

ANNUAL PROGRESS REPORT (2020- 21)

Botanical Survey of India,

Ministry of Environment, Forest and Climate Change (GoI)

High Altitude Western Himalayan Regional Centre,

Dr. Y.S. Parmar University Campus, Nauni, Solan (H.P.)

Annual Research Projects and other Scientific Work During 2020-21

1. Annual Research Project (1):
2. National Webinar Series of Lectures
3. Preparation of Peoples Biodiversity Register for two blocks (Dharmpur and Nalagarh) of district Solan (H.P.).
4. Herbarium Enrichment Work.
5. Establishment of LIBRARY
6. Establishment of Herbarium
7. Land Transfer on Lease to BSI from Dr. Y.S. Parmar University.
8. Events.
9. Research Publications

Name of Research Project: Floristic diversity of Dr. Y.S. Parmar
University Campus, Naini, Solan, Himachal Pradesh.

Executing Scientist (s) : Dr. Kumar Ambrish, Scientist- E /In-charge
&
Dr. Kuldip S. Dogra, Scientist- D

Background of the project

- The campus of the Dr. Y.S. Parmar University is situated at Nauni, in Solan district about 12 Km from Solan on Solan to Rajgarh Road, at an altitude of 1300 m.
- It has around 5.5 Km² area.
- The campus has a rich floristic diversity of angiosperms, gymnosperms, ferns which includes indigenous as well as alien plant species.
- Besides this many species are under cultivation for horticulture and forestry purposes.
- There have been few studies conducted to document the floristic diversity of the campus (Sindhi, 1997).
- In view of the lack of data on the floristic diversity of the Dr. Y.S. Parmar University, Nauni, Solan, the present study has been conducted to document the floristic diversity of the campus in a pictorial form.
- This document will be very helpful to the faculties, researchers and students of UHF Nauni who are engaged in applied aspects of plant research and resource conservation.

Objectives

- Documentation of the floristic diversity of Dr. Y.S. Parmar University Campus, Nauni, Solan, Himachal Pradesh in pictorial form which includes Botanical and local name of species, brief description (identifying characters), flowering and fruiting period, their medicinal or economic uses if any along with digital photographs.
- It will also help in enrichment of the herbarium of Botanical Survey of India, HAWHRC, Solan with acronym registered as BSS- Botanical Survey Solan.
- It will also provide baseline data on floristic diversity of DR. Y.S. Parmar University for the researchers and students in future.

Site of the Study (with map):

- The campus of the Dr. Y.S. Parmar University is situated at Nauni, in Solan district about 12 Km from Solan on Solan to Rajgarh Road, at an altitude of 1300 m.
- It covers about an area of 5.5 km².
- Latitude: 30.8571° N and Longitude 77.1675° E
- The main campus enjoy all the three seasons viz. Summer, Monsoon and Winter with the following weather variations :

Seasons	Temperature (in celsius)		Rainfall (mm)	Humidity (%)
	Min	Max		
Summer (March-June)	10-10	23-34	5-176	36-66
Monsoon (July-Oct.)	11-20	26-28	37-354	58-87
Winter (Nov-Feb)	-0.5-9	16-23	3-111	47-69

Map of the Dr. Y.S. Parmar University, Nauni, Solan



Methodology adopted:

- Floristic survey of the area in such a way to cover maximum area and plant species.
- A total 15 field tours (2 day each) conducted in area of 5.5 Km² .
- Plant collection, drying (dry method) and processed for herbarium records at BSI-BSS, Solan.
- Field notes prepared.
- Digital photography.
- Dr. Y.S. Parmar University herbarium consultation.
- Plants identified through consulting various floras (Flora Himachal Pradesh- (I-III); Flora Sirmour district; Flora Simlensis) and from available herbarium specimens at BSS and University herbarium

