International Journal of Ecology and Environmental Sciences
www.ecologyjournal.in
Online ISSN: 2664-7133, Print ISSN: 2664-7125
Received: 14-06-2021, Accepted: 30-06-2021, Published: 14-07-2021
Volume 3, Issue 3, 2021, Page No. 36-40

Review on scope and importance of medicinal and aromatic crops

G Chandrashekhar[1*], K Prabhavathi[2]
[1] Lecturer, Department of Plantation, Spices, Medicinal and Aromatic Crops, Horticulture Polytechnic College, Ramagirikhilla, Telangana, India
[2] Department of Soil Science and Agricultural Chemistry Horticulture Polytechnic College, Ramagirikhilla–Skltshu, Telangana, India

Abstract
Medicinal and aromatic plants play a significant role in the life of people and are present in innumerable forms. In Indian traditions, all the plants in this earth are considered as medicinal. Medicinal plants have played a significant role in various ancient traditional systems of medication such as the Chinese, Ayurvedic, Unani, and their secondaries in many Asian countries. They also generate income to the people of many Asian countries who earn their livelihood from selling collected materials from the forest, or by cultivating on their farms. However, a simplest definition of the medicinal plant would be "Medicinal plants are those plants which are used in official and various traditional systems of medicines throughout the world". Medicinal plants are plants that provide people with medicines - to prevent disease, maintain health or cure ailments. In one form or another, they benefit virtually everyone on earth. No exact definition of Medicinal Plant is possible. There are related issues, such as for nutrition, toiletry, body care, incense and ritual healing. Aromatic plants are a special class of plants used for their aroma and flavour. Many of them are exclusively used also for medicinal purposes in aromatherapy as well as in various systems of medicine. Similarly a number of medicinal plants also produce essential oils as well as being used for perfumery. Medicinal plants still continue to make important contributions to healthcare and livelihoods. Nearly 80% of the world population use traditional medicine, mainly medicinal plants, to cure illnesses and ailments.

Keywords: constrains, importance, opportunities and scope

Introduction

India has been considered as treasure house of valuable medicinal and aromatic plant species. Ministry of Environment and Forests have identified and documented over 9500 plant species considering their importance in the pharmaceutical industry. The diverse Agro-climatic situations in the Region offer excellent scope for growing different horticultural crops like fruits, vegetables, spices, plantation crops, medicinal and aromatic plants (Rajeswara Rao *et al*., 2012) [10]. Medicinal and aromatic plants constitute a major segment of the flora, which provides raw materials for use in the pharmaceuticals, cosmetics and drug industries (Jeelani *et al*., 2018) [4]. The indigenous systems of medicines, developed in India for centuries, make use of many medicinal herbs. Plants have been used since ancient times of all civilizations and cultures, mostly as home remedies for treating seasonal flu viruses, cough, cold, stomachache, sore throat and headaches. Besides, the aromatic plants are still used in making perfumes, because of their pleasant smelling flowers, in cooking because of their strong flavors, and liquor industries. At the present there are used many herbal treatments that are becoming very popular in the society because of their efficiency and less side effects. The medicinal and aromatic plants are less expensive, more available and have potential to control disorders. According to Andrea (2011) [2] use of these plants is also a potential material for maintaining good health and conditions, not only for a remedy for specific diseases and also play a vital role in national economy.

Medicinal plants

According to the World Health Organization, "a medicinal plant is any plant which, in one or more of its organs, contains substances that can be used for therapeutic purposes, or which are precursors for chemo-pharmaceutical semi synthesis".

Aromatic plants

The plants possess Odiferous and volatile substances, which are extensively used in perfumery, food flavouring, cosmetics and allied industries.

Medicinal and Aromatic Plants have been a major source of health care since time immemorial.

