

Chapter Twelve

Charred Plant Remains

Karen R. Adams

INTRODUCTION

Homol'ovi IV is a 150+ room pueblo along the Little Colorado River near Winslow, AZ. Initially occupied in A.D. 1250-1260, it was abandoned by A.D. 1300, or perhaps as early as A.D. 1280-1285. Situated initially on a butte, Homol'ovi IV occupants routinely tossed household debris down an adjacent slope, accumulating a midden of at least a meter depth at the slope's base. As the pueblo expanded from the butte top down over its slopes, people built additional structures on this midden. Roasting pits and hearths were frequently dug into the midden and utilized. At the base of the slope, a plaza area appears to have been used consistently through time, with occupation layers interfingering with midden debris.

METHODS

During excavations in 1989, archaeologists routinely acquired flotation samples from Homol'ovi IV structures, the midden, and the plaza. A total of 20 flotation samples, ranging in size from 0.6-8.6 liters, were processed via water to separate and concentrate light fraction organic remains ranging in volume from 10-560 ml. For this study, the light fraction volumes of fifteen samples were examined entirely; for five samples with light fraction volumes over 135 ml, a minimum of 78% of the available material was examined. All items discussed in this report are charred, presumably due to prehistoric activities.

RESULTS

The plant record of Homol'ovi IV is relatively rich. A total of four domesticates (*Zea mays*, *Cucurbita*, *Phaseolus vulgaris* and *Gossypium*) preserved (Table 12.1). Reproductive parts of 16 wild plants were also recovered, along with charcoal or vegetative parts of an additional 17 taxa. Maize dominated the record of foods in terms of ubiquity. Wild plants commonly utilized included bugseed (*Corispermum*) and ricegrass (*Stipa*) grains, along with other plants of weedy habitats, plus grasses. The most frequently recovered charcoal types, implying common reliance on wood for fires, are all riparian species such as cottonwood/willow (*Populus/Salix*), New Mexican privet (*Forestiera*) and ash (*Fraxinus*). Although many of the additional woods likely grew relatively close in prehistory, some (*Pseudotsuga*, *Juglans*, *Quercus*, *Juniperus* and *Pinus*) probably did not. These were either rare on the landscape, or were picked up as driftwood during flooding of the Little Colorado (Adams and Hedberg 2002). The recovery of a limited amount of *Acer* charcoal represents a new record for this area, as it was not reported in a survey of the archaeobotanical literature of this region (Adams 1996). Three common species of *Acer* (*Acer negundo*, *A. glabrum*, *A. grandidentatum*) all grow above 3500', sometimes along streams (Kearney and Peebles 1960), and apparently on occasion became available to Homol'ovi IV occupants as limited amounts of driftwood.

Table 12.1 Ubiquity of charred reproductive and non-reproductive parts in 20 flotation samples from Homol'ovi IV, organized in order of ubiquity

Reproductive parts	Common Name	N=20
Domesticates		
<i>Zea mays</i> cob, cupule embryo, kernel	maize, corn	15
<i>Phaseolus vulgaris</i> seed	common bean	2
<i>Cucurbita</i> seed fragment	squash	1
<i>Gossypium</i> seed	cotton	1
Wild Plants		
<i>Corispermum</i> seed	bugseed	5
<i>Stipa caryopsis</i>	ricegrass	5
Cheno-am seed	cheno-am	3
<i>Cycloloma</i> seed	winged pigweed	3
Gramineae Types 1,2	grass	3
<i>Portulaca</i> seed	purslane	3
Gramineae Type 3	grass	2
<i>Yucca baccata</i> seed	broad-leaf yucca	2
<i>Cleome</i> seed	Beeweed	1
<i>Descurainia</i> seed	tansy mustard	1
<i>Euphorbia</i> seed	spurge	1
Leguminosae seed, 2 types	legume	1
Malvaceae seed	mallow	1
<i>Scirpus</i> achene	sedge	1
Charcoal, non-reproductive parts		
<i>Populus/Salix</i> charcoal	cottonwood/willow	18
<i>Forestiera</i> charcoal	New Mexican privet	12
<i>Fraxinus</i> charcoal	ash	11
<i>Allenrolfea</i> charcoal	pickelweed	6
<i>Chrysothamnus</i> charcoal	rabbitbrush	6
<i>Pseudotsuga</i> charcoal	douglas fir	5
<i>Sarcobatus</i> charcoal	greasewood	5
<i>Atriplex</i> charcoal	saltbush	4
Monocotyledon tissue fragment	monocotyledon	4
Monocotyledon stem fragment	monocotyledon	4
<i>Juglans</i> charcoal	walnut	3
<i>Juniperus</i> charcoal	juniper	3
<i>Quercus</i> charcoal	oak	3
<i>Acer</i> charcoal	maple	2
<i>Pinus</i> charcoal	pine	2
<i>Artemisia</i> charcoal	sagebrush	1
<i>Juniperus</i> twig fragment	juniper	1
<i>Phragmites</i> stem fragment	reedgrass	1
<i>Rhus</i> charcoal	lemonade berry	1
Unknown charcoal	unknown	1

