Supporting Information

Haas et al. 10.1073/pnas.1219425110

Starch Grain Analysis

For coprolite study, starch analysis must be done before pollen processing. Acetolysis procedure and hydrofluoric acid destroy starch and phytoliths. Starch and phytolith analyses are done immediately after rehydration and screening and before chemical pollen extraction. The manner and success of starch analysis in coprolites are dependent on the condition of the coprolites themselves. *Lycopodium*-based quantification in terms of starch granules per gram of material is ideal. This is achievable in rare studies in which coprolites are excellently preserved and contain an abundance of starch, such that it is possible to obtain 200 starch grain counts from a majority of samples. In a study of change in maize dependence between the Inka Late period (A.D. 1400–1532) and the pre-Inka Late Intermediate period, the extreme reliance of prehistoric populations on starches resulted in the fact that starch was the most abundant microfossil in ideally preserved coprolites (1). Thus, starch was readily recovered in postrehydration analysis. In such samples, dependence is signaled by high concentrations of starch grains. In other cases, the nature of the coprolite and food remains can make it impossible to obtain 200 starch grain counts with Ancestral Pueblo coprolites (2). In this case, the nature of a high-fiber diet reduced the number of starch grains observable per slide. In some cases, over 60 starch grains were encountered per slide. In a majority of cases, however, less than 1 starch grain was encountered per slide. Therefore, the nature of the diet has an impact on starch recovery. In this study, the ubiquity of maize starch in all samples signaled that maize was a major carbohydrate source at the site. However, with poorly preserved coprolites, such as those from Norte Chico, starch recovery is hampered by taphonomic conditions. The organic component of the coprolites had partly decomposed and was replaced by sand and carbonate material from the surrounding soil matrix. Therefore, after rehydration, the slides exhibited an overabundance of fine silica that impaired analysis. Thus, we scanned slides from the rehydrated coprolites solely for presence or absence of starch identifiable to a botanical taxon. As in other studies (2), maize reliance would be signaled by the overall ubiquity of the presence of starch in the coprolites.

1. Vinton SD, Perry L, Reinhard KJ, Santoro CM, Teixeira-Santos I (2009) Impact of empire expansion on household diet: The Inka in Northern Chile's Atacama Desert. *PLoS ONE* 4(11):e8069.

2. Reinhard KJ, et al. (2012) Understanding the pathoecological relationship between ancient diet and modern diabetes through coprolite analysis: A case example from Antelope Cave, Mojave County, Arizona. *Curr Anthropol* 53(4):506–512.

