



**Eastern Regional Centre, Botanical Survey of India, Laitumkhrah, Shillong -793 003**

- **Joined BSI** : 30 May 1990 as scientist-B
- 1992-1996, **Ph.D. Thesis Title** :  
*'Tissue culture of a range of plant species from North-east India'*.
- **Specialization**: Plant tissue culture and allied techniques.
- **Guide**: Prof. PDS Caligari, Head, Department of Agricultural Botany, **Reading University**, U.K.
- **Co-Guide**: Dr. M. F. Fay, i/c Micro propagation Division, Royal Botanic Garden, Kew, U.K.



### Annual Action Plan Carried out till date.

1. Micro propagation of some rare and threatened plant species of N.E. India.
2. Population studies of *Paphiopedilum* species found in N.E. India and its natural habitats (2001-2003).
3. Checklist for the Flora of Meghalaya (2013-2015) (A.A. Mao, B.K. Sinha, D. Verma & N. Sarma)
4. Flora of Dzukou Valley (2005-2007) (A. A. Mao & R. Gogoi)
5. Ericaceae of Arunachal Pradesh (2009-2012)
6. Checklist of Flora of Nagaland (2014-2015) (A.A. Mao, N. Odyuo & D. Verma)
7. Flora of Nagaland Vol. I&II (2016-2019) (A.A. Mao, N. Odyuo & D.K. Roy))
8. Flora of Amchang WLS, Assam (2015-2018) (A. A. Mao, Scientist F and N. Sarma, Sr. Pres. Asstt.)
9. Yangoupokpi Lokchao Wildlife Sanctuary, Chandel District, Manipur (A. A. Mao, Scientist F and L. R. Meitei, Bot. Asstt.)

### Funded Projects

1. DBT-funded project (2001-2005) - Multiplication of *Iris bakeri*, *Gaultheria fragrantissima* and *Panax assamicus* using tissue culture and allied techniques.
2. DBT-funded project– “Multiplication and ex situ conservation of Rhododendron species of north east India” (2005-2009).
3. DBT-funded project – “Preventing extinction and improving conservation status of threatened plants through application of biotechnological tools” (2012-2017).
4. Collaborating Project with North Eastern Space Application Centre (NESAC), Umiam, Meghalaya. Field data collection in Pynursla & Mawphlang Block & Mapping of Forest flora in East Khasi Hills district, Meghalaya (2012-2014).
5. “Micropropagation and screening of secondary metabolites of six medicinal orchids in Meghalaya”(by Miss Gargi Prasad, D. Vijyan & A. A. Mao).





# TISSUE CULTURE

Established in 1984 for RAPID MASS PROPAGATION OF RARE, ENDANGERED, THREATENED and ENDEMIC SPECIES of North East INDIA

Under the Project successfully propagated *Vanda coerulea*, *Paphiopedilum insigne*, *P. villosum*, *P. spicerianum*, *Dendrobium primulinum*, *Cymbidium erythraeum*, *C. eburneum*, *C. tigrinum*, *C. mastersii*, *Rhododendron formosum*, *Nepenthes khasiana*, etc.





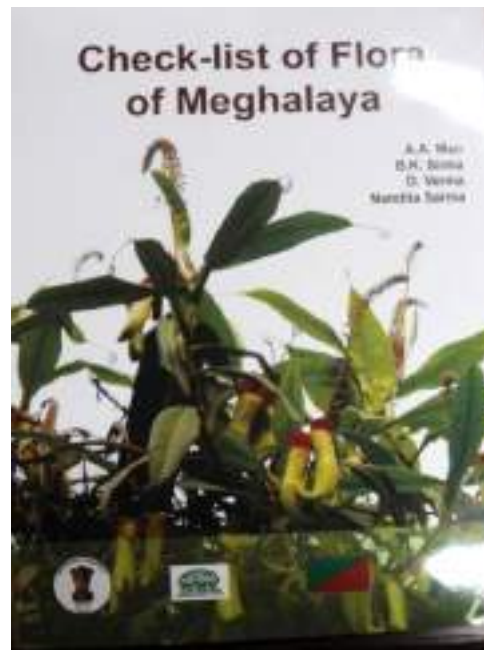
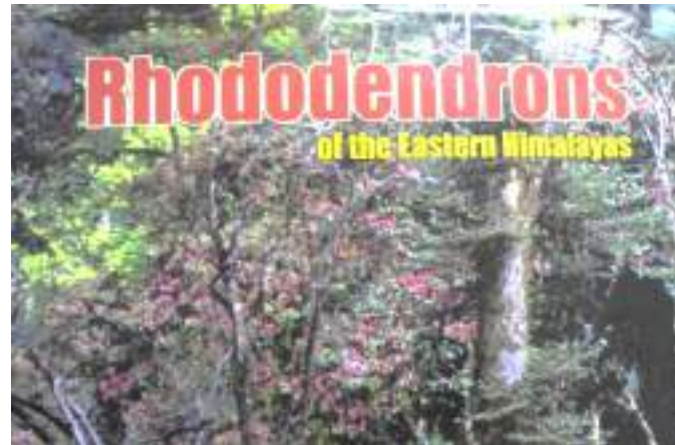


