March 30, 2020

Evolution & Behavior

Bronze Age food diversity: *ceci n'est pas un bagel*

by **Andreas G. Heiss** [1] | Senior Researcher

[1]: Austrian Academy of Sciences (ÖAW), Austrian Archaeological Institute (ÖAI), Wien, Austria

This Break was edited by Max Caine, *Editor-in-chief* - TheScienceBreaker

ABSTRACT

Think about prehistoric food. Images of chunks of roasted meat may appear before your inner eye, maybe also of coarse flatbread, porridge, a slice of cheese, soups of wild herbs, and tubers. But there is much, much more to it. In the following, three pieces of peculiar pastry from a 3,000 years old settlement are presented, which add up to the knowledge of the complexity of past cuisines.

Image credits: Pixabay

The primary motivation of archaeology is to find out how people in the past lived their lives. Among all the different activities that people follow, eating and drinking are certainly among the most important ones: We just have to eat. This makes all activities involved in providing food ingredients and preparing dishes from them – *cuisine* – a set of cultural techniques of enormous importance. A cuisine is also much more complex than just being a means for survival. The rules and traditions of what to eat or not to eat are tightly woven into all human cultures, making dietary habits themselves essential ways of how to express culture itself. Social groups are negotiated and forged by traditions and taboos of eating and drinking not only in the past but also today. Think of concepts such as veganism, kosher food, the various religious regulations to alcohol consumption, or the comet-like rise in socio-economic importance that we have seen in "superfoods" recently.

Because knowledge of ancient food and beverages promises many insights into our past, archaeological research has been working for decades to unlock more of their details. One source of information is the direct analysis of the remains of ancient dishes. These organic artifacts bear information on their ingredients as well as on the way these have been prepared. Within the scope of a current ERC project named PLANTCULT, we are currently hunting for ancient recipes of mostly prehistoric food remains. The fact that these remains are mostly preserved in a charred state due to baking accidents or

catastrophic fires does not really make things easier. The original chemical composition is so fundamentally changed during charring that chemical analyses are not very successful. Microscopical structures, however, are preserved, and by using an SEM (scanning electron microscope), even tiny remains of the ingredients can be revealed. The field of research into ancient food is, however, quite young and is still developing.

In the current paper, we had a look at three exceptional finds from the Late Bronze Age settlement near Stillfried in eastern Austria, where an important economic and political center was situated at that time. The three charred rings with diameters of 1–1.4 inches originate from a peculiar assemblage of household elements that had been placed into a former storage pit before filling it up. Among them fourteen likewise ring-shaped loom weights made of clay, a length-wise split pot and a saddle quern stone which had also been split in half. Current hypotheses interpret this assemblage as some kind of ceremonial deposition of a previously burnt-down house.

The more or less standardized set of methods used for the analysis of the rings has been established only very recently. The first step was the identification of plant tissue fragments under the SEM in order to support or falsify the hypothesis that the rings were actual food remains at all. Once done, cell structures of the observed cereal bran were used to identify the cereal components. Measurements carried out using image analysis software were then applied to all images made of the objects' surfaces in order to reconstruct the degree of grinding of the flour, and to find out whether the size distribution of gas bubbles in the dough rather pointed towards fermented (leavened) or unfermented dough. As many other features as possible, whether macroscopic or microscopical ones, were also recorded, such as the preservation of starch granules as well as surface features allowing conclusions on the production process.

The three charred ring fragments indeed turned out to be cereal-based during analysis. They had been produced from a dough made from cleaned and rather finely ground flour (rather middlings or semolina according to modern standards) from hulled barley and a wheat species. The dough was rather dense and had not been leavened. The overall water content had been rather low as 1) the starch had not entirely dissolved, and some starch granules were still detectable, and 2) the dough had ruptured in multiple places when it had been rolling into tubes and bent into the ring shapes.

The three wheat-barley-rings may have had an original consistency similar to dry cookies, and in contrast to some suggestions in the science press, it seems to be most reasonable to compare them to modern Italian *tarallini*. Quite some time had been invested in making them, and their shape likely imitates the loom weights from the same archaeological context. These 3,000 years old pieces of pastry demonstrate that the variability of prehistoric cuisine is still being underestimated to a large extent. It is definitely worth searching for more documents of how people actually cooked (and baked) in our past.