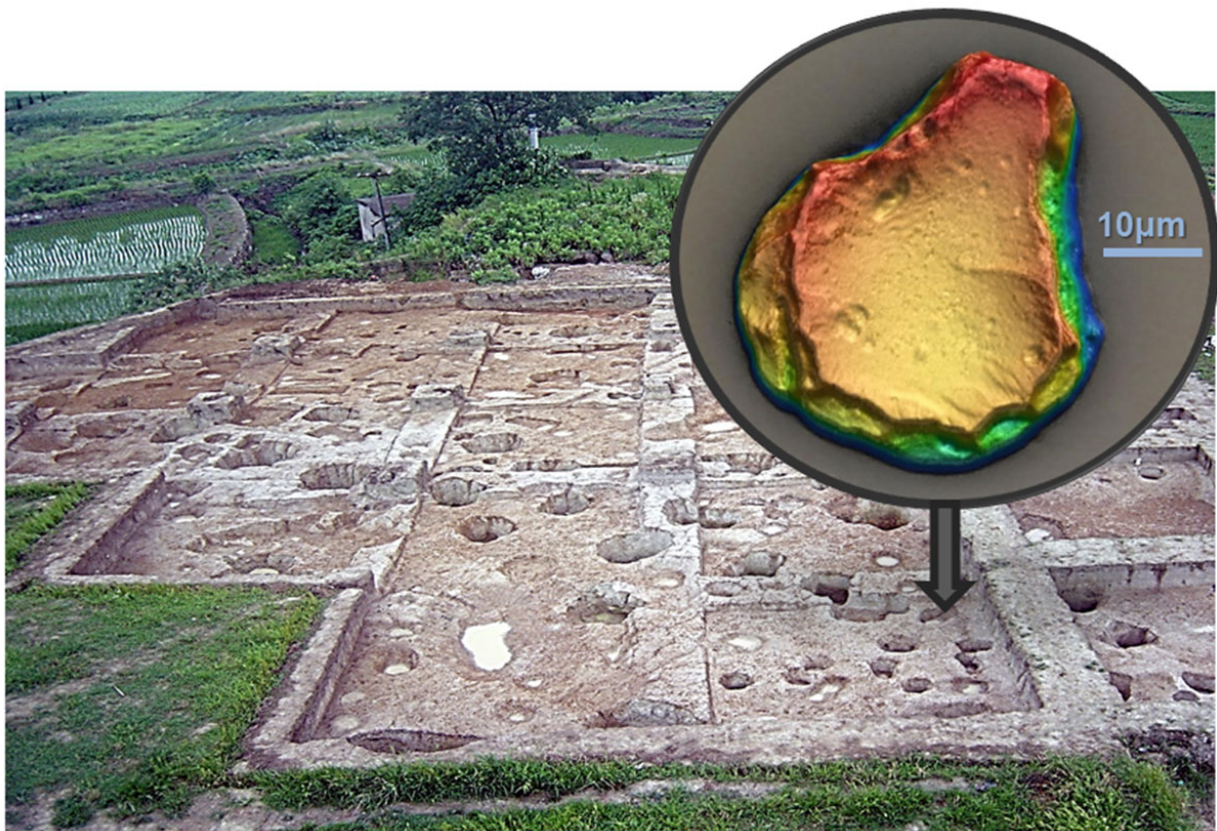


# Domesticated rice dated back 9,400 years in China

May 30 2017, by Bob Yirka

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3D image of rice bulliform phytolith from the Shangshan site for dating and identification. Credit: Houyuan Lu et al.

(Phys.org)—A team of researchers affiliated with several institutions in China has dated rice material excavated from a dig site in South China's

