NEWS

MEETING REPORT

Medicinal plants and herbal drugs*

Herbal medicine is still the mainstay of about 75–80% of the world’s population, mainly in developing countries, for primary health care because of better cultural acceptability, better compatibility with the human body and lesser side effects. It is estimated that approximately one quarter of prescribed drugs contain plant extracts or active ingredients obtained from or modelled on plant substances. Aspirin, atropine, artemisinin, colchicine, digoxin, ephedrine, morphine, physostigmine, pilocarpine, quinine, quinidine, reserpine, taxol, tubocurarine, vincristine and vinblastine are a few important examples of what medicinal plants have given us in the past. Most of these plant-derived drugs were originally discovered through the study of traditional cures and folk knowledge of indigenous people and some of these could not be substituted despite the enormous advancement in synthetic chemistry.

To discuss the scientific progress made in different aspects of medicinal plants research, an international conference on medicinal plants and herbal drugs was organized in Pachaiyappa’s College, Chennai, with support from various government and private funding agencies. The conference highlighted the importance of herbal medicines and discussed techniques and strategies for their conservation addressed by national and international representatives drawn from academic and research institutions, pharmaceutical companies, government and indigenous communities. The event was attended by more than 400 research scholars, students, scientists and teaching faculties from India, USA and Taiwan. Two hundred and ten research papers on medicinal plants were received for the conference; it reflected the significance of the focal themes of the conference.

A wide range of subject areas on medicinal plants were covered, such as cultivation, use of medicinal plants as food additives, sustainable harvesting of local resources, conservation and utilization of genetic resources, biotechnological methods for conservation of medicinal plants, biodiversity and bioprospecting, ethnobotany and ethnoveterinary medicine, pharmacognosy and ethnopharmacology, development of drugs and commercialization of local knowledge, quality control and standardization of herbal products and formulations, challenges, constraints and opportunities in herbal medicines, and agrotechniques and pest control strategies for medicinal plants.

Six technical sessions were organized on six themes: (1) Biodiversity and conservation, (2) Plant biotechnology, (3) Ethnobotany and Ethnoveterinary medicine, (4) Bioprospecting, (5) Ethnopharmacology and (6) Pharmacognosy and drug development. Each day of the conference consisted of a few invited lectures followed by oral presentations on specific themes. Besides, full-day concurrent poster presentations were held. There were more than 230 presentations including one keynote speaker, 21 invited lectures, 117 oral and 93 poster presentations. In each session, the best oral and poster presentations were awarded, to encourage the young research scholars’ interest.

The first keynote lecture of the conference was given by S. Madhavan (University of Nebraska, Lincoln) on ‘Molecular and biochemical approaches to study potential compounds of medicinal interest from herbs’. He stated that the resurgence of herbal drug usage in recent years may be attributed to the associated hazardous side effects that many of the synthetic drugs appear to cause. Hence, this is the opportune time to be involved in herbal medicine research and education. He presented the role of acetylocline machinery in plants and discussed how one could potentially employ genomics, proteomics and transcriptomics strategies, in concert, to enhance the production of secondary metabolites in medicinal plants.

The second keynote lecture was on ‘Quality control and standardization of traditional medicine/herbal drugs’ by M. J. Nanjan (JSS College of Pharmacy, Ootacamund). He pointed out that herbal medicines may also contain excipients in addition to active ingredients. But the problem with traditional medicine/herbal drugs is that their method of action is not understood in terms of modern science. He notified that the standardization of herbal medicines can serve a number of purposes including batch to batch consistency, accuracy in the amount of extract/marker per dosage unit and positive control to indicate possible loss or degradation during manufacturing. Standardizing traditional/herbal products is challenging because every step, right from botanical identity, botanical purity, assessing potency and designate markers to availability of reference materials, is crucial.

Medicinal uses of a few important species belonging to *Saussurea, Aconitum, Picrorhiza, Berberis, Ephedra, Amanita, Podophyllum, Trichopos, Aristolochia, Aegle, Helicteris, Gymnema, Jankaiia, Phyllanthus, Mucuna, Celastres, Commiphora, Plantago* and *Withania* were discussed by R. R. Rao (Central Institute of Medicinal and Aromatic Plants, Bangalore) in his presentation on ‘Diversity, conservation and bioprospection of medicinal plants of India: prospects and challenges’. He projected an urgent need for intensive and critical evaluation of all medicinal plants in the country. T. Vasanthkumar (Indian Institute of Horticultural Research, Bangalore) stated that a large number of medicinal plants sourced from the wild still need to be domesticated and varieties or cultivars developed and multiplied for various niches. It is necessary to develop good agricultural practices and conserve the gene pool of the species for posterity. Realizing the importance of medicinal plants the Government of India, with the formation of the National Medicinal Plants Board, has addressed the various issues of the sector and is encouraging the establishment of nurseries and cultivation of medicinal plants in the country.

Some biotechnological approaches for sustainably meeting the demand for plant-based raw material and conservation strategies were discussed by M. Thirunavukkarasu (Institute of Minerals and Materials Technology, Bhubaneswar) in his lecture on ‘Impact of plant biodiver-
sity degradation and possible solution for its conservation – biotechnological approaches’. N. Rama Swamy (Kakatiya University, Warangal) spoke on ‘Role of biotechnology in isolation of medicinally important plant secondary metabolites’. He said that different types of pharmacologically valuable secondary metabolites, viz. alkaloids, glycosides and terpenoids have been isolated from cell cultures in vitro, the new technologies will serve to extend and enhance the continued usefulness of higher plants as renewable sources of medicinal compounds. S. S. Deokule (University of Pune, Pune) expressed that medicinal plants have a lot of scope in the wide areas of drug development, ethnopharmacology, nutraceuticals, ecodies, cosmeceuticals and transfer of ITK (Indigenous Traditional Knowledge) and IPRs (Intellectual Property Rights).

