About the Newsletter
The Directorate of Medicinal and Aromatic Plants Research (DMAPR) is one of the institutes of the Indian Council of Agricultural Research (ICAR). DMAPR's mission is to conduct research on all aspects of improvement, production and utilization of medicinal and aromatic crops. It also supports and is engaged in activities of multilocational testing of technologies through its outreach organ, All India Co-ordinated Research Project on Medicinal & Aromatic Plants and Betelvine (AICRPMAP&B).

AICRPMAP&B works in partnership with State Agricultural Universities and other organisations, undertakes research, multilocation testing of technologies and training; provides scientific information and technical advice to a host of clients such as farmers, industries, etc.

This newsletter is published half yearly to promote overall concern on medicinal and aromatic plants with emphasis on their conservation and production technology. It provides information, mainly generated in DMAPR and AICRPMAP&B.

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XXIII Group Meeting of All India Coordinated Research Project on Medicinal & Aromatic Plants and Betelvine (AICRPMAP&B) was organised at ICAR-Directorate of Medicinal and Aromatic Plants Research (ICAR-DMAPR), Boriavi, Anand, Gujarat during September 28-30, 2015. The Group Meeting was inaugurated on September 28, 2015 by Dr. N.K. Krishna kumar, Deputy Director General (Hort. Sci), ICAR, New Delhi. Dr. N.C. Patel, Vice Chancellor, Anand Agricultural University, Anand was Chief Guest of the function and Dr. M. Anand Raj, Director, ICAR-Directorate of Spices Research, Kozikode was the Guest of Honour. Other dignitaries present in the function included Dr. S.B. Dandin, Former Vice Chancellor, University of Horticultural Sciences, Bagalkot, Dr. K.C. Dalal, Former Director, NRCMAP, Boriavi, Anand and Dr. K.B. Kathuria, Director Research, Anand Agricultural University, Anand and Dr. Jitendra Kumar, Director, ICAR-Directorate of Medicinal and Aromatic Plants Research and Project Co-ordinator, All India Coordinated Research Project on Medicinal & Aromatic Plants and Betelvine.

After the formal welcome of the delegates by Dr. P. Manivel, Principal Scientist, ICAR-DMAPR, Anand, a brief report on the “Prospect of the Project” was presented by Dr. Manish Das, Principal Scientist, Hort. Sci, ICAR, New Delhi. He highlighted some of the important issues concerning, in particular to release of varieties and management of plant genetic resources at AICRPMAPB centres.

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MEDICINAL PLANTS AND NON-COMMUNICABLE DISEASE MANAGEMENT

Globally non-communicable diseases (NCD) are among the major cause of mortality. It is being estimated that NCD are killing more individuals each year in comparison to all other diseases taken together. Cardiovascular diseases, diabetes, cancer, gastrointestinal problems, respiratory disease, etc, are some of the major NCD. With changing lifestyle and food habits, the percentage of population suffering from NCD is projected to increase worldwide. Despite the advances in the arena of modern medicine, still to date the management of NCD is far from satisfaction level and also beyond the rich of larger population. Continued use of medicinal plants in our country and also across the globe for management of NCD is evidence of their effectiveness as well as beneficial effects. Advances in the area of research in combination with ethnopharmacological information about medicinal plants could be utilized for devising strategic plans in order to alleviate the maladies caused by NCD. It would not be out of context to mention here that life saving molecules such as taxol and metformin are gifts from nature. Polysiprenylated benzophenones found abundantly in an endemic plant of India, mostly located in Western Ghats and North Eastern Regions of India with apoptosis inducing and also microtubule-tubulin inhibiting properties is globally being recognized as a substitute for destructive harvesting of Taxus species. Although, since ancient time Terminalia species have been in practice for remedy of heart related problem, preliminary reports for one of Terminalia species have established it as a source of lead molecules for HIV. Sleeping disorders/insomnia is also rising among Indian population as a consequence of our modern life styles. Medicinal plants such as Ashwagandha (Withania somnifera), Sarpagandha (Rauwolfia serpentina), etc, are in traditional use for alleviating the problems of sleeping disorders. Many of the Indian medicinal plants could be explored as a cheap source for NCD therapy, if investigated properly covering all issues starting from proper taxonomic identification to good collection and cultivation practices, primary and secondary processing, pharmacological validation and enhanced delivery with nanotechnology.

