

THE FLORAL REMAINS

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A preliminary analysis of some of the floral remains from Kom el-Hisn has been published elsewhere by Moens and Wetterstrom (in press). The vast majority of flotation samples have yet to be analyzed, however.

In this chapter, some preliminary findings are reviewed, and some tabulations and summary statistics are presented. To date our analyses have focused on charred plant macrofossils floated from sediment samples, but we also hope to complete analyses of pollen and phytolith samples and to present these studies in our final report.

Introduction

The importance of floral analyses in our general research design is substantial. Our reconstructions of the composition of the community at Kom el-Hisn (Chapter ^I~~One~~) specify alternative economic bases, whose reflections in the floral remains found at Kom el-Hisn may be somewhat different; we also expect that the floral remains will tell us a great deal about the local environment at Kom el-Hisn.

Geological studies (see Chapter ^{VIII}~~One~~) indicate that the ~~landscape~~ ^{landscape} in the western Delta ^{in the} in the Old Kingdom ~~period~~ ^{period} was much like it is today, with a high water table, deep alluvial sediments, and

lush vegetation. The courses of the Nile branches in this area and the coastline itself may have been somewhat different, but the general environment would have been quite similar to what it is today. The plant and animal species ~~of the Old Kingdom Period~~ differed in some respects from ^{later} later periods, since many new species of flora and fauna were introduced in ~~the~~ late Pharaonic and in succeeding centuries.

If we rely mainly on water-flotation of charred plant macrofossils for evidence about the flora of ancient Kom el-Hisn, we cannot expect a complete inventory of local environments. Not all plants can be expected to ^{have been?} be burned in these ancient economies with sufficient regularity that all species will be represented. What we can expect to see in flotation samples are, obviously, the remains mainly of plants used for fuels and for food.

Methods - ^{Ch. 9}

We collected a flotation sample from each of our basic excavation units, or "SUs." As discussed in Chapter ^{II} Two, these SUs were defined and differentiated on the basis of both cultural and natural stratigraphy, in that each SU was intended to represent a unique depositional event: that is, the excavator defined a new SU each time he or she noticed a change in the nature of the sediments being removed. Thus, for example, in any given excavation unit, ^a a mudbrick wall may have been one SU, while various levels of "floors" associated with these walls would have been other SUs, as would layers of "wall-fall" on these floors, ^{or} and finely laminated layers of water-laid clays at the bottom of pits dug into the debris laying on top of these walls.

In short, the tabulation of floral remains by SU provides a

data set that must be interpreted with the aid of stratigraphic evidence and other data. The floral remains in an SU representing the mortar of a mudbrick wall and the bricks themselves can be compared to the floral remains in successive "floors" associated with these walls, but this may not be a particularly meaningful comparison, if one is trying to estimate changes over time in the economy of the community. Thus, statistical inferences about the use of plants at Kom el-Hisn will be a complicated procedure in which the kinds and relative frequencies of floral remains are scaled to the volumes and depositional characteristics of the individual SU.

At present our analyses of the flotation samples and our understanding of the stratigraphic relations of the SUs are inadequate for extensive statistical analysis. Thus our discussion here is mainly descriptive and speculative.

About 3 to 4 liters of sediments were collected from each SU (smaller amounts from smaller SU) and were air-dried for several days prior to processing. When dry they were weighed, ~~and then~~ gently poured into a bucket of water, ~~then~~ stirred, and allowed to settle for several minutes. The flotage was then decanted into a sieve lined with fine cloth. The cloth was ~~then~~ folded over the sample and set to dry for several days. When entirely dry the flotage was gently brushed from the cloth into small plastic boxes. These samples were then identified at Harvard University's Botanical Museum. Each sample was scanned under a binocular microscope, and plant parts ^{separated} separated from other residues and then identified with the aid of reference collections and manuals (Haines and Lye 1983; Berggren 1970-1981; Martin and Barkley 1973).

Wetterstrom has collected a large reference collection to aid in these identifications, and these collections will be augmented in future seasons at Kom el-Hisn.

Results — *copy*

Nearly 20,000 carbonized seeds and other plant parts have been recovered from the samples analyzed to date (Figure X), but only approximately 5% of the samples have been analyzed. The costs of identification are such ^{that} ~~they~~ we can hope to identify only a small proportion of the SU.

Almost all of the remains identified belong to one of four categories: cereal straw, field weeds, reeds and sedges, and fodder plants. The proportions represented by each of these categories are given in Figure X.

