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REVIEW ON COMERERSIAL CULTIVATION AND COLLECTION ASPECTS OF MEDICINAL AND AROMATIC PLANTS

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ABSTRACT:

Nowadays, growing medicinal and aromatic plants (MAP) is not only advised in order to prevent wild plant gathering, but it also serves as a safeguard for the survival of damaged, disease-free plants from which disease-free seeds are unlikely to develop. It is also a strong industrial branch that provides quality raw materials to the pharmaceutical, cosmetics and food sectors. Many issues pertaining to the production, marketing, and fluctuating costs of small, medium, and big goods are encountered in the general cultivation of medicinal plants, which are primarily regarded as secondary crops. The herbal sector accepts Cultivation MAP information since it facilitates the estimation of plant quality, quality, and chemical content—particularly when contrasted to wild goods. The risk of plant misidentification and adulteration is removed when using farmed MAP data. The outcomes of chemical farming are contrasted with those of normal farming, which makes use of pesticides, fertilizers, specialized equipment, and techniques to manage insects, vermin, and insect stings. Low-cost monoammonium monophosphate cultivation is necessary to generate competitive, high-quality food from wild plants on the global market. The most frequent problems encountered by herbalists are financial, related to access and quantity of wildlife, the agricultural environment, energy and expenses, technological investment, post-harvest processing, and production results. The creation of superior plants depends on having ideal genotypes.

Keywords: *cultivation, collection, drying, harvest, medicinal plants, plant growth hormones.*

INTRODUCTION

Medicinal plants help agriculture. Aromatic and medicinal plants, or MAPs, include important components of ecosystems, biological history, and biodiversity worldwide. Pesticides, resins, proteins, vitamins, spices, seasonings, wood, fibers and other important chemicals. The plant is also considered an important source of drugs, aromatic substances and precursors in modern medicine Health systems that rely on medicinal and aromatic plants (MAPs) are frequently focused on the market and/or have a direct connection to the employment and income of the impoverished. Research conducted in South Asia by the International Development Research Center (IDRC) indicates that livelihoods based on biodiversity, such as MAP, not only alleviate poverty but also advance gender equality. MAP as a livelihood source can easily be linked to other resources to improve the health of people, especially women working in agriculture. Medicinal plants are gifts to people. Eighty percent of individuals in underdeveloped nations receive their main healthcare from traditional medicine, according to the World Health Organization. Only 60 of the almost 45,000 kinds of medicinal plants that exist in India—one of the richest nations in the world—are grown for commercial purposes, according to the National Medicinal Plants Council. Medicinal plants are a vital source of income for millions of rural people worldwide, particularly women and tribal people. The gathering, processing, and marketing of medicinal herbs raises the income levels of impoverished families, particularly those headed by women. Plant knowledge and knowledge (TK) for plant

breeding, restoration and conservation is a game in many countries. Since we are improving every day, our health will not be a problem. Currently, one in four Korean adults, or 760 million people, suffers from high blood pressure and diabetes. Herbs are therefore crucial for improving health and cutting expenses. And in ancient times, our ancestors only used plants as medicine, so they were healthy without further harm to health. However, excessive consumption and misuse of medicinal plants threatens our important natural resources. Therefore, it is important to protect and use medicinal plant biodiversity. Since women are the first victims of dwindling resources, they need to be involved in the collection, storage, processing and added value of medicinal and aromatic plants.[1] Additionally, they lack access to recent research that would enable them to earn more money and live better lives. New avenues in agriculture have been made possible by the cultivation of valuable plants, particularly therapeutic ones. Women with marginal land will benefit from the cultivation and production of productive crops. Guarantees the purity and efficacy of medicinal plants. What makes essential drugs useful is their chemical composition. If consistency is maintained throughout the cultivation process, high quality pharmaceutical products can be produced. When growing rhizomes, it is very important to use the right type of irrigation and sufficient fertilizer. Careful cultivation ensures a harvest with the highest concentration of volatile oils and other components. To illustrate this concept, we can use ginger, turmeric, and liquorice as examples. Drug contamination of raw materials can be easily avoided by removing weeds from growing plants.

