Chapter 23: Archaeobotanical Report

by

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§ 23.1 Methodology

The ancient plants from Kissonerga have been preserved by charring. These were recovered using the flotation process which, by the use of water, separates organic material from soil deposits collected during excavation. Sieves with 1 mm and 250 micron mesh were used to collect the plant remains. The volume of the deposits ranged up to 496 litres, although 50 litres was considered a minimum sample volume in most cases (and unless the context was smaller). In total 10,881 litres of soil were floated from 370 samples, 306 of these contained ancient plant remains and all calculations are based on the latter figure. Tables 23.5-23.8 give the number of samples, the volume of soil in litres, context type and other relevant sample information by period.

The plant samples (or flots) were analysed under a low power binocular microscope (10x to 65x) and a scanning electron microscope (SEM) was used for higher magnification. All items, such as the seeds and chaff of cereals, legumes, fruits, nuts, wild/weed taxa, possible root/tuber tissue and wood charcoal were extracted from each sample. Samples 100-261 were analysed by Drs. Sue Colledge and Mike Charles from 1983 to 1986. Identifications of plant taxa were made on the basis of morphological characteristics and the comparison of the ancient specimens with modern comparative reference material. The Near Eastern reference collection of Gordon Hillman at the Institute of Archaeology, London was most helpful in this regard. Drs. Jon Hather and Anne Butler of the Institute of Archaeology, London, helped identify certain specimens of roots and tubers, and members of the Leguminosae family, respectively. A total of 28,536 identifiable plant remains were recovered. A portion of the wood charcoal from the samples, as well as other charcoals from the site were also analysed (see § 27).

All but six of the samples were sorted in their entirety. These were too large to justify the time needed for their completion and were subsampled so only one half of their contents were studied. Subsampling was carried out using a riffle box which splits the large flot into smaller, more manageable equivalent fractions. The taxa from these samples were then multiplied by two to give a statistically representative count.

The heavy fraction of the sample is the remainder of the soil sample that does not float and remains within a 1 mm mesh inside the flotation machine. This primarily consists of gravel as well as the remains of bone, teeth, chipped stone, pottery, and other artefacts. Nearly 100% of the heavy fraction material (1,415 litres) was sorted through to recover these items. (See § 11 for further methodological procedures).

§ 23.2 The presentation of data

In the lists of taxa (Tables 23.1 and 23.2), cereals and other economic plants are listed first while all other taxa follow the order and nomenclature of the *Flora of Cyprus* (Meikle 1977, 1985). The seed of the plant is always referred to in this table unless otherwise stated. The counts for each item in Table 23.2 represent the number of whole seeds in each sample, plus the number of equivalent whole seeds which is carefully estimated from the fragments of each taxa. Since a certain amount of archaeobotanical material is always fragmentary, the whole grain equivalent (WGE) serves as a consistent quantification of these partial seeds. For example, the grass species *Lolium* is abundant in the Kissonerga samples though many of the remains are fragmented. Simply listing the counts of the fragments gives no estimation of the true numbers of whole items represented. Therefore, to attain a close equivalent of the whole grains represented by the fragments, the average weight (in mg) is determined for a single *Lolium* seed. This is achieved by using a digital scale which reads to the nearest two decimal places and by weighing several batches of 10 *Lolium* seeds each, then dividing by 10 to determine the average weight of a single specimen. The broken *Lolium* seeds from the various samples are then weighed. This result is then converted to the equivalent number of whole grains present for the species in that sample. Thus, it is believed that a final single number for each item, which is the sum of the actual whole grains present plus the estimated whole grain equivalent, is the truest representation of the material.

For certain categories which have no single species to be equated to, such as ‘Graminae indeterminate’ (unidentifiable wild grass), a single equivalent species was chosen. In this case, fragments of undetermined grass taxa were equated with the average weight of *Lolium*, a known grass taxa. Likewise, items in ‘Cereal indeterminate’ were quantified using the average weight of a mixture of wheats and barley comparable to

the proportions found in the range of the Kissonerga samples. Similarly, 'Vesicular indeterminate' remains which have been subjected to very high temperatures have a characteristic hollowed texture, and have been given a whole grain equivalent comparable to the known averages of 'Cereal indeterminate' since most of the vesicular material appears to be from either cereal or grass remains.

On the list of taxa (Table 23.2), spikelet forks and glume bases from the glume wheats (*Triticum monococcum* and *T. dicoccum*) were treated as single units. In the calculations, however, the number of spikelet forks was divided by two since glume bases represent one half of a spikelet fork. The rachis fragments of barley and free threshing wheats were counted by each internode present. Certain plants were designated as species types, (for example *Valerianella dentata* type). This means that the seed most closely resembles this species but that not every other species of the genus could be checked to verify this. The abbreviation cf. means 'compares with' and denotes that a specimen most closely resembles that particular taxa more than any other. Those taxa identified with cf. were not included in the calculations of presence analysis. In most samples there were completely indeterminate fragments; these are indicated by an x on the list of taxa.

Two main types of archaeobotanical analysis were applied to the Kissonerga plant assemblage. Firstly, the relative density of plant items in the samples was measured by the average items per litre of soil deposit. This figure is a useful indicator of the relative 'richness' of samples when compared by area and context type and it is used to even out inequalities in sample size and depositional history. The second analysis is a determination of the presence (or ubiquity) of a species which is quantified by the number of samples in which it occurs. Table 23.1 shows the presence of selected taxa by period and area of site while Table 23.2 shows the presence of all taxa from Kissonerga by period. This method is a more reliable measure of the relative proportions of taxa than a simple count of items since, due to the effects of plant characteristics, processing, charring, disposal, deposition and recovery, it is impossible to assume that the absolute numbers of seeds accurately reflect the original proportions (or indeed the relative importance) of any plant taxa on a settlement in antiquity.

Tables 23.1 and 23.2 appear here before the discussion of the plant remains.

Tables 23.3 to 23.11 are only referred to in § 11 and are presented at the end of this chapter. As are Tables 23.12 and 23.13 which provide the measurements for the economic and wild/weed taxa described below.

§ 23.3 The plant remains

Table 23.1 shows the presence of the following economic taxa (i.e. - the percentage of samples in which the taxa is found) for each period. Poor preservation, distortion and fragmentation often hindered identification of certain taxa, particularly cereal grains and some members of the Leguminosae family. For a further archaeobotanical discussion of many of the economic species discussed here also see Zohany and Hopf 1993; Murray in press a and b).

Table 23.1. Presence of selected flora taxa by period and location

Period	*2*	*3A*	*3B*	*4*	*Upper Terrace*	*Main Area*
Total sample	*16*	*24*	*55*	*150*	*34*	*272*
cf. Triticum monococcum	1 (6%)	--	1 (2%)	1 (0.7%)	2 (6%)	4 (1%)
Triticum dicoccum	4 (25%)	4 (17%)	1 (2%)	2 (1%)	7 (21%)	7 (3%)
Triticum monococcum/T. dicoccum	7 (44%)	1 (4%)	2 (4%)	1 (0.7%)	4 (12%)	10 (4%)
Triticum durum /T. aestivum	6 (37%)	13 (9%)	5 (9%)	11 (7%)	15 (44%)	27 (10%)
Hordeum sativum	11 (69%)	15 (62%)	16 (29%)	25 (17%)	22 (65%)	65 (24%)
Cereal indeterminate	11 (69%)	12 (50%)	14 (25%)	30 (20%)	20 (59%)	83 (30%)
Lens sp.	13 (81%)	16 (67%)	26 (47%)	60 (40%)	26 (76%)	126 (46%)
Pisum sativum	1 (6%)	--	--	1 (0.7%)	--	5 (2%)
Cicer arietinum	--	1 (4%)	--	--	1 (3%)	--
Lathyrus sativus type	--	--	--	2 (1%)	1 (3%)	3 (1%)
Vicia spp.	1 (6%)	1 (4%)	2 (4%)	2 (1%)	1 (3%)	6 (2%)
Ficus carica	10 (62%)	20 (83%)	41 (74%)	125 (83%)	23 (68%)	222 (82%)
Vitis vinifera	5 (31%)	14 (58%)	16 (29%)	58 (39%)	15 (44%)	98 (36%)
Olea europaea	14 (87%)	7 (29%)	8 (14%)	4 (3%)	20 (59%)	37 (14%)
Pistacia cf. atlantica/terebinthus	10 (62%)	11 (46%)	18 (33%)	71 (47%)	22 (65%)	106 (39%)
Celtis sp.	2 (12%)	--	1 (2%)	1 (0.7%)	2 (6%)	2 (0.7%)
Juniperus sp.	1 (6%)	--	--	--	--	1 (0.3%)
Linum usitatissimum	1 (6%)	--	1 (2%)	1 (0.7%)	--	3 (1%)
Capparis spinosa	--	--	--	2 (1%)	--	2 (0.7%)
Nut shell	13 (81%)	8 (33%)	8 (14%)	27 (18%)	19 (56%)	54 (20%)
Wild grasses	16 (100%)	23 (95%)	38 (69%)	123 (82%)	32 (94%)	216 (79%)
All leguminosae	13 (81%)	18 (75%)	23 (42%)	65 (43%)	26 (76%)	216 (79%)
Wet loving species	2 (12%)	2 (8%)	3 (5%)	42 (28%)	3 (9%)	54 (20%)

Note: Whole numbers represent the number of samples in which an item is present and the numbers in brackets represent these as a percentage of the total number of samples.

