Second National Conference

on

Integration of Medicinal and Aromatic Plants for Rural Development and Prosperity

January 22-23, 2013

Proceeding

Medicinal and Aromatic Plants Association of India

Directorate of Medicinal and Aromatic Plants Research, Boriavi, Anand, Gujarat, India

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Technical Session I: Biodiversity conservation

Chairman : Dr. Bhag Mal, Consultant, APARI, New Delhi
Co-chairman : Dr. R.C. Srivastava, Joint Director, BSI, Kolkata
Rapporteurs : Dr. Geetha K.A., Principal Scientist, DMAPR, Anand
: Dr. Ruchi Bansal, Scientist, DMAPR, Anand

The session included two lead lectures and two oral presentations. The first lead lecture was delivered by Dr. R.C. Agrawal, Registrar General, Protection of Plant Varieties and Farmers Right Authority (PPVFRA), Ministry of Agriculture, GOI, New Delhi on 'Role of PPVFRA in promoting Agri-biodiversity with special reference to medicinal and aromatic plants'. In his lecture, he presented an overview of PPVFR Act, vis-à-vis various schemes available with National Biodiversity Authority and PPVFRA for recognizing the role of farmers and tribal communities in conservation of varieties/ wild varieties/ land races over the generations; protection of IPR with special reference to agriculture, gene fund etc. He also informed that 57 DUS descriptors so far have been notified which includes a few medicinal and aromatic plants (MAPs). Large number of varieties were already registered under different categories, however, he emphasize the need for registering more and more varieties of MAPs.

The lecture was followed by a thorough discussion. Dr. Minoo Parabia, Advisor, RMD Ayurveda College and Hospital, Gujarat showed his concern for the protection of farmers' varieties/ knowledge. Dr. B.R. Tyagi, Retired Deputy Director, Central Institute of Medicinal and Aromatic Plants (CIMAP), Lucknow expressed his concern about the large

number of varieties registered under the authority. He cautioned about the reliability of information provided by the breeders regarding the parental lines even though the Act has taken measures against the violation of non-declaration/ hiding of information regarding the parental/ genetic stocks used for the development of new varieties.

The second lead lecture was delivered by Dr. Sarvapalli Badari Narayan, DGM, AgroBiotech, Dabur India on 'Conservation and cultivation of critically important medicinal plants through green house approach'. In his lecture, he has given an overview of the vision, focus, research thrust, R&D of Dabur India. He presented the role of Dabur India in conservation of various medicinal and aromatic plants which are in various levels of threat categories. Highly sophisticated and fully automated green house nurseries for planting material production have been created by Dabur. Various species included in their nurseries are *Anacyclus pyrethrum, Taxus wallichi, Aconitum heterophyllum, Swertia chirayita, Nardostachys jatamansi, Inula racemosa,* etc.

The presentation was followed by discussion. Dr. B.R. Tyagi raised the issue of the role of conservation of natural variability *vis-a- vis* mass multiplication of individual plant in biodiversity conservation. He requested Dabur India to initiate efforts for the same for local flora of important MAPs. Dr. Minoo Parabia, opined that sustainable collection along with cultivation is the model that we have to follow for biodiversity conservation. Dr. S.N. Tyagi, Joint Managing Director, GSFDC Ltd., Gujarat also suggested the Dabur India for providing technical support to farmers in selected species of MAPs by providing low cost infrastructural facilities like, green house/ poly house facilities.

A consensus was built among the group about the necessity to re-look into the conservation categorization of MAPs. Dr. Satyabrata Maiti, Director, DMAPR, however, cautioned about unscrupulous usages of RET status of various MAPs since, sometimes it will cause negative long term effect on export once any species is placed under the tag 'RET'.

Dr. R. Raina, Professor, AICRP-MAPB, Solan pointed out about the role of synchrony in Public Private Participation and need for realistic figure of demand and supply before going for mass scale production of planting material on any species in MAPs.