Medicinal and aromatic plants (MAPs) are traded as such in bulk from many developing countries for further value addition in developed countries. Plant parts, extracts and phytochemicals derived from medicinal plants are being used in different systems of medicine like Ayurveda, Siddha, Unani, Homeopathy, Folklore and Allopathy. There is growing interest of natural products as a source of new chemical entities for development of modern drugs, also use of natural products as dietary supplements (nutraceuticals), ingredients to food and beverages, phytocosmetics and other herbal products Medicinal and aromatic plants are receiving considerable attention across the world because they offer a wide range of safe and cost effective, preventive and curative therapies.

Table 1: Some of the important Medicinal and Aromatic plants and their chemical constituents and uses.

S. No	Crop	Chemical constitute	Uses
1	Alove	Aloin	Drugs, cosmetics,burn heal
2	Ashwaghanda	Withnine, somniferine	Antibiotic, antitumour
3	Coleus	Forskolin	Drugs, diuretic, treating intestinal disorders
4	Ambret	Farnesol and ambrettolide	Cosmetics, perfumes and drugs
5	Henna	Lawsone	Drugs,cosmetics, dying and perfumery
6	Isabgol	Colloidal mucilage	Used in control of piles and diarrhoea
7	Mint	Menthol	Perfumes and cosmetics
8	Periwinkle	Vincristine, vinblastine	Drugs, cosmetics
9	Saffron	Crocin	Spice, drugs and cosmetics
10	Geranium	Geranial, citronellol	Cosmetics, perfumery
11	Patchouli	b-patchoulene, a-guaiene, caryophyllene	Insecticides, flavouring and perfumes
12	Lemon Grass	Citronellal, geraniol	Perfumes, hair oils, scents and medicines
13	Eucalyptus	a-pinene, b-pinene, a-phellandrene, 1,8-cineole, limonene	Drugs and oilos
14	Davana	Cis-davanone	Expensive perfume, flavouring beverages
15	Occimum	Eugenol	Insecticides and culinary purpose

Historical perspective

Medicinal plants use was Likely to be started when people recognized its magical power. The Aryans of Indus valley wrote three treatises, *viz*. the Rigveda (2000bc), Atharveda (2000-1000 bc) and Ayurveda (100-600 bc) which mentions several medicinal plants and their uses. The Charaka samhitra, an encyclopaedia od Indian medicine, published at Varanasi between 100 Bc and 100 AD, is a comprehensive record of medicinal plants and their uses. During 1200 AD important medicinal plants were introduced into India by Arabs From 1800 AD introduction of western allopathic system in India included the uses of medicinal plants of proven therapeutic value.

The Himalayan region is diverse also in traditions of medical practice. Apart from the Ayurvedic (Indian) tradition, the Unani (Islamic) and Sowa-rigpa (Tibetan) systems of medicine, as well as diverse folk traditions, are practiced in the region. The international market for medicinal and aromatic plants (MAPs) is dominated by China, Japan, five European countries and the USA (Shilpa *et al*., 2018) [14]. Within Europe there are good reasons to focus on the UK as the primary target for new sales of these products from India. The shape of the UK market is here outlined. Current sales into Europe from India are relatively low.

Table 2: Area and production of medicinal and aromatic plants in India

Year	Area ('000 Hectare)	Production (' 000 Tonne)	Productivity: MT/Hectare
2001-02	106	535	5.05
2002-03	70	735	10.50
2003-04	101	580	5.74
2004-05	249	818	3.29
2005-06	391	856	2.19
2006-07	468	1058	2.26
2007-08	563	1264	2.25
2008-09	597	1417	2.37
2009-10	692	1593	2.30
2010-11	701	1636	2.33
2011-12	760	2218	2.92
2012-13	790	2647	3.35
2013-14	748	3192	4.27
2014-15	908	3143	3.46
2015-16	912	3206	3.52
2016-17	970	3364	3.47
2017-18	1044	3651	3.49

Source: Statistics at a Glance 2018, Government of India.

