BOTANICAL ANALYSIS OF SELECTED HISTORICALLY-OCCUPIED CAVE SITES IN THE LIMPOPO PROVINCE, SOUTH AFRICA

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DECLARATION

I declare that this Dissertation is my own, unaided work. It is being submitted for the Degree of Masters of Science at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at any other University.

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(Signature of candidate)

27th day of August 2013 in Braamfontein.

ABSTRACT

This study set out to identify and interpret botanical remains from Historic Cave, Balerno Main Shelter and Balerno Shelter 2 in the Limpopo Province. Botanical remains were identified through comparative collections, and quantified through a raw count and presence analysis. They were interpreted through literature on plant uses in southern Africa. Over 12 500 remains were recovered from Historic Cave, almost 1 500 from Balerno Main Shelter and only five from Balerno Shelter 2. Remains from Historic Cave fell into food, water, storage and *muti* categories of use. Balerno Main Shelter revealed plants in the water and *muti* categories. Balerno Shelter 2 had too few remains. The study demonstrated that plant remains can shed light on why cave sites were occupied, as the assemblages reflect different plant uses. The remains from Historic Cave describe a society living and taking refuge in a cave under siege. Balerno Main Shelter may have been used for ritual purposes.

To my family: those who could be here,
and especially to those who could not.

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DEFINITIONS, TERMS AND NOMENCLATURE

Carbonisation -

Carbonisation – the process whereby plant remains are converted into elemental carbon through burning (Dimbleby 1967:100-101)

Fruit -

Fruits are the product of flowering plants or angiosperms as they develop from the flowers (Langeheim & Thimann 1982: 321, 589; Moore et al 1995: 398). It acts as a protective vessel for the seeds and also provides the means of dispersal for the seeds (Langeheim & Thimann 1982: 321). Fruits develop from ovaries that have been fertilised and can also include other parts of the flower (Langeheim & Thimann 1982: 321-323, 589; Moore et al 1995: 398, 407; Lack & Evans 2001: 52). The ovary wall matures into the fruit wall, or pericarp (Ingrouille & Eddie 2006: 149). Fruits are dry or fleshy (Moore et al 1995: 407).

The term 'fruit' can also be used for certain fungi where the 'fruiting body' describes the reproductive structures (Langeheim & Thimann 1982: 589).

Macroremains –

Macroremains – plant remains that can be seen or identified by the naked eye or under low-power magnification. These remains include seeds, wood and nuts (Pearsall 1989).

Microremains –

Microremains – plant remains that cannot be identified by the naked eye and that require high-power magnification to do so. Microremains include phytoliths, pollen and charcoal (Pearsall 1989).

Nuts –

Nuts are dry fruits that generally contain a single seed, although they can contain a few seeds (Langeheim & Thimann 1982: 323, 325, 595; Moore *et al* 1995: 399;

van Wyk & Gericke 2007: 19). The pericarp, or ovary wall, is hard, thick and woody or stony (Langeheim & Thimann 1982: 323-325, 595; Moore *et al* 1995: 399). These fruits are indehiscent; they do not split open when they are ripe (Langeheim & Thimann 1982: 323, 325, 595; Moore *et al* 1995: 399).

Potherbs –

Potherbs – vegetation (leaves) cooked in water and some salt until the water is soaked up by the leaves. The leaves are served whole (Quin 1959).

Seed –

An ovule that has been fertilised matures into a seed (Langeheim & Thimann 1982: 321-323, 600; Moore *et al* 1995:407, G13; Lack & Evans 2001: 49; Ingrouille & Eddie 2006: 147-148, 215). The important features of a seed include the embryo and the seed coat that envelops the embryo and tissue (Moore *et al* 1995: 400, 407, G13; Lack & Evans 2001: 49). An endosperm, or cotyledons that absorb the endosperm, may be found in seeds as well (Moore *et al* 1995: 400; Lack & Evans 2001: 49). The hilum is found on the surface of the seed (Ingrouille & Eddie 2006: 148). Seeds are contained within the fruits of angiosperms; the seeds are exposed in other plants (Lack & Evans 2001: 49).

NAMES OF PEOPLE MENTIONED IN THE DISSERTATION

Chief Mugombane II: also known as Makapan, Mokopane and Setšwamadi, he is referred to in this dissertation as this is the Ndebele form of his name (after Esterhuysen 2006: 2). Makapan is the Afrikaans version of Mokopane (Esterhuysen 2006).

Historic Cave: The cave is also known as Gwaša and later known as Makapan after Chief Mugombane but is referred to in much of the literature as Historic Cave (after Esterhuysen 2006: 2).

Acronyms

B.P. – Before Present

m.a.s.l. – metres above sea level

SANBI – South African National Biodiversity Institute

Chapter 1: INTRODUCTION

Three cave sites in the Limpopo Province of South Africa offer a unique insight into the plant remains left behind after the caves were occupied for different reasons. The Limpopo Province is situated in the north-western corner of South Africa, and is separated from Botswana and Zimbabwe by the Shashe and Limpopo Rivers. The locations of the two farms on which the sites – Historic Cave, Balerno Main Shelter and Balerno Shelter 2 – are highlighted below in Figure 1.1.

Historic Cave is a cave site that was occupied only once, during AD 1854 (Esterhuysen 2006; 2008a: 461; 2008b: 202). It is located in the Makapan Valley, no more than 20km east-northeast of the town Mokopane (formerly Potgietersrus) (Esterhuysen 2008a: 461; Esterhuysen *et al* 2009:1038; Maguire 2009; Le Roux *et al* 2013: 98). The cave's use as a refuge for a month and its subsequent abandonment provides a unique opportunity to study the use of plants within that month, and season, in AD1854. These remains can provide insight into the foods that were cultivated and then stored in the cave as well as insight as to how the plants were used and by whom.

Balerno Farm is roughly 10km south-east from Pont Drift, off the road that runs to the Botswana border (van Doornum 2000: 13, 2005: 61, 2008: 252). The farm includes three occupied cave sites: Balerno Main Shelter, Balerno Shelter 2 and Balerno Shelter 3. The former two sites were occupied shortly before Historic Cave; the latter cave was occupied between 2 500 and 700 BP but contained no plant remains (van Doornum 2000, 2005) and so is not included in this dissertation. Balerno Main Shelter and Shelter 2 appear to have been occupied in certain periods throughout the year. Plant remains provide a chance to understand when and why the caves where occupied.

Palaeoethnobotany is a recent area of study globally, especially so in South Africa. The focus of this dissertation is on the plant macroremains recovered from three cave sites in the Limpopo Province. These cave sites were excavated primarily for other research (Esterhuysen 2006; van Doornum 2000, 2005). I did not participate in any of the excavations detailed in Chapter 3. All the plant material was recovered from these excavations. No flotation techniques were used during any of the excavations. I completed the analysis of all macroremains except for plant material which was identified from Historic Cave as part of a grab sample (Esterhuysen 2006).

Each of these three sites was occupied at roughly the same time but each for different purposes. Taking the social, historical and environmental context into consideration together with the plant species identified from the caves, this dissertation will explore the information that plant remains are able to provide about how and why they were brought into the cave shelters. The dissertation will describe the various known uses of the plant species that have been identified in an attempt to understand how they may have been used in the past, with regard to food, rituals or items within the household. A further objective within this dissertation is to understand the social contexts surrounding these rituals and the use of the site itself through these plants.

Plant remains can provide information regarding site habitats and the environment around the sites, in which seasons the sites are occupied, land use, fuel use, crop production, plant processing and diet (Hastorf 1988, 1999; Johannessen 1988; Miller 1989; Fahmy *et al* 2011). Plant remains can provide a means to reconstruct palaeoenvironments and to track the introduction of new food plant species and/or plant domestication through morphological changes in the plants or linguistics (Dimbleby 1967; Ford 1988; Hastorf & Popper 1988; Marquardt 1988; Miller 1989; Smart & Hoffman 1988; Cappers 1993; Fuller 2002; Fahmy *et al* 2011).

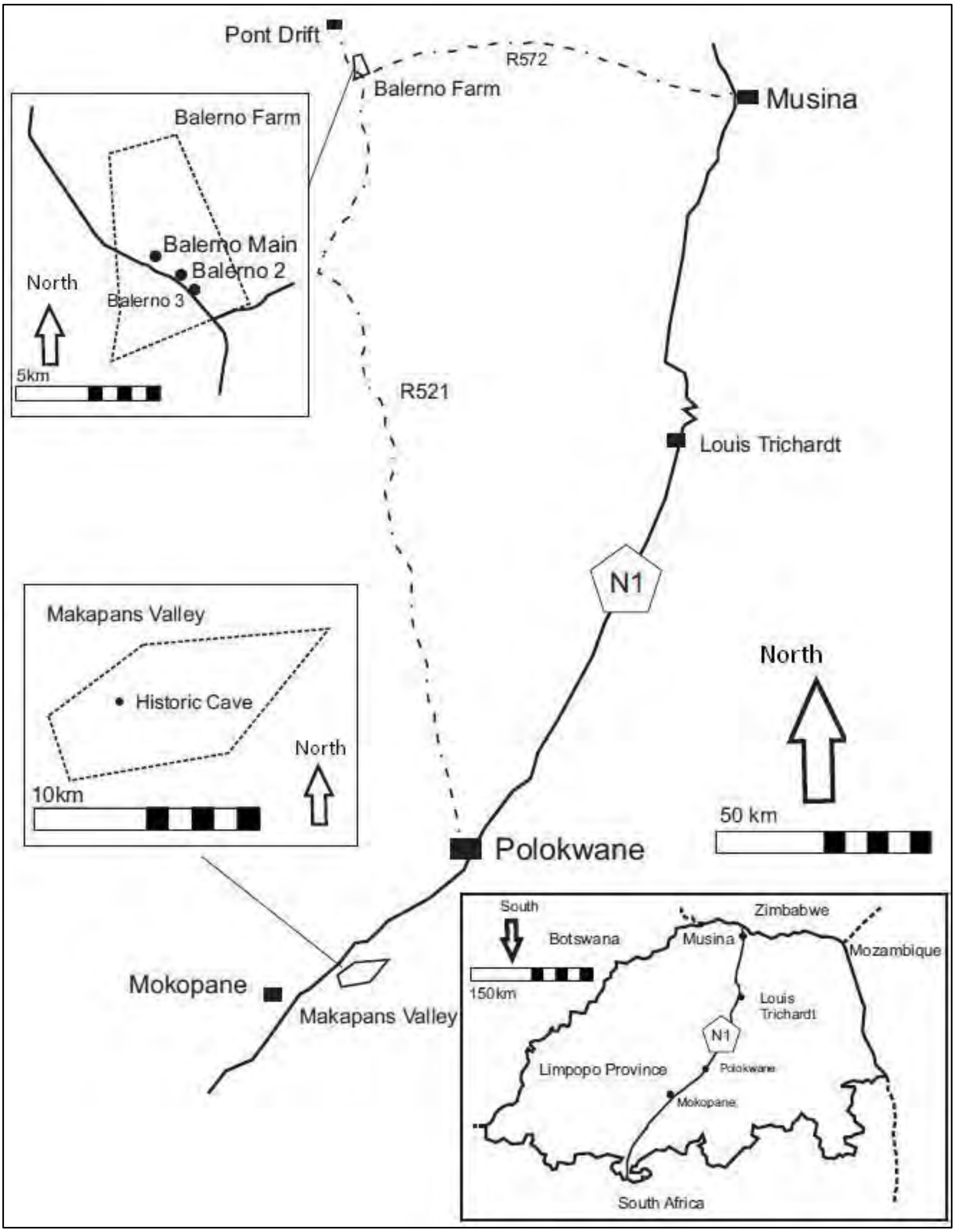

Figure 1.1: Map of Limpopo Showing Balerno Sites and Historic Cave

This research seeks to answer the following question: "What information can plant remains recovered from historical occupations in cave sites provide with regard to the social and historical contexts in which they were deposited?". In order to answer this question, three sub-questions must be answered first:

1. "What plant species are found within the historical occupations of Historic Cave and Balerno?",
2. "Why have these specific plant species been chosen or utilised?" taking the specific details of each occupation into account,
3. "How were these plants prepared and does this method link to any specific social or ritual directive?".

My dissertation will explore these questions within a number of chapters. The following chapter, Chapter 2, describes the sub-discipline of palaeoethnobotany, the techniques used and the history of palaeoethnobotany in South Africa specifically. Chapter 3 describes all three cave sites – their locations, environmental context, excavations and their social context and history.

Chapter 4 will outline the methods used within this dissertation. The chapter will focus on sources of information used to identify the plant remains and the methods used to count and interpret these remains. Photographs of the plant species dealt with in this dissertation are inserted as plates (Figures 5.1 to 5.11). Chapter 5 summarises the results for the three cave sites. It includes lists of the species found at each site and the graphs generated by the presence analyses. The more detailed data is available in Appendices B, C and D.

Chapter 6 contains a discussion of the results and puts the plant remains into context, using the environmental and historical information described in the third chapter. The details of the many uses of the identified plant species is described in Appendix E. This chapter is then followed by the conclusion chapter.

I am not a medical professional. All medical applications of plants included in this dissertation should be viewed as a discussion on documented or reported accounts of the ways in which plants have been used. This dissertation should not be seen as a prescription or as medical advice. All mistakes and omissions are my own.

Chapter 2: STUDIES OF PLANTS

First described in 1959 by Helbaeck (Pearsall 1989: 1), palaeoethnobotany is a recently established sub-discipline within archaeology but comparatively little work has been done in South Africa or in Africa as a whole. The sub-discipline focuses on the use of plant remains to describe the environment and activities that have occurred at an archaeological site. Research proceeds in three steps – plant recovery, identification and interpretation. Plant remains, including fruits, nuts and seeds, can be recovered using a variety of methods described in this chapter. The plants are then identified through comparisons of the plant features between modern and archaeological plant materials and then interpreted. The interpretation consists of two parts – qualitative and quantitative, each of which has multiple techniques. This chapter will also discuss the possible sources of patterns and biases that can be introduced through many channels.

2.1 PALAEOETHNOBOTANY AND ARCHAEOBOTANY

The study of plant use and plant remains can fall into multiple categories including ethnobotany, palaeoethnobotany, palaeobotany and archaeobotany (Andrews 1961; Helbaeck 1966; Hastorf & Popper 1988; Fuller 2002). The two terms 'archaeobotany' and 'palaeoethnobotany' are used differently by different authors and they are often used interchangeably (Hastorf & Popper 1988; Hastorf 1999; Fuller 2002). Hastorf (1999:55-56) explains the difference in terms as the different words being used by American scholars and European scholars, but essentially meaning the same concept.

The term 'ethnobotany' was first used to describe Australian Aborigines' use of plants by Harshberger in 1895 and the term 'palaeoethnobotany' was introduced afterwards by Helbaeck in 1959 (Pearsall 1989: 1; Fuller 2007: 186). Helbaeck (1966: 350) defined palaeoethnobotany as the study of plants that were cultivated by 'prehistoric man' and were recovered and dated by archaeologists. Palaeoethnobotany has also been defined as a field within ethnobotany that is concerned with finding and describing the human-plant relationships in the past through the study of archaeological plant remains, including phytoliths, pollen, charred wood and seeds (Hastorf & Popper 1988; Hastorf 1999: 55; Pearsall 1989: 2). Palaeoethnobotany is an interdisciplinary field, combining archaeology, botany and ecology and uses both ethnographic and botanical data (Hastorf & Popper 1988; Pearsall 1989: 2). The sub-discipline usually includes the relationships between plant species and human populations, but can also look at cultural development of communities, environmental change and the effects that each may have on the other (Hastorf & Popper 1988).

Palaeobotany includes the study of features of remains, mainly charred seeds, fruits, pollen, phytoliths, and fragments of inflorescences as well as petrified or mineralised wood (Andrews 1961; Helbaeck 1966: 350). Plants that are not physically preserved but that are recovered as imprints that have been preserved in clay or tufa can also be included (Andrews 1961: 8-9; Helbaeck 1966: 350). Identifications of the plant remains are made through comparisons between fresh and archaeological material, however in this definition, much of the archaeological material would be fossilised (Andrews 1961; Helbaeck 1966; Fuller 2002:248). Andrews (1961:1) includes a time frame into his definition of palaeobotany, stating that the discipline deals with plant remains that are half a billion years old and younger. Within this geological time frame, palaeobotany would be able to describe the evolution of plant families, from the earliest, now extinct, families to modern-day extant ones (Andrews 1961). Plant remains that are very much younger – a few thousand years old – and that are not necessarily fossilized but have been excavated are also studied in palaeobotany (Andrews 1961:4). Palaeobotany can therefore be summarised as the study of plant materials recovered over a geologic time-frame that may or may not be fossilized but that are useful in describing the evolution of plant species or family or in describing the ancient environments of geological epochs. The studies of palaeobotany and archaeobotany do overlap.

Archaeobotany is defined by Fuller (2002: 247) as a combination between botanical information and archaeological artefacts that relates to interactions between humans and the environment. Plant remains are not fossilised and they are recovered from contexts specifically related to human activities, which distinguishes archaeobotany from palaeobotany (Fuller 2002: 248). Archaeobotany can be distinguished from palaeoethnobotany in that the former is usually concerned with the collection of data, whereas palaeoethnobotany focuses on the interactions between people and plants (Dimbleby 1961; Pearsall 1989:1-2; Hastorf 1999: 56; Fuller 2002: 248).

While there is a large overlap between these terms, I will make use of two terms as follows – archaeobotany to describe the plant remains in the context of deposition, recovery and identification (i.e., data) and palaeoethnobotany to describe the identification and usage of plant species by people (i.e., interpretation of the data).

2.1.1 PALAEOETHNOBOTANY: PLANTS AND PEOPLE

Plants are important to people as they fulfil a range of needs, including food and beverages, and are important in economic, social, medicinal and religious or ritual activities within a homestead, a site and beyond (Dimbleby 1967; Hastorf 1988, 1999; Hastorf & Popper 1988; Maguire 2009: 29). Plants also provide protection from the elements, which is especially important in extreme weather conditions or marginal environments (Dimbleby 1967:18-19). The natural environment provides resources for exploitation (Hastorf & Popper 1988). In exploiting these resources, humans affect the natural environment and can also change characteristics of the land or vegetation (Dimbleby 1967; Hastorf & Popper 1988; Johannessen 1988). Resources that are available in an area can determine aspects of the culture of people in that area as they are limited to using the resources that are available to them – resources that are outside a group's physical and social range cannot hold cultural significance (Hastorf & Popper 1988). The beliefs, rules and customs of the people in that area can affect what, how, when and where plants, or other resources, are used (Hastorf & Popper 1988; Popper 1988; Smart

& Hoffman 1988). Recovered remains can illustrate relationships between plants and people in a number of ways, as described by Dimbleby (1967), Johannessen (1988) and Pearsall (1989). Plant remains may be able to highlight contact between multiple groups of people through their geographic distribution within and across archaeological sites (Pearsall 1989: 6). The seasonal availability of certain plants may influence settlement patterns and the exploitation of plant resources by humans may also have visible impacts (Pearsall 1989: 2). Research can include the use of plants as medicines or in rituals, as well as their use as food and fuels (Dimbleby 1967; Pearsall 1989: 2). The two-way relationships between plants and people change constantly (Dimbleby 1967; Hastorf & Popper 1988).

Plant remains recovered in archaeological contexts represent remains from the activities they were used in and so they are useful when studying site habitats, seasonal occupations, land use, fuel use, crop production, plant processing, diet and changes within diets as well as the consumption of food (Hastorf 1988, 1999; Johannessen 1988; Miller 1989; Fahmy *et al* 2011). Plant remains can also be used by ecologists and botanists to reconstruct palaeoenvironments and as evidence for the introduction of new food plant species and/or plant domestication through morphological changes in the plants or linguistics (Dimbleby 1967; Ford 1988; Hastorf & Popper 1988; Marquardt 1988; Miller 1989; Smart & Hoffman 1988; Cappers 1993; Fuller 2002; Fahmy *et al* 2011). Palaeoenvironmental data are obtained through identifying the plant species represented by macro- or micro-remains and by extension the environmental conditions necessary for those plant species to survive (Dimbleby 1967; Shackleton & Prins 1992; Esterhuysen & Smith 2003; Fahmy *et al* 2011; Mitchell *et al* 2011). The reconstruction of past environments through the use of botanical material can be skewed by a small sample size. The remains can be a tiny fraction of the original plant species living in the past environment (Johannessen 1988; Smart & Hoffman 1988). Reconstructing past environments is best done with assemblages or communities of plant species rather than one or two identified species (Dimbleby 1967:22-23; Fahmy *et al* 2011). Palaeoenvironmental reconstructions become more compelling if multiple sources of data for the environment are incorporated

(Dimbleby 1967; Shackleton & Prins 1992; Esterhuysen & Smith 2003; Allot 2006).

Plant remains can also be useful when studying stratigraphy and when looking at cultural change as well as the underlying economic base of that change (Asch & Sidell 1988; Johannessen 1988; Marquardt 1988). In some cases where the context of an excavation is unclear, the plant remains may be able to help identify or describe the context after analysis (Hastorf 1988; Hastorf & Popper 1988; Pearsall 1988). Botanical remains can reflect a wide variety of uses and activities, and so it is not always possible to determine which specific activity it does suggest (Dimbleby 1967; Hastorf 1988, 1999; Pearsall 1988). Not every activity that involves the use of plants will leave an archaeological trace (Hastorf 1988). This is especially true with regard to food plants, as they are processed before being eaten. Food plants can be eaten whole, raw or cooked, or as gruel, porridge, soup and in many other forms (Dimbleby 1967:40-41). The bark, flowers, fruit, fibres, leaves, stem, rhizomes and roots of plants can all be useful to humans (Dimbleby 1967). Different parts of the plants are used for different purposes (Dimbleby 1967) which will affect if or how the plants preserve (this will be discussed in 'Problems in palaeoethnobotany').

2.1.2 PALAEOETHNOBOTANY AROUND THE WORLD

Pearsall (1989) summarises the early history of palaeoethnobotany in the United Kingdom and the United States of America. The first European palaeoethnobotanical research included studies of desiccated material in Egyptian tombs and later waterlogged materials from lakeside villages in Switzerland (Pearsall 1989: 3-4; Hastorf 1999). After these initial studies, ethnobotanical work continued to spread throughout areas in Europe, as well as to coastal Peru, during the late nineteenth and earlier twentieth centuries. This expansion continued into the Near East during the 1950s and focused on ancient food crops in Iran and Iraq (Pearsall 1989: 4). Also during the 1950s, American archaeological plant studies began in earnest with Gilmore and Jones who investigated desiccated plant remains from rock-shelter sites in the United States (Pearsall 1989: 4-5). The

1950s and ‘60s saw a greater importance being placed on the analysis and recovery of plant macroremains and pollen with a new focus on subsistence strategies and palaeoenvironments (Pearsall 1989: 5).

Strueuer outlined the process of floatation in 1968 (cited in Pearsall 1989: 5-6). This process resulted in archaeologists systematically looking for and recovering archaeobotanical remains, especially in places that were not known for preservation of plant materials at the time, i.e., sites that were very dry or waterlogged (Harlan *et al* 1973: 52; Pearsall 1989: 6). Flotation, together with the emergence of Cultural Resource Management (CRM) in American and rescue archaeology in Great Britain, has led to an abundance of archaeobotanical data in these two countries (Harlan *et al* 1973: 52; Minnis 1981:143; Pearsall 1989: 6; Fuller 2007:187).

The focus of American archaeobotany has been on the use of plants by humans and its two-way impact, whereas the focus of British archaeobotany has moved to cultural interpretations – a move away from the morphology and taxonomy of plant remains (Pearsall 1989: 7). Research regarding the origins and rise of food production has also led to archaeobotanical undertakings in Egypt and the Middle East (Helbaeck 1966; Harlan *et al* 1973; Minnis 1981: 143).There is a well-established tradition of palaeoethnobotany in India (Pearsall 1989: 9; Fuller 2002). The last fifty years of archaeobotanical work in India is summarised by Fuller (2002). Flotation was introduced into Indian archaeobotanical work during the 1970s, which created a need for full-time professional archaeobotanists (Fuller 2002: 257).

2.1.3 PALAEOETHNOBOTANY AND SOUTH AFRICA

Neither Pearsall (1989) nor Hastorf (1999) discuss any palaeoethnobotanical or archaeobotanical undertakings in South Africa specifically or even within Africa as a continent, with the exception of mentioning Heer’s original work in Egypt. Examples come from North America and Europe, although the presence of a palaeoethnobotanical tradition in India is also mentioned (Pearsall 1989; Hastorf 1999). Wing and Brown (1979) also do not mention African palaeoethnobotany and take their examples from North, Central and South America. The paper by Harlan *et al* (1973) mentions African archaeology in terms of Egyptian food production theories but does not mention any palaeoethnobotanical investigations south of Egypt. The main focus of the palaeoethnobotanical research of Helbaeck (1966) is in the Middle East, although brief comparisons are made across Europe and into North Africa. No African sites, excavations or palaeoethnobotanical undertakings are mentioned (Helbaeck 1966). Similarly, Fuller (2002, 2007) makes no mention of any African work but focuses on archaeobotany in the United Kingdom and Asia.

The International Workshop on African Archaeobotany (IWAA) is an international workshop (originally known as the International Workshop on Archaeobotany in North Africa) and conference that has met every three years since 1994, most recently meeting in Vienna in July 2012 (van der Veen 1999; Nuemann *et al* 2003; Cappers 2007; Fahmy *et al* 2011; University of Vienna 2012; Fuller & Murray, in prep.). Papers read at the conference and the published research includes both macro- and micro-remains, including phytolith, pollen and starch grain analysis, from multiple African countries, including Burkina Faso, Egypt, Ethiopia, Libya, Malawi, Mali, Morocco, Namibia, Nigeria, Sudan, Uganda and South Africa (van der Veen 1999; Nuemann *et al* 2003; Cappers 2007; Fahmy *et al* 2011; Fuller & Murray, in prep.).

South African macroremains-based projects tend to focus on the Stone Age, as most Iron Age projects simply include a list of plant species as appendices. Christine Sievers (2006) identified and described carbonised seeds, nuts and fruit stones from the Middle Stone Age layers at Sibudu Cave. Remains from this layer date to between roughly 37 and more than 60 000 years ago and contain a minimum of sixty-six taxa, thirty-five of which were identified (Sievers 2006). Sibudu Cave is also the site of more recent palaeoethnobotanical papers regarding plant bedding and settlement patterns (Sievers in Fahmy *et al* 2011:9-18; Wadley *et al* 2011). Sedge nutlets and aromatic leaves from another species from roughly 77 000 years ago were identified and interpreted as simple, unwoven bedding used in the cave (Sievers in Fahmy *et al* 2011; Wadley *et al* 2011). These plant remains were burnt, probably in order to maintain the site (Wadley *et al* 2011). Wadley *et al* (2011) detected an increase in the use of plant bedding and site maintenance procedures roughly 58 000 years ago, which could suggest a change in the settlement pattern of people and may link to a population increase during that time (Wadley *et al* 2011: 1390). Sibudu Cave is also the site for the first application of a new technique – the Coexistence Approach based on Geographic Information Systems (GIS) (Bruch *et al* 2012). The Coexistence Approach uses the plant species identified from the plant remains in a certain period of time and describes the maximum and minimum tolerances of the species for a range of environmental factors, for example, temperature or rainfall (Bruch *et al* 2012). These tolerances are then combined with all the plant species for that time frame to outline a range for the environmental factors that encompasses most, if not all, the requirements of the flora to describe the palaeoenvironments (Bruch *et al* 2012). This technique illustrates changes in the climate, with cooler temperatures during the Howiesons Poort Industry (Bruch *et al* 2012).

Another experimental paper by Sievers and Wadley (2008) investigated the effects of hearths and fires on plant remains. Seeds, fruits and nuts from indigenous plant species were placed at specific depths and distances away from hearths (Sievers & Wadley 2008). Fires were then lit in the hearths and the remains were later excavated when the ashes and remains had cooled (Sievers & Wadley 2008). The depth at which the plants were buried had an effect on whether the plants were burnt, carbonised, dehydrated or unaffected (Sievers & Wadley 2008).

Archaeobotanical research in my research area was carried out by Peters and Maguire (1981). They collected plant foods in both the wet and dry seasons in the area surrounding Makapans Valley between 1980 and 1981 in an effort to describe the food sources that may have been available to *Australopithecus* *africanus* living in the area several million years ago. During the dry season, ten plant species were collected and during the late wet season, twenty-eight plant species were collected (Peters & Maguire 1981). These species were put through a number of tests to describe the bite force necessary to break the foods down and masticate, in order to test their viability as foods for the australopithecines (Peters & Maguire 1981).

Palaeobotanical studies at Boomplaas in the Oudtshoorn district include plant macroremains, charcoal, and pollen with faunal remains to recreate the palaeoenvironment and track changes over time (Moffett & Deacon 1977). Modern plant samples were collected to describe the species diversity of the area (Moffett & Deacon 1977). The vegetation has had a long history in the area, showing many changes since the Upper Pleistocene and Holocene (Moffett & Deacon 1977).

More charcoal studies have been carried out in South Africa than studies focusing on macrobotanical remains. Charcoal studies have been carried out at Middle and Late Stone Age sites including Sibudu Cave (KwaZulu-Natal), Elands Bay Cave (Western Cape) and sites within the Free State, the Caledon River Valley, the Natal Drakensburg and Lesotho (Esterhuysen *et al* 1994; February 1994, 2000; Esterhuysen 1996; Parkington *et al* 2000; Cowling *et* al 2001: Esterhuysen & Smith 2003; Allot 2006). Charcoal studies have been used to reconstruct palaeoenvironments and provide evidence for changes in climate, past rainfall regimes, vegetation, fuel-wood gathering strategies and, by extension, human behaviour (for example, Shackleton & Prins 1992; Esterhuysen *et al* 1994; February 1994, 2000; Esterhuysen 1996; Cowling *et* al 2001; Esterhuysen & Smith 2003; Allot 2006; Mitchell *et al* 2011). Wood charcoal can be contested as evidence for climate and/or vegetation change, as the recovered samples are often biased towards plant species chosen and used by humans and not necessarily a direct reflection of the environment surrounding the site (February 2000; Esterhuysen & Smith 2003, Allot 2006). However, wood charcoal can describe a change in climate if the analyses can be supported by other palaeoenvironmental evidence (for example, faunal or isotope studies) or across multiple sites, or even if the identified species are found in sufficiently different vegetation zones (Shackleton & Prins 1992; February 2000; Cowling *et* al 2001; Esterhuysen & Smith 2003; Allot 2006). Wood charcoal is identified through comparing the archaeological specimens to modern ones; charcoal can often be identified to a species (Pearsall 1989; February 1994, 2000; Esterhuysen 1996; Esterhuysen & Smith 2003; Allot 2006). The identification to a genus or species usually provides data on the environmental needs of the plant species and therefore describes the environment within which the plant was found (Dimbleby 1967; February 1994, 2000; Hastorf 1999). This principle is applied to any type of botanical remains, whether macro- or microscopic (Andrews 1961; Dimbleby 1967; Esterhuysen *et al* 1994; February 1994, 2000; Cowling *et* al 2001; Esterhuysen & Smith 2003; Allot 2006; Fahmy *et al* 2011)

Pollen studies are also useful for reconstructing environments in the past (Shackleton & Prins 1992; Cappers 1993; Parkington *et al* 2000; Cowling *et* al 2001; Esterhuysen & Smith 2003). Pollen cores at sites such as Wonderkrater provide climate data over long periods of time (Esterhuysen & Smith 2003). Pollen data from Elands Bay Cave in the Western Cape has also yielded information for palaeoenvironmental reconstruction (Parkington *et al* 2000). Pollen can usually be identified to a genus or family level, although sometimes it is also possible to assign it a species (Dimbleby 1967:117). Although there are specific conditions that cause pollen to degenerate, pollen is usually well preserved (Dimbleby 1967). Pollen is generally widespread by the nature of its dispersal and so it can be useful in describing general environmental conditions but is usually not helpful in describing small, regional patterns (Dimbleby 1967:117-119; Cappers 1993:173).

Other types of botanical remains include phytoliths and tree rings. Studies of microscopic phytoliths can also be used to describe palaeoenvironments and track changes in climate and human behaviour (Dimbleby 1967; Hastorf 1999: 63; Fuller 2007; Bamford *et al* 2010; Mitchell *et al* 2011). Phytolith studies have been carried out in Lesotho, at the site Likoaeng (Mitchell *et al* 2011). Phytoliths are inorganic remains and so, in some cases, they preserve where macrobotanical remains might decay (Hastorf 1999: 64; Fuller 2007). Dendrochronology, the study of past climates and dating through tree ring analysis, can also provide data on past climates, environments and rainfall patterns (Dimbleby 1967; February 1994, 2000). Norström *et al* (2005) used two *Breonadia salicina* trees in the Limpopo Province to chart the changes in rainfall over the past six centuries. Unfortunately, few trees in South Africa have the potential to be used in these studies; one species that may prove useful is endangered in South Africa and cannot be used extensively (February 1994, 2000). Stable carbon isotope analysis can also be carried out on tree rings to provide information regarding humidity, temperature, water usage by the tree and water potential in soil (February 2000). Stable carbon isotope analysis was also used by Hopely *et al* (2006) to recreate the diet of two herbivorous extinct rodent species from the Makapansgat Limeworks site in the Limpopo Province. This has enabled them to recreate the palaeoenvironment of the region during the Mid-Pleistocene, showing it to be more wooded than the area is today (Hopely *et al* 2006).

Plant remains recovered from coprolites can also sometimes be identified (Dimbleby 1967, Hastorf 1999; Bamford *et al* 2010). Plant remains from coprolites can provide some environmental data although they are more useful in providing direct evidence of diet (Dimbleby 1967). Bamford *et al* (2010) used plant evidence recovered from coprolites from an animal, most likely of a carnivore species. This information was used to recreate the environment around 1.95 to 1.78 million years ago when *Australopithecus sediba* was extant (Bamford *et al* 2010:23-24). Recovered plant remains were microfossils that included wood, pollen and phytoliths (Bamford *et al* 2010).

Peat from near the Drakensberg escarpment provided fossil pollen and microscopic charcoal, as well as carbon and nitrogen content and isotopes, which enabled Norström *et al* (2009) to recreate climate change in the eastern part of South Africa. Wetland conditions meant that the peat, which was cored, existed continuously for the past 16 000 years (Norström *et al* 2009). Periods of drier and wetter conditions were reflected in the peat cores (Norström *et al* 2009).

2.2 Macroremains and the Three Part Process

Analysis of macroremains is the most common approach in palaeoethnobotany and has contributed to the knowledge of diets, subsistence strategies, and plant domestication (Minnis 1981:143; Pearsall 1989: 15; Hastorf 1999; Fuller 2002:248). The analysis of any archaeobotanical remains can be seen as a three-part process, i.e. the recovery of plant remains from archaeological sites, the identification and the interpretation of the remains (Pearsall 1989: 15).

2.2.1 Recovery

Plant remains are usually collected in bulk and then later sorted and analysed, usually after the fieldwork has been completed (Asch & Sidell 1988). Botanical remains can be found in and recovered from multiple contexts and can be charred, waterlogged or desiccated or as impressions (Dimbleby 1967; Pearsall 1989; Cappers 1993; Hastorf 1999; Fuller 2002: 249; Fahmy *et al* 2011). Plant remains can be recovered in three ways: through *in situ* collection during the excavation, through screening or through using flotation or water-based recovery techniques, all of which have been outlined by Pearsall (1989: 15) and Fuller (2007:194, 196). Each of these recovery techniques has its own recovery biases, problems and limitations and each varies in the type of data that can be obtained through its use (Pearsall 1989: 15). *In situ* recovery of plant materials may be able to show connections between the botanical and non-botanical remains of a site and, in cases such as charcoal and burnt wood, may show what features (e.g. hearths) may have been used for (Pearsall 1989: 16). Charcoal removed *in situ* is also very helpful for dating purposes (Pearsall 1989: 16). However, relying on the naked eye to remove material tends to result in only the larger pieces being recovered, leading to bias in the sample as small taxa or fragments are missed (Pearsall 1989: 16). Because it is only the remains that can be seen in the soil that are recovered, problems occur when the material (especially charred or burnt material) lies within dark or heavier soil or when the excavation is set in dim light, such as in cave settings or even in the lower levels of any excavation (Pearsall 1989: 16). This recovery technique is also dependent on the skill level of the excavators and the techniques used to excavate (Pearsall 1989: 16). Assemblages that are removed by the naked eye may miss entire taxa or may under-represent other taxa (Pearsall 1989: 16).

Screening is often used in excavations, because it recovers not only samples that are less biased but also samples that include a class or multiple classes of material that had been missed by *in situ* recovery (Pearsall 1989: 17; Esterhuysen 1996). This technique is also more systematic than *in situ* techniques (Pearsall 1989: 17). The mesh size and the force used in passing materials through the mesh are the two most important factors influencing the effectiveness of both wet and dry screening and can be responsible for introducing biases to the sample (Pearsall 1989: 17, 79). Plant remains can sometimes be damaged or even destroyed by the process; remains that do survive are often characterised by their smoother and more worn texture (Pearsall 1989: 17). Fine sieving is often used in cases where the use of water flotation cannot be used and it may also be used in soils that are unsuitable for flotation or wet screening (Pearsall 1989: 19). The screening process is a balancing act: as much soil as possible must be removed from the excavated material to avoid a more time-consuming sorting process, but this must be done while leaving the remains as undamaged as possible (Pearsall 1989: 19). As a result, materials are often passed through a series of sieves or mesh that gradually become finer and therefore can potentially recover remains across all size grades (Pearsall 1989: 19). Sieving is more time consuming than flotation (Pearsall 1989: 80).

As described by Pearsall (1989: 19), water flotation is a process that uses differences in the densities of organic and inorganic materials to separate them. This process can lead to both an increase in the raw numbers of recovered botanical materials and the recovery of materials across all size grades (Minnis

1981:143; Pearsall 1989: 19). Although the process was only described in the late 1960s, it has become common in archaeology in certain locations (Pearsall 1989: 19). This may be due to the relative ease with which samples may be processed together with the straightforwardness of the equipment itself that makes the process simple to include in the field (Pearsall 1989: 19). However, this recovery method has many systems of use within it (e.g., chemical, froth and manual flotation) and choosing the right one for an excavation requires research and investigation (Pearsall 1989). In cases where the archaeobotanical remains are charred, waterlogged, or desiccated, any flotation technique will be unsuitable (Pearsall 1989: 79; Esterhuysen 1996). Flotation can lead to other issues with the recovered materials and can include mould growth, discoloration and the loss of seed coats and may cause the remains to break more easily (Pearsall 1989: 80). Even seeds that may look more 'modern' and fresh on the surface can be structurally weak and damaged before they are recovered (Pearsall 1989: 79).

2.2.2 IDENTIFICATION

The identification of plant remains is done through comparisons between the recovered material and descriptions, line drawings, photos and/or charred or fresh modern examples, and with or without the use of a microscope (Hastorf & Popper 1988; Johannessen 1988; Pearsall 1989; Cappers 1993; Esterhuysen 1996; Cowling *et* al 2001; Miller 2011). Access to good comparative material, preferably that covers a wide area, is essential in making successful identifications (Dimbleby 1967; Pearsall 1989: 128; Cappers 1993; February 1994, 2000; Esterhuysen 1996; Cowling *et* al 2001). Reducing the state of the known specimens to that of the unknown archaeological specimen (through burning or mechanical damage, for example) can also be very useful in making identifications, although this is not always feasible (Pearsall 1989: 128). Comparisons between modern and archaeological samples can be problematic when the morphology of the seed has gone through changes, for example domestication or burning (Hastorf & Popper 1988). It is important to note that, as Harlan *et al* (1973: 54, 60) caution, there is always a level of uncertainty included in the identification of plant materials, especially when the remains are poorly preserved or in inadequate numbers.

There are a limited number of characteristics that can be used to identify seeds, the two simplest and most obvious being the shape and size of the unbroken seed (Pearsall 1989: 145). Where the seed coat is present, it can be used to describe the colour and texture of the seed as well as any attachment points or scars (Pearsall 1989: 145). Other, minute characteristics of the seed coat may be useful in identifying plant specimens to a species, although these characteristic may require the use of a scanning electron microscope (Pearsall 1989: 145). However, desiccation, charring, carbonisation and a number of post-depositional forces can lead to changes in the seed coat or the seed itself, damaging or obscuring these characteristics (Dimbleby 1967; Harlan *et al* 1973: 54; Pearsall 1989; Sievers & Wadley 2008: 2909). Carbonisation or charring can result in the remains shrinking or becoming enlarged (Dimbleby 1967:131; February 1994; Esterhuysen 1996). Seed coats can be 'puffed' when the coats are damaged or removed as the endosperm expands in response to heat and charring (Pearsall 1989: 149). In cases where the seed coat is absent, identification becomes much more difficult (Pearsall 1989: 145). The seed embryo, characteristics of the endosperm and the cotyledons may also help when identifying the botanical remains (Pearsall 1989: 145-146). The characteristics of seed species may be used to place remains within orders or families as a first step to identifying them (Pearsall 1989: 147). This can be useful in narrowing down the search when using books or databases for comparative purposes (Pearsall 1989: 147). In some cases, the identification of a species may not be appropriate, due to the similarity of species within a genus and so only a genus-level identification can be made (Pearsall 1989: 149).

Fruits (as well as legumes) may also be found in archaeological deposits, although they are usually broken and charred (Dimbleby 1967; Pearsall 1989: 150, 151). Nuts may also be recovered archaeologically and may be whole or broken (Pearsall 1989: 151). As fruit and nut remains are usually found fragmented, drawings and pictures are often not useful when identifying them (Pearsall 1989:

151). A comparative collection is especially important in these identifications, especially when samples can be broken or charred to mimic the conditions the remains were recovered in (Pearsall 1989: 151). Pericarp thickness, texture and surface features, as well as the nature of the endosperm, embryo, exocarp, and attachment features are all useful comparisons to identify fruit and nut species (Pearsall 1989: 151).

Using vegetation and species distribution maps can also be useful in narrowing down possible matches (Pearsall 1989: 148). However, in areas where there have been changes in the climate or vegetation, or trade, species may be found in areas that are not marked on distribution maps and so they should not be excluded if they are a likely match (Pearsall 1989: 148). Distribution or vegetation maps are useful in double-checking the identification of species, but they are not sufficient on their own to exclude a species (Pearsall 1989: 148). Modern distributions and associations could have changed from ancient times (Dimbleby 1967; Hastorf & Popper 1988).

2.2.3 Interpretation: Qualitative and Quantitative

The methods chosen to interpret or present the results of a botanical study can limit the comparability between two or more sites, especially when different approaches have been taken at each site (Pearsall 1989: 222). Interpreting botanical remains is both a qualitative and quantitative process (Pearsall 1989: 194-195). There is a multitude of approaches within these categories and each has its own advantages and disadvantages (Pearsall 1989). As a result, the use of multiple techniques is usually more useful and more appropriate than the use of a single method (Pearsall 1989). Raw, quantified and statistical data alone will not give value to archaeobotanical remains – these data must be linked to information to answer research questions (Hastorf & Popper 1988; Popper 1988). Knowledge about the processes involved in creating the site and the remains is vital when interpreting the data (Ford 1988; Smart & Hoffman 1988; Fuller 2002). Understanding the preservation and depositional contexts is also important when interpreting the numerical data (Pearsall 1988; Miller 1989). Plant samples must be large enough and must be analysed systematically for them to be of use archaeologically (Johannessen 1988). Whether plants are local, imported or introduced will also impact the interpretation of the results (Smart & Hoffman 1988). Comparing the patterns found across multiple sites in a region may provide additional information on the identification or use of plant species (Marquardt 1998; Toll 1988).

The qualitative aspect of interpretation revolves around the site and the plant species that have been identified at the site; the species themselves, how secure the identification is and the time frame of the site are all qualitative data (Pearsall 1989:194). Plants that are securely identified but that do not occur within the environmental or geographic area can add information regarding the agents that brought them there, including trade, climatic changes or natural agents such as wind or animals (Pearsall 1989). The potential uses and usefulness of the identified plant species is another beneficial qualitative exploration and can also answer questions regarding diet and subsistence (Pearsall 1989:195). Seasonality can also be investigated, through plotting the times of the year when the identified species would be available for harvest (Pearsall 1989:195).

There are also various approaches that can be taken using quantitative methods (Pearsall 1989). Quantitative approaches can be useful, but only when the methods are fully understood and are appropriate for the data (Pearsall 1989:196). Quantitative data are meaningless without interpreting the data or understanding the context that the plants were used, deposited, preserved, and recovered in (Pearsall 1989). Certain contexts, such as middens, will not benefit very much from the use of quantitative techniques due to the large number of variables influencing the remains that are deposited there (Pearsall 1989: 226). Other contexts may have fewer variables, but not enough recovered remains for the techniques to be applicable (Pearsall 1989: 226). There is no single, 'correct' method to use in quantifying archaeobotanical results and using a range of techniques is suggested (Pearsall 1989; Fuller 2002).

Counts and/or weights are the most fundamental starting points for quantifying plant remains (Pearsall 1989:196; Miller 2011). These counts or weights may often be grouped into different taxa or stratigraphic level and are usually presented in a table (Pearsall 1989:196). These measurements are often used as a starting point for other analyses and may hint at patterning in the data (Pearsall 1989: 197).

To compare plant species independently of each other, raw counts can be converted into standard scores, by calculating the standard deviation and mean through time for each species (Pearsall 1989: 200). Each count is then calculated to a standard score by adding a standard deviation to each side of the mean (Pearsall 1989: 200).

