Appendix 4 – Plant macrofossils

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APPENDIX 4: CONTENTS

LIST OF ILLUSTRATIONS

1 INTRODUCTION

Previous palaeoenvironmental work undertaken as part of the assessment of material from St Patrick's identified the potential for further palaeoecological work from these deposits (Timpany 2007). For this analysis phase the main focus of the investigation was the primary occupation layer [142] dating to AD 1020–1210 and the basal layers of the medieval ditch [090 & 089]. These deposits were found to contain well-preserved organic material and thus a multi-disciplinary study including pollen (see Mighall Appendix 5), beetles (see Reilly Appendix 6) and plant macrofossils was undertaken. The results of the plant macrofossil analyses are presented here.

2 METHOD

Four ten litre bulk samples were chosen for analysis; three from the primary fills of the medieval ditch (sample 67 from Context [089]; samples 68 and 85, from Context [090]) and one from the primary occupation layer (sample 110, Context [142]). All samples were subject to flotation through a Siraf-style flotation tank and the floating debris (flot) collected in a 250μm sieve.

All plant macrofossil samples were analysed using a stereomicroscope at magnifications of × 10 and up to × 100 where necessary to aid identification. Identifications were confirmed using modern reference material and seed atlases including Cappers *et al* (2006). Results from the analyses have been plotted as plant macrofossil diagrams using the TILIA and TGView version 2.0.2 programmes (Grimm 2004). Diagrams follow the taxonomic order of Stace (1997).

3 RESULTS

3.1 Introduction

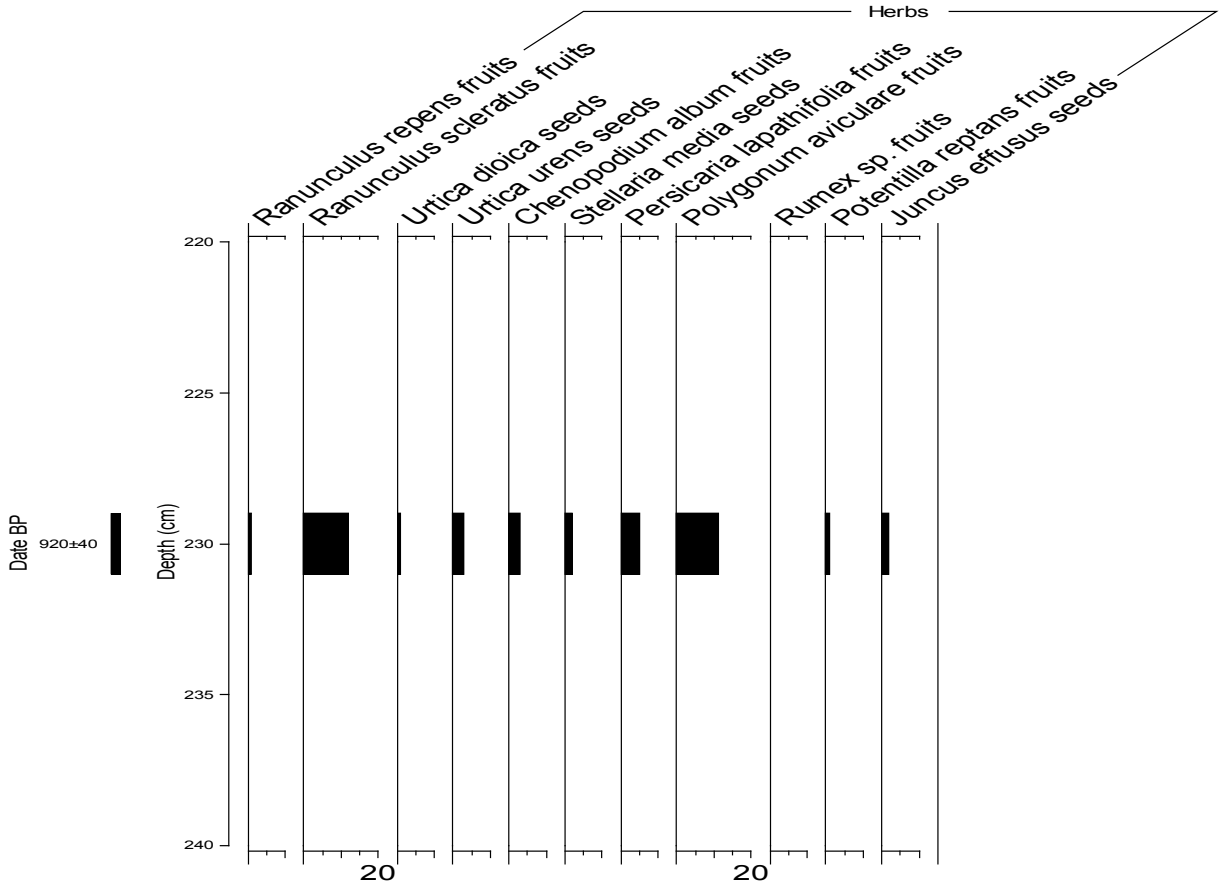
Preservation of material was found to be good in all samples, with waterlogging of sediments being the main mechanism for preservation of material. Cereal grain recovered from the samples was preserved through charring and is thus likely to indicate anthropogenic (ie domestic/commercial activities) mechanisms for preservation rather than natural (ie waterlogging) mechanisms. The results of the analyses are presented in illus 4.1 and 4.2.

