Sorted samples from Luis Callasaya site. Bolivia 2007.

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We received three samples from a Formative site, excavated by Lic. Luis Kallasaya. The site is located at the edge of the Tiwanaku Valley in Bolivia. This period in the southern Titicaca basin prehistory is of special interest for we know that after the end of this sequence, during the Tiwanaku III and IV times, now called the late Formative became home of a major political, social, and religious center for the region (Albarracin-Jordan and Mathews 1990; Janusek 1992; Kolata 1993; Ponce Sanginés 1981, 1989). In addition, by this time there are massive and well organized intensive agricultural systems on the southern shores of the lake (Kolata 1986, 1991, 1996). Surely the Formative people participated in the development of these large scale production changes in many ways. It is through detailed excavation and recording that we hope to gain further insights into the development of what ultimately became the Tiwanaku polity by looking at the Formative precursors and their economic, religious, and social relations.

The region:

There are four major ecological zones in this area. The first zone is the valley, marshy to damp pampa near the lake shore which is approximately 3800 msmm. The second zone is the dry pampa/terraces above the wet pampa, the third zone is the upland/hilltops with the *quebradas,* and the final zone is the lake resources.
The valley is watered by springs evident at the break in slope of the Taraco Formation that flow into seasonal streams. Seasonal rains that can be torrential also provide water and rejuvenate the water table. Erosion is the major geomorphological action in the region. The altiplano climate is a two season regime of wet and dry. The significant fluctuations are diurnal with freezing night time temperatures during the dry season and milder temperatures throughout the rainy season. The precipitation comes mainly from the northeast, moving in from the Amazon Basin. The mean annual rainfall on the lake today is 690 mm, 581 mm at Guaqui along the lakeshore like Chiripa (Binford and Kolata 1996:26, 31). Most of the rain falls between December and March.

The lake shore elevation today is 3810 m. Thirty percent of Lake Wiñaymarka is less than 10 meters deep, which is mainly in the southern part of the lake, where the Peninsula is located. Just before the site seemed to be occupied, around 2050 B.C., the lake shore was about 1-2 km out from where it is today, approximately 10 meters below its present level (Binford and Kolata 1996:36-37). After this time the lake gradually rose to its present level by about 50 B.C. (Binford and Kolata 1996:37). Since then there has been a series of fluctuations determined by drier and moister conditions in the region.

The primary indigenous tree species are small trees (*Polylepis* sp.) and scattered bushes (*Buddleja* sp.) but the primary plant type is grasses with scattered small shrubs (see Pulgar-Vidal 1977, Cárdenas 1969,

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Soukup 1970). The crops traditionally grown in the area include a mix of traditional and introduced domesticates. The species list includes but is not limited to *Solanum tuberosum* L. (potato), *Chenopodium quinoa* Willd. (quinoa), *Chenopodium palicule* (Kañiwa), *Oxalis tuberosum* (oca), *Ullucus tuberosum* (papa lisa), and *Zea mays* (corn).Like the wild species of this zone, the domestic plants grown in each area depend on the soil type, drainage and microclimate for each field. When not in cultivation, this zone provides a fallow pasturage with a variety of grasses, herbs and small shrubs.

Archaeobotany Analysis

This report discusses the presence/abundance of archaeobotanical remains and the range of conditions, qualities, fragmentation, and firing conditions (*sensu* Hubbard and al Azm 1990).