Population studies of *Paphiopedilum* species found in N.E. India and its natural habitats (1998-2003)(A. A. Mao).

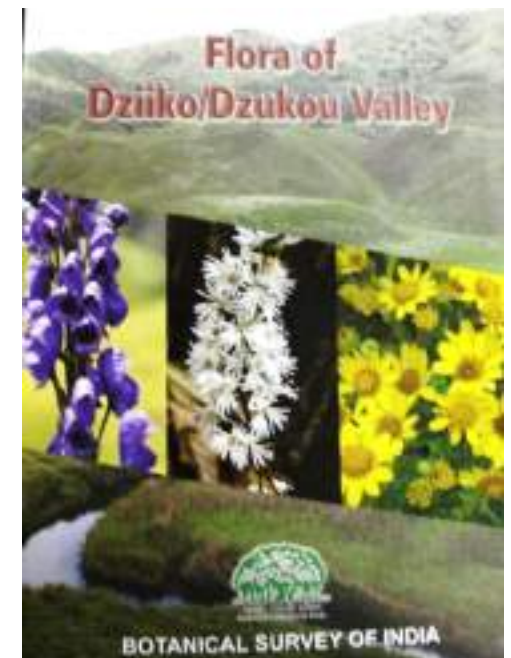


## Annual Action Plan Carried Out

Ericaceae of Arunachal Pradesh (2009-2012) - completed



5. Checklist for the Flora of Meghalaya (2013-2015) (A.A. Mo, B.K. Sinha, D. Verma & N. Sarma) – completed –



Flora of Dzukou Valley (2005-2007) (A. A. Mao & R. Gogoi) – completed





- **Checklist of Flora of Nagaland (2014-2016) (A.A. Mao, N. Odyuo & D. Verma) – completed (2287 taxa Fam. 194, Genus 946, Spp. 2239, subsp. 10, var. 39)**

### **Field tours: 2 COMBINED WITH TOUR OF EASTERN NAGALAND – NEW PROJECT**

1. 24<sup>th</sup> Apr. to 15<sup>th</sup> May 2016 (22 days): 412 field numbers, 112 live plant collected & 500, Field Photographs taken.
2. 4<sup>th</sup> to 25<sup>th</sup> Oct. 2016 (22 days): 348 field numbers, 83 live plant collected & 500 Field Photographs taken.
3. **Area covered:** About 10% of the area covered so far.
4. **SO FAR:** 760 field numbers & 195 live plants collected. Ca. 1000 field photographs

- **Flora of Nagaland, (2016-2021) (A. A. Mao, Odyuo, & D.K. Roy)**



## Progress Report from April, 2016 to February, 2017

**Title of the Project:** Flora of Yangoupokpi Lokchao Wildlife Sanctuary, Chandel District, Manipur

**Name of the Executing officer:** Dr. A. A. Mao and Shri L. R. Meitei

**Date of Initiation and Completion of the Project:** April 2014-March, 2017

**Field Tours:** Under taken 1 Field Tour and collected herbarium specimens for 104 Field nos., 163 live plant species with 450 photographs

**Identification:** Identified 72 species

**Documentation:** Completed description of 101 species

**Summary:** Till date undertaken 5 Field Tours, collected 726 Field nos. with 2400 photographs, identified 424 species and completed description of 320 species.

Also 225 live plant species collected from the Wildlife Sanctuary & planted in EBG, Barapani for ex-situ conservation.