Thereafter, there were two oral presentations *i.e.* 'Spatial and temporal distribution of two cytotypes of *Peganum harmala* L. in Kashmir Himalayas' by Dr. Aijas A. Wani, University of Kashmir, J&K and 'Endemic medicinal plant biodiversity of Andaman and Nicobar Islands' by Dr. K. Abirami, CARI, Andaman and Nicobar Islands.

The session was concluded by the remarks made by the chairman and the co-chairman. Active participation by the delegates during discussions was highly appreciated.

They also appreciated the efforts of PPVFRA for conservation of biodiversity by recognizing and protecting farmers' varieties. They requested the authority to prioritise species of MAPs for registration. Appreciation was also expressed for the efforts made by Dabur India in conserving some of the important RET species of MAP.

The recommendations emerged from the discussion are as follows:

Recommendations:

1. Repetition and duplication in research was felt as great concern and researchers have to take care of avoiding repetition of works by thorough review before any work is initiated.
2. Efforts have to be taken for availability of published information in the public domain.
3. Collaboration between industry and MAP researchers are strongly recommended without which there won't be any future for the MAP sector
4. Availability of quality planting material is an important issue which agriculture scientists have to address.
5. Collection of RET species for *ex situ* conservation may be organized judiciously.

Technical Session II - Cultivation and utilization of MAPs

Chairman : Dr. B. R. Tyagi, Ex. Deputy Director, CIMAP, Lucknow

Co-chairman : Dr. K. Rajamani, Professor, Technical Officer to Agriculture Production Commissioner & Secretary Secretariat, Govt of Tamil Nadu, Chennai

Rapporteurs : Dr. G. R. Smitha, Scientist, DMAPR, Anand

: Dr. Vanita Salunke, Scientist, DMAPR, Anand

The session included two lead lectures and two oral presentations. The first lead lecture was delivered by Dr. K. Rajamani, on 'Precise agro-technology for important medicinal plants'. He talked about the potential of a number of commercially important medicinal plants for tapping the growing demand of the phyto-pharmaceuticals in Tamil Nadu. Glory lily (*Gloriosa superba*), *Coleus forskhohli*, senna (*Cassia angustifolia*) and periwinkle (*Catharanthus roseus*) can be effectively cultivated in Tamil Nadu. He has stated that glory lily is being cultivated in >3000 ha area in India and is also exported to Europe and USA. The average price of *G. superba* is highly fluctuating, depending on its demand in the market. He mentioned that pollination is a problem in *G. superba* and farmers have to go for assisted pollination by air blowing using power sprayer. He also emphasized that fertigation with 125% RDF with water soluble fertilizer gave good seed yield and rapid multiplication of glory lily tubers by micro tubers is effective for its cultivation. Showed the important post harvest technologies to maintain the quality of the final produce. TNAU has also developed a glory lily seed thresher and is available for the farmers at subsidized price. In *C. forskholi,*

about 37 germplasm accessions have been evaluated for various traits of interest and best selections contain an average of 0.7% forskholin on dry weight basis and also exhibited tolerance to *Fusarium* wilt and nematodes. Some Suggestions were made in his presentation on longevity of pollen grains and receptivity of stigma in *G. superba* needs to be studied, and in case of *C. forskholi* germplasms having mainly tapering root types results in low forskholin content, hence, collection should be aimed at genotypes having other root types.

The second lead lecture was delivered by Dr. E.V.S. Prakash Rao, Chief Scientist, Climate and Environmental Modelling Programme, Bangalore on 'Crop diversification through medicinal and aromatic plants for livelihood security'. He discussed the global changing scenario, export and import of agricultural crops and their fluctuating prices, and emphasized the need of crop diversification with medicinal and aromatic plants. He mentioned that when sugarcane was intercropped with mint resulted in good returns. Intercropping *Centella asiatica* with *Ocimum sanctum* enhanced light use efficiency and profitability. MAPs are better suited as intercrops with different food crops such as cow pea (*Vigna unguiculata*), finger millet (*Eleusine coracana*), groundnut (*Arachis hypogaea*), black gram (*Vigna mungo*), sorghum **(***Sorghum bicolour*) etc. Aromatic plants such as lemongrass (*Cymbopogon flexuosus*), palmarosa (*Cymbopogon martini*), citronella (*Cymbopogon nardus*), vetiver (*Chrysopogon zizanioides*) etc. are better suited for different problematic soils such as eroded soils, semi-arid tropical condition, saline alkaline soils, acidic soils, heavy metal contaminated soils, shaded soils, newly reclaimed soils etc. He suggested that crop diversification through medicinal and aromatic plants should be aimed at increasing the yield and quality of the produce per unit area and time leading to maximum land use efficiency.