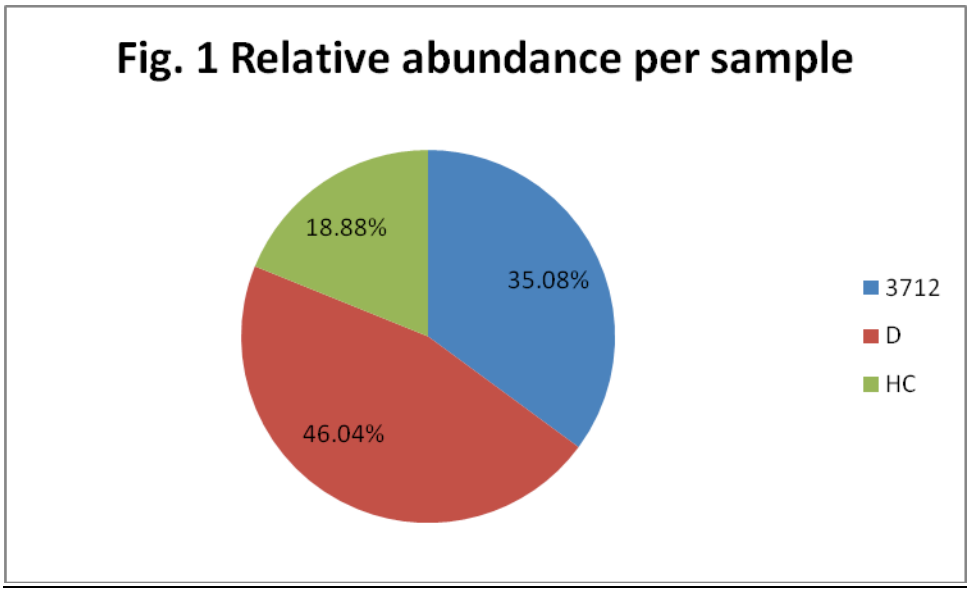
Methodology

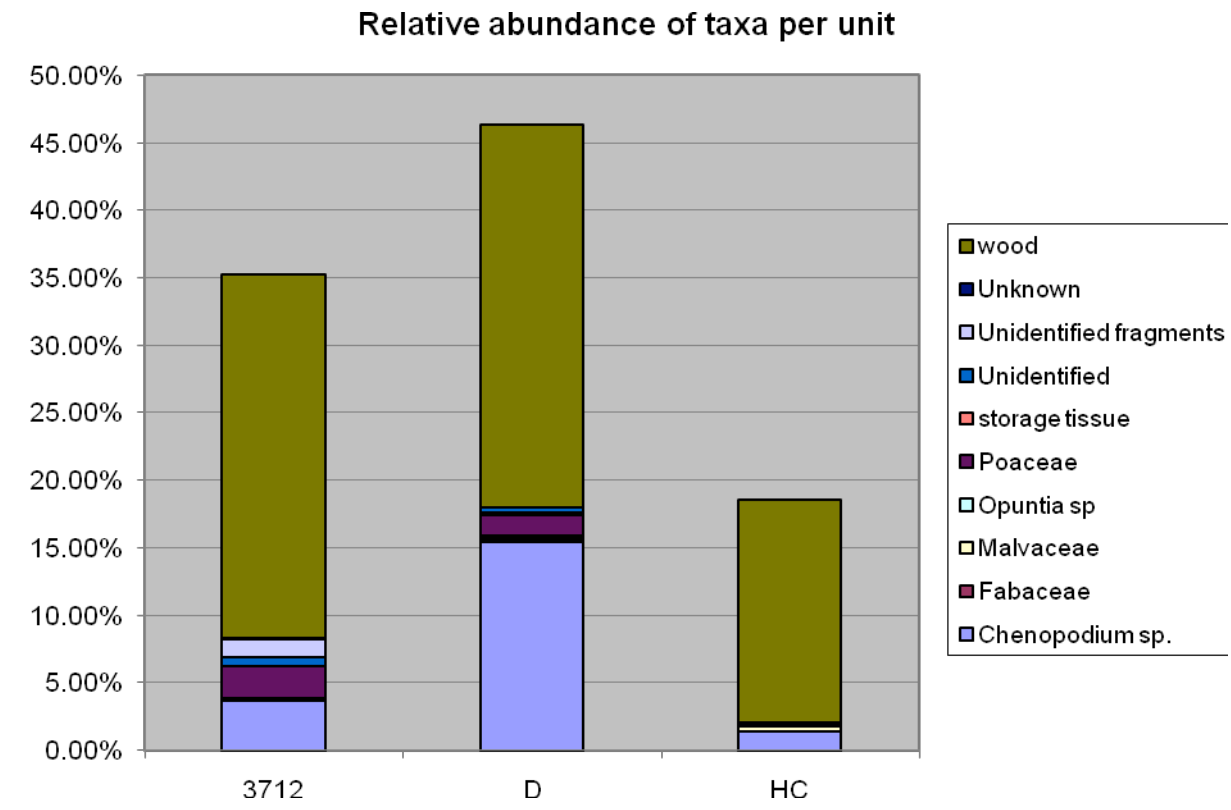
Once brought to the McCown laboratory at UC Berkeley in 2008 the floated samples were weighed and separated by size mesh in >2mm, >1.5mm & >05 for analysis. For each size grade was invested for identifiable plant specimens by separating and identifying the different plants remains. This was done by counting and weighing of each plant taxon by size (See the Archaeobotany sheet attached for each sample). Virginia McRostie completed the analysis and Christine Hastorf checked the identifications.