**Publication:** 2 research paper

1 genus - new record to India & 9 species- new record to Manipur.



**Project: Flora of Amchang Wildlife Sanctuary, Kamrup, Assam.**

(786401) (A. A. M. & N. S. S.) (2014-2017)

**Field tour conducted: 4**

**Number of specimens collected – 548**

**Identification:** Identified **188** species

**Documentation:** Completed description of **94** species.





# Micro propagation of RET plants of N. E. India, BSI, ERC, Shillong, (2016- 2017)

Dr. A. A. Mao, Scientist-F & Miss L. Ibemhal Chanu, Bot. Asstt.



lab to land plantlets growing in green house.



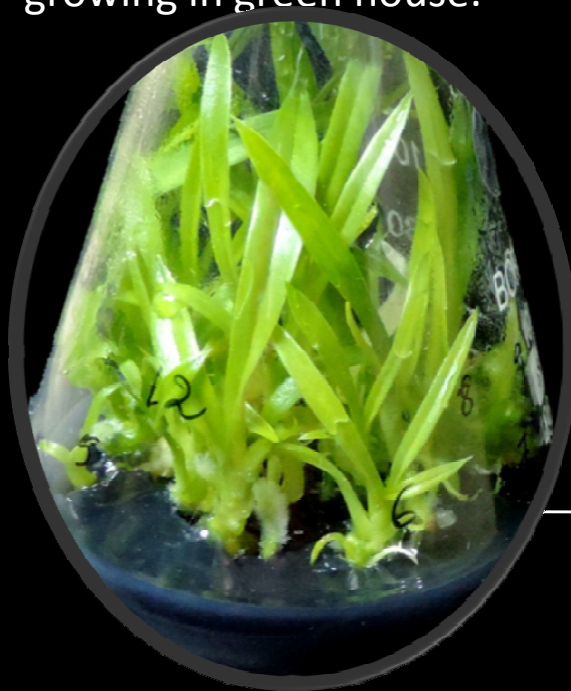
Callus of *Rhododendron coxianum* subcultured in different concentration of 2ip.

-*Paphiopedilum hirsutissimum* - *Illex khasiana*

*Cymbidium tigrinum*: ca 7000 siblings are grown in culture room , c. 2000 seedlings are subculture & c.100 plants are planted in greenhouse.



*Armodorum senapatianum*: c. 250 plants are subcultured for mass multiplication , c. 70 plants planted in greenhouse

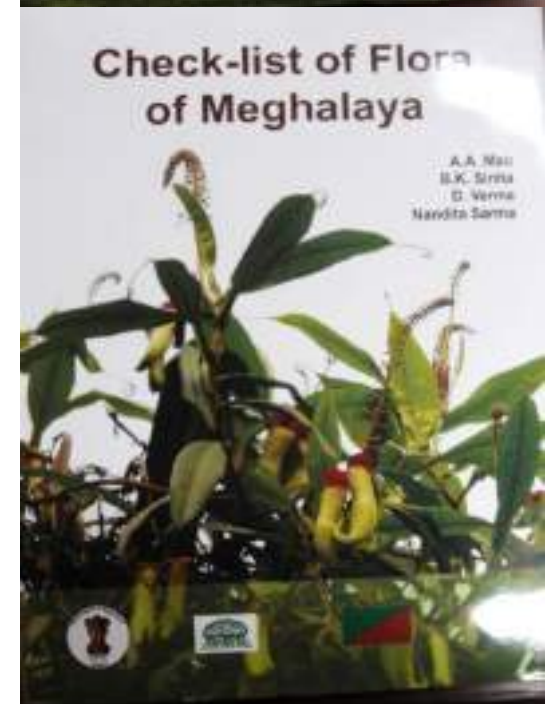
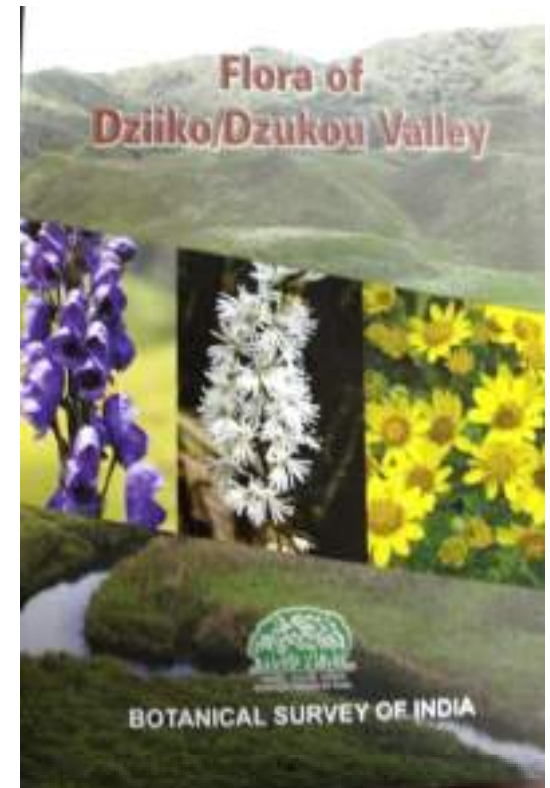


