

**DR VINEET KUMAR RAWAT**  
**Scientist-D & HOO**  
**BOTANICAL SURVEY OF INDIA,**  
**APRC, ITANAGAR**

Joined as JRF in 16<sup>TH</sup> May 2001 and SRF in 2003 at BSI,  
CRC, ALLAHABAD in AICOPTAX –PTERIDOPHYTES

# Pteridophytes of Mehao Wild Life Sanctuary, Lower Dibang Valley, Arunachal Pradesh



FOR THE  
DEGREE OF  
DOCTOR OF PHILOSOPHY



**VINEET KUMAR RAWAT.**

[AICOPTAX-PTERIDOPHYTES, Funded By MoEF & CC]

Supervisor  
Dr. T. R. Sahu

Co-Supervisor  
Dr. R. D. Dixit

DR H. S. GAUR UNIVERSITY, SAGAR, MP ..... BSI, CRC, ALLAHABAD

(JRF and SRF): Taxonomic Study of Pteridophytes in MWLS, Arunachal Pradesh  
Joined as JRF in 16<sup>TH</sup> May 2001, at BSI, CRC, ALLAHABAD

## Progress of work done during the Research from April 2001 to January 2007

<b>Number of Tours</b>	<b>5</b>
Field no. collected/identified species	More than 1000/207
Descriptions prepared with illustrations	All 207 species
New Record from State/India	16/2
Papers published during Phd work	22
New species/ Rediscovered taxa after 50 years	2/4
Herbarium Consultation tour	04
RET taxa/medicinal importance	17/21

## Other than PhD work

- Joined Environment Planning and Coordination organisation, Bhopal (EPCO) in October 2007 with Dr R. P. Singh.
- Project-Taxonomical Study in Pachmarhi and Achanakmar Amarkantak Biosphere Reserve.
- Received MAB UNESCO committee status for WORLD HERITAGE SITE.
- Documented 86 fern species from this area.
- Participated in Socio-Economical activities



# Received DST Young Scientist

(w.e.f. November 2009-October 2010)

- Worked in NBRI, Lucknow with Dr P. B. Khare (Pteridology Lab)
- Project: Studies on the species richness of Pteridophytic Diversity of Itanagar Wild-Life Sanctuary.
- Documented 127 ferns and allied species with some interesting findings.
- (Report submitted to DST)



Joined as Scientist-C in BSI, WRC, Pune on 8<sup>th</sup> October 2010

**FERNS OF MAHARASHTRA (OCTOBER 2010- March 2013)**

<b>Number of Tours</b>	<b>8</b>
Field no. collected/identified species/genus/families	More than 400 f. no./92/46/24
Descriptions prepared with illustrations	All 92 species
New Record from State	7
Papers published during this Project	7
Rediscovered species	2
Herbarium Consultation tour	02
RET taxa/medicinal importance	17

# Interesting findings

- *Annogramma leptophylla* (Small fern)
- *Botrychium*
- *Osmunda regalis*
- *Actiniopteris radiata*
- *Asplenium inaquileterale*
- *Adiantum conicinnum*
- *Nephrolepis undulata*
- *Aleuritopteris rufa*
- *Pteris blumiana*
- Some filmy ferns (*Crepidomanes spp.*)
- *Angiopteris evecta*
- *Isoetes and Ophioglossum* (4 and 5 species)
- (From Panchgani, Mahabaleshwar, Lonawala, khandala)

