

Ancient Egyptian animal mummies: Host-pathogen evolution

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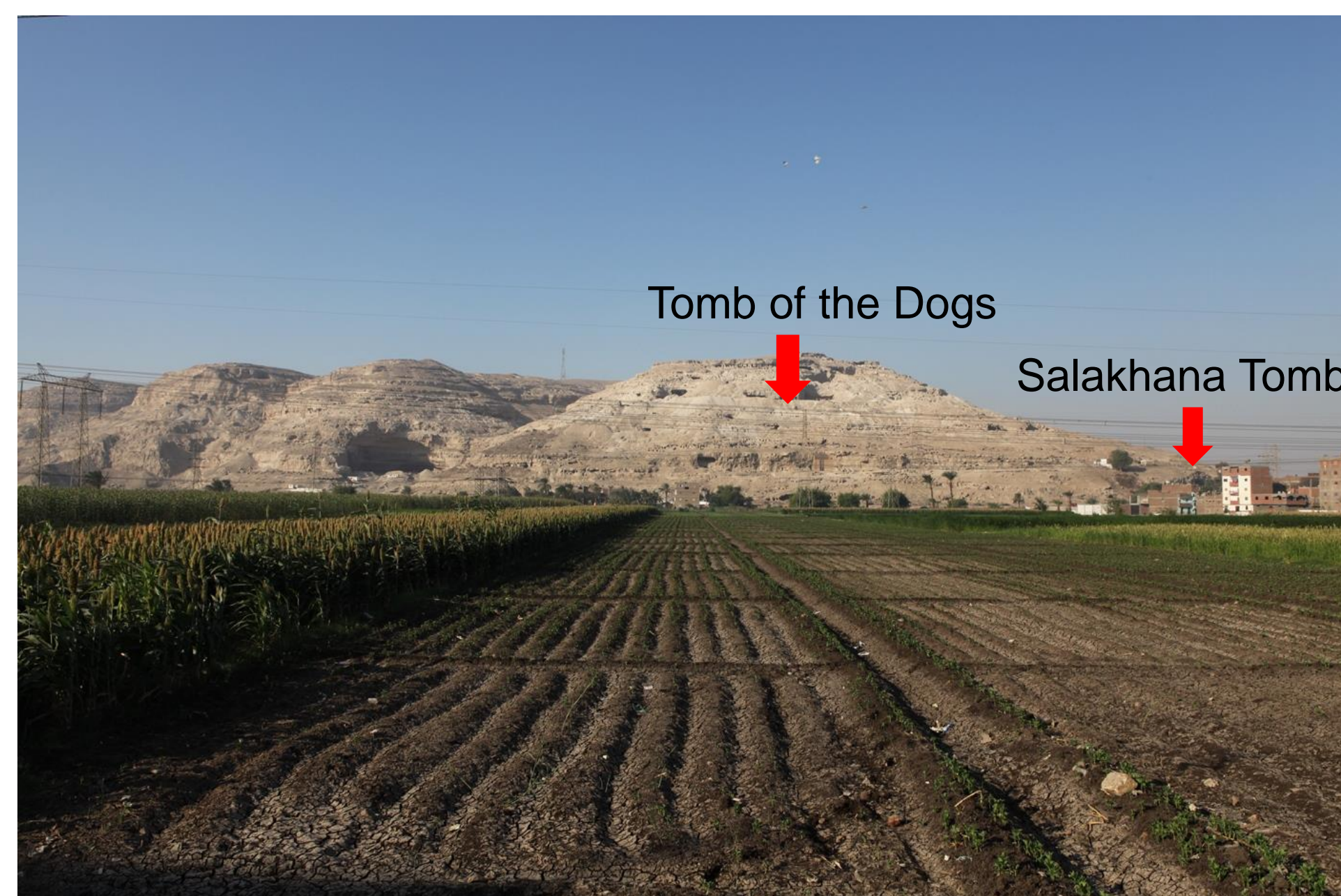
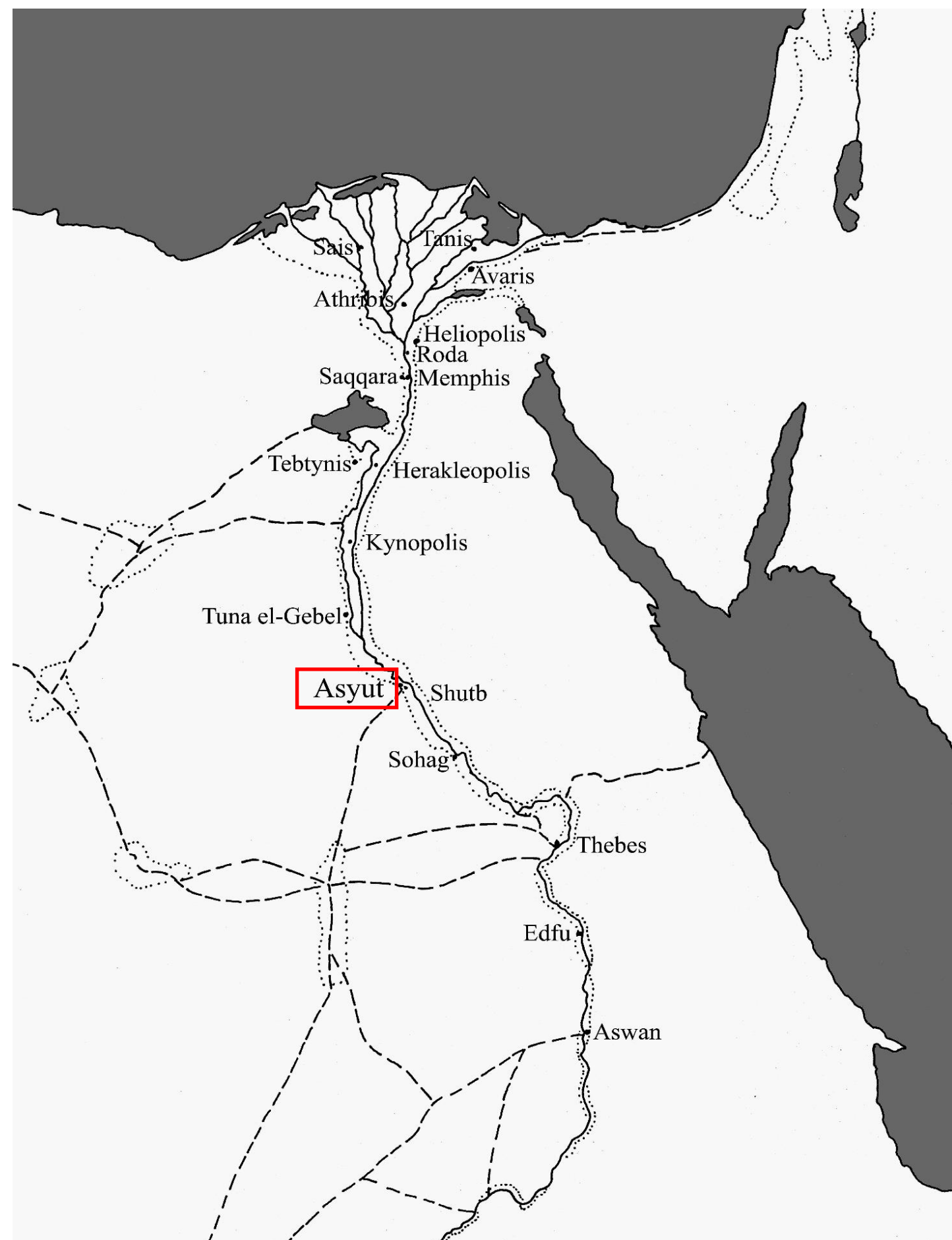
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Introduction