1. Ensure the raw material leaves the plantation. In other words, crop planning is an agricultural practice. Planning crop production enables predictability, preventing product shortages in industries that rely on APIs.
2. Cultivation of aromatic plants and herbs also leads to greater economic opportunities. Kerala's coffee and cocoa plantations have given rise to many small businesses and small businesses. The cinchona alkaloid factory near Darjeeling was established from cinchona cultivation in West Bengal. The government's theatre in Ghaziabad is a testament to the importance of thinking about good practice.
3. Modern technologies such as polyploidy, hybridization and mutation can be used in plant breeding. Cultivation of medicinal and aromatic plants provides natural, high-quality products at high prices for the pharmaceutical, pesticide, food and cosmetic industries. It also creates new opportunities for farmers to earn more money and provides great scope for the development of the rural economy. Although these plants have been used to treat and prevent diseases since ancient times, the development of modern technology, knowledge and recognition of medicine encourage consumers to prefer natural products and increase the economic value of these products. He replied that this crop, which currently has only around 400,000 hectares in India, is expected to grow at a rate of 10-15 percent annually and be successful in the international market. Currently, only around 400,000 hectares of rice are cultivated in India but it has a high position in the global market with an expected growth of 10-15% annually.[2]

THE BENEFITS OF EDIBLE AND FRAGRANT PLANTS

1. The Viewpoint of Society:

In Southern Asia, the use of herbs to meet basic medicinal and nutritional needs in family meals is common and established across all cultures. At the very least, this method has been employed for over 40 years in several nations for thousands of year. In this case, there is no information about the use of herbal products, the methods of growing various types of plants and the strategies that should be used to make them a home product and useful. Herbs are a good way to work out for women. Traditionally, women have played an important role in herbal medicine and small businesses because their products and activities can meet women's needs. Families in rural regions can also benefit from the usage of medicinal plants to enhance their health and well-being. A lot of conventional healers employ MAP-based healing. Arya Vaidya Sala (AVS), located in Kottakal, Kerala,

is an excellent illustration of how pharmaceutical services and business may coexist. In addition to strengthening bonds between people, these enterprises: a) support the preservation of traditional medical knowledge; b) give young people without jobs and the impoverished in rural areas a convenient means of subsistence so they may continue learning from their parents and friends while still able. sustaining oneself and assisting others.

2. Environmental Perspective:

The poor growth of chemical crops and the unsustainable conversion of forests to illegal products has created a new market for high-quality, certified organic products. Because they provide green and healthful options for a range of residential and commercial applications, as well as ecologically responsible goods, medicinal plants can satisfy these demands. This plant grows widely in South Asia as trees, shrubs, grasses and vines. Its introduction as an eco-friendly botanical product into the global food and pharmaceutical markets is viewed as a fresh chance to support community-driven conservation and contribute to environmental protection. Financial incentives based on medicinal plants are increasingly used to encourage people to participate in the protection of forest ecosystems.[3]

3. The health of humans and medicinal plants:

There are several medicinal plants in South Asia (CHM). The Ayurvedic system has a history that begins in ancient BC. It has 5,000 years of history. Millions of people still rely heavily on TSM, the Unani, Siddha, and Tibetan systems, for their everyday health and way of life. The phrase "Nanaushhadhi Bhootam Jagat Kinchit" (meaning "There is no plant in the world that does not have medicinal properties") was once said by a Himalayan physician. It's believed that hundreds of plants have therapeutic use in the knowledge of ancient scientists. Thus, it wouldn't be a stretch to suggest that using plants for medicinal purposes predates human history. For almost 80% of people, medicinal plants represent an accessible, cost-effective, and culturally meaningful source of healthcare resources. The impoverished and those without access to healthcare are especially reliant on these easily accessible, affordable, and high-tech medications. To address medical demands, it is crucial to concentrate on promoting life health. This is particularly true in South Asia, where local governments are finding it more difficult to pay for healthcare due to growing prescription prices.[4]

UTILIZATION AND CONSERVATION OF FRAGRANT AND FRAGRANT PLANTS

Because of their therapeutic, nutritional, and aromatic qualities, some 60,000 plant species are utilized globally, and each year more than 500,000 tons of goods are derived from these plants.