3.2 Sample 110

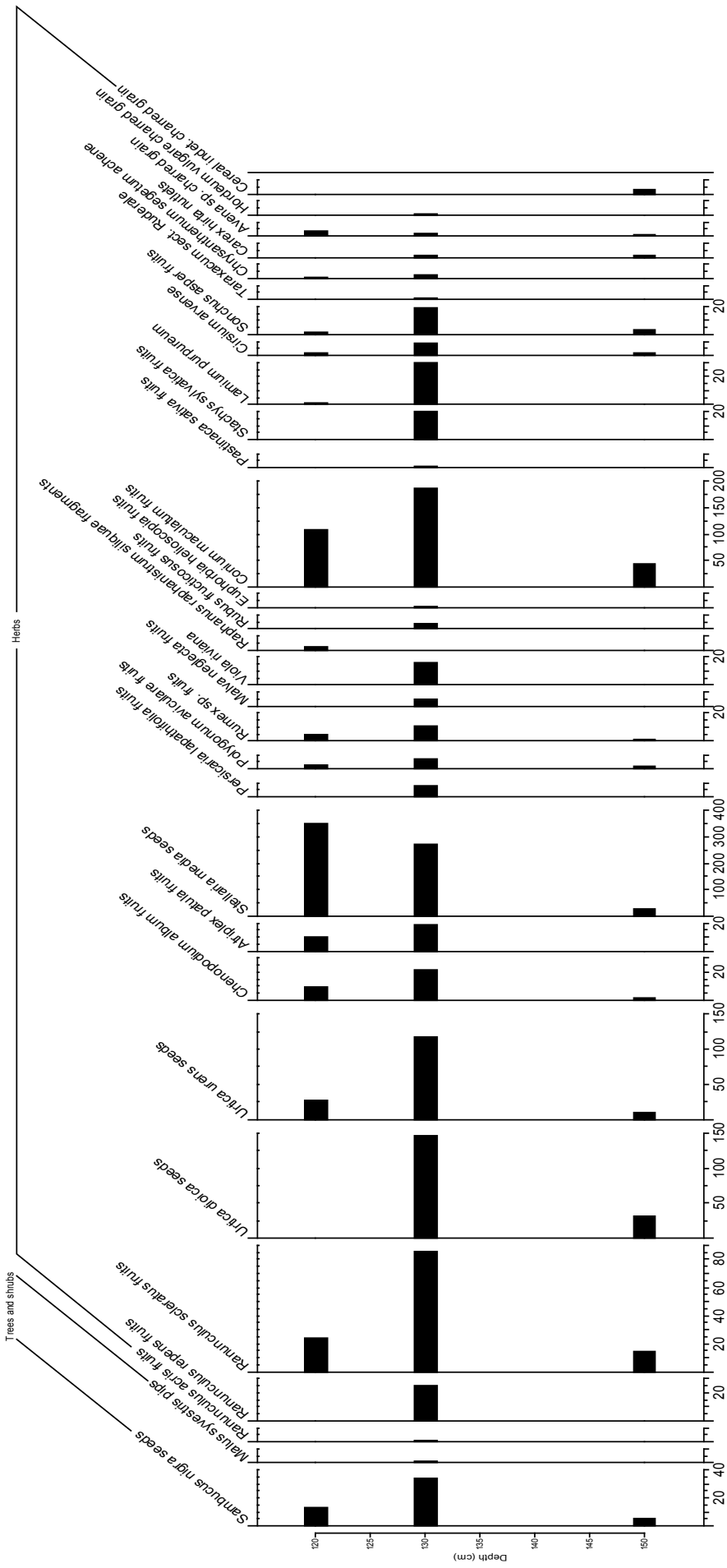
Sample 110 from the primary occupation layer was found to contain relatively sparse numbers of plant macrofossils (see illus 4.1). The largest numbers of fruits from within this sample were of *Ranunculus sceleratus* (celery-leaved buttercup), *Polygonum aviculare* (knotgrass) and *Persicaria lapithifolia* (pale persicaria). Smaller numbers of seeds and fruits were recovered from species including *Urtica urens* (small nettle), *Chenopodium album* (fat-hen), *Stellaria media* (common chickweed) and *Juncus effusus* (soft rush).

