



**Name: Avishek Bhattacharjee**  
**Designation: Scientist 'B'**  
**Total tenure in BSI: 12 years 6 months +**

**Research Fellow** under '**Flora of India**' scheme: **01.10.03 - 30.09.08 (CNH)**

Topic: **Revision of the subtribe Goodyerinae (Orchidaceae) in India**

Supervisor: **Dr. H.J. Chowdhery**

Period: Report submitted in **2009 (under publication as 'Fascicles of Flora of India 28')**

Title of the Ph.D. thesis: **Taxonomic studies on the subtribe Goodyerinae Klotzsch (Orchidaceae) in India.**

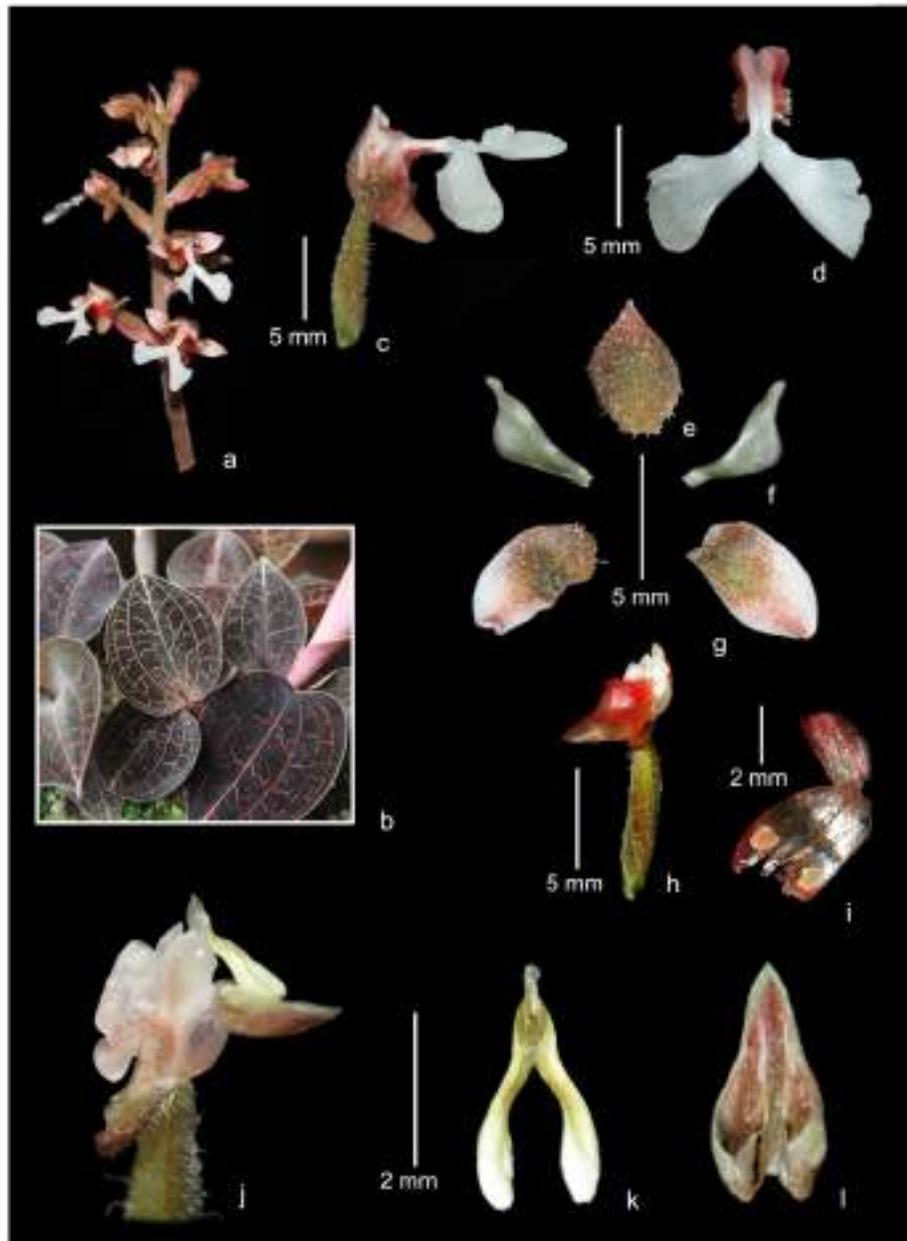
University: **Vidyasagar University, Midnapore, West Bengal**