Structures

Two Homol'ovi IV Structures, 201 and 301, were intact and complex. Both had hearths and multiple floors. Numerous artifacts on the floors of each suggested rather abrupt, non-planned aban-

donment, and no return. Two hearths in Structure 201 preserved charred plant materials suggestive of both foods and fuels. In the earlier hearth associated with Floor 2, a variety of annual seeds preserved, including cheno-am, *Corispermum*, *Cycloloma*, Gramineae Type 2 and *Portulaca*

seeds. These resources are usually ripe in late summer/early fall, suggesting season of hearth use. No identifiable charcoal was recovered. In the later hearth, *Corispermum* seeds and *Zea mays* cupules suggest one food, plus use of maize cobs as fuel. Other fuels used in this hearth included *Fraxinus*, *Populus/Salix*, *Rhus* and *Sarcobatus*.

Plant materials in Structure 301 are equally diverse. Excavators recovered a wide variety of likely foods from the hearth, including cheno-am, *Cleome*, *Euphorbia*, Gramineae, and *Yucca baccata* reproductive parts. They also excavated domesticated maize cob and kernel fragments, plus a common bean (*Phaseolus vulgaris*) seed. Again, the bulk of these remains reflect availability in the late summer/early fall. A diversity of fuel types present included *Chryso-thamnus*, *Fraxinus*, *Populus/Salix*, *Pseudotsuga* and *Sarcobatus* charcoal. Some are local dryland species, others riparian, and the *Pseudotsuga* was likely picked up as driftwood along the Little Colorado river.

A trashy layer in Structure 301 also contained debris of both foods and fuels. Monocotyledon tissue fragments with calcium oxalate crystals may represent a local species of *Yucca*, possibly *Yucca baccata*, also recovered as a seed from this locus. A *Stipa* grain hints that people were in the area in late spring/early summer, when rice grass is ripe. A *Portulaca* seed and charred maize cupules complete the list of reproductive parts. A total of seven charcoal types preserved in this trashy layer, revealing the broad nature of materials that were burned in thermal features.

Structure 2, a pit structure thought to be a ritual structure, was excavated near the top plaza surface, and is considered relatively late in the occupation of Homol'ovi IV. Two flotation samples preserved a moderate record of plant remains. Maize cupules were recovered from an ash deposit along with *Forestiera* and *Populus/Salix* charcoal, all likely fuels. From a pit excavators retrieved *Gossypium* seeds, grass stem fragments, and maize cupule and kernel parts, along with five

charcoal types including *Pinus*. The *Pinus* wood may have been relatively rare in prehistory in the surrounding region, or came down the Little Colorado river during flooding.

Structure 5 was built on the uppermost midden/plaza surface and is also among the latest structures built at Homol'ovi IV, as is structure 10. From a fine, ashy layer in Structure 5, excavators recovered grass grains and maize cob and kernel fragments. Possibly maize kernels were roasted in the final event(s) which produced the ash. Five charcoal types also preserved, including *Pinus* type. An ash lens above the floor in Structure 10 preserved evidence of domesticates (maize, common beans) and wild plant use (*Cycloloma*, Gramineae), along with four charcoal types that were likely available locally.

Middens

All the structures, plus the plaza, overlay layers of midden or general trash deposited during the occupation of Homol'ovi IV. Samples from four separate midden strata in the Plaza give a good view of regularly discarded plant parts (Table 12.2). The stratum 4 sample labeled "trashy fill" preserved a wide variety of reproductive parts, including resources representing early (*Descurainia*, *Stipa*) and later portions of the growing season. The charcoal types were equally diverse, representing local mesic habitats (*Forestiera*, *Populus/Salix*), and long distance transport (*Pseudotsuga*, *Juglans*, *Acer*). The other strata preserved fewer taxa. A final sample from fill between the floor of structure 201 and Plaza surface 4 preserved only evidence of fuel use.