Approximately 44% of the identified remains are cereal straw and field weeds, both of which probably are the residues of grain processing. The straw consists mainly of dense tough fragments of cereal spikes, which comprise glume bases and rachises of, mainly, emmer wheat. These components of the cereal head are usually separated from the grains during winnowing, after the grain has been threshed (Hillman 1984:19-26). The weed seeds are probably so numerous in these samples because they grow in the cereal fields and are harvested along with the crops. Darnel, one of the most abundant species in our samples, grows almost exclusively in cultivated fields, and two other common weeds in these samples—*Scorpiurus* and canary grass (*Phalaris*)—are common invaders of Egyptian grain fields. Mayweed and vetching ^{may} ~~are~~ also have been harvested along with grain crops, as some species of these plants are common in cultivated fields. Specimens of all these species of weeds were found in grain offerings in Djoser's

tomb at Saqqara, indicating perhaps that they were common contaminants of stores of harvested cereals (Lauer, Laurent-Tacholm, and Aberg 1951). Darnel, canary ~~grass~~, grass, mayweed, and Scorpiurus were also found among crop-processing debris in two Middle Kingdom tombs at Abusir (Schweinfurth 1908).

Reeds and sedges, which represent about 24% of the Kom el-Hisn samples, are common in wet habitats and almost certainly have been part of the Delta's natural vegetation since long before human habitation there.

Fodder plants comprise about 27% of the identified remains. Clover, vetch, and medick are commonly grown ^{as} as livestock fodder (Lahaye et al. 1946:197-210; Duke 1981:148-152, 234-268, 271-286); the weeds mustard and dock are regarded ~~and used~~ as good forage (Miller 1984); dock, knotweed, and mallow invade both clover and wheat fields.

In general, the species of plants in the Kom el-Hisn samples are entirely what one would expect from a site of this period, but the proportions of species ~~is~~ somewhat different from both the expected distribution and from collections ~~from~~ other archaeological sites. The fodder plants, in particular, occur in the Kom el-Hisn samples with much greater frequency than they do, for example, ~~at~~ the Predynastic community at Nagada (Wetterstrom in press; Hassan 1984:13-15). A comparison of the remains from these two sites is presented in Figures x and y.

Figures x and y are somewhat premature attempts to establish patterns of spatial co-occurrence of classes of plant remains. In Figure x the frequencies of floral remains for the 41 SUs have

been converted to presence/absence (0 = absent, anything greater than 1 = present), and then a similarity matrix of Phi-squared coefficients (SPSS) was calculated and subjected to a non-metric multidimensional scaling analysis (the principles of which are discussed in Chapter ^{III}_A). The resulting plot (Figure x) of these taxa in a transformed two-dimensional space can be interpreted as a cluster analysis, in the sense that taxa located close together are more similar in terms of their presences and absences in the different SUs than those that are far apart. The two dimensions on which these taxa are scaled are abstractions that may or may not relate to some fundamental kind of variability. With additional data and stratigraphic analyses ^g~~with~~ these kinds of multidimensional analyses may be quite informative as to the factors that produced the spatial clustering of these taxa.

In Figure y, a similar form of multidimensional analysis was done, but in this case the units being scaled ^w~~are~~ the excavation units themselves. It is interesting that the SUs from the only Middle Kingdom deposits in these samples ^g~~from~~ (12615-1074E) are distinctive, even though they contain the same basic kinds of plants. Here too only additional data and other evidence will determine whether these apparent patterns have significance.

ANALYSIS

The floral remains identified in the Kom el-Hish samples are probably best understood as the remains from domestic cooking in which cattle dung was the principal fuel.

This interpretation would account not only for the high proportion of the fodder species in these samples but also for the relative scarcity of large fragments of wood charcoal.

Ethnographic evidence in support of this interpretation has been provided by Miller (1984) and Bottema (1984), among others. Miller analyzed hearth debris from contemporary villages in southwestern Iran and found that sheep, goat, and cattle dung is commonly used for fuel and that it is laden with seeds that pass through the ovine, caprine, and bovine gut relatively unscathed. In addition, Miller noted that floral remains can be deposited in hearths in the form of food that is spat into the fire, in debris from grain cleaning that is intentionally discarded in the hearth, from cooking accidents, and from ^dseeds blown or dropped into the fire. Bottema (1984), in a study of Turkish villages, found similar patterns of deposition of plants ^gremains and observed that plant parts in sheep dung appeared to be a major source of charred floral remains in hearths.

In contemporary Egyptian villages, women and children mix chopped straw with cattle and bird dung and then form the mixture into cakes, which are then dried in the sun and stored on house roofs, along with sticks and bundles of maize stalks, which are also used for fuel.

