

**MINUTES OF THE  
7<sup>TH</sup> RESEARCH ADVISORY AND MONITORING COMMITTEE (RAMC) MEETING OF THE BOTANICAL  
SURVEY OF INDIA HELD AT WESTERN REGIONAL CENTRE, BSI, PUNE  
ON 18<sup>TH</sup> JANUARY 2016**

**MEMBERS PRESENT**

1. DR. (PROF.) A. K. KOUL, University of Jammu – Chairman
2. DR. (MRS.) R. DALWANI, Advisor, CS, MOEFCC
3. DR. PARAMJIT SINGH, Director, Botanical Survey of India
4. DR. R. R. RAO, CIMAP (Director Grade Scientist, Retd.)
5. DR. C.S. NAUTIYAL, Director, NBRI
6. DR. (PROF.) D. J. BHAT, Goa University (Retd.)
7. DR. P.G. LATHA, Director, JNTBGRI
8. DR. (PROF.) S.C. SRIVASTAVA, Lucknow University (Retd.)
9. DR. B. K. SINHA, Scientist 'F', BSI, Hqrs. – Member Secretary
10. DR. P. LAKSHMINARASIMHAN, Scientist 'E' & HOO, BSI, WRC
11. SHRI. SABYASACHI SAHA, Asst. Inform. Officer, BSI, Hqrs.

The 7<sup>th</sup> meeting of the Research Advisory & Monitoring Committee (RAMC) was held at Botanical Survey of India, Western Regional Centre, Pune on 18<sup>th</sup> January 2016 under the chairmanship of Dr. (Prof.) A. K. Koul, University of Jammu. The meeting was preceded by visit to the campus garden, museum, herbarium and formal inauguration of the Scanning Electron Microscope Room and Mycological Research Laboratory by the Honøble Chairman. The meeting started at 10.30 am in the conference hall of BSI, WRC, Pune.

Director, National Bureau of Plant Genetic Resources, New Delhi and Director, G. B. Pant Institute of Himalayan Environment and Development, Almora and Prof. M. Daniel, Maharaja Sayajirao (MS) University were not present in the meeting due to their preoccupation.

Prof. A.K. Koul, Chairman greeted all the members and expressed pleasure over the presence of Dr. R. Dalwani, Advisor (CS), MoEFCC, New Delhi in the meeting which will help in follow up of the recommendations of the Committee at Ministry level. At the beginning a short film on Botanical Survey of India and its activities was shown to the Committee.

The Chairman appreciated the film and suggested to include the oldest herbarium specimen deposited in any BSI Herbaria also in the film. D/BSI explained the genesis of the film making and gave details about the oldest herbarium. The oldest herbarium specimen deposited at CAL is *Cyperus procerus* Rottb. (Cyperaceae) which was collected by Dr. Samuel Brown between 15<sup>th</sup> & 20<sup>th</sup> of June A.D. 1696 from between Fort St. George, Madras and Tirupati. Prof. A. K. Koul recalled his long association with BSI since his student period. The Chairman as well as the Advisor deeply expressed their concern over neglect of taxonomists/botanists for a long time. BSI is a vital organization in India and plays a major role in survey and documentation of the plant resources. However, its recognition in the outside world is insufficient. They stressed the need for reconnect of BSI to the outside world. There is a need for more interaction and activities for BSI to connect to the outside world. The role of botanists is ignored over a time. The Director, BSI expressed that there should be

change in society's mind-set. He referred the 2015 Nobel Prize in Medicine which was awarded to a Chinese woman **YouyouTu** for her discoveries concerning a novel therapy against Malaria (**-artemisinin**) based on traditional knowledge. To attract more young generation towards taxonomy BSI need to extend the activities beyond the basic taxonomy. Dr. C.S. Nautiyal stressed upon the need of utility of Botanical Research. Dr. R. R. Rao expressed that unlike other professions, the Taxonomists suffer more and they are treated as Service providers for bio-technologists. Hence to change this scenario, taxonomists should come forward and contribute to collaborative works/publications which will add value to the taxonomic studies. Dr. Rao talked about en-cashing the experience of taxonomists. The Chairman and Advisor further emphasized, while keeping the basic mandate of Survey, further provisions should be made for additional research, digitization, commercialization / industrial/applied/value added components. BSI should be connected with other institutions and have collaborative works (for example like TBGRI which is connected to Hindustan Lever Ltd.).

Dr. P. Lakshminarasimhan gave a brief presentation on the BSI, Western Regional Centre, Pune and also about the recently completed projects and projects nearing completion. Dr. R.R. Rao enquired about the use of GPS by scientists/scholars for all the projects. Prof. Koul said some projects should concentrate on the conservation aspect. Dr. Bhat also emphasized about the Conservation of fungi also. Official deposition of cultures is very much required.