Table 23.2. Presence of all flora taxa by period*

Period *Number of samples*	*2* *16 (%)*	*3A* *24 (%)*	*3B* *55 (%)*	*4* *150 (%)*	*Other* *61 (%)*	*Total* *306 (%)*
cf. Triticum monococcum spikelet forks	1 (6)	--	1 (2)	1 (0.7)	--	3 (1)
cf. Triticum monococcum glume bases	2 (6)	--	--	--	2 (2)	4 (0.6)
Triticum monococcum/T. dicoccum	2 (6)	--	--	--	--	2 (1)
Triticum monococcum/T. dicoccum spikelet forks	4 (19)	--	1 (2)	--	--	5 (1)
Triticum monococcum/T. dicoccum glume bases	41 (37)	1 (4)	2 (4)	1 (0.7)	8 (6)	53 (5)
Triticum dicoccum	--	8 (8)	1 (2)	2 (1)	1 (2)	12 (2)
Triticum cf. dicoccum	1 (6)	2 (4)	--	--	1 (2)	4 (1)
Triticum dicoccum spikelet forks	1 (6)	1 (4)	--	--	--	2 (0.6)
Triticum dicoccum glume bases	7 (25)	--	--	--	2 (2)	9 (2)
Triticum durum/aestivum	20 (31)	87 (50)	5 (5)	14 (6)	12 (6)	138 (11)
Triticum cf. durum/T. aestivum	4 (12)	2 (8)	2 (4)	2 (1)	8 (5)	18 (4)
Triticum durum/T. aestivum rachis internodes	1 (6)	--	--	--	--	1 (3)
Triticum sp.	17 (50)	19 (29)	6 (7)	14 (7)	32 (13)	88 (12)
Hordeum sativum (twisted)	2 (12)	7 (21)	5 (5)	--	4 (3)	18 (4)
Hordeum sativum (straight)	3 (19)	12 (21)	2 (4)	6 (1)	7 (6)	30 (5)
Hordeum sativum (indet.)	36 (50)	53 (46)	18 (14)	42 (12)	49 (20)	198 (19)
Hordeum cf. sativum	28 (6)	5 (12)	3 (5)	1 (0.7)	14 (8)	51 (4)
Hordeum sativum (2 row) rachis internodes	6 (6)	9 (17)	2 (2)	1 (0.7)	4 (5)	22 (3)
Hordeum sativum (cf. 2 row) rachis internodes	--	--	2 (2)	--	1 (2)	3 (0.6)
Hordeum sativum (2 row) florets	21 (6)	--	--	1 (0.7)	--	22 (0.6)
Hordeum sativum (6 row) rachis internodes	1 (6)	2 (8)	--	--	3 (2)	6 (1)
Hordeum sativum (cf. 6 row) rachis internodes	--	2 (8)	--	--	--	2 (0.3)
Hordeum sativum rachis internodes	26 (19)	18 (12)	5 (7)	9 (5)	13 (6)	71 (7)
Cereal indeterminate	38 (69)	37 (50)	26 (25)	95 (20)	56 (31)	252 (28)
Cereal awn fragments	132 (6)	145 (29)	10 (4)	153 (9)	863 (10)	1,303 (10)
Cereal awn fragments (twisted)	3 (12)	--	3 (5)	--	1 (2)	7 (2)
Cereal culm nodes	2 (6)	11 (17)	--	4 (1)	15 (6)	32 (4)
Cereal culm bases	2 (12)	1 (4)	1 (2)	--	1 (2)	5 (2)
Lens sp.	96 (81)	172 (67)	111 (47)	221 (40)	147 (2)	747 (38)
cf. Lens sp.	--	2 (8)	1 (2)	3 (2)	3 (3)	9 (3)
Pisum sativum	7 (6)	--	--	2 (0.7)	--	9 (0.6)
cf. Pisum sativum	--	--	1 (2)	--	2 (3)	3 (1)
Cicer arietinum	--	2 (4)	--	--	--	2 (0.3)
Lathyrus sativus type	--	--	--	2 (1)	11 (2)	13 (1)
cf. Lathyrus sativus type	--	--	--	--	1 (2)	1 (0.3)
Ficus carica	468 (62)	3,475 (83)	663 (74)	4,750 (83)	1,290 (77)	10,651 (79)
Ficus carica fruit fragments	6 (6)	141 (29)	5 (5)	11 (1)	99 (10)	262 (6)
Vitis vinifera	3 (19)	25 (46)	13 (20)	102 (33)	30 (26)	173 (30)
cf. Vitis vinifera	--	1 (4)	1 (2)	5 (3)	--	7 (2)
Vitis vinifera fruit fragments	--	5 (8)	--	5 (2)	13 (2)	23 (2)
cf. Vitis vinifera fruit fragments	--	10 (8)	50 (5)	3 (2)	1 (2)	64 (3)
Vitis vinifera stem	10 (19)	23 (33)	15 (13)	28 (11)	14 (11)	90 (14)
Olea europaea	24 (87)	8 (29)	9 (14)	5 (3)	19 (21)	65 (15)
cf. Olea europaea	--	2 (8)	1 (2)	5 (3)	3 (5)	11 (4)
Pistacia cf. atlantica/terebinthus	13 (37)	6 (8)	15 (13)	44 (19)	25 (13)	103 (17)
Pistacia sp.	9 (31)	4 (8)	3 (4)	35 (17)	12 (8)	63 (12)
cf. Pistacia sp.	4 (25)	11 (56)	15 (22)	34 (22)	11 (16)	75 (22)
Celtis sp.	5 (12)	--	1 (2)	1 (0.7)	--	7 (1)
Juniperus sp.	1 (6)	--	--	--	--	1 (1)
Linum usitatissimum	1 (6)	--	1 (2)	1 (0.7)	--	3 (1)
Capparis spinosa	--	--	--	2 (0.7)	--	2 (0.3)
Wild/weed species	*2*	*3A*	*3B*	*4*	*Other*	*Total*
Adonis sp.	--	--	--	7 (4)	2 (2)	9 (3)
Delphinium/Consolida sp.	--	--	--	--	2 (2)	2 (0.3)
PAPAVERACEAE	3 (6)	1 (6)	--	1 (0.7)	--	5 (1)
Fumaria cf. densiflora type	12 (31)	16 (25)	24 (22)	21 (12)	16 (8)	89 (7)
Fumaria sp. (Type A)	19 (6)	--	--	--	--	19 (0.3)
cf. Brassica sp.	--	--	--	1 (0.7)	--	1 (0.3)
Neslia cf. paniculata type	--	2 (8)	2 (4)	9 (6)	3 (3)	16 (5)
cf. Sisymbrium sp.	--	--	--	1 (0.7)	--	1 (0.3)
CRUCIFERAE	--	1 (4)	2 (4)	1 (0.7)	1 (2)	5 (2)
cf. CRUCIFERAE	2 (6)	2 (4)	--	1 (0.7)	3 (3)	8 (2)
cf. Cleome type	25 (6)	--	--	2 (0.7)	--	27 (1)
cf. Spergula sp.	12 (25)	2 (4)	2 (4)	6 (4)	3 (3)	25 (5)
CARYOPHYLLACEAE	--	--	--	4 (1)	--	4 (1)
Malva sp.	153 (87)	15 (33)	19 (16)	51 (13)	41 (29)	279 (22)
cf. Trigonella type	--	7 (17)	5 (9)	1 (0.7)	8 (6)	21 (5)

Medicago sp.	--	--	1 (2)	2 (1)	--	3 (1)
Medicago sp. pod fragments	2 (6)	3 (4)	2 (2)	10 (2)	1 (2)	18 (3)
Trifoliae tribe	37 (37)	37 (50)	11 (16)	13 (7)	28 (18)	126 (16)
Scorpiurus muricatus	8 (31)	12 (21)	--	1 (0.7)	3 (3)	24 (4)
Coronilla cf. scorpioides	--	2 (4)	--	4 (0.7)	3 (3)	9 (1)
cf. Onobrychis pod fragments	1 (6)	--	1 (2)	18 (3)	5 (3)	25 (3)
Vicia sp.	1 (6)	1 (4)	3 (4)	3 (0.7)	4 (3)	12 (2)
cf. Vicia sp.	--	--	--	2 (0.7)	--	2 (0.3)
Lathyrus sp.	2 (6)	--	--	7 (1)	--	9 (1)
cf. Lathyrus sp.	--	1 (4)	--	--	--	1 (0.3)
Vicia/Lathyrus spp	57 (56)	66 (54)	27 (14)	83 (21)	89 (18)	322 (24)
cf. Vicia/Lathyrus spp.	3 (6)	--	2 (2)	--	3 (3)	8 (1)
Legumes in pod	--	--	--	4 (2)	--	4 (1)
Small LEGUMINOSAE	6 (12)	58 (29)	10 (11)	37 (10)	38 (10)	149 (12)
Large LEGUMINOSAE	23 (25)	16 (17)	9 (13)	90 (17)	11 (8)	149 (15)
ROSACEAE	--	--	--	--	2 (2)	2 (0.3)
Bifora cf. testiculata type	--	2 (4)	--	--	--	2 (0.3)
Bupleurum cf. subovatum type	--	3 (8)	--	--	--	3 (1)
UMBELLIFERAE	--	2 (4)	--	--	--	2 (0.3)
Galium sp. (Type A)	50 (25)	272 (50)	91 (27)	35 (13)	71 (26)	519 (22)
Galium sp. (Type B)	2 (12)	2 (8)	--	2 (1)	--	6 (2)
cf. RUBIACEAE	--	3 (4)	--	8 (3)	--	11 (2)
Valerianella cf. dentata type	1 (6)	5 (12)	1 (2)	1 (0.7)	2 (3)	10 (3)
Chrysanthemum coronarium/segetum	1 (6)	--	6 (7)	--	--	7 (2)
Chrysanthemum sp.	1 (6)	--	--	3 (0.7)	1 (2)	5 (1)
Centaurea sp.	--	1 (4)	1 (2)	1 (0.7)	--	3 (1)
COMPOSITAE (Type A)	5 (12)	31 (33)	126 (33)	45 (13)	39 (21)	246 (20)
COMPOSITAE (Type B)	3 (6)	--	--	--	--	3 (0.3)
COMPOSITAE	2 (6)	1 (4)	--	2 (1)	--	5 (1)
Limonium sp.	--	--	--	1 (0.7)	--	1 (0.3)
Androsace maxima	--	--	--	--	1 (2)	1 (0.3)
PRIMULACEAE	10 (6)	1 (4)	1 (2)	3 (2)	--	15 (2)
Heliotropium sp.	--	1 (4)	2 (4)	--	--	3 (1)
Buglossoides arvensis	22 (25)	135 (50)	101 (24)	378 (33)	268 (20)	904 (46)
Buglossoides tenuiflorum	4 (6)	1 (4)	--	5 (3)	--	10 (3)
Echium sp.	--	36 (8)	2 (2)	19 (2)	--	57 (2)
cf. BORAGINACEAE	1 (6)	--	1 (2)	--	--	2 (1)
cf. Cuscuta sp.	--	1 (4)	--	--	--	1 (0.3)
cf. SOLANACEAE	1 (6)	--	--	--	--	1 (0.3)
Veronica sp.	--	2 (4)	1 (2)	--	--	3 (1)
Veronica/Linaria sp.	--	--	--	--	2 (2)	2 (0.3)
Teucrium cf. polium type	--	--	--	1 (0.7)	--	1 (0.3)
LABIATAE	--	--	--	2 (1)	--	2 (1)
Plantago sp.	--	3 (8)	--	1 (0.7)	3 (3)	7 (2)
Chenopodium cf. album	31 (12)	4 (12)	3 (4)	6 (4)	2 (2)	46 (5)
Beta vulgaris	3 (12)	--	--	--	2 (2)	5 (1)
Suaeda cf. fruticosa type	--	2 (4)	--	--	--	2 (0.3)
cf. Salsoleae tribe embryo spiral	--	--	1 (2)	--	--	1 (0.3)
cf. CHENOPODIACEAE	1 (6)	1 (4)	--	--	--	2 (1)
Polygonum sp.	--	--	--	2 (1)	--	2 (1)
Rumex sp.	9 (19)	2 (8)	1 (2)	1 (0.7)	3 (3)	16 (3)
Thymelaea cf. passerina type	--	5 (12)	--	--	2 (3)	7 (2)
Euphorbia peplus	1 (6)	3 (8)	--	--	--	4 (1)
Euphorbia sp.	--	--	--	1 (0.7)	--	1 (0.3)
Ornithogalum/Muscari/Bellevalia type	1 (6)	--	--	--	--	1 (0.3)
LILIACEAE	--	2 (4)	--	3 (1)	--	5 (1)
cf. LILIACEAE	1 (6)	--	1 (2)	1 (0.7)	6 (2)	9 (1)
Scirpus cf. maritimus	--	--	--	--	2 (2)	2 (0.3
Schoenus nigricans	25 (12)	1 (4)	1 (2)	145 (14)	18 (8)	190 (10)
CYPERACAE (Type A)	--	2 (4)	1 (2)	5 (2)	16 (3)	24 (3)
CYPERACAE	--	--	1 (2)	47 (13)	1 (2)	49 (7)
Lolium sp.	209 (69)	614 (79)	203 (53)	911 (71)	433 (56)	2370 (62)
Arrhenatherum elatius var. bulbosa tuber	--	1 (4)	--	--	--	1 (0.3)
Phalaris sp.	5 (19)	8 (12)	14 (16)	22 (12)	4 (5)	53 (12)
Stipa sp.	4 (12)	--	1 (2)	4 (3)	1 (2)	10 (3)
cf. Stipa sp.	--	--	--	3 (2)	--	3 (1)
Bromus sp.	3 (6)	1 (4)	1 (2)	1 (0.7)	4 (2)	10 (2)
cf. Aegilops sp. spiklet base	--	2 (4)	--	--	--	2 (0.3)
Hordeum bulbosum tuber	1 (6)	--	--	--	--	1 (0.3)
Hordeum spp. (wild/cereal)	287 (6)	--	--	1 (0.7)	--	288 (1)
Hordeum spp.	14 (31)	40 (29)	11 (14)	52 (15)	49 (25)	166 (19)
cf. Hordeum spp.	6 (12)	--	2 (4)	3 (2)	2 (2)	13 (3)
Setaria sp.	--	--	--	1 (0.7)	--	1 (0.3)
Avena sp.	63 (12)	4 (12)	1 (2)	3 (0.7)	14 (6)	85 (4)
cf. Secale cereale	2 (6)	--	--	--	--	2 (0.3)

GRAMINAE (wild/cereal)	28 (6)	--	6 (5)	13 (5)	--	47 (4)
GRAMINAE (wild)	235 (94)	492 (83)	229 (62)	1035 (71)	519 (67)	511 (71)
GRAMINAE embryos	1 (6)	12 (12)	3 (5)	4 (3)	8 (5)	28 (5)
Fungal spores indeterminate	3 (6)	48 (25)	195 (22)	40 (10)	4 (3)	290 (12)
Seeds indeterminate	138 (94)	206 (83)	135 (49)	363 (48)	251 (57)	1093 (49)
Other items	*2*	*3A*	*3B*	*4*	*Other*	*Total*
Fruit/nut indeterminate	3 (12)	--	--	1 (0.7)	--	4 (1)
Fruit fragments indeterminate	2 (12)	5 (8)	9 (5)	2 (0.7)	--	18 (3)
Nut shell fragments (Type A)	72 (56)	1 (4)	--	20 (2)	26 (11)	119 (6)
Nut shell fragments	34 (50)	27 (29)	21 (14)	128 (17)	73 (23)	283 (20)
Root/Tuber indeterminate	2 (6)	--	--	--	--	2 (0.3)
Vesicular indeterminate	98 (87)	140 (71)	36 (45)	138 (48)	142 (58)	554 (54)
Textured fragments	--	1 (4)	1 (2)	--	7 (2)	9 (1)
Dung indeterminate	2 (12)	--	1 (2)	2 (1)	--	5 (2)
Indeterminate fragments	*	*	*	*	*	*
*Uncharred Boraginaceae & Cyperaceae***						
Buglossoides arvensis	9 (19)	778 (56)	33 (18)	80 (23)	54 (15)	954 (21)
Buglossoides tenuiflorum	22 (19)	24 (17)	74 (18)	21 (8)	19 (13)	160 (12)
Echium sp.	--	777 (17)	5 (2)	3 (0.7)	--	785 (2)
Schoenus nigricans	89 (6)	--	11 (7)	232 (15)	11 (6)	343 (10)
CYPERACEAE (Type A)	--	--	--	8 (3)	1 (2)	9 (2)
Total	2921	8256	2454	9794	5111	28536

* Whole numbers represent the number of items within a given period and the number in brackets represents the percentage of the total number of samples for the period in which the item is present. For example the 468 *Ficus carica* seeds found in Period 2 are from 62 of the total number of samples for that period.

