Summary of Twined Textiles of Huaca Prieta

There were 863 textile artifacts recovered from the 2006-2011 Huaca Prieta excavations and of that total, 368 specimens featured twining. Some of Pit 1/3 and Pit 3 were composed of the backfill from Bird's 1946-1947 excavations, where 29.08% of the recovered twined textiles could not be accurately dated, while another 4.35% of the specimens were documented without an assigned provenience. The other 70.38% of the twined textiles were recovered from Trinchera N-S, Unidad 14 / 14-3 (U.S.), Unidad 16, and Unidad 3, where Dillehay assigned the site phases according to their provenience data (Tom Dillehay personal communication, January 2014). No specimens dated to Phase 1, but the other four phases were represented in the 259 twined textiles that were recovered from areas of the site that Bird had not previously excavated (Figure 1).

Raw Material Assessment

The most prevalent raw material in the textile specimens' warps and wefts is cotton. Over 97% of the textiles exhibited cotton in their wefts and over 98% displayed cotton in their warps (Figures 2 and 3). When other raw materials, unidentified vegetal fiber, and milkweed, were identified, they were usually a part of the cotton yarn's structure. The unidentified vegetal fiber was only found in Bird's backfill, while milkweed was exhibited in specimens dating to as early as Phase 2.

Examples with twined wefts composed of milkweed and cotton were found only in Pit 3, Trinchera N-S and Unidad 3 but date only as early as Phase 3 (Figure 4). Trinchera N-S was the only part of the site to represent multiple phases of wefts with both cotton and milkweed. The milkweed and cotton wefts found in Pit 3 were assigned to Phases 3-4, while Unidad 3 was assigned only to Phase 5. There were only four specimens with milkweed-only wefts discovered in non-disturbed areas of the site. They were all found in Trinchera N-S, where one dated to Phase 3 and the others to Phase 5.

The specimens with warps composed of milkweed and cotton were found in Pit 3, Trinchera N-S, Unidad 14 / 14-3 (U.S.), and Unidad 3 (Figure 5). Pit 3 and Trinchera N-S were the only units of the site to have specimens with milkweed and cotton warps which represented multiple phases. Pit 3 had warps dating to Phases 3, 4, and 5 while Trinchera N-S had specimens dating as early as Phase 2. Unlike the wefts, there were no warps composed of only milkweed fiber.

Unidads 16 was the only unit where milkweed was not exhibited in either the warps or the wefts. When milkweed was part of the yarn structure, there were more warps with milkweed than the wefts, both throughout the phases and across the site's units (Figures 6 and 7). Warps with milkweed dated as early as Phase 2, but wefts with milkweed were found only as early as Phase 3. Out of the combinations of Cotton Warps/Cotton Wefts, Cotton Warps/Milkweed Wefts, Milkweed Warps/Cotton Wefts, and Milkweed Warps/Milkweed Wefts, the specimens which featured milkweed in both the warps and wefts numbered the fewest.

Structure Assessment

Yarn structure analysis of the twined textiles revealed there was a variety of twist and ply structures used to create the warp and weft yarns. The most common structure used was Z(2S) (68.59%), followed by S(2Z) (12.33%), but there were no apparent trends through time or across space at the site as to when each structure was used in a specimen. The other 19.08% comprised a variety of more intricate yarn structures, but are difficult to discuss in such a limited capacity. Any of the specimens which incorporated milkweed fibers assessed the patterns of spin direction: S, Z, and I (lack of twist, or unspun fiber). All three types of twist were exhibited by milkweed-containing yarns, and there did not appear to be any trends in the yarn structure.

Diameter Assessment

The minimum value, maximum value, mean, and standard deviation were calculated for the diameter measurements taken by Splitstoser (min, max, and norm) (Tables 1, 2, 3, 4). Both across space and through time at the site, the twined weft and warp diameter means were closer to their minimum rather than their maximum values, suggesting that the warp and wefts typically had finer diameters. Except for the finer warp diameters represented in Phase 5, there did not appear to be much variation in the diameters through time as their standard deviations exhibited <1mm in variability,

Conclusion

Each of the textile attributes were analyzed for patterns suggesting changes in textile design across space and through time at the site. Data obtained for these variables do not seem to represent any shifts or trends in the raw material, structure, and yarn diameters of the Huaca Prieta twined textile sample.