Outcomes

- A check list of 576 plant species from 123 flowering families prepared and in the process of finalization.
- It includes a total of 444 wild species and 132 cultivate species.
- The wild plants belongs to 109 plant families and cultivated plants to 14 plant families.
- More than 1500 digital photographs have been taken,
- The Asteraceae, Fabaceae, Lamiaceae, Rosaceae, Poaceae and Solanceae are most dominant families.
- *Clematis gouriana* Roxb., *Ranunculus arvensis* L., *Ranunculus laetus* wall, *Thalictrum foliolosum* DC., *Cissampelos pareira* L., *Cocculus laurifolius* DC., *Berberis lycium* Royle, *Fumaria parviflora* Lam., *Viola serpens* wall. *Viola tricolor* L., *Flacoutia indica* (Burm. f.) Merr., *Silene conoidea* L., *Stellaria media* L., *Centella asiatica* Urban. *Hedera nepalensis* K.Koch., *Galium aparine* L., *Artemesia annua* L., *Artemesia scoparia* Waldst. & Kit., *Bidens pilosa* L., *Bidens tripartita* L., *Eclipta alba* Hassk., *Erigeron annus* Pers., *Erigeron bonariensis* L., *Sonchus arvensis* L., *Melia azedarach* L. *Ehratia acuminata* R.Br., *Solanum indicum* L., *Solanum nigrum* L.,

- *Solanum surattense* Burm.f., *Holmskioldia sanguinea* Retz., *Withania somnifera* (L.) Dunal, *Leucas aspera* Spreng. *Mentha arvensis* L., *Mentha longifolia* (L.) Huds., *Mentha piperita* L., *Euphorbia hirta* L., *Euphorbia prostrata* Ait., *Euphorbia royleana* Boiss, *Mallotus philippinensis* Muell. Arg., *Putranjiva roxburghii* Wall., *Bombax ceiba* L., *Pterospermum acerifolium* (L.) Willd., *Pterygota alata* (Roxb.) R. Br., *Grewia asiatica* L., *Grewia optiva* J.R. Drumm. Ex. Burrett, *Reinwardtia indica* Dumort., *Geranium divaricatum* Ehrh. Beitr., *Geranium ocellatum* Camb., *Oxalis corniculata* L., *Impatiens balsamina* L. and *Zanthoxylum armatum* DC. Are the most dominant plant species occurring in the campus of Dr. Y.S. Parmar University.
- Besides this *Koelreuteria paniculata* Laxm., *Solidago canadensis* L., *Sonchus arvensis* L., *Spilanthus acmella* Murr., *Tagetes minuta* L., *Taraxcum officinale* Webber. ex. Wiggers, *Cestrum nocturnum* L., *Solanum surattense* Burm.f., *Verbascum thapsus* L., *Jacaranda mimosaeifolia* D.Don., *Tecomaria capensis* (Thunb.) Spach., *Tecoma stans* (L.) H.B.& K., *Duranta repens* L., *Amaranthus viridis* L., *Amaranthus spinosus* L., *Chenopodium album* L., *Chenopodium ambrisooides* L., *Populus deltoides* Marshall, *Salix alba* L., *Jacaranda mimosifolia* D.Don., *Chorisia speciosa* (A.St.- Hil) Ravenna, *Paulownia tomentosa* (Thunb.) Steud., *Jasminum mesnyi* Hance, *Salvia coccinea* Buc'hoz ex Etl., *Verbena brasiliensis* Vell., *Nicotiana tabacum* L. *Tithonia rotundifolia* (Mill.) S.F. Blake, *Tithonia diversifolia* (Hemsi.) A. Gray, *Lonicera japonica* Thunb., are the most dominant IAPS occurring in the campus of Dr. Y.S. Parmar University.



Holmskioldia sanguinea Retz.



Koelreuteria paniculata Laxm.



Paulownia tomentosa (Thunb.) Steud.,



Tithonia rotundifolia (Mill.) S.F. Blake



Cestrum nocturnum L.



Tropaeolum majus L.



Verbena brasiliensis Vell.



Bauhinia variegata (L.) Benth.



Eriobotrya japonica (Thunb.) Lindl.



