

**WOMEN
IN
SCIENCE**

INDABA 2023



FRIDAY, 10 FEBRUARY 2023

Celebrating women working on African bat research across Africa!

IN PARTNERSHIP WITH:



WOMEN IN BAT SCIENCE INDABA 2023

Friday 10 February 10.30am-1.45pm (SAT) | 8.30-11.45am (UK)



TIMETABLE

#WiBS2023

| Time | | Description | Who |
|---|-------|---------------------------|-------------------------|
| UK | SAT | | |
| 8:20 | 10:20 | Zoom opens | |
| 8:30 | 10:30 | Welcome and introductions | BwB team |
| Host: Dr Rachael Cooper-Bohannon | | | |
| 8:45 | 10:45 | Keynote speaker | Dr Dina Dechmann |
| 9:45 | 11:45 | Presentation 1 | Damilare Ayokunle |
| 10:00 | 12:00 | Presentation 2 | Ana Gledis da Conceição |
| 10:15 | 12:15 | BREAK | |
| Host: Helen Taylor-Boyd | | | |
| 10:30 | 12:30 | Presentation 3 | Siphesihle Magagula |
| 10:45 | 12:45 | Presentation 4 | Alex Howard |
| 11:00 | 13:00 | Presentation 5 | Dr Marike Geldenhuys |
| 11:20 | 13:20 | Presentation 6 | Dr Leigh Richards |
| 11:40 | 13:40 | Closing remarks | BwB team |
| 11:45 | 13:45 | End | |



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WOMEN IN BAT SCIENCE IN DABA 2023

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KEYNOTE

#WiBS2023



DR DINA DECHMANN

Max Planck Institute of Animal Behavior / University of Konstanz

Tracking straw-coloured bats across Africa - past, present and future

African straw-coloured bats (*Eidolon helvum*) are amazing in many ways. They form huge colonies, often in the middle of cities, they are likely the most numerous mammal of Africa, they are the only fruit bats that migrate large distances and even though they are a keystone species for the environment they are often perceived as negative because they are noisy, sometimes compete for fruit and thought to transmit diseases. Others often see them as an easy source for meat.

Despite these many roles, we know surprisingly little about straw-coloured fruit bats, but we have been learning more mainly thanks to our many volunteers and scientific collaborators in many African countries, who have helped us employ emerging tracking technologies and dig deep into these bats' ecology. I will give an overview of our work in the past decade and give a glimpse into the future of our research of this wonderful species- Africa's secret gardener.

LINE UP

#WiBS2023



DAMILARE AYOKUNLE

Bowen University, Nigeria

Isolation of bacteria from Straw-coloured fruit bats in Bowen University, Nigeria.



ANA GLEDIS DA CONCEIÇÃO

National Administration of Conservation Areas

The relationship between the morphology of the vestibular system and echolocation parameters of bats of Gorongosa National Park, Sofala, Mozambique



LINE UP

#WiBS2023



SIPHESIHLE MAGAGULA

University of Eswatini

Morphological identification of pipistrelle-like bats in Eswatini with the discovery of a new species *Neoromicia hlandzeni*



ALEXANDRA HOWARD

University of the Free State

Perceptions and pest control of bats in apple orchards, central South Africa



DR MARIKE GELDENHUYS

University of Pretoria

Understanding coronavirus maintenance and excretion dynamics within bat populations



DR LEIGH RICHARDS

Durban Natural Science Museum

Natural Science Collections-based research: the good, not-so-good, and downright amusing

THANK YOU

#WiBS2023

To our speakers, sponsors and everyone who joined us for our first Women in Bat Science event! To find out more about Bats without Borders and how to get involved and support our work please visit:



DAMILARE AYOKUNLE

Bowen University

Isolation of bacteria from Straw-coloured fruit bats in Bowen University, Nigeria

Bats are known to be reservoirs for a variety of mammalian pathogens, including viruses, fungi, and bacteria. Many of the studies examining the microbial community inhabiting bats have investigated bacterial taxa found within specific bat tissues and isolated bat guano pellets, but relatively few studies have explored bacterial diversity within bat guano piles. In large bat roosts, bat guano can accumulate over time, creating piles several meters deep and forming complex interactions with coprophagous organisms in a habitat with low light and oxygen. As the guano decays, the nutrient composition changes, but the bacterial communities deep within the pile have not been characterized. The study assessed various bacterial communities found within bat guano and determined their molecular characterization.

