ARCHAEBOTANICAL SAMPLE PROCESSING, TARACO ARCHAEOLOGICAL PROJECT, 2024

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Scholars across multiple disciplines are engaged in understanding how subsistence practice across the world has changed over time, particularly regarding the emergence of agriculture. The Andes region of South America has given rise to some of the world's most significant food crops, including potatoes and quinoa, as well as textile products from camelid species such as llamas and alpacas. Certain loci within the Lake Titicaca Basin are thought to be significant to plant and animal domestication in the Andes; archaeological work has been conducted at key sites such as Chiripa, Lukurmata, and Wankarani in pursuit of knowledge surrounding the domestication transition by archaeologists of many subdisciplines. A base of knowledge regarding certain aspects of this transition has been established over the decades, particularly through the work of the Taraco Archaeological Project (TAP), yet many questions remain about its timing and context. Recent excavations by TAP in 2022 and 2023 were conducted with the aim of addressing these questions through multiple lines of archaeological evidence, including archaeobotanical remains.

In May and June of 2024, I worked with TAP in Chiripa, Bolivia to process archaeobotanical samples that had been collected during two previous field seasons in 2022 and 2023. A total of 119 samples were processed using two methodologies: flotation and dry screening. In addition to sample processing, work was done to curate archaeobotanical samples and other artifacts recovered from flotation and dry-screening for long-term storage in the community of Chiripa. Finally, in accordance with TAP's agreement with the community of Chiripa, 87 archaeobotanical samples exported the year prior for laboratory analysis were returned during a community meeting on May 15th, 2024.

Archaeobotanical Samples Processed in 2024 Field Season - Taraco Archeaological Project							
Site	Chiripa				Chiaramaya	Chiripata	**Total**
Sector	Apaza	Monticulo 5A	Monticulo 5B	Monticulo 1D			
# of Flotation Samples Processed	6	39	25	13	1	2	**86**
# of Dry Screen Samples Processed	3	7	14	3	6	0	**33**
Total	**9**	**46**	**39**	**16**	**7**	**2**	**119**

Table 1. Quantity and type of samples processed from sites across the Taraco Peninsula in 2024.

A total of 86 sediment samples from three sites across the Taraco Peninsula (Chiripa, Chiaramaya, and Chiripata) were processed using mechanized flotation on-site at Chiripa. Excavators followed a standard protocol for collecting samples: a 10L bulk sample was collected from each locus to be processed via flotation, along with analogous samples for dry screening and

phytolith analysis. In certain contexts, an additional judgmental sample was collected. The flotation system consisted of a SMAP-style machine that was supplied with water via a solar-powered bilge-pump. This novel solar-powered system was constructed in 2022 and retooled in 2023 to accommodate a higher-powered 1100 GPH pump. In 2022 and 2023, the efficiency and effectiveness of this novel system was evaluated by calculating processing speed and recovery rate, which revealed that sample processing was slightly slower under the solar system compared to a traditional gas-powered system (a mean of 12.65 samples processed per day versus 13.55). However, the rate of recovery, determined using a control input of 50 poppy seeds in a random sample each day, was higher under the novel system (93.62%); the gas-powered system demonstrated a recovery rate of 83.00%. Processing speed and recovery will be evaluated from the 2024 field season's data, with the goal of further evaluating the effectiveness of a solar-powered flotation system.

Figure 1. SMAP-style mechanized flotation machine with solar-powered bilge pump used for sample processing.

Light fractions derived from the flotation process were dried, packaged, and curated for future laboratory analysis. A total of 30 light fractions were exported for Phase 1 macrobotanical analysis at the McCown Archaeobotany Laboratory, UC Berkeley. The 86 heavy fractions derived from the flotation process were sorted on-site by size fraction using geological sieves (>2mm, >1mm, >0.5mm, Pan). Artifacts recovered from the heavy fraction included botanical remains, ceramics, lithics, faunal remains, and beads, which were curated for long-term storage at Chiripa.

In addition to flotation, dry screening was used as a method of recovering botanical remains from sediment samples; analogous samples were taken at each locus with the aim of recovering more delicate remains that might otherwise be destroyed during the flotation process, such as parenchymatous tissues. Dry screening was conducted using the same procedures as the 2022 and 2023 field seasons: geological sieves were used to separate the samples into three fractions: >4mm, >2mm, and Pan. Each fraction was then examined on trays, and botanical remains, bone, ceramics and lithics were collected and weighed. A total of 33 samples were sorted on-site. All botanical remains found during dry screening were exported for analysis at the McCown Archaeobotany Laboratory.