** Due to the high silica content of certain members of the *Boraginaceae* and *Cyperaceae* families, it is often difficult to determine if they have been charred. The definitive test is to destroy the seed, although this is not considered to be an acceptable method in most cases. These possibly uncharred specimens are listed here but are not included in any other calculations except presence analysis which does not affect the ratios of any of the other species.

§ 23.3.1 Cereals

cf. *Triticum monococcum* (Einkorn wheat) - Evidence of einkorn wheat in the Kissonerga samples is scarce. The possible evidence for einkorn comes in the form of two distorted grains which may be either einkorn or emmer and seven items of chaff (3 spikelet forks, 4 glume bases) tentatively identified as einkorn. If present, einkorn may have been a field weed or an admixture to the emmer crop, a known practice in the ancient Near East (e.g. van Zeist and Bakker-Heeres 1988, 273). Einkorn is not considered to be best quality wheat for bread but is used for porridge or as cooked grain, as well as animal fodder (Zohary and Hopf 1993, 32). Einkorn grains are laterally compressed with a strong dorsal ridge and attenuated ends with a shallowly angled embryo end.

Triticum dicoccum (Emmer wheat) - Emmer, although more abundant than einkorn, is also not common in the assemblage. Emmer grains were present in 2% of the samples whilst emmer spikelet forks and glume bases were found in .65% and 1.6% of the samples, respectively. Emmer is a hulled wheat, meaning that after the threshing process breaks up the cereal ear into spikelets, these then need to be processed further to rid them of their chaff (spikelet forks and glume bases) in order to obtain a clean grain product. Emmer grains generally have a flat ventral face and a high point above the embryo on the rounded dorsal face. The embryo is steeply angled. Emmer was the principal bread wheat grown in the Near East prior to the free threshing varieties (cf. Zohary and Hopf 1993, 46).

Triticum monococcum/dicoccum chaff (Einkorn/-emmer chaff) - Most of the glume wheat chaff was in poor condition and precluded the possibility of identification to either emmer or einkorn. Five spikelet forks and 53 glume bases are in this category, present in 1.31% and 4.25% of the samples, respectively.

Triticum durum/aestivum (Free threshing wheat) - Free threshing cereal grains appeared in 10.8% of the samples and comprise 19% of the total cereal grains present. The grains of *T. durum* and *T. aestivum* are not readily distinguishable from each other; only by their chaff can a specimen be securely identified to species (e.g. Zohary and Hopf 1993, 48; Jacomet 1989). A single unidentifiable free threshing rachis internode was recovered. Charring experiments have shown that free threshing rachis are more likely to disappear during charring than glume wheat chaff and are often underrepresented (Boardman and Jones 1990, 6). Free threshing grains are generally shorter, plumper and more rounded than glume wheat grains.

Triticum sp. (Wheat indeterminate) - This category contains whole or fragmented wheat grains which were impossible to identify to species. Twelve percent of the samples contained unidentifiable wheat, making up 11% of the total cereal grains.

Hordeum sativum (aka *H. vulgare*) (Domesticated

hulled barley) - Present in 18.7% of the samples and comprising 37% of the total cereal remains, barley is the most common cereal found in the Kissonerga assemblage. Hulled barley is usually angular in shape with attenuated ends and slight longitudinal ridges, often with lemmas and paleas still attached. Two rowed barley has two rows of fertile spikelets and six rowed barley has six rows of fertile spikelets, two thirds of which are slightly twisted around at the point of attachment (Zohary and Hopf 1993, 55). 12% of the barley grains are straight (symmetrical) and 7% are twisted (asymmetrical), however for 81% of the grain this characteristic, used to indicate the 2 or 6 row status of an assemblage, is obscured by charring or breakage. The barley chaff shows that 21% of the rachis are two row, 6% are six row and 73% are unidentifiable to variety. Since such a large percentage of these items are unidentifiable, it is not possible to determine the true proportion of the two varieties within the samples. No naked barley was found.

The term *Hordeum sativum* here refers to both two and six row cultivated hulled barley. Another common term for cultivated hulled barley, *Hordeum vulgare*, has also been used in the past to name a specific lax eared six row variety. Therefore, to avoid confusion, the term *Hordeum sativum* is currently in use for sites in the Near East by a number of botanists and archaeobotanists, including Colledge (1985 for Cyprus), Guest (1933, 46), Hillman (e.g. 1984), Charles (1984, 29), and others. Barley was used for bread and beer and as an important animal fodder. Although barley is often considered a poorer quality cereal for humans, it is well suited to the harsher conditions of drought, salinity and poor soils (Zohary and Hopf 1993, 55).

Cereal indete rminate - These are whole or fragmented cereal grains too badly distorted or preserved to identify to genus and composed 31% of the cereal grain, found in 28.1% of the samples. Cereal chaff which was also unidentifiable to species included awn fragments (97% of this chaff category), culm nodes (2%) and 5 culm bases (negligible).

§ 23.3.2 Legumes

Lens sp. (Lentils) - Lentils are present in 47.4% of the samples. The distinction between wild and domesticated lentils in archaeological material is based primarily on seed size, with the latter generally larger although there is great overlap between them. The use of the gradual change in size as an indication of the wild or domesticated status of lentils often creates uncertainty on sites of an early date, especially in areas like Cyprus which also have several wild species, such as *Lens nigricans*, *L. ervoides* and *L. orientalis* (Zohary and Hopf 1993, 94). Fig. 23.2 gives the size distribution of the 195 measurable lentils and shows no clear evidence of major size progression through time. It seems most likely that the assemblage represents the use of both wild and domesticated species.

Pisum sativum (Pea) - Peas were present in 2% of the samples. Both wild species are native to Cyprus (*P. sativum* subsp. *elatius* and subsp. *humile*) (Zohary and Hopf 1993, 98). As is often the case with charred material, the seed coat (testa) of the Kissonerga peas and other features have not been preserved. As with lentil, it is possible that both the wild and cultivated subspecies were collected for food as has been shown on other Near Eastern sites (e.g. van Zeist and Bakker-Heeres 1985, 208).

Cicer arietinum (Chick pea) - Two poorly preserved chick peas were identified. Wild chick peas are also found in Cyprus and the wild or domesticated status of these specimens is unclear. The chick pea is angular with a distinctive protruding radical, often missing in charred material as it is here.

Lathyrus sativus type (Grass pea) - Grass pea type seeds were found in 1.3% of the samples. These have a roughly triangular chisel shape with the hilum located on the top of the broadest part of the seed. Certain wild *Lathyrus* sp. growing in Cyprus are indistinguishable from the domesticated *Lathyrus sativus* and therefore these finds have been identified by type alone. Grass pea has been grown as food and especially as animal fodder (Zohary and Hopf 1993, 114).

§ 23.3.3 Fruits

Fruit remains composed 41% of the total assemblage yet the over representation of fig (94% of all fruit remains) due to the large numbers of seeds in the fruit makes this figure misleading. It is most likely that all of the major fruits represented here (grape, olive, pistachio and fig) were nutritionally important to the Kissonerga residents.

Ficus carica (Fig) - The ubiquitous fig was found in 80% of the samples. It is impossible to distinguish between seeds of the wild and domesticated species, although it is assumed that these fig remains are wild. The smooth surfaced seeds of fig are ovate, often pyriform in shape and laterally compressed. The distinctive round hilum is located below the pointed apex.

Vitis vinifera (Grape) - Evidence of grape (including seeds, fruit and stems) was found in 37% of the samples. The seed morphology of the wild and domesticated varieties are similar enough to create problems of identification. The wild variety is generally plumper and more rounded in shape with a short truncated beak than the cultivated type which has a longer tapering beak and is more pyriform in outline. These characteristics are not consistent, however, partly due to the varying number of seeds in each fruit (Kislev 1988, 236-8) and the additional variability of the effects of charring on the seeds. Experimental charring of grape seeds, for example, has shown that, especially at high temperatures, the seeds of both the wild and cultivated varieties have a tendency to become shorter and more

rounded, and therefore most closely resembling the wild variety with regards to the breadth:length criteria often used to differentiate between the two (Smith and Jones 1990:324). In all, 65 of the Kissonerga grape seeds were complete enough for measurement. Using Stummer's (1911) criteria (breadth/length x 100), 63% of the seeds fall into the wild category (and 63% of these are from the later Period 4), 37% are in Stummer's indeterminate category (could be either wild or domesticated) and none of the seeds were in the domesticated category. Further analysis using other criteria is needed for the Kissonerga grapes. As Stummer's criteria is no longer considered reliable.

The possibility that the presence of crushed grape skins, stalks and seeds in charred archaeobotanical assemblages may represent the remains of wine pressing, perhaps subsequently used as fuel and thus preserved, has been discussed by several authors working on Mediterranean sites (e.g. Py 1992; Buxo 1996; Mangafa and Kotsakis 1996; also see Murray in press c). Certain samples from Kissonerga contain these items although it is impossible to determine in this assemblage if the remains of wine making are represented here. Although wild grapes are generally smaller and more sour than cultivated grapes, they are nevertheless suitable for wine making.

Olea europaea (Olive) - Olive was found in 15% of samples. Although the fruits of wild olive are usually smaller than the domesticated variety, the fruit stones may not be and size alone is no longer considered a valid criterion of domestication (e.g. Liphschitz *et al.* 1991, 450). In Cyprus, wild olive is a common component of the maquis and garigue environments and they were no doubt collected long before their domestication.

Pistacia cf. atlantica/terebinthus. (Pistachio) - Pistachio was found in 42% of the samples. It is notoriously difficult to distinguish between the overlapping shapes and sizes of the various species though most early Near Eastern finds of the genus have been identified as *P. atlantica* (Zohary and Hopf 1993, 197). This species and *P. terebinthus* (= *P. palaestina*) appear to be the two most likely candidates for the Kissonerga assemblage (which do not resemble *P. lentiscus* or *P. khinjuk*). A method for distinguishing between species has been suggested by Kislev (1988, 238-9) using the shallowness of the hilum as the key criterion. It is claimed that this crater like feature is very shallow, flattened or even slightly convex in *P. terebinthus* whilst in *P. atlantica* the crater of the hilum is noticeably deeper. The use of this criteria shows that for the 40 measurable pistachios from Kissonerga; 65% most closely resemble *P. terebinthus* and 35% are closest to *P. atlantica* (including 7 from one sample). This criterion would be less subjective (and therefore more reliable) if the hilum depths were somehow quantifiable. According to this method, however, the majority of the Kissonerga pistachios appear to be *P. terebinthus*. Pistachio trees are exploited for their fruits, resin and wood (see Serpico in press). These specimens have a thin nutshell with a circular hilum crater.

Seven hackberry fruits (*Celtis sp.*) were found. It is a wild species used for its fruit and timber, and a single juniper berry (*Juniperus sp.*) was also recovered. Other potentially useful species include *Linum usitatissimum/bienne* used for oil (linseed) and fibre (flax); as well as the seeds of the caper (*Capparis spinosa*), a wild plant food.

§ 23.3.4 Wild/weed species

Adonis sp. (Pheasant's Eye) - Nine specimens were found at Kissonerga. There is possibly more than one species present although these cannot be distinguished. Certain *Adonis* species are weeds of crops. The seeds have a reticulated surface, keeled margin and are roughly ovate in shape.

cf. *Delphinium/Consolida sp.* - Two of these were recovered. They have the remains of the characteristic scaly ridges which often cover the seeds of these genera.

PAPAVERACEAE (Poppy Family) - Five seeds were put in this category. Preservation was not sufficient to classify them any more specifically. The seeds are reniform in outline with a reticulate surface pattern.

Fumaria cf. densiflora type (Fumitory) - 15% of the samples contain *Fumaria* seeds. They have a rugose surface and are nearly circular, bi-convex fruits with an obvious margin and two distinctive holes at their base.