# Project: TAXONOMIC STUDY OF FAMILY POLYPODIACEAE OF NORTH-EAST INDIA

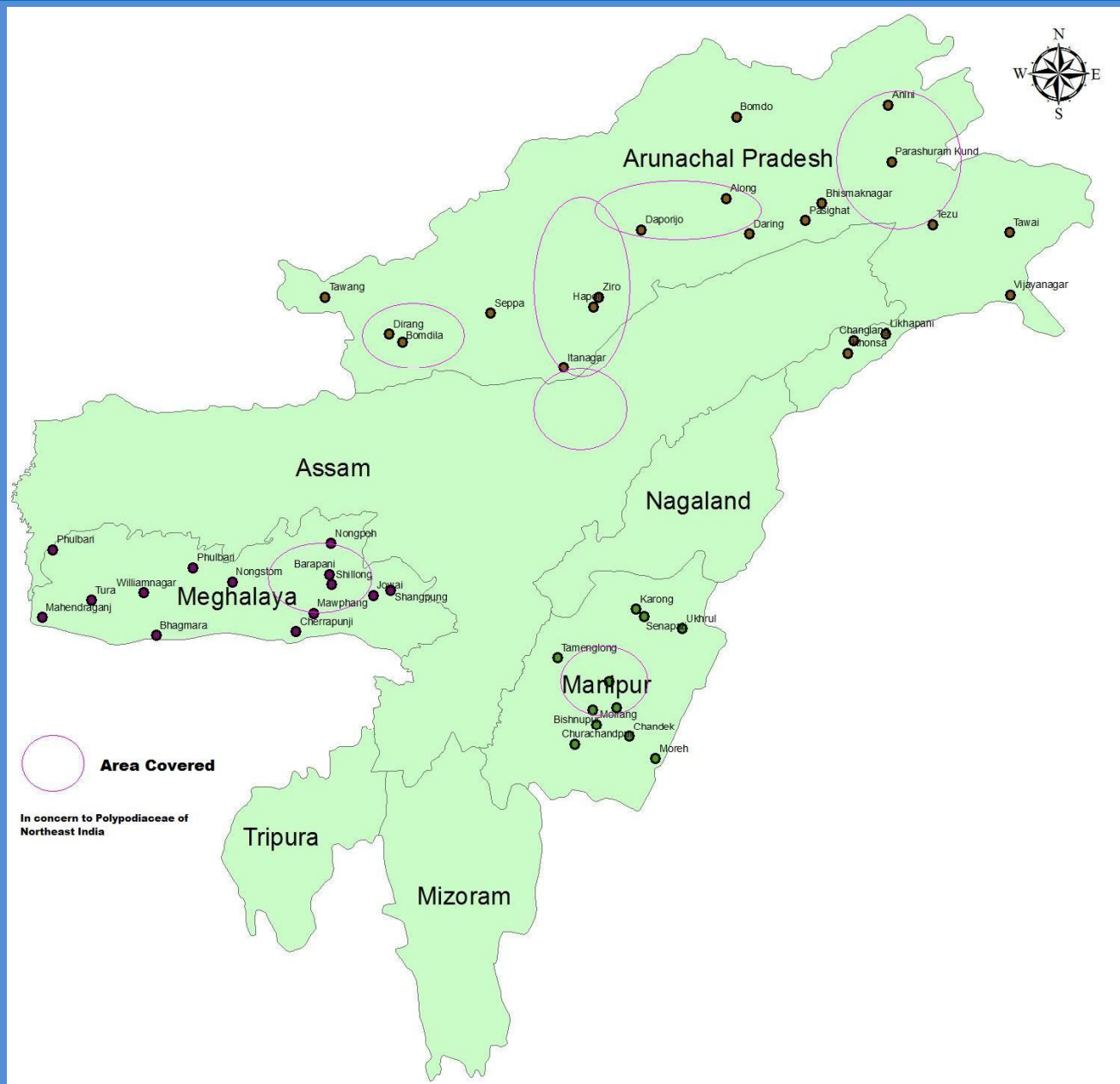




## Objectives

- To find out the present Diversity and Distribution status of Polypodiaceae Family (largest family) in the North-East India (Part of Hot Spot).
- Documentation and Taxonomic treatment.

# Study Area Map: Surveyed area from April 2013 to January 2017 (7 Field Tours)



Cont..

## Surveyed Area

➤ Dibrang Valley, Lower Dibrang Valley and Lohit Districts including Dihang-Dibrang Biosphere Reserve

2014-15

- ✓ Anjaw, Lower Dibrang valley, Zero (Lower Subansiri District)
- ✓ Manipur (Thoubal District)

2015-16

➤ Kurungkumey, East, West and Upper Siang and Lower Subansiri Districts.

➤ **Meghalaya** (Pynarsula, Shillong Peak, Upper Shillong, Nearby Shillong)

## Special work other than project

- Expedition tour carried out w.e.f. 01/05/16-06/05/16 to Nagajiji, Omaliang lake in West Kameng District.
- Collected 67 field nos and found some interesting Hymenophyllum species.
- Identified into 48 species.



<b>Number of Tours</b>	<b>7</b>
Field no. collected/identified	1205/1180
Descriptions prepared	75
Illustrations prepared	68
Papers published/ communicated	18/08
Herbarium Consultation tour	03
Identification done for the unidentified specimens kept at ARUN.	206
Identification done for research scholars, Scientist and other	178

## Progress of work during the period from April 2013 to January 2017

- Prepared line drawing of 68 species including Fronds, Pinna, pinnule, Veins, sori pattern of pinna, Rhizome and spores to describe species.
- Prepared description of 75 species.
- RET species listed for this project- 17.
- Recorded 6 new record to Arunachal Pradesh, 1 for India.
- And find out 3 species as new (concern work for confirmation is in progress)
- Introduced 37 ferns species in BSI, Garden for conservation point of view.



