

Mummies tell history of a 'modern' plague

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Mummies from along the Nile are revealing how age-old irrigation techniques may have boosted the plague of schistosomiasis, a water-borne parasitic disease that infects an estimated 200 million people today.

An analysis of the mummies from Nubia, a former kingdom that was located in present-day Sudan, provides details for the first time about the prevalence of the disease across populations in ancient times, and how human alteration of the environment during that era may have contributed to its spread.

The [American Journal of Physical Anthropology](#) is publishing the study, led by Emory graduate student Amber Campbell Hibbs, who recently received her PhD in anthropology.

About 25 percent of mummies in the study dated to about 1,500 years ago were found to have *Schistosoma mansoni*, a species of schistosomiasis associated with more modern-day irrigation techniques.

"Often in the case of prehistoric populations, we tend to assume that they were at the mercy of the environment, and that their circumstances were a given," says Campbell Hibbs. "Our study suggests that, just like people today, these ancient individuals were capable of altering the environment in ways that impacted their health."

The study was co-authored by Emory anthropologist George Armelagos; William Secor, an [epidemiologist](#) at the [Centers for Disease Control and](#)

[Prevention](#); and Dennis Van Gerven, an [anthropologist](#) at the University of Colorado at Boulder.

"We hope that understanding the impact of schistosomiasis in the past may help in finding ways to control what is one of the most prevalent [parasitic diseases](#) in the world today," Campbell Hibbs says.

Schistosomiasis is caused by [parasitic worms](#) that live in certain types of freshwater snails. The parasite can emerge from the snails to contaminate fresh water, and then infect humans whose skin comes in contact with the water.

Infection can cause anemia and chronic illness that impairs growth and [cognitive development](#), damages organs, and increases the risk for other diseases. Along with malaria, schistosomiasis ranks among the most socio-economically damaging parasitic diseases in the world.

As far back as the 1920s, evidence of schistosomiasis was detected in mummies from the Nile River region, but only in recent years did the analysis of the antigens and antibodies of some of the individuals become possible.

This latest study tested desiccated tissue samples from two Nubian populations for *S. mansoni*. The Kulubnarti population lived about 1,200 years ago, during an era when Nile flooding was at its highest average known height, and archaeological evidence for irrigation is lacking. The Wadi Halfa population lived further south along the Nile, about 1,500 years ago, when the average heights of the river were lower. Archeological evidence indicates that the Wadi Halfa used canal irrigation to sustain multiple crops.

The analysis of tissue samples showed that 25 percent of the Wadi Halfa population in the study were infected with *S. mansoni*, while only 9

percent of the Kulubnarti were infected.

The standing water collected by irrigation canals is particularly favorable to the type of snail that spreads the *S. mansoni* infection. Another form of the disease, *Schistosoma haematobium*, is spread by snails that prefer to live in more oxygenated, free-flowing water.

"Previously, it was generally assumed that in ancient populations schistosomiasis was primarily caused by *S. haematobium*, and that *S. mansoni* didn't become prevalent until Europeans appeared on the scene and introduced intensive irrigation schemes," Campbell Hibbs says.

"That's a sort of Euro-centric view of what's going on in Africa, assuming that more advanced technology is needed to control the elements, and that irrigation conducted in a more traditional way doesn't have a big influence on the environment."

Co-author George Armelagos is a bioarcheologist who has been studying ancient Nubian populations for more than three decades. Through extensive analysis, he and colleagues have shown that nearly 2,000 years ago the Nubians were regularly consuming tetracycline, most likely in their beer, at levels high enough to show they were deliberately brewing the antibiotic effects.

"The Nubians were probably in healthier shape than many other populations of their time, due to the dry climate, which would reduce their bacterial load, and because they were getting tetracycline," Armelagos says. "But the prevalence of schistosomiasis shown in this study suggests that their parasite load was probably quite heavy."

Provided by Emory University

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