1. Medicinal Plants and Plants Trade:

While the value of medicinal plants throughout Europe is 462.8 million USD, exports in the same period are 1,034.8 million USD, and both imports and exports increased during the research period. The international market for medical plants has expanded significantly over the previous three years, according to the Secretariat of the Convention on Biological Diversity; sales of these plants were valued at US$60 billion in 2002. Each year, half a million tonnes of aromatic herbs and hay (MAPs) are trafficked as unidentified goods around the world; nevertheless, the primary products are exchanged in local marketplaces and urban areas. The most widely used and efficacious type of medicine available worldwide is herbal medicine. In 2003–2004, the yearly revenue in Western Europe alone was US$5 billion. The United States, Hong Kong, and Germany are the three major centers that dominate the pharmaceutical sector. Twelve nations account for 80% of global imports and exports. Despite the fact that industrialized nations have the majority of the industries, the majority of medicinal plants

are exported from poor nations that produce little to nothing and are harvested from the wild. The industry also provides income for millions of families involved in harvesting, in which women often play a key role, and enables the commercialization of many medicines and household goods. Although there is no clear data, current data shows that the number of studies is increasing. Ninety percent of MAPs in Europe are given for commercial purposes, according to Traffic International. This is because herbal products are cheaper than herbal products. The total European crop is estimated at 20,000-30,000 tonnes per year. As a result, only 10% of the ingredients come from fields, but even then, the consistency and risk of contamination are lower than with wild products. [5]

2. Measures to Promote Sustainable Development and Conservation:

The Global Conservation Strategy was introduced in 2002 with the following long-term objective; Wild plants should not be threatened and at least 30% of all crops should come from sustainably managed areas. At least 2000 MAP species are used commercially in Europe, with 1200-1300 being the last for Europe. The growing need for raw materials in a variety of industries (food, electronics, cosmetics, fragrances, etc.) has raised interest in the usage of MAP internationally. This has led to a demand for MAP and increased strain on natural resources because many of the species employed are exploited. Uncontrolled overexploitation, habitat loss and adaptation of wild plants is the main reason why research, evaluation, use and conservation of medicinal plants have become an important part of expansion plans.[6]

GENERAL ASPECTS INVOLVED IN CULTIVATION OF MEDICINAL PLANTS

Factors Affecting the Cultivation of Crude Drugs:

Altitude: An important consideration in growing medicinal plants is height. Listed below are examples of medicinal and aromatic plants that grow well at various altitudes.

Table no.1: Altitude

PLANT	ALTITUDE
Tea	1000 - 1500
Cinchona	1000 -2000

Temperature: Many plants grow in temperate regions in summer but cannot withstand frosts in winter. When the temperature rises, breathing increases.

Table no.2: Temperature

Plant	Temperature (°F)
Cinchona	60 – 75
Coffee	55 - 70

Irrigation or Rainfall: Except for xerophytes, most other plants need water, good water, and adequate rainfall to grow. Minerals in the soil dissolve in water and are absorbed by plants, and water affects the shape and physiology of the plant. For example, frequent rainfall can cause the loss of water-soluble substances from leaves and roots through leaching.