Fumaria sp. (Type A) (Fumitory) - Nineteen seeds from one sample were classed in this way. These were larger than the *Fumaria cf. densiflora* type species (3.0 x 3.0 x 2.8 mm) but were otherwise morphologically similar apart from small "spikes" near the two holes at the base of the fruit.

cf. *Brassica sp*. (Mustard) - One possible *Brassica sp.* seed was found. The *Brassica* genus is a common weed in Cyprus. The greens of most *Brassica* species are also edible, and the seeds have a high oil content.

Neslia cf. paniculata type (Ball Mustard) - This species was found in 5% of the samples. The rounded seed has a coarsely reticulate surface and keeled margin. It is found mainly as a weed of winter cereal crops, preferring nutrient rich, alkaline, often calcareous clays and loams though also found on wet, poorly aerated soils (Hanf 1983, 283).

cf. *Sisymbrium sp.* (Mustard) - A single specimen was recovered, most closely resembling the *Sisymbrium* genus with a roundly oblong shape. Members of this cruciferous genus are commonly found on arable land (Hanf 1983, 296).

CRUCIFERAE (Mustard Family) - Five Cruciferae and 8 possible Cruciferae seeds were found. Almost all the weeds from this family are annual or biennial, many are edible and some are found as weeds of crops.

cf. *Cleome* type (Cleome) - Twenty seven possible *Cleome* seeds were found, mostly from a single Period 2 sample. They are very poorly preserved, missing much of their testa but what remains most closely r e-sembles a *Cleome* type seed.

cf. *Spergula sp.* - 5% of the samples contained seeds most closely resembling this species. These are smooth, rounded, almost lenticular seeds with a narrow rim. They are found as weeds of spring crops on sandy soil. The species is not listed in the *Flora of Cyprus* (Meikle 1977, 1985).

CARYOPHYLLACEAE (Carnation Family) - Four poorly preserved seeds were found which belong to this family.

Malva sp. (Mallow) - *Malva* was present in 22% of the samples (279 seeds). The species is a common one on Near Eastern sites and the question has been raised by some as to whether its abundance is due to its being collected for food, especially for use as greens (e.g. Crowfoot 1932). Many species of *Malva* are weeds of waste places and disturbed areas like cultivated fields. Although there is quite a size range, all of the *Malva* species here have the classic flat surfaced wedge shape. It is very difficult to distinguish between *Malva* species with charred material. Only one seed had the remains of a strongly rugose patterning on its dorsal surface, but no species can be determined.

cf. *Trigonella* type (Trigonel) - Twenty one possible *Trigonella* seeds were found. There is a great deal of overlap between many of the small leguminous species, including this one. The seeds included in this category are characteristic of the *Trigonella* type, strongly a n-gular with a distinctively notched hilum groove.

Medicago sp. (Medick) - Eighteen fragments of *Medicago* pod were recovered. Three *Medicago* seeds were found still in their pods. The seeds of the various *Medicago* species are impossible to distinguish, a l-though their coiled pods are often more distinctive. These fragments, unfortunately, could not be identif i-able to species. *Medicago* is a common weed and is also used as an animal fodder. Nearly all of the *Medi-cago* species found in Cyprus can be found on arable land (Hanf 1983, 357).

Trifoliae tribe (Clover tribe) - This category covers the genera *Trifolium*, *Medicago*, *Melilotus*, *Trigonella, Ononis* and *Tetragonolobus*. The seeds of these genera overlap to such an extent that to realistically different i-ate between them with charred material is unwise (Butler, pers comm). In all, 15.7% of the samples co n-tained the seeds of this category. Seeds in this category are distinguished by the shape, position and size of the embryo. Members of the Trifoliae tribe are weeds of crops, waste places and disturbed habitats and most are considered valuable species for animal fodder.

Scorpiurus muricatus (Caterpillar) - Twenty four specimens were found of this crescent shaped seed. The area of the hilum in the centre of the outer surface is often elongated when endosperm breaks through this weak point during charring. A widespread annual, found mostly in pastures, vineyards and cereal fields (Hanf 1983, 365).

Coronilla cf. scorpioides type (Scorpion vetch) - Eight specimens. These are long, rounded seeds; smooth and slightly curved. They most closely resemble *C. scorpioides* type, commonly found on arable land and wastelands (Hanf 1983, 351).

cf. *Onobrychis sp.* pod fragments (Sainfoin) - Twenty five fragments of the distinctive *Onobrychis* pod were found, including a seed in one of the pod fragments.

Vicia spp. (Vetch) - Vetch seeds are present in at least 2.3% of the samples although the rather larger *Vicia/Lathyrus* category probably contains mostly un i-dentifiable vetch specimens (Butler, pers comm). The hilum of the seed is usually needed to securely identify members of this genus to species and this material is mostly too poorly preserved to attempt this. Certain members of the genus were cultivated in antiquity (i.e. *V. ervillia*, *V. sativa*) although this cannot be demo n-strated with this material. Many of the wild *Vicia* sp e-cies in Cyprus are found as weeds of crops.

Lathyrus sp. (Grass pea) - *Lathyrus* specimens of indeterminate species are found in 0.98% of the sa m-ples.

Vicia/Lathyrus spp. (Vetch/Grass pea) - These specimens were found in 24% of the Kissonerga sa m-ples. The morphological criteria of these seeds were too poorly preserved to realistically place them in either category (Butler, pers comm).

Small LEGUMINOSAE (Pea Family) - 11.8% of the samples contained small legumes, 149 in all. This category is made up of several small seeded leguminous species whose morphological characteristics overlap considerably. The category includes all small seeded members of the Leguminosae family that cannot be identified to the Trifoliae tribe or other identifiable small legumes. Dr. Anne Butler of the Institute of A r-chaeology, London has done an extensive study of small legume morphology using SEM photographs of modern material. Based on the extent of various ove r-lapping morphological characteristics, she concludes that the small members of Leguminosae mentioned above should be grouped since any distinguishing crit e-ria are often obscured in archaeological material. Four small legumes were found in fragments of their pods but were unidentifiable beyond this.

Large LEGUMINOSAE (Pea Family) - This cat e-gory contains larger unidentifiable members of the Pea family which have two obvious cotyledons such as *Vi-cia, Lathyrus*, *Pisum*, *Lens*, *et al.* Fifteen percent of the samples contained these fragments which were all too poorly preserved for further identification.

ROSACEAE (Rose Family) - Two seeds from the Rose family were found, similar to *Potentilla* or *Fra-*

garia types.

Bifora cf. testiculata type (Small coriander) - Two specimens. These most closely resemble the *Bifora testiculata* type (and definitely not the *B. radians* type). The surface of the fruits are rugose with a granular appearance. The fruits are almost globular and have a distinctive flattened and peaked area with a hole at the upper end of the peak. This is the point of attachment of the two fruits. Van Zeist (1985, 232) has pointed out that the ancient seeds resembling this species from Ramad were smaller than modern specimens and the measurement of the Kissonerga fruit is slightly smaller still. *B. testiculata* is an annual species and often a weed of winter cereal crops (Hanf 1983, 457).

Bupleurum cf. subovatum type (Hare's ear) - Three specimens found. These *Bupleurum* seeds are not the *B. rotundifolia* or *B. lancifolia* types but appear to most closely resemble the *B. subovatum* type, though this species does not presently appear in the *Flora of Cyprus* (Meikle 1977, 1985). The seeds are roundly rectangular in shape with five ribs across the rounded rugose dorsal surface.

UMBELLIFERAE (Carrot Family) - Two poorly preserved seeds from this family were recovered.

Galium sp. (Bedstraw) - *Galium* occurred in 22.2% of the samples. There are at least two types present. Type A is most common, representing 98% of the *Galium* seeds. This type appears to be very slightly longer than wide with the distinctive bisecting diaphragm of Rubiacae. Type B (2% of the *Galium* seeds) are larger and rounder than Type A.

cf. RUBIACEAE (Bedstraw Family) - Eleven seeds most closely resemble members of the Rubiacae Family but were unidentifiable to genus.

Valerianella dentata type (Cornsalad) - Ten seeds recovered. These are ovate in outline, with an elongated apex. The dorsal side is domed and the ventral side shows an almost circular, collar-like ridge. The surface is covered with small dots. The seeds most closely resemble the *Valerianella dentata* type which is commonly found as a weed of crops, especially cereals (Hanf 1983, 470).

Chrysanthemum coronarium/segetum (Crown Daisy) - Seven specimens. These seeds are elongated, vertically ridged, sometimes winged but wings may have been lost during charring and this could be a mixture of *C. coronarium* and *C. segetum*. Both are very common species in Cyprus today, often found in cereal fields, vineyards and waste places (Hanf 1983, 229).

Centaurea sp. (Star Thistle) - Three specimens were recovered. The fruits are almost roundly oblong in outline with a pappus rim at the top and the hilum indentation near the base. Many *Centaurea* species are weeds of crops.

COMPSITAE (Type A) (Daisy Family) - 20% of the samples contained this small Compositae type which appear to be closest to the Anthemidae tribe.

COMPOSITAE (Type B) (Daisy Family) - Three specimens found in one sample, most closely resembling a *Cirsium* type.

COMPOSITAE (Daisy Family) - Five indeterminate seeds of this family.

cf. *Limonium sp.* (Statice) - One possible specimen of *Limonium sp.* was found: a genus commonly found on sandy ground near the sea.

Androsace maxima (Androsace) - One specimen. This is a triangular seed with horizontal ridges, ovate in outline with pointed ends. The species is often found in the spring weed flora of winter cereals in warmer regions like Cyprus (Hanf 1983, 409).

PRIMULACEAE (Primula Family) - This seed type was present in 2% of the samples. They have the distinctive features of the family; several flat, bevelled surfaces and a slightly coarse, granular texture.

Heliotropium sp. (Heliotrope) Three *Heliotropium* seeds recovered. These rugose seeds are ovate in outline with a slight collar at the upper end. The genus is found as a weed of crops, vineyards, and waste places, preferring warm, loose soil (Hanf 1983, 175).

N.B. - Certain members of Boraginacae (including the following three species) are problematic, not only from a morphological view for identification purposes but also because of their high silica content. This characteristic means that the seeds are more likely to survive the charring process, yet they tend to turn white or grey rather than black. Moreover, since the resilient silica tends to preserve the seed without charring for long periods, it is often difficult to determine whether a specimen is modern or ancient. The most definitive test is to destroy the seed, although this is not considered to be an acceptable method in most cases. This particular problem with the Boraginacae (and the Cyperacae) family is widespread throughout the Near East and several authors have addressed the problem (e.g. Hansen 1991:233 for Cyprus, 1980; van Zeist and Buitenhuis 1983; Miller 1991:155). For this material, each species was sorted into charred and uncharred specimens and counted. The uncharred seeds are included on the species list and are listed as such but are not included in any of the calculations except presence analysis which would not affect any of the other species. In the Kissonerga assemblage, 34% of the Boraginacae were charred, 66% were uncharred.

Buglossoides arvensis (Field Gromwell) - The majority of the Boraginacae family present was composed of this species. 48% of these seeds were charred (found in 30% of the samples), whereas 51% did not appear to be charred (found in 21.2% of the samples). The roundly triangular nutlets of this plant are highly rugose with a tapering tip. As the name implies, this annual species is commonly found as a weed of winter cereal fields.

Buglossoides tenuiflora (Gromwell) - 94% of this

species appeared to be uncharred and were found in 12% of the samples. The remaining 6% of charred specimens were found in 2.3% of the samples. *B. tenuiflora* is similar to *B. arvensis* though it is most distinguished by humps on either side of the dorsal side, giving the seed a distinctly high backed appearance. The species is found in cultivated fields and waste ground (Meikle 1985, 1148).

Echium sp. (Viper's Bugloss) 93% of the *Echium* species found were uncharred and these 785 specimens were concentrated in only 6 samples. The remaining 7% of charred *Echium* was also found in 6 samples. Like the previous two species, these seeds are trigonous and roughly rugose, though broader and more squat in appearance.

cf. BORAGINACEAE (Borage Family) - Two possible, badly charred members of this family were found.

cf. *Cuscuta sp.* (Dodder) - One possible *Cuscuta* seed found. The seed is roughly circular with a slightly roughened surface and the rounded point of attachment present.

cf. SOLANACEAE (Nightshade Family) - One seed found. Several genera of this family occur as weeds.

Veronica sp. (Speedwell) - Three of these were recovered and they are oval in outline with horizontal ridges on the dorsal side and a concave ventral side. Two *Veronica/Linaria sp.* seeds were also found.

Teucrium cf. polium type - One seed found. This rounded seed has a reticulate surface and a large hilar scar and most closely resembles *Teucrium polium* type.

LABIATAE (Mint Family) - Two poorly preserved members of this family found.

Plantago sp. (Plaintain) - Seven *Plantago* recovered, probably representing more than one species. The seeds are roundly elliptical in outline with a ridged furrow on the ventral surface and a slightly domed dorsal surface.

