

# **BOTANICAL SURVEY OF INDIA, CENTRAL REGIONAL CENTRE, ALLAHABAD**



<b>DATE OF ESTABLISHMENT</b>	<b>:</b>	<b>31<sup>ST</sup> JULY 1962</b>
<b>AREA UNDER JURISDICTION</b>	<b>:</b>	<b>Chhattisgarh, Madhya Pradesh and Uttar Pradesh.</b>
<b>TOTAL AREA</b>	<b>:</b>	<b>6,95,540 sq. km</b>

**G.P. Sinha**

**Scientist-E & Head of Office**

## A BRIEF INTRODUCTION ABOUT THE CENTRAL REGIONAL CENTRE, B.S.I., ALLAHABAD

- Central Regional Centre, BSI was established at 10 Chatham Lines, Allahabad on 31st July 1962, covering the areas of the then M.P., major parts of U.P. and Rajasthan with Dr. G. Panigrahi as Regional Botanist–in–Charge.
- However, with the creation of AZC, Jodhpur in 1972, Rajasthan was excluded from the Central Regional Centre, BSI, Allahabad.
- At present the jurisdiction areas of Central Regional Centre cover a newly created state of CHHATTISGARH (1,46,361 sq km) (carved out of M.P. on 1st Nov., 2000), the present MADHYA PRADESH (3,08,252 sq km), and the present UTTAR PRADESH (2,40,927 sq km), covering a total area of *ca* 6,95,540 sq km.

- It encompasses two biogeographic zones *viz.* Upper Gangetic Plain and Central Indian zone along with Satpura and Vindhyan plateaus.
- At present Central Regional Centre is functioning in its own land of over 2 hectares of Associated garden with an office cum herbarium building and a residential complex.
- The centre has a well established Herbarium, Library, Museum and Associated Garden in order to take various research activities on taxonomy, ethno-botany, conservation of plants with well furnished laboratory for work on lichens.



*Saraca asoca* (Roxb.) Willd.



*Bombax ceiba* L.

## OBJECTIVES OF CENTRAL REGIONAL CENTRE, BSI, ALLAHABAD

The Main objectives of the centre are:-

- To survey/explore plant wealth of entire jurisdiction areas covering M.P., U.P. and Chhattisgarh including Protected Areas, Wetlands (Fragile ecosystem) and their ethno-botanical aspects, if any.
- Documentation/Publication of state floras under its jurisdiction.
- To develop a living repository of plants of rare, threatened and endangered species. Introduction and propagation of medicinal and economic plants.

- **Survey, inventorization and documentation of non-flowering plants.**
- **Library consultation/herbarium study tours to various herbaria in connection with the state Floras.**
- **Preservation of identified collected plants in the herbarium (BSA).**
- **EIA studies of the areas under jurisdiction of the circle.**
- **Assessment/Monitoring of Botanic Gardens.**
- **Advisory services to various institutes and state government organizations.**

# HERBARIUM

**Acronym:**

**BSA**

**Holdings:**

**Angiosperms & Pteridophytes-**

***ca 99,000 specimens***

**Lichens-**

***ca 10,500 specimens***

## MUSEUM

- ***ca 330 specimens of economic, medicinal and botanical interest.***
- **Several carpological collections.**
- **Several plant-based articles of common use prepared by the tribals of Madhya Pradesh and Chhattisgarh.**

# **LIBRARY**

## **HOLDINGS**

**Books 5614**

**English 5033 Hindi 581**

**Journals 3515**

**Foreign 1596 Indian 1917**

# ASSOCIATED BOTANIC GARDEN

- **Total Area :** *ca* 2 Acres.
- **Location:** Compound of Botanical survey of India, Central Regional Centre, 10 Chatham Lines, Allahabad.
- **Objectives:**
  1. To develop a living repository of plants of rare, threatened and endangered species.
  2. Introduction and propagation of medicinal and economic plants of the country for acclimatization and multiplication under local conditions.
- **Total Collection of Live Plants:** *ca* 600 species of trees, shrubs, herbs and aquatic plants.
- *Rauvolfia serpentina* (a rare plant) also included under CITES (App. II) is in cultivation.