Poisson distributions are the simplest models of data and can also be used to create comparable data (Kadane 1988). These distributions can also be used to calculate the probabilities of remains being found in a certain amount of soil (Kadane 1988). Poisson distributions do require preservation probabilities, which may be difficult to calculate or obtain (Kadane 1988). These models also do not take time or preservation factors into account (Kadane 1988). A disadvantage with using a Poisson distribution is that, while they are very often important for the cultural or qualitative interpretations, outliers can be widely separated and statistically meaningless (Ford 1988).

Ratios, which can also be expressed as percentages, are often used to standardise the unevenness present within the raw data, caused by non-standardised volumes of soil that are removed from excavations or differences in the number of taxa studied per excavation square or stratigraphic level (Miller 1988; Pearsall 1989: 197). Ratios can also be used to compare within and across sites (Miller 1988). Choosing what to compare can often be difficult (Pearsall 1989:127). Ratios are divided into two main categories, the first of which is a ratio where material that is included in the numerator is also included the denominator (Miller 1988; Pearsall

1989:197). This ratio can include density ratios, where the counts of remains are expressed per unit of floated or excavated soil (Pearsall 1989: 197). The second type is a ratio in which the numerator and denominator are not related and are mutually exclusive and can include ratios such as seed-to-nut ratios (Miller 1988; Pearsall 1989: 197). This second type of ratio can be used to show a change in the replacement of one species by another over time or space or it can be used as a control against differential preservation (Pearsall 1989: 201). Replacement comparisons should be made using similar plant uses, i.e., comparisons should be made between two fuel plants or two food plants and not one food and one fuel (Pearsall 1989: 201-202). Comparison ratios can be difficult to make and understand when it is not known if two categories of remains serve similar functions and they are unable to show a change in the use of a species, for example if a species that was used for food is later used as fuel (Pearsall 1989: 202). The use of ratios can also help offset the effects of preservation bias, especially when burnt remains are used as a value to compare (Johannessen 1988; Pearsall 1989: 198). Ratios and percentages are relative and are not an absolute measure of plant remains (Pearsall 1989: 198). A conversion factor can also be used to make plants, or parts of plants, more comparable to each other and to minimise the impact of past cultural practices (Miller 1988). Attributing meaning to ratios can be difficult (Miller 1988).

Converting the quantified remains into estimates of food value is another approach that can be used to standardise data (Pearsall 1989: 205; Miller 2011). This approach is used by both zooarchaeologists and archaeobotanists (Pearsall 1989: 205). This procedure can be used to determine the relative importance of meat and plant foods or to compare wild versus cultivated foods (Pearsall 1989: 205-208). Through the use of experimentally-derived formulae, plant remains can also be converted into estimates of the minimum number of whole plants (Hastorf 1988; Miller 1988). Food can be expressed either in litres or as grams of edible material and it requires the knowledge of the number of organisms recovered from the site as well as how much food each individual organism is able to provide (Pearsall 1989: 205). For food provided by plants, the percentage of the edible parts of each individual must be determined as well as how much of the edible portion was recovered and represented in the excavation can then be calculated (Pearsall 1989: 206). This technique does however carry a high degree of error (Pearsall 1989: 208; Miller 2011). Quantities can be estimated too roughly and therefore not fully represent the measurements in use or errors can stem from factors used to correct for preservation factors (Pearsall 1989: 208). Another problem with applying this technique to botanical remains is that the calculations may be based on inedible portions of plants and on uneaten but edible sections; deposition and preservation differs greatly between these two categories (Pearsall 1989: 210). The preservation of the food plants is a major factor influencing the success or failure of this technique – the majority of plants need to be preserved in order for the technique to work (Pearsall 1989: 210; Miller 2011). Foods that are eaten completely (i.e. all portions of the food are edible) leave no trace and therefore a portion of the overall diet will be missing (Pearsall 1989: 210). Other foods that are easily or quickly decomposed or that are deposited in a high-traffic area will also disappear from the overall diet (Pearsall 1989: 210). A change in the technique of preparing the food will also lead to changes in the disposal patterns or the remains that are recovered (Pearsall 1989: 210-211). Some plant remains can also be quantified by estimating the minimum number of individual (MNI) plants represented by the remains, although this method tends to underestimate the quantity of plants (Miller 2011).

Species diversity is another approach derived from zooarchaeology (Pearsall 1989: 205). This approach uses both the total number of species that are present in the excavation as well as the abundance of the species to describe the diversity of the species; evenly distributed species will have a high diversity whereas sites with a low number of species or an assemblage characterised by a few dominant species will have a low diversity (Pearsall 1989: 211). Species diversity may be expressed as one of several indices, including the Shannon-Weaver index or the Simpson index (Pearsall 1989: 211). Species diversity may be able to describe changes in the exploitation of plants or may reveal a change in the function of the site, provided the preservation bias is relatively uniform (Pearsall 1989: 211-212).

There are multiple methods of calculating diversity and not all of them will be useful or applicable to every archaeobotanical study (Fuller 2002: 268).

Presence analysis, also called ubiquity analysis, is a simple but useful approach to describing patterning in the plant data (Pearsall 1989: 212; Hastorf 1999; Fuller 2002). Plant species are marked as present or absent in one portion or square of the excavation regardless of how many times the species appears within that section (Pearsall 1989: 212 Hastorf 1999: 59). The presence of the plant species is then expressed as a percentage of the total site or excavation (Pearsall 1989: 212; Fuller 2002:268). This method limits the effect of the raw, absolute quantity of each species and can help to determine the relative importance of the plant species, by describing it as common or not (Pearsall 1989: 214). Hastorf (1999:59) states that sample sizes should be roughly standardised for the technique to be most effective. Presence analysis can also be applied at many scales, to compare between or within sites (Pearsall 1989: 214; Fuller 2002:268). The quality of the raw data may however influence the outcome of the presence analysis, especially with regard to the importance of the plant species (Pearsall 1989: 214). This is especially true when comparisons are made between data collected by different researchers and in different climatic and environmental contexts where the preservation and deposition biases will differ (Pearsall 1989: 215). Presence analysis is the most appropriate measure to use in these types of comparisons, as the effects of differential preservation are limited by this approach (Pearsall 1989: 215).

All the above approaches (ratios, standard scores, food value estimations, species diversity and presence analysis) fall within a group of quantitative approaches called non-multivariate approaches (Pearsall 1989). There are also a number of techniques that fall into another category called multivariate approaches (Pearsall 1989: 217; Fuller 2002: 268). These approaches are less commonly used as they require a more detailed understanding of statistics and may not be appropriate for the archaeobotanical data (Pearsall 1989: 217). These multivariate approaches can help identify patterns in the data where several variables influence the units that are being investigated (Pearsall 1989: 217). The main advantage of using multivariate techniques is their ability to classify or categorise groups of data or data that are completely ungrouped as well as distinguish between these categories (Pearsall 1989: 217-218; Fuller 2002: 268). Cluster analysis is the main multivariate technique, although other techniques include discriminant analyses and factor analyses (Pearsall 1989: 218).

2.3 Problems within Palaeoethnobotany

A recent survey (Miller 2011) completed by one hundred and twenty archaeobotanists, almost entirely from the northern hemisphere, highlighted a lack of comparative information. While a few online databases and websites are available and maintained, there is simply not enough botanical, and archaeological, information available to the respondents of the questionnaire and many of them rely on their personal comparative collections (Miller 2011). A lack of training and institutional support was also highlighted in the survey (Miller 2011). Fuller (2007) also notes the problems with the lack of specialised archaeological training, especially within a fieldwork context, including sampling and recovery techniques. Finally, communication between archaeobotanists and similar experts is described as difficult by many of the respondents and many of the archaeobotanists feel intellectually isolated (Miller 2011). These four problems, while discussed in a northern-hemisphere context, can also be seen within the sub-discipline in the Southern Hemisphere, and within South Africa specifically.

An important point to note in archaeobotanical work is that botanical remains that are recovered from a site do not always reflect the plant use of the people living at and using the site (Minnis 1981:150; Pearsall 1989: 230). Especially important to note is that a list of the species recovered through the excavation is not a complete list of the species eaten, brought in or used by the population of the site (Pearsall 1989: 230; Hastorf 1999). Botanical remains undergo several taphonomic processes and are subject to multiple biases introduced from uses and preparation of the plants, the disposal of the garbage, from differential preservation and the efficiency and proficiency of recovery before the remains are quantified and interpreted (Minnis 1981:149; Pearsall 1989; Hastorf 1999; Sievers & Wadley 2008: 2909).

2.3.1 Patterns and Biases in the Record

Patterns can be found in the preservation of archaeobotanical remains (Toll 1988). Patterning refers to the types, numbers, distributions and taxa found in archaeological contexts (Popper 1988). These patterns influence the interpretation of the assemblage and therefore identifying the source of the patterning is important (Popper 1988). Sources are cumulative and there are many factors influencing the type and quantity of the remains that are recovered (Popper 1988). Patterning can originate from cultural or noncultural sources (Hastorf & Popper 1988). Natural forces and planned and unplanned cultural activities will affect the distribution of plant remains at a site (Hastorf 1988; Hastorf & Popper 1988; Johannessen 1988; Popper 1988). In archaeobotanical research, determining the cultural context within which the remains are found is crucial (Popper 1988). Plants can be used in a variety of ways; this can influence what other remains are deposited with the plant species and the depositional context of the plant species (Popper 1988). Patterns can also be created through the methods that are used to collect, process and analyse the remains (Popper 1988; February 2000).

There are three types of biases inherent within palaeoethnobotany: recovery, depositional and preservation (Pearsall 1989: 194). The chosen technique and the execution of the methods used during the recovery of plant macroremains can affect both the quality of the recovered data and the final results of the analysis based on the recovered data (Pearsall 1989: 15). Flotation and fine sieving (either wet or dry) are the only reliable methods for recovering all size grades of macroremains (Pearsall 1989: 75). Interpretation of plant remains may also be affected by the sampling strategy (Pearsall 1989: 2). With careful planning and implementation, it may be possible to eliminate the majority of the recovery bias, if not remove it completely (Pearsall 1989: 228).

As no part of the archaeological record can be considered ‘complete’, depositional bias is not a problem unique to palaeoethnobotany (Pearsall 1989: 228). There will always be some portion missing from the record, some of which is random and some which is not (Pearsall 1989: 228; Cappers 1993). In terms of archaeobotany, not all plants are equally likely to be deposited or preserved and these biases will differ from species to species as well as within individual plants (Dimbleby 1967; Minnis 1981:149; Pearsall 1989:197). Biases will also differ between different types of remains – biases that affect macroremains may not influence wood or pollen (Minnis 1981:143; Pearsall 1989). The environment and the type of site itself will also affect the deposition, preservation and recovery of the plant remains (Minnis 1981:143; Miller 1989; Cappers 1993). Understanding the context of the deposition is very important, especially when interpreting the results of the excavation (Minnis 1981:143; Pearsall 1989: 225).

Preservation bias, the result of differential preservation, is the single biggest problem in palaeoethnobotany (Pearsall 1989: 228; Hastorf 1999:60). Not all plant remains are equally likely to preserve, nor undergo processes, such as charring or desiccation, which will affect the ability of the plant to be preserved either positively or negatively (Asch & Sidell 1988; Ford 1988; Hastorf 1988, 1999; Hastorf & Popper 1988; Johannessen 1988; Miller 1988; Popper 1988; Smart & Hoffman 1988; Miller 1989; Pearsall 1989; Cappers 1993; February 2000). Time is not directly a factor influencing whether or not remains will be preserved as the earliest deposits are not necessarily the better preserved deposits (Andrews 1961). The methods used to prepare plant foods will also affect how, if and which parts of the plant will preserve (Popper 1988; Pearsall 1989: 228-229). Site formation processes and whether or not a plant is preferred by scavengers will also affect how and if the remains are preserved (Andrews 1961; Asch & Sidell 1988; Ford 1988; Hastorf 1988, 1999; Hastorf & Popper 1988; Johannessen 1988; Miller 1988; Popper 1988; Smart & Hoffman 1988; Miller 1989). Climate and environment factors such as soil type, soil acidity and moisture content and the activities of animals all impact plant remains between deposition and recovery (Andrews 1961; Dimbleby 1967; Johannessen 1988; Miller 1989). Preservation bias affects the interpretation of the data, as it is very difficult to compare species that preserve easily and those that decompose more readily (Pearsall 1989: 229). This situation can be tempered somewhat by using presence analysis, but there is no true correction factor for balancing lost or under-represented species (Johannessen 1988; Pearsall 1989: 229).

As a result of the biases and issues mentioned above, it is important to note that plant remains recovered from a site do not mirror the vegetation of the area, nor of the plant species used in the site while it was occupied (Minnis 1981:150; Pearsall 1989: 230; Cappers 1993:173). Plants can be underrepresented or overrepresented in the archaeological remains and so the archaeological results are not sufficient for describing plants as dominant or important in the past (Johannessen 1988; Pearsall 1989; Cappers 1993:173).

2.3.2 Including and Excluding Plant Material

Another important issue in palaeoethnobotany is the source of the remains. Botanical remains, especially seeds, may be brought into the site through a number of means besides the purposeful inclusion by humans, through use or storage (Minnis 1981; Miller 1989; Pearsall 1989; Cappers 1993; Sievers & Wadley 2008: 2911). Cave sites, open-air sites, arid sites and water-logged sites will each have different agents that can bring seeds in and so each site will have its own problems with interpretations (Minnis 1981:143; Miller 1989). Seeds may be brought in to a site through wind, water or animal transport, for example through seed-eating birds or bats (Miller 1989; Pearsall 1989: 224; Cappers 1993; Sievers & Wadley 2008: 2911). Animals, especially rodents, can remove or damage archaeological plant remains (Minnis 1981:144; Miller 1989). Ploughing, digging or other human actions as well as the actions of earthworms and burrowing animals can introduce modern seeds into archaeological deposits and can move material vertically through multiple layers (Minnis 1981:145; Miller 1989; Pearsall 1989: 224). Accidental inclusion can also occur while excavating or through cross-contamination during flotation (Minnis 1981:144; Miller 1989; Pearsall 1989). Seeds may unintentionally be included while a cave is still occupied as seeds may be dragged in from everyday activities, through the burning of animal dung for fuel or through the utilization of other parts of the plant (Minnis 1981:145; Pearsall 1989: 224-225; Sievers & Wadley 2008: 2911). Natural seed dispersal from nearby plants is also a major factor in introducing modern seeds into archaeological sites; it also introduces seeds into the site while it is occupied even though the seeds may not be utilized (Minnis 1981:1434; Pearsall 1989: 224). This process can also be referred to as 'seed rain' and can introduce seeds from unutilised species in both modern and archaeological times (Minnis 1981:144; Pearsall 1989: 224). Seeds can be incorporated into a site from areas further afield and can represent multiple plant communities (Cappers 1993:173).

As a result of all these processes introducing seeds into sites and into archaeological soils, a large number of modern seeds may be present in an excavation (Minnis 1981:144; Miller 1989). Differentiating the modern and archaeological seed can be difficult and complicated (Minnis 1981; Pearsall 1989). When differentiating modern and archaeological seeds, the general rule has been to only accept charred seed as archaeological and all uncharred seed as modern and therefore to be excluded (Minnis 1981:147; Miller 1989; Fahmy *et al* 2011). In some cases where the preservation of the site is exceptional, uncharred remains that have been identified as archaeological are included in the data but the general rule seems to have continued (Minnis 1981:147; Miller 1989; Fahmy *et al* 2011). Following this general rule does result in the loss of some of the archaeological patterning but this is seen as a better alternative than the increase in noise and 'chaos' that inclusion of all the charred and uncharred seeds may lead to (Minnis 1981:147-148). In some cases, archaeological seed species may differ from the modern and/or local plant species (Minnis 1981:147; Pearsall 1989: 224). The state and appearance of the seed itself may suggest whether a seed is modern or archaeological, although this can often disguise the effects of the processes breaking down the archaeological seed internally (Minnis 1981:147; Pearsall 1989). The unintentional or accidental charring of seeds, especially when sites are burned after they are abandoned, may preserve the seed and can cause them to be included in the archaeological seeds when they are post-occupational intrusions (Pearsall 1989: 224-225).

Ethnographic data may be useful in determining whether a seed is viewed as edible, 'useful' or not and can help in certain cases to distinguish between utilized seed and accidental inclusions (Pearsall 1989: 225). Analogies and experimentation can also be useful in understanding how and if plants were used and can also be used to interpret seed assemblages (Pearsall 1989: 230-231). Studies of the surrounding plant species may also help identify species that may grow in the site as weeds or seeds that may be included through seed rain (Pearsall 1989: 225). The manner in which seeds are recovered can also include or exclude certain seeds – finding a cache of seeds or if there is an association between seeds and other areas, features or material culture suggests the deliberate use of those species (Minnis 1981:149; Pearsall 1989: 225).

2.4 Summary of Chapter

Palaeoethnobotany is the study of relationships between humans and plants, through the remains that are deposited, preserved and recovered. The sub-discipline is a fairly recent addition to the field of archaeology and has a longer history in the United Kingdom than in Africa, or even in the United States. Palaeoethnobotany focuses on archaeological plant material and seeks to interpret plant-human relationships in the past through the plant material and identified species. This is an interdisciplinary approach and combines data from many fields. Recovered remains can include seeds, fruits, and nuts – referred to as plant macroremains – and can be identified with or without the use of a microscope through comparison with the appropriate materials. Biases and patterns are introduced in the archaeological work through the recovery of these plant materials, the processes that the plant species undergo during deposition and, most importantly, preservation. These biases – depositional, preservation and recovery – must not be ignored in the interpretation of the materials. Characteristics of the archaeological site, the plant species recovered and the cultural context of the people or peoples who may have used the plants will all affect the interpretation of the site and plant materials. Modern plant remains, as well as unutilised archaeological species, can be brought in to the site through a number of agents – wind, animal actions or humans during the occupation or the excavation of the site. Qualitative and quantitative methods should both be used in the interpretation of the archaeological materials. Ethnographic resources can also be used in identifying and interpreting the plant remains in the record.

Chapter 3: Cave Sites and Their Contexts

This chapter will describe three cave sites and will describe the social and historical backgrounds of these sites. The sites are situated in two different areas of the Limpopo Province and were occupied at different times. The two more northern cave sites are found on the same property, a farm called Balerno (see Figure 1.1). These caves have a history of multiple occupations surrounded by variations in interactions between hunter-gatherers and farmers moving in and out of the area. In contrast, the more southern site, Historic Cave has only one occupation (Figure 1.1). This cave site, on the farm Makapansgat 39KS, was the site of a very tragic and devastating event in AD 1854. None of these cave sites were excavated for the purposes of this project – all three had been excavated and published before the commencement of this work.

3.1 Historic Cave

3.1.1 Location, Climate and Environmental Context

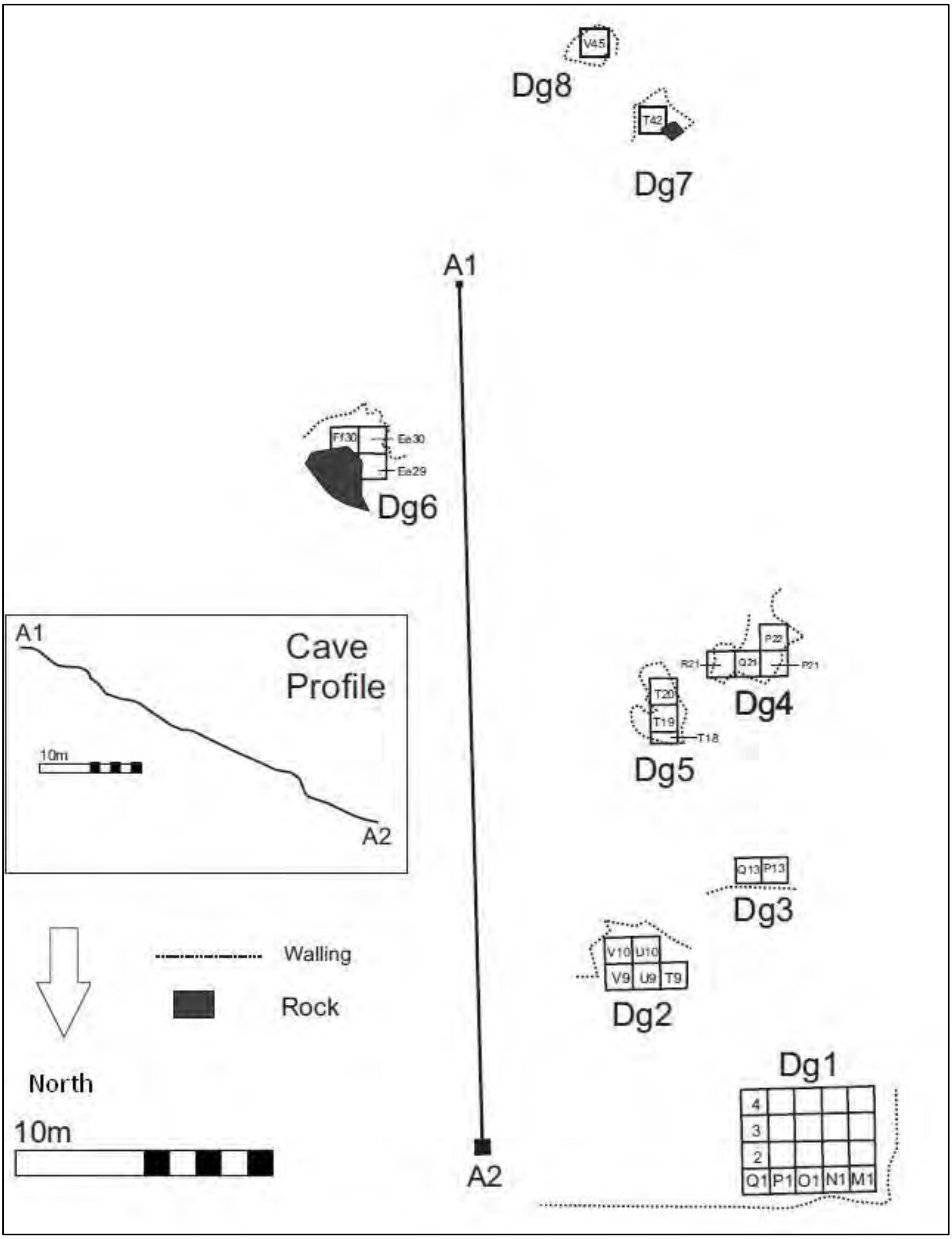

Figure 3.1: Historic Cave Site Map (after Esterhuysen 2008b: 205)

Historic Cave is located within the Limpopo Province, in the Makapan Valley, no more than 20km east-northeast of the town Mokopane (Esterhuysen 2008a: 461;

Esterhuysen *et al* 2009:1038; Maguire 2009; Le Roux *et al* 2013: 98). Nearby caves include the well-known Cave of Hearths, Ficus Cave, Rainbow Cave, Buffalo Cave, Two Skulls Cave, Cold Air Cave, Peppercorn Cave, Grand Canyon Rock Shelter, Magazine Cave and Katzenjammer Cave(Esterhuysen 2008a; Esterhuysen *et al* 2009; Latham & Herries 2009; Maguire 2009; McNabb & Sinclair 2009). Other geographical features include Makapan Limeworks, Red Cliffs, Sugar Loaf Hill and Star, Spider and Nettle Gullies (Esterhuysen 2008a; Esterhuysen *et al* 2009; Latham & Herries 2009; Maguire 2009; McNabb & Sinclair 2009). Some of these caves are physically linked to each other or have been in the past (Latham & Herries 2009)

The Main Makapans Valley divides into two sections; Historic Cave is found in the southern arm called Mwaridzi or Makapan Cave Valley (Esterhuysen 2006: 6). Makapans Valley forms part of a north-south isolated spur known as the Highlands Mountains, which is separated from its parent Strydpoort Mountains (which mainly runs along the east and west axis) by only 5 km (Esterhuysen 2006: 6; Maguire 2009: 30). This spur, which covers an area roughly 20km by 10 km, has also been called Makapaansberg and the Makapan Highlands (Esterhuysen 2006: 6; Maguire 2009: 31). The Makapan Cave Valley is on the western part of the Highland Mountains, the slightly gentler-sloping side (Maguire 2009: 31). The highest point of the spur is at 2040 metres above sea level (m.a.s.l.) at the Spain-Portugal Beacon and drops to bush-covered plains at 1090 m.a.s.l. in the eastern edge (Maguire 2009: 31). The area around Mokopane consists of a lower-lying valley (Maguire 2009: 43). The Mpumalanga Drakensberg and the Springbok Flats (with an average altitude of 1524 m.a.s.l.) are two other important topographical features creating an area known as the Wolkberg Centre of Plant Diversity (Maguire 2009: 31). The Pietersburg Plateau extends for 48km northwards and 64km eastwards, occupying much of the higher-lying land north of the Highlands and Strydpoort Mountains (Maguire 2009: 43). The Mogalakwena or Nyl River is found west of the Highlands Mountains, where it flows north to join the Limpopo River (Esterhuysen 2006: 20, Maguire 2009: 31). This river separates the Highlands Mountains and the Pietersburg Plateau from the

Waterberg in the west (Maguire 2009: 43). The size and proximity of the caverns and passages of the Cave of Hearths, Historic Cave and Makapan Limeworks has led Latham & Herries (2009: 54) to suggest that the caves are remnants of a river-cave system that used to exist in present day lower Mwaridzi valley. The Historic Cave-Cave of Hearths complex may represent an abandoned oxbow coming off the river (Latham & Herries 2009: 55).

The geology has a large impact on the landscape and ecology of the area (Maguire 2009: 38). The farm overlies rock that is mostly dolomite with low but steep rocky hills and discontinuous cliffs which provide good baboon habitats today, and that would have provided attractive sites for australopithecines in the past, for which the site became famous and was listed as a World Heritage Site (Maguire 2009: 32). The geology of the farm and of the area does vary though (Maguire 2009: 33-38). Soil is also varied and generally very shallow in the Makapans Valley area due to the steep topography (Maguire 2009: 38-39). This impacts the vegetation as there are few tall trees on the mountain slopes, except where deep pockets of soil have been created (Maguire 2009: 38).

The topography of the area allows for the formation of orographic or relief rain (Maguire 2009: 39-40). This also creates a rain shadow over the western side of the mountains, towards the city of Mokopane (Maguire 2009: 39-40). This is important as much of the rainfall, temperature and climate data for the region is taken from Mokopane weather station as it is the closest available source of this data (Maguire 2009: 40). Table 3.1 illustrates the difference in rainfall of areas inside the rain shadow and locations beyond the rain shadow. Year to year variation is very erratic, which is illustrated in the personal rainfall records kept by the owners of Glenesk over the last 65 years (Maguire 2009: 40). At Glenesk, the highest recorded rainfall in one year was 1014mm and the lowest was 382mm in one year (Maguire 2009: 40). Rain in the area falls in summer, usually between the beginning of October and the end of March, with the wettest month being January (Maguire 2009: 40). The rainy season is sometimes extended into late September and early October earlier in the year, or into April later in the season

(Maguire 2009: 40). The dry season covers the months from April to May, usually until September, with August regularly being a month with no rain (Maguire 2009: 40). The rainfall shows periods of consecutive dry or wet years (Maguire 2009: 40). The longest stretch of below average rainfall was six years which was then followed by six years of above average rainfall (Maguire 2009: 40). Rain usually falls from tropical thunderstorms (Maguire 2009: 40). Rainfall information comes from personal records from owners of farms in the areas, as well as from the weather station in Mokopane (Maguire 2009: 40).

Table 3.1: Rainfall figures inside and outside the rain shadow near Historic Cave (adapted from Maguire 2009: 39-41)

Rainfall locations at a decreasing distance from Historic Cave (furthest to nearest)					
Location	Inside the rain shadow				Outside shadow
	Mokopane	Planknek	Glenesk	Makapan Limeworks	Portugal Farm
Rainfall	569mm p.a.	630mm p.a.	598mm p.a.	700mm p.a.	930mm p.a.

Weather Bureau data from Mokopane for temperature are the only data available for the area (Maguire 2009: 40). These data cover the period from 1964 to 1992 (Maguire 2009: 40). Temperature ranges between the hottest month, October, with an average maximum 35°C and a minimum of 10°C to the coldest months, June and July, which have maximum and minimum temperatures of 26°C and just above freezing respectively (Maguire 2009: 40-41). Summer days are generally very hot but dry with warm summer nights (Maguire 2009: 40). Winter days are generally pleasant between 10 a.m. and 4 p.m. but are chilly to very cold during the rest of the day and night; heavy frost can occur during winter (Maguire 2009: 40).

North-facing slopes in the area around the Highland Mountains are generally 3 to 4°C warmer than the south-facing slopes (Maguire 2009: 41). This slope, or aspect, is responsible for the differences in vegetation on the slopes, especially as the south-facing slopes are generally shaded in winter (Maguire 2009: 41). The Cave of Hearths complex is situated in a comfortable thermal belt, within a temperature inversion created by cold air sinking along the slope of the Highlands Mountains (Maguire 2009: 41).

There are no formal data available on the area for the wind patterns; the only available data come from owners of the farms (Maguire 2009: 41). Their personal experience describes Mid-July to Mid-September as the windy period (Maguire 2009: 41). This coincides with the dry season and is when vegetation is at its driest; fires during this time of year are often blown out of control by the wind (Maguire 2009: 41). August is the windiest month (Maguire 2009: 41).

Fire is very important in the Makapans Region (Maguire 2009: 41). Fire helps to create enhanced nutrient levels in the soil and lessens bush encroachment and shade-producing trees (Maguire 2009: 41-42). Frequent fires favours the growth of grasses and hinders the growth of saplings and trees (Maguire 2009: 42).

The topography, geology, climate, aspect of slope and rain shadow effects combine to create multiple microhabitats and so there is a wide range of growing habits in the area (Maguire 2009).

3.1.2 VEGETATION CONTEXT

The environmental factors discussed above, especially altitude, have resulted in a wide variety of plant species found around Historic Cave, some of which are endemic to the region (Maguire 2009: 29-31). Mountain linkages, valleys and river courses in the area provide migration corridors introducing other species into the area (Maguire 2009: 31). There are two distinct migratory floras – a tropical flora from both east and west migration branches which is now found in the lower altitudes of Makapan and a more temperate flora that appears to have migrated from a southern route which is found at the uppermost altitudes of Makapan (Maguire 2009: 43). As a result of the geographical factors and the migration routes, there are over 800 species of plants within Makapan Cave Valley alone –

an area covering only 2.5 kilometres squared (Maguire 2009: 39, 44). Kloofs[1] in the valley help to protect patches of relict afromontane forests among zones of plant species from the higher moist-temperate Mpumalanga Drakensburg in the east and the lower, drier and warmer bushveld of the central Limpopo in the west (Maguire 2009: 30). In the higher altitudes of the Makapan area, there are even patches of fynbos-like vegetation (Maguire 2009: 42). The modern plant record at Makapan suggests that at least three prehistoric vegetation invasions have taken place, resulting in plant species from different climatic contexts adapting to this area (Maguire 2009: 43). Every plant species that was identified by its pollen in the three million year old Member 3 of Makapan Limeworks by Cadman and Rayner (1986) and later Rayner *et al* (1993) is still present in the area today (cited by Maguire 2009: 44).

The vegetation around Historic Cave has been subjected to multiple disturbances in the past, from Iron Age communities needing agricultural land, construction material and hardwood for fuel to more modern disturbances created by stump-clearing to create agricultural land, fuel requirements for the nearby Makapans Limeworks and lowering of the water table through the removal of groundwater (Maguire 2009: 32). Sorghum and millet remains found in the Historic Cave complex provide evidence for Iron-Age, and pre-European cultivation in the area (Maguire 2009: 38).

3.1.2.1 Regional Vegetation Types

Regionally, there are six different vegetation types around the Makapans area today as described by Acocks (1988) and Mucina and Rutherford (2006) (also described in Maguire 2009: 42-43). These types are described below, in Table 3.2. All these types of vegetation are within walking distance of the Mogalakwena River Valley, within roughly a 40km radius (Maguire 2009: 42). As the types are so close to each other, there is a wide variety of plant foods available to modern

[1] Kloof refers to a mountain pass, gorge, steep-sided valley or ravine [King 1942: 36; Dictionary.com 2013]

humans and would have been available in the past (Maguire 2009: 43). Presently, there are 117 edible plant species that are found within an eight kilometre radius of the Makapan Limeworks; within a sixteen kilometre radius, the number of edible plant species increases to 150 (Maguire 2009: 44). Fruits from local plant species are able to provide a varied and adequate vegetable diet between late spring and late summer, while underground plant parts could provide food during winter (Maguire 2009: 45).

Table 3.2: Regional Vegetation the Makapans Valley (adapted from Acocks 1988; Mucina & Rutherford 2006; Maguire 2009).

No.	Vegetation Names		Description	Dom. Species
1	Springbokvlakte Thornveld (SVcb 15) [2] [3]	Springbok Flats Turf Thornveld [1] [3]	Thorn trees or bushes cover a broad area south of the Highlands and Strydpoort Mountains for more than 160km [3]. Thornveld is generally open [3]. Found at an average altitude of 1 524 m.a.s.l. with a rainfall of 450 to 750mm p.a. [3].	*Acacia* species, *Dictrostachys cinera* and *Gymnosporia heterophylla* [3]
2	Waterberg Mountain Bushveld (SVcb 17) [2] [3]	Montane Sour Bushveld [1] [3]	Soil is nutritionally poor and so the vegetation is comprised of non-thorny sourveld [3]. Type requires 650 to 900mm of rain annually and is found at altitudes between 1 200 and 1 500 m.a.s.l.[3].	*Acacia caffra*, *Protea caffra* and *Faurea saligna* [3]
3	Strydpoort Summit Grassland (Gm 29) [2] [3]	North-Eastern Mountain Sourveld [1] [3]	Type is found in the higher parts of the Highlands and Strydpoort Mountains and is found on the Makapansgat Farm [3]. See Table 3.3.	See Table 3.3.
4	Poung Mountain Dolomite Bushveld (SVcb 25) [2] [3]	Sourish Mixed Bushveld [1] [3]	A large portion of Makapan is covered by the type as it covers the lower altitudes and gentle plains of the mountains [3]. This type is found between the sour grass- and bush-veld and the mixed bushveld of the valleys and plains [3]. It is described as an open savannah with a fairly dense grassveld [3].	*Acacia caffra* (dominant tree), *Cymbopogon pospischilii*, *Themeda trianda*, *Elionirus muticus* and *Hyparrhenia* species (grass species) [3]
5	Mamabolo Mountain Bushveld (SVcb 24) and Makhado Sweet Bushveld (SVcb20) [2][3]	Mixed Bushveld [1][3]	Found as a belt between thorny Springbok Flats types and the Sourish Mixed Bushveld across the medium and lower altitudes of the Highlands Mountains [3]. Type is also found at the lower slopes of the Waterberg and Strydpoort Mountains [3]. Includes a	*Combretum apiculatum*, *Acacia caffra*, *Combretum imberbe*, *Dichrostachys cinera*, multiple *Grewia* species and *Sclerocarya birrea* [3]

			combination of thorny and non-thorny trees [3].	
6	Polokwane Plateau Bushveld (SVcb 23) [2][3]	Pietersburg Plateau False Grassland [1][3]	This type is found within a rainfall range of 400 to 600mm p.a. along the Pietersburg Plateau which ranges from 1 200 to 1 500 m.a.s.l. [3]. Vegetation is mostly a false grassveld with patches of sourish, partially-thorny bushveld [3].	*Acacia rehmanniana* is the dominant tree species[3]

References: Acocks 1988[1]; Mucina and Rutherford 2006[2]; Maguire 2009: 42-43[3].

Vegetation at the base of the Red Cliffs has been described as a mix of composite evergreen forest and 'part-deciduous' fringing forest with Upper Bushveld hillside vegetation or a North-Eastern Mountain Sourveld that transitions to Sourish Mixed Bushveld in the valley (Esterhuysen 2006: 20).

3.1.2.2 Local Vegetation Types

The slope around the cave is covered with two main vegetation types and eight recognisable local habitats, which are described by Maguire (2009: 45-48). The two vegetation types are Acocks's (1988) Sourish Mixed Bushveld and North-Eastern Mountain Sourveld mentioned above (cited Maguire 2009: 45). These regional types are described in Table 3.3.

Table 3.3: Local Vegetation within Makapans Valley (adapted from Maguire 2009: 45-48)

No.	Vegetation Zone	Description	Species
1 2	Disturbed vegetation	Vegetation patterns 1 and 2 are grouped together. Pattern 1 includes current and abandoned worker's settlements and cultivated ground. Pattern 2 includes abandoned agricultural lands of the farm. Vegetation in these two patterns have been destroyed over thousands of years through Early Iron Age and more modern farming and the land is characterised by pioneer plant species.	include *Rhus (Searsia) lancea, Rhus pyroides* and *Ziziphus mucronata*. Marula trees found at Ficus Cave Iron Age site are not within their natural habitat and are most likely the result of Iron Age people using them as a source of food.
3	Sourish Mixed Bushveld on	Different plant communities are found on the north to north-west facing slope of the valley than the plants found on the south-facing slopes,	South-facing slopes: *Acacia caffra, Ziziphus mucronata*, *Vitex rehmannii*,

	the dolomite	due to the aspect of the slopes. North-facing slopes support multiple edible trees and shrubs and have a greater community of succulent plants than the south-facing slopes, which are thorny.	*Tarchonanthus camphoratus* and *Cussonia spicata*. North-facing slopes: *Pappea capensis, Bridellia mollis, Cussonia paniculata, Grewia occidentalis, Kirkia willmsii and Schotia brachypetala.*
4	Subtropical evergreen forest	This type is unusual for the rainfall conditions; it appears to be relict species of moist forest and mist belt environments. This pattern is found at the base of Red Cliffs and within Star, Spider and Nettle. These areas are cooler due to them being semi-permanently shaded and protected from wind and frost. Springs, a stream and a waterfall provide water for these plants While fruit-bearing trees are common in this type, fruits are often inaccessible for humans as they are often very high on the trees.	*Mimusops zeyheri*, *Olea capensis*, *Ficus sur, Podocarpus latifolius* and *Diospyros whyteana*
5	Wooded grassland on a diabase intrusion (or lava)	This type covers a small area of the farm and is usually only sparsely covered with vegetation. Well-grown trees are not usual for this type; typical vegetation is comprised of aloes, shrubs, bushes and herbs.	*Acacia caffra, Lannea discolour* and *Olea europea* subsp. *capensis*. Two dense communities of *Aloe marlothii* are interspersed with grass
6	Vlei vegetation and wetlands	The pattern is found within the North-Eastern Mountain Sourveld This pattern is very herbaceous and includes a number of *Cyperaceae* species, some of which are edible.	*Cyperaceae* species, *Juncus* species (edible rhizomes; sleeping mats recovered from Historic Cave may have used stems).
7	North-Eastern Mountain Sourveld: Protea woodland	This pattern appears to be wooded grassland but is interspersed with sparse mixed sour woodland and patches of mountain grassland. Multiple edible species occur in this pattern, especially on the lower slopes.	*Protea caffra* and *Protea roupelliae*; *Engelerophytum magalismontananum*, *Vangueria infausta, Ximenia caffra* and *Pappea capensis*
8	Fynbos-like vegetation of the Quartzite Mountain Crests	This is only found at the extreme eastern point of the Makapans farm, on a few of the highest points of the Highlands Mountains at altitudes between 1 900 and 2 045 m.a.s.l. Shrubs and shrublets in this pattern are low-growing and have fine leaves. This community most likely represents true relict fynbos	No species described

3.1.3 Social Context and History

Historic Cave was the site of a month-long siege that took place during October and November of 1854 (Esterhuysen 2006; 2008a: 461; 2008b: 202).

Competition over trade, resources and political authority characterised the eighteenth and nineteenth centuries in South Africa (Esterhuysen 2008b:197).

Trekkers from the Cape Colony branched out into northern South Africa, attracted by the elephant trade, during the early nineteenth century AD, bringing with them a demand for tribute and labour (Esterhuysen 2006: 3, 2008b:198). This demand lasted for roughly a decade, until the African societies resisted and protected themselves through acquiring guns (Esterhuysen *et al* 2009:1038). With this access to guns came a period of intimidation and acts of violence to reaffirm Trekker power and authority (Esterhuysen *et al* 2009:1038). By 1851, Mugombane had become an important part in the growing resistance to the trekkers (Esterhuysen 2008b: 209). Kekena Ndebele, among many other groups in the area, had lost women and children to the Trekkers and their African auxiliary forces; these people were sold off as slaves for both local and international trade (Esterhuysen *et al* 2009:1038). In response to these and other acts of cruelty at the hands of the trekkers, the Kekana and Langa Ndebele (under their chief, Mankopane) rebelled by murdering some Trekkers (between 23 and 28) passing through their terrain in AD 1854 (Esterhuysen 2008a: 461, 2008b: 202; Esterhuysen *et al* 2009:1039). The Kekana Ndebele chiefdom then took refuge in Historic Cave (Esterhuysen 2006: 2, 2008a: 461, 2008b: 202; Esterhuysen *et al* 2009:1040). Huts, storage areas and fortifications from the excavation show that the cave had been prepared for this purpose (Esterhuysen 2008b: 202; Esterhuysen *et al* 2009:1040).

Commandant-General M.W. Pretorius recorded the events of the siege a month after it ended (Esterhuysen 2006: 4, 2008a: 461). Commandant-Generals Pretorius and P. Potgieter led roughly 480 men into Makapan Valley, arriving on the 25th of October and proceeded to attack the cave repeatedly over the following three days before placing the cave and its people under siege (Esterhuysen 2008a: 461; Esterhuysen *et al* 2009:1040). The Kekana resisted these attacks and subsequent attacks until early November, including an attempt by the Trekkers to blast open the cave on October 30th (Esterhuysen 2008a: 461; Esterhuysen *et al* 2009:1040). The Trekkers cleared the cave entrances of all foliage and obstructed the entrances to block Kekana access and restrict their movement with the aim of initially smoking the Kekana out, but later of denying them access to water (Esterhuysen

2008a: 461; Esterhuysen *et al* 2009:1040). A group of women and children, driven by thirst, left the cave on November 6 and many of the escapees died after drinking water too quickly; the survivors were taken prisoner (Esterhuysen 2008a:461; Esterhuysen *et al* 2009:1040). Also on this day, Commandant-general Potgieter was shot dead at the cave mouth (Esterhuysen *et al* 2009:1040). Two days later, on November 8, a group of over 700 men left Historic Cave (Esterhuysen 2008a:461; Esterhuysen *et al* 2009:1040). According to Pretorius, most of the men were shot (Esterhuysen 2006:53, 2008a:461; Esterhuysen *et al* 2009:1040). A group of women and children came out the cave behind the men; they were taken captive (Esterhuysen 2006:53, 2008a:461; Esterhuysen *et al* 2009:1040). November 17 saw 364 women and children surrendering after 24 days in the cave (Esterhuysen 2006:53, 2008a:461; Esterhuysen *et al* 2009:1040). The trekkers entered the cave and reclaimed guns, powder and the personal effects of those killed by the Kekana in the original attack (Esterhuysen 2006:53, 2008a:461; Esterhuysen *et al* 2009:1040). The siege of Historic Cave ended on the 21st November 1854 with the death or surrender of the Kekana people (Esterhuysen 2008a: 461; Esterhuysen *et al* 2009:1040). Kekana women and children were divided amongst the trekkers and the Kgatla and Shangane/Tsonga subsidiary forces, along with livestock as another prize (Esterhuysen 2008a: 461, 2008b: 203).

According to his records, Pretorius estimated that 900 bodies lay outside the cave and had been partially scavenged by birds and dogs; a further 3 000 corpses lay inside the cave totalling 3 900 deaths (Esterhuysen *et al* 2009:1040; Le Roux *et al* 2013: 100). Some structures in the cave were burnt down after the siege broke (Esterhuysen 2006).

3.1.4 EXCAVATION

Historic Cave has had a long history of research in the cave itself as well as in the caves in the surrounding Makapan Valley (Esterhuysen 2006; McNabb & Sinclair 2009). The earliest recorded visit to Historic Cave was made by Clarence van Riet Lowe in January 1937 or 1938 (McNabb & Sinclair 2009: 14). The Makapans

Valley contains a long history of events, from the Early Stone Age and australopithecines right up to Iron Age and historic times (Esterhuysen 2006; Maguire 2009: 30). As such, the valley was listed as a World Heritage Site in July 2005 (Esterhuysen 2006; Maguire 2009: 30).

Historic Cave was surveyed in 2001 (Esterhuysen 2006: 27, 2008a:463). The cave is naturally divided into an Eastern and Western Chamber (Esterhuysen 2006:26, 2008a: 463). The Western Chamber was characterised by a layer of vitrified dung and has a level floor, and it is assumed to have been used as an enclosure for keeping stock (Esterhuysen 2006: 27, 2008a: 463). The Eastern Chamber was characterised by a dolomite rock fall that produced a series of terraces; twenty stone enclosures were among these terraces (Esterhuysen 2006:26, 2008a: 463). Excavation took place in the Eastern Chamber only between 2001 and 2005 and later in 2007 (Esterhuysen 2008a: 463; Esterhuysen *et al* 2009:1040). The excavation is divided into eight sites, labelled from Dg1 to Dg8 as can be seen in Figure 2.1 (Esterhuysen 2008a: 463; Esterhuysen *et al* 2009:1040). In total, the excavated area equalled 38m^2 (Esterhuysen 2008a: 463, 2008b: 204-205; Esterhuysen *et al* 2009:1040). The sites were chosen based on how protected they had been by fallen roof spall or by their distance from pathways to minimise the effect of people who had explored the cave previously and who had removed material (Esterhuysen *et al* 2009:1040). Half of the excavation zones (Dg1, Dg2, Dg4, and Dg5) included households, with separate areas for sleeping and for food preparation (Esterhuysen *et al* 2009: 1040). The households were circled by reed fences or low walls (Esterhuysen *et al* 2009:1040). The other half of the excavation areas consisted of two units smaller than the households with no storage or food preparation area, a section of pathway and a communal storage area (Esterhuysen *et al* 2009: 1040).

