



NEWSLETTER

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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.

Contents

Dr. S. Ayyappan, Secretary, DARE & DG, ICAR Inaugurated Guest House	1
Editorial.....	2
Breakthrough and Research Highlights	3
From the Directorate.....	4
Species of Conservation Interest	8

Dr. S. Ayyappan, Secretary, DARE & DG, ICAR Inaugurated Guest House at DMAPR



Dr. S. Ayyappan, Secretary, DARE & DG, ICAR, New Delhi visited DMAPR on June 02, 2012. On his arrival, the Honourable Dr. Ayyappan was welcomed by Dr. Satyabrata Maiti, Director, DMAPR and staff members. As a symbol of developing "GREEN INDIA, GREEN ICAR", he planted a Yellow Ashoka (*Saraca thaipingensis*) sapling in the premises of newly constructed guest house. Later on, he formally inaugurated the guest house facility and dedicated it to the nation in presence of a galaxy of dignitaries. At the outset of the inaugural function, Dr. Maiti welcomed the Chief Guest and other dignitaries. He also presented a brief report on growth and development

of the directorate. Thereafter, Dr. S.K. Garg, Superintendent Engineer, CPWD, Gandhinagar presented the project report of newly constructed guest house facility. Addressing the function, Dr. Ayyappan, stressed the need and importance of the research on high value medicinal plants as a functional food for ensuring the health security of the nation. He urged the scientists to work in the area of secondary and speciality agriculture. The efforts of the directorate for development of sustainable production technologies of major medicinal plants for meeting the increasing demands of industry was applauded by the Honourable Dr. Ayyappan. He also congratulated the directorate

...Continued at page 2

EDITORIAL

Ayurveda as Traditional Medicine

Traditional medicines are the sum total of ancient wisdom, knowledge, skills and practices based on the philosophy, viewpoint and experiences indigenous to different cultures which are used to maintain health, as well as to prevent, diagnose, improve or treat various diseases. As per the WHO estimates about 80% population of some of the Asian and African countries rely upon traditional medicines for their primary health care. Herbs are the principal component of traditional medicines although some system use limited ingredients from animal source as well as heavy metals and various salts. The market of various traditional medicines such as Ayurveda, Unani, Siddha, Traditional Chinese Medicine, Tibetan Medicine, Kempo and Korean Medicine are growing for a number of reasons such as ethnic settlements in developed countries, affordability and reputation of some of these traditional medicines. These traditional medicines are expanding well their territories from their place of origin to other advanced countries. Today more than 100 countries have regulations for such traditional medicines. Traditional medicine that has been adopted by other populations (outside its indigenous culture) is often termed as alternative or complementary or non-conventional medicine although these traditional medicines system can be used as full-fledged medicines as parallel to modern medicines. Meanwhile, in many developed countries, complementary and alternative medicine are becoming more and more popular. The percentage of the population which has used CAM at least once is 48% in Australia, 70% in Canada, 42% in USA, 38% in Belgium (WHO Traditional Medicine Strategy 2002–2005).

Now-a-days herbal treatments are the most popular form of traditional medicine, and are highly profitable in the international marketplace. Annual revenues in Western Europe reached US \$ 5 billion in 2003-2004. In China, sale of products totalled US \$ 14 billion in 2005. Herbal medicine revenue in Brazil was US\$ 160 million in 2007 (WHO data). Market is growing steadily.

Although many people believe that because traditional medicines are mainly of herbal in nature (natural), they are safe and carry no risk, traditional medicines and practices can cause harmful, adverse reactions if the product or therapy is of poor quality, or it is taken inappropriately or in conjunction with other medicines. Increased awareness about patients' safety and safe usage is important, as well as more collaboration and communication among providers of traditional medicines and practitioners.

It is therefore timely for International Standard Organization (ISO) to define its role in traditional medicines by developing a strategy to address issues of certification for ensuring safety, efficacy and quality of traditional, complementary and alternative medicines available in the market. In June 2009, the ISO technical management board established ISO/ Technical Committee (TC) 249 with the provisional title of Traditional Chinese Medicines. The scope of TC 249 is on the standardization of Traditional Chinese Medicine. The committee is focusing on quality and safety of natural material and medical devices used in the system as well as information on nomenclature and classification as the foundation of work. Training and education of Traditional Chinese Medicine will be at a later stage.

