

inputs to study the climate induced variation in wood anatomy of different species. Till date, the internal structures of more than 135 species of woody plants have been studied. Altogether 1,190 samples of wood as well as 3,350 permanent slides of different species have been preserved at KATH Xylarium.

6. Plant Ecology section

This section deals with the study of ecosystems, relationship between the plant species and the impact of different climatic and topographic factors upon the occurrence as well as status of the plant species in a population. Study of the rare, threatened and endemic plants of Nepal and the impact of climate change on their occurrence, status and diversity have been prioritized by this section.



7. Cytology section

Cytology section undertakes the studies related to the morphology and physiology of plant cells. It involves the collection of fresh plant samples from different areas of Nepal, preparation of permanent slides and their subsequent observation under compound microscope thereby characterizing each of the species studied through their cytological features. Researches on cyto-taxonomy of morphologically similar plants may reveal their phylogenetic positions and thus help to ascertain their taxonomic status. Cytological information such as number, shape, size and behaviour of chromosomes and genome analysis helps to establish the evolutionary relationship among the species. Cyto-taxonomical attributes including chromosome number, morphology, ploidy level, ploidy type and chromosomal aberrations provide valuable data for classification of plants.

8. Plant Protection section

Biological invasion, environmental degradation, human and animal disturbances are some of the serious problems creating degradation of biodiversity. This section deals with the impact of environmental degradation, anthropogenic disturbance and biological invasion upon the plant species and identifies the methods to prevent infection, control plant diseases as well as invasion.

Museum

NHPL also has a museum, which preserves the samples of economically important plants and carpological collections. About 600 museum

specimens are preserved and categorized according to their economic importance (medicinal, food, fiber etc.) and parts used (flowers, fruits, seeds, bark, stem, roots etc.).

Library

The library of National Herbarium and Plant Laboratories contains 3,300 books and 2,115 journals related to plant species, floras, and fascicles on flora of Nepal. The list of these books and journals can be accessed at KATH eLibrary (http://elibrary.kath.gov.np/opac_css).

Services

NHPL has been continuously working on the identification of plant specimens brought by students, national and international researchers, institutions, traders, public, Division Forest Offices and the Police authority. Similarly, visiting students from different schools, colleges and universities are provided with detailed information regarding herbarium collection, preparation techniques, its importance and utilization.

Some Publications

Name of publication	Price (NRs.)	Name of publication	Price (NRs.)
Fungi of Nepal, 1997	-	Flowering Plants Discovered from Nepal, 2019	980
Fungi of Lalitpur, 2003	-	A Handbook of the Flowering Plants of Nepal Vol. 2, 2019	500
Wood Anatomy of the Family Fagaceae, 2004	-	Ferns and Fern-Allies of Nepal Vol. 2, 2019	800
Catalogue of Nepalese Flowering Plants-1, 2010	415	Bryophytes: Collection, Preservation and Identification, 2019	200
Catalogue of Nepalese Flowering Plants-2, 2011	400	Ferns and Fern-Allies of Nepal Vol. 3, 2020	528
Wood Identification Manual of Important Timbers of Nepal Vol. 1, 2012	-	Algal flora of Nepal Vol. 1 Cyanobacteria, 2020	672
Catalogue of Nepalese Flowering Plants-3, 2012	373	A Handbook of Gymnosperms of Nepal, 2020	520
Catalogue of Fungi preserved in NHPL, 2014	-	A Handbook of Bryophytes of Nepal Vol.1, 2020	-
Catalogue of Nepalese Flowering Plants, Supplement 1, 2015	600	A Handbook of the Flowering Plants of Nepal Vol. 3, 2021	-
Ferns and Fern-Allies of Nepal Vol. 1, 2015	-	Bijaysal- A Monograph of <i>Pterocarpus marsupium</i> in Nepal, 2021	-
A Handbook of the Flowering Plants of Nepal Vol. 1, 2017	600	विजयसाल, वि.सं. २०७८	-
Yews of Nepal, 2017	-		
Flowering Plants of Nepal: An Introduction, 2017	560		



