

the shape of a 3D surface by exploiting a 2D image of the surface. A common example/application of SFS is to reconstruct a 3D surface from a 2D radar image of the surface, especially to identify mountains, valleys and other areas. P. S. Datti (TIFR, Bangalore) talked on basic results of partial differential equations (PDE). The need for diverse numerical

schemes for the solution of PDE was emphasized.

Vasudev Murthy (TIFR, Bangalore) spoke about Ramdas layer and its modeling. He traced the history of the phenomenon and explained how numerical and singular perturbation technique could give consistent and qualitative explanation to the cause of the Ramdas layer.

A large number of research students, teachers from various colleges and universities attended the seminar.

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MEETING REPORT

Ethnopharmacology and alternative medicine*

Ethnopharmacology is an interdisciplinary area of research that deals with the identification, description, observation and investigation of ingredients used in various recipes of traditional medicine and their effect on animal models. It is also the study of the relevant forms of knowledge, practice and cultures implementing them. The role of natural products, herbal medicine, tribal and traditional medicines is being increasingly appreciated in recent years for the prevention and cure of human ailments. Our country has a long tradition of using herbal products for healthcare. There is an increasing awareness of the significance of ethnic and traditional knowledge in the development of therapeutics. In the current scenario of globalization, information technology and knowledge system on traditional medicine have significant importance. Keeping this in mind, an International Conference on Ethnopharmacology and Alternative Medicine was organized recently. This also coincided with the Fifth Annual Conference of the National Society of Ethnopharmacology.

The three-day conference was attended by nearly four hundred participants from all over India and abroad. Welcoming the delegates, Rev. Fr. Pius (Managing Director, Amala Hospital and Research Centre and Amala Institute of Medical Sciences) stated that considering the importance of traditional medicine, Amala

has established a well-equipped Ayurveda Hospital and Research Centre with modern facilities. In his presidential address, K. V. Peter (Vice-Chancellor, Kerala Agricultural University, Thrissur) focused on the needs of conservation of the vast reserve of indigenous medicinal plants and their genetic diversity.

P. Pushpangadan (National Botanical Research Institute, Lucknow) in his keynote address on traditional medicine and the IPR regime stated that knowledge-based development of value-added products from bioresources and their commercialization has become one of the fastest developing economic activities in the world. Traditional knowledge (TK) related to food, nutrition and health is the most vital information for the modern drug-hunters. Therefore, measures to protect the Intellectual Property Right (IPR) on traditional knowledge are urgently needed and necessary legislation is to be enacted immediately.

D. B. A. Narayana (Hindustan Lever Limited Research Centre, Bangalore) speaking on the documentation of human-use data for traditional medicine (ayurveda) indicated the helplessness of Indian industry and scientists to provide human-use safety and efficacy data of ayurvedic products. This has led to the humiliation when Lord Walton Committee of the UK categorized ayurveda as 'unscientific and unproven for safety, lacking documentation'. He enumerated several lost opportunities and strongly advocated the need for documentation of safety and efficacy data of herbal products.

S. Rajasekharan (Tropical Botanic Garden and Research Institute (TBGRI), Thiruvananthapuram) spoke on the necessity

of scientific documentation of TK to safeguard the IPR of indigenous communities and establishing the ownership of indigenous knowledge. He highlighted the major activities of scientific documentation of TK.

V. George (TBGRI) spoke on the role of ethnobotanical leads and traditional knowledge in drug discovery and the studies carried out at TBGRI during the past decade. He reiterated the significant role of ethnobotanical knowledge providing leads for the selection of raw materials for developing novel bioactive molecules. P. G. Latha (TBGRI) highlighted the ethnopharmacological screening programme of the Western Ghats medicinal plants in her institute. S. Ganeshan (TBGRI) discussed the importance of plant genetic diversity and its potential to exploit and develop healthcare formulations.

Pulok Mukherjee (King's College, London) spoke on the quality determination of natural health products by marker profiling. In order to rationalize the use of herbal products, particularly in the form of extracts, the concept of marker analysis is gaining momentum. This will help to develop quality control profile of products based on their chemoprofile. Mukherjee emphasized the need for international coordination in this aspect.

Radha K. Maheshwari (Uniformed Services University, USA), spoke on the enhancement of wound-healing by novel phytochemicals. He highlighted the successful story of Indo-US collaboration in this programme. Speaking on the molecular mechanisms underlying immunomodulatory effects of *Viscum album* preparation, Srinivas V. Kaveri (INSERM U618, Institut des Cordeliers, France) said that the mechanism of antitumour

*A report on the International Conference on Ethnopharmacology and Alternative Medicine organized jointly by Amala Cancer Research Centre, Amala Ayurveda Hospital and Research Centre, Thrissur, and National Society of Ethnopharmacology from 20 to 22 January 2006.

activity of viscum extract or mistletoe lectins is complex involving apoptosis, angiogenesis and immunomodulation. He highlighted some of the recent developments in this area of research. Speaking on the miracle metabolite, resveratrol found in grape skin, red wine and peanuts, Dipak K. Das (University of Connecticut, School of Medicine, USA), highlighted the cardio-protective, neuro-protective, anti-inflammatory and cancer chemopreventive properties of this novel compound. While resveratrol exerts cardio-protection, it causes cancer cell death by promoting apoptosis through increased oxidative stress.