S. Seeni (Sathyabama University, Chennai) spoke on ‘Biotechnology-based process and product development in medicinal plants’. He said that drug discovery from natural sources relies on: (i) a large number of structurally diverse compounds synthesized by plants, fungi, actinomycetes and sponges, and (ii) selection of one or more candidate molecules for testing and development into a therapeutic agent as such or after synthetic modification from a lead compound. He also discussed a case study on Hypericum hookerianum, a better source of hypericin than Hypericum perforatum under conditions of in vitro culture; productive cultures of H. hookerianum were developed by his team and efforts are under way to develop anti-depressant herbal tea and capsules based on the pharmacological profile for further evaluation. The value of trans-Himalayan plants in traditional medicine for human welfare was discussed by T. Parimelazhagan (Bharathiar University, Coimbatore). He avowed that scientific validation of traditional medicine, derivation of drugs through bioprospecting and systematic conservation of the concerned medicinal plants are of great significance. Traditional medical knowledge is important not only for its potential contribution to drug development and market value, but also for human healthcare.

D. Narasimhan (Madras Christian College, Chennai) focussed his presentation on the conservation point of view in ‘Access of medicinal plant resources and benefit sharing’. He stated that medicinal plants are accessed by several people, viz. local traditional healers, researchers in academic institutions, scientists in industries, medicinal plant collectors and traders, most of whom are unaware of the regulations of the National Biodiversity Act. He suggested that researchers should take permission from the respective state biodiversity boards which would take a decision after consulting the local biodiversity monitoring committees.

Besides the invited talks, a number of scientific presentations were allowed to give an opportunity to researchers and students to present their ongoing work. K. Subrahmanya Prasad (Sir Syed College, Kannur) conveyed that there are 308 species of medicinal plants in selected sacred groves of Kannur District, Kerala. Increasing anthropogenic activities are the major threat to sacred groves and there is an urgent need of complete protection and public awareness for the survival of these near-climax communities. Uday Homkar (State Forest Research Institute, Jabalpur) spoke on vegetative propagation of Lithospernum glutinosum through root cuttings. He expressed that root cuttings of 15-20 mm diameter give good results while those <15 mm diameter decayed after one month of planting. S. Khan and L.S. Singh (Bidhan Chandra Krishi Viswa Vidyalya, Nadia) discussed the extracts and medicinal values of some seed spices. Madhusmita Panda (Sambalpur University, Sambalpur) presented the antimicrobial efficacy of Minusopus elengi in controlling the growth of Streptococcus mutans.

K. M. Maria John (SRM University, Chennai) elucidated the free radical scavenging activity of Catharanthus roseus root extract against DNA damages. He said that higher concentrations of vincristine enabled maximum protection and lower concentrations resulted in lower protection to DNA. Somatogenic embryogenesis from leaf base explants of Cholorosphyton borivilianum was presented by Nasim Akhtar (AL-AMEEN Arts, Science and Commerce College, Bangalore). A. Pragash (Kanchi Mamunivar Centre for Post Graduate Studies, Puducherry) spoke on the pharmacognostic studies on Cissus vitelina. Qualitative phytochemical observations have revealed the presence of many primary and secondary metabolites such as alkaloids, flavonoids, tannins, phenols, fixed oils, fats, proteins and carbohydrates.

Presentations made on the antihyperglycemic effect of Albizzia lebbeck by Rupali Sengupta (Narsee Monjee Institute of Management Studies, Mumbai); the antitumor potential of Prosopis juliflora leaf alkaloids on MOLT-4 cells in vivo by M. Sathiyam (Madurai Kamaraj University, Madurai); the neuroprotective effect of Hemidesmus indicus by S. Shanthakumar (C.L. Baid Metha College of Pharmacy, Chennai); the antibacterial activity of selected medicinal plants by P. Amudha (Jaya College of Arts and Science, Chennai) and the antihyperglycemic activity of β-sitosterol and agnuside of Vitex agnus-castus by S. Arokiyaraj (Sathyabama University, Chennai) provoked fruitful discussions among the young researchers. Commercialization of traditional knowledge through the preparation of ‘Herbal Dip Tea’ was expounded by S. Annabazhan (A.V.C College, Mayiladuthurai). S. Padmavathy (Nirmala College for Women, Coimbatore) said that a total of 24 plants are employed for the treatment of fracture, intestinal worms, indigestion, diarrhoea, fever and wounds in domestic animals. Development of quality standards for herbal products with reference to Jawarish Ood Shirin was presented by D. Ramasamy (Regional Research Institute of Unani Medicine, Chennai). He stated that this formulation is prescribed as a stomachic to treat lack of appetite and weakness of the stomach. Physicochemical analysis, Thin Layer Chromatography (TLC)/High Performance TLC (HPTLC) finger print, microbial load, heavy metals, pesticide residues and aflatoxin of the formulation have been done.

On the whole, the conference recognized the efforts of students, scientists and teachers in India and abroad. It provided them a platform to present their work to a wide audience and was a reflection of the participation of researchers in the scientific workforce. The young research scholars and students who participated in the conference were motivated and benefitted from the experts’ presentations.

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