Twenty square metres were excavated from the base of the chamber, referred to as Dg1 (Esterhuysen 2009; Le Roux *et al* 2013: 100). The base of the excavation was marked by a thick, hard compact and complex daga floor (Esterhuysen 2010). Although two props were installed across three squares of the excavation (N-P4) to prevent roof fall meant that a complete spatial analysis of the floor was not possible, there were several features that could still be described (Esterhuysen 2010). Multiple fire pits, post holes, fences, a pit with a stone lid and a platform along the daga floor and cave wall are some of the features from this area (Esterhuysen 2010). Eight stratigraphic layers were recorded by Esterhuysen (2006: 30). The excavated area was extended in the 2007 season (Le Roux *et al* 2013: 101).

Dg 2 was defined horizontally by a built wall and rock fall and vertically by a consolidated layer representing the floor, beneath which was a sterile layer (Esterhuysen 2008a: 465). This section of the excavation began as a 2m by 2m square, which was later extended by another square meter (Esterhuysen 2006: 40). There were no clay features noted on this floor (Esterhuysen 2008a: 465). Two concentrations of fine grass matter were interpreted as sleeping mats and suggest there was some spatial arrangement of this floor (Esterhuysen 2006: 40, 2008a: 465). There were six stratigraphic levels in this area (Esterhuysen 2006: 40).

Dg3 covered a well-used pathway (Esterhuysen 2006: 43; Esterhuysen *et al* 2009:1040; Le Roux *et al* 2013: 100). It was small – a 2m by 1m grid with two layers – and so yielded the smallest number of artefacts (Esterhuysen 2006: 43-44). The bottom of the second layer revealed the hard, consolidated pathway (Esterhuysen 2006: 44).

Dg 4 was circumscribed by large boulders and many rocks covered the surface (Esterhuysen 2006: 45, 2008a: 465). The edges of the 3 square meter grid were extended slightly to facilitate excavation (Esterhuysen 2006: 45). Partial Square R21 is the result of one of the extensions (Esterhuysen 2006: 45). Distinct activity areas were suggested for this section through fine grass material, possibly sleeping mats, in P21-22 and a grindstone and wooden spoon found in Q21 and R21 respectively (Esterhuysen 2006: 46, 2008a: 465). Food storage bins were noted in this excavation area (Esterhuysen 2006: 46, 2008a: 465). The excavation of Dg4 also ended at a consolidated layer overlying a sterile layer (Esterhuysen 2008a:

465; Esterhuysen *et al* 2009:1040). Four layers were found through this excavation zone (Esterhuysen 2006: 45).

Dg5 was also a household site, similar to those excavated in Dg2 and Dg4 (Esterhuysen *et al* 2009:1040). Dg6 was an area used for storage (Esterhuysen *et al* 2009:1040; Le Roux *et al* 2013: 100). The remains of divining paraphernalia suggest that a diviner was present in this area (Esterhuysen 2008a). Dg7 and Dg8 covered areas that were smaller than the households mentioned above and didn't have a place for preparing food or for storage (Esterhuysen *et al* 2009:1040). These two areas, which were higher and nearer to the cave mouth, may have been used for specific tasks, such as guarding the cave entrance (Le Roux *et al* 2013: 107). This idea is reinforced by the faunal remains of burnt animal remains which may have been opportunistically hunted by the guards who would probably have eaten lower and further in the cave (Le Roux *et al* 2013: 107)

Areas that may have been used as storage were found across several squares of the excavation (Esterhuysen 2008a: 465). Forked poles, baskets and rodent activity found together with a large amount of grain indicate that the area within M1-2 and N1-2 was likely used for storage (Esterhuysen 2008a: 465). Storage is also suggested for an area at the back of Dg2 (U10) through the recovery of forked poles, bin fragments and sorghum (Esterhuysen 2008a: 465). In squares Q-R21 (Dg4) a moulded dung storage bin with two woven grass objects, possibly lids, were found on top of a plastered base or platform, indicating the area was used for storage (Esterhuysen 2008a: 465).

Conditions within Historic Cave have allowed for exceptional preservation of animal, plant, and human remains (Esterhuysen 2006: 94). Material culture was abandoned at Historic Cave after the siege, so this site provides a good opportunity for studying activities and social organisation within the cave (Esterhuysen 2006; Le Roux *et al* 2013: 98-100). Archaeological materials that were removed from the cave during the excavation include sleeping mats, beads, clothing, ceramics, wood items, decorated and undecorated pottery, grind stones, leather items, plant material, faunal remains and human remains (Esterhuysen 2008a, 2008b; Esterhuysen *et al* 2009; Le Roux *et al* 2013). Remains were not put through any flotation process. All materials that were recovered from the entire excavation at Historic Cave were passed through a 5mm (coarse) and 1mm (fine) sieve (Esterhuysen 2006: 27; Le Roux *et al* 2013: 100).

Divining objects were concentrated in squares M-N3 in Dg1 and include calabash containers with red and white pigment residue, a pot with blue pigment and animal fat, and a long cow's horn (Esterhuysen 2006: 118, 2008a: 466-467; Le Roux *et al* 2013: 103-104). The cow's horn had a leather loop at one end so it could be hung and the other end had been sharpened (Esterhuysen 2006: 34, 118, 2008a: 467; Le Roux *et al* 2013: 104, 108). The containers and their pigments can be used in traditional medicine practices; animal fat specifically can be used for rainmaking and protective magic (Esterhuysen 2006: 119, 2008a: 467; Le Roux *et al* 2013: 103-104). A drilled sheep astragalus or talus bone (an anklebone) recovered from N2 would have been used in divination (Esterhuysen 2006: 119, 2008a: 468; Le Roux *et al* 2013: 103-104). Other objects relating to medicine recovered during the excavation include a leather hat, a bolus of wood from a species of *Ficus* (a ritual wood), a phalanx from a sheep or goat, a cow's hoof and incisor and a bag made of skin (Esterhuysen 2006: 120, 2008a: 468-469). A maize cob was also recovered from M3 which may have been an item of spiritual importance as opposed to a food as maize may not have been a crop that was adopted wholeheartedly in this area (Esterhuysen2006: 120, 2008a: 468). Items that offered protection included a small bag of white pigments (recovered from O3), a '*muti* protector' or leather thong with a seed or wood fragment attached to it, and a piece of skin from a ground monitor (both recovered from M2) (Esterhuysen 2006: 121, 2008a: 469; Le Roux *et al* 2013: 103-104). Ritual objects were also recovered from other floors in Dg2 and Dg6 (Esterhuysen 2008a: 469; Le Roux 2013: 103-104). These objects include a horn container (Dg2), four amulets (Dg4), and divining dice (Dg6) (Esterhuysen 2006: 123, 2008a: 469). Two of the amulets and the horn likely contained *muti* and the other two amulets may have been from a different tradition than the material from Dg1, a tradition from further north (Esterhuysen 2006: 123, 2008a: 469). These amulets would have been used in divining to help make decisions – one amulet with a bone pointer would be related to the guilt or innocence of someone while the other amulet with an ornamented shell would predict a good/bad or a positive/negative outcome for a situation (Esterhuysen 2006: 123, 2008a: 469; Le Roux *et al* 2013: 103-104, 108). Beads may also have had ritual or divination connotations (Esterhuysen 2006: 122).

Material within the cave appears to have been organised in a specific way mirroring the spatial organisation of the normal settlement (Esterhuysen 2006: 98, 2008a, 2008b: 203; Esterhuysen *et al* 2009). Status is usually ascribed through the height or elevation of individual houses within a community; however this very unlikely in Historic Cave as the highest point was the most exposed to attack (Esterhuysen 2006: 98-99; Esterhuysen 2008a: 465). Instead, the higher status individuals would have been located in the most protected location at the back of the cave in Dg1 while the higher elevations would have been occupied by soldiers (Esterhuysen 2006: 99,2008a: 465). This idea is strengthened by the presence of fences in Dg1 which also represent status (Esterhuysen 2006: 99, 2008a: 465). The fence could also have been a symbolic boundary against spying and witchcraft if the diviner was a royal (Esterhuysen 2006:100, 2008a: 466).

The status that was ascribed to the people living in Dg1 then relates to the platform running along the back of the cave (Esterhuysen 2006: 100, 2008a: 466). This platform, known in Zulu as the *umsamo,* was commonly used to store pots and utensils and was also the most important, sacred part of all huts (Esterhuysen 2006: 100, 2008a: 466). The *umsamo* was where the spirits of ancestors were thought to stay (Esterhuysen 2006: 100, 2008a: 466). At the back of the chief's hut, this platform would have been especially important, as this would be where offerings to the spirits guarding the community would have been made (Esterhuysen 2006: 100, 2008a: 466). Multiple stores of grain associated with this floor stored on this platform may have also served as an indicator of status and power (Esterhuysen 2006: 100, 2008a: 466).

Makapan Valley has had a history of occupations and has been used multiple times as a refuge for people in various caves and locations (Esterhuysen 2006). All the layers within Historic Cave, however, appear to have related to a single event (Esterhuysen 2006: 48-49, 2008a: 465; Esterhuysen *et al* 2009:1040). Throughout the excavation, a sterile layer was found beneath consolidated, solid layers or floors, suggesting a single occupation (Esterhuysen 2006, 2008a: 465; Esterhuysen *et al* 2009:1040). This is also suggested by the fact that multiple pieces of ceramic, skin, and calabash found throughout the cave in layers above the floors could be refitted (Esterhuysen 2006: 48). The cave had been prepared before its occupation – the settlement inside the cave had been built up through stone, clay, dung and poles and boulders in the cave were rearranged around living areas (Esterhuysen 2006; Esterhuysen *et al* 2009:1041; Le Roux *et al* 2013: 100). Storage for large amounts of food plants (grains, legumes and fruit) were also installed prior to the occupation of the cave and animals were brought into the cave in accordance with traditional selection strategies (Esterhuysen 2006; Esterhuysen *et al* 2009:1041; Le Roux *et al* 2013). Based on historical records, the single occupation at Historic Cave was the siege event (Esterhuysen 2006, 2008a, 2008b; Esterhuysen *et al* 2009; Le Roux *et al* 2013: 98-100).

3.1.5 Spiritual Beliefs

The spiritual barricades at Historic Cave were just as important as the physical preparations and fortifications of Historic Cave (Esterhuysen 2006: 127, 2008a; Le Roux *et al* 2013). As mentioned above, several items were recovered from the excavations that point to the presence of at least one diviner, but perhaps as many as three (Esterhuysen 2006, 2008a; Le Roux *et al* 2013: 103). Diviners were responsible for divining the source of a social problem or misfortune and identifying the cause or person responsible for it (Esterhuysen 2006: 124, 2008a: 463; Le Roux *et al* 2013: 103). Practitioners of traditional medicines are known by many names, including *inyanga* and *sangoma* which are interchangeably today, in the past they referred to herbalists or diviners (van Wyk *et al* 1997: 10). These practioners make use of *muti* (Ashforth 2005: 211-212).

Witchcraft or harmful magic, angering the ancestors and pollution or ritual impurity could all be seen as possible causes of misfortune (Esterhuysen 2008a: 463-471). Diviners are highly important people as they were responsible for detecting hostile forces and protecting, fortifying and cleansing the community from them, as well as acting as the conduit for the ancestors to communicate through throwing dice (Esterhuysen 2008a: 463). Death especially was seen to contaminate the living and required intervention from the healer to cleanse and protect the living (Esterhuysen 2006: 126-127, 2008a: 471). The chief was important for, among his other duties, he guaranteed rain (Le Roux *et al* 2013: 98). Tree-ring and oral reports indicate that the early 1850s, the 1853/1854 season specifically, was an exceptionally dry period (Esterhuysen 2008: 472). The lack of rain, which would have caused the trekkers to abandon the siege, or other external aid may have been seen as a result of the ancestors becoming displeased with the community as the proper practices and rituals were not followed (Esterhuysen 2006: 128, 2008a: 472).

Diviners had detailed knowledge regarding plants, amongst other substances, and they were used in divination (Esterhuysen 2006: 124, 2008a: 463). Plants could also be used for rainmaking and purification, two highly regarded functions of doctors and diviners (Esterhuysen 2008a: 463). As a result, it was expected that plants with ritual or ceremonial links would be recovered from this cave site.

3.2 BALERNO FARM

3.2.1 LOCATION

Balerno Farm is roughly 10km south-east from Pont Drift, off the road that runs between Alldays to the Botswana border (van Doornum 2000: 13, 2005: 61, 2008: 252; see Figure 1.1). The farm now forms part of the Vhembe-Dongola Reserve (van Doornum 2005: 61).

Balerno Main Shelter is found at 22°15’24” S and 29c11’17” E (van Doornum 2005: 61). Balerno Shelter 2 is found only 150m away from Shelter 3, at 22°17’13”S and 29°12’13”E (van Doornum 2005: 76). Balerno Shelter 3 is found at 22°17’30” S and 29°11’50” E (van Doornum 2000: 15).

Balerno Farm has three cave sites on the property – Balerno Main Shelter, Balerno Shelter 2 and Balerno Shelter 3 (van Doornum 2000, 2005). Balerno Main Shelter has also been called Petroglyph Shelter in an unpublished report by Eastwood and Cnoops (1999, cited in van Doornum 2005: 61). Balerno Shelter 2 has also been referred to as Apron Shelter, in the same unpublished report (Eastwood and Cnoops 1999, cited by van Doornum 2005: 76). Balerno Main Shelter and Shelters 2 and 3 are all found with a 3 to 4km buffer zone where there are no contemporary farmer sites (van Doornum 2000, 2005).

3.2.2 ENVIRONMENTAL CONTEXT

The Soutpansberg Mountains create an ecological barrier between the old Northern and Central Transvaal (van Doornum 2000: 13). Undulating plains extend from the mountain range to an escarpment formed by sandstone features that are host to multiple volcanic intrusions (van Doornum 2000: 13). Balerno Main Shelter and Shelters 2 and 3 are composed of sandstone (van Doornum 2000, 2005: 61, 76, 2008: 252).

The mountain ranges in the area create a rain-shadow effect and so rainfall can be erratic (van Doornum 2000: 13). The overall annual average for the region is 329,5 mm, although this varies from 140mm per year to over 500mm per year in different places (van Doornum 2000: 13-15).

The climate of the region is a tropical but arid climate (van Doornum 2000: 13). The Soutpansberg Mountains are covered with mixed bushveld while arid sweet bushveld dominates the area between Soutpansberg and the town of Alldays up north (van Doornum 2000: 13). To the north and the east of Alldays, the area is defined by the Mopaneveld (van Doornum 2000: 13, 2008: 252). Along the banks of the Limpopo River, however, the vegetation is more riverine (van Doornum 2000: 13). All three of the shelters on the farm are screened and protected by fairly thick vegetation (van Doornum 2005).

As mentioned above, the area around the three Balerno shelters is Mopaneveld (van Doornum 2000: 13, 2008: 252). Mopane veld as described by Acocks (1988: 43) is found north of the Soutpansberg in the undulating Limpopo Valley. This type is found at altitudes between 400 to 750 m.a.s.l. and in areas with summer rainfall that averages 250 to 400mm in a year (Acocks 1988: 43). Vegetation is usually short and is comprised mostly of dense shrubby *Colophospermum mopane* (Acocks 1988: 43). North of the Limpopo, however, the Mopaneveld takes on a more forest-like look, with mopane trees that can be over 10m tall with little undergrowth (Acocks 1988: 44). Other important species in this veld type include several *Acacia*, *Commiphora, Grewia* and *Ximenia* species, *Adansonia digitata* (Baobab) and *Sclerocraya birrea* subsp. *caffra* (Acocks 1988: 43).

3.2.3 EXCAVATION

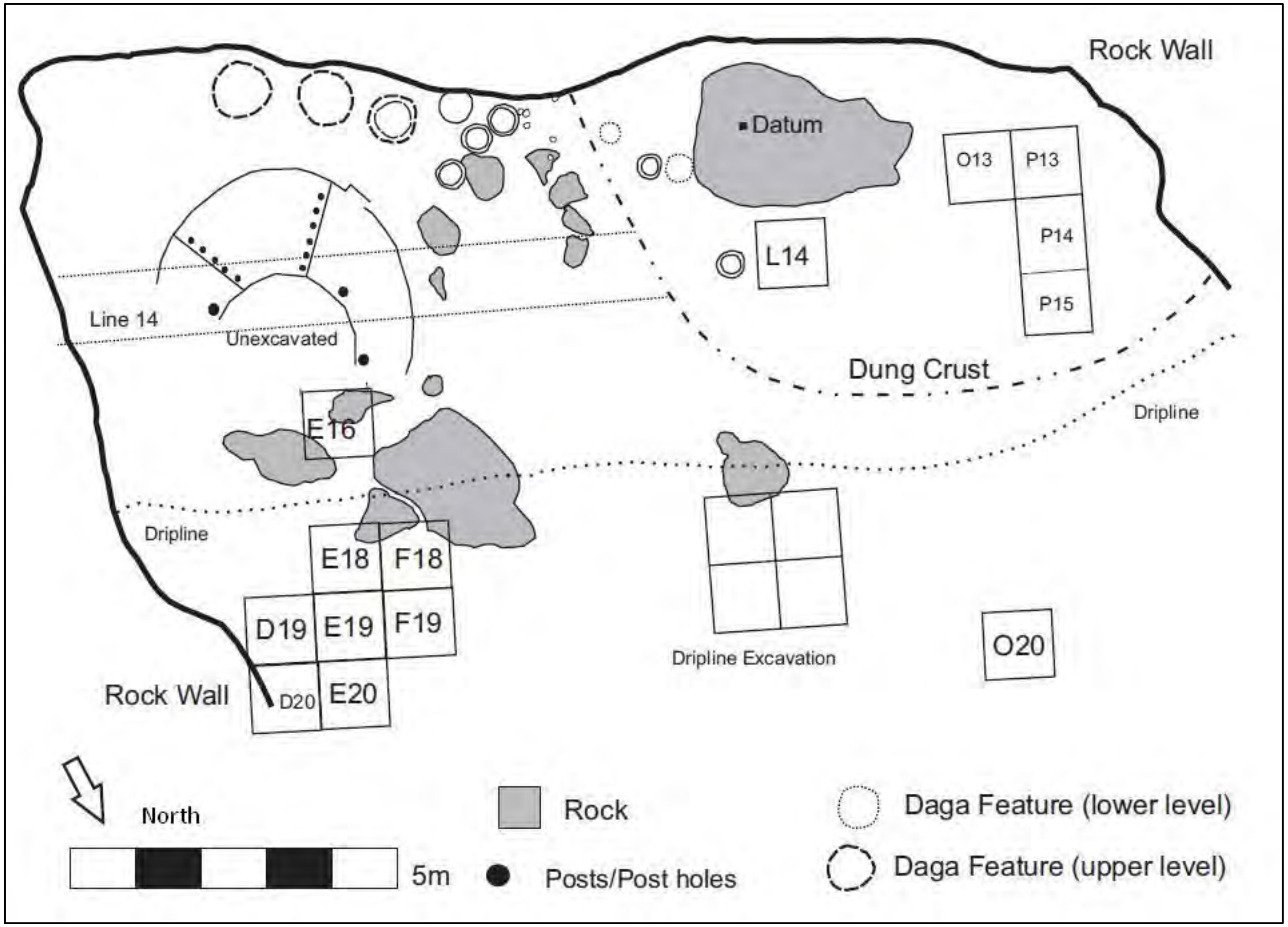

Figure 3.2: Balerno Main Shelter Site Map (after van Doornum 2005: 66 and S. Hall, 14 April 2011, correspondence)

3.2.3.1 Balerno Main Shelter

This shelter is the largest of the three and measures 23m long, 5m deep and 6m high (van Doornum 2005: 61; 2008: 253). The site map is provided on the previous page (Figure 3.2).

Balerno Main Shelter was excavated in two stages (van Doornum 2008: 250). The first stage began in 1998 and was overseen by Simon Hall (van Doornum 2008: 250). These excavations focused on the left hand side of the shelter and exposed a thick dung crust and daga floors (van Doornum 2008: 250). In the following year, the dung crust was removed to expose more daga flooring as well as a number of circular features, indicated in Figure 3.2 (van Doornum 2008: 250). The second stage of the excavation of this cave took place in the right-hand side of the shelter and concentrated on an area that would not destroy the daga floors and their features (van Doornum 2005: 63, 2008: 254). Four square meters were excavated in an L-shape in an area covered by the hardened thick dung crust which sealed the deposit (van Doornum 2005: 64, 66, 2008: 254). One square, Square P13, began as a test trench in September 2000 (van Doornum 2005: 64). The other three squares were excavated in December that same year (van Doornum 2005: 64). A total of ten stratigraphic layers were recorded in the excavation (see van Doornum 2005: 65-75, 2008: 254, 257 for a full description). The cave was excavation in 50mm spits within the recognisable stratigraphic layers (van Doornum 2005: 64, 2008: 254). The layer Brown-Red Ash (BRA) was excavated as one undivided layer in the 1999 excavation for 50cm below the datum; afterwards it was removed in spits and so there are no spit levels for square P13 (van Doornum 2008: 254). Flotation was not used during either stage of the excavations.

This shelter has four periods of occupation: an early pre-contact phase between 11 120 to 10 890 BC and 6230 and 6060 BC (all dates are calibrated), a later pre-contact period hunter-gatherer period from 340-320 to 210-100 BC, a contact period between AD 100 and 1300 and an occupation by farmers between AD 1640 and 1800 (van Doornum 2005: 61, 75, 158, 2008: 269). Balerno Main

Shelter was thus not continuously occupied, but was returned to over time by various populations (van Doornum 2005: 75, 2008: 255). There was a break in occupation for roughly 400 years between the first millennium and second millennium occupations (van Doornum 2008: 256).

Stratigraphic layer Damp Black/Grey (DBG) represented the pre-contact occupation of the shelter – as well as layers ABR and DAF which were excavated but not described in any publications thus far (van Doornum 2005: 64). The post-contact occupation was represented in the darker and greyer levels of this same layer, through Brown-Red Ash (BRA) and Lighter Brown (LB) units (van Doornum 2005: 64). The white-grey Dung Crust (DC), Consolidated Surface (CS), Grey-Brown Ash (GBA), Rocky Corner (RC), grey Base of Dung (BOD) and Dark Brown Dung (DBD) layers represented the farmer occupation (van Doornum 2005: 64). The Base of Dung layer may represent a transition between hunter-gatherer and farmer occupation of the cave (van Doornum 2005: 61). The farmer occupation is suggested through daga flooring covering a large portion of the cave floor as well as the thick dung crust (van Doornum 2005: 61).

Excavated remains include faunal remains, plant remains, *Achatina* shell, freshwater mussel shell, pottery, colouring material and specularite, lithics and beads (van Doornum 2005, 2008). Engraved and painted rock art is found at the site as well as in the immediate area (van Doornum 2005: 61, 2008: 253).

3.2.3.2 Balerno Shelter 2

Excavation of Balerno Shelter 2 began in 1999, alongside Balerno Shelter 3 (van Doornum 2000: 135). This shelter is small and low and becomes narrow towards the rear of the cave, due to sediment build up (van Doornum 2005: 76).

Two 1m x 1m test pits were excavated between the drip-line of the cave and collapsed roof fragments (van Doornum 2005: 80). Three statigraphic layers were observed in this shelter – the surface layer, a Grey-Brown (GB) layer, and an Orange-Brown (OB) layer that was observed in one of the two squares (van

Doornum 2005: 80). The excavation was also carried out in spits of 50mm within the stratigraphic layers (van Doornum 2005: 80).

Two phases of occupation were identified in Balerno Shelter 2 – a ceramic phase between 600 and 350 AD and a pre-ceramic phase over 2 000 years ago (van Doornum 2005: 81, 161). No radiocarbon dates were available and so the dating is based on the presence and absence of ceramics in the archaeological record (van Doornum 2005: 161).

Excavated remains include faunal remains, plant remains, pottery, colouring material and specularite, lithics, Achatina shell and beads (van Doornum 2005). Painted rock art is found both inside and outside the cave, along the outcrop of sandstone that the cave was formed in (van Doornum 2005: 76). There are also incised grooves and cupmarks in the shelter (van Doornum 2005: 77). No floatation techniques were employed at the site.

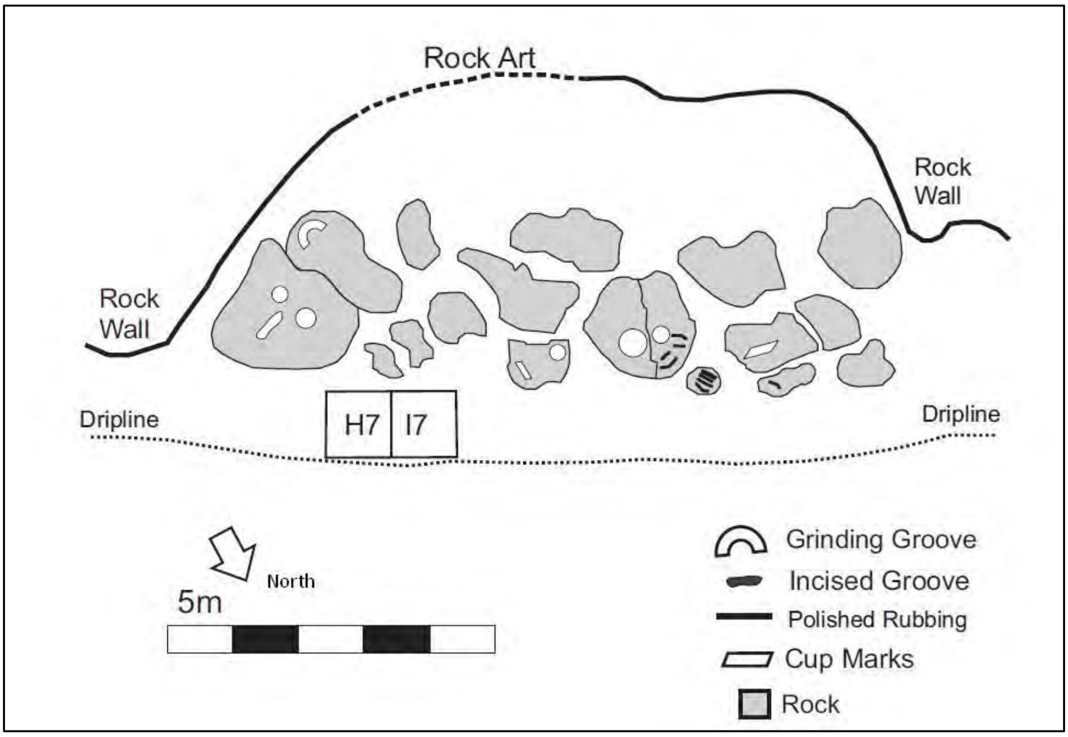

Figure 3.3: Balerno Shelter 2 Site Map (after van Doornum 2005: 79)

3.2.3.3 Balerno Shelter 3

Balerno Shelter 3 is a small shelter that was excavated in 1999 (van Doornum 2000: 15). This is a Later Stone Age site with three periods of occupation: a pre-ceramic phase ending about 1 800 BP, a ceramic phase from 1 800 BP and a third period that corresponds to Zhizo and K2 Phases (van Doornum 2000). This shelter appears to have been continuously occupied between 2 500 and 700 BP (van Doornum 2000: 22). Balerno Shelter 3 also contains rock art, both painted and cut into the rock (van Doornum 2000). However, no plant remains were recorded from this site, and is therefore excluded from this dissertation.

3.2.4 Social Context/History

Previous research in the Shashe-Limpopo Confluence Area (for example Hall & Smith 2000, also cited in van Doornum 2005, 2008) proposed a model of forager-hunter interactions based on two cave sites in the area: Little Muck Shelter and Salt Pan Shelter and Open Site further south. Van Doornum (2000, 2005, 2007, 2008) sought to expand this research and data regarding forager-farmer interactions, while testing Hall and Smith's (2000) hypothesis. Tshisiku Shelter was the final shelter studied and excavated by van Doornum (2005, 2007) for this purpose. Tshisiku Shelter was chosen to test the hypotheses made at Little Muck Shelter, as these two caves are similar in their social contexts and distance from farmer settlements; similarly, Balerno Main Shelter was chosen to compare to Shelter 2 and Balerno Shelter 3 was chosen due to its proximity to both Balerno shelters (van Doornum 2005).

The three shelters on Balerno Farm are surrounded by farmer sites outside of the 3 to 4 km buffer zone (van Doornum 2000, 2005). The distances between the forager and farmer sites result in a variety of ways in which places were used and how the two groups of people interacted (van Doornum 2000, 2005, 2007, 2008). There are many responses of foragers to the farmers entering into the landscape and these responses change over time – the area seems to be fluid and complex in its interactions (Hall & Smith 2000; van Doornum 2005, 2007, 2008). At Balerno

Shelter 3, van Doornum (2000, 2005: 61) suggested that the material culture shows a pattern of hunter-gatherers moving closer to and then further away from famers outside the buffer zone over time, in order to trade.

Information from sites in the Shashe-Limpopo Confluence Area suggests four stages of hunter-gatherer occupation in the region. These include an early pre-contact phase from about 6000 to 1220 BC and a late pre-contact period between AD 100 and 900 (van Doornum 2005: 161). The next phase is the late first millennium/early second millennium contact period between AD 900 and 1300 (van Doornum 2005: 161). The last period is a late second millennium contact phase between AD 1600 and 1900 (van Doornum 2005: 161).

This last period of occupation forms the focus of this project. In this period, many shelters in the Shashe-Limpopo area seem to have been occupied by Bantu-speaking farmers instead of the hunter-gatherers of previous occupations (van Doornum 2005: 182-184). At Tshisiku Shelter, this is seen in the grain bins on the surface level and at Little Muck Shelter, multiple gaming boards had been bored into the rock surface of the cave (van Doornum 2005: 183-184). At Balerno Shelter 2, there were also gaming boards cut into the rock surface and the occupation of Balerno Main Shelter is suggested by circular features (as seen in the site map, Figure 3.2) that may be linked to ancestral rituals (van Doornum 2005: 184).

3.2.5 SPIRITUAL BELIEFS

Farmers may have taken over shelters that once housed hunter-gatherers for a variety of reasons (Hall & Smith 2000; van Doornum 2005, 2007, 2008). These reasons may be utilitarian, for example at Balerno Shelter 2 and at Tshisiku Shelter (van Doornum 2005: 184). The appropriation of the caves may have also been done purposefully in order to harness a power of the hunter-gatherers perceived by the farmers, due to their status as 'first peoples' (van Doornum 2005, 2008: 252). These hunter gatherers were seen as having special ties to the land

and powers over the land simply by virtue of them being there first (van Doornum 2005). Rainmaking was an especially important ability for the hunter-gatherers (van Doornum 2005). Balerno Main Shelter, on the other hand, may have been chosen for its ritual purposes in spite of its previous occupations by hunter gatherers (van Doornum 2005: 184). The long period of time in which the cave was abandoned means that the farmers occupying the shelter during the last phase of occupation (in the seventeenth and eighteenth centuries AD) may have been unaware of previous occupations by hunter-gatherers (van Doornum 2005: 184, 2008: 251-252). The site may have been chosen as a place of power for other reasons (van Doornum 2005: 184, 2008: 252). Simon Hall (14 April 2011, correspondence) suggests the basins carved into the rocks at Balerno are key to the rituals held there.

3.3 Chapter Summary

Three cave sites are described above in terms of their environmental, social and historical contexts. Balerno Shelter 3 was excluded as no recorded plant remains were recovered from this excavation. Balerno Shelter 2 was occupied in two broad phases, loosely dated by the presence or absence of ceramics in the record. Balerno Main Shelter has four periods of occupation reflected in its material culture:

1. an early pre-contact phase (11 120 to 10 890 BC and 6230 and 6060 BC)
2. a later pre-contact period hunter-gatherer period (340-320 to 210-100 BC)
3. a contact period (AD 100 and 1300)
4. an occupation by farmers between AD 1640 and 1800.

These three cave sites show a history of hunter-gatherer occupation in the area, followed by a phase of contact with the farmers moving in from the more southern parts of the country and finally a period of occupation of farmers in shelters previously used by hunter-gatherers. It is this final occupation that this dissertation is focused on. Farmers may have appropriated these cave sites for multiple reasons – one reason may be to gain access to the powers that the hunter-gatherers are believed to have by virtue of them being the ‘first people’ in the landscape. This power enabled the hunter-gatherers to form a special link to the land, a link that was often expressed in terms of rainmaking. Balerno Main Shelter may not have been appropriated for this purpose, due to the long gap in the occupation of the shelter. This cave may have been seen as a place of power by the farmers regardless of the previous occupants and the farmers may have used this cave to express their own spiritual beliefs.

Historic Cave has a shorter but more violent history. The cave, found fewer than 20 kilometres away from the town Mokopane, was host to a siege event in AD 1854, which appears to have been the only occupation of the cave. The Kekana Ndebele people took refuge in the cave after attacking a group of Boers as a sign of resistance against the Boers’ demands for tribute and manpower. The trekkers retaliated and, after some unsuccessful attempts to gain entry into the cave, placed the people under siege. In less than a month, the Kekana surrendered, weakened by thirst. Excavation of the cave revealed that Historic Cave had been prepared for such an event, both physically and spiritually. The spatial arrangement of the cave captured the settlement hierarchy, and daga floors and homesteads had been built inside the cave. Food in the form of plants and cattle, selected under normal herd management practices, was also stored in the cave. Spiritual defences took the form of protection *muti*, administered by at least one diviner in the cave, although evidence shows there may have been a second and third diviner, possibly from separate traditions.

Chapter 4: PROJECT METHODS

The condition of the material included in the project will be briefly described, as will the biases affecting the plant assemblage. Plant remains from the excavations of the cave sites – Historic Cave, Balerno Main Shelter and Balerno Shelter 2– were identified using multiple sources of comparative material. The remains were then quantified, using a raw count and presence analysis. The chapter ends with a discussion of why the remains were included in this study as archaeological materials, and not modern intrusions into archaeological soil.

4.1 PLANT REMAINS: CONDITION AND BIAS

Most of the plant remains that were recovered from all three cave sites were damaged in some way. A few burnt remains were recovered from Historic Cave. Some structures in Historic Cave were burnt down after the siege broke (Esterhuysen 2006), which may account for some of this burnt material. Plant remains could also be charred accidentally during preparation and cooking. At Balerno Main Shelter, however, burnt remains made up the majority of the counted remains. Broken remains were recovered at both sites and constituted a fair portion of each assemblage. Fewer remains were recovered at Balerno than at Historic Cave, but at each of the sites the majority of the plant remains was identifiable.

The largest bias affecting the plant remains that were recovered during the excavations is that the species brought into the cave sites were chosen by people. People selectively harvested or gathered plant species and brought them into the caves to meet their needs. As a result, the plant collection recovered from the caves will not reflect the flora surrounding the sites. Excavation in a cave site will not necessarily represent all the species found in the area and the species that are recovered will not represent the abundance of one species relative to another in the natural environment.

The characteristics of the plant itself will also affect whether it is preserved and therefore recovered and, if it is recovered, in what condition. Some plant species are hardier and less easily degraded and so will be recovered in better conditions and therefore will be easier to identify. Other species are more susceptible to decay and are less likely to be recovered at all; if they are recovered, it is usually in a poor condition. In most species however, certain parts will be more resistant while other parts of the plant will degrade. In these cases, the species will influence which parts of the plant are recovered from excavation. It is important to note that the plant parts that have been excavated will not necessarily reflect the most useful or most utilized parts of the plant. The excavated plant remains may have been ignored or treated as waste by those who brought the plant in to the site.

The plant species and the parts of the plants that were excavated are affected by the manner in which the plants were prepared and treated. There is a large variety of preparation and cooking methods described by Quin (1959), who studied the Pedi and their diet. Each of these methods will leave behind different remains – plants that are prepared as porridge will be less likely to preserve than plants that would have been boiled or eaten raw, for example. The way in which foods were prepared will also affect the plant parts that would be recovered in the excavation.

The excavations themselves exerted a large influence over which remains were recovered, due to the physical placement of the squares and grids of the excavations. It is therefore entirely possible that species that may have preserved were excluded from this study simply because they were not in the excavated areas. The recovery biases mentioned in Chapter 2 will all play a part in which plant remains will be excavated, however since the deposits at Historic Cave were sieved through a fine mesh, all size grades of plant remains should be represented in the assemblage (Esterhuysen 2006:28, Le Roux *et al* 2013: 101). The mesh sizes used during excavations at Balerno are not published. It is therefore assumed that similar mesh sizes were used for the two Balerno shelters, as macroremains with a small diameter were recovered from the excavations.

4.2 Excavations and Samples

Excavations at both sites were completed before this project began. Balerno Main Shelter and Shelter 2 were dug in spits of 50mm within layers of the stratigraphy but the sieving process was not described (van Doornum 2005:64, 80, 2008:254). The volume of material removed from each level of the excavation was recorded in terms of 10*l* buckets (van Doornum 2005:70, 83). Van Doornum (2008) makes no mention of any storage items at Balerno Main Shelter or at Shelter 2. In contrast, Historic Cave contained a number of storage bins as well as storage pits that were excavated.

None of the plant remains at Balerno Main Shelter or Balerno Shelter 2 have been analysed in any way before this project. A small sample of the plant remains from Historic Cave, however, has been identified from Dg1 to Dg4 (see Esterhuysen 2006). These remains were identified by Mr G. Hall and were included in the final counts in Appendix B. This dissertation includes all the recovered material from the three cave sites, and has not been sampled in any way.

4.3 Methods Used Within this Project

The first step was to remove all the seeds and botanical remains that were to be included in the project from the other excavated material. The remains included seeds, fruits, fungus, thorns and flowerheads. Material from each site was sorted and kept in polystyrene trays with labels denoting where the remains were recovered from until they could be identified.

4.3.1 Identification

Material was identified using comparative samples. These samples came from a number of places, including the comparative collection within the Archaeology department, housed in the Origins Centre at the University of the Witwatersrand (Wits University). The C.E. Moss Herbarium, found in the Life Sciences and

Biodiversity Museum on Wits' Main Campus, was consulted in the identification of some species (marked in Appendix C). Multiple visits were also made to the National Herbarium in Pretoria, where the majority of the species were identified. In order to narrow down possible matches, species lists from other research reports and studies done near to both sites were used (see for reference Greenfield *et al* 2005, Schoeman 2006 and Götze *et al* 2008). Online databases and distribution maps (e.g. SANBI's SIBIS database) (SANBI 2013) were also used, both to create lists of possible matches of species and to double-check identifications. Photos of species, both from online sources and books (listed in the reference list), were also used to compare species where no physical sample was available. Although this is not as accurate as using physical samples to compare, in some cases this was necessary to make an identification as there was no physical sample to compare. In the case of Historic Cave, the remains that had already been identified by Mr G. Hall (listed in Esterhuysen 2006) were used to compare to the unidentified material.

In order to identify a species, comparisons were made by keying out the features of the seed. These features included the size, shape and colour of the seed as well as texture and any other defining feature such as the hilum of the seed or attachment points. Species were noted as 'fractured' where the seed had been damaged in some way but one or none of the defining features had been damaged or removed and were noted as 'broken' when more than one of the defining features had been removed or damaged, but enough remained for a positive or tentative identification. Seeds that ranged from being singed on part of the seed to remains that were completely carbonised were keyed into the single category, burnt. Charred seeds are much more difficult to identify as multiple diagnostic characteristics may be altered, for example, the size, colour and texture of the seed. Many burnt seeds are also cracked and/or damaged from the effects of fire, damaging more defining characteristics. Some botanical remains were recorded as 'unidentifiable'. In these cases, not enough features of the seed remained for an identification to be possible. This was for a number of reasons: the remains may have been too small to contain any features, the features found on the remains may not have been specific enough to make a secure identification or the specimen may have been too badly damaged or broken for identification.

Once the botanical remains were identified (or marked unidentifiable), they were placed into different-sized sealable plastic bags with a label that included the species name. In cases where the remains were moved out of the laboratory (during visits to the National Herbarium, for example), the specimens were put into sealable plastic bags with temporary labels that included a species number for easy reference. These labels were kept until a positive identification was made. Species that could not be identified through comparison to either physical or photographic material was given a type number (Appendix A). All the remains, identified, unidentified (i.e. those that were given a species number) and unidentifiable, were then quantified – in other words, they were counted and recorded. Each fragment was counted as a 'whole' seed or macrobotanical item, i.e., there was no attempt at creating a minimum number of plants. Fragments are noted in the tables in Appendices B to D. In some cases, remains were also weighed (see Appendices B to D). Weighed species included calabash, sorghum, millet and the aloe species – species that were recovered only in fragments and where a number of recorded pieces would not reflect the amount of material recovered accurately. This information is all considered a raw count, as it is simply a measure of the material recovered, with no other statistical or other influence.

4.3.2 PRESENCE ANALYSIS

A species list detailing the species recovered from each of the sites was compiled using the raw counts. This served as a base for the next quantification step – a presence analysis. For the presence analysis, each identified species (and those with a type number) were marked as '1' (present) or '0' (absent) for each square of that was excavated at each site (see Appendices B to D). These values were then added up to create the total number of species present in each excavated square. The total was then expressed as a percentage of the total number of species. A second presence analysis was created by totalling up the number of squares a species was present in. This total was then converted into a percentage of the squares that a species was recovered from. All these steps mentioned here were repeated for all three cave sites, resulting in a presence analysis by species and a presence analysis by square for each cave site. The results of the presence analyses can be seen in Figures 5.1 to 5.10.

Presence analysis is the most appropriate measure for analysing sites that have different depositional, preservation and/or recovery bias (Pearsall 1988:214-215). Such sites could have been excavated by multiple researchers or could be located in areas with different environments (Pearsall 1988: 214-215). Presence analysis is therefore the most appropriate measure to use when comparing between the excavated sites. Presence analysis is appropriate when looking at Balerno Main Shelter, as it was excavated by two different researchers. At Historic Cave, the different Dgs were used differently (i.e. Dg3 was a pathway, whereas Dg1 was a living area housing upper-status people). The depositional contexts were different for each of the Dgs. The excavation squares at the sites may or may not have been independently deposited. However, presence analysis is often used to compare between analytical units, including excavation squares (Pearsall 1989: 214). Fuller (2002: 268) notes that there is no 'correct' method of quantifying archaeobotanical remains and suggests that raw counts are made available so that other numerical methods can be employed on a dataset. This suggestion has been carried out here (Appendices B to D).

4.3.3 CURATION AND STORAGE

All the plant materials included in this project will be stored in the archives (in the basement) of the Origins Centre on the Main Campus at Wits. The archives are arranged by site number. The remains will be stored in large sealable bags, containing material from each square of the excavation. These bags are then placed in sturdy cardboard boxes marked with the site number and will be stored alongside material collected from the same site. The labels in the bags are printed in black ink on white acid-free archival-quality paper.

4.3.4 PHOTOGRAPHY

As part of this dissertation, examples of most of the species were photographed. Most of the species were photographed under a microscope with minimal magnification. An Olympus SZ61model microscope was used, with an Olympus C-5060 wide-zoom digital compact camera. Some species were too large to be photographed under the microscope and were photographed instead with a Canon EOS 500D digital camera. The photographs, Figures 5.1 to 5.11, are included in this dissertation as plates.

4.4 INCLUDING AND EXCLUDING MATERIAL

As described in Chapter 2, archaeological material is often very difficult to distinguish from modern plants introduced through natural processes. The usual procedure is to include the charred material only and put all material that is not burnt aside as modern intrusions (Minnis 1981:147; Miller 1989; Fahmy *et al* 2011). This procedure was not followed at any of the sites for two reasons. The first reason is that the historical sources and the archaeology describe the use of Historic Cave as a living and storage area for food plants, among other supplies, in the time leading up to and including the siege event in 1854. As this was a single occupation site, plant remains stored in the cave are most likely to have been brought there for the siege event. Storage baskets and pits that were uncovered in the excavations support the statement that humans brought plant foods into the cave. Some of these remains (especially sorghum, millet and cowpea) were found uncharred. It is possible that the uncharred plant remains survived until present day, as the occupations of the caves are relatively recent. There was no mention of storage facilities at Balerno Main Shelter or Shelter 2, although the other material culture removed from the sites shows that the cave was occupied by humans. While I was not involved in the excavation at either Balerno site, the stratigraphy seems to be undisturbed. This suggests that recent seeds were not included in archaeological deposits. Secondly, remains found in both cave contexts do not reflect the flora outside the cave. Both cave sites lack remains of the vegetation around them; Balerno especially lacks evidence for most of the dominant species found in the vegetation zone around the cave. This suggests that the plant remains were not brought in through natural agents such as seed rain, or wind or water dispersal. As a result, all the plant remains recovered from Historic Cave, Balerno Main Shelter and Balerno Shelter 2 have been identified (where possible) and included in this project.

