

STANDARD OPERATING PROCEDURE FOR THE RESEARCH COLLECTIONS FACILITY, NCBS

SECTION I: INTRODUCTION

The Research Collections facility is a state-of-the-art collection of Natural History specimens at the National Centre for Biological Sciences, Bangalore campus. The aim of this facility is to build a modern museum and its allied facilities to highlight India's biodiversity and ecosystem. The Research Collections accomplishes its aim through public exhibitions, educational programmes and interpretation of natural history information, alongside preservation, research and publication in chosen fields.

SECTION II: USE OF SPECIMEN COLLECTION

A. GENERAL GUIDELINES:

- a. The specimens in the collections are not available for personal uses, like recreation, amusement or personal adornment. Such uses cannot guarantee the high level of control and handling that are prerequisites of professional collections management.
- b. No specimen will be used for commercial purposes.

B. TYPES OF COLLECTIONS AND THEIR USES:

While the use of the collections is encouraged, it must follow the preservation objectives, as per the following criteria:

1) Research Collections

- a. Specimens in the research collections are available for legitimate examination and research by staff, research colleagues, collaborators, students, and educators.
- b. No handling, storage or examination methods should affect the long-term preservation of the specimens.
- c. The specimens may be available to the Facility staff and qualified users for teaching and exhibition purposes, within the Facility premises provided that this use does not jeopardize the condition of the collections. Environmental conditions, case construction methods, mounting, transportation, installation, handling and duration must not damage the physical integrity of the material being exhibited.

2) Education Collections

- a. The facility will maintain specimens meant for education purposes separately. These specimens conform to the collections procedures but are not viewed as a permanent resource of the facility. Reasonable effort is made to ensure their long-term survival through adequate storage, security and handling. The scientific integrity of these objects is always respected.

C. VISITORS/ACCESS TO THE RESEARCH COLLECTIONS FACILITY

- a. Visitors/external users must contact the Facility-in-charge regarding their purpose and duration of visit prior to their visit for approval.

- b. External Users need to pay the bench fees for accessing the specimens during the stay (Bench fees for one day= Rs. 500, weekly=Rs. 2500, monthly= Rs. 7500, yearly=Rs. 75000). This is subject to change usually on a yearly basis.
- c. Access to the collections storage areas and the collections is limited to curatorial and collections management staff or official designees. All others, including visitors, researchers, contractors, or repairmen will be accompanied by appropriate staff and/or have specific prior approval.
- d. Accessioned materials used by the external users, removed from storage, being photographed or undergoing taxonomic examination remain the responsibility of the user.

D. PHOTOGRAPHY (STILL, FILM, VIDEO)

- a. There is a photography set-up in the mezzanine floor of the facility. All activities related to specimen photography is restricted to that set-up.
- b. To minimize handling and possible damage to exhibits, users are encouraged to use the existing photographs made by the collection staff. For photographing specimens, the bench fees as mentioned above are applicable.
- c. For public visits, visitors are not allowed to take photographs and videos with their own equipment.
- d. The visiting photographer assumes all liability and financial responsibility for any injury, loss, or damage that may result from activities related to the photography.
- e. Visitors are not allowed to photograph from inside an exhibit or touch objects on exhibit without express written permission obtained in advance from the curatorial personnel. No equipment, clothing, etc., may be placed on any case, exhibit, or object belonging to the Research Collections

E. PUBLICATIONS

The NCBS Research Collections must be acknowledged in any publication (scientific or popular) coming out of specimens studied or photographed from this facility. For significant contributions towards specimen identification, taxonomic examination; the concerned person from the facility should be a co-author in any resulting publications.

SECTION III: AQCQUISITION OF SPECIMENS FOR RESEARCH COLLECTIONS FACILITY

- 1) The facility has limited storage space, established goals, and financial and ethical constraints, and thus the specimens are selectively acquired. The specimens tied to valid specimen collection permit under the Wildlife Protection Act (1972) from the respective regional Forest Department; are allowed to be deposited here. It is not feasible for the Facility to allow indiscriminate growth of collections.
- 2) Further, specimens collected without permit for ‘non-commercial purposes’, may be deposited with proper documents explaining the need to do so.

- 3) Priority for acquisition will be given to specimens for research, exhibition, and educational programs of the Facility, that fill the gaps and improve the comparative series in the existing collection and add to the documentation of natural history specimens.

SECTION IV: CURATORIAL PROCEDURES OF THE FACILITY

A. ADDITION OF SPECIMENS TO THE COLLECTION

a. ADDING TO THE DATABASE/DEPOSITION OF SPECIMENS (DRY AND WET COLLECTION)

Wet Collection (specimens are stored in 70% ethanol):

Materials and Equipment:

1. Specimen collection tools (gloves & containers)
2. Molecular grade ethanol (100%)
3. 8% formalin solution
4. 70% crude ethanol
5. Tap water
6. Long-term storage containers (e.g., vials, jars)
7. Labels
8. Permanent markers
9. Data collection forms/notebook.

Procedure:

Specimen Collection:

- Before collecting specimens, ensure that all necessary permits and ethical considerations are in place.
- Approach the specimen location with minimal disturbance to the natural habitat, taking care not to damage the environment.
- Use appropriate collection tools such as gloves and containers to collect the specimens gently and efficiently.
- Document relevant information for each specimen, including location, date, time, and any notable observations, using data collection forms and permanent markers.
- Handle specimens with care.