Encouraged by the initiative of ISO, Bureau of Indian Standards (BIS) in their Food and Agricultural Division (FAD) has set up a sectional committee – FAD 26 - on Ayurveda to promote the countries' old wisdom on health care by setting Indian Standards which will in turn support the inclusion of Ayurveda in the ISO/TM standards. This effort will facilitate the promotion of Ayurvedic products in the international markets and also remove the trade barriers that is existing today because of various apprehensions on the issue of safety and efficacy.

I wish that India should be able to negotiate with its full strength to include the Ayurveda and Unani in the ISO/TC under Traditional Medicine. This will improve the visibility of India in this health sector and fulfil our ancient dream of "सर्वे सन्तु निरामयाः".

Jai Hind!

Satyabrata Maiti

...Continued from page 1

for adding this facility for the growth and development of science. Prof. Harish Padh, Vice Chancellor, S.P. University, V.V. Nagar, who was guest of honour, complemented the directorate for excellent research work done in the area of medicinal and aromatic plants for ensuring the supply of quality raw drugs and ICAR in general for research work in the area of agriculture for ensuring the food security of our country. Dr. A.M. Shekh, Vice Chancellor, Anand Agricultural University, Anand, in his presidential address expressed his happiness over the infrastructure and instrumentation facility created for research at the directorate. The programme ended with the vote of thanks proposed by Dr. Satyanshu Kumar, Principal Scientist and In Charge, PME Cell, DMAPR, Anand.

Breakthrough and Research Highlights

Comparative study of starch granules of *Tinospora* spp.

Comparative studies of starch granules in three *Tinospora* species namely *Tinospora cordifolia*, *T. crispa* and *T. sinensis* (= *T. malabarensis*) were conducted at DMAPR. Starch granular shapes of the three species were of similar types. Starch granular sizes of *T. crispa* and *T. sinensis* (= *T. malabarensis*) were also within the size range of *T. cordifolia*. Starch granular size, LI (μm) ranged from 15.31 ± 3.90 to 29.05 ± 5.48 and L2 (μm) ranged from 9.57 ± 2.72 to 23.62 ± 4.93 among the different accessions of *T. cordifolia*.

Average starch granular size, LI (μm) was 15.11 ± 3.96 and L2 (μm) was 11.56 ± 3.77 in *T. crispa*, however, average starch granular size, LI (μm) was 13.11 ± 3.29 and L2 (μm) was 10.02 ± 2.03 in *T. sinensis* (= *T. malabarensis*). Starch granules of *T. cordifolia* were compared with starch granules of rice, wheat, maize and potato. It was observed that granular shape of *T. cordifolia* was similar to that of wheat and potato, however, granular size was similar to that of wheat. Biggest starch granules were in potato and smallest was in rice.

Quality of market samples of *Swertia chirayita* and *Picrorhiza kurroa*

Fourteen samples of *Swertia chirayita* received from the AICRPMAP&B centers were analyzed by TLC and HPLC methods at YSPUHF, Solan. The results were compared with genuine *S. chirayita* sample and only four samples showed the presence of marker compound of the *S. chirayita*, amarogentin. Similarly, out of eleven samples of *Picrorhiza kurroa* analysed at YSPUHF, Solan, only seven samples showed the presence of marker compounds picroside I and picroside II.

Elite germplasm registered



Two elite germplasms *i.e.*, one each in *Withania somnifera* - DWS 327 and *Plantago ovata* - DPO 14 were identified at DMAPR and registered with NBPGR, New Delhi. DWS 327 (INGR 11026) is a dwarf (25- 30

cm), early maturing (120-130 days) with high withanolide A content ($>1.75 \text{ mg g}^{-1}$ dry weight). DPO 14 (INGR 11035) is an early maturing (80-85 days) mutant line with high harvest index ($>22\%$).

New pest of Varun (*Crataeva nurvala* Buch. Ham.)



