
Shedding a new light on Egyptian animal mummies: Synchrotron investigation of a 2000 years old crocodile

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Résumé

Within the framework of the MAHES project a crocodile's mummy from the collection of the Confluence museum in Lyon was analysed through a variety of approaches: the chemical analysis of the mummification balms, radiocarbon dating, radiography, and medical scanner. This first set of analysis confirmed that this specimen was well preserved, did not undergo evisceration, and would then be perfect for a more detailed study.

A more elaborated analysis using multiscale synchrotron propagation phase contrast microtomography was conducted at the ESRF on this crocodile mummy. Synchrotron tomography is based on the same principle than medical scanner, but can yield resolution up to 1000 times higher with far better sensitivity thanks to phase contrast effect. In the present case, the mummy was entirely scanned with a voxel size of 90 μm , and then some areas of interest were scanned at 13, 6.3, 2.8 and 1.4 μm (up to virtual histological level) to investigate various biological and preparation aspects.

Synchrotron tomography is a well established technique that is applied to a great variety of subjects. Among others, palaeontology was, 15 years ago, an unexpected research field that became rapidly one of the big success of synchrotron imaging at the ESRF. More recently, a similar dynamic seems to be emerging for archaeological applications. It is in this framework that we conducted the first series of synchrotron tomography on animal mummies in 2014 on the beamlines BM5 and ID19. Here we present the results of the virtual autopsy of this crocodile, through determination of its. Species, sex, stomacal content, as well as the probable cause of its death, and several other aspects... This crocodile mummy, investigated in a non-destructive way, allows us to come up to the cult organised around crocodiles in the ancient Egypt.

Based on these novel pieces of information we propose that this animal was a wild crocodile killed without the primary intent of sacrifice, and that its body was used to make a mummy. It wasn't a crocodile specifically raised to become a divinity. It's an important point of egyptological research, as it helps to understand the religious importance attached to animal mummies.

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