Date of Ph.D. degree award: **15.02.2011**

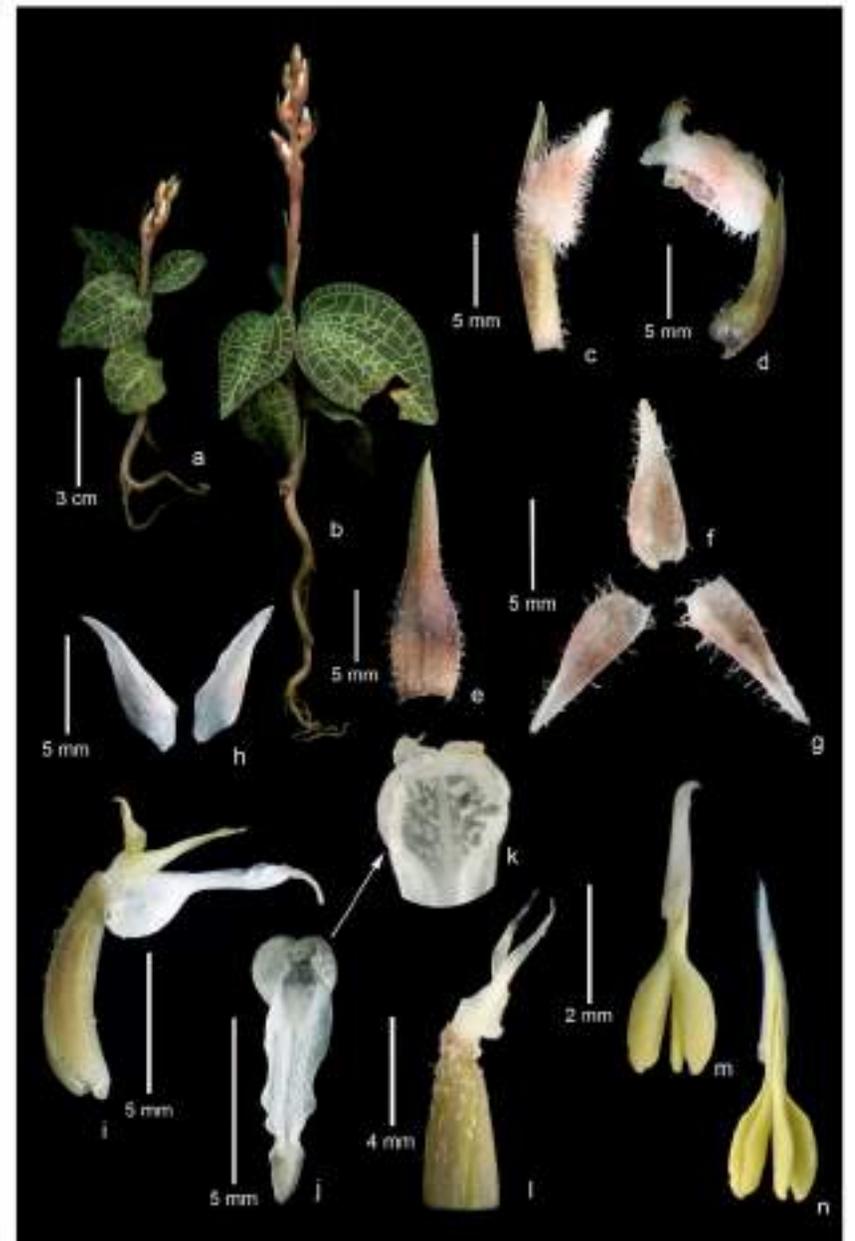
### **Publications from this project**

Papers published: **41**

Book under publication: **1**



***Anoectochilus brevilabris* Lindl.**



***Goodyera hemsleyana* King & Pantl.**

**Research Associate (first as RA I and then as RA II)** under **ICMR** funded collaborative project with Bose Institute, Kolkata: **15.01.09–30.04.13**

Project: **Advanced Research in DNA Finger Printing and Diagnostics of Medicinal Potential in Plants from Eastern and North East India.**