Chenopodium album (Fat Hen) - Found in 4.6% of the samples. These are smooth, lentil shaped seeds with minute radial striations. This species is often found as a weed of spring cereal crops. The seeds are rich in nutrients and in many areas of the world are used as a vegetable (Hanf 1983, 166).

Beta vulgaris (Beet) - Five fruits were recovered. The root stock of the wild varieties are not as well developed as the cultivated species. Wild beet is often found on coastal, sometimes saline, nutrient rich soils. At times, it is also found in arable fields (Hanf 1983:206).

Suaeda cf. fruticosa type (Seablite) - One seed recovered which most closely resembles the *Suaeda fruticosa* type. It is a smoothly rounded comma shaped seed with a protuberance below the radicle tip. This genus is commonly found on relatively salty soils.

cf. Salsolacae embryo spiral (Saltwort tribe) - A single specimen found. Due to its size and position it may belong to the Salsolacae tribe of Chenopodiaceae (Hillman, pers comm), however the large size does not correspond to any reference material. This tribe is found mainly on saline coastal soils.

cf. CHENOPODIACEAE (Goosefoot Family) - Two unidentifiable specimens from this family.

Polygonum sp. (Knotweed) - Two smooth, triangular seeds of this genus were found.

Rumex sp. (Sorrel/Dock) - Sixteen *Rumex* fruits which may represent more than one species. These are sharply triangular seeds with ridged margins.

Thymelaea sp. (Shaggy sparrow wort) - Seven seeds found. These are shiny, tear drop shaped seeds; the top is tapered to a point gradually becoming very rounded at the base, resembling *T. passerina* type.

Euphorbia peplus (Petty spurge) - Four fruits found. This annual species is a common weed in the coastal area (Edgecombe 1970, 234) and is found primarily in gardens or waste places, less often as a weed of crops and vineyards (Hanf 1983, 307). One unidentified *Euphorbia sp.* was found.

Ornithogalum/Muscari/Bellevalli group - Two specimens found. These seeds are somewhat circular though asymmetrical with bevelled edges and a hole in the apex.

LILIACEAE (Lily Family) - Specimens from this family have a round aperture at the top of the seeds, often running from the top to the base of the seeds.

Scirpus cf. maritimus (Sea club-rush) - These two specimens are roughly triangular in shape with a flattened ventral surface and a ridged dorsal side.

N.B.- The problems with the charred material of Boraginacae also apply to the following members of the Cyperacae family in this assemblage.

Schoenus nigricans (Sedge) - These seeds are triangular in shape with attenuated ends. All of the seeds are white but some show the darkened discoloration of charring and they have been separated on this basis. Both charred and uncharred seeds were each found in 10% of the Kissonerga samples.

CYPERACEAE (Type A) (Sedge Family) - This indeterminate species is ovate in shape with a heavily granular surface and has also been separated into charred and uncharred by the discoloration of the white seeds.

CYPERACEAE (Sedge Family) - Completely indeterminate members of the Sedge family were present in 7.2% of the samples.

Lolium sp. (Rye-grass) - 62% of the samples contained *Lolium* (2,370 seeds in total), a genus is commonly on ancient Near Eastern sites. More than one species may be present. These specimens are generally long and narrow with ridges on either side of the a flat ventral surface and a rounded dorsal surface.

Arrhenatherum elatius var. *bulbosa* tuber - One tuber of this grass species was identified by Dr. John Hather using an SEM. Meikle (1985, 1765) notes that this species is found primarily in Pine and Cedar forests

in Cyprus. It may have been collected as a wild plant food or for some other purpose.

Phalaris sp. (Canary grass) - *Phalaris* is found in 12% of the samples. These are flat, ovoid shaped grains with a radicle shield on the dorsal side.

Stipa sp. (Feather grass) - Ten *Stipa* grass seeds and 3 possible *Stipa* grains were found. These are long, cylindrical seeds, sharply attenuated at both ends with a prominent ventral groove.

Bromus sp. (Brome grass) - Seven examples of *Bromus* and 3 possible *Bromus* seeds were found. All were fragmentary, none measurable. These *Bromus* are a slender, flattened grain with a slightly domed dorsal side and blunt apex.

cf. *Aegilops sp.* spikelet base (Goat grass) - A single possible Aegilops spikelet base was recovered. It was relatively large like that of *Aegilops crassa* but without more evidence no species name can be given.

Hordeum bulbosum tuber (Bulbous barley) - Two specimens of this wild barley tuber were identified by Dr. John Hather using an SEM (see Pl. 38.19). This perennial grass is found in variety of habitats including field margins and sometimes in coastal garigue (Meikle 1985, 1831). The roots of this species may have been collected deliberately for food.

Hordeum spp. (wild/cereal) - Badly fragmented barley specimens which could be either wild or domesticated.

Hordeum spp. (Wild barleys) - All wild barley seeds were put under this heading. 19% of the samples contained wild barley remains. The majority of these seeds were fragmentary and no attempt was made to identify them to species.

Setaria sp. (Bristle grass) - A single *Setaria sp.* was identified in one sample analysed by Sue Colledge.

Avena sp. (Oats) - Oats are present in 3.6% of the samples. In all, 67 oat grains were found, most are from one sample. The seeds are believed to be wild and many are weeds of cereal fields. No oat chaff was recovered, with the possible exception of seven twisted awn fragments similar to those associated with the genus. Oat is long and narrow with a very shallow ventral groove and a rounded dorsal side. It has a bluntly attenuated apex end and a distinctive triangular scute llum.

cf. *Secale cereale* (Rye) - Two possible rye grains were tentatively identified from one sample. They were fragmented and in poor condition. No chaff remains were found. Rye is often found as a weed of cereal crops, commonly bread wheat (*Triticum aestivum*) (Hillman 1978). Wild rye is long and slender with a deep ventral groove and a strong dorsal ridge. It has a blunt apex and a long sharply angled embryo end.

GRAMINAE (wild/cereal) (Grass Family) - These mostly small indeterminate fragments were recovered in 3.6% of the samples and it could not be established whether they were from cereal grains or from fragments of wild grass species.

GRAMINAE (wild) (Grass Fam ily) - This category is for those whole or fragmented unidentifiable grass grains which could not be placed into one genus or another. Unidentifiable wild grass was found in 71% of the samples. The vast majority of these grass remains were very fragmentary. Whole grain equivalents of *Lolium* were used to estimate how many whole grains the broken grass represented (see Methodology). Using this method, the equivalent of 2511 grass seeds were unidentifiable. Much of the indeterminate Graminae is likely to be poorly preserved *Lolium* species but these remains cannot be identified further.

GRAMINAE embryos - Embryos from cereal or wild grasses were found in 4.6% of the samples. An abundance of embryos may suggest the breakage of cereals after burning since it seems unlikely that fragile, separated embryos would survive a conflagration although it is characteristic in barley for embryos to separate from the grain during charring (Charles, pers comm).

Fungal spores indeterminate - Fungal spores were found in 12% of the samples although there is some difficulty determining their charred status. A number of these do indeed appear to charred and thus possibly contemporary with the contexts in which they were found, whilst others apparently do not. In all, 291 spores were recovered. The spores are round and more or less featureless.

Seeds indeterminate - 49% of the samples contained unidentified seeds. In all, 1093 whole or partial seeds had to be categorised in this way. The vast majority are too poorly preserved to attempt further identification.

§ 23.3.5 Other items

Fruit/nut indeterminate - There were four fruit/nut remains, completely unidentifiable.

Fruit fragments indeterminate - Eighteen small fragments of unidentified fruit were recovered. Most of these appear to be fig or grape remains but cannot be proven so without clearly embedded or impressed seeds.

Nut shell fragments (Type A) - 30% of the total number of nut shell fragments (402 in all) are considered to be of Type A. These small nut shell fragments all have a distinctive, though variable, reticulate surface pattern as well as being of varying thickness. Found in 6.5% of the samples, there is a possibility that some of the Type A remains may be from the *Prunus* genus but these are too fragmentary and poorly preserved to be properly identified. Likewise, the genus of *Pistacia* is considered because the flesh of the fruit tends to wrinkle into a net-like pattern not unlike the reticulate surface present here. There seems to be no break, however, between the nut shell and the reticulate surface as one might expect with the flesh of a fruit. There is probably more than one species represented here.

Nut shell fragments - These were found in 21% of

the samples and comprised 70% of the total nut shell fragments. These fragments were small (rarely more than 4 mm) and could not be identified to species although it is believed that at least some of them might be poorly preserved *Pistacia* fragments and perhaps *Prunus* fragments.

Root/Tuber indeterminate - Two unidentified root/-tuber fragments were found. These were analysed using a scanning electron microscope (SEM) but none of their features were diagnostic enough to distinguish them beyond this category.

Vesicular indeterminate - This category contains fragments which have been exposed to very high temperatures. They have a characteristic hollowed texture and appear to be mostly cereal and grass fragments. Hubbard refers to this as "clinkered" or Class 6 on his scale of preservation (Hubbard and al Azm 1990, 104). To quantify this category, the whole grain equivalent number of the cereals present on the site was used (as described in Methodology section). Using this method of quantification, the vesicular fragments equalled 533 cereal grains.

Textured fragments - This category contains unusually textured fragments which were checked further to establish their source, such as root or tuber parenchyma. In the end, nine unidentified fragments remained in this category.

Dung indeterminate - Five fragments of dung were recovered. It is impossible to establish what animal these may have come from. Their presence may be a clue to the use of animal dung as fuel.

Indeterminate frags - The presence of completely indeterminate fragments are denoted by an asterisk (*). These items have been badly charred and eroded and further identification of any sort is not possible.

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Table 23.3. Economic species from Cypriot sites

Period	*Site*	Einkorn	Emmer	Bread/hard wheat	Barley	Oats	Rye	Lentil	Pea	Chick pea	Grass pea	Vetch	Fig	Grape	Olive	Pistachio	Flax	Caper
Aceramic Neolithic	Khirokitia	x	x	-	x	x	-	x	x	-	x	x	x	-	x	x	-	x
Aceramic Neolithic	Kalvassos-Tenta	x	x	-	x	-	-	x	-	-	-	x	-	-	-	x	-	-
Aceramic Neolithic	Cape Andreas Kastros	x	x	-	x	x	-	x	x	-	-	x	x	-	x	x	x	-
Aceramic/Late Neolithic	Dhali-Agridhi	-	-	-	x	-	-	x	-	-	-	x	-	x	x	x	-	-
Late Neolithic	Ayios Epiktitos Vrysi	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	-
Chalcolithic	Kissonerga-Mosphilia	x?	x	x	x	x	x?	x	x	x	x	x	x	x	x	x	x	x
Chalcolithic	Kissonerga-Mylouthkia	-	x	-	x	-	x	x	-	x	x	-	x	x	x	x	-	-
Chalcolithic	Kalavassos-Ayious	-	x	-	x	-	-	x	-	-	-	-	-	-	-	-	-	-
Chalcolithic	Lemba-Lakkous	-	-	x	x	-	-	x	-	-	x?	x?	x	x	x	x	-	-
Early/Middle Bronze Age	Marki-Alonia	-	x	-	x	-	-	x	-	x	-	x	x	x	x	x	-	x
Middle Bronze Age	Phaneromeni	-	-	-	x	-	-	x	-	-	-	-	-	x	-	-	-	-
Late Bronze Age	Kalopsidha	-	-	x	x	-	-	x	-	-	-	-	-	x	-	x	-	-
Late Bronze Age	Ayios Dhimitrious	-	-	-	x	x	-	x	-	-	-	x	x	x	x	x	-	-
Late Bronze Age	Apliki	-	-	x	x	-	-	x	-	-	-	-	-	x	x	-	-	-
Late Bronze Age	Hala Sultan Tekke	-	x	x	x	x	-	x	-	-	-	-	x	x	x	x	-	x
Late Bronze Age	Maa Palaeokastro	x	-	x	-		-		-	-	-	x	x	x	x	-	-	-
Classical	Salamis	-	-	x	x	-	-	x	x	x	x	x	x	x	x	-	-	-

Table 23.4. Summary of context types with flora, by period

Period	*Context Type*	*Number of samples*	*Litres of deposit*	*Number of items*	*Items per litre*
Period 2	General	1	32	19	0.6
	Pit	8	612	2,239	3.7
	Fill	7	290	663	2.3
Period 3A	General	2	100	340	3.4
	Paved floor	1	50	70	1.4
	Pit	9	492	4,730	9.6
	Fill	10	375	1,482	4.1
	Pot spread	1	16	2	0.1
	Disturbance	1	50	1,632	33.0
Period 3B*	General	5	333	775	2.3
	Unpaved area	1	100	34	0.3
	Paved floor	1	110	31	0.3
	Hearth	1	50	33	0.7
	Grave	6	84	39	0.5
	Post hole	1	4	2	0.5
	Pit	11	482	547	1.1
	Wall collapse	1	20	13	0.6
	Plaster/paving	1	28	5	0.2
	Fill	20	626	706	1.1
	Pot spread	3	-	52	-
	Oven	1	50	212	4.2
Period 4*	General	16	491	1,306	2.6
	Unpaved area	7	286	1,252	4.4
	Paved floor	3	74	71	1.0
	Plaster basin	1	5	8	1.6
	Hearth	6	67	77	1.1
	Grave	26	495	1,214	2.4
	Post hole	1	4	6	1.5
	Pit	14	569	1,749	3.1
	Wall collapse	1	16	23	1.4
	Stone setting	3	75	112	1.5
	Stakescape	1	50	122	2.4
	Misc.	1	2.5	1	0.4
	Fill	48	1,586	3,603	2.3
	Pot spread	7	118	97	0.8
	Oven	1	2	6	3.0
	Fireplace	3	49	41	0.8

* Fourteen of the seventeen samples from Periods 3B and 4 for which the litres of deposit is unknown have not been used in these calculations. The three Period 3B pot spread samples are included as they do not effect the other calculations.

