

# Researchers use isotopic analysis to explore ancient Peruvian life

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The ancient Paracas culture of Peru is known for its ornate textiles. This culture has been well documented by archaeologists yet neglected by bioarchaeologists. A team of researchers, including Arizona State University bioarchaeologist Kelly Knudson, is working to correct this deficit.

Mummies excavated nearly a century ago are yielding new information about past lifeways through work conducted in Arizona State University's Archaeological Chemistry Laboratory.

Using new techniques in bioarchaeology and biogeochemistry, a team of bioarchaeologists and archaeologists have been able to study the diets of 14 individuals dating back almost 2,000 years.

The findings were recently published in the *Journal of Archaeological Science*.

The mummies were unearthed from one of the most famous sites in Peru: the Paracas Necropolis of Wari Kayan, two densely populated collections of burials off the southern coast. The region has a rich archaeological history that includes intricate

textiles and enormous geoglyphs, yet it has been relatively overlooked for bioarchaeological research.

With support from the National Science Foundation, ASU associate professor Kelly Knudson and her colleagues are attempting to rectify that.

In addition to Knudson, the team was made up by Ann H. Peters of the University of Pennsylvania Museum of Archaeology and Anthropology, and Elsa Tomasto Cagigao of the Pontifical Catholic University of Peru.

The researchers used hair samples - between two and 10 sequential samples for each mummy, in addition to two hair artifacts - to investigate the diets of Paracas' ancient people. They focused on carbon and nitrogen isotope analysis of keratin to determine what these individuals ate in the final stages of their lives.

Diet not only provides insight into health, but can also indicate where people lived and traveled, as well as offer clues about their daily lives by pointing to whether their foods were sourced from farming, fishing, hunting or gathering.

During the last months of their lives, the Paracas individuals appear to have eaten primarily marine products and C<sub>4</sub> and C<sub>3</sub> plants, such as maize and beans. Also, they were either geographically stable or, if they traveled between the inland highlands and coastal regions, continued to consume marine products.

"What is exciting to me about this research is that we are using new scientific techniques to learn more about mummies that were excavated almost 100 years ago. It is a great application of new science to older museum collections," says Knudson, who is in ASU's School of Human Evolution and Social Change in the College of Liberal Arts and Sciences.

Knudson, who is affiliated with the school's Center for Bioarchaeological Research, explained why it is so important to learn about the lived experiences of people who existed long ago.

"By using small samples of hair from these mummies, we can learn what they ate in the months and weeks before they died, which is a very intimate look at the past," Knudson said.

When first discovered in 1927 by Peruvian archaeologist Julio Tello, each mummy was bound in a seated position, found with burial items like baskets or weapons, and wrapped in a cone-shaped bundle of textiles, including finely embroidered garments.

Since the sampled individuals were mostly male, Knudson and her colleagues suggest that future research may involve more females and youths. The researchers also plan to further examine artifacts and mortuary evidence to build context for their isotopic data.

**More information:** *Journal of Archaeological Science*,  
[authors.elsevier.com/a/1QWIU15SITUSMo](https://authors.elsevier.com/a/1QWIU15SITUSMo)

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