

Group Name: Herbarium- A National Facility

Group Works on:

1. Objectives

Herbarium is a place, where plants collected from far and wide are preserved in pressed and dried condition and are kept in pigeon holes of almirahs according to some accepted system of classification. It is a great filing system for information about plants primarily in the form of actual specimens and secondarily in the form of recorded notes on labels attached on the sheets. No doubt it acts as a data bank and caters the needs students, teachers, foresters and other plant-based professionals. The Herbarium of CSIR-National Botanical Research Institute is relatively a new organisation when compared to some large herbaria in the World as well as in India. This herbarium was established in 1953 and is now internationally known with its acronym LWG and has been recognised as National Repository for Indian flora by National Biodiversity Authority of India. The credit of establishing this herbarium goes to Prof. K.N. Kaul, the founder Director of the Institute. Considering the importance of this herbarium in botanical researches, it has now been given the status of “National Facility” in CSIR system. The current holding of LWG Herbarium is about 2,86,927 specimens of which 1,00,369 specimens are of higher plants and 1,70,558 specimens of lower plants. Apart from this, there are 16,000 carpological collections. 290 Type specimens and 895 Type photographs are also present in our herbarium..

The major objectives of LWG Herbarium are:

- To develop and maintain a herbarium as per international norms.
- To undertake floristic and revisionary studies on Indian flora.
- Survey, collection, identification and documentation of floral wealth of the country.
- To carry out biodiversity assessment.
- To study and monitor the RET plants.
- To maintain active link with other institutions through loan and exchange of herbarium specimens and related literature.
- To act as a service centre for solving all queries about plants.

2. Goals:

- Conservatory for plant material and related data
- Serves as a fundamental resource for identification of plants of India as well as of globe.
- Serves as easies and efficient source for plant biodiversity information.
- Serves as a repository of historic collections and at times acts as the only record of past vegetation.
- Aids in assessment and cataloguing of all species of economic values.

- Aids in assessment of conservation status of RET taxa.
- Helps in development of digital data-bases on plants.

3. Competencies

Scientists of all groups viz., Angiosperms, Gymnosperms, Ferns, Bryophytes, Lichens and Algae are competent to carry out taxonomic research which is also aimed at enrichment of herbarium with fresh collections. There are specialists in several Angiosperm genera like *Ixora*, *Berberis*, *Pedicularis*, *Citrus*, *Phyllanthus*, *Podophyllum*, *Aconitum*, *Tricholepis*, *Astragalus*, *Oxytropis* and leguminous Tribes Thermopsidae, Genisteae, Trifoliae and Lotiae. Similarly there is core competence in lower group of plants like Lichens, Bryophytes, Pteridophytes and Algae. Apart from revisionary studies there are generalists to carry out floristic studies, especially in western Himalayan region and Gangetic plain.

4. Facilities

There is a well established herbarium with all amenities equipped with Zoom microscopes for study of plant specimens and attached library containing all sorts of Periodicals, Floras and Taxonomic treatise.

5. Highlights of Current research

Currently herbarium group is involved in following activities:

- Digitization of Herbarium: Digitization of about 30,000 herbarium specimens has so far been done, it includes a scanning of all the specimens and data contained on the labels of herbarium sheets.
- Propagation and reproductive biology of some RET taxa: DST, New Delhi funded project to investigation the bottle neck in natural reproduction and to develop propagation methods using both in-vitro and conventional methods for the conservation of some critically endangered taxa of high medicinal potential.
- Bioresource mapping of GWLS: To prepare a complete inventory of higher plants from GWLS: 175 species have been collected.
- Taxonomic studies on the family Lamiaceae: 5 species of the genus *Leucas* have been collected and rare taxa of *Leucas* have been studied.

Significant achievements:

Upto 11th five year Plan:

- Digitization of 30000 herbarium specimens accomplished.
- Scientific validation of nomenclature of 2642 species and uploading of morphological description of 500 species, 700 images of herbarium and live plant images of 150 plants accomplished for CTKDL.

In 12th five year plan:

- Complete floristic account of higher plants of GWLS with coloured photographs.

List of on-going projects:

NBRI In house Projects:

- Digitization and organization of CSIR-NBRI Herbarium.
- Bioresource mapping of Govind Wild Life Sanctuary (Garhwal Himalaya) Uttarakhand.
- Taxonomic studies on the family Lamiaceae from upper Gangetic Plains of Uttar Pradesh.

Outside Agencies like DBT/DST/MOEF Projects:

- Propagation and reproductive biology for conservation of some critically endangered highly potential medicinal plants. Duration 3 years: Nov. 2010 to Nov. 2013. Project co-ordinator: Dr. Tariq Husain; PI: Dr. Priyanka Agnihotri.

Foreign Collaborations:Nil

Areas Open for Collaboration:

- Bioprospection, Reproductive biology.
- Climate change and Ecological studies.
- Molecular systematics and Phylogenetic studies.

8. Recent publications (of Last 5 Years)

1. Agnihotri P., Tariq Husain and S. D. Maliya. 2008. Aquatic flora of some notified bird sanctuaries of Uttar Pradesh. **The Indian Forester** 134 (10): 1398 –1401.
2. Husain Tariq and P. Agnihotri. 2009. Invasive Alien species and climate change. In: Proceedings of National Conference on Invasive Alien species a threat to native Biodiversity, pp. 36-39.
3. Agnihotri P., Tariq Husain and H. Singh. 2009. Nakuleshwar: A newly discovered sacred grove from Pithoragarh District. **Sci. & Cult.** 75 (1-2): 42.
4. Agnihotri P. and Tariq Husain 2009. Analysis of species diversity in *Pedicularis* associations of Eastern Himalaya. **Indian J. Forestry** 32(1): 165-170.