Agave americana L.



Smilax spp.



Rubus ellipticus Sm.

National Webinar Lecture Series

- A total of 7 lectures organised through online mode on different topics of interest on Floristic Diversity especially in the Western Himalaya, Molecular Plant Taxonomy, Invasive Alien Plant Species etc.
- Lectures given by Dr. A.A. Mao, Dr. S.K. Srivastva, Dr. R.K. Kohli, Dr. D.K. Singh, Dr. Manjoor A. Saha, Dr. M Sanjappa and Dr. Arun Pandey.
- The participants from different reputed institutes, Universities and colleges across India have attended the said lectures.

People's Biodiversity Register

- The Peoples Biodiversity Register Project was given by Himachal Pradesh Biodiversity Board Shimla.
- The primary data collected through field survey and secondary data from published literature.
- A total of 27 formats completed for each block.
- The PBR's of two blocks (Dharampur and Nalagarh) have finalized and submitted to the Himachal Pradesh Biodiversity Board Shimla.

Establishment of LIBRARY

- **Books:** At present the center has a small library with around 510 books on topics like floristics (National, State, District, Conservation Reserve floras), plant taxonomy, ecology, phytogeography, cytology, genetics, environment, conservation, etc.
- **Scientific Journals:** Two journals subscribed for the library i.e. Indian Journal of Forestry and Journal of Non-Timber Forest Products. In future some other national and international journals related to plant taxonomy, ecology, cytology, biodiversity conservation and climate change will also be subscribed.
- **Future Subscription:** Some of the significant classic publications which will be subscribed in future are van Rheedee's "Hortus Malabaricus", Linnaeus's "Species Plantarum" and "Mantissa Plantarum", Roxburgh's "Flora Indica" and "Plants of the coast of Coromandal", Burman's "Flora Indica", Forsskal's "Flora Aegyptiaco-Arabica", Wallich's "Tentamen Florae Nepalensis" and "Botany of Himalayan Mountains and Flora of Cashmere", etc.
- **Hindi Publication:** Previous volumes of Vanaspati Vani published by BSI are available. A good collection of Hindi publications will also be subscribed under the **Raj Bhasha Section** of the centre.

Library at BSI-HAWHRC, Solan



Establishment of HERBARIUM

- The herbarium has been established at a small scale with the registered acronym BSS i.e. Botanical Survey at Solan. At present it houses around 3000 herbarium specimens belonging to Western Himalaya brought from the BSI, NRC Dehradun which were collected under various plant exploration tours conducted in the past.
- Besides this work more than 650 field numbers (*ca.* 435 plant species) from the district Solan to enrich our herbarium (BSI-BSS) were also collected.
- The first target of this center is to enrich the herbarium in the coming years and bring it up to 10,000 by conducting floral exploration tours and expeditions in the High Altitude areas of Western Himalaya.
- The herbarium will provide facilities to researches, students and scientists of various colleges and universities which fall under this region to identify their collected plant specimens with the available protologues and housed specimens.
- Cryptogamic section will also be established which includes specimens of Algae, Fungi and Bryophytes (both mosses and liverworts) besides ferns and flowering plants.

Herbarium BSI-BSS BSI-HAWHRC, Solan



Land transfer from Dr. Y.S. Parmar University for the Establishment of Office Building and Residential Complex

- The land transfer (6.6. acres) on lease basis for 99 years from the Dr. Y.S. Parmar University for the establishment of Office building and Residential Complex is almost completed.
- The mutation will be done by the end June, 2021.
- The demarcation of the land has has been completed in the month of July, 2021.
- The officers from Executive Engineer CPWD office Shimla has already visited and inspected the feasibility of land.
- They have also submitted the preliminary estimate of budget for digital survey and soil testing of the land on 19th April, 2021.
- The first work after the digital survey to construct the boundary wall around the allotted land.