## Facts about Family Polypodiaceae

- **Polypodiaceae** is a Family of polypod ferns which includes more than 65 genera divided into several tribes and containing around 1,000 species. Nearly all are epiphytes, but some are terrestrial.
- More than 250 genera and ca. 1,2000 species of Pteridophytes in world: Pantropical.
- Polypodiaceae represents 65 genera in world, only 27 genera are reported from India, of which 24 genera have been reported from Northeast India.
- This family is the largest family with ca 27 genera followed by Thelypteridaceae (21genera) and Athyriaceae (14 genera).

### ***Analysis of the Family Polypodiaceae in Northeast India ( On the basis of Preliminary Study)***

**Genus in Northeast India: ca 24 (27genera in India)**

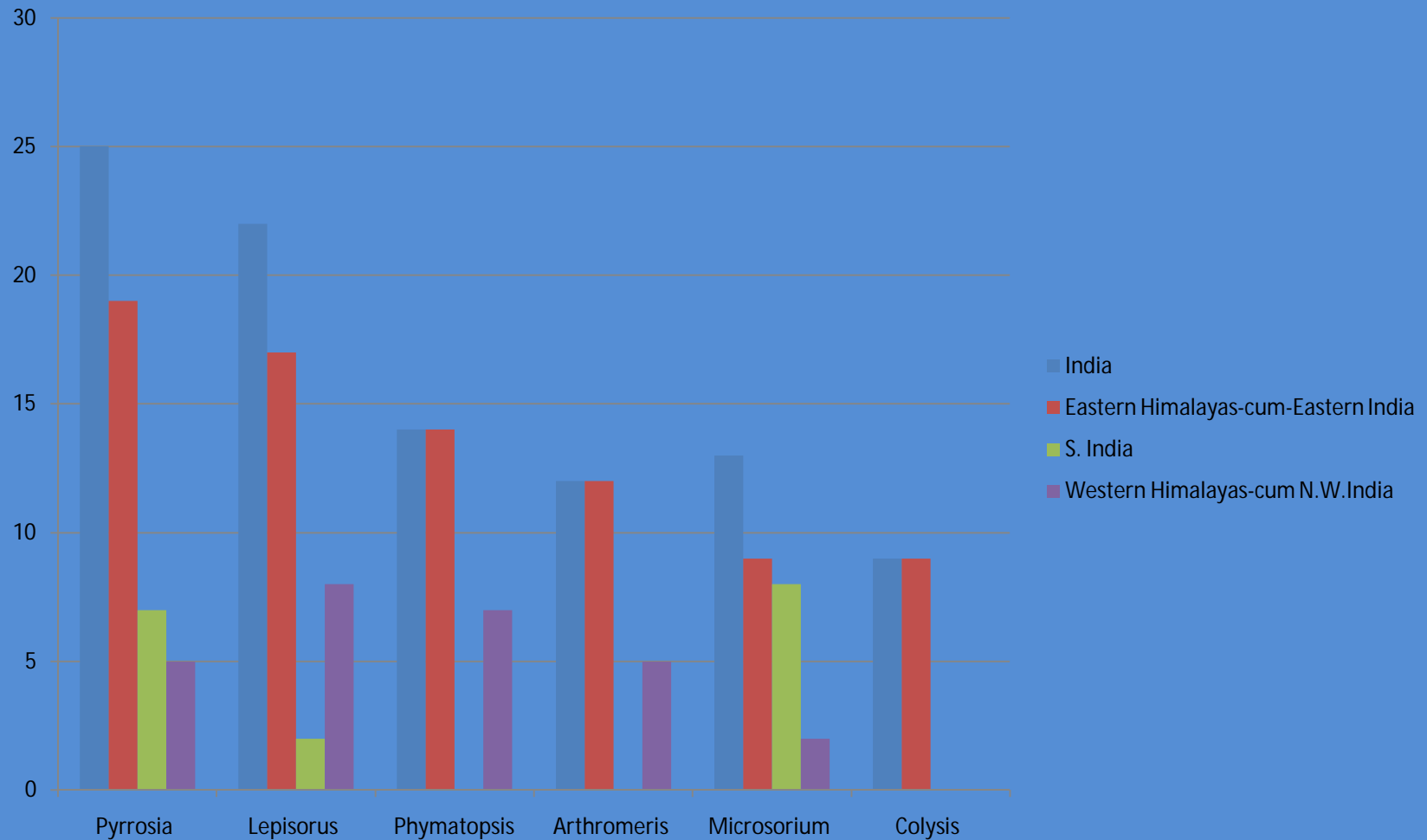
**Species no in Northeast India: ca 100 now** 123