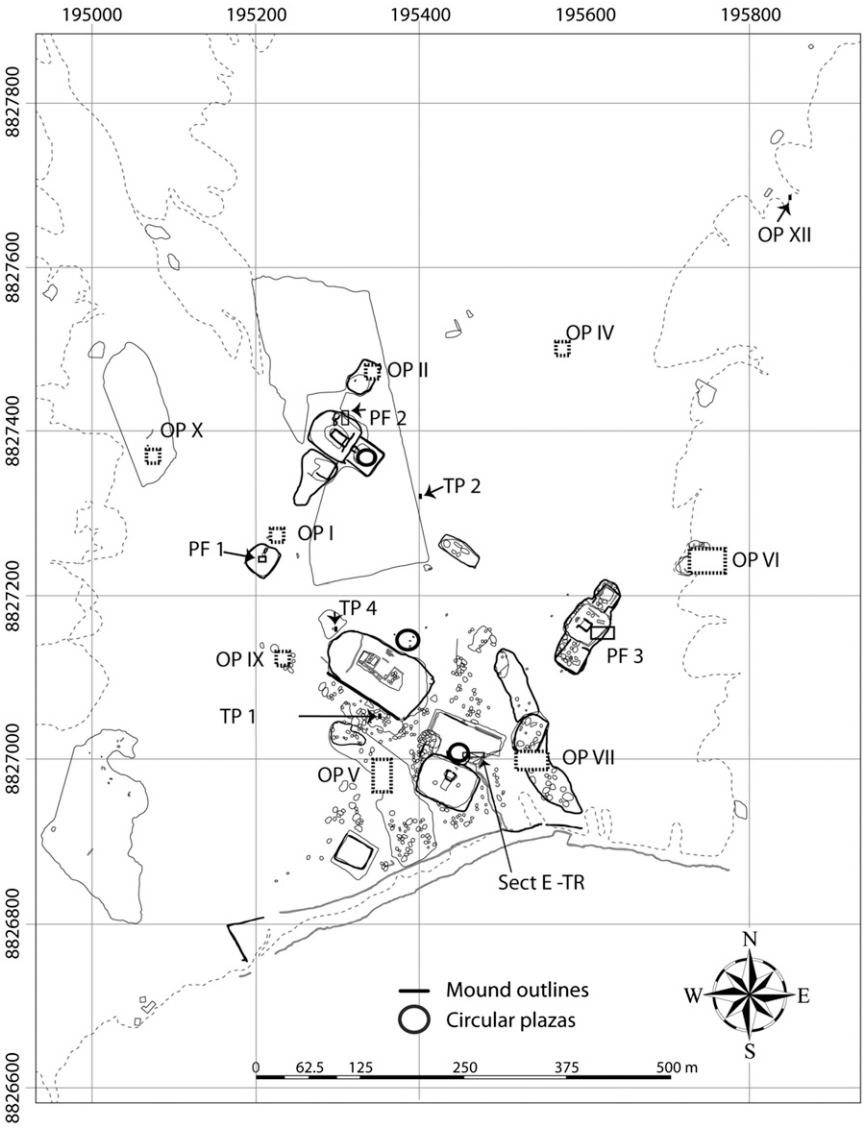

Fig. S1. Map of the site of Caballete.

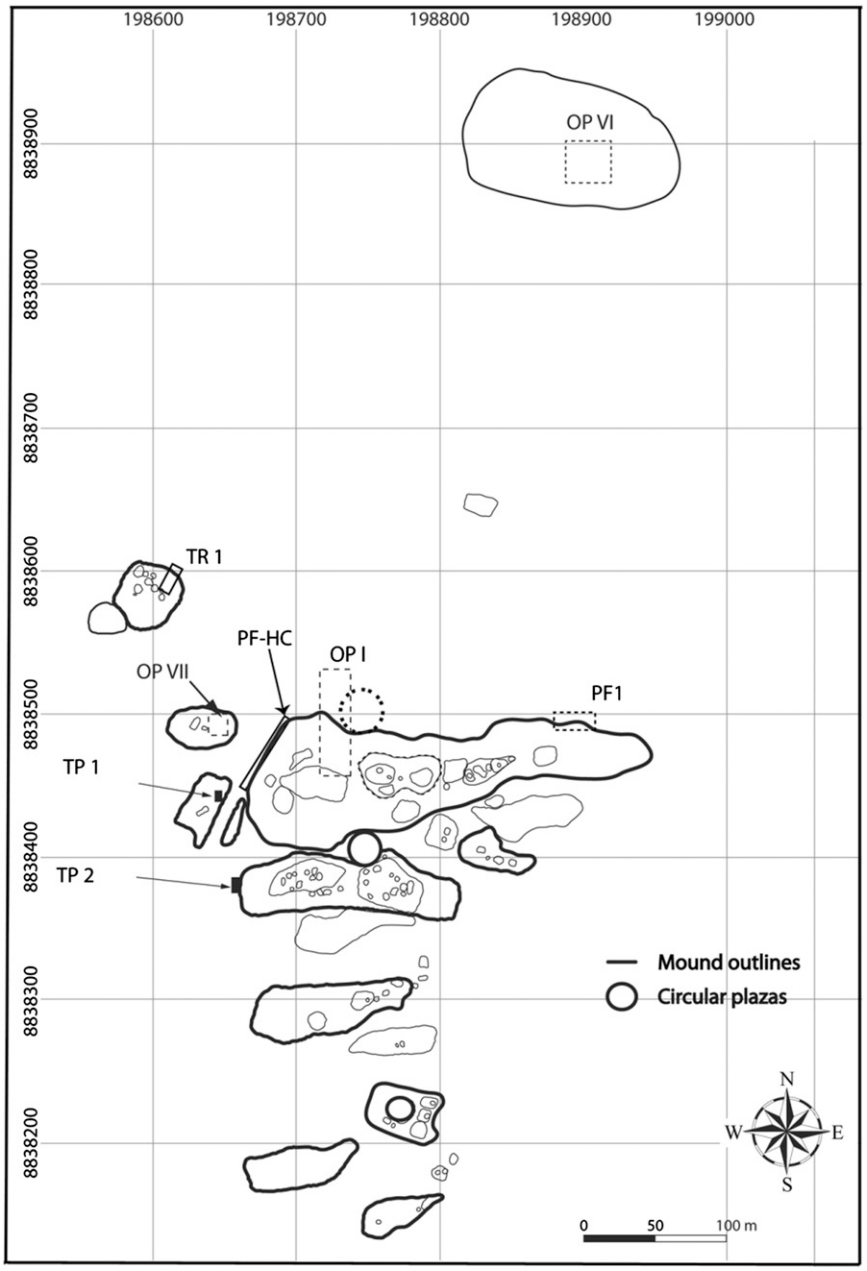

Fig. S2. Map of the site of Huaricanga.