The study was carried out at Bowen University, Iwo, Osun state, Nigeria. The school covers a land area of 1,300ha and serves as a habitat for the frugivore bats; *Edolon helvum*. The school is populated with over a million of the bat species. Selected roosts sites were mapped out and served as collection sites for the samples. Molecular characterization of the samples was done at Genlab, Ibadan. Results were reported to have identified two different gram-positive bacteria genera; *Brevibacillus borstelensis* and *Bacillus aerius*. *Brevibacillus borstelensis* is an environmental organism that is rarely implicated as a human pathogen. It is a comprised environmental bacterium observed in diverse habitats including agricultural soil, wastewaters, and hot springs, and also exploited in pollutant degradation services. *Bacillus aerius* is an antibiotic-resistant bacterium, exploited for industrial importance because it is thermostable and halotolerant in nature. The present study's results indicate that non-pathogenic bacteria communities can be isolated from bat guano.



ANA GLEDIS DA CONCEIÇÃO

National Administration of Conservation Areas

The relationship between the morphology of the vestibular system and echolocation parameters of bats of Gorongosa National Park, Sofala, Mozambique

Bats play an important role as seed dispersers, pollinators, pest control agents, and are suitable indicator species for habitat disturbance. However, identifying bats to species can be difficult for certain groups. Traditionally, bats have been identified based on morphometric features, such as the size and shape of the cranium, teeth, and baculum. More recently researchers have been incorporating genetic and acoustic characters, allowing the identification of bats through integrative taxonomy. I investigated the relationship between the bony elements of the vestibular systems and selected echolocation parameters in 38 bat species from Gorongosa National Park, central Mozambique: Vespertilioniformes (Vespertilionidae - 15 spp., Miniopteridae - 3 spp., Molossidae - 3 spp., Nycteridae - 3 spp., and Emballonuridae - 1 sp.) and Pteropodiformes (Rhinolophidae - 6 spp., Pteropodidae - 3 spp., Hipposideridae - 2 spp., and Rhinonycteridae - 1 sp.) The vestibular system was photographed and processed with a focus-stacking technique that used a combination of software by Helicon Soft Ltd. Pteropodiformes have a greater proportion in the number of cochlear coils than the suborder Vespertilioniformes that has a lower number. The PCA results demonstrate an association between the parameters of bat echolocation calls and the structure of their vestibular organs, with species that emit lower frequency calls having larger but less complex vestibular organs than those emitting higher frequency calls.

A study has never been done relating the morphology of the vestibular system and echolocation parameters in Southern and Central Africa bats. The present study demonstrated this relationship found differences in the shape of the vestibular system among species of bats, therefore, it is suggested that the study be used as a new method for identifying bats in addition to the existing methods. It is recommended that the study be replicated between species using more individuals of the same species, combined with computed tomography (CT) methods and histological investigations, therefore, the standardization of photographs should be more effective to obtain more informative and accurate results.



SIPHESIHLE MAGAGULA

University of Eswatini

Morphological identification of pipistrelle-like bats in Eswatini with the discovery of a new species *Neoromicia hlandzeni*

