



**LIVINGSTONE MUSEUM**  
**GBIF-BID Project BID-AF2017-0301-NAC**

**TRAINING REPORT**  
**GEOGRAPHIC INFORMATION SYSTEMS (GIS) AND MOLECULAR METHODS TRAINING WORKSHOPS**  
**CBIO-InBIO, Portugal - 11-19 DECEMBER 2017**

The Biodiversity Information for Development (BID) Project Core Team, comprising Keeper of Mammalogy and Project Lead, Clare Mateke, and project research assistants Sande Mulwanda and Debra Nachinga, travelled to Porto, Portugal to attend two workshops on Geographic Information Systems (GIS) and Molecular Methods. These workshops were two of the scheduled activities of the BID Project. The BID Projects are organised by the Global Biodiversity Information Facility (GBIF) and are funded by the European Union.

**GEOGRAPHIC INFORMATION SYSTEMS (GIS) WORKSHOP**



**Aim**

The purpose of the GIS Workshop was to provide basic training in the use of GIS software and georeferencing techniques.

**Trainers**

The training for the GIS Workshop was provided by Hugo Rebelo from the Research Centre in Biodiversity and Genetic Resources (CIBIO) and Rachael Cooper-Bohannon from Bats without Borders.

**Topics covered**

The GIS Workshop ran for three days, during which the following topics were covered:

1. Overview of GIS
2. Understanding of data types
3. Understanding of software
4. Downloading ArcGIS and QGIS
5. Downloading shape files and species records
6. Importing shape files, rasters and clipping
7. Displaying occurrence data
8. Upscaling and downscaling
9. Changing projections
10. Producing figures

During the time in Portugal the participants were also able to attend a public viva of a PhD student, Helena Santos, at the University of Porto. The student's project combined molecular analysis with predictive modelling using GIS to study the population history of some Iberian bat species, so was highly relevant to the training.

### **Application**

The project core team now have relevant basic training in molecular methods and geographic information systems that will be used in the implementation of several aspects of the BID project, specifically:

1. Collection of tissue samples from bat specimens for molecular analysis
2. Creation of DNA library for Zambian bats
3. Georeferencing bat specimen occurrence data (part of transforming the data for publishing)
4. Preparation of species distribution maps for Zambian bats, eventually leading to a bat atlas for Zambia

### **MOLECULAR METHODS WORKSHOP**



### **Aim**

The aim of the molecular methods workshop was to provide basic training in molecular methods to the project core team to enable them to acquire skills in extraction of tissue samples from bat specimens for molecular analysis, to understand the processes involved in the molecular analysis of the samples and to be able to analyse the results.

## Trainers

The training for the Molecular Methods Workshop was provided by staff from the Research Centre in Biodiversity and Genetic Resources - InBIO Associate Laboratory (CIBIO-InBIO), an internationally recognized Research Unit in biological sciences conducting basic and applied research on the three main components of biodiversity: genes, species and ecosystems. CIBIO-InBIO is located at the University of Porto's Vairão Campus. The lead trainer was Raquel Godinho (Auxiliary Researcher), who provided theoretical training, while practical training was provided by laboratory technicians including Susana Lopes, Sofia Mourão, Patricia Ribeiro and Diana Castro.

## Topics covered

The training was for five days and was conducted mainly in the Centre for Molecular Analysis (CTM). The following topics were covered:

1. Genetic attributes of populations
2. Levels and types of variation in populations
3. Invasive and non-invasive sampling
4. Environmental DNA sampling
5. Preservation of tissue samples for molecular analysis
6. DNA extraction
7. DNA detection
8. Molecular markers
9. DNA amplification by polymerase chain reaction
10. Preparing sequences of a genome for analysis
11. Sequencing and comparing individuals among populations and species
12. Microsatellites
13. Using microsatellites (Genotyping)

*Clare Mateke*

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Keeper of Mammalogy  
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