Dr. Jitendra Kumar presented the Project Coordinator report and highlighted the actions taken for the implementation of the technical programme effectively. Dr. Kumar also highlighted some of the achievements at AICRPMAPB centres.

Dr. Anand Raj, Guest of Honour, described spice as a food and medicinal plants as medicine. He suggested that enrichment of knowledge about medicinal and aromatic plants would be of great help for harnessing their full potential. Dr. N.C. Patel, Chief Guest of the function mentioned that medicinal plants are directly related to human beings but this group of important crops are still neglected. He mentioned that trade of medicinal and aromatic crops is about $ 62 billion, however, contribution of India is about 0.5 percent only.

Dr. Patel mentioned that about 1315 species of medicinal and aromatic plants are found in Gujarat which amounts to sixteen percent of total species of medicinal and aromatic plants found in India. He suggested that exploration in the areas of Junagargh and Dang may be useful for identification of some high value shrubs.

Dr. S.B. Dandin mentioned that since time immemorial India is known for spices and medicinal plants and suggested that medicinal plants shall be harnessed to make medical services more pluralistic in nature. Describing medicinal plants as “Future Crops”, he highlighted that livelihood security in tribal areas could be ensured by cultivation of these crops. Identification of varieties, supply of planting materials, end to end production technology and economics of cultivation were listed as issues of immediate concern for medicinal and aromatic crops. He also suggested that in addition to trade, more emphasis on production of these crops is also required.

In his presidential address, Dr. N.K. Krishna kumar said that with overexploitation of medicinal and aromatic crops, documentation is essentially required. Globally, the demand of cheaper medicine is constantly increasing, therefore, understanding of chemistry behind blending of ingredients should be explored completely, he mentioned. And also it is imperative to work for poor man’s disease like leishmaniasis, elephant...
Dr. Satyanshu Kumar, Principal Scientist, ICAR-DMAPR, Anand

During the workshop, various research activities under AICRPMAPB related to plant genetic resource management, crop improvement, crop production, crop protection and phytochemistry were reviewed and technical programmes for the next year were formulated.

The plenary session was held on September 30, 2015.

Breakthrough and Research Highlights

Yield loss due to defoliator in Senna

Senna (Cassia angustifolia) is an important medicinal plant of India. Leaves, tender pods and flowers are medicinally important and India is the largest exporter of Senna. About 47% leaf yield loss was recorded due to the infestation of defoliator, Catopsilia pyranthe in field experiment.

Demonstration of IDM technology in Betelvine (Piper betle)

Betelvine is a perennial evergreen dioecious climber. Demonstration of integrated disease management, IDM (field sanitation + first application of Bordeaux mixture (1%) at pre-monsoon stage + application of Trichoderma plus @ 12.5 kg ha\(^{-1}\)) one month after application of Bordeaux mixture (1%) + second application of Bordeaux mixture (1%) two months after first application + application of RDF of NPK ha\(^{-1}\) was conducted on farmer’s field at MPKV, Rahuri, RAU Pusa and BCKV, Kalyani. The results showed that the IDM technologies of the centres were significantly superior over farmers practice in lowering disease incidence and also higher leaf yield was recorded.

Institute Research Committee meeting

Institute Research Committee meeting of the Directorate was held under the Chairmanship of Dr. Jitendra Kumar, Director, ICAR - DMAPR on October 14, 2015.

Dr. S. Ayyappan, Secretary DARE and Director General, ICAR, New Delhi visited the Directorate

Dr. S. Ayyappan, Secretary DARE and Director General, ICAR, New Delhi visited the Directorate on July 08, 2015. Dr. Jitendra Kumar, Director, ICAR-DMAPR welcomed Dr. Ayyappan. In an interaction meeting with staff members of the Directorate, he emphasized the importance of secondary agriculture with particular reference to medicinal

Panel Discussion on Medicinal and Aromatic Plants Research: A Way Forward

A panel discussion on Medicinal and Aromatic Plants Research: A Way Forward was organised at the Directorate by Medicinal and Aromatic Plants Association of India (MAPAI) in association with ICAR-DMAPR on October 01, 2015. Eight presentations including the research areas of biodiversity, conservation, plant genetic resources, crop
diversification, breeding, good agricultural and collection practices, pest management and post harvest management and phytochemistry were made. Thereafter in interacting meeting many other related aspects of complete value chain of medicinal and aromatic plants were also discussed.