# Family Polypodiaceae (Summary)

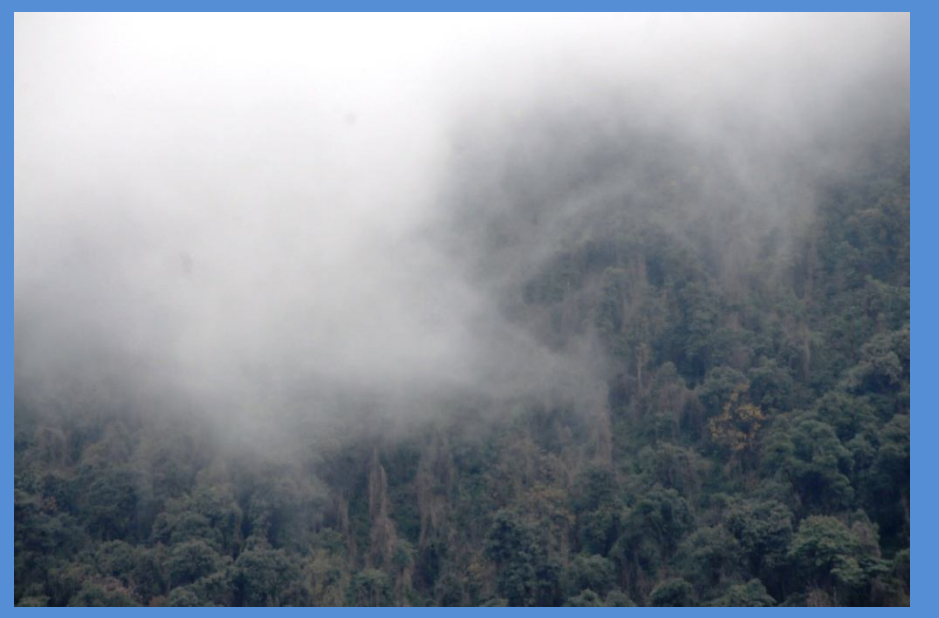
<p><b>Total genera in World/India</b>          Copeland (1947) included as many as 65 genera in the family Grammitiidae Swartz and other allied genera like Loxogramme (Bl.) Presl.</p>	<p>(65/45/27)          45 according Ching          65...Copeland</p>
<p><b>Total no. of species in India/North-East India</b>          In annotated catalogue (Bir 1989) the Pteridophytes of the North-East India, 59 species of fern allies and 500 species of fern allies are listed indicates that this region is the richest region. In this paper Bir S. S. reported 100 species in Polypodiaceae family within 22 genera.</p>	<p>157/123</p>
<p><b>Total No. of genus India/ North-East India</b>          Polypodiaceae is not only the largest family in India but also in the North Eastern India while its position becomes third in Western Himalayas and fifth in Western Ghats.</p>	<p>27/24</p>
<p><b>Largest Genus in North-East India</b>          Among the genera <i>Pyrrosia</i> (19 spp.) is the larger with 19 species  <b>At generic level <i>Pyrrosia</i> shows the maximum species diversity with 19 species followed by <i>Lepisorus</i> (17 spp.) <i>Phymatopsis</i> (14 spp). <i>Arthromeris</i> (12 spp. each). <i>Microsorium</i> and <i>Colysis</i> are found with 9 species each.</b></p>	<p>19 spp (<i>Pyrrosia</i>)</p>
<p><b>Pteridophytes in India Spp.</b></p>	<p>1021 species</p>
<p><b>Pteridophytes in India genera/ family.</b></p>	<p>250/ 47</p>