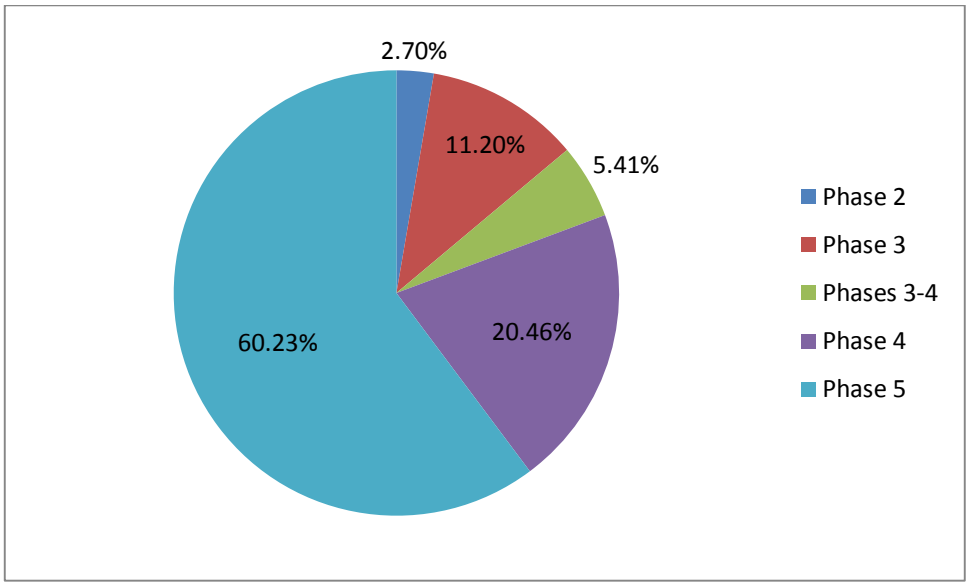

Figure 1: Percentage of twined specimens represented through Huaca Prieta's phases.

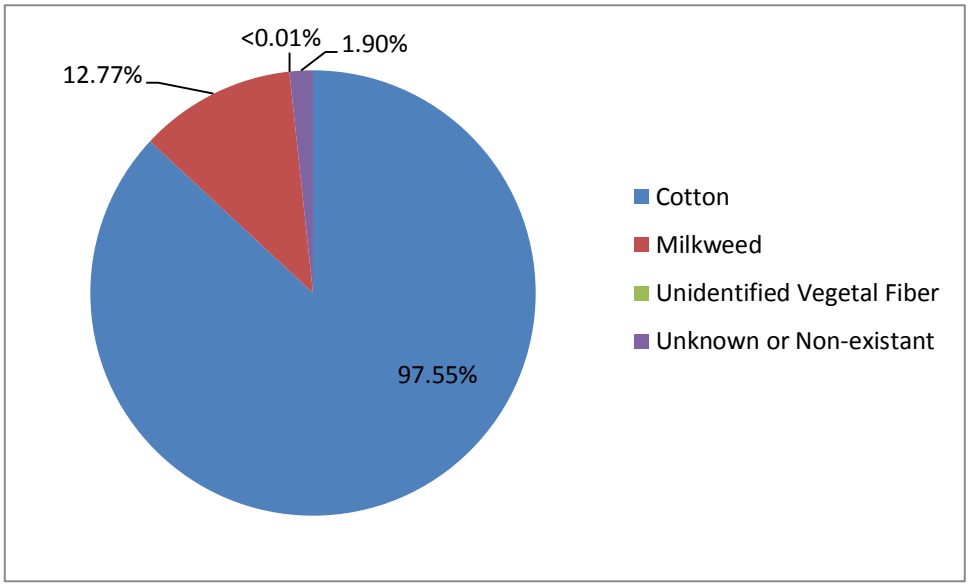

Figure 2: Percentage of raw materials represented in the wefts of the 368 twined specimens.

