Archaeobotanical Analysis of the Chiripa site in Bolivia.

Introduction

The purpose of this paper is to analyze midden and floor deposits that were excavated during the Taraco archaeological Project field season of 1998. This analysis involves the discussion of archaeobotanical material from the middens through time. The data was divided into three categories of food, fuel and overall species diversity. These three categories were then organized by events within each area and by date for all three areas. The areas include Monticulo 1, Monticulo 2, and Choquehuanca. Percent presence and densities were used in the analysis of the data that was sorted and identified during the Fall of 1998.

The material that was analyzed was collected from Chiripa, an Formative period archaeological site in Bolivia. The site is located on the shores of Lake Titicaca. The site is best known for the presence of the its ceremonial mound structure and for the yayamama motifs that were made some of the stone carvings that were discovered by previous excavators. Because of its early date, Chiripa may have had an influence on cultures that developed later on. Previous excavations have focused on the excavations of the main mound which was built up successively over thousands of years by both the Formative period (1500-100 BC) Chiripeños and by the Tiwanaku empire(100BC to AD1000). The work that is currently being conducted at Chiripa has focused on the Formative period habitation of the site. The material that I have been studying dates to the Early (1500-

Locus 2034 consists of an ashy cobble filled midden. This locus also dates to the Late Chiripa. The loci that lie beneath locus 2034 also date to the Late Chiripa. Six bulk flotation samples were also extracted from this locus.

Event D136- High density primary midden

Locus 2035 consists of the lower level of the midden that was described for locus 2034. In addition to the midden, a yellow surface appears. M. Bandy believes that the yellow surface is associated with a House G occupation. Only one flotation sample was extracted from this layer.

Event D137-High density primary midden

A mixture of plaster and adobe fragments was found in this locus. This layer also contains part of the midden that was first excavated in locus 2033. One flotation sample was extracted from this locus.

Event D138- High density primary midden

M. Bandy states that locus 2037 consists of a series of four types of lenses. The first type of lense consists of a green layer with low densities of ceramics and bones. The second type of lense consists of a charcoal dense layer. It may represent a burning event. The third type of lense consists of a yellow layer with straw impressions. The last series of lenses appear to be "molted, midden-like layers"[1].

Monticulo 1

[1] The information for these descriptions was obtained from Matthew Bandy's field notes that were taken during the 1998 Taraco Archaeological Project in Chiripa Bolivia

These events were relatively dated to the Early Chiripa phase. Locus 2298 contains a medium-density midden. Two bulk flotation samples were extracted from locus 2298 along with a scatter flot sample. One bulk and one scatter sample were extracted from locus 2299.

D 169- midden with charcoal

Locus 2375 dates to the Early Chiripa phase. A midden pit was dug into the sterile soil beneath. The material in the midden contains the same type of material that has been excavated in loci 2299, 2298, and 2297. These middens contained charcoal and ash deposits.

Choquehuanca

Choquehuanca appears to have been a semi-subterranean enclosure. The perimeter of the structure and the floor of the structure were excavated during the 1998 field season. The 34 flotation samples that I have analyzed were taken from the excavations that were conducted around the area of the floor.

Micromorphological analysis indicate that Choquehuanca's stratigraphy consisted of fill a floor over another layer of fill. Beneath these layers lie sterile soil. Event B10 appears to be a dumping event. Beneath B10, lies B141. This layer consists of a yellow non-organic mineral. The material is not uniformly distributed and appears to be more like a covering than a surface. A dung rich , lake food rich layer lies beneath the yellow layer. This layer (B150) appears to have been exposed periodically. It may have been a compacted surface.

deposited in a plastic bag. The plastic bags are then individually weighed and labeled with the provenience information. These samples are then sent back to U.C. Berkeley for sorting and analysis.

In the lab the light fractions are sorted by several URAP students. They are asked to remove carbonized fragments and other artifacts from each sample. Flotation number, locus, area and other provenience information is recorded on a flotation form. Once all the information has been recorded, a person can begin the sorting process. The sample is first put through a sieve where it is split into four size categories: >2.00mm, >1.18mm. >0.5mm and <0.5mm. Different types of materials have to be removed from each of these categories. Bone, tubers, seeds, dung, wood and scales are removed from the greater that >2.00mm sample. As the material is being removed from the sample each type of artifact is placed in a gel capsule for storage. Each capsule is labeled with the flotation number, locus number, artifact size and the type of artifact that the capsule holds. The wood and tubers are counted and weighed and this information is recorded on the flotation form. The artifacts that are removed are marked as being present on the flotation form. Except for scales, the same material that was extracted from the >2.00mm sample is also extracted from the >1.18mm sample.