Nymphs and adults of leaf hopper

Varun (*Crataeva nurvala* Buch. Ham.) (*Capparaceae*) is a moderate size deciduous high value medicinal tree that grows almost all over the country, especially in the semi-arid regions. The plant has been categorized as rare or vulnerable in the natural

environment of India. All plant parts, including roots, stem, bark, leaves, and flowers have medicinal value and the plant is considered valuable in treating various diseases. During routine survey for insect pest at DMAPR, severe infestation of a leaf hopper was observed on Varun plants, both nymphs and adults in large number were present on both the

side of leaves. The nymphs were yellowish in color and adults were greenish yellow, small size (length less than 13 mm) elongated and tapering posteriorly. They mainly suck the sap and as a result, leaves gradually turned yellow and under severe conditions complete defoliation was observed. The pest was recorded throughout the year. It

caused complete defoliation and reappeared on the regeneration of leaves it reappeared on the plant. The leaf hopper was identified as *Lectotypella rawa* Dworakowska (courtesy DR. C. A. Viraktamath, PI, Networking Project on Biosystematic, GKVK, Bangalore). This is the first record of this insect on *Crataeva nurvala* from India.

From the Directorate

Xth Research Advisory Committee (RAC) meeting held

Tenth Research Advisory Committee meeting was held on April 24, 2012 at DMAPR under the chairmanship of Dr. B. R. Tyagi, Ex Deputy Director, CIMAP, Lucknow. Other members participated in the meeting were Dr. Y. B. Tripathi, Head, Department of Medicinal Chemistry, Institute of Medical Sciences, BHU, Varanasi, Shri Rajneesh Awasthi, C.E.O., Agricons Agropreneurs Limited, Raipur, Dr. Satyabrata Maiti, Director, DMAPR, Anand and Dr. Manish Das, Senior Scientist (Plant Physiology), Member Secretary, RAC. The meeting started with the presentation of flower bouquet to the chairman and the members of RAC by Dr. S. Maiti followed by the welcome note proposed by Dr. Manish Das. The Chairman initiated the proceedings of the meeting and the action taken report on the recommendations made during the last meeting was presented by the member secretary. The chairman suggested to prioritize the plants for the development of SOPs, for accreditation of

laboratory since the payment for individual test has to be made by the clientele. He also emphasised that ISSR markers should be given priority over RAPD markers in identification of important

traits in medicinal and aromatic plants (MAP). Dr. Y. B. Tripathi, opined that as the standard markers are not available in the market, the directorate should work on the development of standard makers for industry. He also highlighted the importance of research in the area of herbal products and there should be more emphasis on development of standard operating procedures in medicinal and aromatic crops. Sh. Rajneesh Awasthi remarked that aromatic plants should also find place in SOP development programme and emphasised to look for microbial work while working with soil borne



pathogens. He further suggested that as the market of aromatic crop is well structured in comparison to medicinal plants, therefore, more importance to research and cultivation of aromatic crops should be given by the directorate. Dr. Maiti presented an overview of the directorate and it was followed by a presentation of research achievements during the year 2011-12 by Dr. P. Manivel, Principal Scientist (Plant Breeding) and Dr. Vipin Chaudhary, Sr. Scientist (Entomology). Thorough discussions were made on the presentations. The meeting ended with the vote of thanks proposed by Dr. P. Manivel.

21st Institute Research Committee (IRC) meeting held

The 21st Institute Research Committee meeting was held under the chairmanship of Dr. Satyabrata Maiti, Director, DMAPR during April 25-26, 2012. Dr. B. R. Tyagi, Ex. Deputy Director, CIMAP, Lucknow and

Chairman, RAC, DMAPR was also present as a special invitee on first day of the meeting to discuss the new research projects proposals submitted by the scientists who joined the directorate during year 2011. Dr. P.

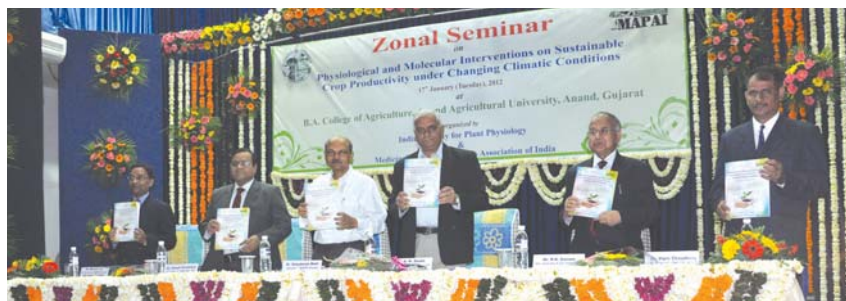
Manivel, Principal Scientist (Plant Breeding) and Member Secretary, IRC, welcomed, Dr. Tyagi, the Chairman and the members of IRC. Dr. Satyabrata Maiti, in his introductory remarks, also welcomed Dr. B. R. Tyagi for the

meeting and asked the scientists to present the achievements of the last year and target for the next year for the ongoing projects. Thereafter, the action taken report of the last IRC recommendations was presented by Member Secretary. New research project proposals were presented by the newly joined scientists namely Dr. Ruchi Bansal, Scientist (Plant Physiology) and Dr. Vanita N.S., Scientist