Following this season's work, no unprocessed sediment samples remain from the 2022 and 2023 field seasons, resulting in a cumulative assemblage of 460 flotation samples (separated by light and heavy fraction). Apart from its necessity in enabling further analysis, the timeliness of work was key in preventing the potential loss of data due to taphonomic impacts on unprocessed sediment samples. The work of analyzing the light fraction botanicals from these samples is ongoing, and the resulting data will be articulated with other lines of material evidence recovered during the 2022 and 2023 excavations, including microbotanical and faunal remains, with the ultimate goal of depicting past subsistence and agricultural practice on the Taraco Peninsula.

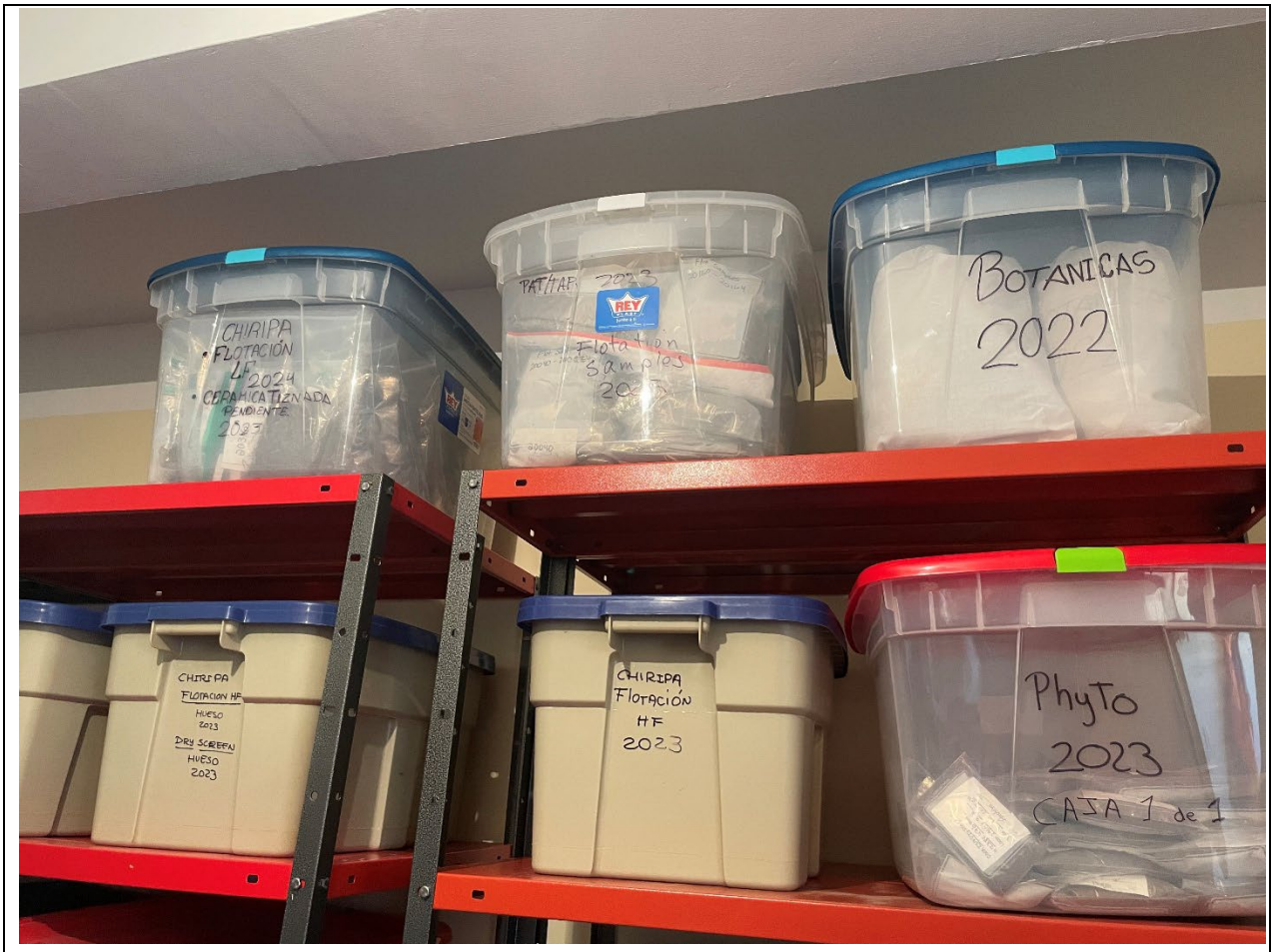

Figure 2. Curated light fraction botanicals, heavy fraction artifacts, and microbotanical samples in long-term storage at the community of Chiripa, Bolivia.

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