

# **Herbarium**

A Herbarium is defined as a collection of plants that usually have been dried, pressed, preserved on sheets and arranged according to any accepted system of classification for future reference and study.

## **Methods of preparation of herbarium specimens:**

The preparation of a herbarium involves: (a) Field visits and collection of specimens (b) Pressing and drying, (c) Mounting on a herbarium sheet, (d) Preservation, (e) Labeling and (f) Proper storage.

### **(a) Field visits and specimen collection:**

A complete specimen should possess all parts including root system, flowers and fruits. Therefore, regular field visits are necessary to obtain information at every stage of growth and reproduction of a plant species. In the fields, the tools required are mainly trowel (digger) for digging roots, scissors and knife for cutting twigs, a stick with a hook for collection of parts of tall trees, a field note book, polythene bag, old newspaper and magazines. To avoid damage during transportation and preservation many replicates of the specimens should be collected. The collected specimen must be tagged with a field number and necessary information should be recorded in a field note book.

### **(b) Pressing and drying:**

The specimens are spread out between the folds of old newspapers or blotting sheets avoiding overlapping of parts. The larger specimen may be folded in 'N' or 'W' or 'V' shapes. The blotting sheets with plant specimen should be placed in the plant press for drying. After 24 to 48 hrs the press is opened.

### **(c) Mounting:**

The dried specimens are mounted on herbarium sheets of standard size (**41 x 29 cm**). Mounting is done with the help of glue, adhesive or cello-tape. The bulky plant parts like dry fruits seeds, cones etc. are dried without pressing and are put in small envelopes called fragment packets. Succulent plants are not mounted on herbarium sheets but are collected in **4% formalin** or **FAA** (Formalin Acetic Alcohol).

### **(f) Preservation:**

The mounted specimens are sprayed with fungicides like **2%** solution of **mercuric chloride**.

### **(e) Labelling:**

A label is pasted or printed on the lower right hand corner. The label should indicate the information about the locality, altitude, habit, date and time of collection, name of collector, common name, complete scientific name etc.

**(f) Storage:**

Properly dried, pressed and identified plant specimens are placed in thin paper folds (specimen covers) which are kept together in thicker paper folders (genus covers), and finally they are incorporated into the herbarium cupboards in their proper position according to a well known system of classification. In India **Bentham and Hooker's system** of classification is used for this purpose. Type specimens are generally stored in separate and safe places.

**Functions and importance of Herbarium:**

A modern herbarium serves numerous valuable functions. Some of the important functions of herbaria are as follows:

(a) A herbarium serves as an invaluable conservatory of plant material of flora collected from different parts of the world. Thus, they provide at one place, basic material for study of flora and vegetation of different places or regions.

(b) The specimens in the herbarium carry valuable data on their labels. These include data on habitat, habit, local names, colour of flowers or other characters of the plant, native uses of the plant, abundance or frequency of the species, associated plants, etc. Thus, herbaria provide data for botanical, ethno-botanical and phytogeographical studies.

(c) The herbarium serves as an aid in teaching botany to students in institutions where a herbarium is present, as it helps a teacher to show his students a plant specimen which may not be available fresh at the time of giving the course. It also helps students to identify local plants collected by them.

(d) Preserved specimens of herbaria are used in almost all types of taxonomic research. It is believed to be an essential requirement for biosystematics research today, for correct identification and nomenclature of the plant under study.

(e) The specimens in the herbaria are also used as a source of material for anatomical, palynological and chemo-taxonomical studies.

(f) The herbaria provide important data on actual places of occurrence, time of flowering and fruiting, associated species and other data for researches in embryology, cytology and ecology.

(g) The herbaria have proved to be very valuable source of information for ethno-botanical researches as many native uses of plants are recorded on the herbarium sheets.

