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Message from The Vice Chancellor

Need for cultivation to enrich Ayurvedic materia medica

Ayurvedic Herbal Pharmaceutical Industry is expanding rapidly. Approximately, 9173 AYUSH drug-manufacturing licensed units are marketing herbal formulations throughout the country (as on April 1, 2008). System-wise distribution of these units are quite uneven as 86.23% licensed pharmacies belong to Ayurveda, whereas, 3.53%, 3.29%, and 6.94% are under Unani, Siddha, and Homeopathy systems, respectively (AYUSH IN INDIA 2008, Planning and Evaluation Cell).

The analysis of the prescription writing by ISM doctors clearly indicates that patent formulations are dominating the clinical practice. One can welcome this trend and at the same time, it is the duty of the ayurvedic practitioners not to get rid of the habit of prescribing classical formulations. National Medicinal Plant Board has prioritized 32 medicinal plants in view of global demand. It is also necessary to prepare the list of herbs which are highly essential for processing the classical formulations. For example, the herbs belonging to *Dasamoola*, *Ashtavarga*, and other herbs such as *Pushkaramoola*, *Amlavetasa*, *Katuki*, *Lodhra*, *Ashoka*, and *Satavari* are to be given top priority and they are to be cultivated to meet the demand of the pharmaceutical industry. Most of the popular herbs are enlisted under endangered or threatened species. One has to consider scientific advancements for adopting them in the conservation and cultivation practices with regard to herbs incorporated in the classical formulations. The following aspects require due consideration for assessing demand and supply of herbs in the business sector.

Government of India has identified medicinal and aromatic plants as one of the sectors that make India a global leader in the twenty-first century owing to the treasure of 8000 medicinal and 2500 aromatic plants that can provide a large number of consumer products with national and international demand.

The World Health Organization estimated that by year 2050, trade in plant-based drugs will reach US$ 5 trillion (Rs. 245 lakh crores). Due to the tremendous global demand for medicinal plants, they are indiscriminately collected from their natural habitats (mostly forest areas), resulting in their dwindling availability and seriously threatening their survival. A number of Indian medicinal plants have become endangered, threatened, and their occurrence has become rare, forcing the Government of India to ban exports of some of those plants. Global and Indian demand has provided an excellent opportunity for scientifically cultivating economically important medicinal plants.

The Natural Products Alert Database developed by Farns Worth dating back to 1970 has documented more than 1,30,000 prescriptions based on 40,000 plant species. The plants used in traditional medicine have been investigated; the constituents and its pharmacological action of the active principles on animal models have been examined.

India is rich with the three levels of biodiversity i.e., species diversity, genetic diversity, and habitat diversity. The traditional village physicians of India are using about 4500–5000 species of plants for medicinal purposes. The annual demand of herbs in the country has been estimated at 3,19,500 MT for the year 2005–2006. *Amala* (*Emblica officinalis*) is the highest consumed botanical raw drug by the domestic herbal industry, exports of *Isabgol* (*Plantago ovata*), Senna (Leaves and pods), Henna (leaves), and Myrobalans (*Triphala*) account nearly 70% of total exports of plant raw drug volume (Foundation for Revitalization of Local Health Traditions).

People in developed and developing countries use medicinal plant remedies as alternatives to modern medicine due to their safety, low cost, independent availability, available in all instances, with no side effects. It has been estimated that as many as 75–90% of the world's tribal and rural people rely on herbal traditional medicine for their primary health care even today.

Drugs derived from natural products are usually secondary metabolites and their derivatives. Secondary metabolites provide a pool of compounds from which new biochemical processes can emerge. Secondary metabolites provide defensive substances or other physiologically important substances. It is estimated that around 95% of the medicinal plants species occur in the wild. In the area of conservation of natural resources, preservation of medicinal plants in the wild and their cultivation outside their natural habitat have assumed significance, especially during the last decade of the last millennium, because of their alarming depletion due to various reasons which are inimical to the natural regeneration of these species. It is necessary to preserve wild populations of different plant species with their inherent intraspecific diversity for further evolution, and this is best done by setting aside forest areas as conservation areas. More and more problems might be discovered and solved in the research of medicinal plants with the tools of bioinformatics, especially in the process of medicinal plant genome project.

Following the pioneering and monumental work of Sir R.N. Chopra and his colleagues in the early period of twentieth century, there has been a tremendous upsurge of interest and research in the field of indigenous drugs. There are various conditions in the current clinical practice (Grey areas in Modern Medicine), where one finds modern medicinal agents

inadequate, either from efficacy or safety or compliance point of view and the patients are consulting alternative medical systems in search of a cure. India ranks sixth among the 12 mega diversity centers of the world, and is home for a usually large number of endemic species. Therefore, we have to design more holistic strategies for management of medicinal plants in the country.

Conservation and cultivation of rare endangered and highly utilized herbs in the classical formulations are very much needed due to over exploitation of natural resources. *Ex situ* as well as *in situ* cultivation of trees (*Ashoka*, *Khadira*, *Arjuna*, *Bilwa*, *Gambhari*, *Syonaka*, *Patala*, *Pilu*, *Shalmali*, *Saptaparni*, etc.), shrubs (*Arani*, *Vasa*, *Vidanga*, *Guggulu*, *Bharangi*, *Nirgundi*, *Danti*, *Jyotishmati*, *Daruharidra*, *Chitraka*, *Dhataki*, etc.), climbers (*Guduchi*, *Shatavari*, *Vidarikanda*, *Jivaka*, *Sariba*, *Asthisamharaka*, *Jati*, *Vridhadaru*, etc.), and herbs (*Shaliparni*, *Prishniparni*, *Kantakari*, *Brihati*, *Gokshura*, *Bhringaraj*, *Mandookaparni*, *Brahmi*, *Shankhaparni*, *Bhumyamalaki*, *Ashwagandha*, *Mamejjaka*, *Bhunimba*, *Kiratatikta*, *Parpataka*, *Kumari*, *Mashaparni*, *Mudgaparni*, *Kasamarda*, *Chakramarda*, *Latakasturi*, *Duralabha*, *Tulasi*, etc.) should be taken up. Establishment of herbal gardens at the district as well as Taluka level, which acts as resource centers for propagation of medicinal plants and ayurvedic traditional knowledge, education to the masses and distribution of medicinal plant seedlings and raw materials required in limited quantity to the local people and local healers, should be taken up. The improved variety of medicinal plants should be selected for cultivation to get maximum production. Heavy metal, pesticides, and radio residues to be tested in the raw material prior to supply to the manufacturing units/consumers. Research studies should be planned to evaluate the activities of leaves of *Dasamoola and Arjuna* as a proper substitution for sustenance of the species.

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