugs are of great demand in the country.
- There is already spurt in demand of plant based drugs and of late may such native species of medicinal values are being brought under systematic cultivation.

- Saffron, opium poppy have been under cultivation for many years.
- Opium poppy is perhaps the exotic plant brought under cultivation in the later part of 16th century through introduction from West Asia. It is one of the cultivated crops where the selection pressure has played a major role in developing new varieties and land races.
- Cinchona has been introduced in India mainly to fight the menace of malaria and diahorrea respectively, while belladonna, ergot, pyrethrum, henbane and toxglove were introduced in India during second world war to meet the demand of raw materials for vital drugs.
- India is blessed with a wide variety of soils and agro-climatic situation that supports a large variety of plants.
- Out of these, about 65 plants have large and consistent demand in world trade.
- India however produces only limited quantities of these materials.
- Interms of market share in production value, India holds only the 6th place with a mere 7% share.
- At present, about 90% collection of medicinal plants is from the forests and since 70% of the plant collections involve destructive harvesting many useful plant species are endangered or threatened.
- In India, more than 15 lakh practitioners use medicinal plants in preventive and curative application.

There are two ancient systems of medicine in India, the Siddha that flourished in the South and the Ayurveda prevalent in the North. Instead of giving the name of any one individual as the founder of either system, our ancients wisely attributed their origin to the Creator. According to tradition, it was Shiva who unfolded the knowledge of Siddha system of medicine

to his consort, Parvati, who handed it down to Nandideva and he, to Siddhars. Therefore it is called 'Saiva Sampradayam' (tradition of Shive), or 'Siddha Sampradayam'. In the case of Ayurveda it was Brahma, the Creator of the Universe, who taught the science to Prajapati, he to Aswini Devatas and they, in their turn, to Atreya etc. So this tradition is called the Brahma or Arsha Sampradaya (the tradition of Rishis). The inference to be drawn from these traditions is that, there is no exact point of time to which the beginning of these systems could be traced. They are eternal, without a beginning or end; they began with man.

Origin of Siddha Medicine: Siddha system is one of the oldest systems of medicine in India. The term 'Siddha' means achievement and the 'Siddhars' were saintly figures who achieved results in medicine through the practice of Yoga. Eighteen 'Siddhars' seem to have contributed towards the development of this medical system. Siddha system's literature is in Tamil and it is practiced in Tamil speaking parts of India. The system is also called Agasthyar system in the name of its famous exponent sage Agasthya. A number of medical works of this system are ascribed to him but it may be difficult at this time to say the exact number that can be credited to him. This system of medicine developed within the Dravidian culture, which is of the pre-vedic period. The Siddha system is largely therapeutic in nature.

The Siddhars: The ancient Tamils in their quest for knowledge for longevity developed two ways by which man can achieve mastery over nature. One is the Yogic way and the other is through medicines. The persons who dedicated themselves to this task were themselves great yogis known as Siddhars. Hence the system of medicine propounded by them came out be known as Siddhars system of Medicine.

The Neem Tree: The Neem tree was regarded as sacred in Mohenjo-daro Civilization. In the annals of the ancient Siddha System of Medicine, the first medicinal plant mentioned as well as found a place, in ancient Tamil literature is Margosa or Neem. This has been used by Tamils

from time immemorial as a deterrent for smallpox and other infectious diseases and also considered to possess powers to ward off evil spirits.

Kalpa Treatment: Ancient Siddha devoted time in finding out suitable remedies rather than describing the causes of a disease in detail. The scope of 'Kaya Kalpa' treatment is two-fold; one is to cure degenerative diseases and the other is to prolong the life span. Kalpa serves as an anti-degenerative elixir -- that can cure cancer and heart diseases is itself rejuvenation.

Timeline of Indian Medicine

1000 BC - Atharva Veda.

600 BC – Codification of medical knowledge into Ayurveda.

400 BC – Caraka Samhita by Caraka.

400 BC - Susruta Samhita by Susruta.

700 AD - Ashtanga Samgraha by Vagbhata.

700 AD - Ashtanga Hridya Samhita by Vagbhata.

800 AD - Rasaratnakara by Nagarjuna.

900 AD - Rug Vinishchaya by Madhakara.

1000 AD - Siddha Yoga by Vrinda.

1000 AD - Nava Nitaka by Navanita.

1300 AD - Sharangadhar Samhiti by Sharangadhar.

1550 AD - Bhavaprakasha by Bhava Misra.

1563 AD - Garcia da Orta`s Coloquios dos simples e Drogas e cousas medicineis da India (A.D 1563) includes description of many Indian medicinal plants.

1591 AD - Christophoras Acosta`s Aromaticum et medicametorum in Orientali Indian nascentium liber and Historia Natural R moral de las Indias scuilla (Barcelona, A.D. 1591) are important works on medicinal plants of India.

Medical Education in Ancient India: Medicinal knowledge has been systematized thousands of years ago in a system of medicine called Ayurveda. Ayurveda is a Sanskrit word, derived from two roots: ayur, which means life, and veda, knowledge. It has its root in ancient Vedic literature and encompasses our entire life, the body, mind and spirit. In ancient India, Medical education was available in in the larger cities such as Taxila, Kasi (Varanasi) and Nalanda. The plant wealth of forest was utilized through 'Ayurveda' for the welfare of human beings. **The city of Ayodhya was inhabited by a good number of vaidyas or physicians. Proficient and skilled surgeons known as 'salyakrt' (v. 28.6) existed at the time of Ramayana. Physicians accompanied royal well developed and surgeons were in special demand. Surgeons of the structure of the human body as can be inferred from the many anatomical terms used in the epic.**

Relevance of medicinal plants today

The World Health Organisation (WHO) estimated that 80 % of the population of developing countries still relies on traditional medicines, mostly plant drugs, for their primary health care needs. Also, modern pharmacopoeia contains at least 25% drugs derived from plants. Many other are synthetic analogues built on prototype compounds isolated from plants. Demand for medicinal plant is increasing in both developing and developed countries due to growing recognition of natural products, being non-toxic, having no side-effects, easily available at affordable prices. There has been resurgence in the consumption and demand for medicinal plants. These plants are finding use as pharmaceuticals, nutraceuticals, cosmetics and food supplements. According to an all India ethno-biological survey carried out by the Ministry of Environment and Forests, Government of India, there are over 8000 species of plants being used for medicine in India.