**Export/sampling permits**

Please note an export permit must be linked to an objectthat has to be created on SAHRIS! If the object you want to work on has not been created yet, you would need to **create an ObjectID**.

Required documents:

* For export of material from KZN, Eastern Cape or Western Cape that involves destructive analysis, the **destructive sampling permit** from the respective Heritage Authority must be submitted;
* A consent letter from the accessioning institution.

The proposal should include (you can fill these in below):

* a list of participants (name, affiliation, phone no, email addresses) and how they are involved;
* the name and address of the facility, including address, it is being scanned at;
* name and address of the museum/university department that currently hosts the object;
* names of the responsible person(s) during transport and while the fossil is at the facility;
* the period/time frame during which the fossil(s) will be outside the country;
* detailed information on the fossil(s), especially as it is a "unique" specimen;
* detailed information on the research project behind it & methodology including expected outcomes (i.e., the reason for export);
* the written confirmation of the institution that currently hosts the object that the object may be used as proposed and be returned in good condition;
* should there be any damage/destructive analysis (e.g., coating for higher resolution) undertaken, this needs to be stated in detail;
* Statement why this study cannot be done in South Africa.

**Applicant (name and affiliation): this is usually the museum curator!**

Rosemary Prevec

Curator, Earth Sciences

Albany Museum, Grahamstown

**Applied for (principal researcher):**

Jonah Choiniere

Reader

Evolutionary Studies Institute

University of the Witwatersrand

**Participants with affiliations, email addresses, phone numbers (& their role):**

1) Jonah Choiniere, Evolutionary Studies Institute, University of the Witwatersrand [Jonah.choiniere@wits.ac.za](mailto:Jonah.choiniere@wits.ac.za), 0799063169

Role: Project leader

2) Kimberley Chapelle, Evolutionary Studies Institute, University of the Witwatersrand, [kimi.chapelle@gmail.com](mailto:kimi.chapelle@gmail.com), 0791457691

Role: Student Participant

3) Kathleen Dollman, Evolutionary Studies Institute, University of the Witwatersrand, [dollman.kathleen@gmail.com](mailto:dollman.kathleen@gmail.com), 0820694968

Role: Student participant

4) Vincent Fernandez, European Synchrotron Radiation Facility, Grenoble, France, [vinfernand@gmail.com](mailto:vinfernand@gmail.com)

Role: ESRF project scientist

The material will be **hand-carried** to ESRF facility, Grenoble, France (facility/institution) in July 2016 (month, year) by Jonah Choiniere, Kathleen Dollman, Kimi Chapelle (name of person responsible for transport) and brought back by \_\_\_\_\_\_\_\_\_\_\_\_\_ (leave blank if same person as above).

Vincent Fernandez (name) will be involved with the scanning (e.g., transport/scanning) of objects and mounting them in containers suitable for scanning. (whatever else).

**Institution incl. address that currently hosts the object:**

Albany Museum

Somerset Street

Grahamstown

6139

Eastern Cape Province

Republic of South Africa

Tel : + 27 46 622 2312

Email: [info@am.org.za](mailto:info@am.org.za)

**Facility incl. address at which the experiment will be done:**

European Synchrotron Radiation Facility

**Table of objects or upload file:**

**Site including age at which object was found:**

**Time frame:**

Transport to ESRF (facility): July 19th, 2016(date)

Return date: July 27th, 2016 (date)

**Aim/rationale:**

 This study aims to extract new three dimensional anatomical data from an exquisitely preserved specimen of the early dinosaur *Heterodontosaurus tucki* from the Eastern Cape.

The most important of the features observed in the specimen of Heterodontosaurus is a well-preserved series of gastral ribs, which have never before been observed in an ornithischian dinosaur [1, 8]. Gastral ribs in other dinosaurian groups likely played a role in ventilating the lungs, and they may be functionally related to the presence of air sacs in the posterior parts of the body [8].

Bones preserved along the specimen’s ventral midline may represent xiphisternal plates, which are only known in one other dinosaur, or they may represent uncinate processes – features of the ribs known to play a role in avian respiration but that are unknown in ornithischians.

Finally, two aspects of the pectoral skeleton - an ossified clavicle and suprascapular bone – are present in the specimen. The former is only known in a handful of ornithischian taxa and the latter has only been reported in one dinosaur. Only comparison of these features with dinosaur outgroups and other early members of the clade can elucidate their functional and phylogenetic importance.

**Methodology (short):**

The specimen will be mounted in archival foam and cardboard for scanning on site at the ESRF facility. It will be scanned with x-rays on the ID17 beamline at the European Synchrotron Radiation Facility for periods ranging from one to twelve hours. Scans will be digitally reconstructed in silico at the ESRF facility and later exported to SA.

**Confirmation/permit by museum (**Attached?):

Yes, attached.

**Damage/destructive analysis? (if yes, explain in detail)**

No

**Statement why this study cannot be done in South Africa:**

Currently, South Africa does not have a synchrotron facility. Synchrotron radiation in the form of X-rays is necessary for the study, and therefore we must work outside of the country. We have exhausted all X-ray sources in South Africa prior to applying for the synchrotron.