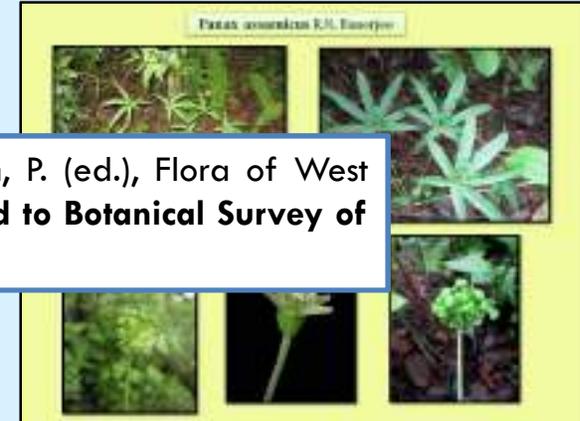
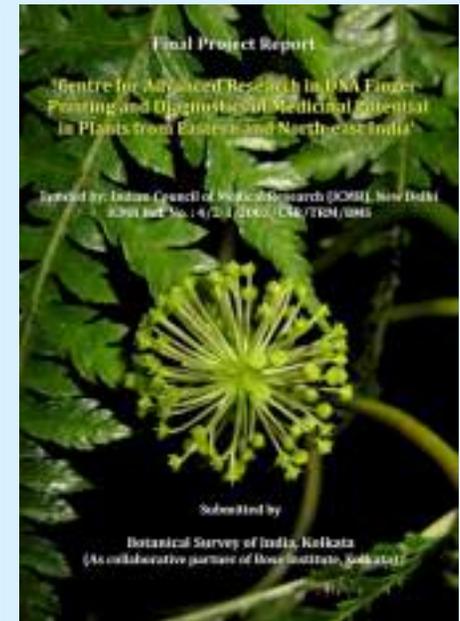
PI: **Prof. Swati Sen-Mandi**, Bose Institute, Kolkata

Co-PI: **Dr. M.S. Mondal** (15.01.09–31.12.09); **Dr. P. Lakshminarasimhan** (01.01.10–30.04.13)

**Targeted species (in original proposal):** *Acorus calamus* L., *Curcuma longa* L., *Digitalis purpurea* L., *Panax pseudo-ginseng* Wall., *Picrorhiza scrophulariiflora* Pennell, *Podophyllum sikkimense* R. Chatterjee & Mukerjee, *Zanthoxylum acanthopodium* DC., *Z. oxyphyllum* Edgew., *Zingiber montanum* (J.König) Link ex A. Dietr.

**Report submitted in 2013**

**Papers published: 2**



**Bhattacharjee, A.** & A.A. Ansari. ----. *Lauraceae*. In: Lakshminarasimhan, P. (ed.), *Flora of West Bengal*, vol. 5. Botanical Survey of India, Kolkata. (**Manuscript submitted to Botanical Survey of India on 20.09.2011 for publication**)

SERB-Young Scientist: 02.09.13–31.12.16

Project: Inventorization of Indian *Calanthe* (Orchidaceae) with focus on micro-morphology of pollinia

A report (up to 100 pages)

before the Ex

held at Manip

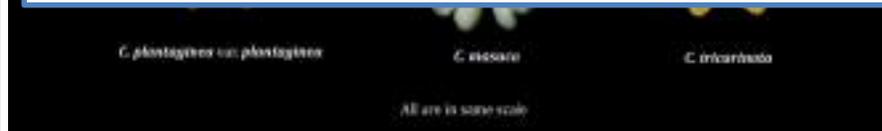
satisfied with

work.

Papers publis



Attended '9th International Symposium on Diversity and Conservation of Asian Orchids' (Fuzhou City, China from 15 – 17 November 2013) and delivered a presentation in the symposium as an invited speaker (with full sponsorship from the Wildlife Conservation and Nature Reserve Management, State Forestry Administration, China and Fujian Agriculture and Forestry University, China).