The Plaza

Plant remains were examined from four separate Plaza features that were likely areas where fires were built. A circular, slab feature retained no reproductive parts, but did preserve a diverse record of charcoal types of local and possibly distant

Table 12.2 Distribution of charred plant parts preserved in four midden strata in the plaza

	Strat 2	Strat 3	Strat 4	Strat 5	Fill
Reproductive Parts					
Cheno-am seed				x	
<i>Corispermum</i> seed		x	x	x	
<i>Cycloloma</i> seed				x	
<i>Descurainia</i> seed		x	x		
Gramineae grain		x			
Leguminosae seeds				x	
Malvaceae seed				x	
<i>Stipa</i> grain, floret			x	x	
<i>Portulaca</i> seed		x			
<i>Scirpus</i> achene				x	
<i>Zea mays</i> kernel		x	x		
Charcoal					
<i>Acer</i>			x		x
<i>Allenrolfea</i>	x			x	
<i>Atriplex</i>				x	x
<i>Chrysothamnus</i>					x
<i>Forestiera</i>		x	x	x	x
<i>Fraxinus</i> x		x		x	
<i>Juglans</i>		x			
<i>Juniperus</i> twig				x	
Monocotyledon tissue		x		x	x
<i>Phragmites</i> stem		x	x		
Populus/Salix	x	x	x	x	x
<i>Pseudotsuga</i>		x	x		
<i>Quercus</i> x					
<i>Sarcobatus</i>				x	
<i>Zea mays</i> cupule	x	x	x		x

(*Pseudotsuga*) habitats. One roasting/fire pit gave no clue to any preparation of plants there, and only preserved *Populus/Salix* charcoal. A second roasting pit contained maize cob parts and *Populus/Salix* charcoal, both likely fuels, along with grass stem fragments. The only possible food materials preserved there were two charred *Stipa* grains. Finally, another possible roasting pit contained maize cob parts, a few burned kernel fragments, and five different kinds of charred wood. The general record of thermal features in the Plaza suggests fires to keep warm or for light, rather than places where food was routinely processed.

One last location within the Plaza was quite unique, in that it contained a massive deposit of reconstructible vessels and numerous ritual-like objects. A single flotation sample preserved the

only *Cucurbita* evidence reported here, and a small number of charred maize kernels. The fuel record included maize cob parts, grass stems, and six charcoal types. Other than possible processing of domesticated foods, the plant record sheds little light into the activities in this particular specialized area of Homol'ovi IV.

DISCUSSION

The record of domesticates in Homol'ovi IV deposits slightly alters a recent archaeobotanical summary for the region. Limited recovery of *Cucurbita* and *Gossypium* remains now places these resources in the area prior to A.D. 1280, as previously reported (Adams 1996). The wild

plant record at Homol'ovi IV is generally similar to that of a contemporary site (J:14:36) in the area, though the Homol'ovi IV record emphasizes use of bugseeds, along with other frequently recovered resources such as a variety of grass grains, cheno-am seeds, winged pigweed seeds and purslane seeds. Regarding fuelwood use, the same wide diversity of types occurred in Homol'ovi IV as in another well-sampled late Pueblo III site (J:14:36) from this area (Adams 1996). The Homol'ovi IV study documented use of *Rhus* and *Pseudotsuga* somewhat earlier than previously known (Adams 1996), and added *Acer* and Monocotyledon tissue to the list of charcoal types recovered. The wood types represent local upland environments, riparian habitats, and long-distance transport of upper elevation species as driftwood (Adams 1996).

Seasonality expressed by plant remains suggests people occupied the Homol'ovi IV com-

munity minimally from late spring through the fall harvest and processing of agricultural products. Likely they were in the area in early spring to prepare fields for planting, and then to harvest such cool season resources as ricegrass and tansy mustard. Most of the wild resources recovered mature during summer and fall, when crops would also need attention.

The common presence of weedy plant taxa (bugseed, cheno-ams, winged pigweed, purslane) suggests the occupants of Homol'ovi IV routinely had access to disturbed land. Agricultural fields and frequently used pathways, along with smaller side-canyon drainages, would provide such habitat. The presence of large numbers of people would increase the amount of available disturbed land. The environment surrounding Homolo'vi IV was apparently heavily used, though perennials such as ricegrass and broad-leaf yucca were still available.