The two oral presentations were made on 'Effect of animal and forest wastes on medicinal properties and yield of rabbiteye blueberries (*Vaccinium virgatum*) and muscadine grapes (*Muscadinia rotundifolia*)' by Dr. Girish K. Panicker, CCA, Director, Center for Conservation Research, School of AREAS, Alcorn State University, Alcorn State, MS 39096, U.S.A., and on 'Effect of time of sowing and crop geometry on growth and yield of *Valeriana jatamansi* (crop raised through rhizome cutting) in Darjeeling Himalaya' by Dr. Dhiman Mukherjee, Regional Research Station (Hill zone), Uttar Banga Krishi Viswavidayalaya, Kalimpong, West Bengal.

Dr. Girish K. Panicker emphasised the importance of organic farming in agriculture. Effective utilization of on farm plant residues as manures can fulfil the crops nutrient requirement. He also emphasised the integrated management of pests and diseases. Rabbiteye

blueberries and muscadine grapes since these are costliest fruits in the United States and he suggested introduction these crops in the foothills of India. He also suggested that while introducing these crops, a genotype that is responsive to organic inputs is needed.

The recommendations emerged from the discussion were as follows:

Recommendations:

1. Suitable technologies for cultivation and utilization of medicinal and aromatic plants need to be farmer's friendly.
2. Participatory research programmes involving scientists, farmers and user industry needs to be implemented in medicinal and aromatic plants of economic interest.

Technical Session III - Role of MAP in rural development and prosperity

Chairman : Dr. Javed Rizvi, Country Manager, ICARDA, Afghanistan

Co-chairman : Dr. M. Vasundhara, Professor (Horticulture), Department of Horticulture, University of Agricultural Sciences, GKVK, Bangalore.

Rapporteurs : Dr. V.S. Rana, Sr. Scientist, DMAPR, Anand

: Dr. Ruchi Bansal, Scientist, DMAPR, Anand

First lead lecture delivered in the session was by Mr. S.N. Tyagi on 'Small-holder MAP farmers and community forest user groups: Problem and prospects'. In his presentation he emphasised on the initiatives taken by GSFDC in non-profitable promotion of medicinal and aromatic plants sector in Gujarat. He discussed the problems and difficulties faced by the farmers (cost and non-availability of quality planting material, incentives for farmers, yield gaps, benefit sharing, value addition, storage and marketing network) in promotion of medicinal and aromatic plants. Suggestions made in this direction were; judicious and sustainable use of forest as seeds source and multiplication purpose, attention to soil health, promotion of socio-economic conditions of farmers through sustainable development and utilisation of MAPs.

Second lead lecture on 'Role of MAP in health and wealth security in rural India' was delivered by Dr. Minoo Parabia. He briefed about the status, domestic production and import and exports of MAPs. He stated that primary health care to rural India is still a distant dream

and there is no guarantee on economic returns. He suggested that there is a requirement to develop the market strategies for MAPs, standardisation criteria of MAPs products should be decided and guaranteed economic return to the farmers should be ensured.

The next presentation was by Dr. Sanjay Singh on performance of 'Jamun (*Syzygium cumini*) for morphometric and physico-chemical attributes under hot semi-arid ecosystem of western India'. He briefed on the medicinal properties, growth and reproductive biology, fruit yield and quality, canopy management, grafting and multiplication of jamun. Twenty six genotypes of jamun are maintained in Regional Research Station, Godhra. He discussed the problem in harvesting and storage of jamun.