# Status of Genus and spp in different regions



# FIELD STUDY





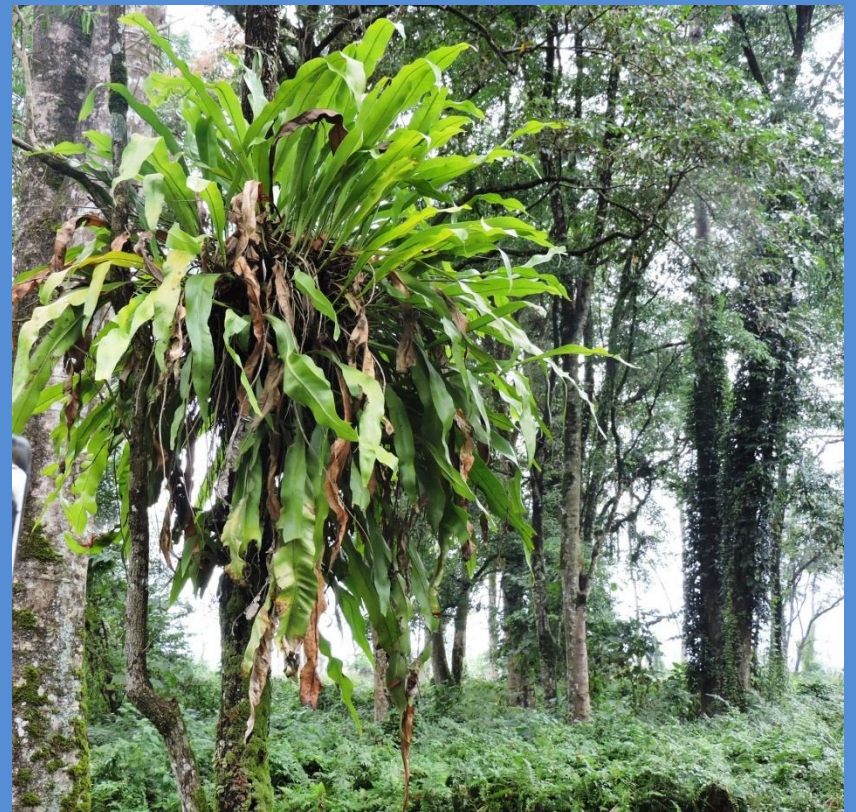
**Tropical Wet Evergreen *Dipterocarpus* Forests**



**Lohit and Dihing to Brahmaputra**

# DURING FIELD TOUR TO WEST