3.3 Samples 67, 68 and 85

Sample 68 is from the basal layer of the primary fill of the ditch [090] and sample 85 from just above this layer but both lie within this context [090]. Sample 67 is taken from the layer overlying the primary fill, context [089]. Sample 85 was found to contain the most abundant numbers of plant macrofossils, with sample 67 also having a rich assemblage (see illus 4.2). The assemblage from sample 68 was fairly sparse in comparison to the other two samples. The assemblages from the ditch deposit contained a number of species with particularly high numbers of seeds and fruits of *Ranunculus sceleratus*, *Stellaria media*, *Urtica dioica* (common nettle) and *Conium maculatum* (hemlock). Small numbers of charred cereal grain of *Avena* sp. (oat) and *Hordeum vulgare* (hulled barley) were also recovered within these assemblages.



Illus 4.1 Plant macrofossil diagram Context [142]



Illus 4.2 Plant macrofossil diagram Context [090]

4 DISCUSSION

4.1 Primary occupation layer (context [142])

The assemblage from this layer is dominated by taxa indicative of open waste ground and cultivated ground, including taxa such as *Polygonum aviculare*, *Persicaria lapithifolia*, *Stellaria media* and *Urtica urens* (Clapham *et al* 1962). However, the absence of taxa purely associated with cultivated ground suggests the assemblage is more likely to represent waste ground. There is some evidence of periodic pooling of water on the surface of this layer through the presence of *Ranunculus sceleratus* and *Juncus effusus* (Clapham *et al* 1962). The plant macrofossil assemblage thus indicates the local environment during this period was a waste ground area that was subject to periodic pooling of water.

4.2 Medieval ditch layers (contexts [089 & 090])

The assemblages from the medieval ditch contexts are representative principally of those plants that grew in or around the ditch following its construction. The basal layer of the ditch contains a relatively species-poor assemblage in comparison to the overlying layers (see illus 4.2). Taxa from within this layer are representative of plants growing in ephemeral pools of standing water, likely when the ditch was inundated, which suggests drainage of the ditch was poor. Such species include *Conium maculatum* and *Ranunculus sceleratus*. There is some evidence of *Sambucus nigra* (elder) in the vicinity of the ditch, with seeds present within the assemblage suggesting the area around the ditch was not completely devoid of trees. The presence of a small number of charred grains of *Avena* sp. and *Cerealia* indeterminate, are likely to have washed into the ditch and represent domestic/commercial activities taking place in the town (eg baking). The remainder of the assemblage of this layer constitutes species suggestive of waste and cultivated ground, including *Stellaria media*, *Sonchus asper* (prickly sow-thistle) and *Urtica dioica*.

The upper levels of the ditch contain a wider variety of species in greater abundance than the basal layer (see illus 4.2). However, despite this increase the assemblage still shows the same surrounding environment: a mixture of waste and cultivated ground. There is an increase in the representation of cultivated ground species within the upper layers with the appearance of species such as *Euphorbia helioscopia* (sun spurge) and *Viola riviana* (common dog-violet), suggesting that some cultivation was taking place near to the ditch. A number of taxa associated with damp meadows are present, including *Cirsium arvense* (creeping thistle) and *Carex hirta* (hairy sedge), which indicate that the drainage of these fields may have been poor and that these species may have grown amongst the cereals. The presence of charred *Avena* sp. and *Hordeum vulgare* grains in these levels shows that agrarian activities were taking place, although it is unknown whether these grains represent local crop usage or importing of crops from elsewhere. The charred grains are again believed to represent domestic/commercial activities in the town.

Of particular note within these samples, particularly that of sample 85, is the major increase in species associated with pooling of water, suggesting that the ditch was largely inundated during these periods. The rise in seed numbers of *Ranunculus sceleratus* and *Urtica dioica* in this sample may also indicate an increase in the amount of faecal matter being washed into the ditch from humans and animals. Both of these taxa are associated with habitats of extremely nitrogen-rich, periodically wetted and disturbed ground, such as the manured surrounds of streams where cattle water (Rodwell 2000). Rodwell (2000) notes that *R. sceleratus* is one of the few plants that will readily grow on the sludge beds of sewage farms. Thus the high amount of *R. sceleratus* fruits not only provides an ecological picture of the site but also an impression of the conditions on the Cowgate during this period.