

# Biodiversity Data Use and Biorepositories in Bhutan

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## Abstract

Biodiversity information and biorepositories in Bhutan were instituted in the 1990s, and have contributed towards biodiversity conservation efforts in the country including citizen-science initiatives. Bioinformatics in Bhutan is still in its initial stage, and some biorepositories have incorporated information systems for their collections. Some major biorepositories in the country include the [National Herbarium](#), [National Animal Gene Bank](#), [National Plant Gene Bank](#), [National Invertebrates Repository](#), and [Taxidermy](#). Other repositories distributed at various institutions cover the taxonomic groups such as fishes, amphibian and reptiles, butterflies and moths, mushrooms, bryophytes, agricultural pests, among others.

Biorepositories are one of the major sources of biodiversity data and information, where the [National Herbarium](#) and [National Invertebrates Repository](#) have initiated digitizing its plant and invertebrate specimens. The digitized specimens will be made freely accessible through the [Bhutan Biodiversity Portal](#) and [Bhutan Biodiversity Specimen Portal](#) managed by the [National Biodiversity Centre \(NBC\)](#). The [Bhutan Biodiversity Portal](#) is an online consortium-based platform for biodiversity documentation of citizen science and collections. [Bhutan Biodiversity Specimen Portal](#) is an online system for documenting herbarium specimens especially from the [National Herbarium](#) of Bhutan (THIM).

Other major information use and sharing systems related to biodiversity include [National Biodiversity Clearing House](#), [National Access and Benefit Sharing Clearing House](#), [National Biosafety Clearing House](#), [Forest Information Reporting and Monitoring System](#), and [Pests of Bhutan database](#). Some of the collection-based offline systems include Royal Botanical Garden Database, National Traditional Knowledge Database, National Plant Gene Bank Information System, National Animal Gene Bank Information System, National Invertebrates Database, and institutional databases.

Citizen science initiatives in Bhutan are increasing annually with major participation from youths. The contribution from young people is playing a major role in biodiversity documentation and data use in the country. The most used applications include [iNaturalist](#),

[eBird](#), Bhutan Biodiversity Portal, [Global Biodiversity Information Facility](#) (GBIF), and social media sites such as [Facebook](#) (groups and pages) and blogs.

Molecular data and information on species are limited in the country, however, through collaboration with international partners, some molecular information, especially for new species, is available to the public, through the use of [Barcode of Life Data System](#) (BOLD). There exists only a handful of laboratories conducting basic molecular studies on biodiversity in the country.

The country's molecular information would be enhanced with the establishment of advanced molecular laboratories and capacities in bioinformatics. Advancements in bioinformatics would also contribute towards enhancing accessibility of specimen collections distributed around the country. Other major challenges include non-availability of experts in some taxonomic groups, especially for understudied groups. It is also imperative to have a coordination mechanism for sharing all data and information related to biodiversity, bringing in all the relevant national and international stakeholders.

## **Keywords**

biodiversity information, eastern Himalaya, bioinformatics

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## **Conflicts of interest**

Authors declare no conflict of interest.