In ancient Asyut, the worship of two deities (Anubis & Wepwawet), which were often depicted as canid figures, has been documented for a period of over 2500 years. Two large burial sites dedicated to the canid deities are known: (i) A Tomb near the so-called Salakhana Tomb and (ii) the Tomb of the Dogs, which was rediscovered by the German-Egyptian Project, The Asyut Project, in 2008-2009. The animal remains (mummies) inside the Tomb of the Dogs are mainly canids (dog *Canis lupus* f. *familiaris*, African wolf *Canis aureus lupaster* and fox *Vulpes* sp.), followed by cats (*Felis* sp.), birds of prey and crocodile. These non-human mummies and osteofaunal remains from the Tomb of the Dogs were archeologically studied between 2008 and 2015. The main goals of these archeological studies were to increase the knowledge concerning the history and art marked by the events associated to that period as well as the subsequent epoch of significant cultural and economic progress.

We are planning **to expand the studies beyond the archeological interests to further include ancient pathogen genomic investigations to study host-pathogen interaction in the past. We will particularly target ancient viral DNA. Furthermore, we will provide information on ancient animal DNA sequences that will help in the evolutionary studies. The animal remains inside the Tomb are unique and never been genetically studied before; particularly, dogs, cats, wolves, foxes, and crocodiles.**

Tomb of The Dogs



Gebel Asyut al-gharbi (Fritz Barthel 2012; © The Asyut Project)



Tomb of the Dogs: inner hall, view from the corridor (Fritz Barthel © The Asyut Project)



Faunal remains collected from the trench in the inner hall, Tomb of the Dogs in 2012 © The Asyut Project



Sampling



© The Asyut Project

Outlooks

- We are planning to design specific probes and develop an ancient viral capture assay (AVCA) to capture viral DNA in the collected ancient samples.
- Double-stranded DNA viruses (bacteria or parasites?) will be included in the study.
- Integrated RNA viruses (retroviruses).
- Care with modern DNA contamination.
- NCBI viral sequence data: unique and conserved among all pathogen strains.
- Light will be shed on the aDNA sequence information of the ancient animals and we will provide answers to questions concerning the origin, evolution, and connection between ancient and modern animal species.
- Where to do the extraction, capture and sequencing?
- Establishing an ancient DNA Lab in Egypt (Cairo).