The sorting continues with the >0.5mm sample. Seeds, tuberous material, and bone are removed from the sample. Each type of seed species or genus is deposited in a gelatin capsule. Seeds in this size category are very diverse and a student has to be able to identify as many as possible. Fortunately as student can ask Professor Hastorf or one of the graduate students for help. Of the many species of seeds that are found in the samples

Once the data has been entered into the computer a variety of statistical methods can be used. I only used two. The first one was density. I found densities by dividing the number of seeds of pieces of wood by the volume of the presoaked flotation sample. In this case the volume for each of the sample in my study was 10 liters. The other method is described by Popper (1988:60-64). A percentage for each species is obtained when you divide how many times a species is present by the total number of samples. With the data that I obtained using these methods, I generated a series of bar graphs for each event in each area.

Discussion

Monticulo 1

I created a series of bar graphs for fuel and plotted them according to their corresponding event. Wood and dung were categorized as fuel. The earliest event, D169 had a ubiquity rate of 100 percent and a density of 10.7 (Figure 2). No dung was found in one flotation sample that I sorted. The analysis of just one sample tends not to be representative of the whole event. D169/D168 is nearly identical to D169. The density of wood is slightly higher in D169/D168 than it is in D169. Dung appears in D168. 167, and 166. Wood appears in all of the samples that were analyzed in these three events as does dung. Density for dung is around 1 for the three events. Densities for fuel appear to be much higher. The density of wood for D166 is around 9.9. It appears that the use of dung appears late in the Early Chiripa phase. The presence of dung in the Middle and Late Chiripa phases may indicate that there may have been a depletion of wood sources in the area and dung could have taken the place of the wood that had been depleted.

Rubus. The only difference between these two areas lies in the density of tubers. Tubers at Choquehuanca are sparse while those of Monticulo 2 are more dense. Densities for the rarer taxa are low in both cases (figure 6).

In terms of fuel presence, Choquehuanca differs from both Monticulo1 and 2. While there is a general increase of dung over time in these to areas, that is not the case at Choquehuanca. Dung in this area is only present at one event and it has a ubiquity rate of 13%. Could the presence of only wood indicate that it had a ceremonial use in this area? Dung appears during the same period at Monticulo 2, why doesn't appear At Choquehuanca?

Conclusion

The presence of dung remains constant through time at Monticulo 1 and 2 starting around the Middle Chiripa (figures 7-9). Dung has a ubiquity rate around 50% and a density of 1. There is very little dung at Choquehuanca. It is only found in small quantities. It has a density of .01. Its presence is virtually negligible. the densities of wood are also very low. Around .5 compared to 7 for Monticulo 1 and 3.0 for Monticulo 2. Densities of food at Choquehuanca are also low. Densities at Monticulo 2 are somewhat higher and they are the highest at Monticulo 1. The low frequency may be due to the fact that Choquehuanca was not a domestic area. The material that is present is so low that its presence in the area may be due to the fact that it was brought into the area by accident. If this is the case, it would support the idea that this space was sacred. The low presence could also be due to the context of the flotation samples. They were extracted from the floors of the structure. The inhabitants probably periodically cleaned the floor