(Plant Pathology). New project proposal on “Data management of medicinal and aromatic Plants by IT applications” by Mr. N.S. Rao, Scientist (Computer Applications) and “Development of good agricultural practices for Mandukaparni (*Centalla asiatica* L.)” by Dr. Ram Swaroop Jat, Sr. Scientist (Agronomy) were also presented. After thorough discussion on new

project proposal, the research achievements in plant breeding, crop production, crop physiology, crop protection, quality management and information technology and the target for the year 2012-13 were presented by the scientists. Modifications in new projects and improvement in ongoing projects were suggested. The meeting ended with vote of thanks proposed by the Member Secretary, IRC.

Seminars organized



Zonal seminar on physiological and molecular interventions on sustainable crop productivity under changing climatic conditions was organized on January 17, 2012. Another state

level seminar on sustainable collection and profitable cultivation of aromatic and medicinal Plants in Gujarat was organized on January 18, 2012.

DMAPR scientist bags “Best Woman Athlete” award



An eleven member team participated in ICAR Zonal Sports Meet (Western Zone) during February 13-17, 2012 organised at CAZRI, Jodhpur. Dr. Smitha G.R., Scientist (Horticulture) won six gold and two silver medals and was adjudged the “Best Woman Athlete” of the tournament. Dr. Vanita Salunkhe, Scientist (Plant Pathology) won one gold and three silver medals. Mrs. S.H.

Nair, T-3 (Laboratory Assistant) also won one gold and one silver medal. The team members were felicitated at the directorate after return.

Institute Management Committee (IMC) meeting held

The 23rd IMC meeting was held on February 25, 2012 under the chairmanship of Dr. Satyabrata Maiti, Director, DMAPR. Dr. Umesh Srivastava, Assistant Director General (Horticulture-II), Dr. G.G.Rao, Dr. R.S. Kurothe, Dr. Vipin Chaudhary, Sh. Mangal Singh and Sh. K. Raghunadhan were the other members present in the meeting. Sh. Raghunadhan, Member Secretary, presented a brief report of progress achieved by the directorate and action

taken report of the last meeting. Agenda items, research and development activities of the directorate were discussed by the committee members.

Director, DMAPR invited to Nepal

Dr. Satyabrata Maiti, Director, DMAPR visited Katmandu, Nepal as an invited speaker in a three day Natural Product Conference on “Natural Products for Better Health, Beauty and Wealth” organized jointly by Indian Embassy, B. P. Koirala – Nepal Foundation and Ministry of Science & Technology, Government of Nepal during April 18-20, 2012. He delivered a lecture on advances in medicinal plant research in India in the technical session “Policy and Planning” on 18th April, 2012 and also chaired as moderator in the technical session on “Stakeholder”.

Anyone who believes that anything can be suited to everyone is a great fool, because medicine is practised not on mankind in general, but on every individual in particular.

– Henri de Mondeville

QRT review meeting held at DMAPR



QRT team under the chairmanship of Padamashree Prof. P. Pushpangadan with members including Dr. C. K. Katiyar, Dr. Bhag Mal, Dr. S. Edison, Prof. S. R. Yadav and Dr. S. K. Pareek visited Anand during February 29- March 01, 2012. Dr. Satyabrata Maiti, Director, DMAPR, welcomed the chairman and members. The team visited the medicinal plants field gene bank, herbal

garden, arboretum, experimental field and laboratories facilities of the directorate on February 29, 2012. Later, in an interactive meeting with the scientists of the directorate, the chairman and members suggested modifications in some of the on-going projects for their improvement. The team also visited AICRPMAP&B centre at Anand Agricultural University, Anand on March 01, 2012.

genesis of PPV&FRA, its different acts and importance in the Indian context were explained in details. In the training programme, farmers' rights under PPV&FRA, notifications, schedules, objectives and its salient features were also described in the lectures. Details of the initiatives of the Government of India with reference to legislation for providing an effective system for protection of plant varieties, farmers' and breeder's rights and encouragement for the development of new varieties of plants were also discussed with trainees. Visit to DUS testing fields, herbal garden and field gene bank of the directorate was also arranged. A leaflet on PPV&FR Act, in Gujarati language was also released. The impact of training was evaluated through a questionnaire.