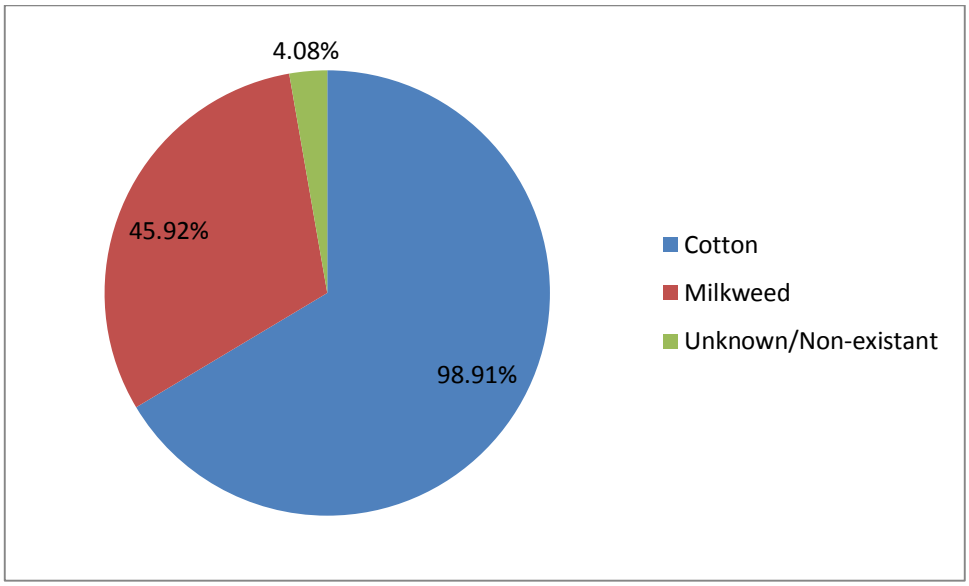

Figure 3: Percentage of raw materials represented in the warps of the 368 twined specimens.

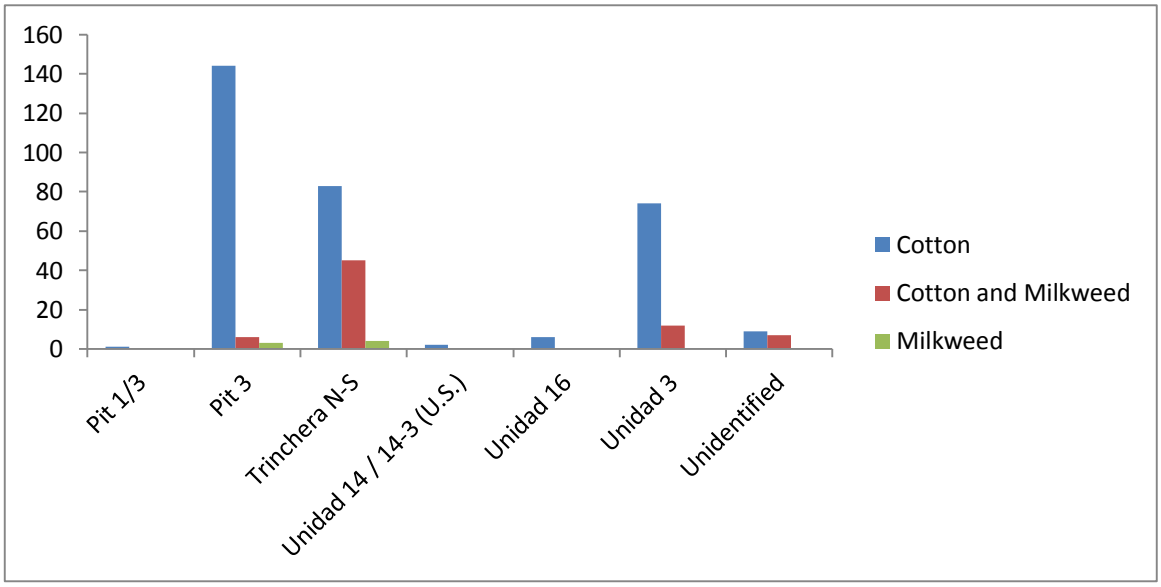

Figure 4: Spatial distribution of wefts composed of cotton, cotton and milkweed, and milkweed.