Table 23.5. Flora sample data for Period 2 (16 samples)

Sample number	*Context type*	*Litres*	*Items*	*Items /litre*	*Wheat: barley*	*Glumes :grain*	*Rachis :grain*	*Weeds :cereal*	*Cereal /litre*	*Weed /litre*
428	General	32	19	0.6	-	-	-	10.0	0.03	0.3
284	Pit	32	126	3.9	0.0	-	0.3	3.3	0.3	0.9
418	Pit	50	253	5.1	-	-	-	3.3	0.2	0.8
420	Pit	250	1,407	5.6	0.3	6.3	0.6	6.2	0.3	1.7
450	Pit	80	204	2.5	0.0	-	0.0	16.8	0.1	1.9
451	Pit	50	96	2.0	0.0	-	0.0	19.2	0.1	1.5
464	Pit	50	100	2.0	1.0	-	0.0	4.5	0.2	0.7
468	Pit	50	40	0.8	0.0	-	0.0	16.0	0.02	0.3
477	Pit	50	13	0.3	0.0	-	1.0	8.0	0.02	0.2
285	Fill	30	36	1.2	-	-	-	8.3	0.1	0.8
469	Fill	50	54	1.1	0.0	-	0.0	3.8	0.1	0.4
470	Fill	50	16	0.3	-	-	-	5.0	0.02	0.1
471	Fill	50	52	1.0	0.0	-	0.0	4.5	0.1	0.5
472	Fill	50	51	1.0	0.6	-	0.0	1.7	0.2	0.4
473	Fill	10	8	0.8	-	-	-	-	0.0	0.7
474	Fill	50	446	8.9	1.0	-	0.2	26.4	0.2	5.8
Total		934	2,921	3.1						

Table 23.6. Flora sample data for Period 3A (24 samples)

Sample number	*Context type*	*Litres*	*Items*	*Items/ litre*	*Wheat: barley*	*Glumes :grain*	*Rachis :grain*	*Weeds: cereal*	*Cereal /litre*	*Weeds /litre*
265	General	50	58	1.2	-	-	-	-	0.0	0.5
435	General	50	282	5.6	1.5	-	1.0	17.9	0.2	2.9
463	Paved area	50	70	1.4	-	-	-	9.7	0.1	0.6
316	Pit	48	698	14.5	2.4	0.3	1.6	7.8	0.9	6.8
319	Pit	90	1,880	21.0	1.3	0.0	0.1	9.0	0.4	4.0
386	Pit	104	18	0.2	1.0	-	0.0	0.5	0.02	0.01
391	Pit	50	5	0.1	-	-	-	2.0	0.02	0.04
404	Pit	32	1,516	47.4	-	-	-	-	0.0	0.2
421	Pit	50	106	2.1	0.5	-	0.0	14.2	0.1	1.1
430	Pit	50	419	8.4	0.6	-	0.1	10.5	0.4	3.8
449	Pit	50	76	1.5	2.0	-	0.0	7.5	0.1	0.9
466	Pit	18	12	0.7	-	-	-	-	0.0	0.4
313	Fill	32	193	6.0	0.3	-	0.0	4.5	0.5	2.4
318	Fill	32	709	22.2	1.0	-	0.1	6.3	1.2	7.3
334	Fill	48	27	0.6	-	-	-	3.5	0.04	0.1
395	Fill	50	22	0.4	-	-	-	-	0.0	0.2
398	Fill	50	86	1.7	0.0	-	0.0	22.0	0.02	0.4
416	Fill	12	17	1.4	0.0	-	0.0	4.0	0.1	0.3
442	Fill	17	12	0.7	0.0	-	0.0	3.0	0.1	0.2
461	Fill	50	328	6.6	0.3	-	0.0	23.1	0.2	4.2
462	Fill	50	83	1.7	0.0	-	0.0	17.5	0.04	0.7
465	Fill	16	5	0.3	-	-	-	-	0.0	0.3
452	Potspread	16	2	0.1	-	-	-	-	0.0	0.1
321	Disturbance	50	1,632	33.0	4.0	0.0	1.3	9.1	0.8	6.9
Total		1,065	8,256	7.7						

Table 23.7. Flora sample data for Period 3B (55 samples)

Sample number	*Context type*	*Litres*	*Items*	*Items/ litre*	*Wheat: barley*	*Glume :grain*	*Rachis :grain*	*Weeds: cereal*	*Cereal /litre*	*Weed /litre*
367	General	20	28	1.4	-	-	-	-	0.0	1.0
383	General	100	357	3.6	0.3	-	0.2	7.7	0.2	1.2
413	General	50	116	2.3	0.5	-	0.0	9.7	0.1	1.2
415	General	50	20	0.4	0.0	-	0.0	11.0	0.02	0.2
432	General	63	170	2.7	0.3	1.0	0.7	17.2	0.1	1.4
437	General	50	84	1.7	-	-	-	-	0.0	0.9
354	Unpaved area	100	34	0.4	0.0	-	0.0	24.0	0.01	0.2
382	Paved area	110	31	0.3	0.0	-	0.0	6.0	0.03	0.2
333	Hearth	50	33	0.7	-	-	-	-	0.0	0.2
101	Grave	8	2	0.2	-	-	-	-	0.0	0.1
108	Grave	8	2	0.2	-	-	-	-	0.0	0.0
114	Grave	-	1	-	-	-	-	-	-	-
115	Grave	6	2	0.3	-	-	-	-	0.0	0.0
377	Grave	12	3	0.2	-	-	-	-	0.0	0.2
412	Grave	50	30	0.6	-	-	-	-	0.0	0.3
403	Posthole	4	2	0.5	-	-	-	1.0	0.2	0.2
239	Pit	50	55	1.1	0.0	-	1.0	13.0	0.02	0.3
259	Pit	-	2	-	-	-	-	-	-	-
261	Pit	-	2	-	-	-	-	-	-	-
297	Pit	48	63	1.3	-	-	-	-	0.0	0.7
299	Pit	10	53	5.3	-	-	-	-	0.0	2.0
300	Pit	176	105	0.6	-	-	-	-	0.0	0.1
305	Pit	8	8	1.0	-	-	-	-	0.0	0.6
330	Pit	72	140	1.9	0.0	-	1.0	6.0	0.04	0.2
355	Pit	40	54	1.3	-	-	-	34.0	0.03	0.8
364	Pit	12	14	1.1	-	-	-	-	0.0	0.5
372	Pit	10	28	2.8	-	-	-	23.0	0.1	2.3
407	Pit	40	22	0.5	-	-	-	10.0	0.03	0.02
385	Pit	16	5	0.3	-	-	-	-	0.0	0.2
422	Wall collapse	20	13	0.6	-	-	-	-	0.0	0.5
207	Plaster/paving	28	5	0.2	1.0	-	0.0	1.0	0.1	0.1
126	Fill	16	168	10.5	0.0	-	0.0	14.0	0.2	3.5
130	Fill	16	2	0.1	-	-	-	-	0.0	0.1

151	Fill	9	3	0.3	-	-	-	1.0	0.1	0.1
154	Fill	16	3	0.2	-	-	-	-	0.0	0.1
168	Fill	16	5	0.3	-	-	-	-	0.0	0.1
212	Fill	7	25	3.6	0.0	-	0.0	0.9	1.1	1.0
213	Fill	8	5	0.6	-	-	-	-	0.0	0.1
219	Fill	50	55	1.1	-	-	-	-	0.0	0.1
224	Fill	5	5	1.0	-	-	-	0.0	0.8	0.0
290	Fill	64	39	0.6	-	-	-	-	0.0	0.3
291	Fill	16	1	0.1	-	-	-	-	0.0	0.1
301	Fill	64	63	1.0	-	-	-	-	0.0	0.1
302	Fill	32	36	1.1	-	-	-	-	0.0	0.7
306	Fill	48	101	2.1	-	-	-	22.5	0.04	1.0
332	Fill	50	90	1.8	-	-	-	-	0.0	0.8
335	Fill	3	4	1.3	-	-	-	-	0.0	0.0
387	Fill	56	11	0.2	-	-	-	2.0	0.02	0.04
410	Fill	50	16	0.3	0.0	-	0.0	9.0	0.02	0.2
414	Fill	50	29	0.6	-	-	-	-	0.0	0.2
448	Fill	50	45	0.9	0.0	-	0.0	13.5	0.04	0.5
251	Potspread	-	1	-	-	-	-	-	-	-
252	Potspread	-	1	-	-	-	-	-	-	-
258	Potspread	-	50	-	0.0	-	0.0	5.0	-	-
311	Oven	50	212	4.2	-	-	-	151.0	0.02	3.0
Total		1,887	2,454	1.3						

Table 23.8. Flora sample data for Period 4 (150 samples)

Sample number	*Context type*	*Litres*	*Items*	*Items /litre*	*Wheat :barley*	*Glumes :grain*	*Rachis :grain*	*Weeds: cereal*	*Cereal /litre*	*Weeds /litre*
147	General	16	39	2.4	-	-	-	-	0.0	0.7
148	General	16	44	2.7	-	-	-	-	0.0	0.6
155	General	-	2	-	-	-	-	-	-	-
159	General	16	15	0.9	-	-	-	-	0.0	0.2
184	General	8	37	4.6	-	-	-	-	0.0	1.2
185	General	16	43	2.7	0.0	-	0.0	4.0	0.1	0.2
193	General	17	67	3.9	-	-	-	-	0.0	0.5
222	General	50	51	1.0	-	-	-	-	0.0	0.3
223	General	50	72	1.4	-	-	-	-	0.0	0.3
273	General	50	170	3.4	-	-	-	-	0.0	0.9
280	General	50	72	1.4	-	-	-	-	0.0	0.6
329	General	12	6	0.5	-	-	-	-	0.0	0.2
342	General	40	232	5.8	-	-	-	-	0.0	1.0
351	General	50	50	1.0	-	-	-	-	0.0	0.3
358	General	50	235	4.7	0.0	-	0.5	21.5	0.1	2.6
397	General	0.25	3	12.0	-	-	-	-	0.0	4.0
440	General	50	170	3.4	-	-	-	-	0.0	1.4
233	Unpaved area	50	41	0.8	0.0	-	0.0	3.0	0.04	0.1
236	Unpaved area	50	135	2.7	-	-	-	-	0.0	0.2
350	Unpaved area	16	46	2.9	0.0	-	0.0	26.0	0.1	1.6
356	Unpaved area	50	57	1.1	-	-	-	-	0.0	0.7
359	Unpaved area	50	404	8.1	3.0	-	0.0	22.5	0.1	2.7
360	Unpaved area	50	511	10.2	1.0	0.0	0.0	33.4	0.3	9.3
376	Unpaved area	20	58	2.9	-	-	-	-	0.0	0.8
122	Paved area	8	2	0.2	-	-	-	-	0.0	0.2
149	Paved area	16	1	0.1	-	-	-	-	0.0	0.1
384	Paved area	50	68	1.4	-	-	-	11.0	0.1	0.7
220	Plaster basin	5	8	1.6	-	-	-	-	0.0	0.2
104	Hearth	3	1	0.3	-	-	-	-	0.0	0.3
110	Hearth	-	2	-	-	-	-	-	-	-
165	Hearth	16	9	0.6	-	-	-	3.0	0.1	0.2
178	Hearth	8	8	1.0	-	-	-	-	0.0	0.6
235	Hearth	8	26	3.2	-	-	-	-	0.0	0.0
338	Hearth	8	12	1.5	-	-	-	-	0.0	0.4
362	Hearth	24	21	0.9	-	-	-	-	0.0	0.3
109	Grave	8	9	1.1	-	-	-	-	0.0	0.4
140	Grave	8	7	0.9	-	-	-	-	0.0	0.5
141	Grave	8	10	1.2	-	-	-	3.0	0.1	0.4
145	Grave	16	5	0.3	-	-	-	-	0.0	0.0
171	Grave	16	13	0.8	-	-	-	5.0	0.1	0.3
175	Grave	24	18	0.7	-	-	-	-	0.0	0.2
208	Grave	16	22	1.4	-	-	-	-	0.0	0.3