## Scientist 'B': 17.04.15 - till date

### WORK DONE AFTER APPOINTMENT

**Projects (under Annual Action Plan):**

**Date of allotment: 04.08.2015**

Bihar	12 genera, 19 species
Jharkhand	15 genera, 24 species, 4 varieties

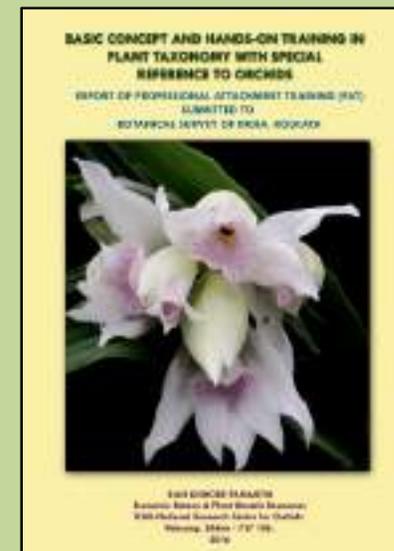
**1. Flora of Bihar, vol. 2 (Apiaceae, Araliaceae, Alangiaceae)**

**2. Flora of Jharkhand, vol. 2 (Apiaceae, Araliaceae, Alangiaceae)**

The work is almost complete and the **final report will be submitted in March 2017.**

APIACEAE		Bihar	Jharkhand
BUPLEURUM	B. falcatum var. biharensis	—	+
	B. ramosissimum var. wightii	—	+
CENTELLA	C. asiatica	+	+
CNIDIUM	C. monnieri	+	—
ERYNGIUM	Eryngium foetidum	+	—
HYDROCOTYLE	H. sibthorpioides	+	+
LIGUSTICUM	L. alboalatum	—	+
OENANTHE	O. javanica	+	+
PEUCEDANUM	P. dhana var. dalzelli	—	+
	P. nagpurensis	+	+
PIMPINELLA	P. bracteata	—	+
	P. heyneana	—	+
	P. wallichiana	—	+
PYCNOCYCLA	P. glauca	—	+
SESELI	S. diffusum	+	+
TRACHYSPERMUM	T. ammi	+	+
	T. roxburghianum	+	—
	T. villosum	+	—

APIACEAE		Bihar	Jharkhand
<b>CULTIVATED</b>			
	Anethum graveolens	+	+
	Coriandrum sativum	+	+
	Cuminum cyminum	+	+
	Daucus carota	+	+
	Foeniculum vulgare	+	+
	Pastinaca sativa	—	+
<b>ARALIACEAE</b>			
ARALIA	A. armata	—	+
HEDERA	H. nepalensis	+	—
HETEROPANAX	H. fragrans	+	+
SCHEFFLERA	S. venulosa var. venulosa	—	+
	S. venulosa var. roxburghii	—	+
TREVESIA	T. palmata	—	+
<b>CULTIVATED</b>			
	Panax cochleatum	—	+
	Polyscias fruticosa	—	+
<b>ALANGIACEAE</b>			
ALANGIUM	A. chinense	+	—
	A. salviifolium	+	+



**(17.04.15 – till date)**

**BSI e-newsletter:** Designed, compiled **3 issues** and designed, compiled, edited (with Dr. V.S. Kumar, CNH) **11 issues** of BSI e-newsletter.

**Training/guidance provided:** Imparted training (**3 months**) to **1 Scientist** of ICAR-NRC Orchids, Pakyong and **guided 2 M.Sc. (Part II) students** of Environmental Science of Jogamaya Devi College P.G. Study Centre, Vidyasagar University, Midnapore for their M.Sc. project works.

**Training imparted as resource person in workshops/seminars: 6**

**On Botanical nomenclature: 2** (BSI ERC, Shillong; CNH, Howrah)

**On basics of taxonomic revision: 1** (BSI WRC, Pune)

**On orchids: 3** (CNH, Howrah; Surendranath College, Kolkata; Muralidhar Girls College, Kolkata)

**Training program attended:** 'Communication Skills and Time Management' from Institute of Govt. Accounts & Finance, Regional Training Centre, Kolkata.

**Seminars attended (enrolled) and delivered presentations:** 3 (2 International, 1 National)

**Publications:** 19 papers (14 in SCI journals with Impact Factor) and submitted revised manuscript of a book (under publication as 'Fascicles of Flora of India 28') during this period.

**Manuscript reviewed:** 8 (3 for *Rheedea*, 1 for *Phytotaxa*, 1 for *Annals Botanici Fennici*, 2 for *Bangladesh Journal of Plant Taxonomy* and 1 for *Annals of Plant Sciences*).

