South African Institute for Aquatic Biodiversity

The development of an amphibian research collection at SAIAB

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1 Description of Research Work

Diversifying the natural history collection has been an on-going focus of curation at SAIAB for some years. Specifically, the recently established amphibian collection has been developing steadily.

The collection comprises amphibian specimens, tissues, photographs, x-rays, recordings of calls and literature. These different collection objects are at varying stages of development: the specimen, tissue and literature collections are the most advanced. As this is a new collection, and by no means the most comprehensive for southern Africa, our aim is to achieve high quality collection resources and to provide facilities to examine these. We put a great deal of effort into obtaining well preserved specimens that are accompanied by good quality photos, habitat information, tissue samples and good associated data all of which are linked in our database. Further, we are trying to improve the value of these collections in-house by bar-coding and x-raying appropriate specimens.

The growth of the amphibian collection over the last three years has been rapid. Current holdings are 1784 lots which comprise 13,065 specimens, seven (7) types, 100 families, 202 genera and 541 species. Most of these have good associated data and many lots comprise multiple preparations (specimens, tissues, photos of specimens and habitats).

Figure 1: Drawings of a Hylarana darlingi tadpole showing lateral view (above) and mouth parts (bottom left) 66.36 mm total length. Photos on right show Gosner stage 37 and images of the preserved tadpole (SAIAB #185858) from Conradie et al. 2012.

Drawings - Elaine Heemstra. Photos - Roger Bills
Frog collections research

Two major projects involving amphibians are currently underway:

- **A bar-coding project** aimed at getting CO1 genetic sequences for as many southern African species as possible. So far 386 specimens have been bar-coded: an example of the results is shown below for the genus *Breviceps* (Fig.2).

- **The topotype project**, making collections of specimens and tissues from sites where species were originally described from, will become a valuable resource as most types of Southern African amphibians are not in Africa, many are very old and of poor quality and most do not have tissues for genetic analyses.

![Figure 2: Bar-code results showing the relationships between some of the Breviceps frogs of southern Africa.](image)

![Figure 3: Breviceps mossambicus from the type locality, Mozambique Island, Mozambique. Photo Roger Bills.](image)

2 Expected Impacts

The growth in the geographical and taxonomic spread of SAIAB’s amphibian collections will increase the value of this resource. In particular, the samples and results from both the barcoding and topotype projects will form a valuable basis for any future taxonomic and systematic studies. SAIAB has already loaned a fair amount of its amphibian material to South African and international researchers and demand for these loan specimens is expected to increase. Coupled with improving curation facilities and the collection of valuable literature, we aim to make the amphibian research collection a destination of choice for researchers in this field.
3 Research team

SAIAB has no dedicated herpetologists. We have overcome this by inviting active amphibian researchers to help with varied curatorial tasks and donations:

Mr Werner Conradie (Bayworld, Port Elizabeth) and Dr Michael Cunningham (University of Pretoria) are both involved with the topotype and barcoding frog projects, have donated species from all over southern Africa and have identified the majority of our samples.

Dr Alan Channing, University of the Western Cape has made significant donations of species from all over southern and eastern Africa.

Prof. Louis du Preez is leading the North West University (NWU) amphibian group whose members are currently cataloguing the NWU amphibian collections with the aim of incorporating these into the SAIAB collections.

Additionally SAIAB’s freshwater researchers collect amphibians in the course of their research field work and, as we are active in many regions of southern Africa, these ad-hoc collections add significantly to the growth of the collection.

4 Additional Information