Figure 1

Cultural Chronology at Chiripa

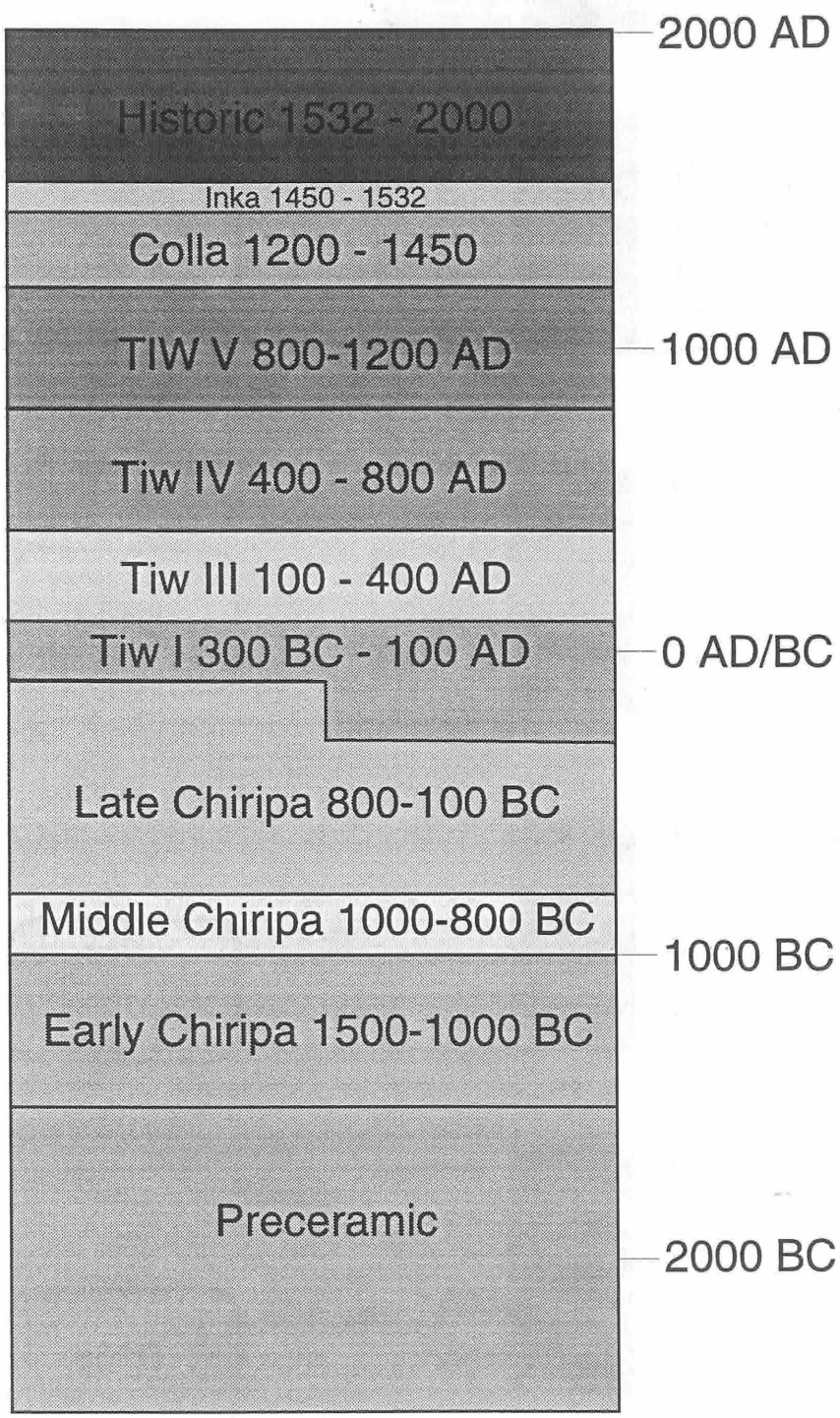

Figure 3: Monticulo 1- Food Ubiquities

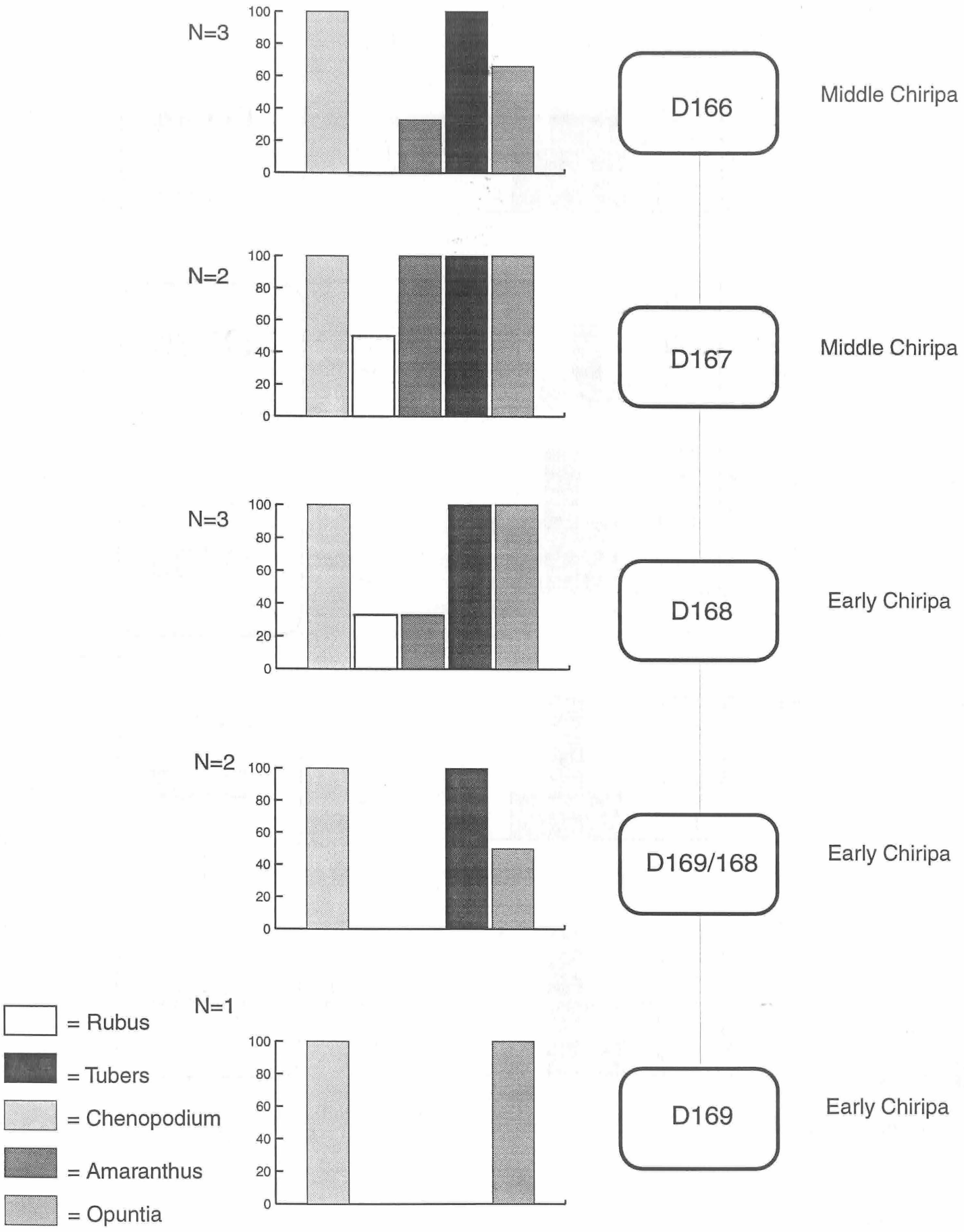

Figure 6: Choquehuanca Food Ubiquities

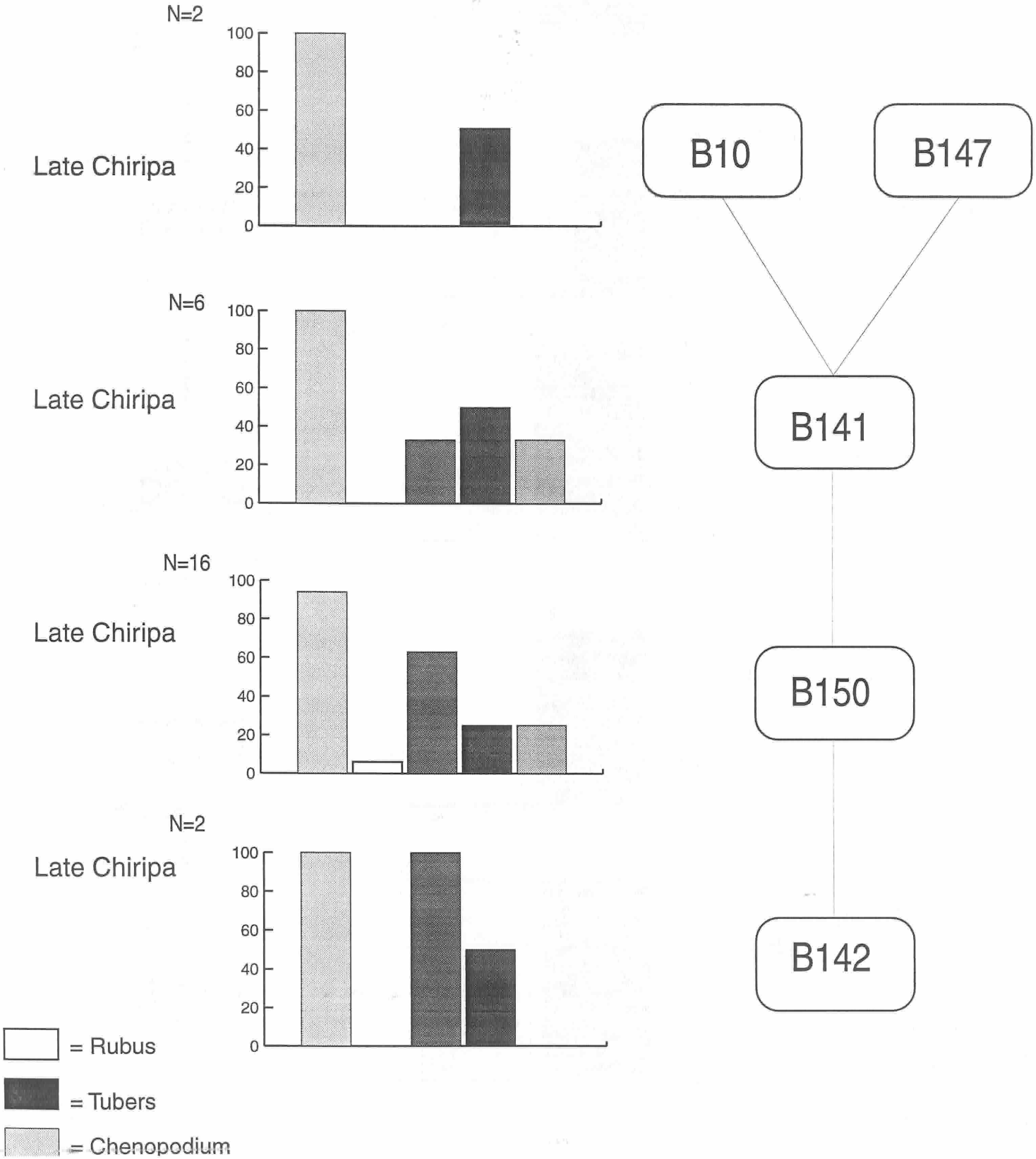

Table 1

Monticulo 2 - Ubiquities/Densities for Food

D134	**N=4**				
Chenopodium	*Rubus*	*Amaranthus*	*Tuber*	*Opuntia*	
100	50	75	75	50	**Ubiquity**
74.5	0.05	0.75	0.23	0.075	**Density**

D134/135	**N=5**				