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National Herbarium and Plant Laboratories (NHPL) is located in Godawari, at the base of Phulchoki hills in the south-eastern part of the Kathmandu valley. It is about 10 km away from Satdobato, which is the main entrance to Godawari. It was formerly established as the Botanical Survey and Herbarium in 1961, under the then Department of Medicinal Plants and later in 1989 it was renamed as National Herbarium and Plant Laboratories. It is one of the central offices of Department of Plant Resources under the Ministry of Forests and Environment. NHPL is internationally abbreviated and recognized as KATH herbarium. NHPL aims at carrying out survey, collection, preparation, identification and preservation of herbarium specimens and documentation of plant resources within the country. These herbarium specimens provide an authentic record of the plant species found in Nepal for the documentation of flora of Nepal. About 165,000 herbarium specimens of both flowering and non-flowering plants have been housed at KATH. NHPL facilitates the scientific researchers as well as general public in plant identification, proper utilization and conservation of the plant resources. There are eight technical sections and one administrative section for conducting research activities and providing services related to the plant resources.

1. Phanerogams section

Phanerogams section deals with the study and documentation of angiosperms and gymnosperms as well as collection, preparation, identification and housing of herbarium specimens and their arrangement according to the accepted system of classification. Herbarium specimens are collected, pressed, dried and identified plant specimens which includes whole plant (herb) or plant twig/parts (trees, shrubs or climbers) with flowers or fruits, mounted on the herbarium sheets with detailed information containing scientific name, family, collectors, collection date, number and locality along with brief field note about that plant. The place where these herbarium specimens are arranged and preserved according to an accepted system of classification is called as herbarium.

About 1,45,000 herbarium specimens of angiosperms and gymnosperms have been housed and systematically arranged according to Bentham and Hooker's system of classification. Based upon the record of herbarium specimens preserved in different herbaria of the world, 5,309 flowering plant species are found in Nepal



of which 4,690 species of flowering plants are housed at KATH. Similarly, herbarium specimens of naturally occurring 23 species of gymnosperms are deposited at KATH. The scientific names and description of plants are always based upon the herbarium specimens or illustrations. Those herbarium specimens used and cited by the author while describing and naming the plant for first time in the original description (Protologue) are known as Type specimens. Altogether, 117 type specimens of flowering plants have been housed at KATH. Those plant species which are found only in Nepal and not in other parts of the world are endemic to Nepal. A total of 293 species of flowering plants are endemic to Nepal and herbarium specimens of 140 such plants are housed at KATH.

2. Cryptogams section (Algae, Fungi and Lichens)

This section focuses on the documentation, collection and identification of algae, fungi and lichens found in different parts of Nepal. A total of 998 species of algae and 1,129 taxa (1078 species and 51 infra specific) of lichens have been reported from Nepal. About 1,700 samples of lichens including one holotype and one isotype collected from different parts of Nepal have been preserved in this section. Similarly, 2,467 species of fungi are



found in Nepal, among which 131 species of fungi are endemic. Out of 1,291 species of recorded macro fungi, 159 species are edible, and 73 species are medicinally important. About 3,500 well labelled fungi specimens have been preserved in the Mycology section of KATH.

3. Cryptogams section (Bryophyta and Pteridophyta)

This section aims at conducting the research on collection, identification and documentation of bryophytes and pteridophytes found in different parts of Nepal. A total of 1,213 species of bryophytes and 583 species of pteridophytes (ferns and fern-



allies) have been reported from Nepal. Out of these, three species of ferns and 31 species of bryophytes are endemic to Nepal. A total of 18,000 herbarium specimens with six type specimens of pteridophytes are housed at KATH.



4. Digitization and Publicity section

Digitization of herbarium is a method of keeping electronic record of data within a database, which contains information about the specimen (Scientific name, collection number, locality etc.). Sometimes the herbarium specimens may become inaccessible to the scientific researchers, students as well as public due to several unavoidable circumstances. Thus, the concept of virtual herbarium is gaining popularity among the herbaria worldwide. Digitization of the herbarium specimens help to keep a record of the herbarium specimens in the electronic media with a high-resolution image, which helps to preserve data for the future.

The high-resolution images are obtained through the Herbscan (Epson 10000XL) and Camera (Nikon D810). A total of 1,09,000 herbarium specimens have already been digitized and 92,641 digitized specimens are available online through <http://plantdatabase.kath.gov.np>.



5. Xylarium section

This section conducts research on the internal structure of the wood in order to identify the tree species as well as the quality of the woods. Different plant species exhibit different characteristics regarding the colour, texture, size of vessels, annual rings, etc. in their woods. The climatic condition of an area causes variation in the wood anatomy (especially tree species). This section has made lots of