### Administrative/other works

Performed duties as **in-charge of monocot type herbarium** (16.10.15– 27.03.16) and then as **in-charges of dicot type herbarium, Technical Section (deals with sending/receiving specimens/types/images on loan/gift and specimen/type/literature related communications with other units/centres of BSI as well as different Indian and foreign institutions/Universities)** and **Mounting Section** (28.03.16 to till date).

Performed duties as a member of several committees in BSI and executed several works as and when instructed by HoO, CNH and other senior scientists of BSI, Hqrs.

## SIGNIFICANT CONTRIBUTION IN RESEARCH

### New species: 5

1. ***Zeuxine pantlingii*** Av. Bhattacharjee & H.J. Chowdhery  
[*Sida* 22: 935 2006]
2. ***Z. chowdheryi*** Av. Bhattacharjee & C.M. Sabap.  
[*Taiwania* 55: 342 2010]
3. ***Amitostigma pathakianum*** Av. Bhattacharjee  
[*Phytotaxa* 230: 268. 2015]
4. ***Asystasia indica*** H.J. Chowdhery & Av. Bhattacharjee  
[*Indian J. Forest.* 29: 211. 2006]
5. ***Strobocalyx mastersii*** B. Bhattacharjee, Lakshmin., S.K. Mukherjee & Av. Bhattacharjee [Phytotaxa ---. 2017 (accepted)]



*Zeuxine chowdheryi*

### New synonyms (12)

- *Cheirostylis chinensis* Rolfe var. *glabra* M. Bhaumik & M.K. Pathak
- *C. seidenfadeniana* C.S. Kumar & F.N. Rasm.
- *Erythrodes seshagiriana* A.N. Rao
- *Gastrochilus jeitouensis* Ormerod
- *Goodyera dongchenii* Lucksom
- *G. dongchenii* var. *gongligongensis* X. H. Jin & S. C. Chen
- *Zeuxine assamica* I. Barua & K. Barua
- *Z. bidupensis* Aver.
- *Z. dhanikariana* Maina, Lalitha & Sreek.
- *Z. hainanensis* H. Xu, H. J. Yang & Y. D. Li
- *Z. pantlingii* Av. Bhattacharjee & H.J. Chowdhery
- *Z. seidenfadenii* Deva & H.B. Naithani



*G. hemsleyana*



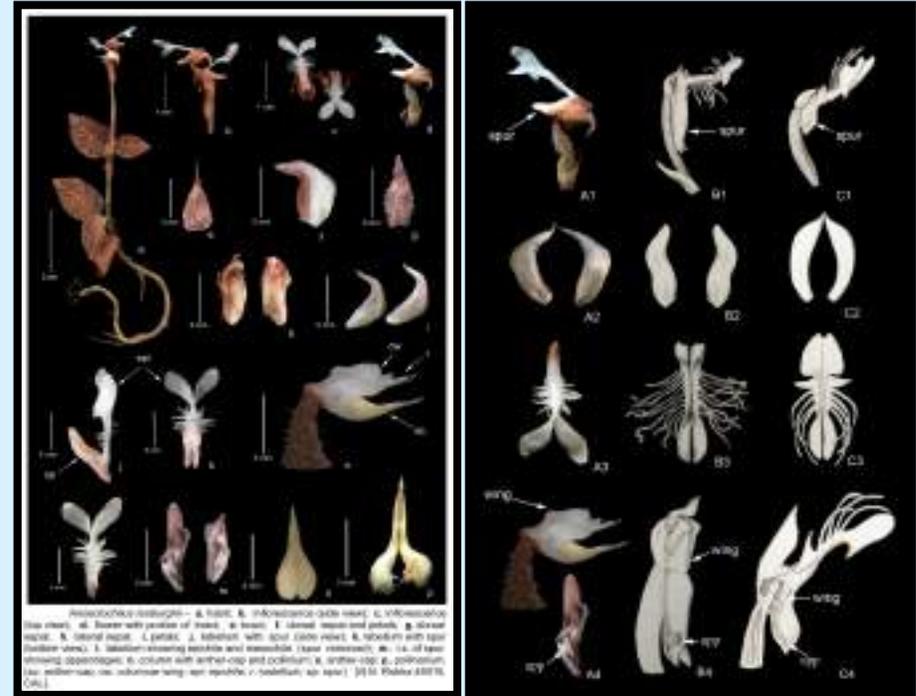
*Z. assamica*

### Names excluded from synonymy

1. **Anoectochilus roxburghii** (Wall.) Lindl.
2. **Erythrodes seshagiriana** A.N. Rao