4.4.1 Rodent Action

Rodents were present at Historic Cave, Balerno Main Shelter and Balerno Shelter 2, but they are not considered a major taphonomic factor for multiple reasons. Rodents were present and may have been eating the remains but they are very unlikely to have brought the (wild or domesticated) species into the cave sites. The accumulation of plant materials brought into Historic Cave was definitely not due to rodent activity alone as the number of plant remains (over twelve thousand) is too high for only rodents to accumulate. Many of these remains were recovered from floors or storage items described earlier in the disseration. Rodent species that were present in Historic Cave were porcupine, rock hyrax and rat. Historic Cave was a source of food for the rodents after the siege as the cave was host to many human and faunal remains. These remains have evidence of rodent gnawing, suggesting that rodents did eat the remains. Porcupine was specifically attracted to the bones in the cave, as opposed to botanical reamains. While gnawed seeds were present at the site, they formed the minority of the plant remains and were more than likely eaten after they were brought into the cave by humans. The gnawing on the seeds does not indicate whether the seeds were brought into the cave by rodents or not. It is unlikely that rodents brought plants into Historic Cave when the cave was already an existing source of food after the siege. The domesticated species exist outside of the scavenging area of the hyrax and rat – the plants are too far for these rodents to have collected these plants. It is possible that rodents are gnawing the seeds that were brought in to the cave until present day without needing to bring in other pieces of food.

There is no documented evidence of rodent activity Balerno shelters, such as gnawed bones, seeds or rodent droppings. It is unlikely that rodents were active in either site as the area is extremely dry and hot. Balerno Main Shelter had a layer of vitrified organics (labelled as dung) that covered much of the excavated area. This layer capped and sealed the deposit underneath it; there would have been no species introduced after the occupation of the site and the formation of this layer. Many of the seeds that were found at the three sites were too large to have been eaten and deposited after it had been digested by the rodent. Finally, all the identified species from all cave sites are useful to humans in some way; *Acrotome inflate* is perhaps one exception at Balerno Main Shelter. The identified species all had some link to human activity, with a known use or value. It is more likely that the species were brought in and utilised by humans.

Human action is the most likely factor influencing which species were brought into the cave sites. Rodents may have brought some individual plant remains into the cave, prior to or after the occupations, but it is impossible to isolate these individuals. Rodents may have acted as a taphonomic agent by eating, damaging or removing plant remains instead. The actions of the rodents have a relatively negligible effect on the interpretation of the plant assemblages on the whole.

4.4.2 Sampling

There was no sampling strategy with regard to the plant remains that were recovered. An attempt was made to identify all plant species recovered from both sites and material that could not be identified at present was quantified and included in the final results. The identified portion of the total recovered remains could be described as a grab or convenience[2] sample, as it includes species that were identified and not species that were selected for sampling.

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[2] A non-random sample made up of units selected for their accessibility or convenience (Rosenfeld 1998; Committee on the Development of the Third Edition of the Reference Manual on Scientific Evidence 2011: 285). The items being sampled will determine how representative the method is (EPA 2004). In this project, the convenience sample refers to all the remains that were identified during the course of the Masters degree.

4.5 SUMMARY OF CHAPTER

Plant remains were identified through a range of comparative materials, including two collections on the Main Campus at Wits and another at the National Herbarium in Pretoria. Identified, unidentified and unidentifiable material were all quantified into raw counts. A presence analysis was carried out on the unidentified remains and the materials identified by G. Hall and myself. The presence analysis describes each species as present or absent across the excavations. All macroremain material (excluding wood) recovered from the caves was included in the analysis, whether they were charred or not, because the vegetation data and historical and archaeological sources all suggest the recovered remains were specifically brought into the cave by human action and not natural agents. Deposition, preservation and recovery biases impacted which remains were excavated and therefore analysed and quantified.

Chapter 5: RESULTS

In previous chapters, I have provided the background to the excavations that took place at Historic Cave, Balerno Main Shelter and Balerno Shelter 2. All the plant remains that were excavated at Historic Cave relate to a single event in AD 1854. Balerno Main Shelter and Balerno Shelter 2, on the other hand, had multiple periods of occupation. While Balerno Main Shelter was occupied during four periods of time, material from the shelter relates to two of those phases. Balerno Shelter 2 shows evidence for two occupation periods, but plant material came from one phase. These results are described below.

This chapter will compare the results from the three shelters (as was outlined in Chapter 3). However, the situations in all three caves are different. Historic Cave was occupied only once, for roughly one month. Therefore, the plant remains will reflect the circumstances and eating habits of the Kekana Ndebele within the month of October AD1854. The spatial layout and spatial use of the excavated portion of the cave provides the framework for the results. The two Balerno Shelters, on the other hand, have evidence suggesting each cave was occupied more than once (see Chapter 3 for more information). Balerno Main Shelter was occupied during four separate periods, dated by radiocarbon and appears to have been occupied by at least two different groups of people. Balerno Shelter 2 has two periods of occupation, dated by the presence or absence of pottery. It is the chronological changes that will be the focus for the Balerno Shelters. These dates are outlined further in the chapter.

Figures 5.1 to 5.7 show selected species that were identified in the three cave sites. Not all the species are shown here; the focus is to highlight some of the rarer species and show some of the more important and well known species. Figures 5.8 to 5.11 show the unidentified species Types from the caves. All the unidentified Types are shown in these plates.

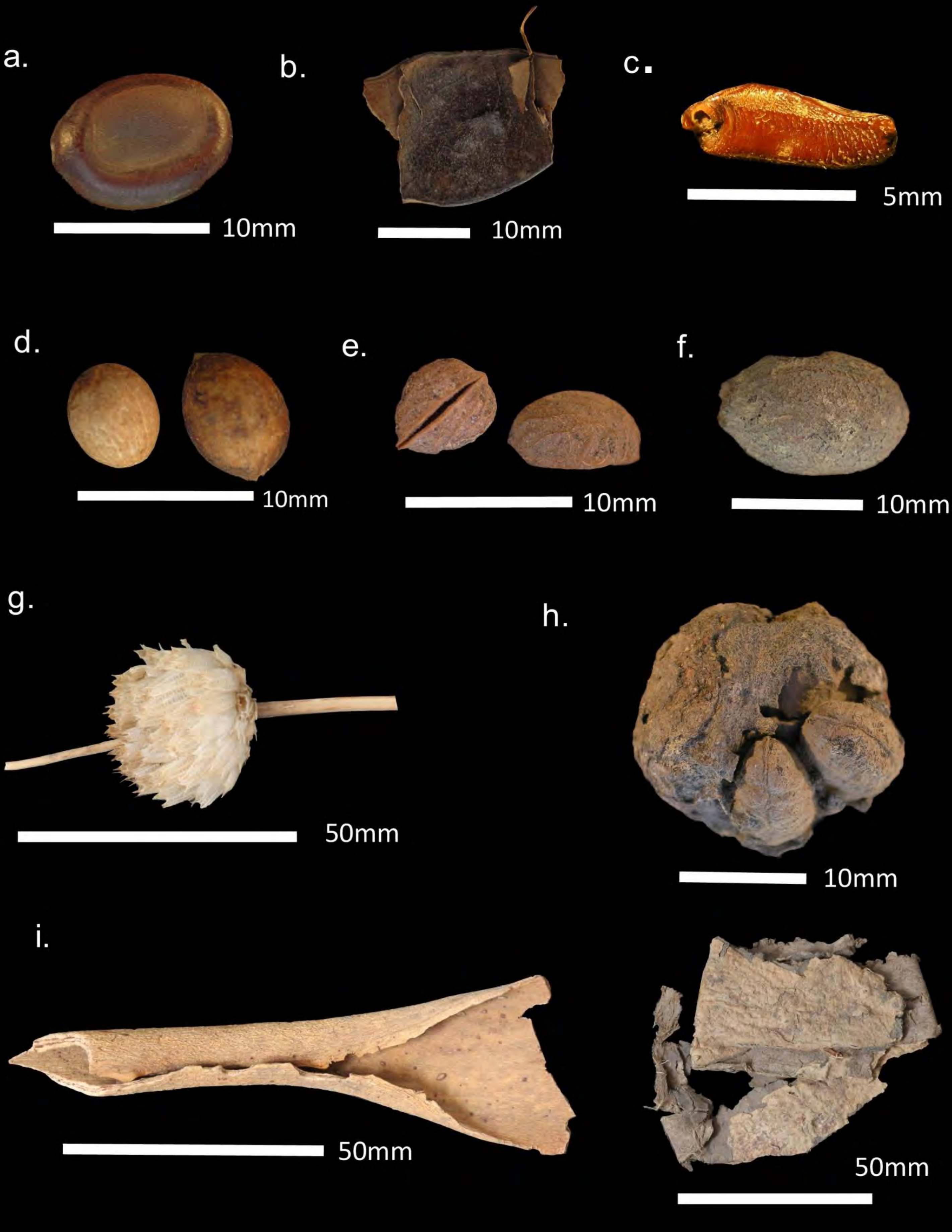

Figure 5.1: Photographs of selected identified species.

a. *Acacia* cf. *schweinfurthii*, b. cf. *Acacia ataxacantha* pod fragment, c. Buxaceae, d. *Bridelia micrantha*, e. *Bridelia mollis*, f. Celastraceae, g. *Acrotome inflata*, h. *Chrysophyllum viridifolium*, i. *Aloe* species.

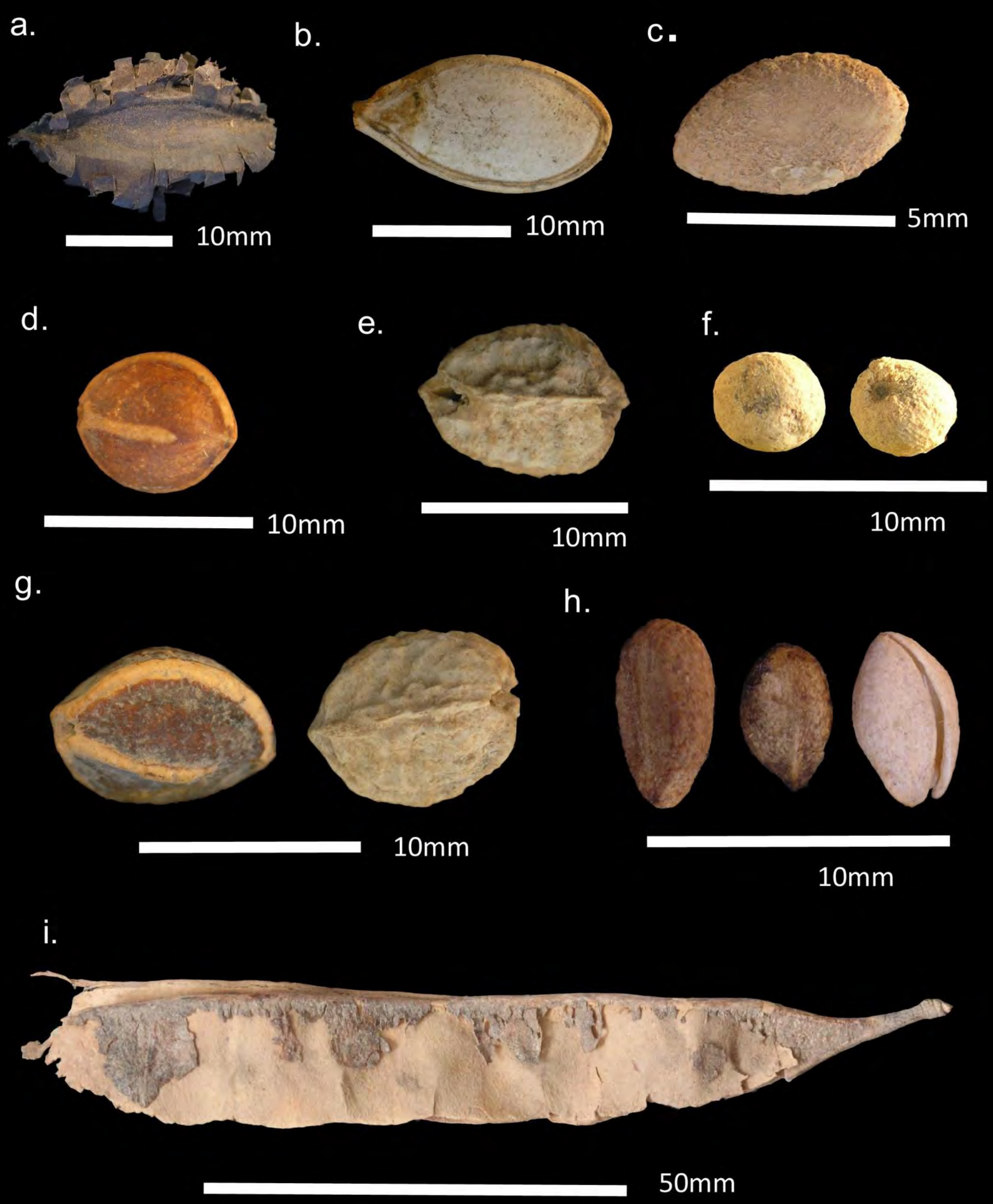

Figure 5.2: Photographs of selected identified species.
a. *Combretum* species, b. *Cucurbita maxima*, c. *Cucumis metuliferus*,
d. *Commiphora* cf. *mollis* , e. *Commiphora schimperi*, f. *Dalechampia capensis,*
g. *Commiphora* spp., h. *Cussonia* species, i. *Cassia abbreviata* subsp. *beareana.*

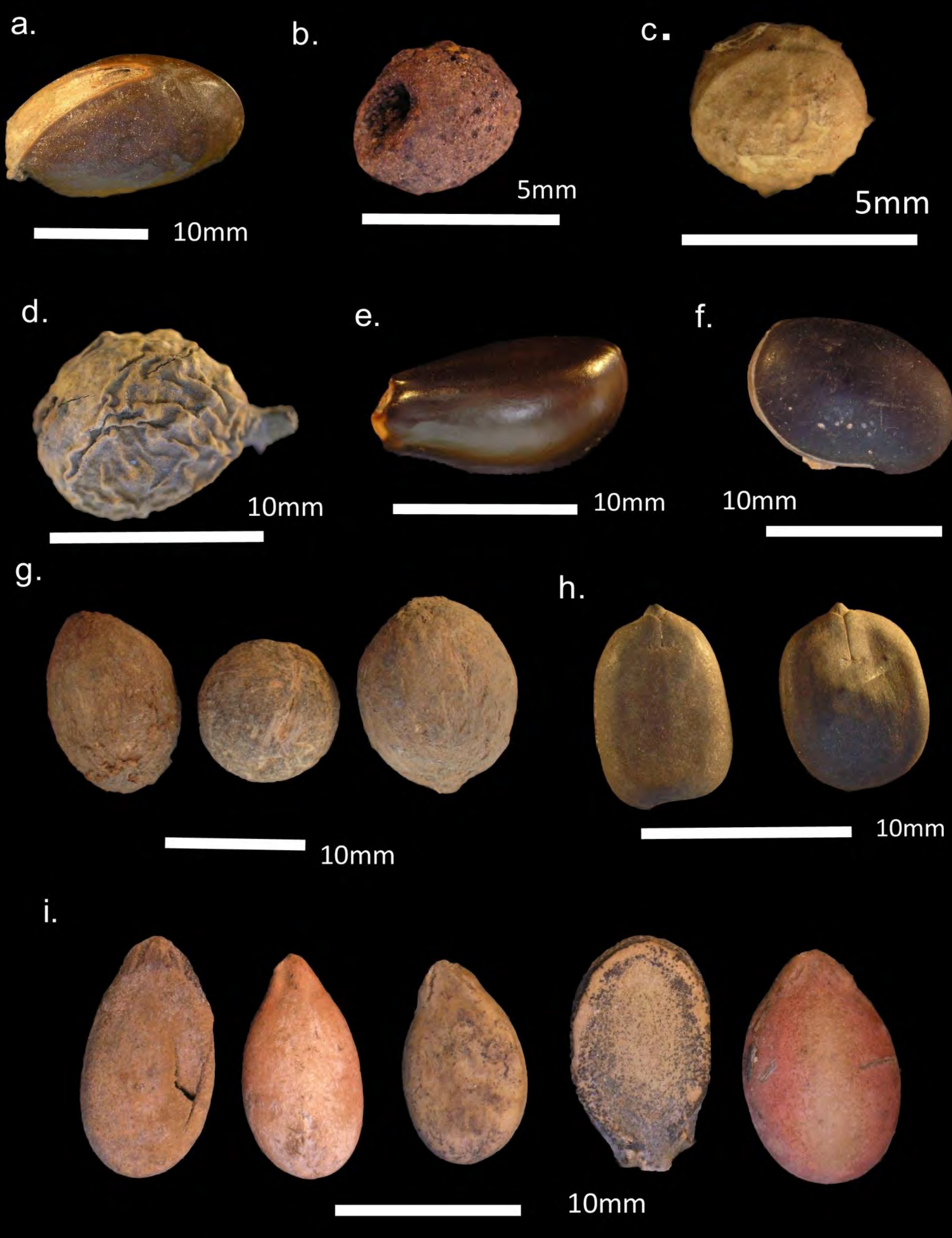

Figure 5.3: Photographs of selected identified species.

a. *Englerophytum magalismontanum*, b. *Euclea* species, c. *Euphorbia* species, d. *Ficus ingens*, e. cf. *Hyaenanche globosa*, f. *Lablab purpureus*, g. *Elaeodendron transvaalense*, h. *Mimosoideae* (Fabaceae), i. *Citrullus lanatus.*

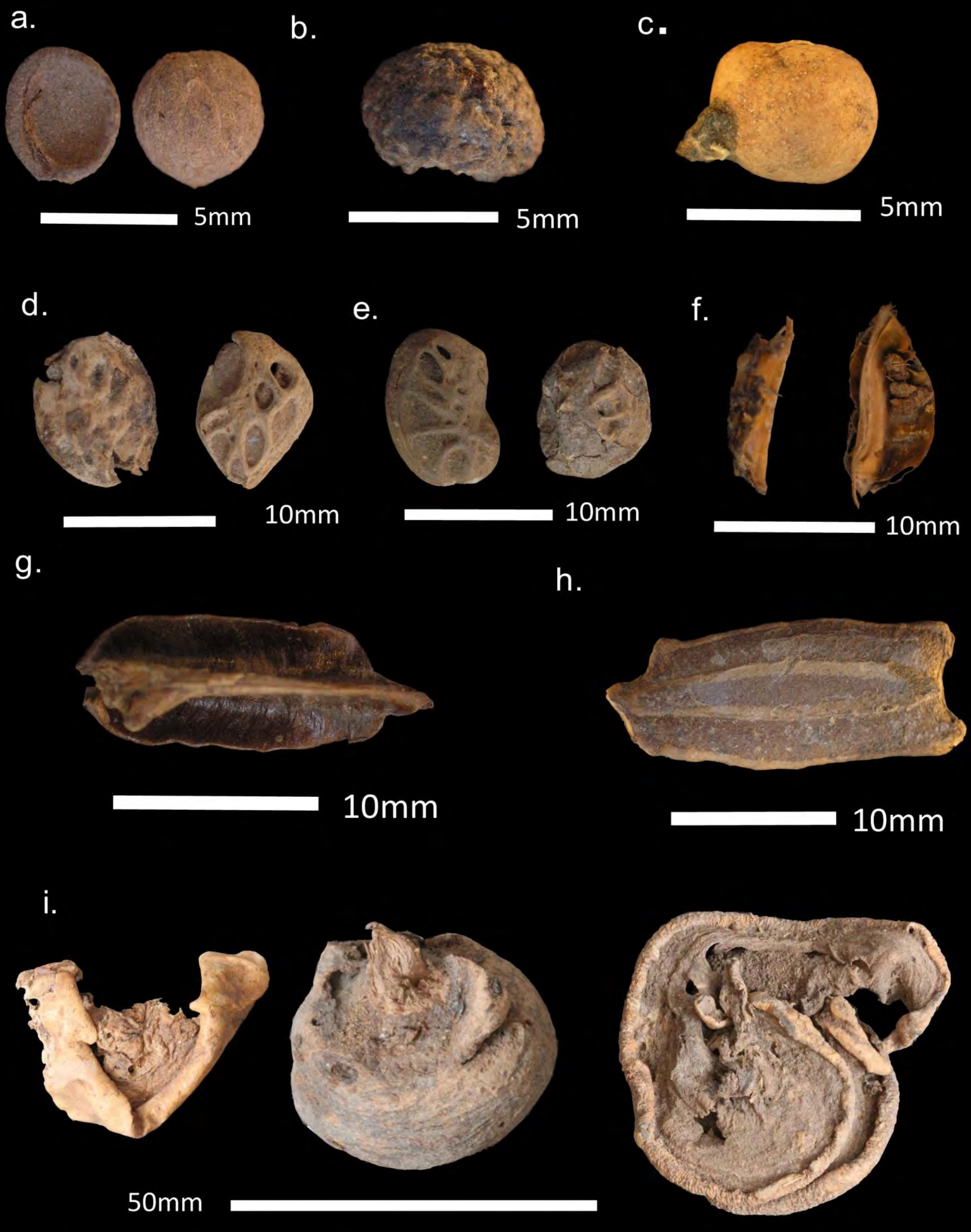

Figure 5.4: Photographs of selected identified species.

a. *Grewia bicolor*, b. *Grewia flava*, c. *Grewia occidentalis*, d. *Lannea discolor*, e. *Lannea schweinfurthii* var. *stuhlmannii*, f. *Kirkia wilmsii*, g. *Kirkia acuminata*, h. *Lagenaria siceraria* seed, i. *Ganoderma* species.

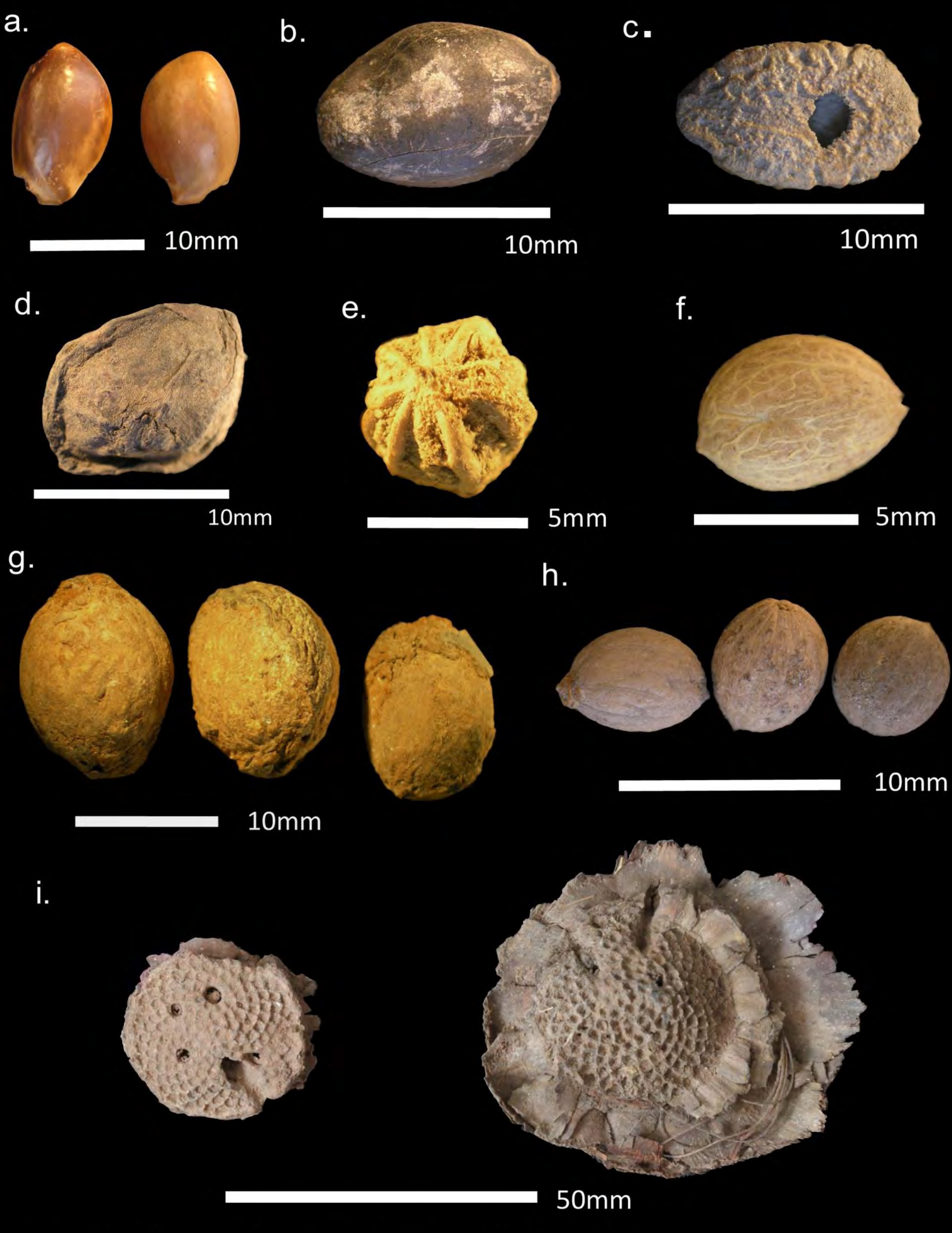

Figure 5.5: Photographs of selected identified species.

a. *Mimusops zeyheri*, b. cf. *Manilkara discolor*, c. *Momordica balsamina*, d. *Moringa oleifera*, e. *Olinia* species, f. *Olea europaea* subsp. *cuspidata*, g. *Olea* cf. *capensis*, h. *Olea europaea*, i. *Protea* flowerheads (worked on left).

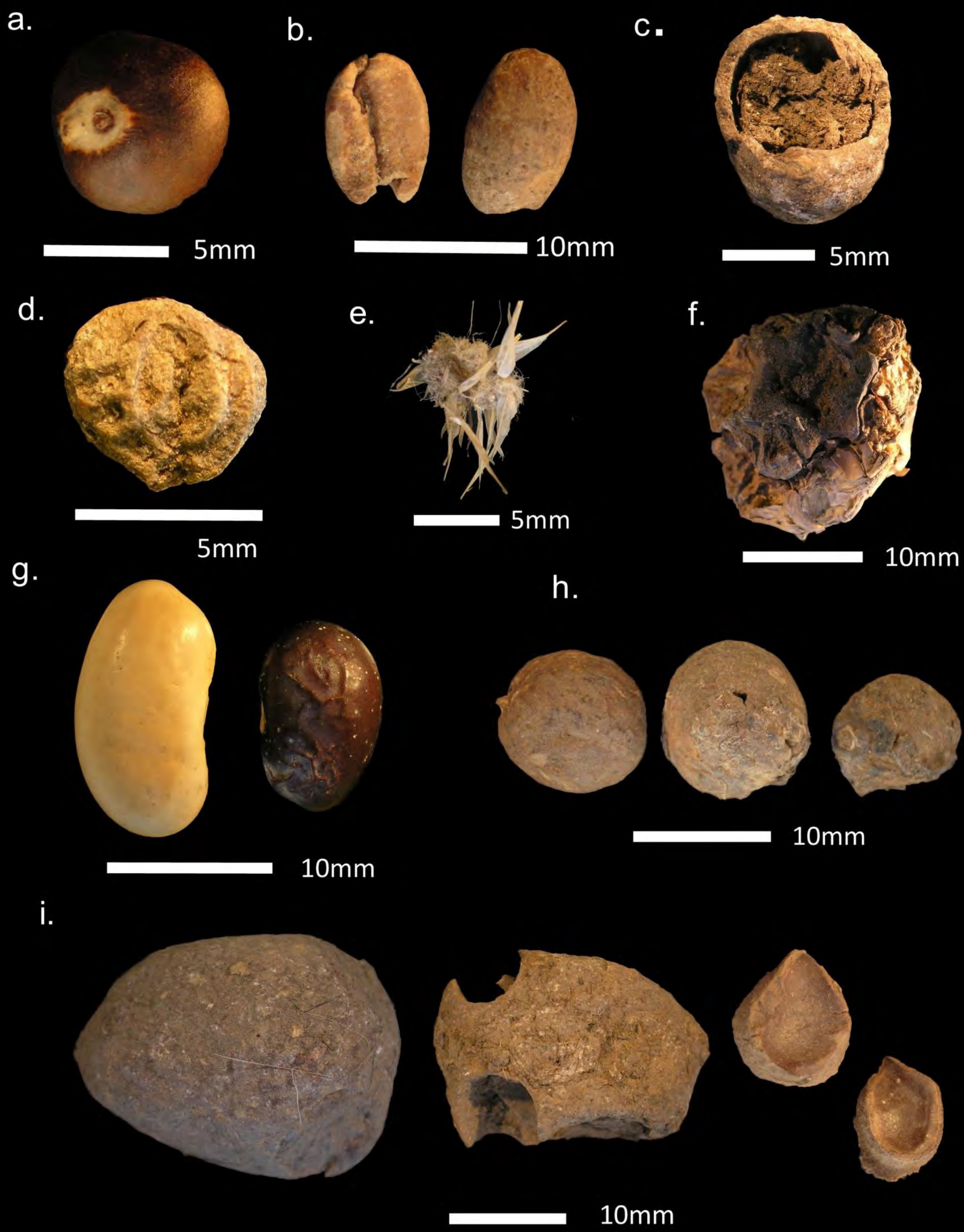

Figure 5.6: Photographs of selected identified species.

a. *Pappea capensis*, b. cf. *Phoenix reclinata*, c. Rubiaceae, d. *Searsia lancea*, e. *Schmidtia pappophoroides*, f. *Solanum* species, g. cf. *Phaseolus vulgaris*, h. *Podocarpus falcatus*, i. *Sclerocarya birrea* nut, broken nut and plugs.

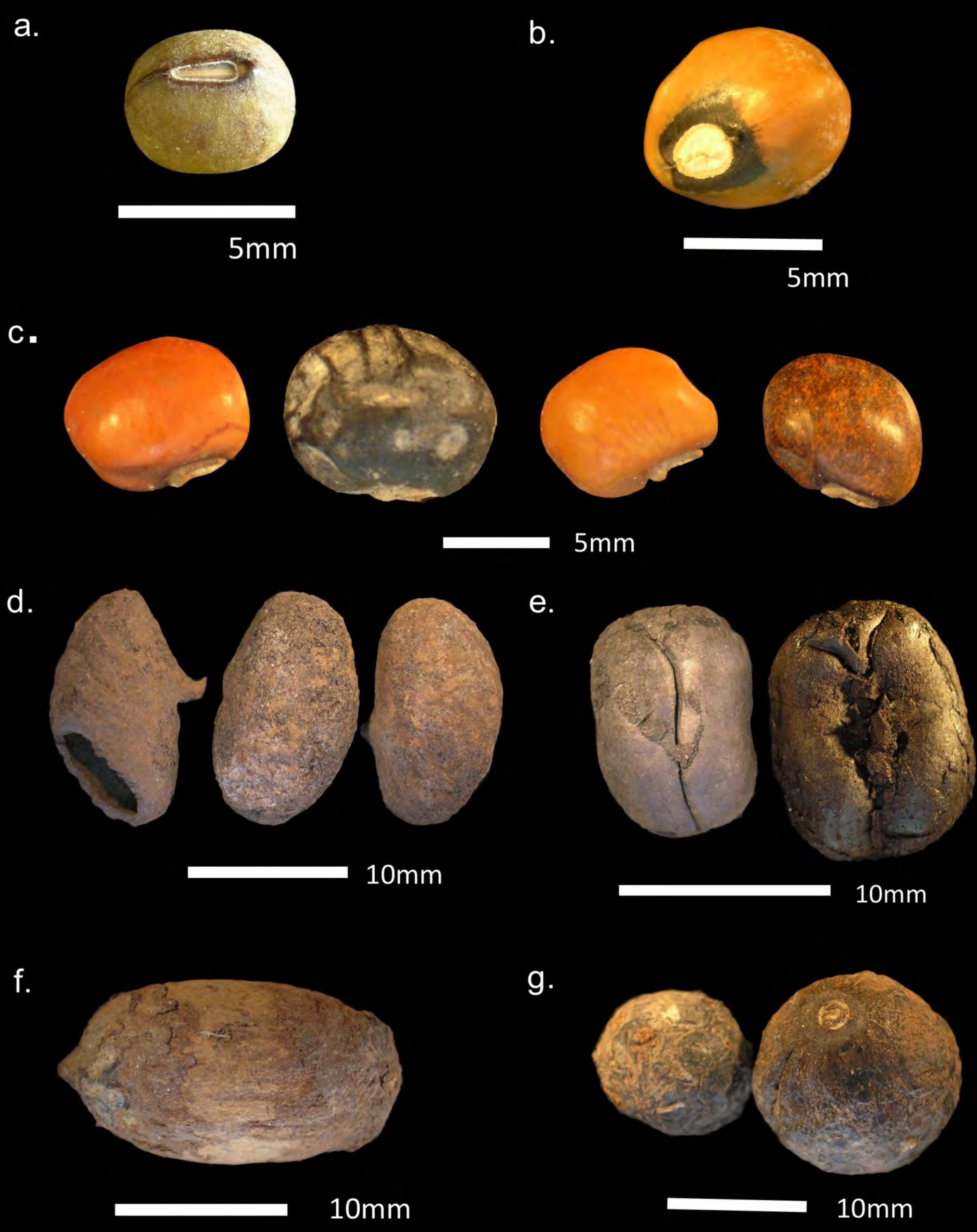

Figure 5.7: Photographs of selected identified species.

a. *Vigna radiata*, b. *Vigna subterranea*, c. *Vigna unguiculata*, d. *Vangueria infausta*, e. *Xanthocercis zambesiaca*, f. *Ximenia* species, g. *Ziziphus mucronata.*

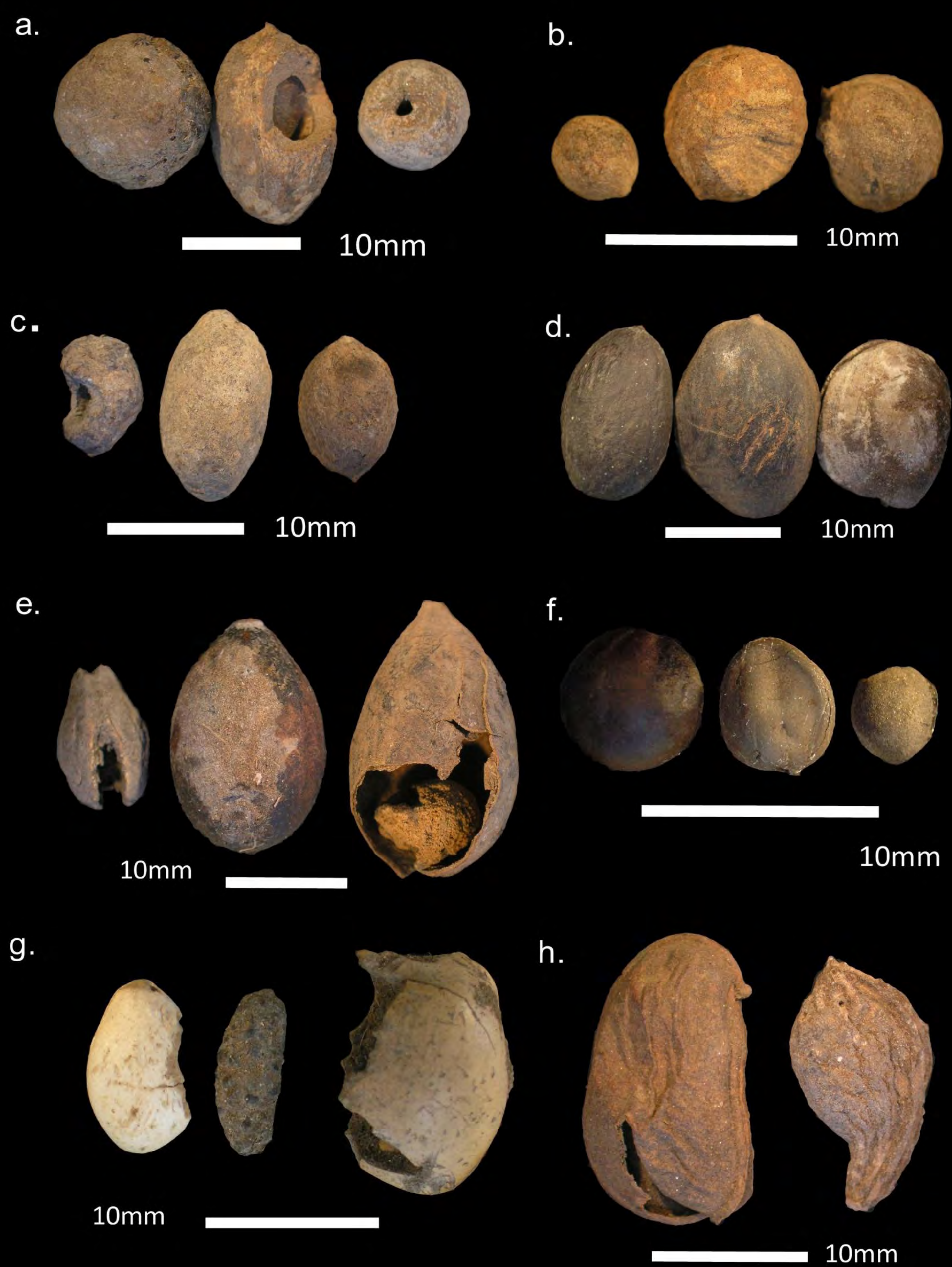

Figure 5.8: Photographs of unidentified species types.

a. Type 1, b. Type 2, c. Type 3, d. Type 4, e. Type 5, f. Type 6, g. Type 7, h. Type 8.

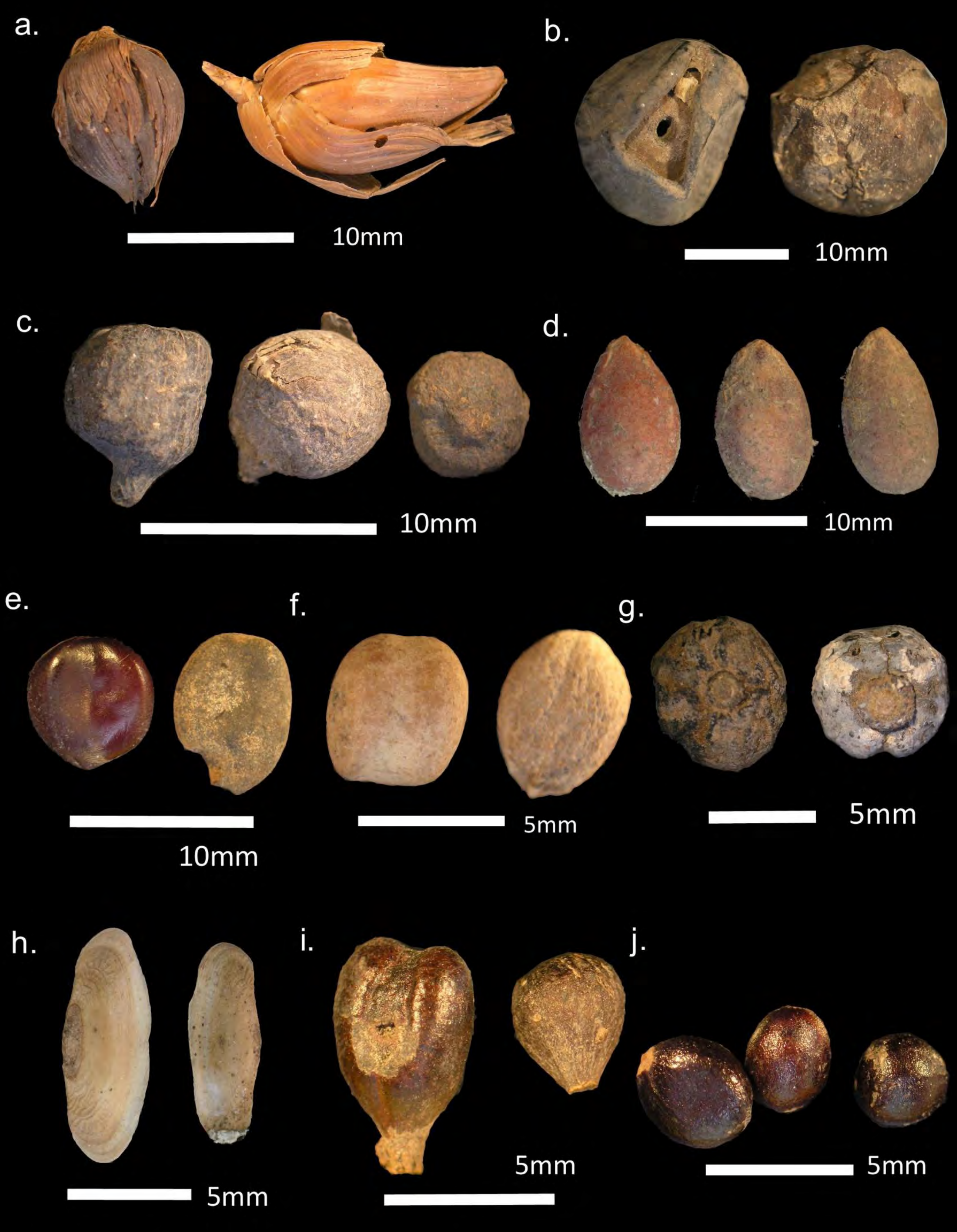

Figure 5.9: Photographs of unidentified species types.

a. Type 9, b. Type 10, c. Type 11, d. Type 12, e. Type 13, f. Type 14, g. Type 15, h. Type 16, i. Type 17, j. Type 18.

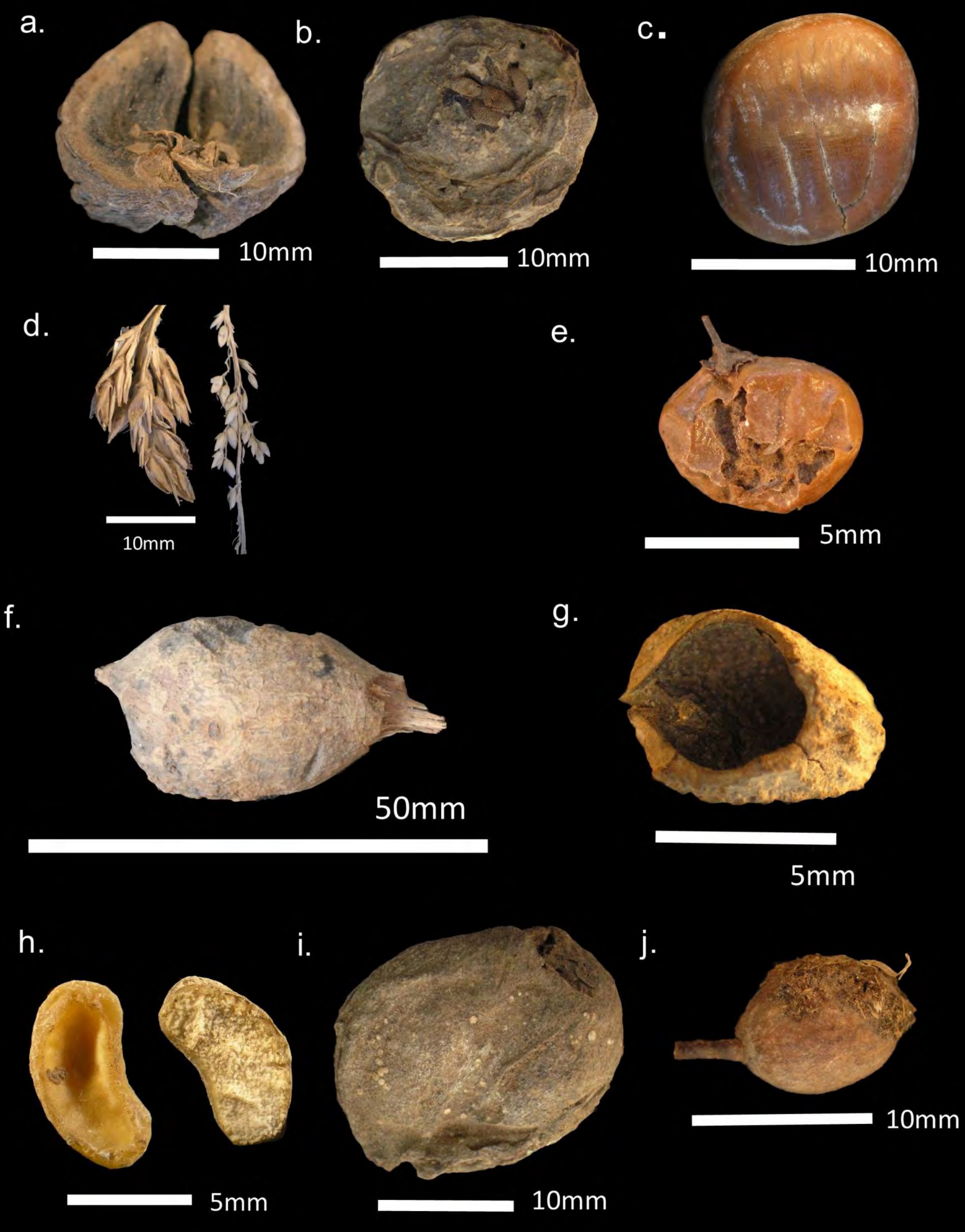

Figure 5.10: Photographs of unidentified species types.

a. Type 19, b. Type 20, c. Type 21, d. Type 22, e. Type 23, f. Type 24, g. Type 25, h. Type 26, i. Type 27, j. Type 28.