Advantages

As compared to the traditional crops, the cultivation of medicinal crops has many advantages. These include:

- Medicinal crops provide better returns than traditional crops
- Have very high domestic and export demand
- Fetch better prices in the market
- Could be stored for a long time, and sold at a time when better prices prevail in the market
- Are the largely drought tolerant, and not easily grazed by animals
- Have low incidence of pest attacks and diseases
- Require minimum resources, therefore the cost of cultivation is lower compared to the traditional crops
- Could be raised as inter-crops, along with traditional crops, and also on degraded lands.

Given these advantages the cultivation of medicinal crops has been picking up in some regions (Sher *et al*., 2013) [13], However, the spread is not so large to meet the demand of the industry. Owing to short supply, prices of some medicinal crops have increased substantially in the recent past. What is also of great concern is that exploitation of some of the species has threatened their extinction.

Global marketing opportunities

Export opportunities of natural products are tremendous, as the world is looking towards natural sources for the purposes of therapeutic use as well as nutritional dietary supplements (Singh *et al*., 2013) [15].

The global herbal remedies market can be classified into five strategic areas:

1. Phyto-Pharmaceuticals - the plant based drugs containing isolated pure active compounds used to treat diseases
2. Medicinal Botanicals / Dietary Supplements - the whole plant or plant-part extracts used for maintenance of health by affecting a body structure and its function
3. Nutraceuticals - the food containing supplements from natural (botanical) sources, that deliver a specific health benefit, including prevention and treatment of disease
4. Cosmeceuticals - the cosmetic products which contain biologically active ingredients having an effect on the user
5. Herbal raw material.

Opportunities

Medicinal and Aromatic Plants offer several opportunities towards developing agri-entrepreneurship in various ways. Some of these are enumerated as under:

1. The farmer's holding small land can grow these crops in rotation or as intercrop with cereals or vegetable crops to enhance per unit area return. Some of the MAPs are also suitable for cultivation in degraded salt-affected soils, stressed conditions and as under crops in orchards thus ensuring optimal use of the available land and other resources to the economic advantage of the growers.
2. Putting up of the processing facilities in the aromatic plants growing areas is another income generating opportunity for a farmer who can extend the facility to the fellow growers.
3. Production of truthfully labelled seeds and propagules in collaboration with the research organizations can open new avenues in the area where possibilities of MAPs cultivation are gaining momentum.
4. Companies or industries requiring quality raw material of MAPs in bulk are now coming forward to join hands with the research organizations for acquiring knowhow for cultivation and promoting the MAPs cultivation through contractual cultivation.
5. Providing technical guidance and consultancy to the farmers by the qualified entrepreneurs and establishing testing facilities and agri-clinics are some of the important areas of emerging opportunities in this sector. Agriculture and horticulture department's recent initiatives in developing scientifically trained human resource through various regular farmers-scientist interaction programmes are likely to make a visible impact in this regard.

Constrains

There is an urgent need to give attention to the following aspects:

- Development of a package of improved practices for cultivation of these aromatic crops.
- Making availability of good quality planting material of high yielding and short-duration (in Case of menthol mint with less water need) varieties
- More demonstration / extension efforts,
- Better access to timely and adequate credit,
- Access to timely market information,
- Establishment of regulated market
- Introduction of minimum support price
- Contract farming,
- Establishment of testing facilities

Linkage with pharmaceutical and perfumery industries so as to boost the cultivation of aromatic crops in the study area.

Scope of medicinal and aromatic plants

India has different agro-ecological zones suitable for growing different medicinal and aromatic plants, which are in demand. However, systematic efforts will need to push this particular sector agro-ecological zone wise. The plant species will have to be identified and their package of practices will be developed. Identification of species will be important criteria for marketing.

Planting material of known varieties

Since availability of quality planting material will be essential items of future development programme the farms of the State Agricultural Universities and Department of Agriculture and nurseries of Department of Horticulture should undertake the programme of collection and conservation of different species of medicinal and aromatic plants prevalent in the region and their multiplication on a large scale (Sharma *et al*., 2018) [12]. The help of KVKs and some of the NGOs will also be important in this endeavor.