Similar fuel was recorded in commercial documents of the New Kingdom (Cerny 1955), and a store of unused fuel in the form of straw and sheep dung was found in archaeological deposits at El-Amarna (Peet and Wooley 1923: 64).

Cattle dung seems to have been the primary fuel, rather than that of sheep or goats. Both Bottema (1984) and Miller (1984) observed that sheep and goat dung preserved well in hearth fires, but few of these were found in the Kom el-Hisn samples. The high proportion of clover in the samples is probably a reflection of the wide use of this plant as a fodder, and the large numbers of

straw and other plants typically found in cereal debris could have derived either from materials fed to the cattle or from temper used in making dung cakes. Barley grains, although not a major constituent of the samples, may also reflect the use of dung cakes for fuel. Barley grains, which are often used for fodder in Egypt (Tackholm and Drar 1941: 284), far outnumber barley rachis segments in the Kom el-Hisn samples, suggesting that they served as forage directly rather than coming from winnowed cereal debris.

The reeds and sedges in the samples may have been burned directly as fuel or reflect the ~~direct~~² consumption of these plants or their use in tempering dung cakes.

The high frequency of fodder plants in the Kom el-Hisn samples is most evident in the form of clover, which represents 21% of the total remains. Egyptian clover, called Berseem, is widely grown in the Delta as a fodder crop. Although the Kom el-Hisn clover samples are somewhat smaller than modern Berseem seeds, they are virtually identical in shape. The Kom el-Hisn clover remains may have shrunk during carbonization or they may be immature specimens. The latter would be expected among fodder plants because forage is usually harvested while still in flower, because they become dry and tough after the fruit develops. At harvest time fruits and flowers of the clover plants would be at various stages of development, since the crop does not grow in perfect synchrony. Another possibility is that the Kom el-Hisn clover seeds represent an older variety whose seeds were smaller.

In addition to the high frequency of fodder plants, the Kom el-Hisn ~~plants~~^{plants} are interesting in that they contain relatively

few grasses. Wild grasses represent less than 1% of the total remains. The paucity of grass remains in the samples is remarkable because one would expect that grasses would be a part of the natural pastures of the Delta. Even on marshy ground grasses are found amidst the sedges and rushes, and cattle prefer the more tender grasses. Carex, the principal sedge in our samples, prefers moist grassy environments, and thus one might expect that the environment around Kom el-Hish would contain an abundance of grasses.

The ~~explanation of the~~ low frequency of grasses may have to do with the way in which the cattle were fed. In general, the bovine diet consists of ^{of 9} ~~4~~ forage consumed in stables, including cereals, straw, and fresh, dried, and siloed fodder plants, and ^{of 1} ~~1~~ fresh vegetation from ^{pastures} in which the cattle graze--usually in the form of grasses.

Both the abundance of clover seeds and the scarcity of grass seeds in the Kom el-Hish samples would be expected if the cattle were fed in pens and stables rather than allowed to range freely in the area of the site.

Although such a labor-intensive method of raising cattle may seem unlikely, it may have been necessary during the period of the annual inundation, when floods would have covered at least some of the areas around Kom el-Hish. But, given that at least 89% of the year these areas were not inundated, plant materials reflecting free-ranging cattle would be expected in at least some of our samples.

An alternative possibility is that the dung cakes were made only during a certain period of the year, when the cattle were penned.

Ancient Egyptian texts and pictures offer some indications that cattle were commonly penned and fed throughout the year. The two names most frequently used to define cattle are iw3 and ng(3) (Montet 1925; Ghoneim 1977). The iw3-cattle, often denoted as stable cattle (iw3-mdt) (ibid), were kept in stables where they were fattened for slaughter. The thinner ng(3)-cattle were used in agricultural labor and herded to fields and pastures to graze. They ^{for} were eventually slaughtered, but for sacrificial offerings the iw3-cattle were much preferred (ibid.). These cattle, like sacrificial animals in many societies, received special care. As often depicted in ancient Egyptian representations and wooden models, fattened cattle and fattened calves were reared with chopped plants and other special foods on a year-round basis. Old Kingdom representations show them being hand-fed with cereals (Lepsius 1849-1858: Bl. 62), cereal stalks, straw and cut fodder ^{up} (1900 Pl. XXI, 1936: 117; Duell 1938 pl. 152-153; Wild 1953 pl. CXXIV; cf. Simpson 1976: 9), and a kind of cake or bread (Davies ; Erman 1919: 31; W). In *Old Kingdom* offering scenes ~~of this period~~ cattle are led by men carrying bunches of cut vegetation (Lepsius 1849-1858: Bl. 69-70; Wild 1966 pl. 18).