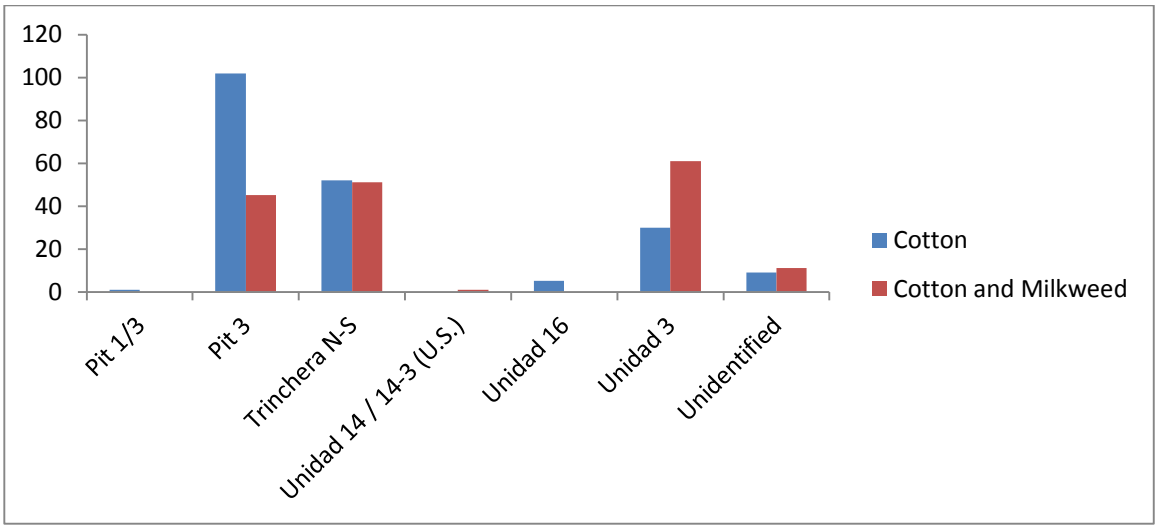

Figure 5: Distribution of warps composed of cotton, and cotton and milkweed across the site.

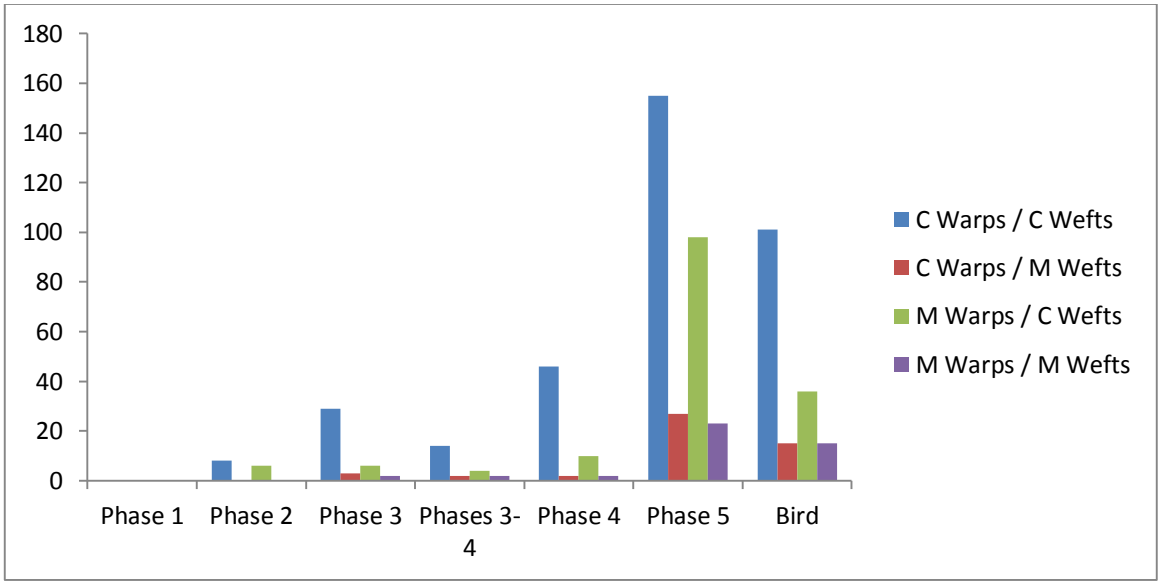

Figure 6: Distribution of warp and weft combinations through the phases of the site. C = cotton and M = milkweed. The milkweed warps and wefts do not denote that the specimens were composed completely of that fiber, but rather that it was a part of the yarn's structure.