Cropping System

Many of the medicinal trees will need gestation period of 8-10 years for economic production. The farmers will need the cropping system, which will be suitable for giving him economic return from first year onwards. Therefore, inter cropping with species of shrubs and trees will be very much essential.

Post-harvest technology

The post-harvest technology for medicinal and aromatic plants is necessary since the plants after harvesting in green stage, if stored unprocessed for want of purchaser may get contaminated with fungi which may impair the quality of the final product (Phondani *et al*., 2014) [9]. Therefore, post-harvest technology for plants their grading and packaging and method of storage should be developed.

Marketing of product

It is experienced that the farmers get convinced about the potential of profit from growing medicinal and aromatic plants. However, once they enter into business they get frustrated because of disorganized market. Therefore, concentrated efforts will be needed to organize marketing of the product produced by the farmers. Ram *et al*. (2012) [11] Reported a cluster of villages

for specified area under cultivation of some species will have to be identified so that the produce from all the farmers of such cluster will be collected at central place. People interested in purchasing can be invited which will help in marketing the product efficiently.

Primary processing

Many items as raw material of aromatic and medicinal plants being very bulky, the storage of such material becomes a problem more so in the case of aromatic plants. Therefore, small processing units to serve the need of the cluster of villages will be a good idea. Small cost effective extraction unit should be developed and Government will have to support self-interest group of farmers for its establishment. Primary processing from the bulk material at village level will reduce the problem of storage and risk involved in the same. This will help the farmers to get more price for their produce.

Conservation of medicinal and aromatic plants

Medicinal plant reserves will go a long way to protect the existing genetic diversity and help in rational exploitation of medicinal plant resources in the Himalayas for overall economic development (Alan 2014) [1]. Priority should be given to species that are endangered throughout the range. Families and genera that are monotypic should receive top priority over polytypic ones. Other things equal, an endangered species should be given priority over the vulnerable one, a vulnerable over a rare one and a rare species over one that even it is declining is considered insufficiently threatened to qualify for one or three categories (Phondani *et al*., 2016) [7]. Creation and development of medicinal plants reserve is a main component of management strategy. A medicinal plant reserve, no matter where it is located in the world must, to some extent, address itself to three basic concepts. In particular it must have one or several protected zones to ensure its "conservation role" which must always be present (Kandari *et al*., 2012) [5]. It must participate in national and international network and thus have a "logistic role" supporting a certain amount of research work taking part in exchange of information. It must go as far as possible through problem oriented research, demonstration, education and local participation in the "development role". The relative importance of these roles will vary from one medicinal plant reserve to the other, but it is their combined presence which is characteristic of the whole scheme (Phondani *et al*., 2013) [8]. An area which combines conservation with research and education or sustainable development can only become a true Medicinal Plant Reserve (MPR).

Quality Control

Four SAUs, Ayurved Rasshala and ATMA should be given permission to establish quality control laboratories so as to fix the quality parameters for various plant species and their varieties. There are many schemes of the Government of India including the Employment Guarantee scheme in which the provisions have been made for financial support to the farmers who will opt for cultivation of medicinal and aromatic plant. These schemes will need further strengthening.

Management practices in MAP

Crop improvement

- Conservation of MAP species for future use
- Germplasm of MAP for specific traits of high yield and quality and resistant to biotic and
- abiotic stresses
- Novel varieties of MAP with specific targeted character
- Standards for better quality seed and planting material of MAP
- Technologies for mass multiplication of planting material
- Technologies for enhanced biosynthesis and production of active principle compounds of MAP

Crop production and processing

- Cultivation of MAP will reduce their over exploitation, fulfil the demand and conserve the natural species and habitats
- GAP for all important MAP to improve the productivity and quality and to fetch better economic returns
- Technologies for efficient utilization of resources such as land, water, nutrients, sunlight, labour etc.
- Technologies for cultivation of MAP in different cropping systems and on the problematic soils to increase the area and generate additional income to sustain livelihoods
- Post-harvest technologies to reduce losses of harvested produce during processing, storage, transportation and to improve the nutritional quality and shelf life of the produce
- Mechanization to reduce man power requirement and human drudgery involved in the cultivation of MAP