# STATE & DISTRICT FLORA

**Published: 28 Books**

**Angiosperms: 16**

- Exotic flora of Allahabad district (1984).
- Grasses of Madhya Pradesh (1984).
- Flora of Pachmarhi & Bori Reserve (1984).
- Flora of Raipur Durg & Rajnandgaon (1985).
- Drug Plant resources of Central India (1989).
- Flora of Bilaspur District Vol. I (1989), II (1999)
- Flora of Kasturba Gram, Indore (1991).
- Flora of Madhya Pradesh (Chhatarpur & Damoh) (1992).
- Floral elements of Madhya Pradesh (Acanthaceae & Euphorbiaceae) (1994).
- Dicotyledonous plants of Uttar Pradesh – A checklist (1999).
- Flora of Madhya Pradesh Vol. I (1993), II (1997) & III (2001).
- Supplement to the Flora of Madhya Pradesh (2001).
- Flora of Indrawati Tiger Reserve (2003).
- Floristic Diversity, Chhattisgarh (2005).
- Flora of Mizoram, Vol. –II (2012).
- Flora of Uttar Pradesh Vol.- I (2016).

### **Pteridophytes: 07**

- **A dictionary of the Pteridophytes of India (1984).**
- **Floristic Diversity, Chhattisgarh (2005).**
- **A Census of Indian Pteridophytes (1984).**
- **Lycopodiaceae of India (1988).**
- **Selaginilaceae of India (1992).**
- **Pteridophytes of Andaman & Nicobar Islands (2001).**
- **Pteridophytes of Uttranchal (A Checklist) (2002).**

### **Mosses: 01**

- **A Checklist of Indian Mosses (2005).**

### **Lichens: 04**

- **Macrolichens of Sikkim (2005).**
- **Indian lichens: An Annotated Checklist (2010).**
- **Lichen Flora of Sunderbans Biosphere Reserve, West Bengal (2012).**
- **Foliicolous Lichens of India (2014).**

## **Manuscripts submitted:**

- **Flora of Uttar Pradesh Vol. II (59 families, 439 genera & 945 species)**
- **Flora of Uttar Pradesh Vol. III (34 families, 179 genera & 447 species)**
- **Phytodiversity of Katarniaghat Wild Life Sanctuary.**
- **Phytodiversity of Bakhira Bird Sanctuary.**
- **Phytodiversity of Suhelwa Wild Life Sanctuary.**
- **Flora of Chambal National Park, Uttar pradesh**

**The revisionary studies have also been completed in respect of Grasses and Sedges of Madhya Pradesh and few families of Pteridophytes. So far, 6 families, 1 genus and 1 tribe have been completed under revisionary studies. Central Regional Centre has described 54 new taxa (Angiosperms-14, Pteridophytes-04, Lichens-35 and Fungi-01).**

# **ENVIRONMENTAL IMPACT ASSESSMENT**

**Environmental Impact Assessment (EIA)  
studies of following areas have been  
completed.**

- **Mara-Pump storage schemes (Hydroelectric Project of MPEB)**
- **Mongra Irrigation Project, Rajnandgaon, Madhya Pradesh**
- **Bansagar Canal Project, Madhya Pradesh and Uttar Pradesh.**
- **Rawghat iron ore mining area, Chhattisgarh**

## **Fragile Ecosystem and Protected Areas studied include**

- **Flora of Salon Wetlands of Rai Bareli, Uttar Pradesh**
- **Wetland Flora of Lakha – Bahosi, Kannauj, Uttar Pradesh.**
- **Flora of Bandhavgarh National Park, Madhya Pradesh.**
- **Pteridophytes of Mehao WLS, Arunachal Pradesh.**
- **Flora of Pachmarhi Biosphere Reserve, Madhya Pradesh.**
- **Flora of Indravati Tiger Reserve, Chhattisgarh.**
- **Flora of Kanha Tiger Reserve, Madhya Pradesh.**
- **Coal mines of Shahdol, Madhya Pradesh and Bilaspur, Chhattisgarh.**
- **Lichens of Mehao WLS, Arunachal Pradesh.**
- **Lichens of Sundarbans Biosphere Reserve, West Bengal.**
- **Lichens of Neora Valley National Park, West Bengal.**

## **Funded projects completed by this Centre**

- **Floristic diversity of Kanger Valley National Park (2004).**
- **Floristic diversity of Sanjay Gandhi National Park (2004).**
- **Floristic diversity of Panna National Park (2004).**
- **Floristic diversity of Pachmarhi Biosphere Reserve (2004).**
- **Foliicolous lichens of North - East India (2008).**
- **Documentation of Biological resources and traditional knowledge of Achanakmar - Amarkantak Biosphere Reserve (2008).**

## **PUBLICATIONS**

**Concerted efforts by the Scientists of this centre have resulted in the publication of about 20 Red Data Sheets, over about 650 research papers, over 100 popular articles in Hindi and 33 Books.**