After that, Dr. R. Dalwani, Advisor, MoEFCC, New Delhi appreciated the efforts by the RAMC and enquired about the **status of MIS** and suggested to **expedite the development of website**. She stressed upon the **Red Data Book of Indian Plants** and the **Red List Status of important species**. Besides, the Chairman and the members discussed about the Conservation of threatened plants. There were suggestions that the projects related to conservation need to be routed through State Forest Department. Further, after reintroduction of the threatened plants to the natural habitat, monitoring should be done to record the success rates of those reintroduced plants. Dr. Dalwani, also suggested that in future, the RAMC Committee should have one Forest Dept. as a member which will also be helpful in getting necessary permits for doing the floras of protected areas.

Thereafter the Agenda items were discussed serial wise.

#### **Agenda Item No. 1: Confirmation of the minutes**

#### **Agenda Item No. 2: Action taken on the decisions of the previous meeting**

#### **Agenda Item No. 3: Review of the Progress report of BSI since last meeting**

Dr. B. K. Sinha, Member Secretary gave a presentation on the progress made by the BSI from April 2014 to December 2015, during which 203 field tours for collection of plant specimens/plant materials for floristics, ethno-botanical and pharmacognostical studies on flowering and non-flowering plants were undertaken by different Regional Centre and units of BSI covering the following regions, including **four biodiversity hotspots**. This includes 36 protected areas and 07 Sacred Groves. In addition, 21 tours for the collections of live germ-plasm were also undertaken in these areas; *c* **30,603** (incl. **12,733 of non-flowering plants**) specimens were collected, out of which *ca* **26,112** specimens were identified into *c* **13,306** taxa. Apart from that 28 herbarium consultation

tour were also conducted for identification of specimens. This resulted into the **discovery of 3 genera and 76 taxa as new to science; 2 genera and 69 taxa as new to India and 158 new distributional records for different geographic regions/ states; 15 species recollected after a gap of over 50 years;** taxonomic description of **2644** taxa under national flora, **2500** taxa under regional/state/ district flora, **2528** taxa under flora of protected areas were documented; ethno-botanical information of 282 taxa from Korapat, Jajpur, Deogarh and Ganjam districts of Odisha and 220 data from Lodha of West Bengal and 125 ethnobotanical data from Dang district, Gujarat were recorded; A total of 893 plant species were studied through SEM like, pollen & seed morphology of *Andrographis* and *Ficus*; nutlets of *CYPERACEAE*; pollinia of orchid species; samples of angiosperms and Pteridophytes, liverwort and hornworts, Algae, Fungi etc.; Nutraceutical values of 18 wild plants of Meghalaya were also analyzed.

Dr Sinha also informed that as a part of Cyber Taxonomy initiative, **Flora of India** vol 1, 2, 3, 4, 5, 13 and 23 have been converted in the web format and it can be accessed through a web portal already launched on NIC server; also database of around 10,000 records of flowering plants (monocot and dicot) in the web enabled format were completed; work on additional 22,000 records pertaining to Lichens and Fungi Checklist is under way; *e-flora* ([www.efloraindia.nic.in](http://www.efloraindia.nic.in)) portal and Digital Resources of **Rare Holdings** were launched and can be accessed through BSI Website ([www.bsi.gov.in](http://www.bsi.gov.in)); around 735 rare books comprising of 3 lakh pages have been converted in *e-form* and shortly, it will be made available by web portal ([www.bsirarebooks.nic.in](http://www.bsirarebooks.nic.in)); around 300 publications comprising of nearly 1 lakh pages and all 52 back volumes of BSI journal were digitized and shall be available through BSI portal; on line publication of the journal *Nelumbo* were started with functionality of submission, review and final publishing of articles on line; a comprehensive **Management Information System** (MIS) for online reporting of research activities of the Survey is in an advance stage of development and once finalized, could be accessed through internet or BSI intranet; 19 books, 06 periodicals, 432 Research Papers 16 book chapters and 02 obituaries were published.

Under digitization of herbarium specimens, about 12,300 herbarium specimens of all the herbaria spread across different regional Centres of BSI; 14,475 type specimens of Central National Herbarium (CAL); and 20,000 Economic Herbarium Specimens of ISIM, Kolkata were barcoded and digitized.

About 1,265 saplings, seeds, propagules belonging to 173 taxa of threatened, endemic or economically important species were introduced in AJC Bose IBG, Howrah and other associated botanic gardens of BSI. Apart from that, successfully artificially pollinated an IUCN red listed endangered species, *Lodoicea maldivica* Gmeln. (Double Coconut Palm) growing in the large palm house of AJC Bose Indian Botanic Garden, Howrah; micro-propagation and phytochemical screening of selected species of N. E. Region were successfully completed; tissue culture raised seedlings of *Ilex khasiana*, *Cymbidium tigrinum*, *Armadorum senapatianum* *Rhododendron coxianum*; *Paphilpedilum hirsutissimum*; *Indopiptadenia oudhensis*, *Pittosporum eriocarpum* were transferred from Lab to Land; During this period also earned revenue **Rs 86,49,184** from various sources which includes 76,215 towards identification charges of specimens/ samples and organized two training programme/ workshop.

Under work on Red- listing as per IUCN criteria, three (03) project were finalized for publication viz., **Endemic Plants of India, Studies of Orchids of Maharashtra** (Ecological aspects, population studies of Endemics and GIS mapping); **Shingba Rhododendron Sanctuary, Sikkim** with GIS Mapping of EET species and **Endemic and Threatened Pteridophytic Flora of North West Himalaya** and one project on **Red Listing of Orchids of Eastern Himalaya** as per IUCN criteria work is going on.