The fattened cattle, or iw3-cattle, then, may offer a model of the kind of cattle raised at Kom el-Hisn.

? And taking the Egyptological evidence as a whole, there are many indications that settlements like Kom el-Hisn were centers of cattle production. Sekhat-Hor, who was worshiped at Kom el-Hisn, was conceived of as [?] a goddess whose duties included the care of cattle. Represented as a nursing cow, Sekhat-Hor was thought to look after the ~~the~~ rearing of calves and the

production of milk. According to Middle Kingdom inscriptions found at Kom el-Hisn, the cow-goddess Hathor was the principal deity of the settlement at that time (Schweinfurth 1908: 154-157). ¹⁴¹ Remains of her temple, dating to the ~~Nineteenth~~ ^{22nd} and ~~Twenty-second~~ ^{23rd} Dynasties, were found at the site (Porter and Moss ¹⁹³⁴ IV: 51), and some evidence for the Hathor cult at Kom el-Hisn in the 5th Dynasty has been found (Zibelius ^{date} 35:).

Indeed, the entire region of Kom el-Hisn was, as noted in ^{Chapter I,} ~~the first chapter of this report,~~ associated with cattle from the earliest times. The site lies in the IIIrd nome, which Egyptian texts list as the locale of Hwt-ihwt, or "Estate of the Cattle." The exact area of the Estate of the Cattle is not known, but it was apparently one the oldest state foundations in Egypt. ¹⁴² A seal inscription found in the tomb of Queen Merneith at Abydos, dating to about 3000 B.C., refers to the Estate of the Cattle, as do impressions on jar lids in Tomb 6 at Abu Roash from the reign of King Den (ca. 2950 B.C.).

~~In fact,~~ ^{in fact} it is entirely possible that cattle-raising was an important part of the economy of the area of Kom el-Hisn as early as the Predynastic period. A First Dynasty palette in the ^{Egyptian} ~~Gairo~~ Museum shows cattle, donkeys, sheep, and trees from T3-thrw, the ancient Egyptian name for Libya (Corteggiani 1979: 26-29), representing them as war tribute.

UNIT	B A R L E Y	B A R L E Y	E M E R	E M E R	P H A L L A R I S	L O L I U M	T A I F O L I U M	P H R O M I T E	V I C I A	F I N I S T	R U M E	C H E M O P O D	S H A D I C A	C A R E	C Y P R A G E	C A R Y O P H Y	C Y P R E R U S	S C I R P U S	A N T H E R I S	L A P P U L A	G O O P E R S	M A I V A
1184-0902	0	0	1	0	2	10	8	14	0	0	0	1	0	0	0	0	0	0	1	0	0	0
1184-0903	0	1	0	12	8	25	37	14	0	0	0	1	0	0	0	0	0	0	1	0	0	0
1184-0904	0	0	0	0	1	13	3	10	0	0	0	0	0	0	0	0	0	0	0	0	0	
1184-0905	0	1	0	0	8	37	42	21	0	0	0	0	0	0	0	0	0	0	1	0	0	
1184-0906	0	0	0	0	12	11	18	15	1	0	0	0	0	0	0	0	0	0	1	0	0	
1184-0907	3	2	0	18	14	36	56	22	3	0	0	0	0	0	0	0	0	0	1	0	0	
1184-0908	0	0	0	13	9	22	47	22	0	0	0	0	0	0	0	0	0	0	1	0	0	
1184-0909	1	1	0	30	17	62	77	109	0	0	0	0	0	0	0	0	0	0	1	0	0	
1184-0910	3	0	0	9	10	24	34	12	2	0	0	0	0	0	0	0	0	0	1	0	0	
1184-0911	1	1	0	0	5	4	5	7	0	0	0	0	0	0	0	0	0	0	1	0	0	
1184-0912	0	0	0	4	4	8	14	7	2	0	0	0	0	0	0	0	0	0	1	0	0	
1184-0913	0	2	0	31	6	36	29	5	4	0	0	0	0	0	0	0	0	0	1	0	0	
1184-0914	0	1	0	8	4	22	19	13	4	1	2	0	0	0	0	0	0	0	1	0	0	
1184-0915	3	1	0	217	17	11	123	15	12	0	0	0	0	0	0	0	0	0	1	0	0	
1184-0916	0	0	0	0	10	42	18	36	1	0	0	0	0	0	0	0	0	0	1	0	0	
1263-4806	0	0	0	24	1	3	15	0	1	1	12	0	0	0	0	0	0	0	1	15	1	
1263-4807	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4808	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4809	2	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4810	0	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4811	1	0	0	41	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4812	0	0	0	29	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4813	0	0	0	10	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4814	0	0	0	29	2	5	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4815	0	0	0	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4816	0	0	0	46	3	3	8	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4817	0	0	0	13	3	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4818	0	0	1	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4819	0	0	0	31	7	7	15	0	7	0	4	0	0	0	0	0	0	0	0	0	0	
1263-4820	0	0	2	13	0	4	3	0	4	0	1	0	0	0	0	0	0	0	0	0	0	
1263-4821	1	0	1	7	0	8	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4822	1	1	2	44	50	31	104	3	2	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4823	2	0	3	3	2	19	23	20	1	1	0	0	0	0	0	0	0	0	0	0	0	
1263-4824	1	0	0	21	4	4	5	3	1	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4825	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4826	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
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1263-4831	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
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1263-4838	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4839	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4840	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4841	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4842	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4843	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4844	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4845	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4846	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4847	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4848	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4849	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4850	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4851	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4852	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4853	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4854	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4855	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4856	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4857	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4858	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4859	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4860	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4861	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4862	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4863	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4864	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4865	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4866	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4867	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4868	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4869	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4870	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4871	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1263-4872	0	0	0																			