Farmers' training on "Production of Aromatic Plants" organised

At the directorate, a farmers' training programme on "Production of Aromatic Plants" was organised on March 2, 2012. This training programme was supported by the Directorate of Arecanut and Spices Development, Calicut, Kerala. Fifty farmers from different villages of Godhra district of Gujarat attended the training. Training-on-hands on planting techniques was given to the trainees. Later on visit to the aromatic plants' field and nursery was also arranged.



Training-cum-awareness programme on "Protection of Plant Varieties and Farmers' Rights Act" organised

Atraining-cum-awareness programme on "Protection of Plant Varieties and Farmers' Rights Act" supported by Protection of Plant Varieties and Farmers' Rights Authority (PPV&FRA), New Delhi, was

organized at the directorate on March 3, 2012. Participants were from state agricultural university, state medicinal plant board, agriculture departments, Krishi Vigyan Kendra and non-governmental organizations. Officials from the PPV&FRA, New Delhi, research scholars and professionals of *Ayurveda* also attended the training. The

International Women's Day celebrated

International Women's Day was celebrated at the directorate by the Women's Cell, DMAPR. On this occasion competitions like rangoli, memory game, innovative health food preparations etc. were organised. On the onset of the function, Dr. Geetha, K.A. Chairperson, DMAPR Women's



Cell welcomed the guests. The function was chaired by Dr. Satyabrata Maiti, Director, DMAPR and Ms. Viji Varghese,

Centre Head, Zydus Hospital, Anand, was the Chief Guest. A special lecture was delivered by Ms. Varghese and in her lecture

she reminded the audience about the empowerment of women for the well being of the society. Awards to the winners of the various competitions were jointly presented by Dr. Satyabrata Maiti and Ms. Viji Varghese. The programme ended with vote of thanks proposed by Dr. Ruchi Bansal. A contribution received from the staff members was deposited to Old Age Home, Lambhvel, Anand. The function was followed by medical counseling by a team of doctors from Zydus Hospital, Anand .

List of distinguished visitors

- Dr. Umesh Srivastava, ADG (Hort. II), ICAR, New Delhi on February 25, 2012
- Padmashree Prof. P. Pushpangadan, DG, AIHBPD, Trivandrum on February 29, 2012
- Dr. C. K. Katiyar, Vice President & Head, Health Care Research, Dabur India Ltd., Delhi on February 29, 2012
- Dr. Bhag Mal, Formerly Coordinator, Bio-diversity International, New Delhi on February 29, 2012
- Dr. S. Edison, Formerly Director, CTCRI, Trivandrum on February 29, 2012
- Prof. S. R. Yadav, Deptt. of Botany, Shivaji University, Kolhapur on February 29, 2012
- Dr. S. K. Pareek, Retd. Principal Scientist, NBPGR, New Delhi on February 29, 2012
- Dr. S. Ayyappan, Secretary, DARE & Director General, ICAR, New Delhi on June 02, 2012
- Prof. Harish Padh, Vice Chancellor, S.P. University, V.V. Nagar, Anand on June 02, 2012
- Dr. A. M. Shekh, Vice Chancellor, Anand Agricultural University, Anand on June 02, 2012
- Dr. J. Jayashankar, Director, Central Institute of Freshwater Aqua Culture, Bhubaneshwar on June 02, 2012
- Dr. S. K. Garg, Superintendent Engineer, CPWD, Gandhinagar, on June 02, 2012
- Dr. K. B. Kathiria, Director Research, Anand Agricultural University, Anand on June 02, 2012
- Dr. P. P. Patel, Director of Extension, Anand Agricultural University, Anand on June 02, 2012
- Dr. K. P. Patel, Principal, B.A. College of Agriculture, Anand Agricultural University, Anand on June 02, 2012
- Dr. K. C. Dalal, Formerly Director, DMAPR, Anand on June 02, 2012
- Dr. D. J. Patel, Formerly Principal, B.A. College of Agriculture, Anand on June 02, 2012
- Dr. I. L. Kothari, Formerly Head, Deptt. Of Biosciences, S.P. University, V.V. Nagar, Anand on June 02 , 2012
- Dr. S. Sriram, Formerly Head, Medicinal Plants (AICRPMAP&B), Anand Agricultural University, Anand on June 02, 2012
- Dr. G. G. Rao, Head, CSSRI Regional Station, Bharuch on June 02, 2012
- Dr. Sanjay Singh, Head CHES, Godhra, on June 02, 2012
- Dr. Chandrakanta Mishra, Head, CIFA Reginal Station, Anand on June 02, 2012
- Dr. G. C. Jadeja, Prof & Head, Deptt. of Botany and Biotechnology, Anand Agricultural University, Anand on June 02, 2012
- Dr. R. N. Pandey, Prof & Head, Deptt. of Plant Pathology, Anand Agricultural University, Anand on June 02, 2012
- Dr. M. M. Roy, Director, CAZRI, Jodhpur on June 28, 2012