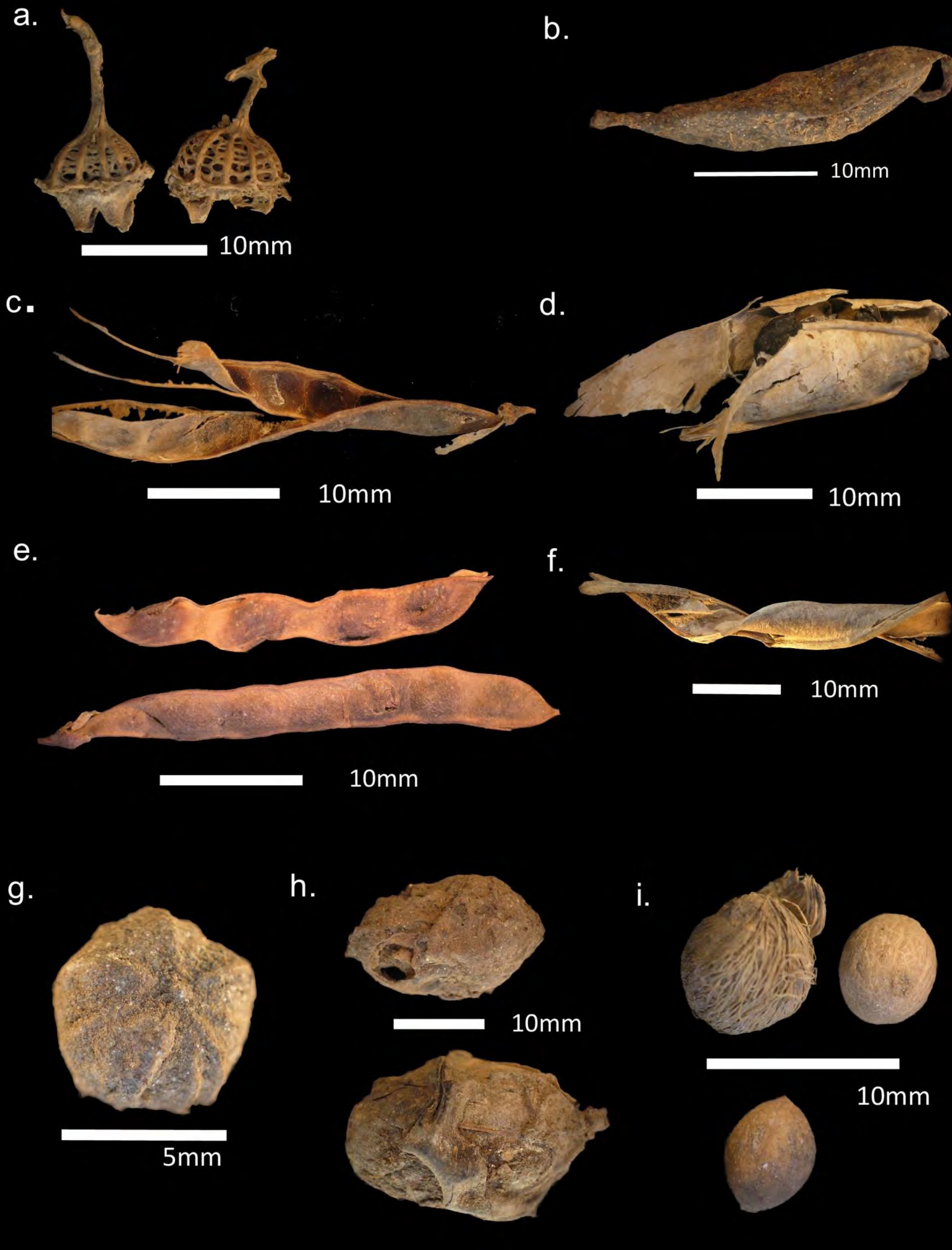

Figure 5.11: Photographs of unidentified species types.

a. Type 29, b. Type 35, c. Type 31, d. Type 32, e. Type 33, f. Type 34, g. Type 30, h. Type 36, i. Type 37.

5.1 HISTORIC CAVE RESULTS

Three plant groupings were identified to family level, twenty to generic level and a further 58 to species level from the deposits at Historic Cave, excluding the unidentifiable material. The recovered species are named below, in Table 5.1. More detailed information is listed in Appendix B. These tables include information on where in the excavation the plants were recovered and the counts for the recovered plants. More than 12 500 macroremains were included in the assemblage from Historic Cave in total. Thirty-five unidentified types (all the types except for Type13 and Type 25) were recovered from Historic Cave. The descriptions for each of the types can be found in Appendix A.

A grab sample carried out by Grant Hall yielded a variety of plant species (noted in Appendix B). Medicinal plants that were recovered and identified in this sample include *Diospyros* species, *Ximenia caffra*, *Englerophytum magalismontanum*, *Citrullus lanatus*, *Mimusops zeyheri*, *Vangueria infausta* and *Aloe* species (described in Esterhuysen 2006: 12, 2008a: 469). These species can be and have been used to treat a variety of ailments.

Appendix E describes the known and recorded usage of all the identified plant species recovered from Historic Cave. These uses are summarised in Table 5.1 below. The plant uses have been divided into three main categories:

- food (F) where at least one portion of the plant is edible;
- medicinal (M) where at least one portion of the plant is used to treat a wound or sickness, or where there is ritual or spiritual significance attached to the plant species (i.e. it is seen as *muti* used by diviners, healers or sangomas); and
- utilitarian (U) where the plant is used for hut, fence or kraal construction, for example, or for carving into household utensils or ornaments, or for storing items in the homestead.

Columns marked with an 'x' mean that the plant is used for a purpose within that category.

Table 5.1: Species Recovered From Historic Cave

Scientific Name	Common Name	Family	Use*		
			F	M	U
BUXACEAE		Buxaceae	-	-	x
CUCURBITACEAE	Cucumber family	Cucurbitaceae	x	-	-
RUBIACEAE	Coffee family	Rubiaceae	x	x	x
Acacia	Acacia	Mimosoideae (Fabaceae)	x	x	x
cf. *Acacia ataxacantha* DC	Flame Thorn	Mimosoideae (Fabaceae)	-	x	x
cf. *Acacia*	Acacia	Mimosoideae (Fabaceae)	x	x	x
Aloe L.	Aloe	Asphodelaceae	x	x	x
cf. *Aloe* L.	Aloe	Asphodelaceae	x	x	x
Bridelia micrantha (Hochst.) Baill	Velvet Sweetberry	Euphorbiaceae/ Phyllanthaceae	x	x	x
Cassia abbreviata Oliv. subsp. *beareana* (Holmes) Brenan	Long-tail cassia	Caesalpinioideae (Fabaceae)	-	x	-
Chrysophyllum viridifolium J.M. Wood & Franks	Fluted milkwood	Sapotaceae	x	-	x
Citrullus lanatus (Thunb) Matsum. & Nakai	Tsamma melon	Cucurbitaceae	x	x	-
cf. *Citrullus lanatus* (Thunb) Matsum. & Nakai	Tsamma melon	Cucurbitaceae	x	x	-
Combretum	Bushwillows	Combretaceae	x	x	x
Commiphora schimperi (O. Berg) Engl	Velvet-leaved corkwood	Burseraceae	-	-	x
Commiphora Jacq	Corkwoods	Burseraceae	x	x	x
Cucumis metuliferus E.Mey. ex Naudin	African horned cucumber	Cucurbitaceae	x	x	-
Cucurbita maxima - Duchesne. ex Lam.	Pumpkin	Cucurbitaceae	x	x	-
Cussonia		Araliaceae	x	x	-
Dalechampia capensis A. Spreng.	Wild hop	Euphorbiaceae	-	x	-
Diospyros lycioides Desf.	monkey plum	Ebenaceae	x	x	x
cf. *Diospyros* L.		Ebenaceae	x	x	x
Elaeodendron transvaalense (Burtt Davy) R.H. Archer	Bushveld saffron	Burseraceae	x	x	-
Englerophytum magalismontanum (Sond.) T.D. Penn.	Transvaal milkplum	Sapotaceae	x	x	x
cf. *Englerophytum magalismontanum*	Transvaal milkplum	Sapotaceae	x	x	x

(Sond.) T.D. Penn.					
Euclea		Ebenancea	-	x	x
cf. *Euclea*		Ebenancea	-	x	x
Euphorbia L.		Euphorbiaceae	x	x	-
Ficus ingens (Miq.) Miq	Red-leaved rock fig	Moraceae	x	x	-
Friesodielsia obovata (Benth.) Verdc	Northern dwaba-berry	Annonaceae	x	x	x
Ganoderma species			-	-	-
cf. *Ganoderma species*			-	-	-
Grewia bicolor Juss	White raisin	Tiliaceae	x	x	x
Grewia flava DC	Brandybush	Tiliaceae	x	x	x
Grewia monticola Sond.	Silver Raisin	Tiliaceae	x	-	x
Grewia occidentalis L.	Cross-berry	Tiliaceae	x	x	x
Grewia		Tiliaceae	x	x	x
cf. *Hyaenanche globosa* (Gaertn.) Lamb. & Vahl	Hyena-poison	Euphorbiaceae/ Picrodendraceae	Poisonous		
Kirkia acuminata Oliv	White seringa	Kirkiaceae	-	-	x
Kirkia cf. *acuminata*	White seringa	Kirkiaceae	-	-	x
Kirkia wilmsii Engl.	Mountain seringa	Kirkiaceae	-	-	x
Lablab purpureus - (L.)Sweet	Hyacinth Bean	Papilionoideae (Fabaceae)	x	x	x
Lagenaria siceraria (Molina) Standl.	Calabash	Cucurbitaceae	x	x	x
cf. *Lagenaria siceraria* (Molina) Standl.	Calabash	Cucurbitaceae	x	x	x
Lannea discolor (Sond.) Engl	Tree grape	Anacardiaceae	x	x	x
cf. *Lannea discolor* (Sond.) Engl	Tree grape	Anacardiaceae	x	x	x
Lannea schweinfurthii (Engl.) Engl. var. *stuhlmannii* (Engl.) Kokwaro	False marula	Anacardiaceae	x	x	x
Mimusops zeyheri Sond	Red milkwood	Sapotaceae	x	-	x
Mimusops cf. *zeyheri*	Red milkwood	Sapotaceae	x	-	x
Mimusops zeyheri Sond		Sapotaceae	x	-	x
Momordica balsamina L.	Balsam pear	Cucurbitacea	x	x	-
Moringa oleifera Lour	Horse-radish tree	Moringaceae	x	x	x
Olea cf. *capenis*	Rock ironwood	Oleaceae	x	x	x
Olea europaea – L.	Olive tree	Oleaceae	x	x	x
Olea europaea L. subsp. *cuspidata* (Wall ex G. Don) Cif.	African Olive	Oleaceae	x	x	x
Olinia	Hard-pear	Oliniaceae/Penaeaceae	-	-	x
Pappea capensis Eckl. & Zeyh	Jacket plum	Sapindaceae	x	x	x

cf. *Pappea capensis* Eckl. & Zeyh	Jacket plum	Sapindaceae	x	x	x
cf. *Phaseoulous vulgaris* L.	Common bean	Papilionoideae (Fabaceae)	x	-	-
cf. *Phoenix reclinata* Jacq	Wild date palm	Arecaceae	x	x	x
Pennisetum glaucum (L.) R. Br	Pearl millet	Poaceae	x	x	-
Podocarpus falcatus (Thunb.) R.Br. ex Mirb	Outeniqua yellowwood	Podocarpaceae	x	x	x
Protea	Protea	Proteaceae	-	x	-
cf. *Protea*	Protea	Proteaceae	-	x	-
Schmidtia pappophoroides Steud. ex J.A.	African finger millet	Poaceae			
Sclerocarya birrea (A.Rich.) Hochst	Marula	Anacardiaceae	x	x	x
cf. *Sclerocarya birrea* (A.Rich.) Hochst.	Marula	Anacardiaceae	x	x	x
Searsia lancea (L.f.) F.A. Barkley	Karee	Anacardiaceae	x	-	x
Solanum	Nightshade	Solanaceae	x	x	-
Sorghum bicolor (L.) Moench	Sorghum	Poaceae	x	x	x
Vangueria infausta Burch.	Wild medlar	Rubiaceae	x	x	x
cf. *Vangueria infausta* Burch.	Wild medlar	Rubiaceae	x	x	x
Vangueria type		Rubiaceae	N		
Vigna radiata	Mung bean	Papilionoideae (Fabaceae)	x	-	-
Vigna subterranea (L.) Verdc. var. *subterranean*	Bambara nut	Papilionoideae (Fabaceae)	x	-	-
Vigna unguiculata	Cowpea	Papilionoideae (Fabaceae)	x	x	-
cf. *Vigna unguiculata*	Cowpea	Papilionoideae (Fabaceae)	x	x	-
Vigna		Papilionoideae (Fabaceae)	x	x	-
Ximenia Caffra Sond.	Large sourplum	Olacaceae	x	x	x
Ximenia	Sourplum	Olacaceae	x	x	x
Zea mays – L.	Maize	Poaceae	x	x	-
Ziziphus mucronata Willd	Buffalo thorn	Rhamnaceae	x	x	x
Unidentifiable					

* x means the plant has been recorded for that use; – means it has not. N = means the plant's uses are not known. M = medicinal (also includes cultural beliefs and *muti*), F = Food (portions are edible), U = utilitarian (firewood, timber, storage, etc.) (See Appendix E for a more detailed breakdown of the various plant uses and their references).

Very few of the plant species excavated from Historic Cave have only one recorded use or value, even though they may be known as a food plant, for example, or used as a food plant by one group of people and a medicinal plant by another. Most of the species recovered from the cave were known to have medicinal value and/or edible portions. Multiple species are known for their water-storage capabilities. *Citrullus lanatus*, *Cucumis metuliferus*, both *Kirkia* species and the *Commiphora* species are all known to store water in some way (see Appendix E for more details).

A presence analysis was carried out for Historic Cave. The presence/absence results can be seen in Appendix B. The graphs for those results are seen below, in Figures 5.12 to 5.16 below.

5.1.1 UBIQUITOUS SPECIES

Figures 5.12 and 5.13 show the percentage of squares in the Historic Cave excavation that each plant species was recovered from, regardless of the layer. Figure 5.12 shows the presence of the species that were identified at Historic Cave and Figure 5.13 shows the types that were not identified, as well as the unidentifiable material, from Historic Cave. Figure 3.1 shows the location of each of the squares mentioned below in the graph.

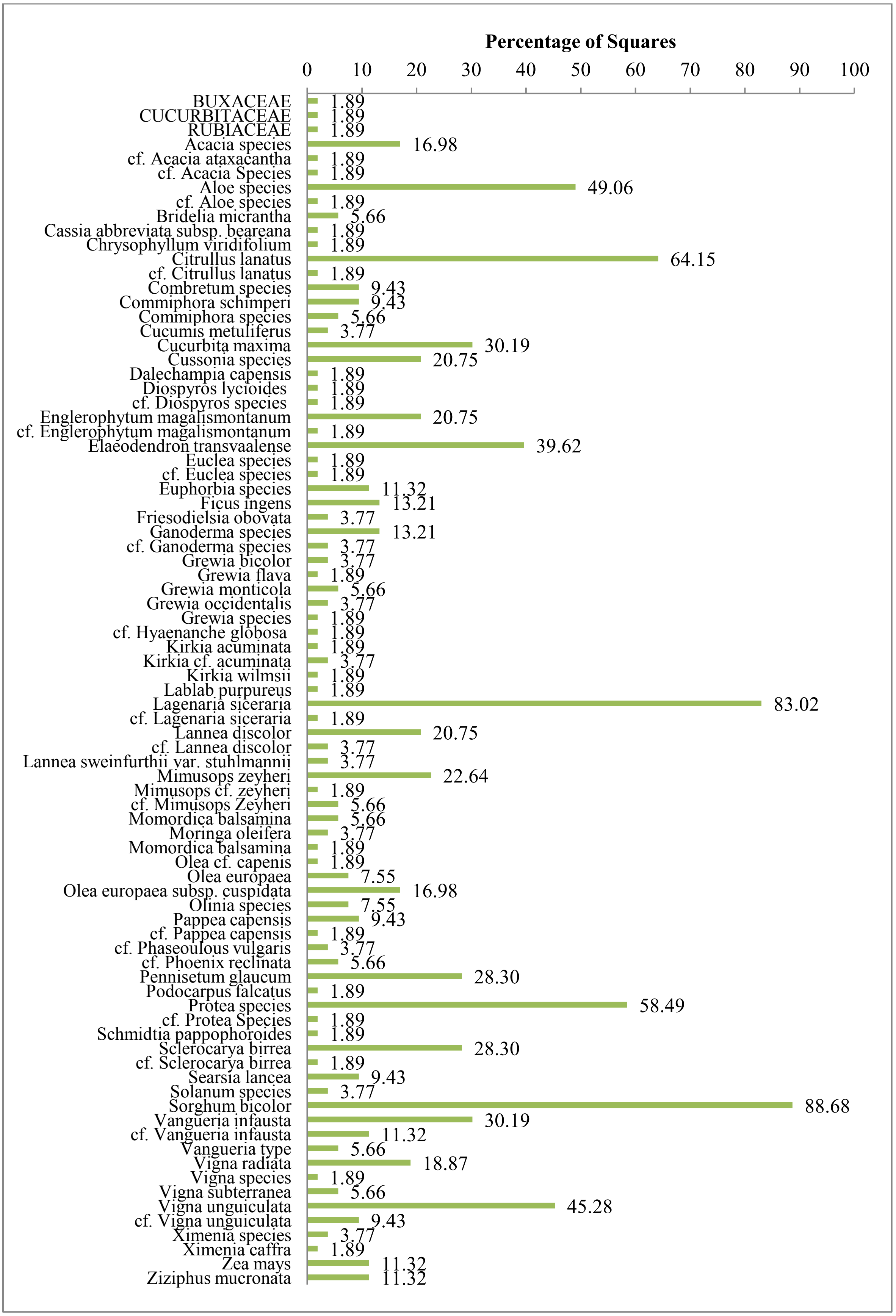

Figure 5.12: Percentage presence (by square) of identified species at Historic Cave.

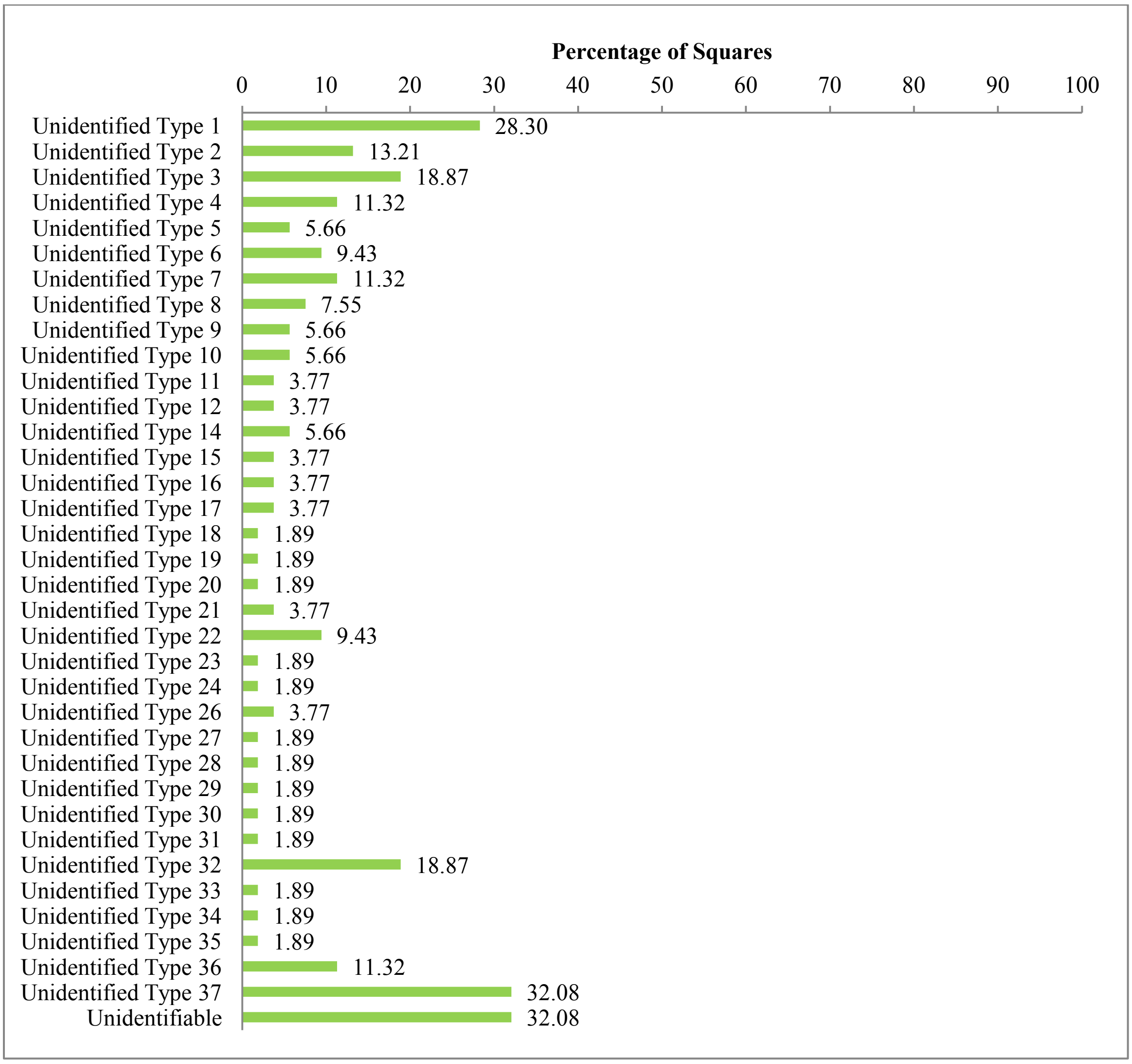

Figure 5.13: Quantity of Squares each unidentified Species was found in at Historic Cave

The most ubiquitous plant species in Historic Cave was *Sorghum bicolor*, appearing in 91% of the squares in the excavation. Sorghum has been cultivated during much of the country's history and is found all over South Africa (Quin 1959). Sorghum is known as being drought resistant (Quin 1959: 26). The *Sorghum bicolor* species shows much variation in the size and colour of the seeds but they all belong to one species (Quin 1959: 25-28). While there is some medicinal and utilitarian value to this plant, it is primarily a food crop (Quin 1959; Long 2005; Plants for a Future. 2012; SANBI 2012; see Appendix E).

The second-most prominent species at Historic Cave is *Lagenaria siceraria*, which appears in 83% of the squares. *Lagenaria siceraria* can be cultivated in the fields amongst other food plants, but it is more common for them to be grown around the home instead (Quin 1959: 54). Calabash can be eaten, but it is extensively utilized as a storage container (Quin 1959: 53-55; Long 2005; SANBI 2012; see Appendix E).

Citrullus lanatus is the third peak in the presence analysis, occurring in 64% of the excavated squares. The species can be divided into three cultigens, differentiated on the size and taste of the fruit. Historically speaking, all three cultigens have been used in South Africa, often without distinguishing between the cultigens (SANBI 2012). The wild fruit is sometimes referred to as *Citrullus lanatus* subsp. *lanatus* (SANBI 2012). There are two more subspecies of *Citrullus lanatus*, one of which is found in West Africa and the other in Europe and Asia and does not resemble the African varieties (SANBI 2012). All the seeds found at Historic Cave have been identified as *Citrullus lanatus*. While the melon can provide food, it is also able to store moisture for people and animals to access when necessary (Watts & Breyer-Brandwijk 1932: 180; Quin 1959: 49; Long 2005; Operation Wildflower 2012; Hyde *et al* 2013; see Appendix E).

The last major spike in the presence analysis is the *Protea species*, occurring in 58% of the excavated portion of Historic Cave. The only portion of the species to be recovered from Historic Cave was the flowerheads and so a species could not be identified. There are seven species of protea recorded in the area surrounding Historic Cave (van Staden & Bredenkamp 2005; SANBI 2013); it is most likely that the species recovered from the cave is one of these seven species. However, it is also possible that multiple *Protea* species may have been brought into and used in the cave. Proteas have medicinal properties and are worn as protective amulets (Watts & Breyer-Brandwijk 1932: 37; Hutchings 1996: 79-80; Long 2005; Esterhuysen *pers. comm.*2010; see Appendix E).

The above-mentioned plants are the only four to appear in the majority of the excavation. The other plant species were distributed within smaller portions of the excavated area.

5.1.2 Other Plants to Note

Other cultivated food plants found in Historic Cave include *Pennisetum glaucum*, *Vigna radiata*, *Vigna subterranea* var. *subterranean* and *Vigna unguiculata* (see Appendix E for more information). These foods are found in 28, 19, 6 and 45 percent of the squares respectively. Both pearl millet, *Pennisetum glaucum*, and *Vigna unguiculata*, the cowpea, have been cultivated over a long span of time and have been an important part of agriculture in South Africa (Quin 1959: 29-30, 40). The cowpea is often planted with other crops (Quin 1959: 41-42). *Vigna subterranea* var. *subterranean* is also known as the bambarra nut or *njugo* bean; it was cultivated throughout South Africa and was well known in the old Transvaal region (Quin 1959: 44). The crop is often planted alongside other food plants (Quin 1959: 45). *Vigna radiata* plants are cropped with other food plants, but never with maize (Quin 1959: 49).

Zea mays is a crop originally from the Americas and was introduced into South Africa (Quin 1959: 32-33). Maize was an important crop in African history; it affected and was affected by the people and communities around it (McCann 2001: 248). Maize can, under the right conditions, be more productive than sorghum or millet, as the number and size of the cobs are greater and the seeds are protected by the husk (Huffman 2007: 453; McCann 2001; van Wyk & Gericke 2007: 16). Maize requires less labour, but is more sensitive to environmental fluctuations (Huffman 2007: 453; McCann 2001). Maize is often planted together with other crops (Quin 1959: 37). *Zea mays* is comparatively rare, occurring in only 6% of the excavated squares.

Wild food plants include: *Vangueria infausta* (30% of squares), *Sclerocarya birrea* (28%), *Englerophytum magalismontanum* (21%), *Ximenia* species (4%) and *Momordica balsamina* (6%). It was most likely that the fruits of these species were collected and brought into the caves (see Appendix E for more detail on the useful aspects of these species). *Sclerocarya birrea* would have been used for the fruits and the nuts within the fruits.

Acacia species are commonly known as acacia. Other names include thorn trees or umgamba (Long 2005; Hyde *et al* 2013). There is at least one species of acacia at Historic Cave, but there may be multiple species present. There are seventeen species recorded in the valley today (Peters & Maguire 1981; van Staden & Bredenkamp 2005; SANBI 2013). The *Acacia* genus is represented by multiple thorns and a broken seed pod. A thorn from Historic Cave was labelled as 'cf. *Acacia* species' as the tip had broken off. The pod fragment from Historic Cave resembles the pod of *Acacia ataxacantha.* Acacia species are known for their medicinal value and have food and utilitarian value as well; *Acacia* thorns are used by some to remove the eyes from marula nuts (Quin 1959: 90; Watts & Breyer-Brandwijk 1932: 64; Hutchings 1996: 121-125; Van Wyk 1997: 24; Long 2005; see Appendix E). *Acacia* species include 15% of the excavation and the species resembling *Acacia ataxacantha* occurs only once (1.85% of the squares).

Seeds currently recorded in Appendix B as '*Euphorbia* species' were originally identified to *Euphorbia marginata*. *Euphorbia marginata* is a plant native to North America and southern Europe (as described in Appendix E).The species has been naturalised in South Africa, but is only found in an area near Bloemfontein (Iziko N.D.; SANBI 2013). As a result, the seeds are unlikely to be *Euphorbia marginata* and have therefore been relabelled as *Euphorbia* species.

Elaeodendron transvaalense was found in 39% of the excavated squares, in the twenty squares making up Dg 1 and on the floor in Dg1. The species has medicinal properties (see Appendix E). Multiple examples had been gnawed before they were recovered, most likely by rodents in the cave.

The seed assigned to *Hyaenanche globosa* was identical to the reference sample at the National Herbarium in Pretoria. However, as described in Appendix E, the plant is distributed in a small area of the Western Cape in a fynbos biome (SANBI 2012). The identification of the species is therefore less solid and a ‘c.f.’ is added in reference to the species *Hyaenanche globosa*. Maguire (2009: 48, see Chapter 3) describes a small area of fynbos-like vegetation covering a small portion of the Makapans Valley. It is possible that *Hyaenanche globosa* may grow in the area surrounding the Historic Cave site. The fruit is highly poisonous and this seems to be its only known use (Watts & Breyer-Brandwijk 1932: 100; SANBI 2012; see Appendix E).There is only one example of this seed (it occurs in the square M1).

Cassia abbreviata subsp. *beareana* was originally identified as a member of the Cassia genus. However, this species is the only member of the genus that is found in South Africa and so the identification was changed to the sub-species. It has many medicinal applications, which are described in Appendix E.

5.1.3 Species per Square

The results for the number of species present in each square of Historic Cave is recorded in Appendix B. Square M2 was the most diverse square of the excavation, with 56% of all the species at Historic Cave being recovered there. The species diversity is generally high in Dg 1, with the exception of some squares, such as N4 and Q3. The species diversity in the squares in the other excavation areas (Dg2 to Dg8) were comparatively low, with each square yielding only between 0.8 and 13% of the total species at Historic Cave. These results will be discussed in the next chapter, but they do hint at an uneven distribution of the plant species.

5.1.4 Species per Excavation Area

A presence analysis per excavation area is shown in the figures below: Figs. 5.14 and 5.15 show the percentage of excavated sections that each species was excavated from, regardless of the layer. Figure 5.14 lists the results for the identified species and Figure 5.15 for the unidentified species types and unidentifiable material. Fig. 5.16 shows the percentage of species recovered from each area of the excavation, also independent of the stratigraphic layer. More detailed information is listed in Appendix B.

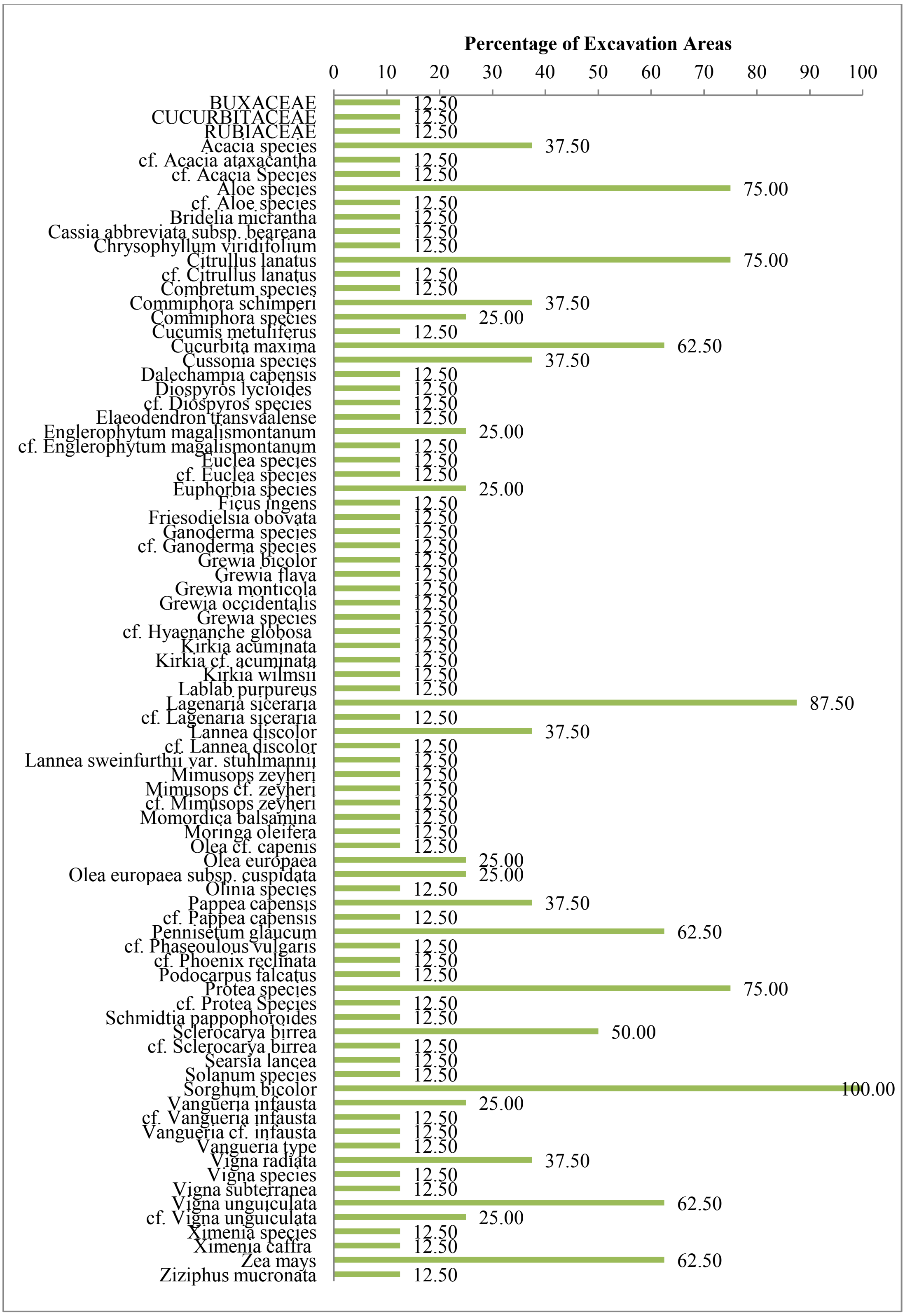

Figure 5.14: Percentage of Areas each identified species was found in at Historic Cave

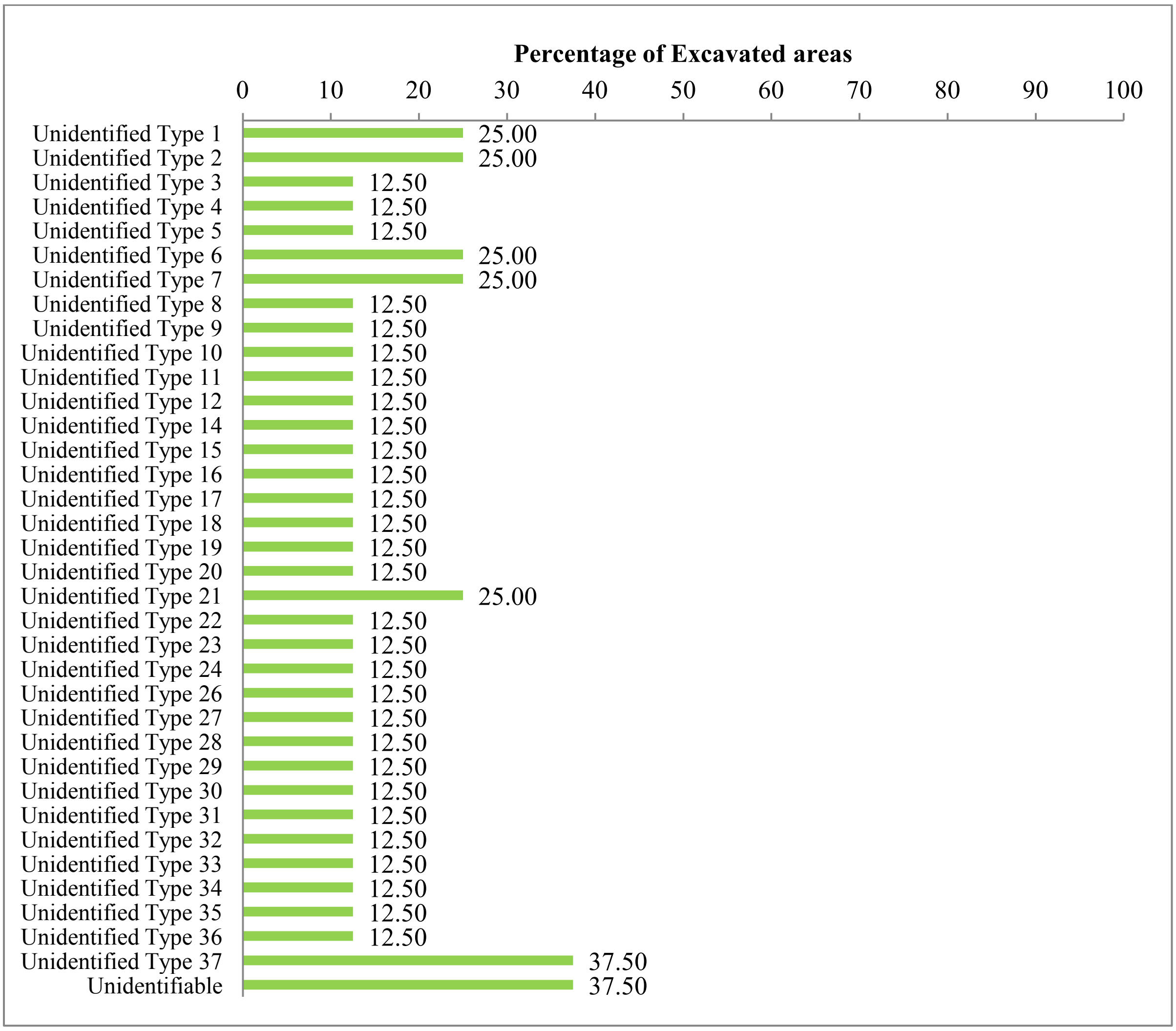

Figure 5.15: Percentage of Excavation Areas each unidentified species was recovered from at Historic Cave

The only species to appear across the entire excavated area is *Sorghum bicolor*. The only other species to cover more than half of the excavation were *Aloe* species, *Citrullus lanatus*, *Lagenaria siceraria*, *Pennisetum glaucum* and *Protea* species. These species were all fairly spread out across the excavation. *Cucurbita maxima*, *Sclerocarya birrea* and *Vigna unguiculata* were all found in four of the eight areas. Eighty-three species were found in only one excavated section.

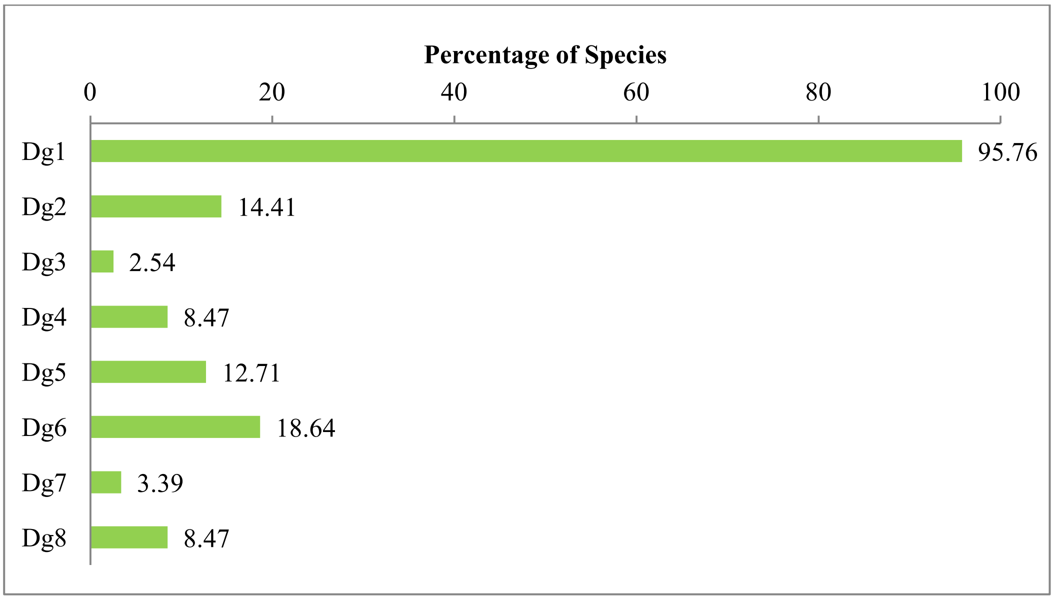

Figure 5.16: Percentage of the species recovered from each Excavation Area at Historic Cave

Dg 1 was the most diverse area in Historic Cave, as 93% of the total species recovered from the entire excavation were found in this section. This was followed by Dg 6 with 20% of all the species from the excavation being recovered from there. Dgs 3 and 7 were the least diverse with 2.68% and 3.57% of the total species from the whole excavation being recovered in those two areas of the excavation respectively.

5.2 Balerno Main Shelter Results

Balerno Main Shelter was host to four distinct occupation events, as described in Chapter 3. No plant remains recovered from the excavation came from the layers formed during the early pre-contact occupation (11 120 – 10890 to 6230 – 6060 BC) and the late pre-contact (340-320 to 210-100 BC) occupations. All plant remains were recovered from the first millennium-early second millennium contact occupation (100 to 1300 AD) and the late second millennium contact phase occupation (1640 to 1800 AD). Seeds were taken from a sample of the vegetation surrounding the shelter during the excavation; two species were identified from this sample but were not excavated from the cave (see Appendix C for information). Over 1 400 macroremains were identified from Balerno Main Shelter.

Two plant remains groupings were identified to family level, three to generic level and a further nineteen to species level at Balerno Main Shelter. Eleven species types (unidentified Types 2, 3, 4, 5, 6, 10, 11, 13, 25, 36 and 37) were also excavated from this cave, as well as plants that are not identifiable. These species are named below, in Table 5.2 while the descriptions for each of the types can be found in Appendix A. Information on where in the excavation the plants were recovered and the counts for the recovered plants is listed in Appendix C.

Table 5.2: Species recovered from Balerno Main Shelter

Scientific Name	Common Name	Family	Use*		
			F	M	U
CELASTRACEAE			N		
Mimosoideae (FABACEAE)			x	x	x
Acacia cf. *davyi*		Mimosoideae (Fabaceae)	N		
Acacia cf. *schweinfurthii*	Brack thorn	Mimosoideae (Fabaceae)	-	-	-
Acrotome inflata Benth	Acrotome	Laminaceae	-	x	-
Bridelia micrantha (Hochst.) Baill	Velvet sweetberry	Euphorbiaceae/ Phyllanthaceae	x	x	x
Bridelia mollis Hutch.	Velvet-leaved bridelia	Euphorbiaceae/ Phyllanthaceae	x	-	-
Citrullus lanatus (Thunb) Matsum. & Nakai	Tsamma melon	Cucurbitaceae	x	x	-
cf. *Citrullus lanatus* (Thunb) Matsum. & Nakai	Tsamma melon	Cucurbitaceae	x	x	-
Commiphora cf. *mollis*	Velvet-leaved corkwood	Burseraceae	x	x	x
Cussonia		Araliaceae	x	x	-
Grewia bicolor Juss.	White raisin	Tiliaceae	x	x	x
Grewia flava DC.	Brandybush	Tiliaceae	x	x	x
Grewia		Tiliaceae	x	x	x
Lagenaria siceraria (Molina) Standl.	Calabash	Cucurbitaceae	x	x	x

Lannea schweinfurthii (Engl.) Engl. var. *stuhlmannii* (Engl.) Kokwaro	False marula	Anacardiaceae	x	x	x
cf. *Manilkara discolor* (Sond.) J.H. Hemsl.	Forest milkberry	Sapotaceae	x	-	x
Momordica balsamina L.	Balsam pear	Cucurbitaceae	x	x	-
Olinia	Hard-pear	Oliniaceae	N		
Sclerocarya birrea (A.Rich.) Hochst	Marula	Anacardiaceae	x	x	x
Sorghum bicolor (L.) Moench	Sorghum	Poaceae	x	x	x
Vangueria infausta Burch.	Wild medlar	Rubiaceae	x	x	x
cf. *Vigna unguiculata*	Cowpea	Papilionoideae (Fabaceae)	x	x	-
Xanthocercis zambesiaca (Baker) Dumaz-le-Grand	Nyala berry	Papilionoideae (Fabaceae)	x	-	-
Unidentifiable					

* x means the plant has been recorded for that use while – means it has not. N = means the plant's uses are not known. M = medicinal (also includes cultural beliefs), F = Food plant, U = utilitarian (firewood, timber, storage, etc.) (see Appendix E for a more detailed breakdown of the various plant uses and their references).

Seeds from a species within *Mimosoideae* (within *Fabaceae*) were narrowed down to one of two possible genera: *Albizia* or *Acacia* (see Appendix E for a description of both genera). There are three species of *Albizia* and sixteen *Acacia* species in the area surrounding the shelters on Balerno (SANBI 2013).

The vast majority of plant species from Balerno Main Shelter were plants recorded as both edible and medicinal. Only one species was solely a food plant (*Xanthocercis zambesiaca*). *Sorghum bicolor* and seeds resembling *Vigna unguiculata* are the only cultivated plants; the other species are all wild plants.

The presence analysis for Balerno Main Shelter comprised of three parts – as species present per square (Figure 5.17) and squares per species (Figure 5.18) as for Historic Cave. These graphs reflect only the spatial distribution of the plant remains recovered from Balerno Shelter and include all layers of the excavation. However, Balerno Main Shelter had multiple occupations by different groups of people. The plant remains from each occupation period are reflected in Figure 5.19 below.

Figure 5.17 shows the squares all the species at Balerno Main Shelter were recovered from, regardless of layer or the occupation period. The focus of this figure is on the spatial distribution of the plant species. Figure 3.2 shows the location of the squares in the shelter.