C. K. K. Nair (Bhabha Atomic Research Centre, Mumbai) spoke on the potential use of natural products as radioprotectors. Although a number of natural products show radioprotective properties, he explained the particular relevance of water-soluble derivatives of vitamin E based on their *in vitro* and *in vivo* studies. Absar Ahmad (National Chemical Laboratory, Pune) spoke on the application of nanoparticles in hyperthermia and drug delivery. He presented results of the exciting investigations carried out in his laboratory, on the use of fungi for the synthesis of nanoparticles. His group was able to synthesize gold and magnetite nanoparticles using fungal extracts. He explained the potential application of these particles in cancer hyperthermia and drug delivery.

K. Sasidharan (Kerala Ayurveda Pharmacy Limited, Aluva) spoke on the use of ayurveda. C. J. Varghese (Kannur) spoke the scope of homeopathy for the prevention and treatment of cancer. Ramadasan Kuttan (Amala Cancer Research Centre (ACRC), Thrissur) explained the anti-tumour activity of some homeopathic drugs on animal experimental models. One of the homeopathic drugs, Thuja 1M inhibited the expression of proinflammatory cytokines. Uma Devi (J.N. Cancer Hospital and Research Centre, Bhopal) presented studies on *Ocimum sanctum* for cancer therapy and chemoprevention. She explained how *tulasi* flavonoids protected radiation-induced damages. D. Ka-

runakaran (Rajiv Gandhi Centre for Biotechnology, Thiruvananthapuram) spoke on the mechanism of apoptosis induced by garlic-derived components. One of the organosulphur compounds from garlic, allicin inhibited cancer cells by inducing apoptosis in cancer cells. Their findings explained the antiproliferative effect of allicin and the chemopreventive activity of garlic extract.

K. Muraleedharan (Aryavaidyasala, Kottakkal) in his presentation on rasyana treatment, revealed that ayurveda holds an optimistic view regarding the prospects of slowing down or preventing the process of aging, if one undergoes a special course of therapies. He indicated that rasayana therapy can effectively be employed for management of new-generation diseases. Rajasekharan Warriar (Louisiana State University, Health Science Center, USA) in his presentation on the chemopreventive effect of rasayana, revealed the ability of rasayana, ICHOR-CR, with its antioxidant properties to prevent or ameliorate acute cardiomyopathy induced by doxorubicin.

T. A. Ajith and K. K. Janardhanan (ACRC, Thrissur) presented their investigations on the therapeutic properties of medicinal mushrooms. They explained the use of extracts of two medicinal mushrooms, *Phellinus rimosus* and *Ganoderma lucidum* to prevent hepato-renal damages caused by toxins or drugs. The activity is mediated through free-radical scavenging property of the mushrooms. K. Natarajan (Centre for Advance Study in Botany, University of Madras) spoke on the hallucinogenic and poisonous fungi occurring in India. According to him, among the mushrooms found in India, there is only a small percentage that is poisonous or hallucinogenic, and real mushroom poisoning is rarely reported from India.

T. N. Nag (M. N. Institute of Applied Sciences, Bikaner) spoke on the screening of desert plants for novel bio-active compounds. R. Krishnamurthy (Zandu Foundation for Health Care, Mumbai) presented studies on two dashmool plants, *Des-*

modium gangeticum and *Pseudathria viscida*. Firoj Ahmed (Khulna University, Bangladesh) explained studies on the anti-inflammatory, antinociceptive and diuretic activities of *Amoora cucullata*. A. Subramoniam (TBGRI, Thiruvananthapuram) presented his studies on the search for phytomedicine in fungal diseases. He said that there is tremendous scope for developing antifungal compounds from bryophytes.

M. Akhtar Siddiqui (Jamia Hamdard, New Delhi) presented studies on the clinical evaluation of a unani formulation for the treatment of hypertension. He revealed that the preliminary results were encouraging. K. S. Jyothsna (Gandhiji Naturopathy Hospital, Thrissur) spoke on the various modalities of naturopathy treatment for health and disease management. Fr. Anto Edakulathur (College of Clinical Magnetology, Thrissur) spoke on the effect and use of magnet therapy for disease management. T. V. Sairam (Indian Revenue Service, New Delhi) in his presentation on music therapy, explained how music phrases are capable of providing psychological and physiological benefits. Listening to musical rhythms does have an impact on brain rhythms and appropriate music helps people in controlling the functions of vital organs.

Besides plenary and invited lectures, the conference included 38 oral presentations and 123 poster presentations on various aspects of ethnopharmacology, ethnobotany, phytomedicine, pharmacognosy and traditional medicine. The conference highlighted the recent developments in ethnopharmacology and alternative medicine and the potentials of phytomedicine and herbal drugs in the developments of novel therapeutics.

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