SIANG















*Arthromeris wallichiana* (Spreng) Ching



*Matteuccia orientalis* (Hook.) Trev.



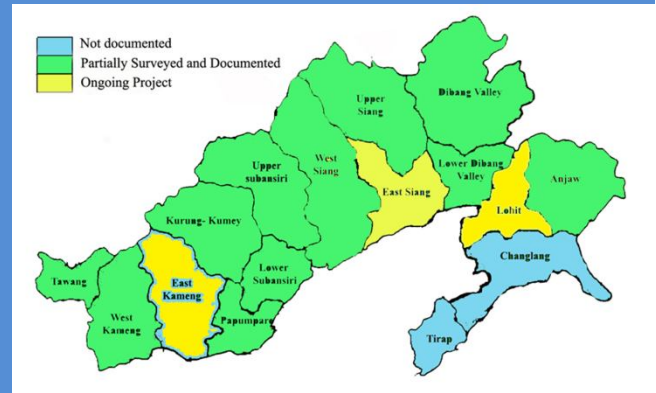
Epiphytic fern



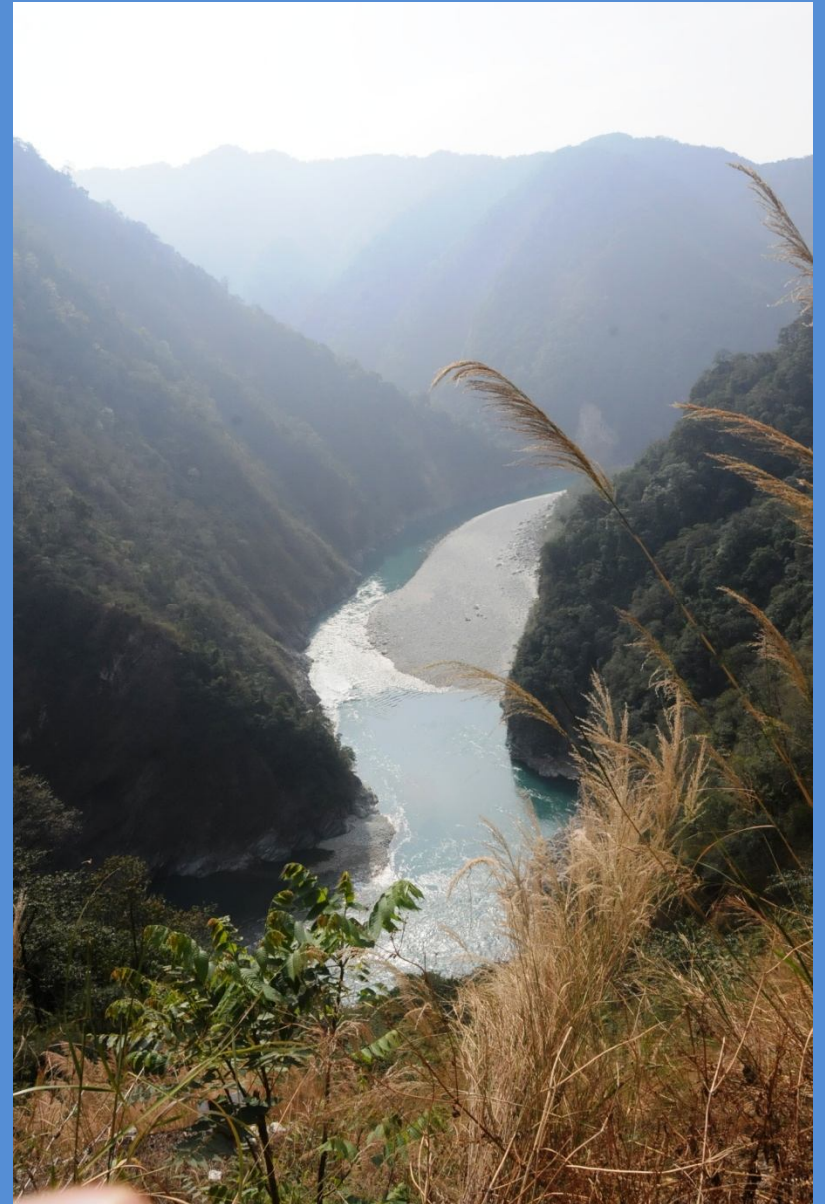
*Pyrrosia subfurfuracia* (D. Don.) Ching