The next presentation was on 'Herbal crop plants: contributions of grass root innovators from Gujarat' by Dr. Baljeet Singh. He briefed about innovation made by the farmers for application of herbal extracts as pesticides for the protection of fruits and vegetables from insect-pests. Botanical pesticides such as *Sristi Prahar, Sristi Sarvatra, Sristi Shastra, Sristi Rakshak, Sristi Suraksha* plus and *Sristi Krushak* for protection against specific insect pests of vegetable and fruits crops was developed by Sristi Lab, Ahmedabad and the products are marketed and available in Gujarat. Application of these botanical pesticides against targeted insect-pests instead of synthetic pesticides was suggested.

The recommendations emerged from the discussion are as follows:

Recommendations:

1. Prioritization of some industrially important MAPs with ensured buy-back guaranty for commercial cultivation and the socio-economic development of rural people/ tribal.
2. Promotion of rural production/ processing centres on MAPs through rural/ panchayat herbal cooperatives.
3. Research on botanical extracts as pesticides.
4. Identifying and promoting elite plant material and propagating items.

Technical Session IV - Quality control, legal issue and policies

Chairman : Dr. Minoo Parabia, Advisor, SRMD Ayurvedic Hospital and College, Valsad, Gujarat

Co-chairman : Dr. A.P. Singh, Member Secretary, Gujarat Biodiversity Board

Rapporteurs : Dr. V.S. Rana, Sr. Scientist, DMAPR, Anand

: Dr.Vandana Tripathy, Sr. Scientist, DMAPR, Anand

In this session, first lead lecture was delivered by Dr. A.P. Singh, on 'Legal issues and policies on biodiversity in general and medicinal plants in particular under the provisions of the Biological Diversity Act and Rules'. In his presentation he talked about preamble, biological diversity and rules and regulation of biological diversity acts notified by the Govt. of India and Govt. of Gujarat in recent past and also about the National Biodiversity Authority and State Biodiversity Board and their aims, objectives and functions about the access of the biological material for research and commercial use. He emphasised on the implementation of the act, constitution and function of Biodiversity Management Committees, people biodiversity register, for the promotion of conservation, sustainable use and sharing of the benefits/ knowledge out of the biodiversity.

The second lead lecture on 'Issues of quality control and certification of medicinal plants in India' was delivered by Dr. Satyabrata Maiti, Director, DMAPR, Anand. He sensitized the house regarding the challenges in the quality control assurance of the medicinal plants. He informed that the major sources of contamination of MAPs include pesticides, heavy metals and microbes. He highlighted the supply chain of medicinal plants in India,

Indian system of quality assurance in medicinal plants and Indian initiative in upgrading value chain of MAPs. He also emphasized on the NMPB targeted quality assurance in raw drugs products and collection and the role of good agricultural and collection practices and its purpose, objective and key concerns to ensure the quality of drug along with their sustainability. He also emphasized on fixing minimum seeds standards, achieving quality pyramid in MAPs seed sector and voluntary certification of MAP procedure. He briefed about the problems of quality assurance in herbal drugs and implementation of certification in production and exports of medicinal plants/ products. He informed that the voluntary certification of MAPs has to be accredited by certifying bodies as per ISO/ IEC 65 guidelines.

The next oral presentation was by Dr. M.R. Yadav on 'Development of multi-component herbal formulation and its evaluation for antifertility activity' He briefed about the work carried out on development of multicomponent herbal formulation consisting of extracts from 6 different plants, namely *Ailanthus excelsa, Azadirachta indica, Piper longum, Curcuma longa, Carica papaya, Plumbago indica* and evaluated their antifertility and implantation activity in white rats. He showed that significant activity was observed at 50 mg/kg body weight.

