



## Letter

### In terms of Section of the National Heritage Resources Act (Act 25 of 1999)

Attention: Dr Nestor  
University of the Witwatersrand

The aim of the project is to perform a detailed study of the teeth microstructure of burrowing mammal-like reptiles (such as *Thrinaxodon*) to understand their adaptations facing the dramatic climatic modifications of the Early Triassic (-252 Million years ago). As these mammal-like reptile were replacing their teeth throughout their live, the rapid mineralization of the bony part of their teeth (the dentine) was affected by environmental variation and metabolic strategies to survive critical part of the year (drought). For each different individual we have the opportunity to assess the stress from the environment at various period of their growth. It will allow us to get new information regarding their thermophysiology (if they were cold-blooded or warm-blooded animals) and if they were experiencing long torpor during periods of drought (called, aestivation, the summer counterpart of hibernation): If the animals were indeed aestivating as it is suggested by many studies, the mineralization of teeth completely stopped during these periods and it will be visible by line of arrested growth. This study will permit to clarify whether or not this animal were using this.

Drs. V. Fernandez, F. Abdala and B. Rubidge are borrowing a cranial material of *Microgomphodon* (SAM-PK-K10160) and *Diictodon* (SAM-PK-K11193) from Iziko Museums of South Africa to analyse the teeth microstructure of burrowing therapsids using high-resolution Synchrotron scanning. This will support the study of the palaeobiology, including thermophysiology and aestivation, of these mammal-like reptiles. It is currently housed at Iziko Museums of South Africa.

Dear Dr. F. Abdala,

Thank you for your application to export 2 samples (1 skull, 1 partial skull) from the Karoo Collection for scanning of the teeth microstructure in collaboration with Drs. Vincent Fernandez and Bruce Rubidge, to be undertaken at the ESRF (European Synchrotron Radiation Facility), Grenoble, France. SAHRA has reviewed the application and has decided to approve it.

We wish you every success with this project.

Should you have any further queries, please contact the designated official using the case number quoted above in the case header.

Yours faithfully



## Scanning specimen in order to study teeth microstructure.

Our Ref: 7864

Enquiries: Ragna Redelstorff  
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CaseID: 7864

Date: Monday June 15, 2015

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an agency of the  
Department of Arts and Culture

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Ragna Redelstorff  
Heritage Officer  
South African Heritage Resources Agency

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Colette Scheermeyer  
SAHRA Head Archaeologist  
South African Heritage Resources Agency

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### ADMIN:

Direct URL to case: <http://www.sahra.org.za/node/274579>

### Terms & Conditions:

1. This approval does not exonerate the applicant from obtaining local authority approval or any other necessary approval for proposed work.
2. If any heritage resources, including graves or human remains, are encountered they must be reported to SAHRA immediately.
3. SAHRA reserves the right to request additional information as required.



The South African Heritage Resources Agency

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