Bats are a diverse group of mammals, with an increasing number of cryptic species having been discovered in the past decade. The cryptic nature of these species makes it challenging for researchers studying ecology, zoonotic diseases and agriculture to identify them leading to poor decision-making and therefore causing unforeseen ecological consequences. Pipistrelle-like bats, of the family Vespertilionidae have been placed in a number of different genera, including *Neoromicia*, *Pipistrellus* and *Hypsugo* based on craniodental features, tragus shape, bacular morphology and chromosomal studies. A recent revision of this group based on integrative taxonomic approach, resulted in the description of several new genera, including *Afronycteris* and *Pseudoromicia*. A total of 32 species of bats have been recorded in Eswatini, of which 14 belong to the family Vespertilionidae - the largest family of bats in the world. Pipistrelle-like bats in Eswatini are represented by the genera: *Afronycteris*, *Laephotis*, *Neoromicia*, *Nycticeinops* and *Pipistrellus*. Pipistrelle-like bats are difficult to identify to species based solely on external appearance (i.e., on a living animal), and even inspection of museum specimens (i.e., with extracted skulls) are still a challenge even for bat experts. Hence, I will explain how to identify pipistrelle-like bats in Eswatini by a variety of methods, and I will highlight, key identification features required to distinguish the different species in Eswatini. I will also present an updated list of pipistrelle-like bat species in Eswatini, including a newly described species *Neoromicia hlandzeni*.



ALEXANDRA HOWARD

University of the Free State

Perceptions and pest control of bats in apple orchards, central South Africa

This research aims to assess and demonstrate the benefits of bat pest control services in agricultural landscapes in the eastern Free State Province of South Africa. Natural pest control services provided by bats has been demonstrated in selected crops in other regions, however, the trophic link between bats and deciduous fruit crop pests remains largely unknown in South Africa. Using molecular diet and acoustic activity patterns as well as indices of pest damage and agricultural yield, the main aim of this research is to quantify the economic and ecological roles of bats in apple orchards and surrounding natural landscapes in the eastern Free State Province. This project aims to incentivize local, relevant stakeholders to consider bats in their integrated pest management approach and understand their perceptions and attitudes towards bats.



DR MARIKE GELDENHUYS

University of Pretoria

Understanding coronavirus maintenance and excretion dynamics within bat populations

Several novel coronavirus species of public health and veterinary importance have emerged in the first two decades of the 21st century. Bats are considered the natural reservoirs for the genetic diversity of mammalian coronaviruses. Despite much coronavirus surveillance among bat populations globally, our knowledge on the mechanisms that drive coronavirus diversity and emergence are limited. Focused wildlife surveillance to identify the complex drivers involved in viral perpetuation within natural host populations and interspecies transmission are needed. We review current existing hypotheses for coronavirus epidemiology in bat populations and report on the results of two-years of surveillance within a maternal colony of *Rousettus aegyptiacus* in Limpopo, South Africa. Excretory samples from monthly collections were tested for coronavirus RNA and resultant infection dynamics compared to the population demographics to identify possible factors for viral maintenance. We report on three distinct coronavirus genetic lineages were observed, with non-identical temporal excretion dynamics. The study identified near constant shedding from the colony throughout the year, with large excretion peaks during specific times that coincided with increased infections of young bats. Analysis of recaptured bats suggest that viral clearance may occur within one month. The findings assist in understanding coronavirus persistence within individuals and populations as well as the identification of greater periods of spillover risk that can be associated with biological life stages of the host. These findings may be useful in the development of risk reduction strategies to eliminate potential zoonotic coronavirus transmission.



DR LEIGH RICHARDS

Durban Natural Science Museum

Natural Science Collections-based research: the good, not-so-good, and downright amusing

Natural science collections often are an under-appreciated treasure trove of information on Earth's biodiversity and associated evolutionary history. The relevance of natural history collections is exemplified by African bat taxonomic research. Historical specimen material, coupled with new material from under-surveyed regions and improved technologies, have unearthed surprising new finds over the past two decades. This 'new golden age' of African bat research appears to continue, with new species being described each year. The Durban Natural Science Museum is a relatively small institution and is the only natural science museum in South Africa under the governance of a municipality. Positioned at the centre of the Maputaland-Pondoland-Albany biodiversity hotspot, the museum holds important specimen collections, mostly from the southern African subregion. With its humble beginnings in 1989, the mammal department has expanded to become a valued resource for academics working on African small mammals, particularly Chiroptera. Working at the interface of collections, research and education brings unique triumphs, challenges and downright amusing experiences. Learn more about the 'behind-the-scenes' work conducted by the two women team of mammal departmental staff, interns and voluntary workers.