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GUIDELINES FOR HERBARIUM PREPARATION

An herbarium is a systematically arranged collection of preserved plant specimens used for study and reference. The preparation of an herbarium involves several essential steps:

Collection of Plant Specimens

- Plants should be collected in their flowering or fruiting stage for proper identification.
- Essential data, including habitat, date, location, altitude, and associated species, should be recorded.
- The collector should ensure minimal damage to the plant population by collecting only necessary parts while leaving enough individuals for ecological balance.
- Tools such as pruning shears, knives, and trowels should be used for careful extraction of plant specimens, especially for herbs and root samples.
- Specimens should be placed in plastic bags or field presses with damp newspaper to maintain freshness until further processing.
- Fragile flowers and delicate parts should be kept in separate envelopes or containers to avoid damage.
- GPS coordinates of the collection site should be noted for precise documentation and future reference.
- Ethical considerations should be followed, ensuring that rare, endangered, or protected species are not collected without necessary permissions.

Pressing and Drying

- Specimens should be placed between sheets of blotting paper or newspaper and pressed using a plant press.
- The press should be tightened to ensure even drying and changed periodically to prevent fungal growth.
- Drying should be done in a well-ventilated area or using artificial drying methods if necessary.

- In some cases, alcohol (70% ethanol or isopropyl alcohol) can be applied to plant specimens before pressing to preserve color and prevent microbial growth.
- Some thick or fleshy plant specimens may require pre-treatment with desiccants like silica gel or drying in an oven at a low temperature (40-50°C) to prevent decay.
- Specimens should be checked regularly to ensure they are drying properly and not developing mold.

Mounting

- Properly dried specimens are mounted on herbarium sheets (usually 42 x 29 cm).
- The herbarium sheet is made of acid-free, heavy-duty paper, typically 100-300 gsm in thickness, ensuring durability.
- Adhesive, thread, or tape may be used to secure the specimen, ensuring it retains its natural shape.
- Large specimens may be carefully cut and arranged in sections to fit within the herbarium sheet without losing essential parts.
- Overlapping plant parts should be minimized to ensure clear observation of leaf arrangements, flowers, and fruits.
- A thin layer of glue or small strips of adhesive tape should be applied sparingly to prevent excessive stiffening of the plant material.
- Special care should be taken when mounting delicate specimens, using additional support like transparent plastic film or paper strips.
- Labeling should be done at the bottom right corner of the sheet, ensuring it does not cover any part of the specimen.

Labeling

A standard label should include details such as:

1. Botanical name
2. Family
3. Common / Local name
4. Sanskrit name
5. Locality
6. Habitat
7. Altitude / GPS Coordinates
8. Phenology
9. Remarks
10. Collector's name
11. Date of collection

- Labels should be printed on acid-free paper to prevent degradation over time.
- Font size should be legible, typically between 10-12 pt, and handwritten labels should be avoided for consistency.
- Labels should be attached securely, preferably using an adhesive that does not cause discoloration or damage to the sheet.
- Additional barcode stickers or QR codes may be included for digital tracking and easy access to electronic records.

Preservation and Storage

- Specimens should be treated with insect repellents such as naphthalene, thymol, or mercury chloride to prevent pest infestation.
- Fumigation using chemicals like formaldehyde or ethylene dioxide can be employed to protect specimens from microbial damage.
- Herbarium sheets should be stored in airtight cabinets or herbarium boxes under controlled temperature (15-20°C) and humidity (50-60%) conditions to prevent fungal growth.
- Regular inspection and re-treatment of specimens should be done to detect signs of insect or fungal attacks.
- Desiccants like silica gel or anhydrous calcium chloride can be placed in storage areas to absorb excess moisture.
- Specimens should be handled with clean hands or gloves to avoid oil and dirt contamination.
- Periodic digitization of herbarium specimens ensures a backup record and helps in easy retrieval of data without frequent handling of fragile specimens.

Digitization and Documentation

- Modern herbaria use digitization to create virtual records of specimens.
- High-resolution scanning / photography is used to capture detailed images of specimens.
- Metadata such as scientific names, collection details, and GPS coordinates are linked to each digital record.
- Barcode systems and databases are used to facilitate easy access and retrieval of data.
- Online repositories allow researchers to access herbarium collections remotely, reducing the need for physical handling of fragile specimens.
- Cloud-based storage and backup solutions ensure long-term preservation and protection against data loss.
- Artificial Intelligence (AI) and machine learning technologies are being integrated into digital herbarium databases for automated species identification and classification.