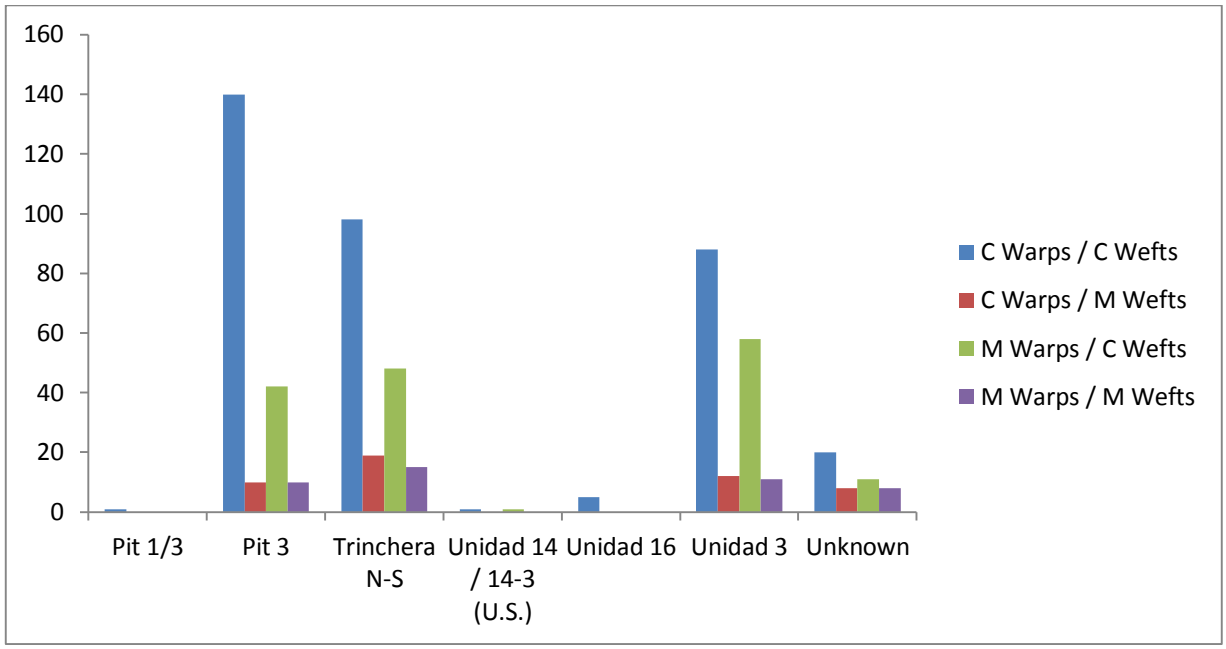

Figure 7: Distribution of warp and weft combinations across the site. C = cotton and M = milkweed. The milkweed warps and wefts do not denote that the specimens were composed completely of that fiber, but rather that it was a part of the yarn's structure.

Table 1: The determined means and standard deviations of the wefts' diameter measurements across the site.

		Diameter Min				Diameter Max				Diameter Norm			
	Count	Min	Max	Mean	St.Dev	Min	Max	Mean	St.Dev	Min	Max	Mean	St.Dev
Pit 1/3	1	0.55	0.55	0.55		1.1	1.1	1.10		0.9	0.9	0.90	
Pit 3	248	0.1	5.1	0.67	0.2848	0.4	7.8	1.35	0.5086	0.4	1.9	0.96	0.3473
Trinchera N-S	197	0.2	1.9	0.73	0.3373	0.4	3.6	1.47	0.6449	0.4	2.3	1.07	0.4563
Unidad 14 / 14-3 (U.S.)	2	0.5	1.1	0.80	0.4243	1	1.7	1.35	0.495	0.9	1.4	1.15	0.3536
Unidad 16	8	0.5	0.8	0.64	0.2477	1.1	1.4	1.20	0.0926	0.8	1	0.89	0.0641
Unidad 3	140	0.3	2.2	0.57	0.249	0.6	3	1.24	0.4119	0.5	2.3	0.84	0.2666
Unknown	29	0.4	0.9	0.6615	0.1602	0.8	2	1.3492	0.2656	0.7	1.3	0.95	0.1771

Table 2: The determined means and standard deviations of the wefts' diameter measurements through the site's phases.