## Research Articles Published :120

- Floristic/Taxonomy - 54
- Plant Tissue Culture – 22
- Ecology and Conservation - 11
- Ethnobotany - 12
- General – 9
- Chapter in edited Books – 6

## Books Published: 5 (Five)

1. Mao, A.A. 1997. Mao language to English – Dictionary of Plants.
2. Mao, A.A. & M. Mishra, 2002. Commercial Floriculture Book I & II (Certificate course in floriculture- Distance Education, NEH University).
3. Moran L, Mao, A.A. & Gamlin J. 2016. *Rhododendrons of the Eastern Himalayas*, Published by Department of Science & Technology, Govt. of Arunachal Pradesh. (Coffee table book).
4. Mao, A.A. & R. Gogoi, 2016. *Flora of Dzukou/Dzukou valley and surrounding hills*, BSI, Kolkata.
5. Mao, A.A., B.K. Sinha, D. Verma & N.Sarma 2016. Checklist of Flora of Meghalaya.





## **A. New species**

1. *Armodorum senapatianum* S. Phukan & A. A. Mao
  2. *Flickingeria abhaycharacnii* S. Phukan & A. A. Mao
  3. *Roscoea ngainoii* A. A. Mao & M. Bhaumik
  4. *Dendrobium arunachalense* C. Deori et al.
  5. *Crawfurdia arunachalense* S.S.Dash, R. Gogoi & A. A. Mao
  6. *Codonopsis vadse* S.S.Das & A. A. Mao
  7. *Rhododendron pangeanum* A.A. Mao & M. Bhaumik
  8. *Rhododendron titapuriense* A.A. Mao, Kenneth Cox & David Chamberlain
  9. *Rhododendron mechukae* A.A. Mao & A. Paul
  10. *Rhododendron pseudomaddenii* A. A. Mao & M. Bhaumick
  11. *Adenophora capillaries* var. *dzukoensis* A. A. Mao & D.K. Roy
  12. *Pennilabium labanyaenum* C. Deori, N. Odyuo & A. A. Mao
- (Orchidaceae)

**RHODODENDRON MECHUKAE**



**RHODODENDRON TITAPURIENSE**



***RHODODENDRON PANGEANUM***

**NEW SPECIES  
DISCOVERED**





*Adenophora capillaries*  
var. *dzukoensis*  
A.A. Mao & D.K. Roy



*Armodorum senapatianum*  
S. Phukan & A. A. Mao

## **B. New records for India (Published)**

1. *Rhododendron hylaeum* Balf.f. & Farrer (Ericaceae)
2. *Rhododendron dekatanum* Cowan
3. *Rhododendron sanguineum* Franchet subsp. *sanguinum* var. *sanguineum*
4. *Rhododendron thomsonii* Hook.f. subsp. *lopsangianum* (Cowan) D.F. Chamb.
5. *Gaultheria heteromera* R.C. Fang (Ericaceae)
6. *Gaultheria trichophylla* var. *eciliata* Rae & D.G. Long
7. *Lyonia villosa* var. *sphaerantha* (Hand.-Mazz.) Hand.-Mazz. (Ericaceae)
8. *Berneuxia thibetica* Decne (Diapensiaceae)
9. *Chimonocalamus longiusculus* Hsueh et Yi (Bambusoidea)
10. *Kaempferia parviflora* (Zingiberaceae)
11. *Ponerorchis chrysea* D.Don (Orchidaceae)
12. *Thrixspermum saruwaterii* (Hayata) Schltr. (Orchidaceae)
13. *Codonopsis tubulosa* Kom. (Campanulaceae)
14. *Pleione saxicola* (orchidaceae)
15. *Dendrobium dantaniense* Guill. (Orchidaceae)
16. *Cleisomeria pilosum* (Orchidaceae)
17. *Arisaema bannaense* H.Li (Araceae)
18. *Arisaema lingyunense* H. Li (Araceae)
19. *Sauromatum horsfieldii* Miquel (Araceae)