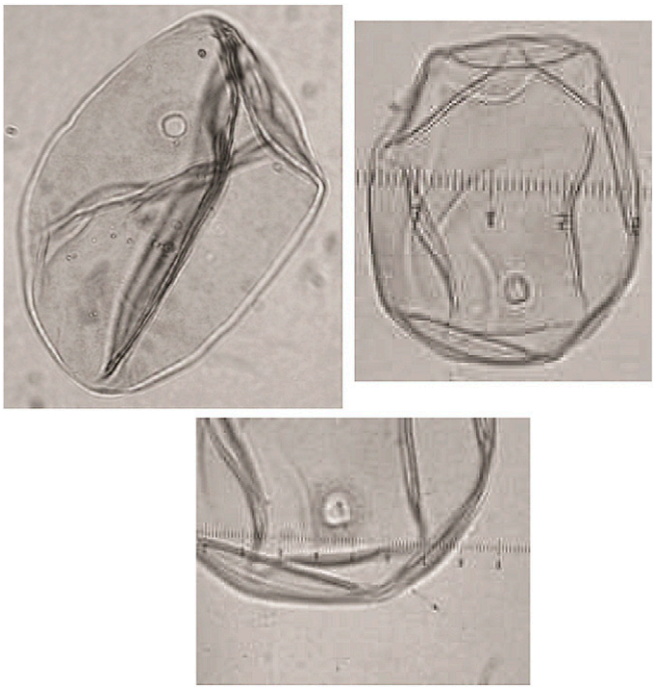

Fig. S3. Photographs of maize pollen. (*Upper Left* and *Lower*) Samples of prehistoric maize pollen from Caballete. (*Upper Right*) Sample of modern maize pollen.

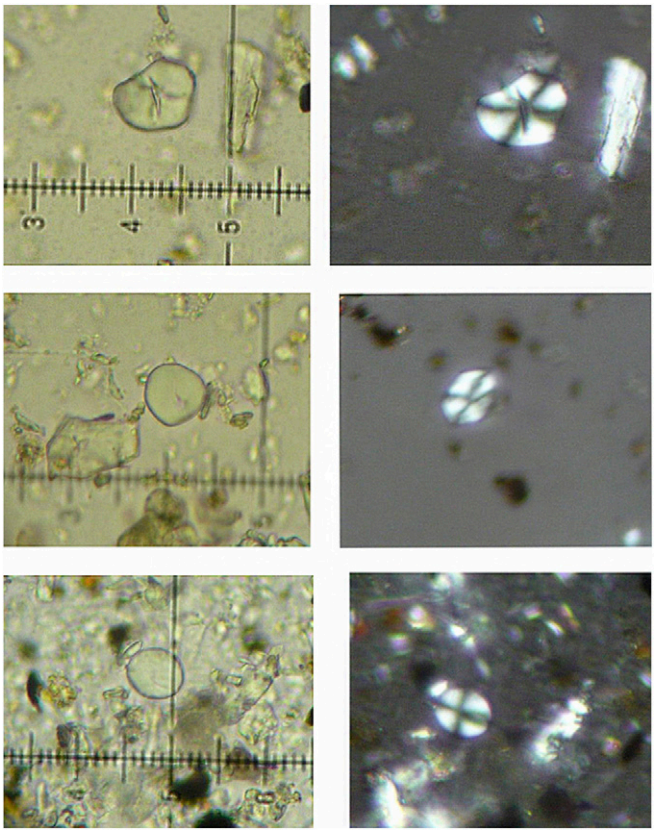

Fig. S4. Photographs of maize starch grains recovered from coprolites. Photos on *Left* are in normal light, those on the *Right* are the same grains in polarized light. Each space on the ruler is equal to 2.5 μm.

Other Supporting Information Files

Table S1 (DOC)
Table S2 (DOCX)
Table S3 (DOC)
Table S4 (DOCX)