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UNIT	P A R A L L E Y C	S A R A L L E Y H	E H M E R R	E H M E R R	H A L A R I S	L I D L I U M	T R I D O L I U M	P H R O M I T E	V I C I A	F I M E R I S	R U M E T	C H E N O P O D	B R A G S I C A	C A R P	C Y P R E R A C E	C A R Y O P H Y	S C I R P U S	A N T H E R I S	L A P P U L A	N A L V	
1104-3502	0	0	1	0	1	1	1	1	0	0	1	0	1	0	0	0	0	1	1	0	0
1104-3503	0	1	0	1	1	1	1	1	0	0	0	1	1	1	0	0	0	1	1	0	0
1104-3504	0	0	0	0	1	1	1	1	0	0	0	1	0	1	0	0	0	1	1	0	0
1104-3505	0	1	0	1	1	1	1	1	0	0	0	0	0	1	0	0	1	1	0	0	0
1104-3506	0	0	0	1	1	1	1	1	1	0	0	0	1	1	0	1	0	1	1	1	1
1104-3507	0	1	0	1	1	1	1	1	1	0	0	0	1	1	0	0	1	1	1	1	1
1104-3508	1	1	0	1	1	1	1	1	1	0	0	0	0	1	0	0	0	1	1	1	1
1104-3510	1	0	0	1	1	1	1	1	1	0	1	1	0	1	0	0	0	1	1	1	1
1104-3511	1	1	0	0	1	1	1	1	1	0	0	0	0	1	0	0	1	1	0	0	0
1104-3512	1	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	1
1104-3513	0	1	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	1	0	0	0
1104-3514	0	1	0	1	1	1	1	1	1	1	1	0	0	1	0	0	1	1	0	0	0
1104-3515	1	1	0	1	1	1	1	1	1	0	0	1	0	1	0	0	1	1	1	1	1
1104-3516	0	0	0	1	1	1	1	1	1	0	1	0	1	1	0	0	1	1	1	1	1
1104-3517	0	0	0	1	1	1	1	1	1	1	1	0	0	1	0	0	1	1	0	1	1
1104-3518	1	0	0	0	1	0	1	0	1	0	1	0	1	1	0	0	0	0	0	0	0
1104-3519	1	0	0	0	1	0	1	0	1	0	1	0	1	1	0	0	0	0	0	0	0
1104-3520	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0
1104-3521	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0
1104-3522	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0
1104-3523	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0
1104-3524	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0
1104-3525	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0
1104-3526	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0
1104-3527	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0
1104-3528	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0
1104-3529	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0
1104-3530	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0
1104-3531	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0
1104-3532	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0
1104-3533	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0
1104-3534	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0
1104-3535	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0
1104-3536	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0
1104-3537	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0
1104-3538	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0
1104-3539	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0
1104-3540	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0
1104-3541	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0
1104-3542	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0
1104-3543	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0
1104-3544	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0
1104-3545	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0
1104-3546	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0
1104-3547	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0
1104-3548	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0
1104-3549	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0
1104-3550	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0

NUMBER OF CASES READ = 41 NUMBER OF CASES LISTED = 41