## Academic

### Guided 5 Ph.D. students and 4 registered

1. Ms R.A. Ranyaphi – Thesis entitled “Micropropagation of *Gaultheria fragrantissima* Wall. – an important medicinal plant” Department of Botany, Gauhati University. (2012)
2. Mr Jayashankar Das – Thesis entitled “Tissue Culture studies and bioprospecting of Indian Valerian with special reference to production of Valerian oil”. Department of Biotechnology, Gauhati University. (2012)
3. Ms Junie Pearl Lyngdoh – Thesis entitled “A study on the Ethnomedicinal plants among the Khasis of East Khasi Hills District, Meghalaya”. Martin Luther Christian University, Shillong. (2012)
4. Ms Larilin Kharpuri – Thesis entitled “Edaphic and Phytosociological study in a Limestone Mining area at Mawsmai, Meghalaya”. Martin Luther Christian University, Shillong. (2012)
5. Mr. Sanjay Gupta - Thesis entitled “In vitro propagation studies of *Gymnocladus assamicus* and *Lysimachia laxa*, two important and rare medicinal plant species from north east India”. Department of Biotechnology, Gauhati University. (2015)

## **Administrative**

1. Scientist-in-charge Plant Tissue Culture Laboratory, BSI, Shillong (1996-2008).
2. Scientist In-charge (17.10.2003 to 16.10.2004). Bio-Resources Development Centre, Shillong, Govt. of Meghalaya. Recruitment of staffs for the centre, project proposal prepared and got sanctioned from DBT, New Delhi, renovation of the office/laboratory building, establishment of botanic garden and introduction of medicinal plants.

## **Head of Office**

3. APRC, Itanagar (12.09.2009 to 30.03.2013) - Head of Office
4. Eastern Regional Centre, Shillong (1.4.2013 to till date) .



## **B. Educational programs**

1. Produced television lecture program on practical plant tissue culture for Open University Program (Produced by Fr. George, St. Xavier College, Kolkata under UGC program).
2. Mao. A.A. 1997. Mao language to English – Dictionary of Plants.
3. Mao, A.A. & M. Mishra, 2002. Commercial Floriculture Book I & II (6 month Certificate course in floriculture- Distance Education, NEH University).
4. Produced 30 minutes documentary video film on Rhododendron Hunting in Arunachal Pradesh for Cop11. 42 Rhododendron species video captured from the natural habitats in West Kameng, Tawang and Lower Subansiri districts.
5. Produced 18 minutes documentary video film on Ethno-Biodiversity of North east India, 2014.
6. Produced 18 minutes documentary video film on Herbarium Techniques, 2014.

## Awards

1. National Overseas Scholarship, Government of India, 1989-1990 for Ph.D.
2. **2. *Schlich Prize*** for Best Research Paper in Forestry in 2009 by *The Indian Forester*.
3. **3. *S.K. Jain Medal*** from Association of Plant Taxonomy for the year 2012.
4. RBG, Edinburgh Associate (2009) (40 days).
5. DBT Overseas Associate (2014) to South Korea (3 months).



**The Regional Centre has established a full fledge plant molecular taxonomy laboratory.**

Presently, the lab. has 3 research scholars.



## **FUTURE PLAN OF RESEARCH**

1. Completion of Flora of Nagaland
2. Completion of Flora of Manipur
3. Completion Flora of all WLS, NP, Biosphere Reserves in NE India
4. Bioprospecting of Medicinal and wild edible plants of NE
5. To develop a strong Unit of Plant Molecular Taxonomy Unit to solve problematic taxa in classical plant taxonomy using modern molecular tools.



# THANK YOU



***Cordiceps sinensis***