221	Grave	5	4	0.8	-	-	-	-	0.0	0.0
229	Grave	50	123	2.5	-	-	-	-	0.0	0.4
230	Grave	50	53	1.1	-	-	-	6.0	0.02	0.1
241	Grave	50	254	5.1	0.5	-	0.5	16.3	0.1	1.0
243	Grave	150	246	1.6	0.0	-	0.0	72.0	0.01	0.5
244	Grave	50	52	1.0	-	-	-	-	0.0	0.08
264	Grave	16	69	4.3	-	-	-	-	0.0	1.3
276	Grave	14	40	2.9	-	-	-	-	0.0	0.9
277	Grave	16	82	5.1	-	-	-	-	0.0	0.2
279	Grave	0.5	21	42.0	-	-	-	-	0.0	16.0
288	Grave	23	143	6.2	-	0.0	-	17.5	0.1	1.5
293	Grave	13	88	6.8	-	-	-	-	0.0	1.7
296	Grave	16	69	4.3	0.0	-	0.0	16.0	0.06	1.0
347	Grave	6	11	1.8	-	-	-	-	0.0	1.0
365	Grave	30	28	0.9	-	-	-	-	0.0	0.4
381	Grave	0.5	4	8.0	-	-	-	-	0.0	4.0
393	Grave	3	10	3.3	-	-	-	4.0	0.3	1.3
399	Grave	6	9	1.5	-	-	-	6.0	0.2	1.0
423	Grave	16	61	3.8	-	-	-	-	0.0	1.6
379	Posthole	4	6	1.5	-	-	-	-	0.0	0.8
100	Pit	-	3	-	-	-	-	-	-	-
124	Pit	-	60	-	-	-	-	15.0	-	-
125	Pit	56	737	13.6	0.2	-	0.6	11.8	0.4	4.4
142	Pit	-	1	-	-	-	-	-	-	-
169	Pit	40	4	0.1	-	-	-	-	0.0	0.03
188	Pit	-	1	-	-	-	-	-	-	-
194	Pit	16	78	4.9	-	-	-	28.0	0.1	1.7
225	Pit	50	35	0.7	-	-	-	-	0.0	0.2
226	Pit	50	105	2.1	-	-	-	33.0	0.02	0.7
227	Pit	50	52	1.0	-	-	-	-	0.0	0.2
228	Pit	50	21	0.4	-	-	-	0.5	0.04	0.02
231	Pit	16	67	4.2	-	-	-	14.0	0.1	0.1
234	Pit	8	5	0.6	-	-	-	-	0.0	0.2
249	Pit	-	1	-	-	-	-	-	-	-
262	Pit	48	164	3.4	-	-	-	-	0.0	0.3
268	Pit	45	113	2.5	-	-	-	-	0.0	1.1
274	Pit	50	66	1.3	-	-	-	-	0.0	0.6
307	Pit	50	173	3.5	-	-	-	-	0.0	2.0
447	Pit	40	129	3.2	-	-	-	-	0.0	1.4
195	Wall collapse	16	23	1.4	-	-	-	-	0.0	0.2
308	Stone setting	45	37	0.8	-	-	-	20.0	0.02	0.4
309	Stone setting	6	7	1.2	-	-	-	-	0.0	0.7
310	Stone setting	24	68	2.8	-	-	-	-	0.0	0.9
242	Stakescape	50	122	2.4	-	-	-	18.0	0.04	0.7
137	Misc.	2.5	1	0.4	-	-	-	-	0.0	0.0
118	Fill	16	19	1.2	-	-	-	1.6	0.4	0.7
119	Fill	16	3	0.2	-	-	-	2.0	0.1	0.1
121	Fill	16	31	2.0	-	-	-	24.0	0.1	1.5
127	Fill	16	60	3.7	-	-	-	-	0.0	0.6
128	Fill	16	27	1.7	-	-	-	-	0.0	0.2
129	Fill	16	16	1.0	-	-	-	-	0.0	0.4
134	Fill	8	5	0.6	-	-	-	-	0.0	0.0
138	Fill	20	3	0.1	-	-	-	-	0.0	0.0
143	Fill	4	4	1.0	-	-	-	1.0	0.2	0.2
144	Fill	16	3	0.2	-	-	-	-	0.0	0.1
146	Fill	14	49	3.5	0.0	-	0.0	0.6	2.2	1.3
150	Fill	-	15	-	-	-	-	1.0	-	-
158	Fill	8	19	2.4	-	-	-	6.0	0.1	0.7
160	Fill	-	11	-	-	-	-	-	-	-
162	Fill	8	2	0.2	-	-	-	-	0.0	0.0
166	Fill	-	9	-	-	-	-	-	-	-
170	Fill	-	1	-	-	-	-	-	-	-
172	Fill	8	15	2.0	-	-	-	-	0.0	0.0
173	Fill	8	15	2.0	-	-	-	-	0.0	0.5
174	Fill	16	27	1.7	-	-	-	-	0.0	0.5
177	Fill	16	5	0.3	-	-	-	-	0.0	0.1
182	Fill	16	24	1.5	-	-	-	-	0.0	0.4
183	Fill	21	40	1.9	0.0	-	0.0	1.2	0.2	0.3
186	Fill	16	35	2.2	-	-	-	-	0.0	0.6
192	Fill	16	4	0.2	-	-	-	-	0.0	0.1
196	Fill	24	10	0.4	-	-	-	-	0.0	0.1
197	Fill	6	3	0.5	-	-	-	-	0.0	0.2
209	Fill	35	35	1.0	-	-	-	1.0	0.1	0.1
211	Fill	8	4	0.5	-	-	-	-	0.0	0.1
232	Fill	50	47	0.9	0.0	-	0.0	1.5	0.04	0.06

263	Fill	76	133	1.7	-	-	-	26.0	0.03	0.7
266	Fill	50	87	1.7	0.0	-	0.0	7.4	0.1	0.7
269	Fill	50	346	7.0	0.0	-	0.0	21.8	0.2	4.0
270	Fill	50	470	9.4	1.0	-	1.0	33.5	0.1	4.0
271	Fill	24	118	4.9	-	-	-	-	0.0	2.5
275	Fill	64	164	2.6	-	-	-	-	0.0	0.5
281	Fill	90	247	2.7	-	-	-	26.0	0.01	0.3
303	Fill	5	12	2.4	-	-	-	-	0.0	1.2
341	Fill	50	29	0.6	0.0	-	0.0	15.0	0.02	0.3
343	Fill	16	167	10.4	0.0	-	0.0	16.0	0.2	3.0
344	Fill	50	325	6.5	0.0	-	0.0	37.0	0.1	3.0
345	Fill	16	44	2.7	-	-	-	-	0.0	1.3
352	Fill	16	152	9.5	-	-	-	-	0.0	1.5
366	Fill	15	3	0.2	-	-	-	-	0.0	0.1
394	Fill	5	15	3.0	-	-	-	-	0.0	0.6
396	Fill	6	4	0.7	-	-	-	-	0.0	0.3
408	Fill	50	100	2.0	-	-	-	-	0.0	0.7
409	Fill	50	80	1.6	-	-	-	-	0.0	0.9
411	Fill	15	67	4.5	-	-	-	-	0.0	1.5
436	Fill	50	99	2.0	0.0	-	0.5	2.9	0.2	0.5
438	Fill	16	70	4.4	-	-	-	-	0.0	1.5
441	Fill	292	129	0.4	-	-	-	59.0	0.0	0.2
139	Pot spread	24	22	0.9	-	-	-	9.0	0.04	0.4
205	Pot spread	8	4	0.5	-	-	-	-	0.0	0.2
210	Pot spread	7	30	4.3	0.0	-	0.0	1.0	0.3	0.3
214	Pot spread	3	1	0.3	-	-	-	-	0.0	0.3
439	Pot spread	20	16	0.8	-	-	-	-	0.0	0.4
443	Pot spread	26	22	0.8	-	-	-	-	0.0	0.6
444	Pot spread	30	2	0.1	-	-	-	-	0.0	0.0
287	Oven	2	6	3.0	-	-	-	-	0.0	1.0
326	Fireplace	16	7	0.4	-	-	-	-	0.0	0.2
388	Fireplace	25	28	1.1	-	-	-	-	0.0	0.4
389	Fireplace	8	6	0.7	-	-	-	-	0.0	0.1
Total		3,890	9,794	2.5						

Table 23.9. Summary of seed densities by location and period

Terrace *Location*	*Period*	*Number of samples*	*Number of litres*	*Number of items*	*Items per litre*	*Crop seeds per litre*	*Weeds per litre*	*Fruits /Nuts /Tubers*
Upper	2	11	540	1,080	2.0	0.10	1.2	0.4
Upper	3A	16	669	6,507	9.7	0.30	3.0	5.3
Lower	2	5	394	1,841	4.7	0.20	1.3	1.1
Lower	3A	8	396	1,749	4.4	0.02	0.2	0.1
Lower	3B*	49	1,887	2,397	1.3	0.03	0.5	0.4
Lower	4*	139	3,890	9,688	2.5	0.04	0.9	1.3

* There are seventeen samples from Periods 3B and 4 for which the litres of deposit is unknown and these have not been used in these calculations.

Table 23.10. Contexts with flora in Upper Terrace

Period	*Context type*	*Number of samples*	*Number of litres*	*Number of items*	*Items per litre*
2	Pit	5	280	453	1.6
2	Fill	6	260	627	2.4
3A	General	1	50	282	5.6
3A	Paved area	1	50	70	1.4
3A	Pit	6	306	3,191	10.4
3A	Fill	6	197	1,330	6.7
3A	Pot spread	1	16	2	0.1
3A	Disturbance	1	50	1,632	33.0
Total		27	1,209	7,587	6.2

Table 23.11. Contexts with flora in Main Area

Period	*Context type*	*Number of samples*	*Number of litres*	*Number of items*	*Items per litre*
2	General	1	32	19	0.6
2	Pit	3	332	1,786	5.4
2	Fill	1	30	36	1.2
3A	General	1	50	58	1.2
3A	Pit	3	186	1,539	8.3
3A	Fill	4	160	152	1.0
3B	General	5	333	775	2.3
3B	Unpaved area	1	100	34	0.3
3B	Paved area	1	110	31	0.3
3B	Hearth	1	50	33	0.7
3B	Grave	5	84	39	0.5
3B	Posthole	1	4	2	0.5
3B	Pit	11	482	547	1.1
3B	Wall collapse	1	20	13	0.6
3B	Plaster/paving	1	28	5	0.2
3B	Fill	20	626	706	1.0
3B	Pot spread	3	-	52	-
3B	Oven	1	50	212	4.2
4	General	16	491	1,306	2.6
4	Unpaved area	7	286	1,252	4.4
4	Paved area	3	74	71	1.0
4	Plaster basin	1	5	8	1.6
4	Hearth	6	67	77	1.1
4	Grave	26	495	1,214	2.4
4	Posthole	1	4	6	1.5
4	Pit	14	569	1,749	3.1
4	Wall collapse	1	16	23	1.4
4	Stone setting	3	75	112	1.5
4	Stakescape	1	50	122	2.4
4	Misc.	1	2.5	1	0.4
4	Fill	48	1,586	3,606	2.3
4	Pot spread	7	118	97	0.8
4	Oven	1	2	6	3.0
4	Fireplace	3	49	41	0.8
Total		203	6,566.5	15,730	2.4

Note: Fourteen of the seventeen samples from Periods 3B and 4 for which the litres of deposit is unknown have not been used in these calculations. The three Period 3B pot spread samples are included as they do not effect the other calculations.