Workshop on "Development of Road Map for Agriculture in Gujarat Plains and Hills Region"

One-day workshop on "Development of Road Map for Agriculture in Gujarat Plains and Hills region" was held at ICAR-DMAPR, Anand, Gujarat on October 12, 2015. The workshop was inaugurated by Dr. A.K. Sikka, Deputy Director General (Natural Resources Management), ICAR, New Delhi. The other dignitaries present in the workshop included Dr. A.R. Pathak, Vice Chancellor, Junagadh Agricultural University, Junagadh, Dr. N.C. Patel, Vice Chancellor, Anand Agricultural University, Anand, Prof. M.C. Varshneya, Vice Chancellor, Kamadhenu University, Gandhinagar, Dr. Shiva Prasad Kimothi, Additional Director General (Coordination), ICAR, Dr. P.P. Rohilla, Director (Acting), ATARI Zone-VI and Dr. Jitendra Kumar, Director, ICAR-DMAPR, Anand. In his welcome address, Dr. Jitendra Kumar, emphasized the need of integration of medicinal and aromatic plants in farming systems especially in hilly/tribal areas of Gujarat. He also mentioned about that necessity of diversification of medicinal and aromatic plants/crops in different cropping systems, problematic soils and wild animal (wild pig, nilgai, rabbit) affected areas. Dr. Sikka, emphasized the need of land use diversification in agriculture and animal husbandry. He also highlighted need for integration of solar and wind power generation system for efficient utilization of natural resources and to convert city compost into effective organic manure.

Stakeholders meet organised

A stakeholders meet was organised on the Foundation Day, November 24, 2015 of the Directorate. About 50 stakeholders from different sections of medicinal and aromatic plant value chain attended the meet. The session was chaired by Dr. Jitendra Kumar, Director, ICAR-DMAPR. At the outset, Dr. Satyanshu Kumar, Principal Scientist, ICAR-DMAPR briefed about the stakeholders meet and mentioned that efforts are needed for sustainable and constant supply of raw materials from grower to industry. In the meet, discussion was held on topics such as identification of strategies for developing the MAP value chain through production, protection and processing technologies. The feasibility of dissemination of technologies developed by the ICAR-DMAPR to farmers through cooperation with developmental agencies were also explored.

On this occasion, one Memorandum of Understanding (MOU) was also signed with Global Indian Business Council, Ahmedabad for promotion of cultivation technologies of medicinal and aromatic plant. The multi-disciplinary team of scientists from ICAR-DMAPR, Anand actively participated in the stockholder meeting.

Summer School on Advances in Medicinal and Aromatic Plants Research

The Directorate organised a summer school on Advances in Medicinal and Aromatic Plants Research during July 14-August 03, 2015.

Model Training Course on "Value Addition and Post Harvest Management in Medicinal and Aromatic Crops" organised at ICAR-Directorate of Medicinal and Aromatic Plants Research, Boriavi, Anand

A Model Training Course on Value Addition and Post Harvest Management in Medicinal and Aromatic Crops was organised at ICAR-Directorate of Medicinal and Aromatic Plants Research, Boriavi, Anand-387310, Gujarat during December 03-10, 2015. This model training course was sponsored by the Directorate of Extension, Department of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture and Farmers Welfare, Government of India, New Delhi. Twenty one participants including Horticulture Officers, Forest Officers, Subject Matter Specialist from KVK, Research Scientists from State Agricultural University and ICAR institute participated in the training course. Resource persons for training course included faculty members from Anand Agriculture University, Sardar
हिंदी कार्यशाला प्रथम : संस्थान की दैनिक गतिविधियों में हिंदी का प्रयोग