### **NEW TAXA DESCRIBED: 54**

- \* Angiosperms : 14**
- \* Pteridophytes : 04**
- \* Fungi : 01**
- \* Lichens : 35**



# TYPE SPECIMENS DEPOSITED IN BSA

## Angiosperms: 04 Types

Isotypes – 03

Paratype – 01

## Pteridophytes: 04 Types

Holotype – 01

Isotypes – 03

## Lichens/ Fungi: 54 Types

Holotypes–27; Isotypes–7; Paratypes – 20

## Ongoing Projects at CRC, Allahabad

Sl. No.	Name of the Projects	Tenure	Executing officials
1.	Floristic diversity of 'Bhoj Ramsar Site' in Madhya Pradesh	2016-2018	Dr. Arti Garg, Scientist D
2.	Flora of Chandra Prabha WLS, Chandauli, UP (78 sq. km.)	2015-2017	Dr. A. N. Shukla, Scientist B and Dr. Nitisha Srivastava, Bot. Asst.
3.	Flora of Chhattisgarh Vol. I (Dicot – 1750 spp.)	2012-2017	Dr. A. N. Shukla, Scientist B and Dr. Arjun Prasad Tiwari, Pres. Asst.
4.	Flora of Chhattisgarh Vol. II (Monocot-570 spp.)	2016-2018	Drs. G.P. Sinha, Scientist E, Arti Garg, Scientist-D, N.K. Gautam, Scientist-B, A.K. Verma, Scientist-B, Sri V.K. Singh, Bot. Asstt. and Dr. N. Srivastava, Bot. Asstt.
5.	Floristic diversity of Kishanpur W.L.S. Lakhimpur Kheri, U.P. (227 sq. km.)	2016-2019	Dr. Neelam Gautam, Scientist B Dr. Arjun Prasad Tiwari, Pres. Asstt.
6.	Floristic Diversity of Parvati Aranga Wildlife Sanctuary and adjacent Tikri forest area, Gonda, UP with ecological aspects, population status of endemics and GIS mapping (ca. 80 sq. km.)	2014-2017	Sri V. K. Singh, Bot. Asst. (under guidance of Dr. S. K. Srivastava, Scientist E, NRC)
7.	Lichens of Rajasthan, and Kutch Gujarat	2012-2017	Dr. G. P. Sinha, Scientist E
8.	<i>Ex situ</i> conservation of EET plants in the office garden	Ongoing.	Dr. A.N. Shukla, Scientist B
9.	Taxonomic studies on lichenised non Thelotreroid Indian Graphidaceae (Date of Joining : 02.08.2013)	2013-2018	Dr. Pushpi Singh, SPF and Dr. K.P. Singh, Ex Emeritus Scientist
10	Lichens of Terai regions of Uttar Pradesh (Date of Joining : 26.08.2013)	2013-2018	Dr. Pooja Gupta, SPF and Dr. G.P. Sinha, Scientist E.

# Action Plan 2017, Central Regional Centre, Allahabad

Sl. No.	Name of the project	Name of the executing scientist	Tenure	Quantifiable deliverables (targets) for 2016-17	Work done so far during 2016-17 (up to January 2016)	Quantifiable deliverables (targets) for 2017 (April to December) and new project proposals of 2017 (April to December)
1.	Lichens of Rajasthan and Kutch, Gujarat	Dr. G. P. Sinha, Scientist E	2012-2017	<p>Q1. Identification of specimens collected earlier.</p> <p>Q2. Identification of specimens collected earlier.</p> <p>Q3. Survey and collection tour to Junagarh and Porebandar districts of Gujarat in first week of November 2016. Completion of inventorization.</p> <p>Q4. Completion of identification of lichens collected in previous tour; finalization and submission of mss.</p> <p><b>Total 01 Field tour</b></p>	<p>One Field Tour to Junagarh and Porebandar districts of Gujarat was undertaken w.e.f. 17.12.16 to 29.12.16 and 43 F.Nos. were collected.</p> <p>Identified 89 specimens in to 37 species, of which 10 is addition for Rajasthan state. Completed Taxonomic description of 26 species.</p>	<p>Extension of another 6 months time is requested to compile the report.</p>
2.	Floristic Diversity of 'Bhoj Ramsar Site' in Madhya Pradesh	Dr. Arti Garg, Scientist D	2016-2018	<p>Q1. Literature Survey and mapping of the area.</p> <p>Q2. Field Tour to the Bhoj Ramsar Site in M.P. identification of specimens collected.</p> <p>Q3. Herb Con. Tour to Barkatullah University, Bhopal Identification of specimens collected.</p> <p>Q4. Identification of specimens collected.</p> <p><b>Total 01 Field tour and 01 HCT.</b></p>	<p>CoConducted 01 Field Tour and 275 F.Nos. collected. Identified 20 specimens into 20 species.</p> <p>One HT to Jabalpur and Sagar Univ. will be undertaken in Feb.-March 2017.</p>	<p>Q1. Field Tour to the Bhoj Ramsar Site in M.P.</p> <p>Q2. Field Tour to the Bhoj Ramsar Site in M.P.</p> <p>Identification of specimens collected in previous tours</p> <p>Q3. Description of 50 species.</p> <p><b>Total 02 Field tours</b></p>
3.	Flora of Chhattisgarh Vol. I (Dicot – 1750 spp.)	Dr. A. N. Shukla, Scientist B and Dr. Arjun Prasad Tiwari, Preservation Assistant Grade I	2012-2017.	<p>Q1. One Herbarium consultation tour to SFRI, Jabalpur for identification of unidentified specimens collected.</p> <p>Q2. To Q4. Finalization and submission of manuscript.</p> <p><b>Total 01 Herb. Consultation Tour</b></p>	<p>Herbarium consultation Tour to SFRI, Jabalpur completed.</p> <p>Identified 1127 specimens in to 570 species.. Tax. Descry. Of 124 spp. completed.</p>	<p>Another one year extension is requested.</p>