Soil: All the nutrients, water, and support that plants need to grow are found in the soil. It is made up of biological stuff, minerals, water, and air. Plants can determine the soil pH range they need to grow. Nitrogenous soil is beneficial for the production of alkaloids in some plants

Table no.3: Soil

SUBSTANCE SIZE (Diameter)	THE SOIL TYPE
I. Less than 0.002 mm	Fine Clay
II. 0.002 – 0.02 mm	Coarse Clay
III. 0.02 -0.2 mm	Small Sand
IV. 0.2 – 2.0 mm	Fine Sand

Soil Fertility: Erosion and seepage also lessen it. Chemical fertilizers, the addition of nitrogen-fixing microorganisms, and animal husbandry can all be used to maintain soil fertility.

Control of Pests and Pests: A pest is an undesirable animal or plant that causes loss of a plant. Various types of pests that can infect medicinal plants are: 1. Fungi/Viruses 2. Insects 3. Weeds 4. The lines are not lines. Different methods are used to effectively combat pests. These methods are discussed below: mechanical, agricultural, biological and chemical methods. [7]

POST – HARVESTING TECHNOLOGY OF MEDICINAL AND AROMATIC PLANTS

Harvesting:

Harvesting is an important activity in agriculture because it marks the commercialization of medicinal products. The composition of the crude drug depends on the type of drug collected and the pharmacopoeial standards it must comply with. Only skilled workers can get a good harvest in everything. Soil chemicals such as roots, rhizomes and tubers are collected by mechanical equipment such as excavators or elevators. Wash the tubers or roots thoroughly with water to remove dirt. For example: flowers, seeds and small fruits are collected with a special device called a seed peeler.

Drying:

This activity involves various operations or treatments depending on the location and medicinal properties of the crude drug. Drying means removing sufficient moisture from a chemical product to improve its quality and make it resistant to bacterial growth. Drying causes some enzymes to react. Some medications have special procedures that must be followed in a certain way. Cut and cut into small pieces to dry. When sliced and cut into small pieces, it dries quickly like licorice. Dry the flowers in a cool place to preserve their color and oil content. The drying method is natural drying. and wait for it to dry. Sun drying, drying in direct sunlight, dryers, vacuum cleaners, dryers, etc. There are many ways to dry, including drying with. [8]

Garbling:

This process is best when sand, soil, and non-medicinal organic impurities of the same plant need to be removed. If foreign substances are allowed in unprocessed medicines, the quality of the medicines may not always exceed pharmacopoeia standards. Fireproof and rodent-proof. Temperature is also very important in storing medication because it enhances many chemical reactions that cause the components to break down.

Packing:

When packaging drugs, their shape, medicinal properties, duration of use, and the effects of air during transportation and storage should be taken into account. For example: aloe Vera is packaged in goat skin. These chemicals are very sensitive to moisture and very expensive.

Storage:

Storage of crude drugs requires a good understanding of their physical and chemical properties. The storage area must be waterproof, fireproof and rodent-proof. Temperature is also very important in storing medication because it enhances many chemical reactions that cause the components to break down.

METHODS OF IMPROVING QUALITY OF CROPS AND THEIR APPLICATION

Breeding:

The art and science of breeding involves enhancing the genetic quality of plants to maximize their economic use to humans. The art and science of breeding involves modifying plants to provide desired traits.

Chemodemes:

A medicinal genus is considered a group of plants of the same species with the same morphological characteristics but different medicinal properties. The nature of the chemical belongs to human beings. Analysis of medicinal communities can only be confirmed by growing different plants of the same species from seeds at the same time, preferably over several generations.

Hybridization:

The creation of a hybrid by crossing two genetically different individuals is called hybridization. The natural or artificial process that leads to the formation of hybrids is called hybridization. Hybridization does not change the composition of the organism but creates new gene combinations.

Types of Hybridization:

Inter varietal Hybridization

Distant Hybridization

Castration, packaging, and labelling are the hybridization processes. [9]

Mutation:

In other words, mutations occur due to changes in the DNA base. Substitution: Changes in nucleotides that can change from one pyrimidine to another pyrimidine or from one purine to another purine are called substitutions. Tran's version: A nucleotide substitution involves substituting a purine with a pyrimidine.