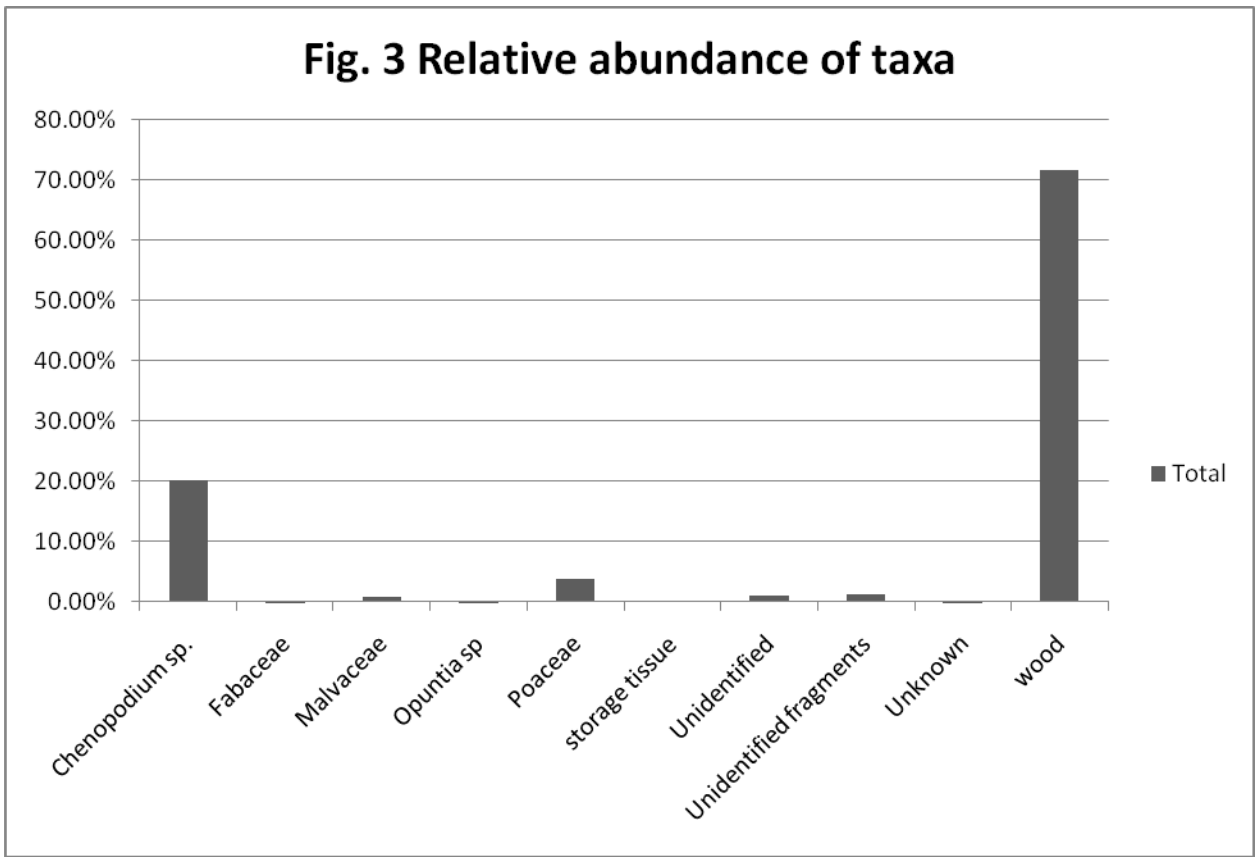
Results

In all there were 10 taxa identified in these three samples, including both wild and domestic plants. The over all relative abundance were sparse ranging from 18,88% to 46,04%. The unit with the most dense macroremains was Muestra D (Fig.1), as well the more diverse with Muestra 3712 (Fig. 2). The most abundance taxa in the three samples was wood in first place, then *Chenopodium* sp. & Poaceae (Fig.3). For *Chenopodium* sp. is quite sure that its quinoa but this have to be checked up by the researchers in Bolivia.

It also was a scarce presence of tiny snails and little bones that can be associated with micro fauna.




Relative abundance of taxa per unit
50.00%
45.00%
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
3712
D
HC
wood
Unknown
Unidentified fragments
Unidentified
storage tissue
Poaceae
Opuntia sp
Malvaceae
Fabaceae
Chenopodium sp.



Discussion

Due to the very few samples from this site, we can only say that the assemblage looks similar to many flotation samples analyzed the Taraco Archaeological Project, especially from fill or secondary deposits (Whitehead 2007; Bruno 2008). The dense wood suggests these samples might have been near a structure or a midden. The taxa identified correspond with the wild and domesticated plants of the area and period. Further samples with their contexts identified would aid on more interpretation at this site.

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