EVENTS Celebrated at Centre

- Hindi Pukhwada 14th to 29th September, 2020



World Ozone Day Celebrations at BSI, HAWHRC, Solan

- The World Ozone Day has been celebrated with great enthusiasm at BSI, HAWHRC, Nauni, Solan on 16th September 2020 from 11.30 A.M. to 1:00 P.M. The theme of this year World Ozone Day was “*Ozone for Life: 35 Years of Ozone Layer Protection*”.
- The Scientists and students of the Forest Product department of the Dr. Y.S. Parmar University have been cordially invited for the interactive session on “*Ozone Layer Depletion: Its Impacts on the Biodiversity and human health in the 21st Centaury*”.
- **Dr. Bhupinder Dutt** (Professor) and **Dr. Rohit Sharma** (Assistant Professor) along with Six Post Graduate students of their department attended the World Ozone Day celebrations at Botanical Survey of India, High Altitude Western Himalayan Regional Centre, Nauni, Solan.



Vigilance Week Celebration

THEME: VIGILANT INDIA, PROSPEROUS INDIA

27th October to 2nd November, 2020

- With reference to the circular of Hqrs. dated 22nd October, 2020 vide letter no. BSI-25/1/2006-adm. to celebrate the vigilance week as decided by the Central Vigilance Commission with the theme “*Satark Bharat, Samriddh Bharat*” (*Vigilant India, Prosperous India*), the BSI, HAWHRC celebrated it from 27th October to 2nd November. The *Scientist in-charge* of the centre organised an assembly to take an integrity pledge by all the officers and staff of BSI, HAWHRC, Solan on 27th October, 2020 at 11:00 A.M. During this week a message has been circulated among the officers and staff to play their active role in the eradication of corruption and also maintain highest standards of integrity, transparency in the office and in their day to day office work.



1st Foundation Day Celebration

- 1st Foundation day of HAWHRC, Solan was celebrated on 10-12-2020.
- An interactive session was held with the Director Research and Estate officer of UHF, Nauni to discuss the future planning of establishment of Office cum residential complex of HAWHRC at the allotted land to BSJ.
- A signage board put at the proposed site for the office cum residential complex of HAWHRC, Solan.



Research Publications

Research Publications (Published and Communicated): 6

- R. Sharma, K.S. Dogra and K. Ambrish 2020. Traditional Knowledge of Medicinal Plants used in the rural areas of Solan District, Himachal Pradesh. *Journal of Non-Timber Forest Products*, 27(2): 104-112.
- K.S. Dogra, R. Sharma, K. Ambrish, S.S. Dash, S.L. Meena, S. Sharma and S. Yadav 2021. Management of Invasive Alien Plant Species by harvesting biomass load for Traditional Ethno-medicinal and Socio-economic uses in the Shiwalik hills of Northwestern Himalaya, Himachal Pradesh, India. Submitted in *South African Journal of Botany*, Elsewhere Press.
- K.S. Dogra, A. Kumar and R. Sharma 2021. *Paulownia tomentosa* (Thunb.) Steud. (Paulowniaceae): A New Record of Alien Plant Species from Solan district of Himachal Pradesh. *Indian Journal of Forestry*, BSPMS Press, Dehradun.
- S. Sharma, K.S. Dogra, K.R. Sharma, R. Shrama, K. Ambrish 2021. Documentation of the Traditional Knowledge of Some Plant Species occurring in the Shilli Conservation Reserve in Solan district of Himachal Pradesh, India, Journal of NTFP, BSPMS Press, Dehradun.
- कुलदीप एस डोगराए कुमार अम्ब्रीश एवं रेणु शर्मा ;2021 उच्च पश्चिमी हिमालयी क्षेत्रीय केंद्र, सोलन- भारतीय वनस्पति सर्वेक्षण में एक नूतन सदस्य
- रेणु शर्मा, कुलदीप एस डोगरा एवं कुमार अम्ब्रीश ;2021 हिमाचल प्रदेश के सोलन जिले के कुछ औषधीय पौधे और उनका पारंपरिक ज्ञान

THANK YOU