

## NITheCS Colloquium

Monday, 30 August 2021, 16h00

Dr Monica Mwale | *Zoological Research, Foundational Research & Services, SANBI National Zoological Gardens (NZG)*

### “South African species reference DNA databases: General gap analysis of vertebrates”



#### ABSTRACT

South Africa is one of the most biologically diverse countries in the world and is home to almost 10% of the world's plants, 7% of the world's reptiles, birds and mammals and 15% of known coastal marine species. It is also home to nine biomes, three of which have been declared global biodiversity hotspots. There is however very limited information on species diversity and conservation status, with most of the species unable to be assessed as they are data deficient, either due to unresolved taxonomies or unknown or unverified extent of occurrence. For most of our species with unresolved taxonomies, ongoing taxonomic revisions among several groups indicate under-estimated species richness. This unknown foundational information, including occurrence and distribution records, is needed to support biodiversity assessments, and monitoring the impact of urbanization and globalization (e.g. habitat degradation, and illegal trade) on species survival. The Barcode of Life Database system (BOLD), developed for the creation and storage of species barcode libraries is currently the most comprehensive database of global mitochondrial cytochrome c oxidase gene (COI) records of species. The barcode reference database has been successfully used in several species identification applications including biodiversity monitoring, invasive species identification and forensic genetic testing of unknown or processed illegally traded biomaterials. Although South African species data has been contributed to BOLD, there is limited information on a lot of species, with the taxonomic and geographic coverage less than ideal. The reliability and accuracy of most of the references submitted is also unknown as. even though 90,000 records have been submitted on BOLD, only approximately 30,000 records have species names representing about 7,000 species of the known ~100,000 described from South Africa It is vital to ensure that a gap analysis is conducted, as a necessary step in the careful compilation, verification and annotation of available DNA barcode records. This was done by comparing verified and published South African animal checklists with an automated progress report in BOLD. This talk will therefore present a gap analysis of available South African barcodes based on published checklists and BOLD species delineation using the barcode index number system (BIN). This talk will also highlight information gaps to inform potential targeted research focus areas for consideration. Providing species level foundational biodiversity information is vital to support decision making under the national biodiversity framework.

#### BIOGRAPHY

My main focus as a senior scientist at the South African National Biodiversity Institute (SANBI) is in molecular systematics and genetics of wildlife under the Zoological Research sub-directorate, in Foundational Biodiversity Sciences (FBS). This research focuses on the use of genetic markers, DNA sequencing and morphological data to elucidate the genetic diversity and phylogenetic relationships among South African species or populations thereby contributing foundational biodiversity information. I also use genetic technologies in conservation management and for DNA barcoding applications for species identifications serving as secretariat of SABOL, the South African Node of the international Barcode of Life Initiative. Am also a member of the Scientific authority of South Africa and the IUCN African Conservation Genetics Species Specialist Group.

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