Technical Session V- Post harvest technology and marketing

Chairman **:** Sh. Shyam Varshney, Director (R&D), Som Extract Limited, Noida

Co-chairman **:** Dr. R. Raina, Prof. & Head, AICRP on MAP&B, YSPUH&F, Solan

Rapporteurs **:** Dr. Vipin Chaudhary, Sr. Scientist, DMAPR, Anand

: Dr. Ruchi Bansal, Scientist, DMAPR, Anand

In this session the first lead lecture was delivered by Dr. M. Vasundhara, on "Post harvest management and value addition of MAP". In her presentation she emphasised on the need of post harvest management of MAPs for better shelf life, quality and market price. She also presented various value added products and highlighted the scope of value added products in MAPs. Then the second lead lecture on "Renewable energy in India and solar energy utilisation in drying for improving the quality of medicinal and aromatic plants" was delivered by Dr. V. Siva Reddy, Principal Scientist, SPRERI, V. V. Nagar, Anand. He elaborated the scope of use of solar energy for post harvest drying of MAP produce for better quality.

The next oral presentation was by Dr. K. Rajamani on 'Standardization of post harvest drying in *Wedelia chinensis* (Osbeck.) Merr'. He briefed about the work carried out at Tamil Nadu agricultural University on post harvest drying of *Wedelia chinensis*. Followed by Dr. Manish Das, Principal Scientist, Horticulture Division, KAB-II, New Delhi on 'Seed

germination of Ashwagandha (*Withania somnifera* Dunal.) under the influence of different treatments'.

The recommendations emerged from the discussion are as follows:

Recommendations:

1. Post harvest processing methods should be standardized.
2. Value added products of MAPs should be prioritized and demonstrated at farm level.
3. Seed standards should be defined in all MAPs.

Plenary session

Chairman : Dr. C. Devakumar, ADG (EPD), ICAR, New Delhi

Co-chairman : Dr. S. Sriram, Former Professor and Head, AICRP on MAP, AAU, Anand

Rapporteurs : Dr. V.S. Rana, Sr. Scientist, DMAPR, Anand

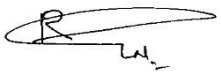
: Dr. G.R. Smitha, Scientist, DMAPR, Anand

The chairman and co-chairman welcomed all the delegates and congratulated the MAPAI for organising 2nd National Conference. Proceeding of technical session-I on 'Biodiversity conservation' was presented by Dr. R.C. Srivastava, Joint Director, Botanical Survey of India, Kolkata which was followed by technical session-II 'Cultivation and utilization of MAPs' by Dr. K. Rajamani, Technical Officer to Agriculture Production Commissioner and Secretary Secretariat, Govt of Tamil Nadu, Chennai. Technical session-III 'Role of MAP in rural development and prosperity' by Dr. M. Vasundhara, Professor (Horticulture), Department of Horticulture University of Agricultural Sciences, GKVK, Bangalore; technical session-IV 'Quality control, legal issue and policies' by Dr. Vandana Tripathy, Sr. Scientist, DMAPR, Anand; and technical session-V 'Post harvest technology and marketing' was presented by Dr. R. Raina, Prof. & Head, AICRP on MAP&B, YSPUH&F, Solan. After a brief discussion on various recommendations following were accepted.

Final recommendations/ suggestions made during the plenary session were as follows:

1. While organizing the next conference, consensuses need to be obtained on the conference topics, themes and objectives to be covered in the forthcoming conference from the MAPAI members and experts in the MAP sector.
2. A network should be created with Institutions working in the MAP sector for promotion of R&D and also to avoid duplication of the research.
3. One summery page of the conference should be published in Current Science.
4. A policy brief on medicinal and aromatic plants need to be prepared for guiding R&D work.
5. Value addition of MAPs at farm level should be taken care off.
6. In-silico screening of MAPs for bioactive compounds/ enzymes is needed.
7. Use of the term 'RET' should be avoided until unless the population was surveyed in that particular area.
8. There should be provision for group discussion in the area of concern during the conference.
9. Self help groups, veterinary people using herbal products, farmers etc. should be included in future conference.
10. Identify the commercially important MAPs and sensitize the people/ tribal for the end use with buy back agreement for the economic development through rural panchayats and herbal co-operatives.

Submitted by



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