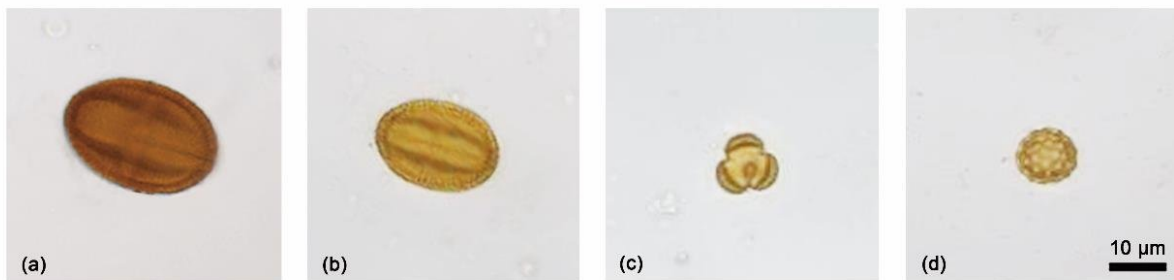


Pollen dispersal in traditional processing of buckwheat

December 13 2018



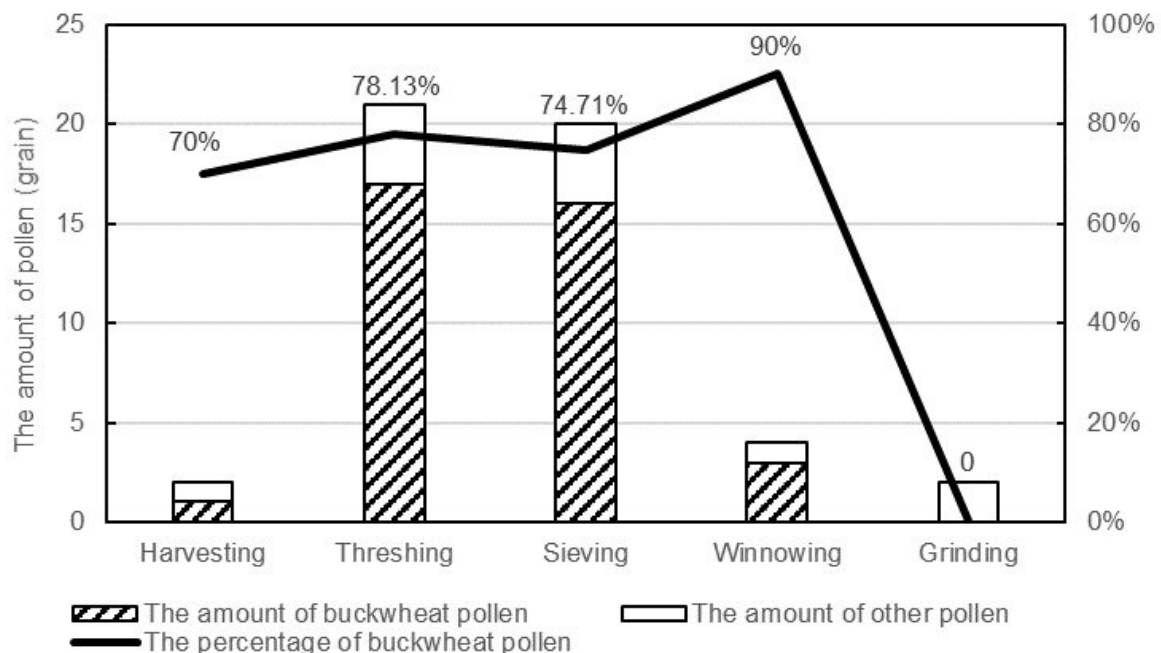
Pollens in the samples of buckwheat processing (400 times)(a) (b) Fagopyrum; (c) Artemisia; (d) Chenopodiaceae Credit: Science China Press

Interpreting the source and significance of crop pollen in archaeological sites has always been a key issue in environmental and agricultural archaeology. The research team of Dr. Shang Xue from the Department of Archaeology and Anthropology of the University of Chinese Academy of Sciences, recently conducted a simulation study on the dispersal pattern of pollen in the traditional processing of buckwheat.

The research paper, titled "Pollen Dispersal in Traditional Processing of Buckwheat and Its Application in Agricultural Archaeology," has been published online in *Science China Earth Sciences*. It was written by Liu Yang, a graduate student of the Chinese Academy of Sciences, as the first author, and Dr. Shang Xue as the corresponding author.

Pollen, as an important index of agricultural archaeology, can be used to indicate the history of paleoenvironment change and ancient human agricultural activities. To date, the study of [pollen dispersal](#) is limited to the analysis of [pollen](#) rain in nature and in surface soil of farmland. The influence of the agricultural processing on pollen dispersal is rarely considered, became a handicap for a better understanding of the source and representation of crop pollen in [archaeological sites](#).

As a kind of pseudocereal, [buckwheat](#) species (*Fagopyrum esculentum* and *F. tataricum*) are short-season [crops](#) with drought-tolerant and barren-resistant features. Buckwheat is globally cultivated because of its low workforce requirements, wide geographical adaptability, strong resistance, and rich nutrient content. Studies have suggested that buckwheat may have been domesticated on the edge of its wild ancestral distribution area in southwestern China. Later, it was transmitted to the north, and then adapted to the arid environment, becoming a pan-Eurasian crop approximately 3000 BP.



The mean value and average percentage of buckwheat pollen released from pollen rain in different processing stages. Credit: Science China Press

Buckwheat pollen is unique in shape. As a kind of cross-pollinated variety, it has large grains, close propagation distance, small distribution area, and low representation. Therefore, it provides a clear indication about its source and relationship with the maternal plant region where pollen grains are discovered. Thus, [archaeological research](#) on buckwheat pollen has been received much attention.

The researchers examined pollen dispersal in traditional buckwheat processing. Via aerial pollen collection, the researchers obtained samples from pollen rains at various processing stages. As control groups, the researchers used surface soil pollen analysis of buckwheat fields and barren land, and the data on aerial pollen rain in the surrounding area.

The results show that the content of buckwheat pollen in aerial pollen rain can reach more than 70 percent during traditional processing; the pollen release amount was the largest in the threshing and sieving stages, followed by the wind winnowing and harvesting stage.

Thus, the processing behavior of crops has a significant impact on the distribution of crop pollen in residential areas. The results can help researchers to interpret the distribution patterns and contribution rates of pollen during buckwheat processing. A high proportion of crop pollen can indicate not only the cultivation behavior, but also the processing behavior of humans. This research provides a scientific and experimental basis for identifying the crop processing remains in archaeological sites as well as assessing the intensity and impact of

agricultural activities.

As a [basic research](#), this study provides new concepts for the application of crop pollen dispersal in agricultural archaeology and new findings on buckwheat pollen research, which has certain interdisciplinary and scientific significance.

More information: Yang Liu et al, Pollen dispersal in traditional processing of buckwheat and its application in agricultural archaeology, *Science China Earth Sciences* (2018). [DOI: 10.1007/s11430-018-9288-5](https://doi.org/10.1007/s11430-018-9288-5)

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