4.	Flora of Chhattisgarh Vol. II (Monocot-570 spp.)	Dr. G. P. Sinha, Scientist E, Dr. Arti Garg, Scientist-D, Dr. N.K. Gautam, Scientist-B, Dr. A. Verma, Scientist-B, Sri V.K. Singh, Bot. Asstt. and Dr. N. Srivastava, Bot. Asstt..	2016-2018	<ol style="list-style-type: none"> <li>1. Dr. G.P. Sinha, Scientist E: Orchidaceae-69 spp</li> <li>2. Dr. A. Garg, Scientist-D: Poaceae – 120 species</li> <li>3. Dr. N.K. Gautam, Scientist-B – Flagellatiaceae to Aponogetonaceae and Zannichelliaceae – 47 species</li> <li>4. Dr. A. Verma and Cyperaceae – 122 species</li> <li>5. Dr. B. Joshi, Botanical Asstt.: Dioscoriaceae to Pontedariaceae and Commelinaceae – 57 species</li> <li>6. R. Kar, Bot. Asstt. – Poaceae 55 species</li> <li>7. Sri V.K. Singh, Bot. Asstt.: Hydrocharitaceae to Burmanniaceae and Xylariaceae – 52 species</li> <li>8. Dr. N. Srivastava, Bot. Asstt.: Poaceae – 48+55 species</li> </ol>	<p>Following No. of species were described</p> <p>GP Sinha : 69/48 spp. Arti Garg : 120/09 spp. NK Gautam : 47/25 spp. AK Verma :122/67 spp. Bhavana Joshi:57 spp./0 R. Kar : 55 spp./0 VK Singh : 52/32 spp. N. Srivast. : 48/21 spp.</p>	Dr. B. Joshi, Bot. Asst. (Dioscoriaceae to Pontedariaceae and Commelinaceae – 57 spp) and Shri R. Kar (Bot. Asstt. – Poaceae 55 species) part to be allotted to other Scientists/ officials during 2017-18.
5.	Flora of Chandra Prabha WLS, Chandauli, UP (78 sq. km.)	Dr. A. N. Shukla, Scientist B and Dr. Nitisha Srivastava, Botanical Asst.	2015-2017	<p>Q1. One field tour to the unexplored or under explored areas of the sanctuary. Identification and documentation of specimens collected.</p> <p>Q2. Inventorisation of specimens collected in previous tour.</p> <p>Q3. Identification and documentation of the all the remaining specimens collected.</p> <p>Q4. Finalisation and submission of manuscript.</p> <p><b>Total 01 Field tour</b></p>	<p><b>01 FT in Q3; 177 F. Nos. collected.</b></p> <p><b>Identified specimens: 173</b></p> <p><b>Identified species – 101</b></p> <p><b>Taxonomic Description: 62 species</b></p> <p><b>Total 01 Field tour</b></p>	Extension for six months period required.