Preservation of Tissues (Liver, muscle etc.):

- Once the specimens are collected, prioritize the preservation of tissues for genetic analysis.
- Wear appropriate personal protective equipment such as gloves and safety goggles.
- Immediately after collection, place the tissues into a clean, labeled molecular-grade 100% ethanol vial. Ensure that the same voucher number assigned to the specimen is written on the paper using pencil or archival ink and keep the paper inside the vial.

To fix the specimens, follow these steps:

- Fixation: Inject 8% formalin solution and keep specimen for approximately 12 to 24 hours (Use Safety Glasses & Mask).
- Washing: After fixation, gently wash the tissues by immersing them in tap water for an additional 24 hours. This step is essential to remove any residual formalin from the tissues. (Use Safety Glasses & Mask).
- Transfer to Ethanol: Following the wash, transfer the specimen for long-term storage to solution of 70% ethanol. Ensure that the specimens are fully submerged in the ethanol. (Specimens, including snakes, geckos, lizards, frogs etc., should be tied with their assigned voucher code before being transferred to the final storage jar or vial.)

Labelling and Documentation:

- Label the containers with the assigned voucher number/numbers, holding the tissues with relevant information, including specimen identification, date, location and type of preservative (e.g., 70% ethanol).
- All the information should be accurately entered into the main database and cross-checked before moving to the storage room (wet collection cabinets).
- Ensure that the specimens are properly labelled and organized for easy retrieval.
- Store the labelled containers.

Dry Collection (Insects, mammals, birds etc.)

Materials and Equipment:

1. Specimen collection tools (net, trap, containers etc.)
2. Molecular grade ethanol (100%) **
3. Pointed forceps, Iris scissor. **
4. Long-term storage containers for tissue (e.g., vials, jars). **
5. Labels
6. Pencil, archival ink pen, paper.
7. Data collection forms/notebook.

** The equipment needed for tissue collection depends on the specific requirements of the project

Procedure:

Specimen Collection: Same as Wet Collection.

Preservation of Tissues (Liver, muscle etc.) (Depends on the specific requirements of the project): Same as Wet Collection.

To fix the specimens, follow these steps:

- Fixation: Wooden or foam insect pinning board, rust proof pins, butter Paper.

- Drying specimens: After mounting the specimen, place it in a hot air oven at 35°C to 40°C for a minimum of 1 day to 15 days, depending on the specimen size.
- Unpinning: After drying the specimen, carefully unpin it and place it in the unit tray with the assigned voucher number.

The process of taxidermy, as directed by Honorary Curators, involves carefully preserving and mounting specimens of birds, small mammals etc.

Labelling and Documentation:

- Ensure that the specimens are properly labelled during the mounting process.
- All the information should be accurately entered into the main database and cross-checked before moving to the storage room (Dry collection cabinets).

B. STORAGE AND MAINTENANCE (DRY AND WET COLLECTION)

Storage (Wet Collection)

1. Ensure that all specimens and jars are properly labeled before placing them in the wet collection cabinets or the 4°C freeze.
2. 70% ethanol should be replaced as needed.

Storage (Dry Collection)

1. All the specimens, drawers and unit trays should be placed in the -80°C freezer for at least 72 hours before being moved to the Dry collection room.
2. The Dry collection room should be free of chemicals (preservatives), with a maximum temperature of 20°C and humidity levels not exceeding 45-50%.
3. All kinds of bags from outside are strictly prohibited in the dry collection room.

Fumigation:

The basement storage area requires fumigation once a year. For the mezzanine floor, it is based on the requirement.

B. ACCESSION PROCEDURE

Access to use the collections for research, educational and other purposes will be through the approval of the Facility-in-charge and/or the Assistant Curator.

a) Request to visit the NCBS Research Collections: All requests should be made in writing or via e-mail to the Assistant Curator or the Facility-in-charge. Visitor access is preferred from Monday through Friday, between 9:00 and 17:00.

b) Denial of Access: The Facility-in-charge and the Assistant Curators have the right to deny access to individuals or representatives of organizations or businesses that plan to use or who are found using the Invertebrate collection in a manner which does not conform to the Research Collections policies of NCBS.

Denial reasons might include these and other reasons:

- compromised security of the collections and facilities
- unauthorized destructive sampling of specimens
- a history of misuse of specimens at other museums
- falsification of credentials, criminal activity, or disruptive conduct.

c) Tours. Tours of the Invertebrate collection for the public or educational groups may be provided by the Assistant Curator or appropriate staff. If possible, please contact them at least 1-2 weeks in advance.

d) Use of Educational Materials. Use of the education collection will be with the approval of the Invertebrate Curators or the Collection Manager

SECTION V: ETHICS

All individuals associated with the Invertebrate collection will:

- maintain the integrity of all specimens because they are irreplaceable
- avoid actions that conflict with responsibilities or cause personnel to favor other interests over those of the Research Collections at NCBS
- have as prime responsibilities the conservation of specimens and associated materials in the public trust and to make specimens available for research, teaching and exhibits
- act ethically and legally in the acquisition of materials.
- use the most acceptable preservation, conservation and management methods
- accept specimens and associated data which improve the scientific and educational value of the collection and preserve important scientific data.
- use prudent judgment about the dissemination of information that may jeopardize sensitive or protected species, or unpublished research
- will deny access to users that fail to follow the policies outlined in this manual or if they misrepresent their research and the NCBS Research Collections
- clearly identify and mark (or make inaccessible) those specimens that might be unsafe for students, workers, volunteers and researchers because they are hazardous, or have become so through preparation or fumigation



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