**PTERIDOPHYTE DIVERSITY IN ARUNACHAL PRADESH**



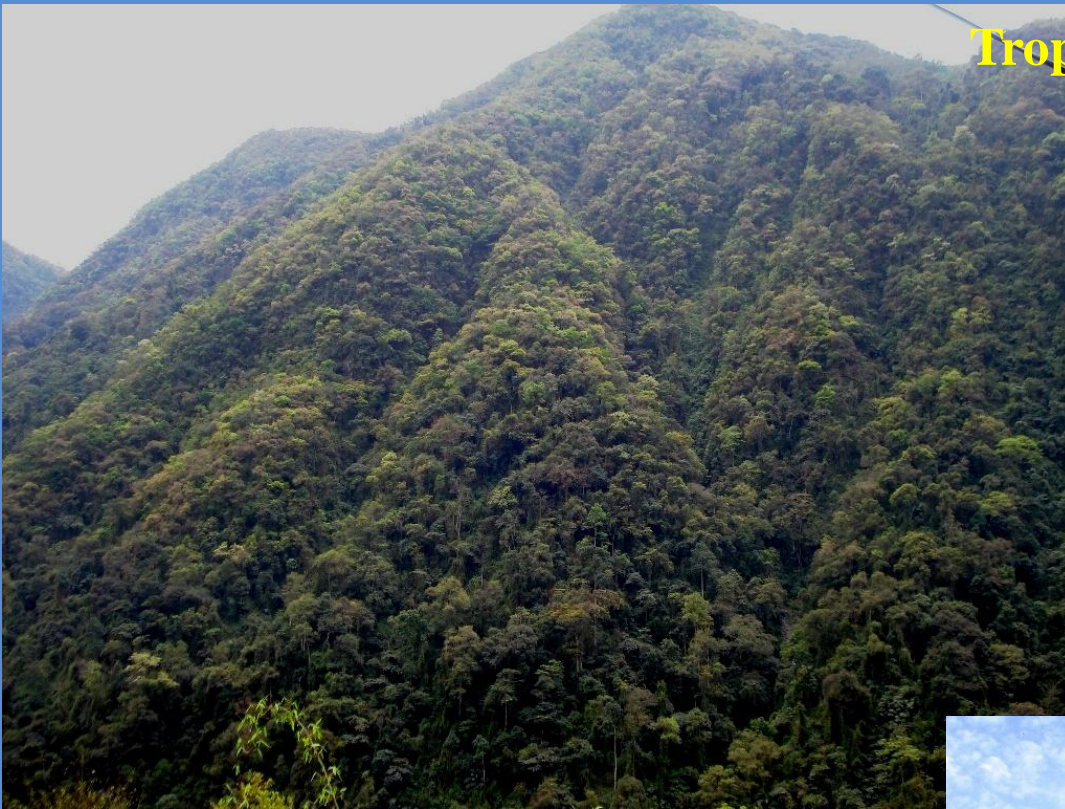


Sub-tropical Pine forests (*Pinus merkusii*) in  
Walong, ANJAW DIST



Lohit River

**Tropical Evergreen forest near Khupa,  
ANJAW DISTRICT**



**Sub-tropical forests of ANJAW DISTRICT**



# Herbarium Study

## Visited Herbaria:

During Herb. Consultation consulted sheets-  
3000 sheets/ identified 220 sheets

- CNH-CAL
- NBRI-LWG
- BSI, CRC-BSA
- BSI, SHILLONG-ASSAM
- BSI, APRC, ITANAGAR- ARUN
- SFRI, ITANAGAR



*A. tenuicauda* *Arthromeris wallichiana* (Spreng.) Ching



*Arthromeris mairei* (Brause) Ching



*Arthromeris lehmannii* (Mett.) Ching

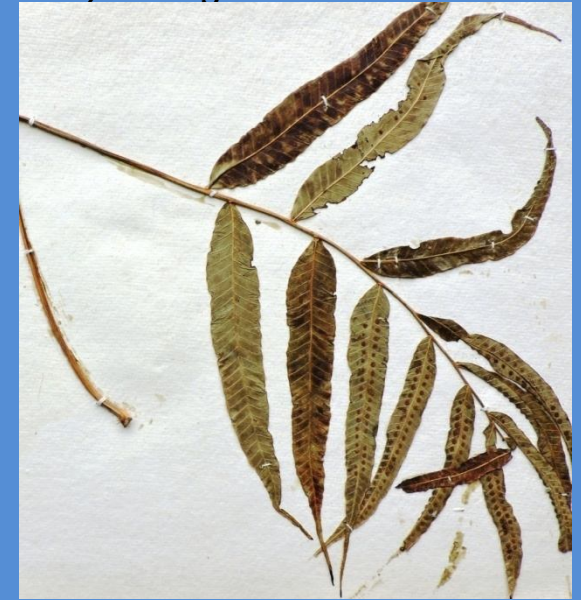




*Arthromeris wardii* (C.B.Clarke) Ching



*Arthromeris tatsienensis* (Franch. & Bureau ex Christ) Ching



*Arthromeris himalayensis* (Hook.) Ching



*Belvisia henryi* (Hieron. ex C.Chr.) Raymond



# Tours to be undertaken

- One proposed field tour to East and West Kameng and Tawang w.e.f. 01 March to 10<sup>th</sup> March 2017.

## Papers Published during 2013-17 from allotted project & communicated:

<b>PAPER PUBLISHED UP TO 2017 Dec.</b>	<b>18</b>
Book chapters published	6
Hindi article published	4
Abstract published	17
Paper communicated	10
Book in final stage (Checklist of Arunachal Pradesh-Pteridophytes)	1

# Target for the Taxonomic Study of Family Polypodiaceae of North-East India 2016-17

**Q1, Q2 & Q3 Identification, Listing, Description writing of the collected ferns species.**

**Q4. One field tour to West and East Kameng, Arunachal Pradesh and finalization of manuscript**



## Administration work

- Carried out duties of Technical Section and preparation/ compilation of all Monthly, Quarterly, Annual, E-news, RTI, Reports of organized events and other reports/ letters and correspondence with HQ.
- Rendered duties of DDOs Time to Time.
- Carried out duties of In charge. Purchase, Medical, Hindi Implementation committee and technical section.
- Attended Land related matters, meetings, seminars/ symposia, trainings and delivered lectures time to time.
- Worked as Liaison officer in Local (PAO Audit) and Scientific audit and prepared answers of all queries with the help of concerned officials and maintenance of files.
- HOO of APRC w.e.f. 30st NOV 2016.