### Species reinstated:

1. **Anoectochilus regalis** Blume
2. **Vrydagzynea viridiflora** Hook. f.  
(also a rediscovery after more than 130 years)



### New combinations:

1. **Odontochilus tetrapterus** (Hook. f.) Av. Bhattacharjee & H.J. Chowdhery  
[≡ *Anoectochilus tetrapterus* Hook. f.]
2. **Goodyera schlechtendaliana** Rchb. f. **var. robusta** (Hook. f.) Av. Bhattacharjee & H.J. Chowdhery  
[≡ *Goodyera robusta* Hook. f.]
3. **Rhomboda pulchra** (King & Pantl.) Ormerod & Av. Bhattacharjee  
[≡ *Zeuxine pulchra* King & Pantl.]

### New records for India:

1. *Calanthe hancockii* R. Br.
2. *Eria merguensis* Lindl.
3. *Zeuxine agyokuana* Fukuy.
4. *Zeuxine grandis* Seidenf.
5. *Leonotis nepetifolia* (L.) R. Br. var. *africana* (P. Beauv.) J.K. Morton



*Z. grandis*



*Z. agyokuana*

### Species excluded from India:

1. *Anoectochilus regalis* Blume
2. *Rhomboda abbreviata* (Lindl.) Ormerod



*A. regalis*

### New reports for Indian States/Union Territories/ Phytogeographic regions:

1. *Alpinia conchigera* Griff. – for Andaman & Nicobar Islands
2. *Cheirostylis parvifolia* Lindl. – for Eastern Ghats
3. *C. yunnanensis* Rolfe – for West Bengal
4. *Etilingera linguiformis* (Roxb.) R.M. Sm. – for Andaman & Nicobar Islands
5. *Odontochilus clarkei* – for Arunachal Pradesh, Sikkim
6. *Zeuxine affinis* (Lindl.) Benth. ex Hook. f. – for Arunachal Pradesh
7. *Z. agyokuana* Fukuy. – for Meghalaya
8. *Z. clandestina* Blume – for West Bengal
9. *Z. lindleyana* A.N. Rao – for West Bengal



*Z. lindleyana*



## Typifications (17; includes lectotypification, epitypification, neotypification)

**Baeolepis nervosa** Decne. ex Moq., **Crysobaphus roxburghii** Wall., **Decalepis hamiltonii** Wight & Arn., **Goodyera affinis** Griff., **Goodyera hemsleyana** King & Pantl., **Goodyera hirsuta** Griff., **Goodyera viridiflora** Blume, **Habenaria dyeriana** King & Pantl., **Herminium gracile** Breda, **Hetaeria fusca** Lindl., **Pentanura khasiana** Kurz, **Psychechilos gracile** Breda, **Saccolabium pseudodistichum** King & Pantl., **Zeuxine agyokuana** Fukuy., **Zeuxine pulchra** King & Pantl., **Zeuxine reflexa** King & Pantl., **Zeuxine rolfiana** King & Pantl.

## Phylogenetic study on Asiatic **Goodyera**

### Red Listing of **Zeuxine rolfiana** King & Pantl.

The screenshot shows the IUCN Red List entry for *Zeuxine rolfiana*. The page includes a photograph of the plant, a distribution map of India with a red circle indicating the species' range, and a table of taxonomic data.

Region	Threat	CGA	DNA	Assess
Andhra Pradesh	Threatened	1000000	1000000	1000000

**Conservation Status:** Endangered (EN) (B1, B2, B3, B4, B5, C1, C2, C3, C4, C5, D, E)

**Assessment Information:** The species is listed as Endangered (EN) because it has a very restricted range and is known from only a few localities. It is threatened by habitat loss and over-exploitation for medicinal purposes.

The screenshot shows the abstract and introduction of a PLOS ONE article. The title is "Phylogenetic Analysis of a 'Jewel Orchid' Genus *Goodyera* (Orchidaceae) Based on DNA Sequence Data from Nuclear and Plastid Regions".