The Committee commended the achievements of BSI during the period under review. While appreciating the progress and the vast details presented, the Chairman suggested that the presentation should be crispy. It was suggested that the areas already well explored should be given least priority. The committee emphasized that more priority should be given to areas that are unexplored or poorly explored which will enable to make more new discoveries and botanically interesting findings. Since BSI has been doing the survey work for more than 125 years, the status of well explored and poorly explored areas need to be redefined and more priority should be given to the survey of poorly explored areas.

The committee suggested that BSI approach during survey should be slightly modified. The variations and other parameters like population size, their threat status should be recorded during field studies. Scientists working on particular group of family should collaborate with world experts of that particular group. In this connection, Director/BSI and Dr. Lakshminarasimhan stated that BSI has recently published a book on the **Endemic Vascular Plants of India**. The introductory chapter is available online. The book comprises a list of all endemic taxa, habit, distribution data along with pictures, etc. Maps have been provided for all the endemic genera. This was appreciated by the committee members. Prof. R. R. Rao was happy about these achievements of BSI and suggested that these achievements of BSI should be put online for better publicity. Director/BSI also said that the BSI journal *Nelumbo* is available online. The chairman suggested that coffee table book on Orchids, *Ceropegias* and other attractive plant groups should be published by BSI. D/BSI said that the **Endemic Vascular Plants of India** published by BSI is a coffee table book. Similar books on other groups of plants will also be brought out soon by BSI.

The Chairman suggested that the text of detailed progress of work report should be provided to the members well in advance. Dr. Sinha stated that the detailed information have already been provided as booklet (Agenda Notes) to the members. The Chairman suggested that the presentation should be of half an hour duration and should include the major achievements in different fronts. At the same time, the Regional Centre where the meeting is held should make detailed presentation on their objectives, achievements, limitations, constraints, etc.

Dr. Dalwani suggested that **Digitization is a very important** activity and should be continued. A separate proposal for funding of digitisation of herbarium specimens should be submitted to the IT Division. She also suggested that BSI should be repository of endemic/threatened plants. The Member Secretary informed that **BSI website is being regularly updated and also digitisation work is being done**. Dr. Dalwani emphasized about the revalidation of Red Data books. As per the NBA rules BSI/ZSI should act as repositories of plant/animal resources. BSI should act as nodal institute where all plant material of all categories should be deposited. The Committee also suggested that after the conservation of threatened plants, monitoring mechanism should be there for

those plants reintroduced in natural habitat. Dr. Dalwani said that there is no website to provide information on the list of threatened plants which have been conserved and reintroduced in nature. We should have data on reintroduced plants that are successfully established and started reproducing.

#### **Agenda 4: Approval of the Annual Research Programme of BSI for the year 2016 – 17.**

There were **21 new project proposals** submitted by various scientists under Action Plan for the year 2016-17. Though all the new project proposals were approved by the Committee, it suggested that before putting the project proposals to the RAMC, the proposals should be **internally reviewed or sent to experts in different plant groups for their comments**. The proposals should be on prioritised research programmes of BSI. More stress was given on exploration of Eastern Himalayas. For surveying protected areas, the Forest Dept. comments should be attached with the proposal. If the project proposal is accepted by the internal committee and also the Forest Department, the RAMC will have no objection. The committee also said the time period for floristic studies should be limited to three years (survey and documentation of plants of protected areas). Before allotting new projects, the man power and resources should be taken into consideration and it should be recorded in the RAMC material. It should be stated that there is enough manpower in the Centre to undertake the project.

**Project Extensions:** The Committee has approved the time period extensions of the following projects:

1. **Study of Impatiens L. of Arunachal Pradesh (2013-16)** ó Extension for one year is approved, along with on pollen mitosis to be done for Chromosome number study.
2. **Revision of genus Fimbristylis of family Cyperaceae under Flora of India (2013-16)** ó Extension for One year is approved. If D/BSI is satisfied with the progress project can be considered for extension for one more year.
3. **Bryoflora (Hepaticae & Anthocerotae) of Mizoram (2008-14)** - One more year extension is approved (till March 2017). The project report should be submitted before March 2017.
4. **Polypodiaceae of North East India (2012-14 extended up to March, 2016)** - One year extension is approved. The project report should be submitted before March 2017.

**The following recommendations emerged from the discussions:**

1. **To prepare a draft guidelines for Emeritus Scientists immediately and send to the Chairman, RAMC for approval.**
2. **Guidelines for preparation of new project proposals (including sending the project proposal especially on protected areas to one member of Forest Dept.)**
3. **Prioritization of project work on yearly basis and allotment of work**
4. **Revising the Fee for plant authentication and providing distribution data based on herbarium label data.**
5. **Forest Dept. official should be made a member during RAMC Committee.**
6. **Follow-up for blanket permission for undertaking field surveys in protected areas.**

At the end, Vote of thanks was proposed by the Member Secretary to end the meeting.

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