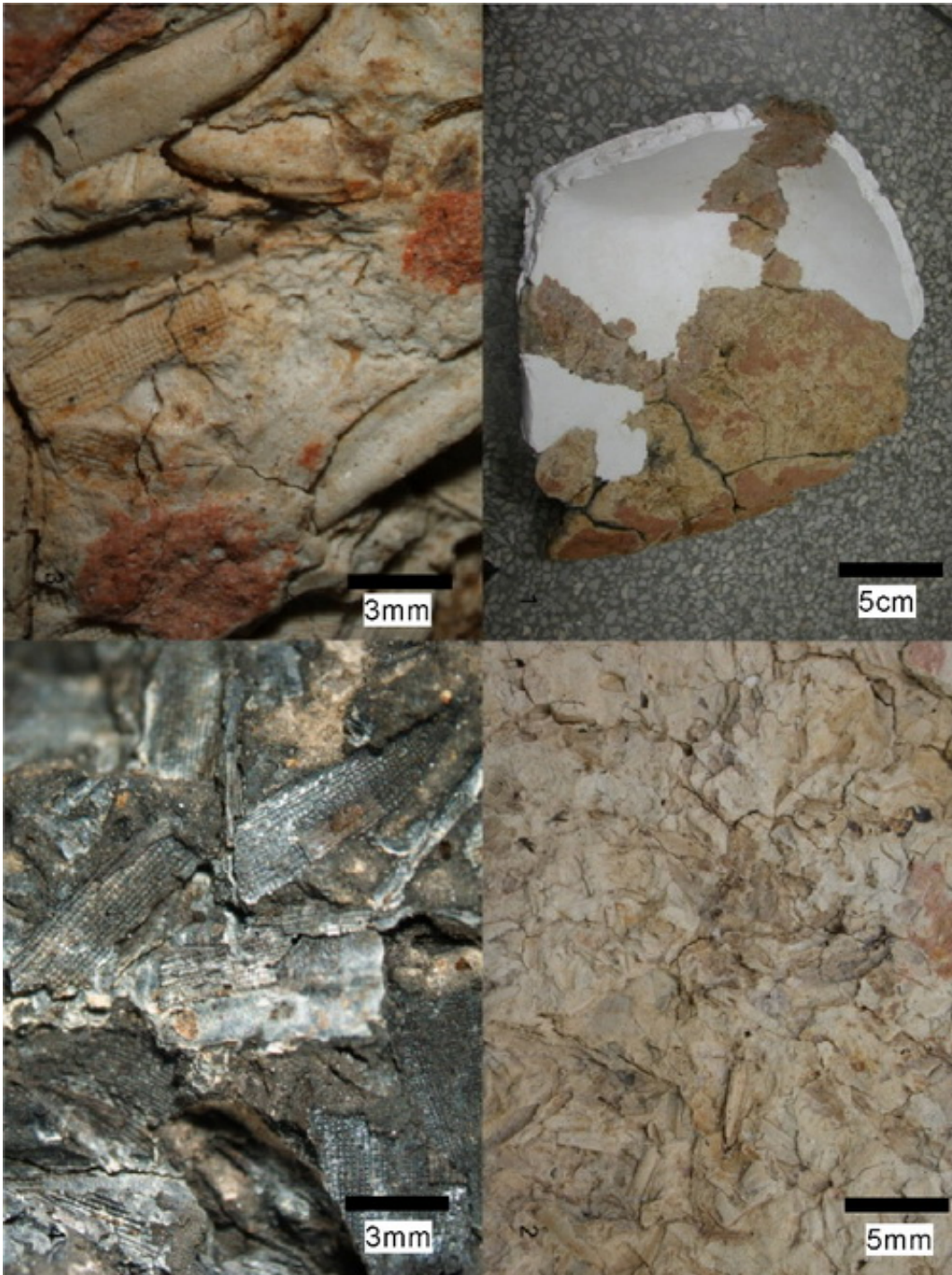
Zhejiang province back to approximately 9,400 years ago. In their paper published in *Proceedings of the National Academy of Sciences*, the group describes where they found the evidence of early rice, their testing and dating techniques, and what they found.

Various research groups from several countries in Asia claim to have found evidence of the earliest cultivation of [rice](#) as a food source. Now, those claims may have been dispelled, as the team in China has found the oldest evidence yet of cultivated rice.

In this new effort, the researchers worked at a dig site near the Yangtze River called Shangshan—prior work there had uncovered some ancient pottery artifacts. The team found numerous samples of phytoliths, which are tiny bits of silica that some plants fashion to protect themselves against pests. Rice plants create fan-shaped phytoliths—they are made of silica, and thus do not digest, burn or decay over time. Specific patterns on the surface of the phytoliths offer evidence of the history of rice as it evolved from wild rice to today's domesticated rice.