Quality management

- Technologies to detect various adulterants and monitor the quality of the produce
- Protocols to assess the quality and certification of products
- Information on safe waiting period/pre harvest interval for the pesticides application
- Technologies to extract high value compounds of industrial demands

Future prospects

Medicinal and aromatic plants form a numerically large group of economically important plants, which provide basic raw materials for medicines, perfumes, flavours and cosmetics. These plants and their products not only serve as valuable source of income for small land holders and entrepreneurs but also earn valuable foreign exchange by way of export.

Conclusions

The role of medicinal and aromatic plants is changing continuously in accord to a period and the role expands such as cure of disease to prevention of disease. The accumulated massive knowledge, information, and materials should be shared in the whole world and go down to generation to generation.

References

1. Alan, CH. Medicinal plants, conservation and livelihoods. Biodiversity and Conservation,2014:13:1477-1517.

2. Andrea L, Robert V. Cultivation of medicinal and aromatic plants for specialty industrial materials. Industrial Crops and Products,2011:34:785-801.
3. Hand Book on Horticulture Statistics: Government of India. Ministry of Agriculture. Department of Agriculture and Cooperation, 2014.
4. Jeelani SM, Rather GA, Sharma A, Lattoo SK. In perspective: Potential medicinal plant resources of Kashmir Himalayas, their domestication and cultivation for commercial exploitation. Journal of Applied Research on Medicinal and Aromatic Plants,2018:8:10-25.
5. Kandari LS, Phondani PC, Payal KC. Ethnobotanical study towards conservation of medicinal and aromatic plants in upper catchments of Dhauli Ganga in the Central Himalaya. Journal of Mountain Science,2012:9:286-296.
6. National horticultural board: Indian horticultural data base 2014.
7. Phondani PC, Bhatt ID, Negi VS, Kothyari BP, Bhatt A, Maikhuri RK. Promoting medicinal plants cultivation as a tool for biodiversity conservation and livelihood enhancement in Indian Himalaya. Journal of Asia Pacific Biodiversity,2016:9:39-46.
8. Phondani PC, Maikhuri RK, Bisht NS. Endorsement of ethnomedicinal knowledge towards conservation in the context of changing socio-economic and cultural values of traditional communities around Binsar Wildlife Sanctuary in Uttarakhand, India. Journal of Agricultural and Environmental Ethics,2013:26:573-600.
9. Phondani PC, Maikhuri RK, Saxena KG. The efficacy of herbal system of medicine in the context of allopathic system in Indian Central Himalaya. Journal of Herbal Medicine,2014:4:147-158.
10. Rajeswara Rao BR, Rajput DK, Nagaraju G, Adinarayana G. Scope and potential of medicinal and aromatic plants products for small and medium enterprises. Journal of Pharmacognosy,2012:3:(2):112-114.
11. Ram S, Sanjay K, Virendra S, Ram P, Tomar VKS, Singh AK. Economics of production to marketing of aromatic crops in Uttar Pradesh: a case study. Agricultural economics research review,2012:25:157-160.
12. Sharma TVRS, Abirami K, Chander MP. Medicinal Plants Used by Tribes of Andaman and Nicobar Islands: A Conservation Appraisal. Indian Journal of Plant Genetic and Resource,2018:31:(2):125-133.
13. Sher H, Elyemeni M, Hussain K. Ethnobotanical and economic observations of some plant resources from the northern parts of Pakistan. Ethnobotany Research and Applications,2013:9:27-41.
14. Shilpa PC, Shreeshail R, Naik BK. Production scenario of medicinal and aromatic crops in India. Journal of Pharmacognosy and Phytochemistry,2018:3:274-277.
15. Singh KM, Awadhesh KJ. Economic potential of medicinal and aromatic plants and conditions for great adoption in Bihar, 2013.