**List of some important herbaria are given below:**

<b>Table 4.1 : Some important herbaria of the world</b>					
<b>Sl. No.</b>	<b>Name of Herbarium</b>	<b>Place</b>	<b>Year of founding</b>	<b>Abbreviation</b>	<b>Total number of sheets (Approx.)</b>
1.	Royal Botanic Garden, Kew	London, UK	1853	K	6,500,000
2.	V.L. Komarow Botanical Institute Meseum National d' Histoire	Leningrad, USSR	1823	LE	5,000,000
3.	Naturelle Laboratoire de Phanerogramme	Paris, France	1635	P	5,000,000
4.	Coservatoire Et Jardin Botaniques	Geneva, Switzerland	1817	G	4,000,000
5.	New York Botanic Garden	New York, USA	1891	NY	3,000,000
6.	U.S. National Museum	Washington, USA	1868	US	3,000,000
7.	Vienna Botanischer Gaertn	Vienna, Austria	1748	W	2,500,000
8.	National History Museum	Chicago, USA	1893	F	2,350,000
9.	Royal Botanic Garden	Edinburgh, UK	1893	E	2,500,000
10.	Missouri Botanic Garden	St. Louis, USA	1859	MO	1,700,000
11.	National Herbarium	Mc Bourne, Australia	1857	MEL	1,500,000
12.	Zurich Botanischer, Gaertn	Zurich, Germany	1834	Z	1,500,000
13.	Gray Herbarium, Harvard University	Cambridge, USA	1807	GH	1,485,000
14.	Philadelphia Academy of Sciences	Philadelphia, USA	1812	PH	1,000,000
15.	Arnold Arboretum	Boston, USA	1872	A	700,000
16.	Department of Agriculture	Peradeniya, Ceylon	1817	PDA	85,000
17.	Gordon College	Rawalpindi	1893	RAW	60,000
18.	Herbarium of the Rangoon University	Rangoon, Burma	1947	RANG	15,000
19.	Botanical Research Institute of Texas	Texas	1985	BRIT	500,000
20.	Fowler Herbarium – Queen's University, Canada	Canada	1987	—	—
21.	G.F. Leningham Herbarium – University	Regina	1989	—	50,000
22.	New Mexico State Range Science Herbarium	New Mexico	—	—	20,000
23.	University of Florida Herbarium (FLAS)	Florida	1990	FLAS	25,000
24.	University of Minnesota Herbarium	Venezuela	1992	—	830,000
25.	Washington State University — Marion Ownbey Herbarium	Marion	1995	—	350,000

Table 4.2 : Some important herbaria of India					
Sl. No.	Name of Herbarium	Place	Year of founding	Abbreviation	Total number of sheets (Approx.)
1.	Central National Herbarium	Shibpur, Howrah	1793	CAL	2,500,000
2.	Botanical Survey of India, Southern Circle	Coimbatore	1874	MH	200,000
3.	Botanical Survey of India, Eastern Circle	Shillong	1956	ASSAM	100,000
4.	Botanical Survey of India, Western Circle	Poona	1956	BSI	125,000
5.	Botanical Survey of India, Northern Circle	Dehradun	1956	BSD	60,000
6.	Botanical Survey of India, Industrial section	Kolkata	1887	BSIS	50,000
7.	Botanical Survey of India, Central Circle	Allahabad	1955	BSA	40,000
8.	National Botanic Garden, Herbarium	Lucknow	1948	NGB	100,000
9.	Forest Research Institute Herbarium	Dehradun	1816	DD	300,000

Table 4.3 : Some other minor herbaria of India				
Sl. No.	Name of Herbarium	Abbreviation	Year of founding	Total number of sheets (Approx.)
1.	Andaman & Nicobar Circle, Botanical Survey of India, Haddo, Port Blair	PBL	1972	20,000 (all groups worldwide specially vascular plants)
2.	Arid Zone Circle, Botanical Survey of India, 775/80, Subhash Nagar, Khema ka Kuan, Pal-Basni Canal Link Road, Jodhpur, Rajasthan	BSJO	1972	16,500 (all groups worldwide specially vascular plants of Arid and Semi-arid zones)
3.	Arunachal Field Station, Botanical Survey of India, Sankie View, Itanagar, Arunachal Pradesh	ARUN	1977	10,000 (all groups)
4.	Sikkim Himalayan Circle, Botanical Survey of India, P.O. Rajbhawan, Below Rajbhawan Campus, Gangtok, Sikkim	BSHC	1979	10,000 (all groups)
5.	Deccan Circle at Hyderabad	—	1984	—
6.	High Altitude Circle at Solan, Himachal Pradesh	—	1984	—
7.	Delhi University Herbarium, Delhi	—	—	15,000
8.	Rajasthan University Herbarium, Jaipur	—	—	30,000
9.	Herbarium of Jiwaji University, Gwalior	—	—	15,000
10.	School of Plant Morphology, Meerut College Herbarium	—	—	25,000
11.	Llyod Botanic Garden, Darjeeling	—	1878	12,000

## References:

<https://www.biologydiscussion.com/plant-taxonomy/plant-herbarium/herbarium-meaning-functions-and-kinds/30287>

<https://www.biologydiscussion.com/angiosperm/methods-of-preparation-of-herbarium-specimens-with-diagram/6532>