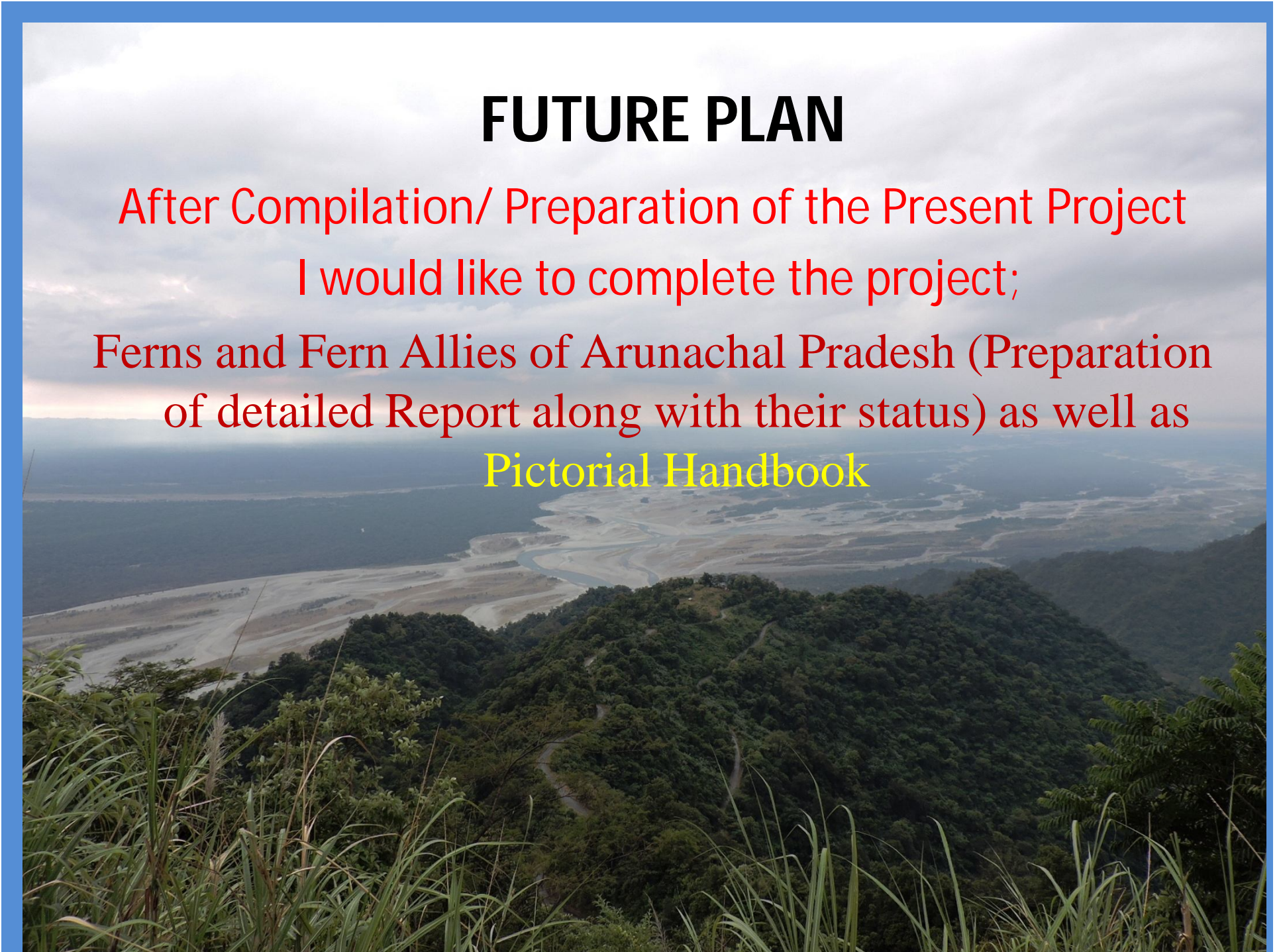


# Member

- Project Reviewing committee of SFRI, Itanagar.
- State Biodiversity Board.
- Wildlife/Tiger Reserves / Management committee.
- Member for Medicinal Plant Board,
- Dihang-Dibang Biosphere Reserve Committee.
- Hindi Rajbhasha Karyanban Commiittee (NARACAS).

# FUTURE PLAN

After Compilation/ Preparation of the Present Project  
I would like to complete the project;  
Ferns and Fern Allies of Arunachal Pradesh (Preparation  
of detailed Report along with their status) as well as  
**Pictorial Handbook**





## Award

- ***Received S. S. BIR Gold medal in Pteridology from Indian Fern society, Chandigarh. in Pteridophytes conference held at Palampur, Himachal Pradesh***





**I request you all to  
Protect the Phytodiversity**

## Some more work I would like to do as HOO in BSI, APROC

- **Museum:** Preparation of posters/framing of different plant groups/preserved specimens.
- **Library:** Re-subscription of Imp journals/ Books/ Publications.
- **Garden:** Preparation of One project related to garden with the help of NMPB agency through proper channel.
- **Technical section:** Timely Submission of All Reports.
- **Store:** Annually verification.
- **Hindi Rajbhasha:** Preparation of bilingual form of official documents etc.
- **Office Maintenance:** Pursue CPWD deptt. for timely execution of work
- **Herbarium :** Digitization work/timely maintenance



# Annual Extra Curricular Activities

- One Workshop on Nomenclature/Taxonomy Basics/ Herbarium methodology for researchers/ Students.
  - (I want to conduct one work. And seminar for the local community)
- One seminar/ Symposia in next financial year.
  - Which will beneficial for the students/ researcher
  - since inception no RCM meeting was held in Itanagar, I WOULD LIKE TO propose one such meeting

## Acknowledgment

I am very much thankful to our Respected Director Sir, Pathak Sir, Padhey Sir, Sinha Sir, Mao sir and all the seniors for their guidance/ suggestions and support for the betterment of the centre.





THANK YOU