New staff members



Sh. Raghuveer Prasad, LDC
joined on March 16, 2012



Sh. Hayat Ashar Mohammad, LDC
joined on March 16, 2012



Sh. Vijay Kumar
Administrative Officer,
joined on June 02, 2012

**Second National
Conference on
Integration of Medicinal
and Aromatic Plants for
Rural Development and
Prosperity**

Second national conference on “*Integration of Medicinal and Aromatic Plants for Rural Development and Prosperity*” has been organized at the Directorate of Medicinal and Aromatic Plants Research, Boriavi, Anand-387 310, Gujarat during January 22-23, 2013 by the Medicinal and Aromatic Plants Association of India (MAPAI), Anand. Thematic areas identified for the conference are : a. biodiversity conservation b. sustainable utilization - GACP, crop diversification c. quality control (certification) and post harvest management d. legal issues and policies in MAP and e. supply chain and market. The detailed information is available on the website : www.dmapr.org.in . Signed copy of the registration form along with the registration fee should be sent by e-mail or by post to the Organizing Secretary on or before due date. The payment can be made either by demand draft issued in favour of Medicinal and Aromatic Plants Association of India, Anand, Gujarat or by e-transfer (A/C No. 457010100084598, AXIS Bank, Satyam Chambers, Amul Dairy Road, Anand; IFSC code: UTIB0000457). Transaction details should be sent by e-mail to: secretary.mapai@gmail.com for confirmation of receipt of the amount received.

Species of Conservation Interest

**Jatamansi (*Nardostachys jatamansi* DC.
= *Nardostachys jatamansi* auct.)**



The plant belongs to family Valerianaceae and is native to the Alpine Himalayas. It is a rhizome-bearing perennial medicinal herb that prefers high altitudes *i.e.* 3,000 to 5,000 m and found in the Himalayas of India, Nepal, Tibet and China. The plant has a rich history of medicinal use and has been valued for centuries in Ayurvedic and Unani systems of medicine. The rhizomes of the plant are used in the Ayurvedic system of medicine as a bitter tonic, stimulant and antispasmodic to treat hysteria, convulsions, and epilepsy. The root has been used to treat insomnia and blood, circulatory, and mental disorders. Some preparations of the plant have been used as a hepatotonic, cardiotonic, analgesic and diuretic in the Unani system of medicine. The plant also has aromatic value and is used in perfumes and dyes. The plant parts contain a variety of sesquiterpenes

and coumarins. The sedative sesquiterpene, valeranone is a major component of the root essential oil. The essential oil from the rhizome (Spikenard oil) is used for the preparation of more than 25 herbal products. The rhizome is the reproductive part also. Overexploitation of the species along with its low regeneration potential in natural habitats made the species status under pressure and the Red Data Book categorises the species as “vulnerable” in nature. The Government of India has included the species in “negative list of plants” for export and had prohibited the exports of the plant, plant parts and their derivatives if obtained, from wild. The species hence requires urgent attention by the researchers for its domestication so that pressure to the natural populations can be effectively reduced which will help the conservation of the species in nature.

Editor : Dr. Satyabrata Maiti, Director

Associate Editor : Dr. Satyanshu Kumar, Principal Scientist (Organic Chemistry)

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