**Abstract:** A molecular phylogenetic analysis of the jewel orchid genus *Goodyera* (Orchidaceae) is presented based on DNA sequence data from nuclear and plastid regions. The analysis reveals a highly diverse and complex phylogeny within the genus, with several new species identified. The results support the monophyly of the genus and provide a robust framework for future taxonomic and conservation studies.

**Introduction:** The genus *Goodyera* is one of the most diverse and complex genera within the subtribe Jewel Orchids (Goodyerinae) of the subfamily Goodyeraceae. It is characterized by its highly ornate and colorful flowers, which are often found in high-altitude or high-latitude environments. The genus is distributed across a wide geographic range, from the Himalayas in the north to the Andes in the south. Despite its diversity, the phylogeny of the genus has remained largely unresolved due to the lack of molecular data.

Number of projects carried out: **5**

Number of books written/compiled/edited individually as well as jointly:

**1 (under publication)**

Chapters in book: **5 (4 published, 1 accepted for publication in BSI)**

Number of papers published individually/ first author as well as jointly/co-author: **75**

Number of – new taxa: **5; new combinations: 3; new reports: 13 (India: 5; Region/States: 9)**

Papers: **75**

**(29 in SCI journals with Impact Factor)**

**In Foreign Journals: 45; In Indian Journals/proceedings: 30**

Journals	No. of papers
Taxon	10
Plos one	1
Phytotaxa	5
Ann. Bot. Fennici	3
Candollea	1
Novon	1
Telopea	2
Current Science	4
Kew Bulletin	2
Taiwania	6
Sida	1
Journal of Japanese Botany	2
Journal of Threatened Taxa	2
Rheedea	1
Others	34
<b>Total</b>	<b>75</b>

The collage features several scientific publications. At the top left is a journal cover for 'TELOPEA - Journal of Plant System' with the title 'A rare species of Calanthe R.Br. first time from India'. Below it is an article page titled 'Lectotypification of the name *Chrysodaphne roxburghii* (Orchidaceae)'. To the right is another article page titled 'Transfer of *Anoectochilus tetrapterus* to *Odontochilus* (Orchidaceae) from India'. Below this is an article page titled 'The generic identity of *Zeuxine pulchra* King & Pantl. (Orchidaceae: Goodyerinae)'. Other visible elements include a 'Blume' logo, a 'Correspondence' section, and a 'PHYTOTAXA' logo.

BULLETIN VOL. 67: 97 – 102 (2012)

The status of two Indian species of *Zeuxine* (Orchidaceae)  
Avishkek Bhattacharjee<sup>1</sup> & H. J. Chowdhury<sup>2</sup>

ISSI  
ISSI

- Attended **36** seminars/ conferences/workshops/trainings/ exhibitions.
- Total **29 presentations (oral)** delivered (**20 as a resource person** and **9 as enrolled participant**) in different workshops/seminars/conferences.



### Awards/Memberships/Reviewer etc.:

- **'M. SABU AWARD in Angiosperm Taxonomy** (Teachers/Scientist category)' in XIX Annual Conference of IAAT and International Symposium on 'Angiosperm Systematics & Phylogeny: Retrospects & Prospects' (12-14.11.2009).
- **'S.R. YADAV AWARD'** in XVIII Annual Conference of Indian Association for Angiosperm Taxonomy (IAAT) and International Seminar on 'Multidisciplinary Approaches of Angiosperm Systematics' (11-13.10.2008).

- **Member of IUCN/SSC-Orchid Specialist Group of Indian Subcontinent.**
- **Member of IUCN/OSG-Trade.**
- **Fellow (F.I.A.A.T.) and life-member of 'Indian Association for Angiosperm Taxonomy'.**
- **Life member of 'The Orchid Society of India (TOSI)'.**
- **Acted as a Content writer (Taxonomy) of UGC's e-pathshala.**
- Reviewed manuscripts for the journal - **'Annals Botanici Fennici'** (Finland), **'Annals of Plant Sciences'** (India), **'Bangladesh Journal of Plant Taxonomy'** (Bangladesh), **'Journal of Threatened Taxa'** (India), **'Phytotaxa'** (New Zealand), **'Rheedea'** (India), and **'Taiwania'** (Taiwan).