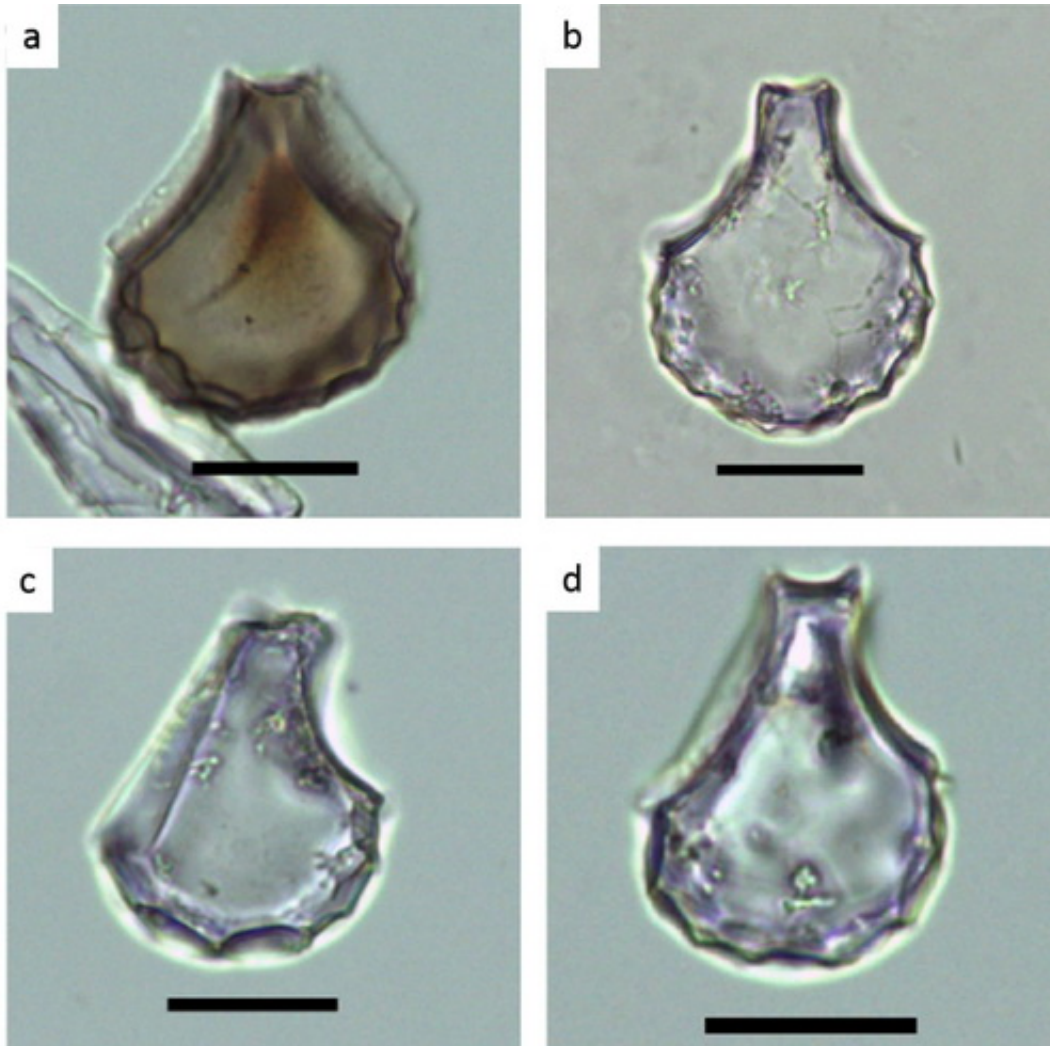
To date the phytoliths, the researchers collected enough samples from soil in areas where they found the [ancient pottery](#) shards and then sifted, cleaned and heated them to create a powder which could be carbon dated. Such testing showed the phytoliths to be approximately 9,400 years old. The team also studied the phytoliths under a microscope to note the patterns on their surfaces, which they report is neither like [wild rice](#) nor modern domesticated rice—instead, it was from a time period somewhere between the two. To add more credence to their discovery, the researchers also carbon dated other materials in the same area and depth, including seeds and charcoal, and found them to be roughly the same age.





Several pottery sherds tempered with rice husks from Shangshan. Credit: Image by LU Houyuan

The work by the team offers more evidence to bolster prior claims that Shangshan was one of the first places to cultivate rice, if not the first outright.



Rice bulliform phytoliths. (a,b) more than nine fish scales decorations; (c,d) less than nine fish scales decorations; black bar = 20 $\mu$ m. Credit: Image by LU Houyuan

**More information:** "Dating rice remains through phytolith carbon-14 study reveals domestication at the beginning of the Holocene," *Proceedings of the National Academy of Sciences* (2017).

[www.pnas.org/cgi/doi/10.1073/pnas.1704304114](http://www.pnas.org/cgi/doi/10.1073/pnas.1704304114)

## Abstract

Phytolith remains of rice (*Oryza sativa* L.) recovered from the Shangshan site in the Lower Yangtze of China have previously been recognized as the earliest examples of rice cultivation. However, because of the poor preservation of macroplant fossils, many radiocarbon dates were derived from undifferentiated organic materials in pottery sherds. These materials remain a source of debate because of potential contamination by old carbon. Direct dating of the rice remains might serve to clarify their age. Here, we first validate the reliability of phytolith dating in the study region through a comparison with dates obtained from other material from the same layer or context. Our phytolith data indicate that rice remains retrieved from early stages of the Shangshan and Hehuashan sites have ages of approximately 9,400 and 9,000 calibrated years before the present, respectively. The morphology of rice bulliform phytoliths indicates they are closer to modern domesticated species than to wild species, suggesting that rice domestication may have begun at Shangshan during the beginning of the Holocene.

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