Polyploidy:

If a cell has more than two pairs of chromosomes, the cell is polyploidy such as triploid, tetraploid. This is when a cell has more than two genomes.

Types:

Spontaneous Polyploidy: This is a natural process.

Induced Polyploidy: This is a trick.

ROLE OF MEDICINAL PLANTS IN NATIONAL ECONOMY

BHRINGRAJ:

Bhringraj is a revitalizing, tonic, and liver protection herb that is also used to make bhringraj hair oil and is used to treat splenomegaly, jaundice, skin conditions, asthma, hair darkening, and liver illness. Bhringraj powder, pills, and fresh leaves are used by people to cure a variety of ailments. Bhringraj comes in two varieties: one has lovely white blooms, while the other has yellow blossoms. Hospitals more frequently utilize yellow Bhringraj out of the two varieties. The numerous health advantages of the bhringraj plant make it worthwhile to grow in the yard. Additionally, this plant needs little care; frequent watering and a tiny bit of fertilizer are all that's needed.[10]

Fig.1. Bhringraj

Common Name:
Sondaki Eclipta, Devedikeni, Sahte Papatya, Sanskritçe: Balari, Bhringraj, Bhengra, Bhangra, Bhangra, Moca, Baava, Hintçe, Maka, Bhringraj Gajrat: Kalobhangro, Dadhal, Bhangro, Tamil: Kaikeshi.[11]

Soil and Climate:
It is a vigorous plant that can grow in many soil types. High moisture content soil is favoured. Plants can be grown in red loamy soil that has a high organic matter content. The crop thrives in tropical, subtropical, and temperate climates and is resistant to cold. For optimum development and production, it Favors a temperature of 25 degrees Fahrenheit above 35 degrees.

Soil preparation:
The depth of soil preparation is 30 cm and a small amount of sand is mixed into the agricultural soil at the rate of 2 kg/m². Propagation: Cuttings and seeds can be used to spread the crop. To plant the seeds, sow them in rows of 1 x 3 x 0.15m, about 6cm apart, in a bed lightly covered with soil and water through a sprinkler. After 45-60 days, the seedlings are ready for planting. This species can reproduce asexually using 10-15 cm long plants with 5-6 nodes. When the rooting process is complete, which should take four to six weeks, you may go on to the main area. Place the plant 15 by 20 centimetres away from the existing field. Per hectare, 2.5 kg of seeds are needed. For the purpose of micro propagating Bhringraj from early shoot axils of shoot tip explants, a successful technique was established. It raises the biomass of the plant, the number of roots, and the amount of chlorophyll in the leaves. Removing superfluous branch development strengthens the plant and improves its surroundings. Compared to untreated plants, Bhringraj micro propagated plants are healthier and more resilient in soil.

Manure and Chemical Fertilizers:
For one hectare of land, around 20 tons of FYM and 50:75:30 kg of NPK are needed. FYM consists of a basal dosage of potassium, full phosphorus, and half nitrogen. Two doses of extra nitrogen are administered following the first and second weaning.

Irrigation:
Water twice a week for up to a month after planting to ensure good plant growth. From now on, this process is done every week depending on the amount of rain and humidity. Plant Care: Thirty to thirty-five days after planting, use the first plant. Plants should be removed after each harvest to prevent them from growing in gaps, if any. Pests and illnesses: Although there are no serious illnesses that affect this crop, diseases like gall, leaf blight, and yellow blight are known to cause harm. Applying a 0.2% mancozeb spray to the crop will help manage this disease.

Processing:
Cut the herb into medium-sized pieces. Drying in the shade is preferred. It's critical to clean and dry your plants to stop microbial invasion and decay. When the seeds start to go black is the ideal moment to harvest them.

Yield:
Four months after planting, prune all plants to 5-10 cm above the ground. This can be done 2-3 times a year. After watering, new shoots will appear on the remaining rhizomes. The Bhringraj factory produces an average of 6000 kg of straw per hectare per year.

Additional products:
Bhringraj hair oil, Bhringraj powder, Bhringraj capsules.