## Future plan -

### I) Proposed project under Annual Action Plan (new):

**Flora of India:**

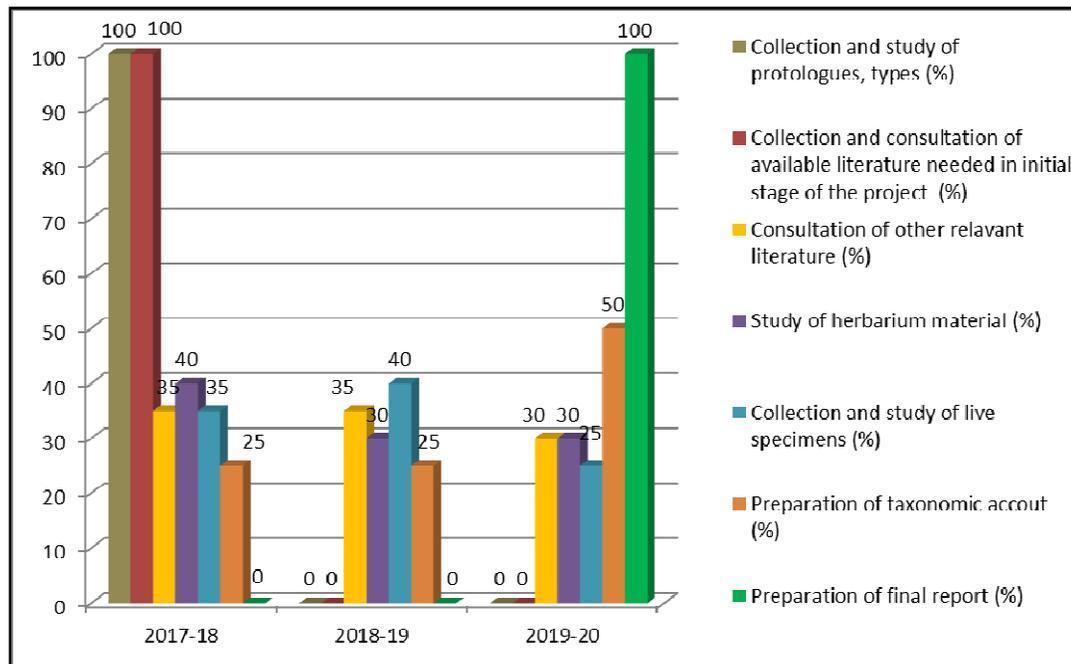
**Revision of the genus *Gastrochilus* D. Don (Orchidaceae) in India**

**Number of species: 22 (-25)**

**Duration: 3 years; April 2017 to March 2020**



*Gastrochilus pseudodistichus*



**Tours:** Total 6 field-cum-herbarium consultation tours in 3 years are proposed. Maximum taxa under the genus are reported in Eastern Himalaya and North-east India followed by Western Himalaya and Western Ghats/South India. Therefore, 4 tours are planned for Eastern Himalaya and North-east India and 1 each for Western Himalaya and Western Ghats/South India.

II) Red Listing of different taxa of orchids under the subtribe **Goodyerinae** and the genus **Calanthe** as per recent IUCN's guidelines.

I am grateful to **Dr. Paramjit Singh**, Director, Botanical Survey of India (BSI) and **Dr. P.V. Prasanna**, Scientist 'F' & Head, Central National Herbarium, BSI for providing research facilities and encouragement.

I am grateful to my Ph.D. guide as well as 'Flora of India' project supervisor **Dr. H.J. Chowdhery** and supervisors of my post-doctoral work **Dr. M.S. Mondal** and **Dr. P. Lakshminarasimhan** for their guidance.

I am grateful to my seniors **Dr. D.K. Agrawala** and **Dr. C.M. Sabapathy** for their help and support throughout my research career; **Dr. Subir Bandyopadhyay**, **Dr. K.N. Gandhi** for their day to day guidance in learning nomenclature; **(Late) Dr. M.K. Pathak**, **Dr. T.K. Paul** for their valuable suggestions in finalising my Ph.D. thesis and **Dr. Kanad Das** for motivating me with valuable suggestions to prepare my SERB-DST project-proposal.

Thank you **Dr. Gopal Krishna**, **Mr. Saurabh Sachan** and **Mr. T.K. Baidya** for helping me in executing the work of Technical Section smoothly.

I am also thankful to other **Scientists/Staff/Research Scholars/Post-doctoral Fellows** of BSI and BSI-ENVIS for their support.

# Thank You