5. Agnihotri P. and Tariq Husain 2009. Effect of climate change on the phenology of *Hypericum oblongifolium* Choisy (Hypericaceae). **Geobios** 36(4): 317-318.
6. Husain Tariq and P. Agnihotri 2009. *Berberis glaucocarpa* Stapf. (Berberidaceae) a new report from Nainital hills. **Flora and Fauna**. 15(2): 357-358.
7. Jain S. K., M. K. Vasudeva Rao and P. Agnihotri. 2009. Name changes in some more common economic plants. **Phytotaxonomy**, 9: 99-108.
8. Husain Tariq and P. Agnihotri. 2010. Typification of some *Pedicularis* (Scrophulariaceae) species from the Himalaya. **Phytotaxonomy** 9 (2009): 114-115.
9. Singh H., Tariq Husain and P. Agnihotri. 2010. Haat Kali sacred grove, Central Himalaya, Uttarakhand. **Curr. Sci.** 98 (3): 290.
10. Singh H., Tariq Husain and F. A. Butt. 2010. Ethno-medicinal Plants and their Conservation through sacred groves in Pithoragarh District of Central Himalaya, Uttarakhand. **Geobios** 37(1): 53-56.
11. Maliya S. D and Datt, B. 2010. A contribution to the flora of Katarniyaghat Wildlife Sanctuary, Bahraich district, U.P. **J. Econ. Taxon. Bot.** 34(1): 42-68.
12. Maliya S. D and Datt, B. 2010. Unique application of *Luffa echinata* Roxb. (Cucurbitaceae) to cure jaundice. **J. Non-Timber For. Prod.** 17(10): 43-44.
13. Agnihotri P. 2010. Floristic diversity of Bhimbetka World Heritage site (Madhya Pradesh)-An overview. **The Indian Forester** 136(2): 215-223.
14. Roy S., A.Tyagi, V. Shukla, A. Kumar, U. M. Singh, L. B. Chaudhary, B. Datt, S.K. Bag, P. K. Singh, N. K. Nair, Tariq Husain and R. Tuli. 2010. Universal Plant DNA Barcode Loci may not work in Complex Groups: A Case Study with Indian *Berberis* species. **PLoS ONE** 5(10): 1-14.
15. Husain Tariq, P. Agnihotri, A.K. Paliwal and M. Singh. 2010. Global Climate Change Impact on Species Distribution in Nainital: A Future Challenge. In: Advancement Science and Technology. Eds. Mahipal Singh & A.K. Paliwal.142-153.
16. Husain Tariq, H. Singh, P.C. Pande, A.K. Paliwal and P. Agnihotri 2010. Role of Sacred Groves in Biodiversity Conservation – A case study from Haat Kali sacred grove, Pithoragarh (Uttarakhand). In: Advancement Science and Technology. Eds. Mahipal Singh & A.K. Paliwal. 85-89.

17. Singh H., P. Agnihotri, P.C. Pande & Tariq Husain. 2011. Biodiversity conservation through traditional beliefs system in Indian Himalaya: A case study from Nakuleshwar Sacred Grove. **Environmentalist** 31:246-253.
18. Agnihotri P., S. Sharma, V. Dixit, H. Singh and Tariq Husain. 2010. Sacred groves from Kumaon Himalaya. **Curr. Sci.** 99 (8): 996-997.
19. Singh H., P. Singh and Tariq Husain. 2011. Medicinal plant diversity in newly reported sacred grove of Pithoragarh District, Uttarakhand. **The Indian Forester** 137(8): 1005-1008.
20. Agnihotri P., H. Singh and Tariq Husain. 2012. Patalbhuvneshwar: a new sacred grove from Kumaon Himalaya. **Curr. Sci.** 102(6): 830-831.
21. Agnihotri P., S. Sharma, V. Dixit, H. Singh and Tariq Husain. 2012. Conserved patches of ethnic flora in Kumaon Himalaya. **Indian Forester** 138 (4): 371-375.
22. Agnihotri P. and Tariq Husain. 2012. A supplement to the flora of Nainital, Uttarakhand. **Indian Forester** 138 (9): 812-818.
23. Singh H. and Tariq Husain. 2012. Sacred groves of Kumaon Himalaya: an abode for lichens. **Phytotaxonomy** 12: 145-150.
24. Singh H., P. Agnihotri, P.C. Pande & T. Husain. 2013. Role of traditional knowledge in conserving biodiversity: A case study from Patalbhuvneshwar sacred grove, Kumaon Himalaya, India. **J. Biodiversity Management & Forestry**. 2.2. doi no.10.4172/2327-4417.1000108.

Names of scientists working in Herbarium with their designations:

1. Dr. Tariq Husain, Senior Principal Scientist
2. Mr. Baleshwar, Scientist
3. Dr. Priyanka Agnihotri, Scientist

Name of Technical Staff

1. Dr. Bhaskar Datt, Senior Technical Officer (3)
2. Shri Mohan Lal, Lab attendant

Res. Fellows/PA's/RA's

1. Dr. Harsh Singh

2. Ms Veena Dixit

Name of Group Leader: Dr. Tariq Husain

Phone: 0522-2297845

Fax: 0522-2205836

Mobile: 09453324466

Email: thusain@nbri.res; hustar_2000@yahoo.co.uk