		Diameter Min				Diameter Max				Diameter Norm			
	Count	Min	Max	Mean	St.Dev	Min	Max	Mean	St.Dev	Min	Max	Mean	St.Dev
Phase 1	0												
Phase 2	9	0.4	0.7	0.52	0.0935	1.1	1.4	1.29	0.1167	0.7	0.9	0.80	0.0707
Phase 3	63	0.4	1.9	0.68	0.2511	0.8	2.4	1.31	0.3689	0.6	2	1.01	0.3701
Phases 3-4	30	0.5	1.3	0.755	0.2131	0.8	2.4	1.4	0.4652	0.7	1.5	1.02	0.2784
Phase 4	124	0.25	1.9	0.77	0.3136	0.4	2.8	1.47	0.5061	0.4	2.3	1.08	0.4194
Phase 5	235	0.2	2.2	0.60	0.2794	0.5	3.6	1.33	0.577	0.4	2.3	0.90	0.3509
Bird	177	0.1	5.1	0.70	0.2713	0.4	7.8	1.37	0.4328	0.4	1.9	0.97	0.3053

Table 3: The determined means and standard deviations of the warps' diameter measurements across the site.

		Diameter Min				Diameter Max				Diameter Norm			
	Count	Min	Max	Mean	St.Dev	Min	Max	Mean	St.Dev	Min	Max	Mean	St.Dev
Pit 1/3	1	0.55	0.55	0.55		1.6	1.6	1.6		1	1	1	
Pit 3	241	0.2	6	0.60	0.1979	0.6	8	1.31	0.3531	0.4	6.6	0.88	0.1886
Trinchera N-S	190	0.16	1.8	0.61	0.1904	0.5	2.6	1.33	0.3209	0.35	2.3	0.909	0.2126
Unidad 14 / 14-3 (U.S.)	1	0.7	0.7	0.7		1.5	1.5	1.5		1	1	1	
Unidad 16	6	0.7	1.3	0.87	0.216	1.1	2	1.7	0.3688	0.7	1.5	1.20	0.4123
Unidad 3	223	0.03	1.4	0.46	0.1701	0.5	2.3	1.13	0.3164	0.35	1.9	0.74	0.1912
Unknown	35	0.3	0.9	0.60	0.1503	0.7	2.1	1.23	0.3415	0.5	1.2	0.85	0.1557

Table 4: The determined means and standard deviations of the warps' diameter measurements through the site's phases.

		Diameter Min				Diameter Max				Diameter Norm			
	Count	Min	Max	Mean	St.Dev	Min	Max	Mean	St.Dev	Min	Max	Mean	St.Dev
Phase 1													
Phase 2	22	0.45	0.7	0.58	0.0668	0.9	1.5	1.13	0.1804	0.7	0.9	0.78	0.0855
Phase 3	38	0.16	0.9	0.60	0.1741	0.7	1.9	1.31	0.3249	0.5	1.4	0.89	0.1973
Phases 3-4	17	0.5	1.1	0.81	0.1853	1.2	2.4	1.8	0.3691	0.8	1.3	1.04	0.1272
Phase 4	68	0.3	1.8	0.63	0.2131	0.6	2.6	1.4	0.3345	0.4	2.3	0.93	0.2501
Phase 5	346	0.03	1.4	0.50	0.1804	0.5	2.3	1.18	0.3224	0.35	1.9	0.79	0.2089
Bird	170	0.2	1.2	0.59	0.2026	0.6	2.3	1.29	0.333	0.4	1.3	0.87	0.1843