Table 23.12. Measurements (mm) of economic species by period

Species / *Period*	*Number*	*Meas.*	*L*	*W*	*Th*
Triticum monococcum/T. dicoccum					
2	1	-	5.3	2.6	2.0
Triticum dicoccum					
2	1	-	6.3	3.2	2.3
3A	2	Min	4.0	2.0	1.9
		Max	5.0	3.0	2.8
		Avg	4.50	2.50	2.35
All	3	Min	4.0	2.0	1.9
		Max	6.3	3.2	2.8
		Avg	5.10	2.73	2.33
Triticum cf. dicoccum					
2	1	-	5.2	2.5	2.2
3A	1	-	4.0	2.0	1.5
All	3	Min	4.0	2.0	1.5
		Max	5.2	2.5	2.3
		Avg	4.60	2.27	2.00
Triticum durum/T. aestivum					
3A	31	Min	3.8	2.1	2.1
		Max	6.0	3.6	3.1
		Avg	4.69	2.92	2.50
3B	1	-	5.0	3.2	2.8
4	7	Min	2.9	1.5	1.4
		Max	5.3	3.3	3.2
		Avg	4.44	2.64	2.44
All	40	Min	2.9	1.5	1.4
		Max	6.0	3.6	3.2
		Avg	4.65	2.88	2.50
Triticum cf. durum/aestivum					
2	1	-	4.7	2.2	2.1
3A	2	Min	5.0	3.0	2.5
		Max	5.0	3.0	3.0
		Avg	5.0	3.0	2.75
3B	1	-	4.8	2.4	2.0
All	10	Min	4.5	2.2	2.0
		Max	5.3	3.2	3.0
		Avg	4.85	2.77	2.41
Triticum sp.					
2	2	Min	6.0	2.8	1.8
		Max	6.5	3.0	1.9
		Avg	6.25	2.9	1.85
Hordeum sativum					
2	21	Min	4.5	2.0	1.2
		Max	7.1	3.8	2.5
		Avg	5.64	2.71	1.86
3A	16	Min	4.1	2.0	1.5
		Max	6.6	3.8	3.6
		Avg	5.71	2.99	2.23
3B	3	Min	6.1	2.4	1.8
		Max	7.3	3.5	2.8
		Avg	6.57	3.13	2.2
4	6	Min	5.1	2.2	2.0
		Max	8.0	3.9	2.9
		Avg	6.32	3.03	2.35
All	60	Min	4.1	2.0	1.2
		Max	8.0	4.0	3.6
		Avg	5.84	2.92	2.14
Lens sp.					
2	41	Min	2.1	2.0	1.1
		Max	3.8	3.6	2.9
		Avg	3.08	2.92	1.99
3A	49	Min	2.0	1.9	1.3
		Max	4.2	4.0	2.6
		Avg	3.18	2.93	1.98
3B	18	Min	2.5	2.0	1.6
		Max	4.1	3.9	2.8
		Avg	3.2	3.02	2.13

4	48	Min	2.0	1.5	1.0
		Max	4.0	3.9	2.9
		Avg	3.27	3.04	1.98
All	195	Min	2.0	1.5	1.0
		Max	4.9	4.0	3.2
		Avg	3.18	2.97	2.00
Ficus carica					
2	8	Min	1.0	0.60	0.50
		Max	1.4	1.2	1.0
		Avg	1.2	0.89	0.75
3A	19	Min	0.80	0.50	0.50
		Max	1.4	1.0	1.0
		Avg	1.11	0.82	0.71
3B	23	Min	0.80	0.40	0.40
		Max	1.5	1.0	1.0
		Avg	1.06	0.79	0.70
4	66	Min	0.70	0.50	0.20
		Max	1.5	1.5	1.3
		Avg	1.14	0.85	0.71
All	150	Min	0.70	0.40	0.20
		Max	1.5	1.5	1.9
		Avg	1.12	0.84	0.73
Vitis vinifera					
2	2	Min	5.0	3.8	3.0
		Max	5.2	4.0	4.0
		Avg	5.1	3.9	3.5
3A	12	Min	5.0	3.8	2.5
		Max	6.2	4.5	4.0
		Avg	5.42	4.12	3.23
3B	4	Min	4.0	3.0	2.5
		Max	5.2	4.2	3.2
		Avg	4.85	3.78	2.90
4	33	Min	4.0	3.0	2.5
		Max	7.0	4.9	4.3
		Avg	5.02	4.03	3.30
All	63	Min	4.0	3.0	2.5
		Max	7.0	5.1	4.3
		Avg	5.09	4.40	3.23
Vitis vinifera fruit					
All	1	-	7.2	5.1	5.0
Vitis vinifera stems					
All	21	Min	1.5	1.8	1.7
		Max	3.9	2.8	2.8
		Avg	2.67	2.19	2.17
Olea europaea					
2	4	Min	8.5	5.6	6.0
		Max	13.7	7.8	6.9
		Avg	10.8	6.50	6.30
3A	1	-	11.0	7.5	7.4
All	7	Min	8.0	5.5	6.0
		Max	14.8	7.8	7.4
		Avg	11.0	6.50	6.52
Pistacia cf. atlantica/terebinthus					
2	12	Min	4.1	3.1	2.1
		Max	6.0	5.1	4.0
		Avg	5.11	4.13	3.22
3A	5	Min	3.9	3.6	2.2
		Max	5.3	4.2	3.4
		Avg	4.90	3.88	2.82
3B	7	Min	3.5	3.3	2.6
		Max	5.0	5.3	4.0
		Avg	4.64	4.39	3.31
4	9	Min	4.0	3.2	2.5
		Max	5.9	5.8	5.0
		Avg	5.02	4.17	3.43
All	52	Min	3.5	3.0	1.6
		Max	6.0	5.8	5.0
		Avg	4.88	4.10	3.12
Celtis sp.					
2	1	-	6.6	6.2	5.5
3B	1	-	7.3	7.0	8.4
All	7	Min	6.6	6.0	5.5
		Max	7.5	7.3	8.4
		Avg	7.06	6.71	6.95
Juniperus sp.					
2	1	-	5.1	5.1	5.0
Linum usitatissimum					
3B	1	-	3.3	1.8	1.2
Capparis spinosa					
4	1	-	1.8	1.6	1.5

Table 23.13. Measurements (mm) of wild/weed species

Species				
Number	*Meas.*	*L*	*W*	*Th*
Adonis sp.				
7	Min	1.0	1.1	1.0
	Max	2.0	1.8	1.6
	Avg	1.61	1.47	1.41
PAPAVERACEAE				
1	-	0.60	0.40	0.30
Fumaria cf. densiflora type				
30	Min	1.5	1.5	1.2
	Max	2.0	2.0	2.0
	Avg	1.81	1.87	1.58
Fumaria sp. (Type A)				
1	-	3.0	3.0	2.8
Neslia cf. paniculata type				
8	Min	1.2	1.2	1.2
	Max	1.7	1.5	1.3
	Avg	1.39	1.36	1.23
CRUCIFERAE				
1	-	1.3	1.5	1.0
cf. Cleome sp. type				
1	-	1.2	1.2	1.5

cf. Spergula sp.				
8	Min	0.80	0.60	0.30
	Max	1.1	1.1	1.0
	Avg	0.98	0.89	0.73
Malva sp.				
45	Min	1.0	0.80	0.40
	Max	2.3	2.8	2.1
	Avg	1.39	1.39	1.02
cf. Trigonella type				
10	Min	1.3	0.80	0.60
	Max	2.8	2.0	2.8
	Avg	2.06	1.54	1.19
Medicago sp.				
1	-	2.8	1.7	1.3
Trifoliae tribe				
13	Min	0.80	0.60	0.50
	Max	2.0	2.0	1.2
	Avg	1.45	1.40	0.90
Scorpiurus muricatus				
13	Min	1.2	1.2	0.90
	Max	3.0	3.5	2.0
	Avg	2.19	2.5	1.41
Coronilla cf. scorpioides				
1	-	2.5	0.80	0.60
Vicia sp				
7	Min	1.3	1.4	1.8
	Max	2.5	2.4	2.3
	Avg	2.13	2.11	2.11
cf. Vicia sp.				
1	-	1.1	1.1	1.0
Lathyrus sp.				
4	Min	2.2	2.1	2.1
	Max	2.9	3.0	2.3
	Avg	2.55	2.55	2.20
cf. Lathyrus sp.				
1	-	2.1	2.6	2.0
Vicia/Lathyrus spp.				
36	Min	1.3	1.1	1.0
	Max	3.2	3.1	3.1
	Avg	2.60	2.38	1.80
cf. Vicia/Lathyrus spp.				
1	-	2.3	2.3	2.3
Small LEGUMINOSAE				
1	-	1.5	2.1	1.3
Large LEGUMINOSAE				
2	Min	2.8	3.0	1.5
	Max	2.9	3.1	2.1
	Avg	2.85	3.05	1.80

Bifora cf. testiculata type				
1	-	2.2	2.1	2.0
Bupleurum cf. subovatum type				
2	Min	2.0	1.3	1.1
	Max	2.3	1.3	1.1
	Avg	2.15	1.30	1.10
Galium sp. (Type A)				
79	Min	1.1	1.0	0.30
	Max	2.2	2.2	1.8
	Avg	1.57	1.49	1.28
Galium sp. (Type B)				
5	Min	2.8	2.8	2.1
	Max	3.0	2.8	2.2
	Avg	2.85	2.76	2.16
RUBIACEAE				
1	-	2.3	1.1	1.0
Valerianella cf. dentata				
9	Min	1.2	0.90	0.60
	Max	1.5	1.0	0.90
	Avg	1.32	0.97	0.74
Chrysanthemum coronarium/segetum				
5	Min	2.4	1.3	1.0
	Max	2.8	2.0	2.1
	Avg	2.57	1.70	1.47
Centaurea sp.				
1	-	1.5	0.90	0.80
COMPOSITAE (Type A)				
61	Min	0.40	0.20	0.20
	Max	1.0	0.50	0.50
	Avg	0.69	0.36	0.36
COMPOSITAE (Type B)				
3	Min	1.2	0.60	0.60
	Max	5.3	2.6	2.1
	Avg	3.67	1.73	1.57
PRIMULACEAE				
3	Min	1.1	1.0	0.70
	Max	1.3	1.1	1.0
	Avg	1.17	1.03	0.83
Heliotropium sp.				
1	-	1.5	1.2	1.0
Buglossoides arvensis (c)				
39	Min	2.2	1.2	1.5
	Max	3.3	2.6	2.1
	Avg	2.97	1.98	1.83
Buglossoides tenuiflorum (c)				
1	-	3.0	1.9	1.6
Echium sp. (c)				
1	-	3.6	3.5	2.7

cf. Cuscuta sp.				
1	-	2.2	2.0	2.0
Plantago sp.				
4	Min	1.7	0.90	0.50
	Max	2.0	1.1	0.90
	Avg	1.88	1.0	0.65
Chenopodium cf. album				
7	Min	1.0	1.0	0.30
	Max	1.3	1.3	1.1
	Avg	1.16	1.17	0.71
Suaeda cf. fruticosa type				
1	-	1.0	1.0	0.80
Rumex sp.				
3	Min	0.60	0.80	0.60
	Max	2.1	1.5	1.5
	Avg	1.43	1.13	1.07
Thymelaea cf. passerina type				
4	Min	1.5	1.0	1.0
	Max	2.0	1.2	1.2
	Avg	1.83	1.13	1.13
Euphorbia peplus	5	Min	1.2	0.60
0.70				
	Max	1.5	1.0	1.0
	Avg	1.38	0.88	0.90
Ornithogalum/Muscari/Bellevalia type				
1	-	2.3	2.0	2.0
Schoenus nigricans (c)				
32	Min	1.2	0.80	0.80
	Max	2.0	1.3	1.2
	Avg	1.62	1.04	1.02
CYPERACEAE (Type A) (c)				
8	Min	1.1	0.90	0.50
	Max	1.4	1.1	0.70
	Avg	1.2	1.0	0.60
Lolium sp.				
171	Min	2.0	1.0	0.40
	Max	5.0	3.1	2.0
	Avg	3.55	1.37	1.03
Phalaris sp.				
12	Min	1.7	1.0	0.40
	Max	3.0	2.0	1.0
	Avg	2.08	1.18	0.65
Hordeum bulbosum tuber				
1	-	11.0	7.3	8.5
Fungal spores indeterminate				
45	Min	0.10	0.10	0.10
	Max	2.2	1.4	1.9
	Avg	0.60	0.58	0.59
Buglossoides arvensis (u)				
12	Min	2.8	1.8	1.7
	Max	3.2	2.1	2.1
	Avg	3.04	2.01	1.88
Buglossoides tenuiflorum (u)				
26	Min	1.5	1.2	1.0
	Max	3.5	2.8	2.7
	Avg	2.52	1.84	1.65
Echium sp. (u)				
4	Min	2.2	1.7	2.0
	Max	3.6	3.6	2.5
	Avg	2.95	2.53	2.15
Schoenus nigricans (u)				
54	Min	1.3	1.0	1.0
	Max	2.0	1.4	1.5
	Avg	1.69	1.12	1.11
CYPERACAE (Type A) (u)				
5	Min	1.1	1.0	0.50
	Max	1.2	1.1	0.80
	Avg	1.12	1.04	0.74

(c) - Charred Boraginaceae & Cyperaceae
(u) - Uncharred Boraginaceae & Cyperaceae