Chenopodium	*Rubus*	*Amaranthus*	*Tuber*	*Opuntia*	
80	0	20	60	20	**Ubiquity**
55.24	0	0.18	0.94	0.02	**Density**

D136	**N=2**				
Chenopodium	*Rubus*	*Amaranthus*	*Tuber*	*Opuntia*	
100	0	50	100	50	**Ubiquity**
75.85	0	0.3	0.6	0.05	**Density**

D137	**N=3**				
Chenopodium	*Rubus*	*Amaranthus*	*Tuber*	*Opuntia*	
100	0	33	100	33	**Ubiquity**
59.3	0	0.06	1.13	0.03	**Density**

D138	**N=2**				
Chenopodium	*Rubus*	*Amaranthus*	*Tuber*	*Opuntia*	
100	50	50	100	0	**Ubiquity**
25.15	0.05	0.2	0.9	0	**Density**

Ubiquities/Densities for Fuel

D134	**N=4**	
Wood	Dung	
100	50	**Ubiquity**
9.63	0.4	**Density**

D135/136	**N=5**	
Wood	Dung	
80	40	**Ubiquity**
1.92	0.14	**Density**

D136	**N=2**	
Wood	Dung	
100	50	**Ubiquity**
2.4	0.1	**Density**

D137	**N=3**	
Wood	Dung	
100	0	**Ubiquity**
2.6	0	**Density**

D138	**N=2**	
Wood	Dung	
100	100	**Ubiquity**

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