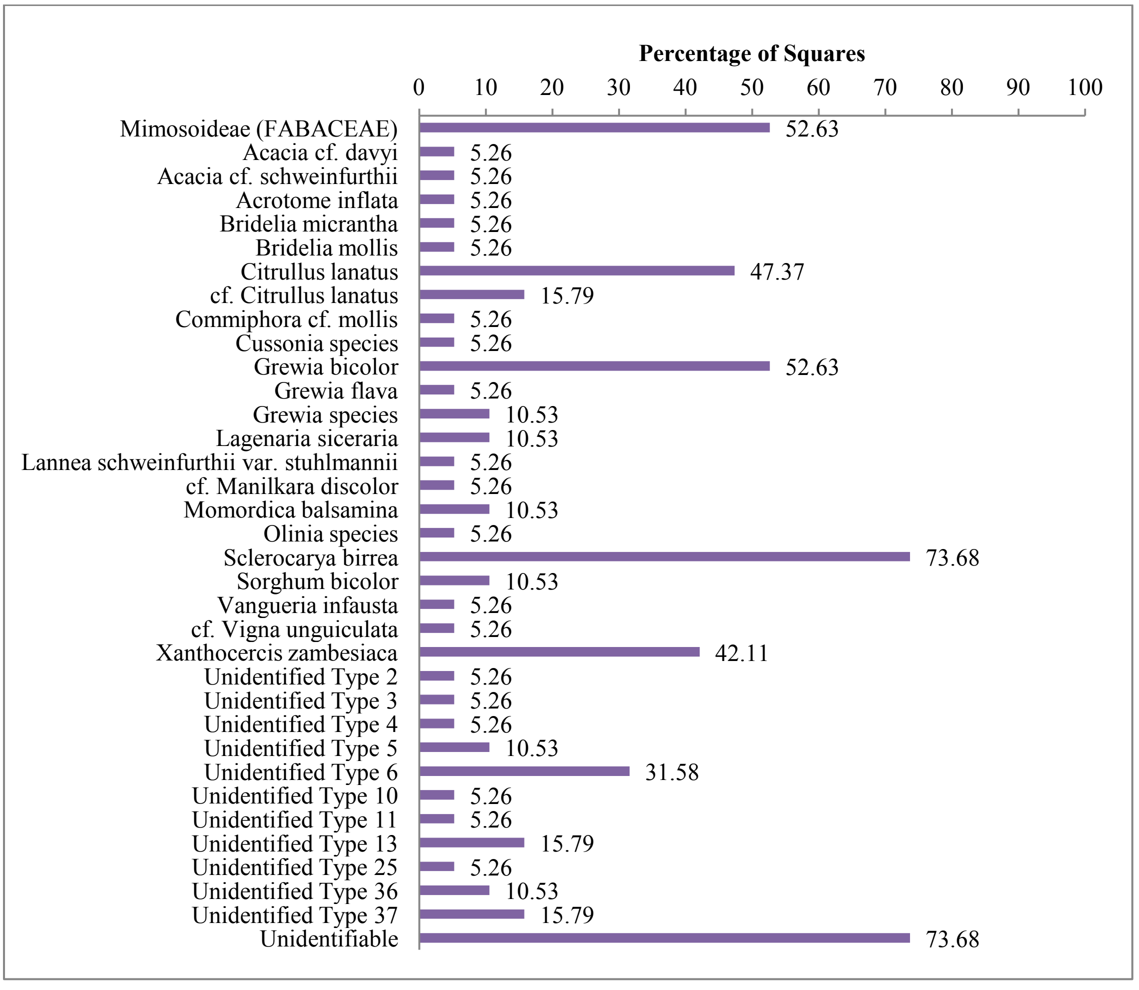

Figure 5.17: Percentage of the squares each species was recovered from at Balerno Main

5.2.1 UBIQUITOUS SPECIES

The most ubiquitous species at Balerno Main Shelter is *Sclerocarya birrea*, appearing in 74% of the squares in the excavation. This tree is extremely useful and provides food and medicine to people in the Limpopo Province (see Appendix E for more detail).

Unidentifiable species, species too damaged or charred to be identified, constituted a large portion of the assemblage at Balerno Main Shelter. Overall, the plant remains from this shelter were more difficult to identify than those from Historic Cave or Balerno Shelter 2.

Grewia bicolor and the *Mimosoideae* sub-family of the *Fabacea*e are the two next most ubiquitous species, occurring in 50% of the excavated area of the shelter. *Grewia bicolor* has recorded value for medicine, food and utilitarian purposes, such as rope-making (described further in Appendix E). The two genera within *Mimosoideae* to which the seeds may belong are known to have medicinal, utilitarian and food value as well (see Appendix E).

5.2.2 NOTABLE SPECIES

Acrotome inflata was excavated from the cave. Medicinally, it is used to treat cattle. It comes from a family known for being aromatic (described in Appendix E). Unfortunately, the single specimen of *Acrotome inflata* was stored after the excavation without a label and so the information about where it was recovered from has been lost.

5.2.3 SPECIES PER SQUARE

Figure 5.18 is the presence analysis showing the percentage of the total number of species found in each square of the excavation, independent of the layer or occupation phase. This is done to highlight any spatial distribution of the plant remains, which may hint at a bias creating any spatial data.

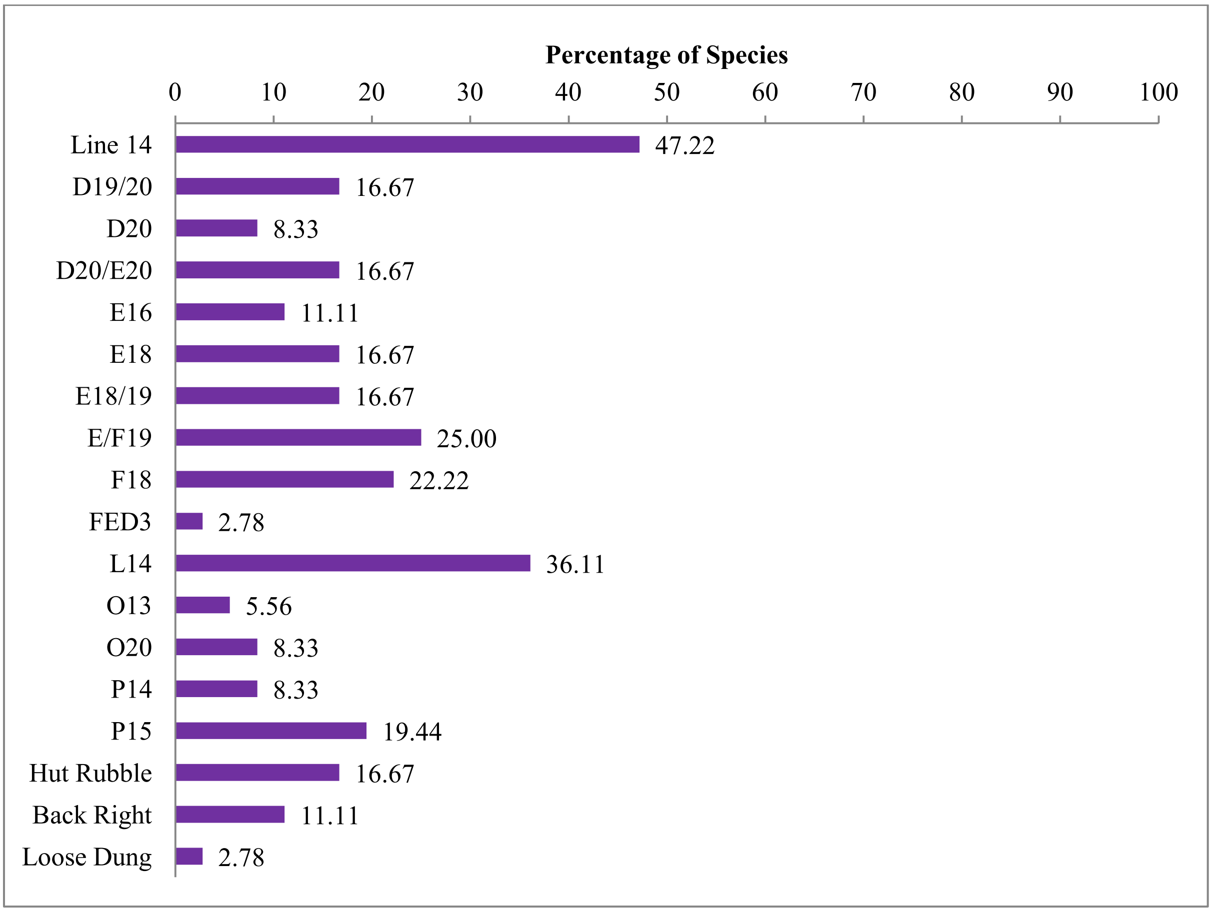

Figure 5.18: Species that were recovered in each square at Balerno Main

Line 14 had the highest number of species, but as this incorporates multiple 1mx1m squares, this is to be expected. The highest number of species found within a single 1m^2 section was L14. The loose dung deposit and FED3 were the areas with the lowest species diversity. FED3 was a storage pit.

5.2.4 Species present in each Occupation

Figure 5.19 below represents the species that were recovered from the different occupation periods at Balerno Main Shelter, independent of where the species were found spatially. The category 'seed sample' refers to a sample of modern-day vegetation surrounding Balerno Shelter 2, taken during the excavation period.

The seed sample is compared to the species found at Balerno Main Shelter, as there were more species recovered from the cave. Both caves are close enough to each other for the comparison to be relevant and both caves occur in the same vegetation zone.

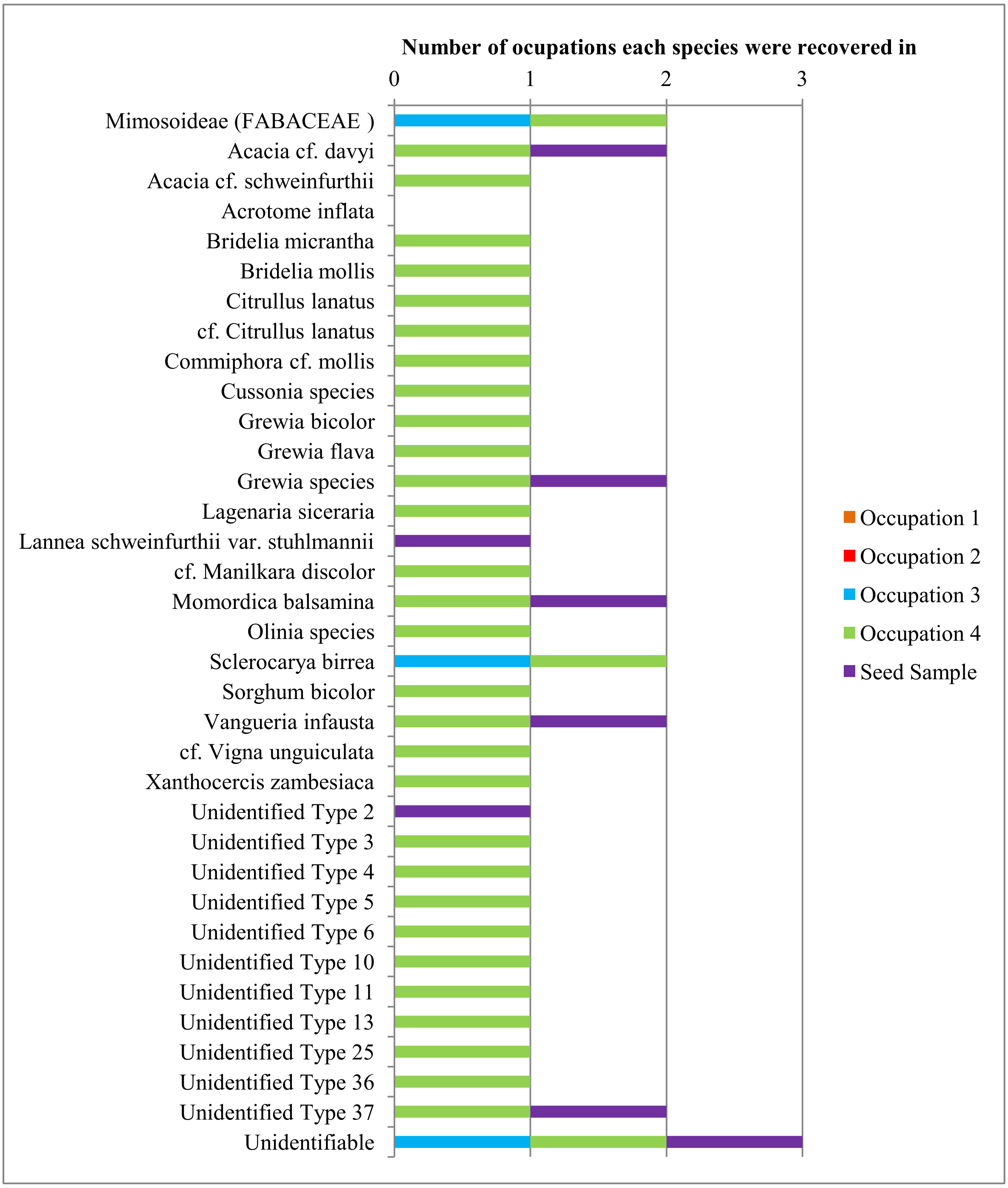

Figure 5.19: Species that were excavated from layers dated to Occupation Phases at Balerno Main

Almost all of the species from Balerno Main Shelter were recovered from the last occupation period, between 1640 and 1800 AD. Two species were recovered from the earlier occupation period, *Sclerocarya birrea* and a species of *Fabacea* sub-family *Mimosoideae*. These two species were the only found in both occupation phases. Multiple species were recovered as a sample of the surrounding vegetation; *Lannea sweinfurthii* var. *stuhlmannii* and unidentified Type 2 were found only in this sample and were not recovered in the excavation. Unidentifiable material was found in the two most recent occupation phases and the seed sample. *Acrotome inflata* is recorded as a zero as the missing label means that it is not known where the remains were excavated from or in which layer, and therefore which occupation.

Five species were found in both occupation Period 4 and the seed sample taken from the existing vegetation surrounding the site. Two species were found in consecutive occupation phases – Period 3 and Period 4.

5.3 Balerno Shelter 2 Results

Balerno Shelter 2 yielded a far smaller number of botanical remains, most likely because of the small size of the excavation itself. Two species, one unidentified type (Type 5) and the unidentifiable material was removed from the two square meters of the excavation. These are listed in Table 5.3 below and a more detailed description of the remains is available in Appendix D. The unidentified type is described in Appendix A. All the plant material recovered from Balerno Shelter 2 came from layers dated by the presence of ceramics to 100 to 1300 AD (see Chapter 3 for more detail). Only five seeds were recovered from Balerno Shelter 2.

Table 5.3: Species Recovered from Balerno Shelter 2

Scientific Name	Common Name	Family	Use*		
			F	M	U
Citrullus lanatus (Thunb)	Tsamma melon	*Cucurbitaceae*	x	x	-

Matsum. & Nakai I					
Momordica balsamina L.	Balsam pear	*Cucurbitaceae*	x	x	-
Unidentifiable					

* X means the plant has been recorded for that use. – means it has not. N = means the plant's uses are not known. M = medicinal (also includes cultural beliefs), F = Food plant, U = utilitarian (firewood, timber, storage, etc.) (See Appendix E for a more detailed breakdown of the various plant uses and their references).

A presence analysis was carried out for Balerno Shelter 2 and is shown below as squares per species (Fig. 5.20) and as species per square (Fig.5.21). As all the plant remains were relatively dated to the same occupation period, there is no chronologic aspect to the following two graphs.

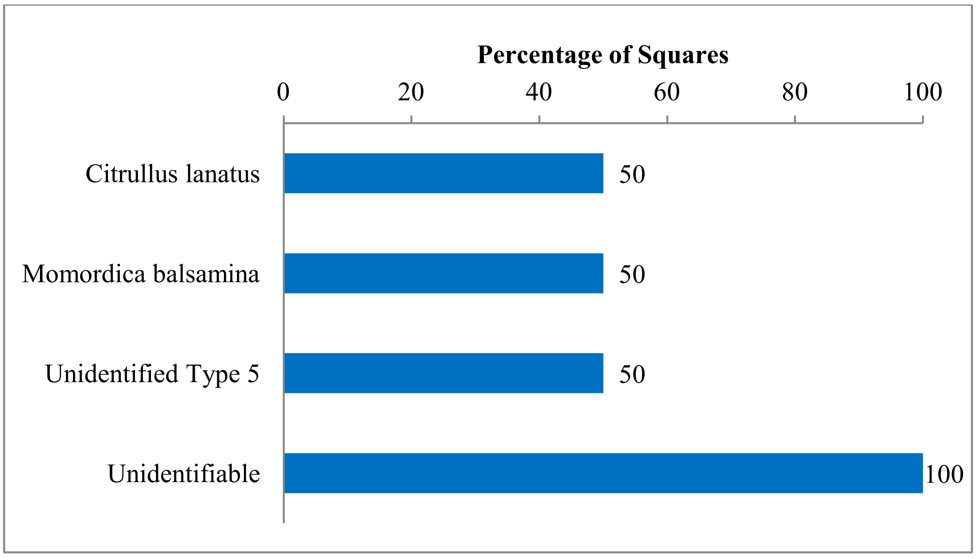

Figure 5.20: Quantity of Squares that each species was recovered in at Balerno 2

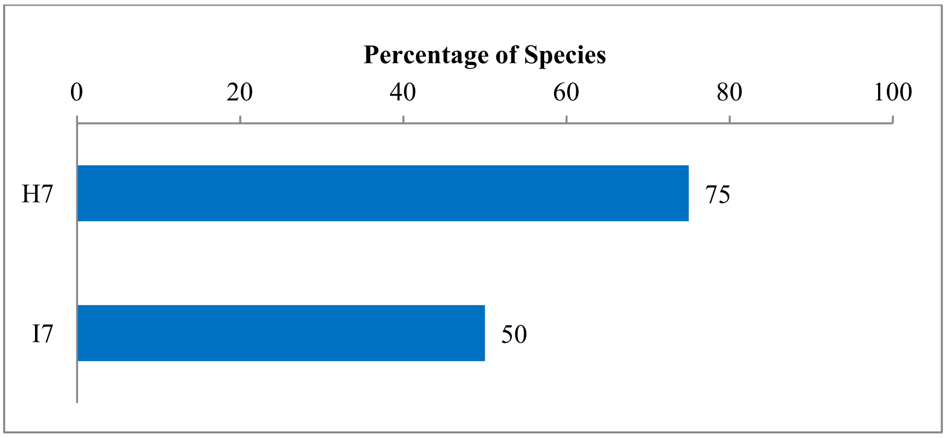

Figure 5.21: Percentage of the species that were recovered from Squares at Balerno 2

The assemblage from Balerno Shelter 2 is not large enough to make any conclusions about the shelter or the people occupying it. This is because only a small portion of the cave was excavated (only $2m^2$) and because there were only three species recovered at the site, one of which was not identified (Type 5). Balerno Shelter 2 does, however, provide some evidence to perhaps suggest that *Citrullus lanatus* and *Momordica balsamina* were two species used and distributed within the Limpopo area.

5.4 General Trends and Results

A total of 37 unidentified species types were recovered from all three cave sites. These types are in Appendix A. Types were created by grouping together species that were not identified based on similar features. Therefore, it is possible that multiple species are included in the unidentified types.

Three species appeared at all three sites: *Momordica balsamina*, *Citrullus lanatus* and the unidentified Type 5. There were no other commonalities between the two shelters on Balerno Farm, although this is most likely due to the small size of the excavation at Balerno Shelter 2.

Twelve further species were common to both Historic Cave and Balerno Main Shelter. All of these plant species are useful – with the exception of a seed resembling *Vigna unguiculata*, all the identified species have medicinal and utilitarian applications and edible parts. Seven unidentified species types were shared with Balerno Main Shelter and Historic Cave.

The assemblages from Balerno Main Shelter, Balerno Shelter 2 and Historic Cave suggest there is a focus on plant species that provide food and that have medicinal qualities. There are two further categories of importance at Historic Cave: storage (utilitarian uses) and water. These categories are represented by multiple species each at Historic Cave; at Balerno Main Shelter, the categories are represented by *Lagenaria siceraria* and *Citrullus lanatus* respectively, although these species do not appear to be important plants in the assemblage as they cover only a small portion of the excavated area. There are no plants that represent these uses at Balerno Shelter 2.

5.5 SUMMARY OF CHAPTER

Balerno Shelter 2 yielded a small assemblage of macroremains. Among them, however, were two species found at all three cave sites, suggesting the species were well known and widely used. Balerno Main Shelter had a larger assemblage. The plant species at the cave were mostly wild species; *Sorghum bicolor* and *Citrullus lanatus* were the only cultivated species identified at the cave.

Conversely, multiple cultivated plants were recovered from Historic Cave. Historic Cave contained food and medicinal plants as well as plants that can be used around the home, for storage, firewood, construction and/or carving utensils. Multiple species from the cave are known to store and provide water to animals and people. These plants were especially important for the people in Historic Cave, as the next chapter will show.

Chapter 6: Discussion

The data described in the previous chapter are meaningless without looking at them within the social and environmental context that the species were used and deposited in. As mentioned earlier, many plant portions were recovered from the cave sites. The use of the word 'macro-remains' applies to all plant remains recovered (such as the thorns, leaves and fruit), but in some cases, the plant portions are mentioned specifically. These macro-remains can help to understand what activities were occurring within the caves.

6.1 Trends in each Cave Site

6.1.1 Historic Cave

Historic Cave was the site of a tragic siege event that continued for a month between October and November of AD 1854 (Esterhuysen 2008a: 461, 2008b: 202). The Kekana Ndebele people prepared the cave prior to the siege, as structures were put into place to create living areas that were guided by traditional norms (Esterhuysen *et al* 2009: 1041). Select animals were separated from the main herd according to the normal herd-management practices of the group prior to the siege (Le Roux *et al* 2013: 105). The cave was prepared spiritually by diviners within the group (Esterhuysen 2008a). It follows, therefore, that plant species were chosen and brought into Historic Cave for specific purposes. A variety of plant food stores were brought into the cave ahead of the siege (Esterhuysen *et al* 2009: 1041). Any norms and taboos surrounding the plant foods would most likely have been followed too. The material culture within the cave suggests that the procedures and norms were upheld. The single occupation and subsequent abandoning of the cave (described in Chapter 3) provides a snapshot in time, a unique look into the use of specific plant materials by the Kekana Ndebele people during the spring of AD 1854.

The four major peaks on the presence analysis represented staple food (*Sorghum bicolor*, found in 90% of the squares in Historic Cave), plants used for storage

(*Lagenaria siceraria*, 80%), fruits with a high concentration of water (*Citrullus lanatus*, 61%) and medicinal plants or *muti* (*Protea* spp., 56%), all categories that would have been vital to people in a siege situation. *Lagenaria siceraria* is the only species known for its storage abilities.

6.1.1.1 Staple Foods

Staple foods brought into Historic Cave would most likely have been the cultivated grasses, vegetables and legumes, including *Sorghum bicolor*, *Pennisetum glaucum, Lablab purpureus*, the species resembling *Phaseolus vulgaris*, all the *Vigna* species and *Cucurbita maxima*. Collectively, these species cover the entire excavated area and contribute a large portion of the recovered species. The status of *Zea mays* and *Ganoderma* species is not known – while they may have each been used as food, they may have been seen as dietary supplements and not as staples. Many other important food plants include the wild plants that are harvested in their seasons – Sc*lerocarya birrea, Pappea capensis, Englerophytum magalismontanum* and *Mimusops zeyheri* are the more widely known examples of these wild foods.

The low numbers of corn (*Zea mays*) remains in Historic Cave is intriguing. The crop has changed with regard to its meaning for people. In some areas, maize complimented local crops, as opposed to completely replacing them, and was sometimes viewed as a vegetable crop rather than as a cereal (McCann 2001). In some cases, maize was not regarded as a food, but seen as medicinal instead (Huffman 2007: 457). In such cases, maize was not cultivated, but gathered instead where it grew without being planted by people (Huffman 2007: 457). Maize spread across South Africa and replaced or supplemented many other food crops (Quin 1959: 32-33). In recent South African history, maize has become the most important staple food (McCann 2001; van Wyk & Gericke 2007: 9). Esterhuysen (2006: 91) described the low numbers as evidence for either the crop's status as famine food or as *muti* used by the herbalist/diviner. Regardless of these two options, maize is unlikely to be a staple crop, despite being brought into the interior by roughly AD 1750 (Esterhuysen 2006: 91). If corn was a staple crop, the stores of the plant would have been depleted before October of 1854 (Esterhuysen 2006:91). However, the drought that occurred in the early 1850s (described in Chapter 3) may have a bigger role to play in the low number of maize remains found in the cave.

The ideal rainfall range for *Zea mays* is between 500mm and 800mm (Mzezewa & Gwata 2011: 100). The specific data for the rainfall during the drought years are not published. However, some species that were recovered in the cave have low water requirements. *Lablab purpureus* can grow with rainfall totalling just 400mm (Andersson *et al* n.d). As illustrated in Table 3.2, most of the wild plant species in the Historic Cave vegetation zones grow in areas which commonly receive rainfall greater than 400mm (Maguire 2009: 42-43). Many other species are drought-tolerant (see Appendix E). Species with a 400mm minimum rainfall requirement were found in Historic Cave and it follows, therefore, that the area received at least that much rainfall. Another alternative was that the Mogalakwena River near to Historic Cave was used to supplement the rainfall to cultivate crops. If roughly 400mm of rain did fall during the cultivation period for the crops, and the growing periods for the wild species, maize would not have grown in the season and this would account for the low number of remains. If the river had been used for cultivation, maize may have been able to grow and produce heads of corn; the low numbers in the cave would then suggest maize was not a staple food.

6.1.1.2 Water

The siege in Historic Cave was characterised by a lack of water, not a lack of food. The early 1850s, the 1853/1854 season, specifically was a very dry period with little rainfall (Esterhuysen 2008a: 472). Climate data from Mokopane show the rainy season sometimes begins in early October but the wet season usually starts from late October (Maguire 2009: 40). October is the hottest month of the year (Maguire 2009: 40). Trekker records describe the rains as coming late that year (Esterhuysen *et al* 2009:1046). Conditions in the area would therefore have been hot and dry. Any sources of water within the cave would have run dry, and any access to water outside the cave was cut off by the trekkers as they placed the Kekana under siege. The lack of water is evidenced by Commandant-General Pretorious's report, in which he describes Kekana women and children leaving the cave to drink from the river nearby, driven by thirst (Esterhuysen *et al* 2009: 1040). The dehydrated mummies found in the cave are a further testament to the dry conditions in the cave (Esterhuysen *et al* 2009). This lack of water explains why so many food plants, especially grains, were recovered, as there was no water for cooking.

One such water-storing species was *Citrullus lanatus*, which appears to have been an important species as it was found in 64% of the squares and six of the eight areas of excavation within Historic Cave. Only the seeds were recovered; no other portions of the plant were recovered from the cave. This suggests that the melons were used for their moisture, as the flesh was mashed into a drinkable pulp and the seeds set aside or discarded (as described in Appendix E). Over three thousand Tsamma melon seeds were recovered from across the excavation; this implies there was an equally impressive number of melons brought into the site before the siege. Whether these were brought in to Historic Cave for their water content or for some other purpose is unclear from the remains alone.

6.1.1.3 Medicinal Plants

Medicinal plants are used across all cultural groups and there is much overlap between the species, and parts of plants, that are used (van Wyk *et al* 1997: 8). Practitioners of these traditional medicines are known by many names, including *inyanga* and *sangoma* (van Wyk *et al* 1997: 10). Although these terms are used interchangeably today, in the past they referred to a herbalist and a diviner respectively (van Wyk *et al* 1997: 10). Healers make use of *muti* (Xhosa) or *muthi* (Zulu) (Ashforth 2005: 211-212). *Muti* is usually translated into English as 'medicine' but can also refer to 'poison' when referring to witchcraft as opposed to healing (Ashforth 2005:212). *Muti* is administered by people with expertise or knowledge regarding the substances to achieve a result such as cleansing or strengthening people or protecting them from evil forces (Ashforth 2005: 212).

Muti is also involved in communication between people and spirits (Ashforth 2005: 213).

The practices are extremely adaptive and fluid (van Wyk *et al* 1997: 10). Plant species that have been recently introduced into the region may find themselves added to the knowledge systems where they are useful, and may even replace other, more traditional plants (van Wyk *et al* 1997: 10). The presence of diviners/herbalists from multiple training backgrounds (Esterhuysen 2006) suggests that a wide variety of plant medicines were employed for various reasons.

Well-known medicinal species include *Aloe* species, *Solanum* species and *Ficus ingens*. The flowerheads from *Protea* species were used as protective muti and were worn around the neck (See appendix E). *Vangueria infausta* is a plant seen to be very unlucky (cf. Tredgold 1986: 133; see appendix E), but was taken in to the siege situation regardless. Most of the other medicinal species treated physical ailments.

Ganoderma, a fungus that only grows on trees, was collected and brought into the cave prior to the siege (Muthelo 2009). The fungus would have been brought in for its medicinal qualities or as food (see Appendix E for more detail). Northern hemisphere countries, including China, Japan, North America and Russia, have long histories documenting the use of medicinal mushrooms (Denisova 2001) and so it is likely that people southern Africa and the Limpopo region made use of fungi for health purposes. The *Ganoderma* species recovered at Historic Cave appears to be the first fungus to be excavated archaeologically, in sub-Saharan Africa at the very least. Although historical sources indicate the use of the various species for thousands of years, especially in China and Japan (Denisova 2001), there are no published records of *Ganoderma* being recovered archaeologically. The fungus has been overlooked by the studies of food plants described in Chapter 3. The *Ganoderma* may have been brought into the cave for medicinal purposes or as food.

The seed resembling *Hyaenanche globosa* is interesting as it is fatally poisonous and has no recorded edible or medicinal portions (see Appendix E for more information). The San used to tip arrows in the past (Watts & Breyer-Brandwijk 1932: 100; SANBI 2012). It is both possible and likely that the Kekana Ndebele in Historic Cave used the species in a similar manner, perhaps tipping spears or arrows with the poison, against the trekkers. It is possible that firearms were not the only weapons made useful by the Kekana. As the hyena poison plant is only known to grow in the Western Cape province in the south-western corner of South Africa, the seed also indicates how far and wide herbalists travelled or traded for *muti* and information.

6.1.1.4 Distribution of Findings

The majority of the species found at Historic Cave were recovered from Dg1 (96%). Many of the species were found in this section of the excavation. A significant number of plant remains were recovered from the area. There are multiple reasons to explain the high species variety there. This section was the largest of the eight areas in the cave (Le Roux *et al* 2013: 100; see also Fig. 3.1). Other areas of the excavation totalled between one and five square metres squared (Esterhuysen 2008a: 463; see Fig. 3.1). No volume measurements were taken during the excavations at Historic Cave.

Noticeably, Dg1 contained more plant remains and more species than Dg6, which was an area reserved for storage and only contained 19% of all species. The cluster of plant materials in Dg1 could reinforce the idea that this area contained the higher-status members of the community, as described by Esterhuysen (2008a: 465). The differing levels of species variety in the two excavations suggest three possibilities. The higher-status Dg1 area could have acquired more variety of plant species when the cave was occupied by virtue of the status of the people staying there; Dg 6 could have had fewer different species due to the lower status of the people staying there. Alternatively, each area could have had similar species variety but the stores at Dg6 could have been depleted more quickly as the stored plants were meant for the community and the stores at Dg1 meant for the royals. The food plants would have been prepared, eaten and discarded and so only the unused plants would remain where they had been stored. The presence of a diviner/herbalist is suggested by the material remains at both Dg1 and Dg6. It could therefore suggest that the variety of species found within the excavation areas is linked to the presence of a diviner/herbalist rather than the size or status of the individuals within the zones of the excavation.

Plant variety in each of the excavation areas decreases towards the entrance to the cave – Dg1 at the base of the excavation has the most species included in it, followed by Dg2 (14%), Dg5 (13%) and Dg4 (9%) closest to the entrance (see Fig. 3.1). The entrance to the cave was the most exposed area of the settlement within the cave. Lower status groups would have been living in this area (Esterhuysen 2008a: 465). The pattern therefore suggests that Dg1 had a large variety of plant species because of the higher status individuals living in the area. However, this idea would need to be tested by looking at the density of remains per square or per unit of excavated soil, to rule out the possibility of an increased number of remains created from an increase in the size of the excavation.

Dg3 had the lowest species variety of all the areas of the excavation. As it was a pathway and not a living area, this result is not unexpected. Species that were found in the locality of the excavated pathway were *Aloe* species, *Lagenaria siceraria* and *Sorghum bicolor*. These deposits were most likely incidental deposits.

Dg7 and Dg8 were small units without any apparent areas reserved for storage or the preparation of food (Esterhuysen *et al* 2009: 1040). These areas had very low species variety as 4% and 8% of the species were recovered there respectively. Each of these excavation covered only 1m^2 each, which may explain the low number of species recovered there, or the low number may be a result of what the units were used for. Dg8 appears to have been used by a sniper or scout on duty or on watch (Le Roux *et al* 2013: 107). Meals would have been prepared and eaten within the cave while the sentry was off-duty (Le Roux *et al* 2013: 107). Food plant food remains would therefore be concentrated in areas other than Dg8. The remains of plants that were found there (*Lagenaria siceraria*, *Sorghum bicolor*, *Cucurbita maxima, Commiphora schimperi* and *Vigna unguiculata*) suggest that staple, cultivated foods and harvested wild foods (*Pappea capensis* and *Olea europaea* subsp. *cuspidata*) were eaten there, possibly stored or brought up in the *Lagenaria siceraria* shell. Two seeds from *Zea mays* were found in this excavation area. Dg7 could have been used for the same purpose, or a similar defence-like activity. The plant remains here are slightly different, however: *Commiphora* species, *Citrullus lanatus, Sorghum bicolor* and *Lannea discolor* were the species found there.

6.1.1.4 Season

Most of the species that were recovered from Historic Cave were summer plants, plants that produce their fruits in between January and May. This is especially true for the wild trees that were harvested by the Kekana. *Engelerophytum magalismontanum* produces fruits from December to February. This means that December of the previous year was the earliest that plants could have been harvested for storage in Historic Cave. Many other species produce fruits in winter, for example, *Grewia bicolor* produces fruits in autumn and *Lablab purpureus* produces pods between August and March (See Appendix E). It is therefore likely that important plants were stored throughout the year as they came into season. However, this does not tell us when the plants were stored in Historic Cave as they may have been stored and utilised elsewhere in the ten months prior to the siege.

6.1.2 BALERNO SHELTERS

Balerno farm hosts three shelters that were occupied in the past. Balerno Main Shelter was occupied during four periods and plant remains were recovered from two of those phases. Balerno Shelter 2 was occupied for two phases and plant remains were found from one of those occupation periods. No plant remains were found from Balerno Shelter 3.

6.1.2.1 Balerno Main Shelter

The two occupation periods from Balerno Main Shelter that did include plant material were dated to between AD 100 and 1300 (contact period) and AD 1640 and 1800 (van Doornum 2008: 269). During the former occupation period, the shelter was occupied by hunter-gatherers and in the latter by farmers (van Doornum 2005). Two species were found in both these occupation periods – *Sclerocarya birrea* and a species of the sub-family *Mimosoideae* within the *Fabaceae* family. Both these species are wild and are not cultivated. No cultivated remains were recovered from the hunter-gatherer occupation. Their presence in both the occupation phases suggests that they were harvested and utilised by both the hunter-gatherers and later the farmers occupying the site. The plants therefore had some value to each of the groups. Unfortunately, no plant remains were recovered from the earliest two occupation phases and so there is no evidence to suggest how long these plants were used by the hunter-gatherer groups. The number of species occurring in the two later occupations is not significant enough to suggest a transitional group or continuity in plant use, but it may warrant further investigation by laterally extending the original excavation. Both species identified from the contact period occupation were found in subsequent layers and there was no species found in this occupation that was not reflected in the later period. This may hint at a broadly similar assemblage being deposited but not recovered from the cave, due to preservation bias or other processes destroying the plant matter. It can reflect a continuation of the use of certain species from the hunter-gatherers which was ‘passed on’ to farmers, through interaction or knowledge-sharing. It could also reflect a small portion of plants that were shared by both groups within two broadly different assemblages, with or without interaction. The small number of shared species makes the pattern unclear. The cultural interaction described by van Doornum (2000, 2005, 2008) between hunter-gatherers and farmers within the Shashe-Limpopo Confluence Area may explain why the plant species were used during both occupation phases.

A seed sample taken near Balerno Shelter 2 at the time of the excavation shared five species in common with the final occupation phase, lasting until roughly AD 1800. Four of the five species were identified; the last species was put into a Type instead. These are species that are still living in the region today and which suggests that the present climate at Balerno farm has remained roughly constant since this occupation. No species recovered from the third occupation phase (AD 100 to 1300) were found in the sample. However, the sample itself was small and may not have been representative of the species surrounding the shelter in the present day. This is not in itself enough to say that the climate had made any significant change over the occupation phases; more sampling, or more systematic samples, would need to be taken to reflect such change.

The small number of samples in common with the excavation and the surrounding area highlights another important point – the species recovered from Balerno Main Shelter were chosen and brought into the shelter by humans. Although the plant remains could have been brought into the cave accidently, the multiple known values of the majority of the species found at Balerno Main Shelter suggests that the plants were brought in on purpose, most likely for specific purposes. Chapter 3 described the vegetation background in the area around Balerno. Balerno Farm is situated in a vegetation zone known as mopaneveld and is characterised by *Colophospermum mopane* shrubs (Acocks 1988: 43). No remains of this species, which surrounds the shelters, was found at either Balerno Main Shelter or Balerno Shelter 2. It is therefore unlikely that the vegetation surrounding the shelters was brought into the cave through natural agents, such as wind, or through the natural dispersal mechanisms of the plants. Remains from some of the characteristic vegetation north of the Limpopo River, including *Commiphora* species, *Grewia* species, *Ximenia* species and *Sclerocarya birrea* (Acocks 1988: 43) are found in Balerno Main Shelter. If the macrobotanical remains in the cave did come over the Limpopo River, it is probable that they were transported over the river by human agents. The fruits and berries of some species are eaten by birds and the seeds could have been transported by them.

A very small number of food crops were recovered from the fourth phase at Balerno Main Shelter - for example, only one *Sorghum bicolor* seed and one stalk (less than 1g) were recovered. *Lagenaria siceraria* and *Citrullus lanatus* grow wild or can be cultivated (see Appendix E). All the other species from the occupation phase are wild species. This is unexpected for a farmer occupation. Cultivated crops were therefore either not preserved or were not deposited. As the wild species did preserve to some extent, it is more likely that cultivated species were not deposited in the cave. The presence of tiny portions of cultivated species suggests that they were deposited accidentally, as there was only one seed and one stalk recovered from the entire excavation. The presence of the cultivated plants shows that such species were brought in to the cave. Six postholes were observed at the site, but there was no evidence to confirm huts or homes were constructed in the shelter for permanent residence (van Doornum 2005: 66). There were some structures built in the shelter, as illustrated in Figure 3.2, but these seem to be huts used in initiation rituals. It is unclear if the shelter was occupied year-long or if it was returned to for portions of the year.

The plant remains may be able to shed some light on the seasons during which the shelter was used. Most of the species that were recovered from the shelter produce fruit between November through to March and April. This would suggest that the shelter was used during the summer. *Lagernaria siceraria* produces fruit between April and July. However, this does not affect the seasonality of the shelter, as the calabash is known as a storage plant. *Grewia bicolor* does stand out as it only produces fruit in the autumn. It is therefore possible that the shelter was used from summer into autumn.

During this occupation phase (AD 1600 to 1800), many shelters in the Shashe-Limpopo Confluence Area were occupied by farmers, as opposed to the hunter-gatherers who had occupied the shelters in previous occupations (van Doornum 2005: 184). At Balerno Main Shelter, the reason for the farmer occupation of the previously hunter-gatherer occupied shelter seems to be linked to ritual reasons (see Chapter 3). Ritual is suggested through the basins made from clay at the shelter (S. Hall, 14 April 2011, correspondence). Farmers were known to appropriate shelters that were occupied by hunter-gatherers in the past in order to harness the power that hunter-gatherers were seen to have, as they were the 'first people' in the area (van Doornum 2005). The shelter would have been seen as a place of power (van Doornum 2008). The farmers may have been trying to access the power of the hunter-gatherers for rain-making purposes, a responsibility that was allocated to hunter-gatherers prior to, and during, this time (van Doornum 2005). Plant species may have been brought up to Balerno Main Shelter as part of a rainmaking ritual.

Rainmaking is a collective term for many types of rainmaking ceremonies (Schoeman 2006). Rainmaking can be an annual ceremony, done once a year before the agricultural year begins to ensure the rains arrive on time (Schoeman 2006). The ceremonies can also be carried out as a response to drought conditions (Schoeman 2006). Several species recovered from the cave (see Appendix E) are perceived to cause drought if the proper procedures are not held. *Grewia flava* is used in some rainmaking contexts to protect against lightning (Schoeman 2006). *Xanthocercis zambesica* trees are sometimes linked with places of water and therefore with rain (Schoeman 2006). Most of the seeds from this species were burnt; a practice recorded in rainmaking ceremonies at E.H. Hill (Schoeman 2006). Cultivated species (such as *Vigna unguiculata* and *Sorghum bicolor*) and certain wild species such as marula can also be used in rainmaking; they are burnt to invoke sympathy with the ancestors (Schoeman 2006). Unfortunately, due to the structural fires at Balerno Main Shelter (S. Hall, 14 April 2012, correspondence) it is unclear whether the seeds were burnt prior to or after deposition.

6.1.2.2 Balerno Shelter 2

Plant remains at Balerno Shelter 2 were recovered from only one layer (Grey-Brown 5-10) in both squares of the excavation. Other objects recovered during the excavation included lithics, bone, ostrich egg shell and colouring material. These objects were found within the twelve layers of the excavation. There is no apparent peak in these other objects within the Grey-Brown 5-10 layer containing plant material to suggest an intensification of the occupation or circumstances promoting preservation. With the exception of the five seeds recovered, plant material that may have been deposited in the area that was excavated did not preserve, or plant remains were not deposited in that section of the cave while it was occupied. Extending the excavation beyond the $2m^2$ would be the only way to describe the situation in the shelter.

Farmers occupied the site in the second occupation phase at Balerno Shelter 2 (van Doornum 2005: 184). This is evidenced by the gaming boards cut into the rock of the shelter, which is a known farmer activity (van Doornum 2005: 184). However, no strictly cultivated plants were recovered from the site. This may indicate that a significant portion of the assemblage is missing or that the shelter was not the primary settlement for the farmers. Only seeds from the *Cucurbitacea* family were recovered from this site. In present times, this family is economically important; the presence of the family at all three sites suggests that it was important in the past as well. The number of seeds recovered from Balerno Shelter 2 is simply too low to make any generalisations or theories about the site and what it was used for.

The low number of species makes it difficult to judge the seasonal use of the shelter. The two species that were recovered from the shelter, *Citrullus lanatus* and *Momordica balsamina*, are both available all year round and so are unable to suggest a timeframe for the use of the shelter.

6.2 General Trends across the Sites

The three cave sites that have been described throughout this dissertation share a cultural connection – i.e., farmers who were using plants for various purposes – within a similar time frame (roughly the early to mid-Nineteenth Century). They are being compared within this shared context.

Generally seeds were the plant parts recovered in the excavations of the cave sites, but thorns, pods and leaves (identified by G. Hall) were also recovered from certain species. Multiple parts of the species were used for various purposes, including the portions recovered from excavation. It is important to note that while the same species may have been used at two or all three of the sites, the different people in the different caves may have been using different portions of the plant, or similar parts of the plant, for different purposes. The same parts of the plant (i.e. seeds) would then be recovered at each site because of preservation bias, i.e. the hardest and most resistant portions (seeds, for example) would survive longer than the softer, least resistant portions (such as leaves or soft fruit).

It is possible that the seeds were deposited in the cave accidently when the plants were brought into the cave and the other portions used. The Tsamma melon (*Citrullus lanatus*) may be one such example – although the seeds are very useful, the moisture in the fruit would have been more important to the Kekana during the siege event. This would be true whether or not the fruits were brought there for water originally. At Balerno too, the moisture of the fruit would have been very important in the hot, dry, sandy environment. The seeds may have been deposited as a result of the people in the cave accessing that water. Similarly, leaves may have been important components of the Kekana diet, but the stores may have been completely depleted, or not preserved in the cave.

Interestingly, some species grow in the region surrounding all three of the cave sites, but were only recovered archaeologically in one site. *Acrotome inflata* is one such example; the wild species is found naturally around both sites but was only taken in to Balerno Main Shelter. The plant materials at Historic Cave were better preserved and so it is unlikely that any *Acrotome inflata* plants brought in to the cave would have decayed. This suggests, therefore, that the Kekana Ndebele chose not to utilise the species while the Kalanga chose to use it. It is possible that the species were brought in and did not preserve, but the preservation at Balerno Main Shelter was fairly good for plant remains and exceptional at Historic Cave.

This scenario is possible, but unlikely. It is more likely that the people living in the respective shelters were choosing and utilising plant species in their regions according to specific criteria and according to their knowledge about the plant species.

6.3 Summary of Chapter

Plant remains at the three cave sites provide a unique look into each of the cave sites. Historic Cave provides a unique look into the food and medicine provided by the plant world within a very specific time frame. Balerno Main Shelter shows an accumulation of plant materials over two phases of occupation by two separate groups of people. The types of plants (wild or cultivated) could suggest the economy of the people occupying a site or the purpose behind the occupation of the site. Beyond this, the assemblages of the plants at the cave sites shows agency of the people living in the caves. Plant species were chosen and brought in to the cave by people for specific reasons and purposes. The plant remains recovered from the caves can help illustrate various activities at the cave sites.

Chapter 7: CONCLUSION

Palaeoethnobotany, the study of human-plant relationships in the past, is a sub-discipline concerned with relationships between plant species and human populations, and the cultural development of communities of people, environmental change and the effects that each may have on the other. Phytoliths, pollen, charred wood and seeds are examples of the type of material that is studied by palaeoethnobotanists. Palaeoethnobotanical research is a three-step process, involving the recovery, identification and interpretation of macroremains, or plant materials that are visible with the naked eye.