6.	Floristic diversity of Kishanpur Wildlife Sanctuary, Lakhimpur Kheri, UP. (227 sq. km.)	Dr. Neelam Gautam, Scientist B Dr. Arjun Prasad Tiwari, Pres. Asstt. and Dr. B. Joshi, Botanical Asstt.	2016-2019	Q1. Study of relevant literature and previous collections. Q2. One Field tour in 2 <sup>nd</sup> week of August. Q3. Processing and identification of specimens collected during the previous field exploration tours. Q4. One Field tour to 10 days in 2 <sup>nd</sup> week of Feb., 2017 <b>Total 02 Field tours</b>	01 FT in Q2; 225 F.Nos. (470) specimens collected. Identified specimens - 26 Identified species - 13  Remaining 01 FT to be undertaken in Feb.-March 2017	Q1. Inventorisation of specimens collected in previous tour. Q2. Identification and documentation of the all the specimens collected in previous tours. Q3. Field Tour to the study area. <b>Total 01 Field Tour</b>
7.	Floristic Diversity of Parvati Aranga Wildlife Sanctuary and adjacent Tikri forest area, Gonda, UP with ecological aspects, population status of endemics and GIS mapping (ca. 80 sq. km)	Sri V. K. Singh, Botanical Assistant (under guidance of Dr. S. K. Srivastava, Scientist E, NRC)	2014 – 2017	Q1. Identification and taxonomic description of 40 species. One field tour in 3 <sup>rd</sup> week of June, 2016. Q2. Identification and taxonomic description of 40 species. Q3. Identification and taxonomic description of 40 species. One herbarium consultation tour to NBRI. Q4. Finalisation and submission of manuscript. <b>Total 01 Field tour &amp; 01 Herbarium Consultation Tour.</b>	One Field Tour undertaken to the study area. Identification of 52 specimens completed. Description of 52 species completed. Field Tour to be conducted from 23 – 30 Dec., 2016. <b>Total 02 Field Tours completed</b>	NA
8.	Taxonomic Studies on genus <i>Strobilanthes</i> Blume in North-Eastern India <b>(New Project)</b>	Dr. Arti Garg, Scientist D and Dr. Arjun Prasad Tiwari, Pres. Asstt.	2017 – 2020	--	--	Q1. Literature study. Library and Herbarium Consultation Tour to CNH, Howrah. Q2. Field Tour for fresh specimen collection to Sikkim and North East. Q3. Identification and study of specimens collected. <b>Total 01 Field Tour, 1 HCT</b>
9.	Floristic diversity of Amangarh Tiger Researve, Bijnor, Uttar Pradesh. <b>(New Project)</b>	Dr. A. K. Verma, Scientist B and Sri V. K. Singh, Botanical Assistant	2017-2018	--	--	Q1. Review of literature and herbarium consultation. Q2. Field tour to the selected site and processing of collected specimens. Q3. Identification and documentation of collected specimens <b>Total 01 Field Tour</b>

10.	Cytotaxonomical studies of selected taxa of Indian subtribe <i>Cassinae</i> Irwin & Barneby <b>(New Project)</b>	Dr. A. K. Verma, Scientist B	2017-2019	--	--	Q1. Review of literature for availability, distribution and morphological characteristics of selected taxa of subtribe <i>Cassinae</i> Irwin & Barneby Q2. Collection of plant material for cytological investigations. Q3. Study of somatic chromosome count and meiotic behavior of selected plant species (5 species). <b>Total 01 Field Tour</b>
11.	Studies of fossil and living plants with reference to the impact of climate change on flora of Gangetic Plains and Central India. <b>(New Project in collaboration with BSIP, Lucknow)</b>	Dr. Arti Garg, Scientist D, Dr. A. N. Shukla, Scientist B and Dr. Neelam Gautam, Scientist B	2017-2019	--	--	Q1. Identification of 10 tree species, literature consultation of their distribution and abundance in Gangetic Plains and Central India. BSIP tour for project initiation and exchange of plant material. Q2. Field tour for plant collection, studies of population structure. Q3. Training of Scientists on studies of Fossil plants at BSIP, Lucknow. Identification of new lot of 10 plant species, literature consultation of their distribution and abundance in Gangetic Plains and Central India. Exchange of living and herbarium plant material between BSI and BSIP. <b>Total 01 Field Tour</b> <b>02 Tours to BSIP</b>
	<b>Trees of Allahabad New Project</b>	Dr. G.P. Sinha, Scientist E	2017-2018			
	<b>Editing of Flora of Uttar Pradesh, Vol.II New Project</b>	Dr. G.P. Sinha, Scientist E	2017-2018			

Nature of Tour	Q1	Q2	Q3	Q4	Total
Field Tour	01	05	01	-	07
Herbarium Consultation Tour/ Training	02	-	01	-	03



*Adansonia digitata* L.

***THANK YOU***