हिंदी शिक्षा विभाग ने 20 अगस्त, 2015 को हिंदी कार्यशाला का आयोजन किया गया। जिसमें निदेशक अंतर्ज्ञाति भारतीय कृषि अनुसंधान परिषद के दिग्विजय अग्रवाल जी, केन्द्रीय मृदा एवं जल संसाधन अनुसंधान संस्थान के प्रमुख राजीव कुमार जी, भूरुपुर्ण, केन्द्रीय जल संसाधन अनुसंधान संस्थान के प्रमुख जीवन चरण जी, केन्द्रीय अंतर्ज्ञाति जल संसाधन अनुसंधान संस्थान के प्रमुख विषयक उपाध्याय डॉ. बिहारी भट्ट जी और CIFIRI के प्रमुख डॉ. एवं अध्यक्ष डॉ. रामदास भट्ट जी के अतिथि निर्देशन की।

हिंदी कार्यशाला के साथ शुभारंभ में सदस्यों का सहभागिता के लिए विभिन्न संस्थानों से भाग लेने वाले अन्य प्रमुखों का भाग लिया। इसके अलावा, केन्द्रीय शिक्षा विभाग के भाषा, साहित्य और संस्कृति अधिकारी डॉ. सनातन चौहान जी, हिंदी उच्च स्तरीय अंतर्गत सी.एस.वी. रामकृष्ण यादव जी, एवं संस्कृत साहित्य अंतर्गत डॉ. एंबर वर्मा जी का प्रभावी भाषण भी किया। इनके पश्चात, हिंदी कार्यशाला के उद्घाटन समारोह में संस्थान के प्रमुख जी.वी.एस.सी.पी. डॉ. जी.एल.आर. पवन लाल भट्ट जी का भाषण भी किया।

कार्यशाला के दौरान हिंदी में पेपर पेजेंट, भाषा, साहित्य और ज्ञान के संबंध में विभिन्न विषयों पर विशेष विवेचनाओं का आयोजन किया। जिसमें इस्लामिक विज्ञान, मानवता, अनुभव, साहित्य और ज्ञान के संबंध में विवेचनाओं का आयोजन किया। जिसमें इस्लामिक विज्ञान, मानवता, अनुभव, साहित्य और ज्ञान के संबंध में विवेचनाओं का आयोजन किया।

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Musa balbisiana Colla belongs to family Musaceae and is commonly known as wild banana or plantain or Jangli kela. It is a wild relative of present day cultivated bananas and is native to South Asia, South East Asia and China. In India, it is distributed in Western Ghats, Tamil Nadu and East and North East India. The species grows upright and taller than the cultivated bananas. The growth pattern is similar to the cultivated bananas. When the plant matures, it stops producing new leaves and an inflorescence develops at its apex. The stem which grows up inside the pseudostem carries the immature inflorescence at its tip, eventually emerges at the top. Each pseudostem produces a single inflorescence which is also known as the “banana heart”. After fruiting, the pseudostem dies, but offshoots normally develop from the base which can be used for propagation. The inflorescence contains many prominent bracts between rows of flowers. The flowers appear in rows and the ovary is inferior. The banana fruits develop into a large hanging cluster, made up of tiers (called “hands”) with up to 20 fruits in a tier. The fruit is described as a berry and a number of stony seeds are embedded in the fleshy pulp of the fruit. The shoot of the species is more fibrous and fruits are seeded.

The different parts of the species have several medicinal and culinary uses. The seeds (which are known as stones) and shoot are medicinally important. Ayurvedic physicians recommend the juice from the shoots of this plantain for the treatment of urinary stones for several centuries. The stones have diuretic properties and are used for the treatment of leucorrhoea, urinary stones, etc. The pulp of the ripened fruit is an excellent skin moisturiser and also used to cure sun burns and tans. The flowers are being used in bronchitis, dysentery and in ulcers; boiled flowers are given for treatment of diabetes; the astringent plant sap is used for the treatment of hysteria, epilepsy, leprosy, fevers, haemorrhages, acute dysentery and diarrhoea, and is applied externally on haemorrhoids, insect and other stings and bites; young leaves are applied as poultices on burns and other skin afflictions; the astringent ashes of the unripe fruit peel and the leaves are taken in dysentery and diarrhoea and also used for treating malignant ulcers; the roots are administered in digestive disorders, dysentery and other ailments; banana seed mucilage is given in cases of diarrhoea in India.