Recovery of the plant materials can be done through a variety of methods and with various tools. Dry sieving was the technique used at all three cave sites, as the desiccated and dried remains would have been damaged by flotation or wet-sieving. Material from each of the three sites was passed through fine sieves. This material was then sorted and stored in polystyrene trays or sealable plastic bags for the following step, identification.

The identification of plant remains is done with the aid of primarily physical samples, but also with descriptions or pictures in books or on the Internet. The plant remains from Balerno Main Shelter, Balerno Shelter 2 and Historic Cave were mostly identified through reference samples at the National Herbarium in Pretoria. Other physical specimens came from the seed collection in the Origins Centre and from the C.E. Moss Herbariums, both on the main campus at the University of the Witwatersrand. Not all the material could be identified; these were put into species Types. All the remains from the cave sites were counted and recorded according to their location and layer within the excavations.

The final step in the three-part process is to interpret the material that was identified. The most important part of the interpretation is to understand the biases within the plant remains assemblage. These biases include preservation bias, where certain species or portions of the plants are more likely to survive and be preserved than others, and recovery bias, where the techniques that are used can affect how likely it is that remains will be recovered from the excavation. To combat these biases as much as possible, a presence analysis was done for all three sites. The other material culture found at the sites, including bone, colouring material, pottery and 'European' artefacts are key in describing the social contexts of the sites. Historical records, especially from Historic Cave, are vital in understanding the context of the cave sites.

The results from the identification and quantification of the materials at the cave sites suggest some interesting patterns. Historic Cave contained an assemblage with four main categories of plants – food plants, plants used for storing items, *muti* or medicine plants and plants that were capable of storing water. These categories of plants would have been highly important to the people within the cave under siege conditions. As all four of these categories were found in the cave, which suggests the cave was occupied as a living area. Plant species were incorporated into society for day-to-day use and this is reflected in the assemblage at Historic Cave. Balerno Main Shelter, on the other hand, had trace numbers of staple food species. The shelter was not occupied as a living space, but rather returned to when it was necessary. While there was some overlap between Balerno Main Shelter and Historic Cave, the assemblage from Balerno Main Shelter focused on plants with medicinal properties. It appears that this shelter was used for ritual purposes, perhaps for initiation as suggested by the hut and the clay features. It is also possible that the cave was used as a rainmaking site and that the cave was chosen specifically to harness the power of the hunter-gatherers before them. Balerno Shelter 2 was excavated over only $2m^2$ and produced a tiny number of seeds. The assemblage is too small and contained only two species. It is thus nearly impossible to say which activities were being carried out in the shelter while it was occupied. The bone remains and the two wild food species would suggest that the shelter was being used to consume food items, but the number of stone tools at the site suggest that there may be other activities occurring there too. Extending the excavation across more of the cave would be the only way to describe what these other activities may have been. The two species at Balerno Shelter 2 were found at both the other shelters. This suggests that *Momordica balsamina* and *Citrullus lanatus* were well known and widely used species. Further excavations in the Limpopo region would help to confirm or alter this pattern.

The species and the numbers of remains at the three cave shelters do suggest that it is possible to understand the activities occurring during occupations of the different caves, provided the assemblage is large enough and varied enough. Although there is an overlap in the species recovered at the cave sites, each site was occupied for different purposes. Historic Cave was the site of a siege event and was occupied as a living area for a short period of time. Balerno Main Shelter was occupied several times by different groups of people. The plant remains that were found at this shelter are not distinct enough to distinguish these groups of people. Further excavation in this cave and in other sites would be needed before it can be said whether distinguishing groups of people based on their plant remains is possible or not, but it seems likely that plant remains cannot. The plant remains do indicate however that the cave site was used for ceremonial purposes – initiation ceremonies and rainmaking rituals are both possibilities. The assemblage from Balerno Shelter 2 is simply not large enough to describe what activities were carried out there. The presence of *Citrullus lanatus* and *Momordica balsamina* at all three cave sites hints at their widespread use and importance in nineteenth century Limpopo, and earlier.

The botanical analysis of the plant remains found at three historically-occupied cave sites within the Limpopo Province can illustrate many ideas about each of these sites, and possibly about the landscape as a whole.

Four questions were presented in Chapter 1 about the identification, use and preparation of species at the three cave sites. Three families, twenty genera and 58 species were recovered from Historic Cave. Balerno Main Shelter included two families, three genera and nineteen species and Balerno Shelter 2 included only two species. These species are described in Chapter 5 and their specific uses and traditional preparation techniques are described in Appendix E. The plant assemblages combined with other material culture recovered in the excavations suggest that Balerno Main Shelter was a ritual site, used for either rainmaking or initiation. Balerno Shelter 2 is unclear and would require extending the excavation to understand the use of plants there. At Historic Cave, the historic records describe the siege of site. The plant remains that were recovered from the site for provide some information about the sustenance and spiritual protection offered by plant species.

This dissertation looks at the information that can be gathered from the plant remains from the historical occupations of cave sites within the social and historical contexts. This information has been highlighted throughout this dissertation. Plant remains are able to suggest or strengthen theories about the reasons behind the occupation of the site, about the diet of those people within a site, about the plants used for *muti*, protection and ceremony and can infer specific activities, such as the use of poison at Historic Cave.

The presence of fungus, *Ganoderma* species, at Historic Cave is a rare find, and the first archaeologically-found fungus in sub-Saharan Africa. The species is both edible and medicinal. The recovery of the fungus does highlight that an important resource has been overlooked in previous palaeoethnobotanical study in South Africa, and could open up a new and intriguing field of research.

Besides highlighting the importance of the *Ganoderma* species, and of edible fungi, as a future area of study, this dissertation adds to the current archaeological knowledge. This dissertation is one of the few archaeobotanical and palaeoethnobotanical studies that have been done in South Africa. This dissertation describes the use of plant remains by two different farmer groups. It shows that plants were not used only as food – it shows that plant species were also used as medicine and for spiritual *muti*. This dissertation describes many of the possible uses of these plants; it describes the importance of plants and hints at the indigenous knowledge systems that revolved around different plants during the early and mid-1800s. The plant remains from Historic Cave describe the people of the site as a group of people actively fighting for survival with the botanical weapons available – stockpiled food resources, medicine, plants for protective magic and even a poisonous plant species. Balerno Main Shelter provides a glimpse into the normal ritual practices of the farmer group using the cave. This project shows that farmer groups were not homogenous – the plant assemblages show different groups within similar contexts using plants and caves for different purposes.

Palaeoethnobotany is a relatively young sub-discipline in South Africa. The study of seeds and macroremains in South Africa is even younger. However, the macroremain studies that have been done across the country show that there is more to be learned about an excavation through the seeds. Plant remains are able to show ideas and activities that other material culture cannot. Taken together with all the available material remains, human remains and historic and oral records, plant remains describe the kinds of plants that people choose in given circumstances. The remains reflect the economic and social value placed on plant species. Plant remains from Historic Cave highlight certain activities, such as the use of poison against foes, while at Balerno Main Shelter, plants can describe the ritual aspects of the site.

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Appendix A: DESCRIPTION OF TYPES

Table A.1: Description of Species Types

Unidentified Type 1	Brown, medium-sized, round to oblong with multiple compartments inside the seed. Many are gnawed and/or broken.
Unidentified Type 2	Brown, small and spherical. No visible attachment points.
Unidentified Type 3	Brown, small- to medium sized, oval to oblong seeds. Many have been gnawed.
Unidentified Type 4	Brown and black, large, oblong seeds, some with visible compartments inside the seed.
Unidentified Type 5	Brown and black seeds, medium to large, raindrop shaped (round tapering to a point at one end).
Unidentified Type 6	Tiny to small seeds, black in colour and spherical.
Unidentified Type 7	Brown to black with an almost metallic texture under low magnification, medium-sized seeds that are long, thin, curved and oblong in shape (almost sausage-shaped). Also includes seeds that are medium-sized, light yellow-brown, oblong to raindrop shaped, many of which are broken.
Unidentified Type 8	Dark to light brown, irregularly/asymmetrically oblong shaped, heavily textured.
Unidentified Type 9	Medium-sized, dark brown with thin layers peeling off. Possibly a small bulb.
Unidentified Type 10	Dark coloured, large, spherical and textured seed. Some examples have been gnawed.
Unidentified Type 11	Small, brown to black seeds that are spherical to oblong in shape. Attachment points are visible.
Unidentified Type 12	Small brown-red raindrop shaped seeds.
Unidentified Type 13	Small, black, round to oblong seeds but with a flat profile. Some specimens have nicks in them.
Unidentified Type 14	Light brown, small seeds that are raindrop shape but have a semi-circular profile.
Unidentified Type 15	Brown to dark blue-brown in colour, sub-spherical in shape. Attachment points are visible.

Unidentified Type 16	Oblong to raindrop-shaped, medium sized seeds that are brown to yellow-brown in colour. All examples are broken.
Unidentified Type 17	Tiny, black seeds shaped like elongated hearts. Visible attachment points.
Unidentified Type 18	Tiny black spherical seeds with attachment points and a single light brown to white marking on each seed.
Unidentified Type 19	Large, round and black arranged in conjoined pairs. Attachment points are visible. Possibly a fruit.
Unidentified Type 20	Circular but flat, light brown species that has several tiny raindrop-shaped seeds melded to it. Possibly a fruit.
Unidentified Type 21	Dark red, circular but flat seed with thick but superficial grooves on the flatter edges. No visible attachment point
Unidentified Type 22	Yellow to light brown grass or cereal species on stalks. Seeds are tiny and light in colour.
Unidentified Type 23	Tiny, brown and oval in shape and have a unique texture. Attachment points are visible. Possibly a fruit.
Unidentified Type 24	Large, light brown 'pinched' oval shape, with stalks coming out of it. Likely a rhizome, tuber or bulb species.
Unidentified Type 25	Small, oval to raindrop shaped seed with a diamond or kite shaped profile. Dark brown in colour.
Unidentified Type 26	Small, kidney-shaped seeds with a flat profile, textured and light brown/yellow to brown in colour.
Unidentified Type 27	Large, dark brown, round but with an irregular, semi-flat profile. May be fruit with seeds.
Unidentified Type 28	Small, oval-shaped, dark brown seed with attachment points.
Unidentified Type 29	Small, flattened sphere with lattice-type texture. Attached to twig fragment.
Unidentified Type 30	Small, brown, rounded-star shaped seed with an oval profile.
Unidentified Type 31	Dark segmented pods
Unidentified Type 32	Non-segmented seed pod that is long and thin and light brown in colour. No seeds inside pods. Most examples are broken.
Unidentified Type 33	Segmented pods containing seeds. Pods are short, thin and dark brown to black. Internal seeds are not visible

	enough to be described.
Unidentified Type 34	Thin, twisted, non-segmented pod without seeds inside. Specimen is broken.
Unidentified Type 35	Non-segmented seed pod that is short and dark brown in colour. May still contain seeds.
Unidentified Type 36	Large, dark brown raindrop to oval shaped seeds that are heavily textured.
Unidentified Type 37	Seeds are small, spherical and brown in colour.

Appendix B: HISTORIC CAVE RESULTS

* Identified by staff at the C.E. Moss Herbarium, Wits

** Identified by G. Hall as part of a grab sample described in Esterhuysen 2006.

Table B.1: Species Counts and Locations from Dg1, Historic Cave

Loc.	Level	Species (Scientific)	Count				Comments
			Tot.	F	Br	Bu	
M1	Surface	Aloe species	6				Aloe fragments, 4g
M1	Surface	Bridelia micrantha	1				Velvet Sweetberry
M1	Surface	Citrullus lanatus	41	12	27		Wild watermelon
M1	Surface	Cucurbita maxima	1		1		Pumpkin
M1	Surface	Elaeodendron transvaalense	6		1		Bushveld saffron
M1	Surface	Euphorbia species	1				
M1	Surface	Lagenaria siceraria					Calabash, 7g
M1	Surface	Lagenaria siceraria	3		3		Calabash seeds
M1	Surface	Lannea discolor	1		1		Tree grape
M1	Surface	Momordica balsamina	1	1			Balsam pear
M1	Surface	Pennisetum glaucum	1				Millet stalk, <1g
M1	Surface	Protea species	1				Flowerhead
M1	Surface	Sclerocarya birrea	1		1		Marula nut
M1	Surface	Sorghum bicolor	118			9	Sorghum stalks, 7g
M1	Surface	Sorghum bicolor	11		6		Sorghum seeds
M1	Surface	Vangueria infausta	8	3	3		Wild medlar
M1	Surface	cf. Vangueria infausta	2		2		
M1	Surface	Vigna radiata	3			1	Mung bean
M1	Surface	Vigna unguiculata	2				Cowpea
M1	Surface	Unidentified Type 1	2				
M1	Surface	Unidentified Type 2	2				
M1	Surface	Unidentified Type 3	7				
M1	Surface	Unidentified Type 4	1				
M1	Surface	Unidentified Type 8	1		1		
M1	Surface	Unidentified Type 9	1		1		
M1	Surface	Unidentified Type 11	1				
M1	Surface	Unidentified Type 22	1				Stalk
M1	Surface	Unidentified Type 37	2		2		
M1	Surface	Unidentifiable	12		5		
M1	Floor (BA)	Citrullus lanatus	124	26	94		Wild watermelon
M1	Floor (BA)	Englerophytum magalismontanum	1		1		Transvaal Milkplum
M1	Floor (BA)	Ganoderma species	1		1		Fungus
M1	Floor (BA)	Lagenaria siceraria					Calabash fragments, 23g
M1	Floor (BA)	Mimusops zeyheri	1	1			Red milkwood
M1	Floor (BA)	Moringa oleifera	1		1		Horseradish tree
M1	Floor (BA)	Pennisetum glaucum	4				Millet stalks, 1g
M1	Floor (BA)	Sorghum bicolor	72			4	Sorghum stalks, 3g
M1	Floor (BA)	Sorghum bicolor	41	1	2		Sorghum seeds
M1	Floor (BA)	Vigna radiata	1		1		Mung bean
M1	Floor (BA)	Vigna subterranea	1	1			Bambara nut, may be drilled
M1	Floor (BA)	Vigna unguiculata	4		1		Cowpea
M1	Floor (BA)	Unidentified Type 4	2	1	1		
M1	Floor (BA)	Unidentified Type 8	2	1	1		
M1	Floor (BA)	Unidentified Type 32	11		11		Pods
M1	Floor (BA)	Unidentified Type 33	2		1		Pods

M1	Floor (BA)	Unidentified Type 35	1					
M1	Floor (BA)	Unidentified Type 36	1		1			
M1	Floor (BA)	Unidentifiable	2					
M1	Floor (AS)	Citrullus lanatus	31	17	12	1	Wild watermelon
M1	Floor (AS)	Combretum species	1				Bushwillow species
M1	Floor (AS)	Elaeodendron transvaalense	1				Bushveld saffron, gnawed
M1	Floor (AS)	Englerophytum magalismontanum	2		2		Transvaal Milkplum
M1	Floor (AS)	Lagenaria siceraria					Calabash fragments, 5g
M1	Floor (AS)	Lagenaria siceraria	1		1		Calabash seed
M1	Floor (AS)	Mimusops zeyheri	3	1	2		Red milkwood
M1	Floor (AS)	Pennisetum glaucum	1				Millet stalk, <1g
M1	Floor (AS)	Sorghum bicolor	8			1	Stalks, 2g
M1	Floor (AS)	Vangueria infausta	1				Wild medlar
M1	Floor (AS)	Vigna unguiculata	2				Cowpea
M1	Floor (AS)	Unidentified Type 10	1				
M1	Floor (AS)	Unidentified Type 32	1		1		Pod
M1	Floor (AS)	Unidentified Type 33	1				
M1	Floor (AS)	Unidentified Type 36	1		1		
M1	Floor (AS)	Unidentifiable	1				
M1	RBL/GM	Aloe species	10				Aloe fragments, 23g
M1	RBL/GM	Citrullus lanatus	1	1			Wild watermelon
M1	RBL/GM	Lagenaria siceraria					Calabash fragments, 20g
M1	RBL/GM	cf. Lannea discolor	1				
M1	RBL/GM	Protea species	1	1			Flowerhead, drilled
M1	RBL/GM	Sclerocarya birrea	1				Marula plug
M1	RBL/GM	Sorghum bicolor	34			5	Sorghum stalks, 6g
M1	RBL/GM	Sorghum bicolor	3		2		Sorghum seeds
M1	RBL/GM	Vigna radiata	1				Mung bean
M1	RBL/GM	Vigna unguiculata	2				Cowpea
M1	RBL/GM	Unidentified Type 1	2		1		
M1	RBL/GM	Unidentifiable	1		1		
M1	GM	Acacia species	2				Acacia thorns, worked
M1	GM	cf. Acacia species	1	1		1	thorn
M1	GM	Aloe species	9				Aloe fragments, 8g
M1	GM	Citrullus lanatus	237	10 7	12 1	1	Wild watermelon
M1	GM	Cussonia species	1				
M1	GM	Elaeodendron transvaalense	1				Bushveld saffron
M1	GM	Englerophytum magalismontanum	31	4	22		Transvaal milkplum
M1	GM	cf. Hyaenanche globosa	1				Hyena poison
M1	GM	Kirkia acuminata	1		1		White seringa
M1	GM	Kirkia cf. acuminata	1				
M1	GM	Kirkia wilmsii	5		5		Mountain seringa
M1	GM	Lagenaria siceraria					Calabash fragments, 60g
M1	GM	Lagenaria siceraria	4				Calabash stalks
M1	GM	Lagenaria siceraria	29	3	25		Calabash seeds
M1	GM	Mimusops zeyheri	11	3	8		Red milkwood
M1	GM	Mimusops cf. zeyheri	1		1		
M1	GM	cf. Mimusops zeyheri	2		2		
M1	GM	Momordica balsamina	1				Balsam pear
M1	GM	Olea europaea subsp. cuspidata	1				African olive
M1	GM	Pennisetum glaucum	1			1	Millet stalks, 2g
M1	GM	Protea species	1				Flowerhead

M1	GM	Sclerocarya birrea	1				Marula plug
M1	GM	cf. Sclerocarya birrea	1	1			
M1	GM	Searsia lancea	1				Karee
M1	GM	Sorghum bicolor	402			32	Sorghum stalks, 46g
M1	GM	Sorghum bicolor	44	2	9		Sorghum seeds
M1	GM	Vangueria infausta	4		1		Wild medlar
M1	GM	Vangueria infausta	3	3			Wild medlar, fruit
M1	GM	Vigna radiata	1				Mung bean
M1	GM	Vigna subterranea	2	1			Bambara nut
M1	GM	Vigna unguiculata	10				Cowpea
M1	GM	Unidentified Type 1	5		3		
M1	GM	Unidentified Type 3	2		1		
M1	GM	Unidentified Type 4	42	1	1		
M1	GM	Unidentified Type 6	1				
M1	GM	Unidentified Type 8	2		2		
M1	GM	Unidentified Type 9	1				
M1	GM	Unidentified Type 10	2		2		
M1	GM	Unidentified Type 15	1				
M1	GM	Unidentified Type 22	2				Stalks
M1	GM	Unidentified Type 28	1	1			
M1	GM	Unidentified Type 32	15	7	8		Pods
M1	GM	Unidentified Type 36	5		4		
M1	GM	Unidentifiable	4				
M1	RBL	Acacia species	5				Acacia thorns, 4 worked
M1	RBL	Aloe species	6				Aloe fragments, 7g
M1	RBL	Bridelia micrantha	1				Velvet Sweetberry
M1	RBL	Citrullus lanatus	84	34	45	1	Wild watermelon
M1	RBL	Commiphora schimperi	1				Velvet-leaved corkwood
M1	RBL	Cucurbita maxima	1				Pumpkin
M1	RBL	Cussonia species	1			1	
M1	RBL	Englerophytum magalismontanum	9	4	4		Transvaal milkplum
M1	RBL	Euphorbia species	3	1			
M1	RBL	Grewia monticola	3	1			Silver raisin **
M1	RBL	Lagenaria siceraria					Calabash fragments, 29g
M1	RBL	Lagenaria siceraria	3		3		Calabash seeds
M1	RBL	Lannea discolor	1	1			Tree grape
M1	RBL	Mimusops zeyheri	2		2		Red milkwood
M1	RBL	Momordica balsamina	2	1			Balsam pear
M1	RBL	Olinia species	1				Hard pear
M1	RBL	Pennisetum glaucum	7				Millet stalks, <1g
M1	RBL	Protea species	1		1		Flowerhead, worked
M1	RBL	Sclerocarya birrea	1				Marula plug
M1	RBL	Sorghum bicolor	285			8	Sorghum stalks, 14g
M1	RBL	Sorghum bicolor	25	3	1	1	Sorghum seeds
M1	RBL	Vangueria infausta	17	6	7		Wild medlar
M1	RBL	Vigna radiata	2				Mung bean
M1	RBL	Vigna unguiculata	5		1		Cowpea
M1	RBL	Unidentified Type 1	3	1	1		
M1	RBL	Unidentified Type 2	2	1	1		
M1	RBL	Unidentified Type 4	2	1			
M1	RBL	Unidentified Type 22	1				
M1	RBL	Unidentified Type 34	1		1		
M1	RBL	Unidentified Type 37	2				
M1	RBL	Unidentifiable	13				
M1	-	Lagenaria siceraria					Calabash fragments, 29g
M2	Surface	Aloe species	6				Aloe fragments, 10g
M2	Surface	Citrullus lanatus	50	11	38		Wild watermelon

M2	Surface	Cussonia species	1		1		
M2	Surface	Euphorbia species	1				
M2	Surface	Lagenaria siceraria					Calabash fragments, 4g
M2	Surface	Lagenaria siceraria	3		3		Calabash seeds
M2	Surface	Mimusops zeyheri	2		2		Red milkwood
M2	Surface	Olea europaea subsp. cuspidata	2	1			African olive
M2	Surface	Pennisetum glaucum	4				Millet stalks, <1g
M2	Surface	Sclerocarya birrea	2	2			Marula nut
M2	Surface	Sorghum bicolor	121			5	Sorghum stalks, 5g
M2	Surface	Sorghum bicolor	11		1	1	Sorghum seeds
M2	Surface	Vangueria infausta	2	1			Wild medlar
M2	Surface	Vigna radiata	2				Mung bean
M2	Surface	Vigna unguiculata	2				Cowpea
M2	Surface	Unidentified Type 1	4	1			
M2	Surface	Unidentified Type 2	1				
M2	Surface	Unidentified Type 3	10				
M2	Surface	Unidentified Type 11	4			1	
M2	Surface	Unidentified Type 15	1				
M2	Surface	Unidentified Type 17	1				
M2	Surface	Unidentified Type 29	1	1			
M2	Surface	Unidentified Type 32	1		1		
M2	Surface	Unidentified Type 37	1	1			
M2	Surface	Unidentifiable	7				
M2	GM	BUXACEAE	1				
M2	GM	Aloe species	15				Aloe fragments, 16g
M2	GM	Citrullus lanatus	23	8	11		Wild watermelon
M2	GM	Cussonia species	2				
M2	GM	Elaeodendron transvaalense	8		1		Bushveld saffron
M2	GM	Ficus ingens	3	1			Red-leaved rock fig
M2	GM	Lagenaria siceraria					Calabash fragments, 48g
M2	GM	Lagenaria siceraria	1	1			Calabash seed
M2	GM	Olea europaea subsp. cuspidata	2				African olive
M2	GM	Olinia species	1				Hard pear
M2	GM	Moringa oleifera	1				Horseradish tree
M2	GM	Pennisetum glaucum	2				Millet stalks, <1g
M2	GM	Sclerocarya birrea	1				Marula plug
M2	GM	Sorghum bicolor	235			16	Sorghum stalks, 23g
M2	GM	Sorghum bicolor	23	3	12	1	Sorghum seeds
M2	GM	Vangueria infausta	3		3		Wild medlar
M2	GM	Vigna unguiculata	4				Cowpea
M2	GM	Unidentified Type 1	2		1		
M2	GM	Unidentified Type 2	1				
M2	GM	Unidentified Type 3	1				
M2	GM	Unidentified Type 11	1				
M2	GM	Unidentified Type 37	3	1	1		
M2	GM	Unidentifiable	5				
M2	GA/RB	Acacia species	1				Acacia thorn, worked
M2	GA/RB	Aloe species	1				Aloe fragment, 2g
M2	GA/RB	Citrullus lanatus	139	68	63	3	Wild watermelon
M2	GA/RB	Combretum species	2				Bushwillow species
M2	GA/RB	Englerophytum magalismontanum	4		2		Transvaal milkplum
M2	GA/RB	cf. Ganoderma species	1		1		Fungus
M2	GA/RB	Lagenaria siceraria					Calabash fragments, <1g
M2	GA/RB	Lagenaria siceraria	5		5		Calabash seeds

M2	GA/RB	Mimusops zeyheri	2	1	1		Red milkwood
M2	GA/RB	Pennisetum glaucum	8				Millet stalks, 2g
M2	GA/RB	Protea species	4	1	1		Flowerheads; 2 drilled, 3 worked, 1 petal
M2	GA/RB	Sorghum bicolor	178			17	Sorghum stalks, 13g
M2	GA/RB	Sorghum bicolor	1				Sorghum seed
M2	GA/RB	Vangueria infausta	6			1	Wild medlar
M2	GA/RB	Vangueria type	1				
M2	GA/RB	Vigna subterranea	1				Bambara nut
M2	GA/RB	Vigna unguiculata	15		1		Cowpea
M2	GA/RB	Unidentified Type 1	2				
M2	GA/RB	Unidentified Type 4	2		1		
M2	GA/RB	Unidentified Type 7	5				
M2	GA/RB	Unidentified Type 8	1				
M2	GA/RB	Unidentified Type 16	1				
M2	GA/RB	Unidentified Type 22	2				Stalks
M2	GA/RB	Unidentified Type 32	6		6		Pods
M2	GA/RB	Unidentified Type 36	2				
M2	GA/RB	Unidentifiable	5				
M2	Floor	Aloe species	4				Aloe fragment, 4g
M2	Floor	Citrullus lanatus	95	42	46	2	Wild watermelon
M2	Floor	Combretum species	1				Bushwillow species
M2	Floor	Engelerophytum magalismontananum	6	1	3		
M2	Floor	Grewia monticola	3	2	1		Silver raisin **
M2	Floor	Lagenaria siceraria					Calabash fragments, 3g
M2	Floor	Lagenaria siceraria	6	3	3		Calabash seeds
M2	Floor	Lagenaria siceraria	1				Calabash stalk
M2	Floor	Mimusops zeyheri	5	1	3		Red milkwood
M2	Floor	Pennisetum glaucum	11				Millet stalks, <1g
M2	Floor	Protea species	2				Flowerhead, 1 worked
M2	Floor	Sclerocarya birrea	3		2		Marula nuts
M2	Floor	Sorghum bicolor	356			11	Sorghum stalks, 39g
M2	Floor	Sorghum bicolor	50	1	2		Sorghum seeds
M2	Floor	Vangueria infausta	1				Wild medlar
M2	Floor	Vigna unguiculata	3				Cowpea
M2	Floor	cf. Vigna unguiculata	1			1	
M2	Floor	Unidentified Type 6	2				
M2	Floor	Unidentified Type 7	2	2			
M2	Floor	Unidentified Type 14	1				
M2	Floor	Unidentified Type 32	5		5		Pods
M2	Floor	Unidentifiable					
M2	GA	Citrullus lanatus	18	7	10	3	Wild watermelon
M2	GA	cf. Citrullus lanatus	2	1	1	2	
M2	GA	Lagenaria siceraria	1		1		Calabash seed
M2	GA	Pennisetum glaucum	1				Millet stalks, <1g
M2	GA	Sorghum bicolor	28			4	Sorghum stalks, 1g
M2	GA	Vangueria infausta	5	2			Wild medlar
M2	GA	Ximenia caffra	1		1	1	Large sourplum**
M2	GA	Unidentified Type 6	1				
M2	GA	Unidentified Type 32	2		2		Pods
M2	RBL	Aloe species	13			1	Aloe fragments, 15g
M2	RBL	Bridelia micrantha	1	1			Velvet Sweetberry
M2	RBL	Citrullus lanatus	143	72	71	2	Wild watermelon
M2	RBL	Cucumis metuliferus	1				African horned cucumber
M2	RBL	Cucurbita maxima	3		1		Pumpkin
M2	RBL	Cussonia species	5	2	1		
M2	RBL	Elaeodendron	5	1	1		Bushveld saffron

		transvaalense					
M2	RBL	Englerophytum magalismontanum	11	2	8		Transvaal milkplum
M2	RBL	Euphorbia species	1				
M2	RBL	Ficus ingens	1				Red-leaved rock fig
M2	RBL	Ganoderma species	1		1		Fungus
M2	RBL	Grewia bicolor	1		1		White raisin
M2	RBL	Lagenaria siceraria					Calabash fragments, 59g
M2	RBL	Lagenaria siceraria	4	1	1		Calabash seeds
M2	RBL	Lannea discolor	1	1			Tree grape
M2	RBL	cf. Lannea discolor	1		1		
M2	RBL	Lannea sweinfurthii var. stuhlmannii	1				False marula
M2	RBL	Mimusops zeyheri	2	1	1		Red milkwood
M2	RBL	Momordica balsamina	2	2			Balsam pear
M2	RBL	Olea europaea subsp. cuspidata	5	1	1		African olive
M2	RBL	Olinia species	1				Hard pear
M2	RBL	Pappea capensis	2				Jacket Plum
M2	RBL	Pennisetum glaucum	6				Millet stalk, <1g
M2	RBL	Protea species	4		2		2 flowerheads; 1 drilled and worked, 1 drilled, 1 petal
M2	RBL	Sclerocarya birrea	2		1		Marula nuts
M2	RBL	Sclerocarya birrea	1				Marula plug
M2	RBL	Searsia lancea	2				Karee
M2	RBL	Sorghum bicolor	296			10	Sorghum stalks, 22g
M2	RBL	Sorghum bicolor	62	5	10		Sorghum seeds
M2	RBL	Vangueria infausta	13	6	2		Wild medlar
M2	RBL	cf. Vangueria infausta	1		1		Pod
M2	RBL	Vigna radiata	3				Mung bean
M2	RBL	Vigna unguiculata	1				Cowpea
M2	RBL	Unidentified Type 1	3	1	1		
M2	RBL	Unidentified Type 4	3				
M2	RBL	Unidentified Type 9	3		1		
M2	RBL	Unidentified Type 5	1	1			
M2	RBL	Unidentified Type 10	1	1		1	
M2	RBL	Unidentified Type 11	2				
M2	RBL	Unidentified Type 32	5	2	3		Pods
M2	RBL	Unidentified Type 36	3	1	1		
M2	RBL	Unidentified Type 37	10	7			
M2	RBL	Unidentifiable	25	1	1		
M2	RBL/GM	Acacia species	3				Acacia thorns, 2 worked
M2	RBL/GM	Aloe species	10				Aloe fragments, 7g
M2	RBL/GM	Citrullus lanatus	41	11	29		Wild watermelon
M2	RBL/GM	Cussonia species	8				
M2	RBL/GM	Elaeodendron transvaalense	4		3		Bushveld saffron
M2	RBL/GM	Englerophytum magalismontanum	3	1	1		Transvaal milkplum
M2	RBL/GM	Euphorbia species	5				
M2	RBL/GM	Ficus ingens	2	1			Red-leaved rock fig
M2	RBL/GM	Ganoderma species	1				Fungus
M2	RBL/GM	Lagenaria siceraria					Calabash fragments, 23g
M2	RBL/GM	Lagenaria siceraria	2		2		Calabash seeds
M2	RBL/GM	Lannea discolor	1		1		Tree grape
M2	RBL/GM	Momordica balsamina	1	1			Balsam pear
M2	RBL/GM	cf. Pappea capensis	1				
M2	RBL/GM	Pennisetum glaucum	1				Millet stalk, <1g

M2	RBL/GM	Protea species	1		1		Protea petal
M2	RBL/GM	Sclerocarya birrea	1		1		Marula nut
M2	RBL/GM	Searsia lancea	2				Karee
M2	RBL/GM	Sorghum bicolor	146			4	Sorghum stalks, 9g
M2	RBL/GM	Sorghum bicolor	19		8	2	Sorghum seeds
M2	RBL/GM	Vangueria infausta	2		1		Wild medlar
M2	RBL/GM	Vigna radiata	4				Mung bean
M2	RBL/GM	Vigna unguiculata	3		1		Cowpea
M2	RBL/GM	Unidentified Type 1	1				
M2	RBL/GM	Unidentified Type 7	1		1		
M2	RBL/GM	Unidentified Type 18	3				
M2	RBL/GM	Unidentified Type 26	2				
M2	RBL/GM	Unidentified Type 29	1		1		
M2	RBL/GM	Unidentified Type 32	1		1		Pod
M2	RBL/GM	Unidentified Type 37	1		1		
M2	RBL/GM	Unidentifiable	13				
M3	Surface	Aloe species	1				Aloe fragment, <1g
M3	Surface	Citrullus lanatus	1		1		Wild watermelon
M3	Surface	Dalechampia capensis	2				Wild hop
M3	Surface	Elaeodendron transvaalense	1		1		Bushveld saffron
M3	Surface	Lagenaria siceraria					Calabash fragments, 9g
M3	Surface	Pennisetum glaucum	1				Millet stalk, <1g
M3	Surface	Sorghum bicolor	22			2	Sorghum stalks, 1g
M3	Surface	Sorghum bicolor	16	1	5		Sorghum seeds
M3	Surface	Vangueria infausta	4	2	2		Wild medlar
M3	Surface	Vigna species	1		1		
M3	Surface	Vigna unguiculata	1	1			Cowpea
M3	Surface	Unidentified Type 37	5		5		
M3	Surface	Unidentifiable	5				
M3	GM	Citrullus lanatus	1	1			Wild watermelon
M3	GM	Lagenaria siceraria					Calabash fragments, 7g
M3	GM	Protea species	1	1			Flowerhead; drilled and worked
M3	GM	Sorghum bicolor	42				Sorghum stalks, 3g
M3	GM	Sorghum bicolor	263	32	22		Sorghum seeds
M3	GM	Zea mays	1				Maize kernel
M3	Floor	Citrullus lanatus	4	1	1		Wild watermelon
M3	Floor	Ganoderma species	1		1		Fungus
M3	Floor	Lagenaria siceraria					Calabash fragment, 6g
M3	Floor	Sorghum bicolor	13				Sorghum stalks,< 1g
M3	Floor	Sorghum bicolor	14	2	3		Sorghum seeds
M3	Floor	cf. Vangueria infausta	1		1		
M3	RBL	Acacia species	2				Acacia thorns, worked
M3	RBL	Aloe species	1				Aloe fragment, 14g
M3	RBL	Citrullus lanatus	60	22	35	1	Wild watermelon
M3	RBL	Englerophytum magalismontanum	5		5		Transvaal milkplum
M3	RBL	Lagenaria siceraria					Calabash fragments, <1g
M3	RBL	Lannea discolor	2				Tree grape
M3	RBL	Mimusops zeyheri	1		1		Red milkwood
M3	RBL	Olea europaea	3	1			Olive tree
M3	RBL	Olinia species	1				Hard pear
M3	RBL	Pennisetum glaucum	1				Millet stalk, <1g
M3	RBL	Protea species	1				Flowerhead, drilled

							and worked
M3	RBL	Sclerocarya birrea	1		1		Marula nut
M3	RBL	Sorghum bicolor	123				Sorghum stalk, 7g
M3	RBL	Sorghum bicolor	210	13	15	4	Sorghum seeds
M3	RBL	Vangueria infausta	8	3	3		Wild medlar
M3	RBL	Vangueria type	1				
M3	RBL	Vigna radiata	4				Mung bean
M3	RBL	Vigna unguiculata	3				Cowpea
M3	RBL	Unidentified Type 1	2		1		
M3	RBL	Unidentified Type 2	2		1		
M3	RBL	Unidentified Type 9	2		2		
M3	RBL	Unidentified Type 32	2		2		Pod
M3	RBL	Unidentifiable	13	2		7	
M3	GA	Citrullus lanatus	4	1	1	1	Wild watermelon
M3	GA	Pennisetum glaucum	3			2	Millet stalks, 1g
M3	GA	Protea species	1				Flowerhead; drilled
M3	GA	Sorghum bicolor	5			3	Sorghum stalks, <1g
M3	GA	Sorghum bicolor	2				Sorghum seeds
M3	Floor (RC)	Aloe species	2				Aloe fragments, 2g
M3	Floor (RC)	Citrullus lanatus	105	39	55		Wild watermelon
M3	Floor (RC)	Lagenaria siceraria	4	2	2		Calabash Seeds
M3	Floor (RC)	Lagenaria siceraria	1				Calabash stalk
M3	Floor (RC)	Mimusops zeyheri	1		1		Red milkwood
M3	Floor (RC)	Momordica balsamina	2	1			Balsam pear
M3	Floor (RC)	Pennisetum glaucum	2				Millet stalks, <1g
M3	Floor (RC)	Sorghum bicolor	93			10	Sorghum stalks, 3g
M3	Floor (RC)	Sorghum bicolor	8		1	1	Sorghum seeds
M3	Floor (RC)	Vangueria infausta	2				Wild medlar
M3	Floor (RC)	Vigna unguiculata	5				Cowpea
M3	Floor (RC)	cf. Vigna unguiculata	7				Discoloured
M3	Floor (RC)	Unidentified Type 1	1				
M3	Floor (RC)	Unidentified Type 3	2				
M3	Floor (RC)	Unidentified Type 4	1				
M3	Floor (RC)	Unidentified Type 23	1				
M3	Floor (RC)	Unidentified Type 32	4		4		Pod
M3	Floor (RC)	Unidentified Type 36	1				
M3	Floor (RC)	Unidentified Type 37	2		2		
M3	Floor (RC)	Unidentifiable	3				
M3	-	Lagenaria siceraria					Calabash fragments, 21g
M4	Surface	Aloe species	2				Aloe fragment, 4g
M4	Surface	Citrullus lanatus	2				Wild watermelon
M4	Surface	Cucurbita maxima	3	1	1		Pumpkin
M4	Surface	Elaeodendron transvaalense	1		1		Bushveld saffron
M4	Surface	Lagenaria siceraria					Calabash fragments, <1g
M4	Surface	Olea europaea subsp. cuspidata	2				African olive
M4	Surface	Pappea capensis	1				Jacket plum
M4	Surface	Protea species	1		1		Protea bud
M4	Surface	Sclerocarya birrea	1				Marula nut
M4	Surface	Sorghum bicolor	44			1	Sorghum stalks, 6g
M4	Surface	Sorghum bicolor	48	3	11		Sorghum seeds
M4	Surface	Vigna radiata	1				Mung bean
M4	Surface	Vigna unguiculata	3		1		Cowpea
M4	Surface	Unidentified Type 37	1		1		
M4	Surface	Unidentifiable	1				
M4	GA	Citrullus lanatus	1				Wild watermelon
M4	GA	Elaeodendron transvaalense	3		3		Bushveld saffron

M4	GA	Pappea capensis	1				Jacket plum
M4	GA	Sorghum bicolor	6				Sorghum stalks, <1g
M4	GA	Sorghum bicolor	22	3	1		Sorghum seeds
M4	GA	cf. Vigna unguiculata	1			1	
M4	GA	Unidentified Type 3	1		1		
M1/N1	Floor (BA)	Citrullus lanatus	42	18	14	1	Wild watermelon
M1/N1	Floor (BA)	Engelerophytum magalismontananum	8	1	5		
M1/N1	Floor (BA)	Lagenaria siceraria	2		2		Seed
M1/N1	Floor (BA)	Mimusops zeyheri	3	1	1		Red milkwood
M1/N1	Floor (BA)	Pennisetum glaucum	2				Millet stalks, <1g
M1/N1	Floor (BA)	Protea species	1	1			Flowerhead, heavily worked
M1/N1	Floor (BA)	Sorghum bicolor	59				Sorghum stalks, 10g
M1/N1	Floor (BA)	Sorghum bicolor	5				Sorghum seeds
M1/N1	Floor (BA)	Vigna unguiculata	6	1			Cowpea
M1/N1	Floor (BA)	Unidentified Type 7	1		1		
M1/N1	Floor (BA)	Unidentified Type 32	1	1			Pod
M1/N1	Pit	Aloe species	2				Aloe fragments, <1g
M1/N1	Pit	Citrullus lanatus	59	30	22		Wild watermelon
M1/N1	Pit	Combretum species	2	1			Bushwillow species
M1/N1	Pit	Elaeodendron transvaalense	2				Bushveld saffron
M1/N1	Pit	Engelerophytum magalismontananum	4		3		Transvaal milkplum
M1/N1	Pit	Ficus ingens	1				Red-leaved rock fig **
M1/N1	Pit	Lagenaria siceraria					Calabash fragments, 6g
M1/N1	Pit	Lagenaria siceraria	6	3	1		Calabash seeds
M1/N1	Pit	Lannea discolor	1	1			Tree grape
M1/N1	Pit	Mimusops zeyheri	2	1			Red milkwood, gnawed?
M1/N1	Pit	Pennisetum glaucum	6				Millet stalks, 4g
M1/N1	Pit	Sclerocarya birrea	1				Marula Nut
M1/N1	Pit	Sorghum bicolor	121				Sorghum stalks, 15g
M1/N1	Pit	Sorghum bicolor	54	2	15	2	Sorghum seeds
M1/N1	Pit	Vangueria infausta	4				Wild medlar
M1/N1	Pit	Vigna radiata	2				Mung bean
M1/N1	Pit	Vigna unguiculata	9				Cowpea
M1/N1	Pit	Unidentified Type 1	1				
M1/N1	Pit	Unidentified Type 5	1				
M1/N1	Pit	Unidentified Type 7	1	1			
M1/N1	Pit	Unidentified Type 31	4	1			
M1/N1	Pit	Unidentified Type 36	1	1			
M1/N1	Pit	Unidentifiable	1				
N1/M1	GM	Aloe species	2				Aloe fragments, 1g
N1/M1	GM	Citrullus lanatus	11	3	8		Wild watermelon
N1/M1	GM	Ganoderma species	1				Fungus
N1/M1	GM	Lagenaria siceraria					Calabash fragments, 4g
N1/M1	GM	Lannea sweinfurthii var. stuhlmannii	1				False marula
N1/M1	GM	Mimusops zeyheri	1		1		Red milkwood
N1/M1	GM	Sorghum bicolor	88				Sorghum stalks, 8g
N1/M1	GM	Sorghum bicolor	10		5		Sorghum seeds
N1/M1	GM	cf. Vangueria infausta	1		1		
N1/M1	GM	Vigna unguiculata	1				Cowpea
N1/M1	GM	Unidentified Type 1	1				
N1/M1	GM	Unidentified Type 32	2		2		Pod

N1/M1	GM	Unidentified Type 36	1				
N1	RBL/GM	Citrullus lanatus	17	6	5		Wild watermelon
N1	RBL/GM	Cussonia species	1				
N1	RBL/GM	Sorghum bicolor	85	7	9	4	Sorghum seeds
N1	RBL/GM	Vangueria infausta	5	1	4		Wild medlar
N1	RBL/GM	Vigna radiata	4				Mung bean
N1	RBL/GM	Vigna unguiculata	8		1		Cowpea
N1	RBL/GM	cf. Vigna unguiculata	1				Discoloured
N1	RBL/GM	Unidentified Type 37	1				
N1	RBL/GM	Unidentifiable	3				
N1	GM	Citrullus lanatus	4	2	2		Wild watermelon
N1	GM	Sorghum bicolor	24			3	Sorghum stalks, 2g
N1	GM	Unidentified Type 1	2				
N1	GM	Unidentifiable	1				
N1	RBL	Aloe species	5				Aloe fragment, 4g
N1	RBL	Citrullus lanatus	41	16	23		Wild watermelon
N1	RBL	Combretum species	1	1			Bushwillow species, kernel **
N1	RBL	Cucurbita maxima	1				Pumpkin
N1	RBL	cf. Diospyros species	1		1		Leaf **
N1	RBL	Engelerophytum magalismontananum	1		1		
N1	RBL	Euphorbia species	4		1		
N1	RBL	Fresodelsia obovata	1				Dwaba-berry **
N1	RBL	Grewia bicolor	1		1		White raisin
N1	RBL	Grewia flava	5	1	4		Brandybush**
N1	RBL	Lagenaria siceraria					Calabash fragments, 2g
N1	RBL	Lagenaria siceraria	2	1	1		Calabash seeds
N1	RBL	cf. Lannea discolor	1				
N1	RBL	Mimusops zeyheri	3		1		Red milkwood
N1	RBL	Olinia species	1		1		Hard pear
N1	RBL	Pennisetum glaucum	1				Millet stalk, <1g
N1	RBL	Sclerocarya birrea	1				Marula plug
N1	RBL	Sorghum bicolor	41				Sorghum stalk, 5g
N1	RBL	Sorghum bicolor	17	1	1		Sorghum seeds
N1	RBL	Vangueria infausta	13	4	8		Wild medlar
N1	RBL	Unidentified Type 4	1				
N1	RBL	Unidentified Type 36	6		5		
N1	RBL	Unidentified Type 37	6	4	1		
N1	RBL	Unidentifiable	6				
N1	Floor (BA)	Citrullus lanatus	15	8	6		Wild watermelon
N1	Floor (BA)	Cucurbita maxima	1				Pumpkin
N1	Floor (BA)	Englerophytum magalismontanum	1	1		1	Transvaal milkplum
N1	Floor (BA)	Lagenaria siceraria					Calabash fragments, 34g
N1	Floor (BA)	Lagenaria siceraria	1		1		Calabash seed
N1	Floor (BA)	cf. Mimusops zeyheri	2	1	1		
N1	Floor (BA)	Olea europaea subsp. cuspidata	1				African olive
N1	Floor (BA)	Pennisetum glaucum	2			1	Millet stalk, <1g
N1	Floor (BA)	Sorghum bicolor	15			2	Sorghum stalks, 3g
N1	Floor (BA)	Sorghum bicolor	7		1		Sorghum seeds
N1	Floor (BA)	Vigna subterranea	1		1		Bambara nut
N1	Floor (BA)	Vigna unguiculata	3		1		Cowpea
N1	Floor (BA)	Unidentified Type 8	2	1	1		
N1	Floor (BA)	Unidentified Type 32	2		2		Pods
N2	Surface	Aloe species	5				Aloe fragments, 4g
N2	Surface	Citrullus lanatus	16	9	6		Wild watermelon
N2	Surface	Elaeodendron transvaalense	1	1			Bushveld saffron