Economics:
6,000 hay plants are grown on average each year, yielding a total return of Rs 2.40 million. The anticipated cost of the delivery is Rs 2.40 lakh. 60,000 per hectare. Consequently, the hotel issued a Rs. 180,000/ha/year reimbursement.[12]

VERIFICATION OF PLANT IDENTITY

Verifying that the appropriate plants and plant components are being used to manufacture herbal treatments. Ensuring the safety and effectiveness of herbal medications is crucial. Comparing the observable morphological traits of plants or botanical medicine with descriptions from floras or monographs is known as a macroscopic examination. This examination approach involves using modest magnification or your unaided eye to examine the size, shape, and color of leaves, flowers, or fruits in order to identify them. Herbal medicine frequently uses this technique.[13]

PATENTING AND REGULATORYREQUIREMENTS OF HERBAL DRUGS

1. Patent:
A patent is a collection of monopoly rights that the government grants to the owner of the patent, preventing others for a specified amount of time from creating, using, selling, or distributing a certain invention. The person who receives the patent is called the patent owner. Inventions related to a process or product can be patented. The definition of "invention" is found in the Patents Act of 1970, which has undergone periodic amendments. "An invention is a new or used product that has economy and creativity." A patent is allowed only for an invention that meets the following conditions: The invention is new. There is creativity involved. There may be

commercial or beneficial applications. The aim of the system is to encourage production by supporting their protection and production, thus contributing to the development of the economy and thus benefiting people.

A. Filling an application
B. Examination of application
C. Opposition /Claim for patent
D. Granting and sealing of patent.

A. Filling an application for patient:

The patent application can be completed using the patent application form. This is available from the Patent Office; the applicant must provide the following information. Name, surname, address and nationality of the manufacturer. Specifications: Provide details of the product. Application: Description and scope of the invention.

B. Examination of application:

The patent office examines the utility of the patent application, the nature of the claims and whether the patent has priority.

C. Opposition /Claim for patent:

All applications will have three months before the patent is granted and closed.

D. Granting and sealing of patent:

If the applicant has no objections or all objections are clearly met, the certificate will be issued by the Patent Office and published in the Ministry of Public Works. Patents can be kept valid by paying an annual fee within days, which extends the life of the patent. Repeat after time is up.[14]

2. Bioprospecting:

Biodiversity research involves the discovery, extraction and analysis of diverse cultural and indigenous information to obtain valuable genetic and biochemical information. Biodiversity research or biodiversity research is the biochemical and genetic study of nature with the aim of producing useful products for medicine, agriculture, cosmetics and other uses. The process of finding and bringing to market novel goods derived from biological resources is known as biological research. Search for plants and animals from which medicines and other useful items can be obtained. Learn how diseases are commercialized for human use. The National Cancer Institute examined 35,000 plants and animals between 1956 and 1976 to see whether they had any anti-cancer qualities. But the program failed to find new cancer drugs and was stopped in 1981[15]

3. Biopiracy:

The word "biopiracy" was coined by "Pat Mooney" to describe the unauthorized use of Aboriginal information from Aboriginal people by others for money or at the expense of Aboriginal people. For example, when biological scientists extract Aboriginal knowledge from medicinal plants, the knowledge is patented from the patent holder by a medical company, without realizing that the knowledge is not new or advanced, thus depriving people in the community of their original Knowledge. Improve themselves. Under U.S. patent law, anyone who creates or discovers a useful new process, machine, product, or has a problem or new development has a reasonable benefit to the patient. In general terms, the quality of the patent must meet the following four conditions the invention must be new; the invention must have the same material or use. Invention requires cunning.[16]

CONCLUSION

Research is needed on the cultivation, long-term storage, preservation and use of aromatic plants. Additionally, the development of programs for medicinal and aromatic plants should be monitored through product evaluation to ensure that these plants are of the same quality in terms of alkaloids, essential oils and other valuable medicinal products on the market.

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