N2	Surface	Lagenaria siceraria					Calabash fragments, 24g
N2	Surface	Lagenaria siceraria	1				Calabash stalk
N2	Surface	Sorghum bicolor	24			5	Sorghum stalks, 2g
N2	Surface	Sorghum bicolor	4				Sorghum seeds
N2	Surface	Vangueria infausta	3	1	2		Wild medlar
N2	Surface	Vigna radiata	1				Mung bean
N2	Surface	Unidentified Type 1	1		1		
N2	Surface	Unidentified Type 5	1				
N2	Surface	Unidentified Type 37	1				
N2	Surface	Unidentifiable	9				
N2	Floor	Sorghum bicolor	5				Sorghum stalks, 7g
N2	RBL	Citrullus lanatus	6	3	1		Wild watermelon
N2	RBL	Sorghum bicolor	16			1	Sorghum stalk, 3g
N2	RBL	Sorghum bicolor	5				Sorghum seeds
N2	RBL	Vigna radiata	1				Mung bean
N2	RBL	Unidentified Type 37	1	1			
N2	RBL	Unidentifiable	3				
N2	GM	Citrullus lanatus	7	3	4		Wild watermelon
N2	GM	Elaeodendron transvaalense	1				Bushveld saffron
N2	GM	Ficus ingens	1	1			Red-leaved rock fig
N2	GM	Grewia monticola	5				Silver raisin**
N2	GM	Lagenaria siceraria					Calabash fragments, 13g
N2	GM	Lagenaria siceraria	1	1			Calabash seed
N2	GM	cf. Phoenix reclinata	1				
N2	GM	Sorghum bicolor	35				Sorghum stalks, 1g
N2	GM	Sorghum bicolor	8	2	1		Sorghum seeds
N2	GM	Vangueria infausta	1				Wild medlar
N2	GM	Vigna radiata	1				Mung bean
N2	GM	Zea mays	1				Maize cob
N2	GM	Ziziphus mucronata	2				Buffalo thorn
N2	GM	Unidentified Type 6	2	1			
N2	Pit	Citrullus lanatus	43	10	30		Wild Watermelon
N2	Pit	Elaeodendron transvaalense	12				Bushveld saffron
N2	Pit	Ganoderma species	2		2		Fungus *
N2	Pit	Lagenaria siceraria					Calabash fragments, 1g
N2	Pit	Protea species	1				Small bud
N2	Pit	Sorghum bicolor	26	1	5	3	Sorghum stalks, 3g
N2	Pit	Sorghum bicolor	19	1	5	1	Sorghum seeds
N2	Pit	Vigna unguiculata	1				Cowpea
N2	Pit	Ximenia species	1				Sourplum
N2	Pit	Unidentified Type 1	1				
N2	Pit	Unidentified Type 2	1				
N2	Pit	Unidentified Type 3	12				
N2	Pit	Unidentified Type 11	2				
N2	Pit	Unidentified Type 37	1				
N2	Pit	Unidentifiable	1				
N2/N3	RBL/Floor	Elaeodendron transvaalense	2		2		Bushveld saffron
N2/N3	RBL/Floor	Lagenaria siceraria					Calabash fragments, 2g
N2/N3	RBL/Floor	Unidentified Type 19	1		1		
N3	Surface	Elaeodendron transvaalense	1		1		Bushveld saffron
N3	Surface	Sclerocarya birrea	1		1		Marula nut
N3	Surface	Sorghum bicolor	1				Sorghum seed
N3	Surface	Vangueria infausta	4	1	3		Wild medlar
N3	Surface	Unidentified Type 37	3		3		

N3	Surface	Unidentifiable	6				
N3	GA	Sorghum bicolor	2			1	Sorghum stalks, <1g
N3	GA	Vangueria infausta	1		1		Wild medlar, fruit
N3	RBL	Citrullus lanatus	42	7	20		Wild watermelon
N3	RBL	Englerophytum magalismontanum	3		3		Transvaal milkplum
N3	RBL	Grewia occidentalis	2	2			Cross-berry
N3	RBL	Lannea discolor	3	2			Tree grape
N3	RBL	Mimusops zeyheri	1		1		Red milkwood
N3	RBL	Olea europaea	2	1	1		Olive tree
N3	RBL	Protea species	1		1		Flowerhead, worked
N3	RBL	Sclerocarya birrea	2				Marula nut
N3	RBL	Sclerocarya birrea	1		1		Marula nut (squashed)
N3	RBL	Sclerocarya birrea	1				Marula plug
N3	RBL	Sorghum bicolor	33			3	Sorghum stalks
N3	RBL	Sorghum bicolor	16		4		Sorghum seeds
N3	RBL	Vangueria infausta	10	7	2		Wild medlar
N3	RBL	Vigna unguiculata	6	1			Cowpea
N3	RBL	Unidentified Type 1	5		4		
N3	RBL	Unidentified Type 3	1		1		
N3	RBL	Unidentified Type 32	1				
N3	RBL	Unidentifiable	6				
N3	/	Lagenaria siceraria					Calabash fragments, 32g
N4	Surface	Elaeodendron transvaalense	1		1		Bushveld saffron
N4	Surface	Sorghum bicolor	5			1	Sorghum stalks, 1g
N4	Surface	Vangueria infausta	1		1		Wild medlar
N4	Surface	Unidentified Type 1	1		1		
N4	Surface	Unidentifiable	1				
N4	GA	Aloe species	2				Aloe fragments, 6g
N4	GA	Sorghum bicolor	2				Sorghum stalks, <1g
N3/O3	Floor	Citrullus lanatus	4	4			Wild Watermelon
N3/O3	Floor	Elaeodendron transvaalense	15				Bushveld saffron
N3/O3	Floor	Lagenaria siceraria					Calabash fragments, <1g
N2/O2	Floor	Lagenaria siceraria	2		2		Calabash seeds
N2/O2	Floor	Mimusops zeyheri	1		1		Red milkwood
N2/O2	Floor	Sorghum bicolor	18			2	Sorghum stalks, <1g
N2/O2	Floor	Sorghum bicolor	9				Sorghum seeds
O1	Surface	Aloe species	12				Aloe fragments, 19g
O1	Surface	Citrullus lanatus	17	11	1		Wild watermelon
O1	Surface	Elaeodendron transvaalense	2	1			Bushveld saffron
O1	Surface	Friesodielsia obovata	2	2			Dwaba-berry, kernel **
O1	Surface	Grewia species	2		2		
O1	Surface	Lagenaria siceraria					Calabash fragments, 58g
O1	Surface	Lagenaria siceraria	1				Calabash seed
O1	Surface	Mimusops zeyheri	1	1			Red milkwood
O1	Surface	Protea species	2		2		'Petal' fragments
O1	Surface	Sorghum bicolor	16		4		Sorghum stalks, 4g
O1	Surface	Sorghum bicolor	17		1		Sorghum seeds
O1	Surface	Vangueria infausta	1	1			Wild medlar
O1	Surface	Vigna unguiculata	1				Cowpea
O1	Surface	Zizyphus mucronata	1				

O1	Surface	Unidentified Type 37	2	2			
O1	GM	Aloe species	48				Aloe fragments, 49g
O1	GM	cf. Aloe species	1				
O1	GM	Bridelia micrantha	3				Velvet Sweetberry
O1	GM	Citrullus lanatus	59	32	13		Wild watermelon
O1	GM	Commiphora schimperi	1				Velvet-leaved corkwood
O1	GM	Cussonia species	7	1			
O1	GM	Elaeodendron transvaalense	22	1			Bushveld saffron
O1	GM	cf. Englerophytum magalismontanum	1		1		
O1	GM	Euphorbia species	1				
O1	GM	Lablab purpureus	1				Hyacinth bean
O1	GM	Lagenaria siceraria					Calabash fragments, 83g
O1	GM	Lagenaria siceraria	5	2	1		Calabash seeds
O1	GM	cf. Lagenaria siceraria	1		1		Seed
O1	GM	Olea europaea subsp. cuspidata	4				African olive
O1	GM	Protea species	1				Flowerhead
O1	GM	Searsia lancea	2				Karee
O1	GM	Sorghum bicolor	90			9	Sorghum stalks, 20g
O1	GM	Sorghum bicolor	122	7	31	1	Sorghum seeds
O1	GM	Vigna radiata	1				Mung bean
O1	GM	Vigna unguiculata	10				Cowpea
O1	GM	Unidentified Type 1	6	1	1		
O1	GM	Unidentified Type 2	2				
O1	GM	Unidentified Type 3	1				
O1	GM	Unidentified Type 7	1		1		
O1	GM	Unidentified Type 14	2				
O1	GM	Unidentified Type 22	1				Stalk
O1	GM	Unidentified Type 37	1		1		
O1	GM	Unidentifiable	7				
O1	RBL/GM	Aloe species	3				Aloe fragments, 8g
O1	RBL/GM	Citrullus lanatus	10	7	2		Wild watermelon
O1	RBL/GM	Elaeodendron transvaalense	2				Bushveld saffron
O1	RBL/GM	Englerophytum magalismontanum	2		2		Transvaal milkplum
O1	RBL/GM	Lagenaria siceraria					Calabash fragments, 34g
O1	RBL/GM	Sorghum bicolor	8				Sorghum stalks, <1g
O1	RBL/GM	Sorghum bicolor	1				Sorghum seed
O1	RBL/GM	Vangueria infausta	1	1			Wild medlar
O1	RBL/GM	Unidentified Type 1	2		1		
O1	RBL/GM	Unidentifiable	1				
O2	Surface	Aloe species	2				Aloe fragments, 6g
O2	Surface	Citrullus lanatus	6	1	4	1	Wild watermelon
O2	Surface	Ganoderma species	2		1		Fungus
O2	Surface	Lagenaria siceraria					Calabash fragments, 2g
O2	Surface	Lagenaria siceraria	1				Calabash seed
O2	Surface	Protea species	1		1		Flowerhead; worked
O2	Surface	Sclerocarya birrea	1				Marula nut
O2	Surface	Sorghum bicolor	17			3	Sorghum stalk, 6g
O2	Surface	Vigna unguiculata	1				Cowpea
O2	GM	Acacia species	1				Acacia thorn
O2	GM	Aloe species	39				Aloe fragments, 52g
O2	GM	Citrullus lanatus	37	15	15		Wild watermelon
O2	GM	Cucurbita maxima	2				Pumpkin

O2	GM	Elaeodendron transvaalense	45		3		Bushveld saffron
O2	GM	Englerophytum magalismontanum	1		1		Transvaal milkplum
O2	GM	Ficus ingens	2	2			Red-leaved rock fig
O2	GM	Ganoderma species	1				Fungus *
O2	GM	Lagenaria siceraria					Calabash fragments, 70g
O2	GM	Lagenaria siceraria	1				Calabash seed
O2	GM	Mimusops zeyheri	2		2		Red milkwood
O2	GM	Olea cf. capensis	39	1			Black ironwood
O2	GM	Olea europaea subsp. cuspidata	2				African olive
O2	GM	cf. Phoenix reclinata	2				
O2	GM	Podocarpus falcatus	24				Outeniqua yellowwood
O2	GM	Protea species	1				Flowerhead, worked
O2	GM	Schmidtia pappophoroides	1				African finger millet, stalk
O2	GM	Sclerocarya birrea	1				Marula nut
O2	GM	Sorghum bicolor	84			1	Sorghum stalks, 28g
O2	GM	Sorghum bicolor	60	3	16		Sorghum seeds
O2	GM	Vangueria infausta	2	1			Wild medlar
O2	GM	Ximenia species	1				Sourplum
O2	GM	Ziziphus mucronata	3				Buffalo thorn
O2	GM	Unidentified Type 1	6		3		
O2	GM	Unidentified Type 2	1		1		
O2	GM	Unidentified Type 14	1				
O2	GM	Unidentified Type 22	1				
O2	GM	Unidentified Type 37	1	1			
O2	GM	Unidentifiable	3				
O2	GM (base)	Sorghum bicolor	19				Sorghum stalks, 4g
O2	GM (base)	Sorghum bicolor	15	1	1		Sorghum seeds
O3	Surface	Aloe species	2				Aloe fragments, 2g
O3	Surface	Citrullus lanatus	5	3	2		Wild watermelon
O3	Surface	Elaeodendron transvaalense	1		1		Bushveld saffron
O3	Surface	Lagenaria siceraria					Calabash, 40g
O3	Surface	Lagenaria siceraria	1	1			Calabash stalk
O3	Surface	Sorghum bicolor	5				Sorghum stalks, 1g
O3	Surface	Vangueria infausta	1		1		Wild medlar
O3	Surface	Unidentified Type 32	1		1		Pod
O3	Surface	Unidentified Type 37	2		1		
O3	Floor	Citrullus lanatus	5	1	3		Wild watermelon
O3	Floor	Englerophytum magalismontanum	2		2		Transvaal milkplum
O3	Floor	Lagenaria siceraria					Calabash fragments, 19g
O3	Floor	Pennisetum glaucum	6				Millet stalks, 1g
O3	Floor	cf. Phaseoulous vulgaris	1				
O3	Floor	Protea species	2		1		Flowerheads, worked and drilled
O3	Floor	Sorghum bicolor	73			5	Sorghum stalks, 18g
O3	Floor	Sorghum bicolor	20	2	1		Sorghum seeds
O3	Floor	Vangueria cf. infausta	1	1			Cracked
O3	Floor	Vigna unguiculata	1				Cowpea
O3	GM	Aloe species	1				Aloe fragment, <1g
O3	GM	Citrullus lanatus	7	3	2		Wild watermelon
O3	GM	Elaeodendron transvaalense	17		1		Bushveld saffron
O3	GM	Ficus ingens	1				Red-leaved rock fig
O3	GM	Lagenaria siceraria					Calabash, fragments

							59g
O3	GM	Sorghum bicolor	59				Sorghum stalks, 10g
O3	GM	Sorghum bicolor	5	1			Sorghum seeds
O3	GM	Ziziphus mucronata	1				Buffalo thorn
O3	GM	Unidentified Type 1	1				
O3	GM	Unidentified Type 4	1				
O3	RB	Citrullus lanatus	1	1			Wild watermelon
O3	RB	Engelerophyum magalimontanaum	2	1			Stamvrug
O3	RB	Lagenaria siceraria	1		1		Calabash seed
O3	RB	Protea species	1		1		Flowerhead; face removed
O3	RB	Sorghum bicolor	5				Sorghum stalks, <1g
O4	Surface	Sorghum bicolor	12				Sorghum stalks, 2g
O4	Surface	Sorghum bicolor	1				Sorghum seed
O4	Surface	Unidentifiable	1				
O4	GM	Aloe species	3				Aloe fragments, 2g
O4	GM	Citrullus lanatus	1				Wild watermelon
O4	GM	Commiphora species	1				Corkwood species
O4	GM	Elaeodendron transvaalense	1				Bushveld saffron
O4	GM	Lagenaria siceraria					Calabash fragments, 2g
O4	GM	Sorghum bicolor	2				Sorghum stalks, 1g
O4	GM	Sorghum bicolor	2	1			Sorghum seed
P1	Surface	Citrullus lanatus	3				Wild watermelon
P1	Surface	Cucurbita maxima	1				Pumpkin
P1	Surface	Elaeodendron transvaalense	1				Bushveld saffron
P1	Surface	Sorghum bicolor	3	1			Sorghum seeds
P1	Surface	Vigna unguiculata	7				Cowpea
P1	Surface	Unidentified Type 10	1				
P1	Surface	Unidentifiable	2				
P1	Floor (BA)	Aloe species	1				Aloe fragment, <1g
P1	Floor (BA)	Citrullus lanatus	106	42	62		Wild watermelon
P1	Floor (BA)	Commiphora species	1				Corkwood species
P1	Floor (BA)	Cucumis metuliferus	1				African horned cucumber
P1	Floor (BA)	Cussonia species	5				
P1	Floor (BA)	Elaeodendron transvaalense	1				Bushveld saffron
P1	Floor (BA)	Englerophytum magalismontanum	1		1		Transvaal Milkplum
P1	Floor (BA)	Ficus ingens	1		1		Red-leaved rock fig
P1	Floor (BA)	Lagenaria siceraria					Calabash fragments, 8g
P1	Floor (BA)	Lagenaria siceraria	1	1			Calabash seed
P1	Floor (BA)	cf. Phaseoulous vulgaris	1				
P1	Floor (BA)	Searsia lancea	1				Karee
P1	Floor (BA)	Sorghum bicolor	27				Sorghum stalks, 2g
P1	Floor (BA)	Sorghum bicolor	9	1	2	1	Sorghum seeds
P1	Floor (BA)	Vigna unguiculata	3		2		Cowpea
P1	Floor (BA)	Ximenia species	2		1		Sourplum
P1	Floor (BA)	Unidentified Type 1	4	1	2		
P1	Floor (BA)	Unidentified Type 27	1				
P1	Floor (BA)	Unidentified Type 37	3		2		
P1	Floor (BA)	Unidentifiable	8				
P1	Floor (CF)	Acacia species	2				Acacia thorns
P1	Floor (CF)	Aloe species	2				Aloe fragments, 1g
P1	Floor (CF)	Citrullus lanatus	6		5		Wild watermelon
P1	Floor (CF)	Lagenaria siceraria					Calabash fragments,

							9g
P1	Floor (CF)	Lagenaria siceraria	9	2	7		Calabash seeds
P1	Floor (CF)	Olea europaea subsp. cuspidata	1				African olive
P1	Floor (CF)	Sclerocarya birrea	1		1		Marula nut
P1	Floor (CF)	Sorghum bicolor	5				Sorghum stalks, <1g
P1	Floor (CF)	Sorghum bicolor	5	1			Sorghum seeds
P1	Floor (CF)	Vangueria infausta	1				Wild medlar
P1	Floor (CF)	Unidentified Type 3	3				
P1	Floor (CF)	Unidentifiable	9				
P2	Surface	Citrullus lanatus	4		1		Wild watermelon
P2	Surface	Diospyros lycoides	1				Monkey plum leaf**
P2	Surface	Elaeodendron transvaalense	1				Bushveld saffron
P2	Surface	Lagenaria siceraria					Calabash fragment, <1g
P2	Surface	Mimusops zeyheri	1				Red milkwood, fruit coat **
P2	Surface	cf. Phoenix reclinata	1				
P2	Surface	Protea species	2		1		Protea flowerheads: 2 drilled, 1 worked
P2	Surface	Sorghum bicolor	22				Sorghum stalks, 4g
P2	Surface	Sorghum bicolor	2				Sorghum seeds
P2	Surface	Vigna unguiculata	9	1			Cowpea
P2	Surface	Zizyphus mucronata	2	1			
P2	Surface	Unidentified Type 1	1				
P2	Surface	Unidentified Type 6	1				
P2	GM	Aloe species	12				Aloe fragments, 14g
P2	GM	Citrullus lanatus	21	5	7		Wild Watermelon
P2	GM	Elaeodendron transvaalense	7		1		Bushveld saffron
P2	GM	Lagenaria siceraria					Calabash fragments, 32g
P2	GM	Mimusops zeyheri	1				Red milkwood
P2	GM	Protea species	4				Flowerheads; 3 drilled and worked
P2	GM	Solanum species	1		1	1	Nightshade species
P2	GM	Sorghum bicolor	25	1	2		Sorghum seeds
P2	GM	Sorghum bicolor	132			18	Sorghum stalks, 14g
P2	GM	Vigna unguiculata	1				Cowpea
P2	GM	Unidentified Type 3	1				
P2	GM	Unidentified Type 20	1		1		
P2	Pit	cf. Ganoderma species	1		1		Fungus
P2	Pit	Sorghum bicolor	2				Sorghum stalks, <1g
P2	Pit	Unidentified Type 32	1		1		Pod
P3	Surface	Aloe species	23				Aloe fragments, 30g
P3	Surface	Citrullus lanatus	23	7	14	1	Wild watermelon
P3	Surface	Cucurbita maxima	1				Pumpkin
P3	Surface	Cussonia species	1				
P3	Surface	Elaeodendron transvaalense	13				Bushveld saffron
P3	Surface	Ficus ingens	1				Red-leaved rock fig
P3	Surface	Kirkia cf. acuminata	1		1		
P3	Surface	Lagenaria siceraria					Calabash fragments, 40g
P3	Surface	Lagenaria siceraria	1				Calabash stalk
P3	Surface	Lannea discolor	1	1			Tree grape
P3	Surface	Pennisetum glaucum	1				Millet stalk, <1g
P3	Surface	cf. Protea species	1	1			Heavily worked

P3	Surface	Sorghum bicolor	218			27	Sorghum stalks, 22g
P3	Surface	Sorghum bicolor	76	8	3		Sorghum seeds
P3	Surface	Vangueria infausta	1				Wild medlar
P3	Surface	Unidentified Type 37	1				
P3	Surface	Unidentifiable	1				
P3	GM	Citrullus lanatus	1	1			Wild watermelon
P3	GM	Pennisetum glaucum	2				Millet stalk, 1g
P3	GM	Sclerocarya birrea	1	1			Marula nut
P3	GM	Solanum species	1				Nightshade species **
P3	GM	Sorghum bicolor	73				Sorghum stalks, 18g
P3	GM	Sorghum bicolor	2				Sorghum seeds
P3	GM	Vigna unguiculata	3				Cowpea
P3	GM	Unidentified Type 32	1	1			Pod
P4	Surface	Citrullus lanatus	2	1	1		Wild watermelon
P4	Surface	Lannea discolor	6	5	1		Tree grape, may have been drilled
P4	Surface	Sorghum bicolor	4				Sorghum stalks, 1g
P4	GM	Elaeodendron transvaalense	6	1			Bushveld saffron
P4	GM	Olea europaea subsp. cuspidata	1				African olive
P4	GM	Sorghum bicolor	23			5	Sorghum stalks, 3g
Q1	Surface	Citrullus lanatus	13	6	5		Wild watermelon
Q1	Surface	Commiphora schimperi	1				Velvet-leaved corkwood
Q1	Surface	Cussonia species	2		2		
Q1	Surface	Elaeodendron transvaalense	15		15		Bushveld saffron
Q1	Surface	Lagenaria siceraria					Calabash fragments, 17g
Q1	Surface	Lannea discolor	2		2		Tree grape
Q1	Surface	Protea species	3				Flowerheads; 2 worked, 2 drilled
Q1	Surface	Sorghum bicolor	22			4	Sorghum stalks, 3g
Q1	Surface	Vigna unguiculata	2				Cowpea
Q1	Surface	Unidentified Type 1	12		12		
Q1	Surface	Unidentified Type 3	1				
Q1	Surface	Unidentified Type 21	1		1		
Q1	Surface	Unidentifiable	2				
Q1	SS	Citrullus lanatus	174	58	112		Wild watermelon
Q1	SS	Cussonia species	3				
Q1	SS	Elaeodendron transvaalense	12		12		Bushveld saffron
Q1	SS	Lagenaria siceraria					Calabash fragments, 19g
Q1	SS	Lannea discolour	3	1	2		Tree grape
Q1	SS	Mimusops zeyheri	1		1		Red milkwood
Q1	SS	cf. Mimusops zeyheri	1		1		
Q1	SS	Olea europaea	1		1		Olive tree
Q1	SS	Pappea capensis	2		2		Jacket plum
Q1	SS	Pennisetum glaucum	2				Millet stalks, <1g
Q1	SS	Sclerocarya birrea	1				Marula nut
Q1	SS	Sorghum bicolor	55			3	Sorghum stalks, 3g
Q1	SS	Sorghum bicolor	15	1	2		Sorghum seeds
Q1	SS	Vangueria infausta	1				Wild medlar
Q1	SS	Vangueria infausta	1				Wild medlar , fruit
Q1	SS	Vigna unguiculata	1		1		Cowpea
Q1	SS	Unidentified Type 1	5		5		
Q1	SS	Unidentified Type 2	3		2		
Q1	SS	Unidentified Type 3	5				

Q1	SS	Unidentified Type 8	1		1		
Q1	SS	Unidentified Type 16	1				
Q1	SS	Unidentified Type 17	1				
Q1	SS	Unidentified Type 22	2				
Q1	SS	Unidentified Type 24	1				
Q1	SS	Unidentified Type 37	8	1	3		
Q1	SS	Unidentifiable	16		2		
Q1	Floor (MUG)	Acacia species	3				Acacia thorn, 1 worked
Q1	Floor (MUG)	Chrysophyllum viridifolium	1	1			Fluted Milkwood
Q1	Floor (MUG)	Citrullus lanatus	79	31	48		Wild watermelon
Q1	Floor (MUG)	Cussonia species	1	1			
Q1	Floor (MUG)	Elaeodendron transvaalense	3		3		Bushveld saffron
Q1	Floor (MUG)	Lagenaria siceraria					Calabash fragments, 7g
Q1	Floor (MUG)	Lannea discolor	2	2			Tree grape
Q1	Floor (MUG)	Protea species	1				Flowerhead
Q1	Floor (MUG)	Sorghum bicolor	8				Sorghum stalks, <1g
Q1	Floor (MUG)	Vangueria infausta	4		1		Wild medlar, 2 are conjoined
Q1	Floor (MUG)	cf. Vangueria infausta	1		1	1	
Q1	Floor (MUG)	Vigna unguiculata	1		1		Cowpea
Q1	Floor (MUG)	Unidentified Type 1	2		2		
Q1	Floor (MUG)	Unidentified Type 3	3				
Q1	Floor (MUG)	Unidentified Type 8	2		1		
Q1	Floor (MUG)	Unidentified Type 36	1		1		
Q1	Floor (MUG)	Unidentified Type 37	3		3		
Q1	Floor (MUG)	Unidentifiable	8				
Q1	Floor (CF)	Acacia species	2				Acacia thorns
Q1	Floor (CF)	Chrysophyllum viridifolium	1	1			Fluted Milkwood
Q1	Floor (CF)	Citrullus lanatus	239	44	184	3	Wild watermelon
Q1	Floor (CF)	Cussonia species	4	2			
Q1	Floor (CF)	Elaeodendron transvaalense	2	1			Bushveld saffron, 1 gnawed
Q1	Floor (CF)	Englerophytum magalismontanum	1		1		Transvaal milkplum
Q1	Floor (CF)	Euphorbia species	1				
Q1	Floor (CF)	Lagenaria siceraria					Calabash fragments, 6g
Q1	Floor (CF)	Lagenaria siceraria	4	1	3		Calabash seeds
Q1	Floor (CF)	Sorghum bicolor	5				Sorghum stalks, <1g
Q1	Floor (CF)	Vangueria infausta	1				Wild medlar
Q1	Floor (CF)	Vangueria type	3				
Q1	Floor (CF)	Vigna unguiculata	5		4		Cowpea

Q1	Floor (CF)	Unidentified Type 26	1				
Q1	Floor (CF)	Unidentified Type 30	1				
Q1	Floor (CF)	Unidentified Type 37	1		1		
Q1	Floor (CF)	Unidentifiable	8				
Q2	Surface	Acacia species	1				Acacia thorn, worked
Q2	Surface	Citrullus lanatus	113	38	72	4	Wild watermelon
Q2	Surface	Cussonia species	2				
Q2	Surface	Lagenaria siceraria					Calabash fragments, 5g
Q2	Surface	Pennisetum glaucum	1				Millet stalk, <1g
Q2	Surface	Protea species	1	1			Flowerhead; drilled and worked
Q2	Surface	Searsia lancea	1				Karee
Q2	Surface	Sorghum bicolor	18			1	Sorghum stalks, 1g
Q2	Surface	Sorghum bicolor	3		1		Sorghum seeds
Q2	Surface	Vangueria infausta	1		1		Wild medlar
Q2	Surface	Vigna unguiculata	2		2		Cowpea
Q2	Surface	Ziziphus mucronata	1				Buffalo thorn
Q2	Surface	Unidentified Type 3	1				
Q2	Surface	Unidentified Type 37	2		1		
Q2	Floor (CF)	RUBIACEA	1		1		Coffee family
Q2	Floor (CF)	Citrullus lanatus	136	47	85		Wild watermelon
Q2	Floor (CF)	Grewia occidentalis	1				Cross-berry
Q2	Floor (CF)	Lagenaria siceraria					Calabash fragments, 2g
Q2	Floor (CF)	Lagenaria siceraria	7		7		Calabash seeds
Q2	Floor (CF)	Lannea discolor	2	2			Tree grape
Q2	Floor (CF)	Sorghum bicolor	2				Sorghum stalks, <1g
Q2	Floor (CF)	Sorghum bicolor	7				Sorghum seeds
Q2	Floor (CF)	Vangueria infausta	2		1		Wild medlar
Q2	Floor (CF)	Unidentifiable	5				
Q2	Floor (BS)	Aloe species	2				Aloe fragment, 4g
Q2	Floor (BS)	Citrullus lanatus	37	18	17		Wild watermelon
Q2	Floor (BS)	Cucurbita maxima	1				Pumpkin
Q2	Floor (BS)	Elaeodendron transvaalense	1		1		Bushveld saffron
Q2	Floor (BS)	Ganoderma species	1		1		Fungus
Q2	Floor (BS)	Lagenaria siceraria					Calabash fragment, <1g
Q2	Floor (BS)	Lagenaria siceraria	1		1		Calabash seed
Q2	Floor (BS)	Pennisetum glaucum	2				Millet stalks, <1g
Q2	Floor (BS)	Protea species	3		1		Flowerheads; 2 drilled, 2 worked
Q2	Floor (BS)	Sclerocarya birrea	1				Marula Nut
Q2	Floor (BS)	Sorghum bicolor	41			4	Sorghum stalks, 5g
Q2	Floor (FHF)	Citrullus lanatus	338	117	220		Wild watermelon
Q2	Floor (FHF)	Combretum species	1				Bushwillow species
Q2	Floor (FHF)	Cussonia species	1				
Q2	Floor (FHF)	Elaeodendron transvaalense	1				Bushveld saffron
Q2	Floor (FHF)	Lagenaria siceraria					Calabash fragments, 33g
Q2	Floor (FHF)	Lagenaria siceraria	4		4		Calabash seed
Q2	Floor (FHF)	Pennisetum glaucum	1				Millet stalk, <1g
Q2	Floor (FHF)	Sclerocarya birrea	2				Marula nut
Q2	Floor (FHF)	Sorghum bicolor	5				Sorghum stalks, <1g
Q2	Floor (FHF)	Sorghum bicolor	34	1	2	2	Sorghum seeds
Q2	Floor (FHF)	Vangueria infausta	2				Wild medlar

Q2	Floor (FHF)	Vigna unguiculata	2		1		Cowpea
Q2	Floor (FHF)	Unidentified Type 4	1				
Q2	Floor (FHF)	Unidentifiable	9				
Q2-4	Surface	Aloe species	1				Aloe fragments, 8g
Q2-4	Surface	Citrullus lanatus	3	1	2		Wild Watermelon
Q2-4	Surface	Lagenaria siceraria					Calabash fragments, 2g
Q2-4	Surface	Sorghum bicolor	4				Sorghum stalks, <1g
Q3	Surface	Sorghum bicolor	3				Sorghum stalk, <1g

Table B.2: Species Counts and Locations from Dg2, Historic Cave

Loc.	Level	Species (Scientific)	Count				Comments
			Tot.	F	Br	Bu	
-	Surface	Aloe species	5				Aloe fragments, 27g
-	Surface	Citrullus lanatus	2				Wild Watermelon
-	Surface	Englerophytum magalismontanum	1		1		Transvaal Milkplum
-	Surface	Lagenaria siceraria					Calabash fragments, 83g
-	Surface	Pennisetum glaucum	12				Millet stalks, 1g
-	Surface	Protea species	2				Flowerhead; 1 drilled
-	Surface	Sclerocarya birrea	4	1	1		Marula nuts
-	Surface	Sorghum bicolor	124			1	Sorghum stalks, 33g
T9	SS	Acacia species	1				Acacia thorn, worked
T9	SS	Lagenaria siceraria					Calabash fragments, 6g
T9	SS	Pennisetum glaucum	1				Millet stalk, <1g
T9	SS	Sorghum bicolor	14				Sorghum stalks, 3g
T9	GL	Aloe species	1				Aloe fragment, 2g
T9	GL	Citrullus lanatus	2				Wild watermelon
T9	GL	Cucurbita maxima	8				Pumpkin
T9	GL	Lagenaria siceraria	1				Calabash seed
T9	GL	Pennisetum glaucum	1				Millet stalk, <1g
T9	GL	Sclerocarya birrea	1		1		Marula nut
T9	GL	Sorghum bicolor	3				Sorghum stalks, 2g
U9	SS	Aloe species	2				Aloe fragments, 6g
U9	SS	Citrullus lanatus	16				Wild watermelon
U9	SS	Cucurbita maxima	2				Pumpkin
U9	SS	Lagenaria siceraria	2				Calabash seeds
U9	SS	Sorghum bicolor	5				Sorghum stalks, 2g
U9	SS	Sorghum bicolor	159	24	8		Sorghum seeds
U9	SS	Vangueria infausta	1				Wild medlar
U9	SS	Vigna radiata	1				Mung bean
U9	SS	Vigna unguiculata	1				Cowpea
U9	SS	Unidentified Type 12	1				
U9	CRL	Zea mays	1				Maize kernel
U9	CRB	CUCURBITACEAE	1	1			Cucumber family
U9	CRB	Citrullus lanatus	6			1	Wild watermelon
U9	CRB	Lagenaria siceraria					Calabash fragments, 12g
U9	CRB	Protea species	4		2		Flowerheads; 2 worked, 2 drilled
U9	CRB	Sorghum bicolor	1				Sorghum stalk, 3g
U9	CRB	Sorghum bicolor	79	2			Sorghum seeds
U9	CRB	Vangueria infausta	2	1	1		Wild medlar
U10	SS	Aloe species	5				Aloe fragments, 22g
U10	SS	Cucurbita maxima	5	1			Pumpkin

U10	SS	Pennisetum glaucum	1				Millet stalk, <1g
U10	SS	Protea species	2				Flowerheads; 2 drilled, 1 worked
U10	SS	Sorghum bicolor	24			1	Sorghum stalks, 3g
U10	GL	Aloe species	1				Aloe fragment, 1g
U10	GL	Citrullus lanatus	2				Wild watermelon
U10	GL	Cucurbita maxima	2	1			Pumpkin
U10	GL	Lagenaria siceraria					Calabash fragments, 2g
U10	GL	Pennisetum glaucum	2				Millet stalks, 3g
U10	GL	Protea species	1				Flowerhead; worked
U10	GL	Sorghum bicolor	4				Sorghum stalks, 2g
U10	GL	Sorghum bicolor	93		4		Sorghum seed
U10	CRL	Aloe species	1				Aloe fragment, 11g
V9	SS	Cassia abbreviata subsp. beareana	1	1			Long-tailed cassia, pod
V9	SS	Sorghum bicolor	12			1	Sorghum stalks, 5g
V10	SS	Lagenaria siceraria					Fragments, 11g
V10	SS	Protea species	1				Flowerhead; drilled and worked
V10	SS	Sorghum bicolor	37	2	1		Sorghum seeds
V10	SS	Vigna unguiculata	1	1			Cowpea
V10	SS	Unidentified Type 12	14				

Table B.3: Species Counts and Locations from Dg3, Historic Cave

Loc.	Level	Species (Scientific)	Count				Comments
			Tot.	F	Br	Bu	
-	Surface	Aloe species	1				Aloe fragment, 2g
-	Surface	Lagenaria siceraria					Calabash fragments, 60g
-	Surface	Sorghum bicolor	3				Sorghum stalks, 2g
P13	SS	Lagenaria siceraria					Calabash fragments, 13g
Q13	SS	Aloe species	1				Aloe fragment, <1g

Table B.4: Species Counts and Locations from Dg4, Historic Cave

Loc.	Level	Species (Scientific)	Count				Comments
			Tot.	F	Br	Bu	
-	Surface	Protea species	1	1			Flowerhead; drilled
-	Surface	Lagenaria siceraria					Calabash fragments, 31g
-	Surface	Sorghum bicolor	3				Sorghum stalk, <1g
P21	SS	Citrullus lanatus	1				Wild watermelon
P21	SS	Cucurbita maxima	3	1			Pumpkin
P21	SS	Lagenaria siceraria					Calabash fragments, 61g
P21	SS	Sorghum bicolor	2				Sorghum stalk, <1g
P21	SS	Sorghum bicolor	70	3	3		Sorghum seeds
P21	SS	Vigna radiata	4				Mung bean
P21	SS	Vigna unguiculata	11				Cowpea
P21	GL	Citrullus lanatus	4				Wild watermelon
P21	GL	Lagenaria siceraria					Calabash fragments, 9g
P21	GL	Sorghum bicolor	2				Sorghum stalk, <1g
P21	GL	Sorghum bicolor	102	5	36		Sorghum seeds
P21	GL	Vigna radiata	1				Mung bean
P21	GL	Vigna unguiculata	4				Cowpea

P21	GL	cf. Vigna unguiculata	2				
P22	SS	Cucurbita maxima	1				Pumpkin
P22	SS	Lagenaria siceraria					Calabash fragments, 61g
P22	SS	Protea species	3		1		Flowerhead; 1 worked, 2 drilled
P22	SS	Sorghum bicolor	2				Sorghum stalk,<1g
P22	SS	Sorghum bicolor	70	7	9		Sorghum seeds
P22	SS	Vigna unguiculata	11		1		Cowpea
Q20	SS	Lagenaria siceraria					Calabash fragments, 33g
Q20	SS	Protea species	1				Flowerhead; drilled and worked
Q20	SS	Sorghum bicolor	1			1	Sorghum stalk, <1g
Q21	Surface	Lagenaria siceraria	?				Calabash fragments, 44g
Q21	Surface	Protea species	1				Flowerhead; worked
Q21	Surface	Sorghum bicolor	5			2	Sorghum stalks, <1g
Q21	SS	Cucurbita maxima	1				Pumpkin
Q21	SS	Lagenaria siceraria					Calabash fragments, 69g
Q21	SS	Lagenaria siceraria	1				Calabash seed
Q21	SS	Protea species	1				Flowerhead; worked
Q21	SS	Sorghum bicolor	3			1	Sorghum stalks, <1g
Q21	SS	Vigna unguiculata	4				Cowpea
Q/R20	Surface	Lagenaria siceraria					Calabash fragments, 75g
Q/R20	Surface	Sorghum bicolor	1				Sorghum stalk, 1g
R20	SS/Pit	Lagenaria siceraria					Calabash fragments, 12g
R20	SS/Pit	Pennisetum glaucum	1				Millet stalk, <1g
R20	SS/Pit	Protea species	2	2			Flowerheads; 1 drilled
R20	SS/Pit	Sorghum bicolor	13				Sorghum stalks, 12g
R21	Surface	Aloe species	1				Aloe fragment, 2g
R21	Surface	Lagenaria siceraria					Calabash fragments, 55g
R21	Surface	Protea species	1				Flowerhead; worked and drilled
R21	Surface	Sorghum bicolor	4				Sorghum stalks, 3g
R21	SS	Aloe species	1				Aloe fragment, 4g
R21	SS	Lagenaria siceraria					Calabash fragments, 58g
R21	SS	Protea species	2		1		Flowerheads; 2 worked, 1 drilled
R21	SS	Sorghum bicolor	1				Sorghum stalk, <1g
R21	SS	Sorghum bicolor	1				Sorghum seed
R21	SS Pit	Sorghum bicolor	2				Sorghum stalks, <1g

Table B.5: Species Counts and Locations from Dg5, Historic Cave

Loc.	Level	Species (Scientific)	Count				Comments
			Tot.	F	Br	Bu	
-	Surface	Aloe species	1				Aloe fragment, 1g
-	Surface	Lagenaria siceraria					Calabash fragments, 41g
-	Surface	Protea species	2		2		Flowerheads; 2 worked and drilled

-	Surface	Sorghum bicolor	1				Sorghum stalk, 1g
T18	SS	Cucurbita maxima	3	1			Pumpkin
T18	SS	Citrullus lanatus	2	1	1		Wild watermelon
T19	SS	Acacia species	1				Acacia thorn, worked
T19	SS	Lagenaria siceraria					Calabash fragments, 5g
T19	SS	Protea species	1		1		Flowerhead; drilled and worked
T19	SS	Sorghum bicolor	3				Sorghum seeds
T19	CL	Citrullus lanatus	1		1		Wild watermelon
T19	CL	Unidentifiable	1				
T19	SB	Citrullus lanatus	12	2	10		Wild watermelon
T19	SB	Cussonia species	1	1			
T19	SB	Lagenaria siceraria					Calabash fragments, 1g
T19	SB	Vigna unguiculata	1				Cowpea
T19	SB	Unidentified Type 6	2				
T19	SB	Unidentifiable	1		1		
T19	SB	Protea species	1			1	Flowerhead; drilled and worked
T19	RBL	Citrullus lanatus	3	1	2		Wild watermelon
T19	RBL	Lagenaria siceraria					Calabash fragments, 2g
T19	SRB	Citrullus lanatus	1		1		Wild watermelon
T19	SRB	Pennisetum glaucum	46				Millet stalks, 2g
T19	SRB	Sorghum bicolor	?14				Sorghum stalks, 3g
T19	CL	Citrullus lanatus	2	2			Wild watermelon
T19	CL	Lagenaria siceraria					Calabash fragments, 9g
T19	CL	Sclerocarya birrea	1				Marula nut
T19	CL	Sorghum bicolor	8				Sorghum seeds
T19	CL	Vigna unguiculata	1				Cowpea
T19	CL	Zea mays	1		1		Maize
T20	SS	Citrullus lanatus	10	4	3		Wild watermelon
T20	SS	Lagenaria siceraria					Calabash fragments, 11g
T20	SS	Lannea discolor	1		1		Tree grape
T20	SS	Protea species	1				Flowerhead; worked and drilled
T20	SS	Sorghum bicolor	1				Sorghum stalk, <1g
T20	SS	Sorghum bicolor	30	3	7		Sorghum seeds
T20	SS	Vigna unguiculata	3	1			Cowpea
T20	CL	Sorghum bicolor	13	1			Sorghum seeds

Table B.6: Species Counts and Locations from Dg6, Historic Cave

Loc.	Level	Species (Scientific)	Count				Comments
			Tot.	F	Br	Bu	
-	Surface	Citrullus lanatus	4	1	3	1	Wild watermelon
-	Surface	Cussonia species	1				
-	Surface	Lagenaria siceraria					Calabash fragments, 30g
-	Surface	Protea species	4	1	2		Flowerheads; 4 worked, 1 drilled
-	Surface	Sclerocarya birrea	1		1		Marula nut
-	Surface	Sorghum bicolor	2				Sorghum stalks, <1g
-	Surface	Unidentified Type 7	1		1		
-	Surface	Unidentifiable	2				

Ee29	SS	Citrullus lanatus	2	1			Wild watermelon
Ee29	SS	Euclea species	1	1			
Ee29	SS	cf. Euclea species	1				
Ee29	SS	Lagenaria siceraria					Calabash fragments, 3g
Ee29	SS	Olea europaea	7	5			Olive tree
Ee29	SS	Protea species	1				Flowerhead; worked
Ee29	SS	Sorghum bicolor	1				Sorghum stalk, <1g
Ee29	SS	Sorghum bicolor	3				Sorghum seeds
Ee29	SS	Zea mays	1	1			Maize
Ee29	SS	Unidentified Type 1	1				
Ee29	SS	Unidentified Type 7	1		1		
Ee29	CRL	Aloe species	1				Aloe fragment, 2g
Ee29	CRL	Citrullus lanatus	3	2			Wild watermelon
Ee29	CRL	Cussonia species	1				
Ee29	CRL	Lagenaria siceraria					Calabash fragment, 2g
Ee29	CRL	Protea species	1				Flowerhead
Ee29	CRL	Sorghum bicolor	1				Sorghum stalk, <1g
Ee29	CRL	Sorghum bicolor	9	1			Sorghum seeds
Ee29	GL	cf. Acacia ataxacantha	1		1		Pod
Ee29	GL	Citrullus lanatus	1		1		Wild watermelon
Ee29	GL	Pennisetum glaucum	1				Millet stalk, <1g
Ee29	GL	Sorghum bicolor	4				Sorghum stalks, <1g
Ee29	RBL	Citrullus lanatus	1				Wild watermelon
Ee29	RBL	Euphorbia species	3		1		
Ee29	RBL	Lagenaria siceraria	1				Calabash stalk
Ee29	RBL	Unidentified Type 37	3		1		
Ee29	GL	Lagenaria siceraria	1				Calabash stalk
Ee30	SS	Citrullus lanatus	2	2			Wild watermelon
Ee30	SS	Commiphora schimperi	1		1		Velvet-leaved corkwood
Ee30	SS	Lagenaria siceraria					Calabash fragments, 8g
Ee30	SS	Pappea capensis	1				Jacket Plum
Ee30	SS	Sorghum bicolor	1				Sorghum stalk, <1g
Ee30	SS	Sorghum bicolor	1				Sorghum seed
Ee30	SS	Unidentified Type 2	1				
Ee30	SS	Unidentified Type 37	1				
Ee30	CRL	Lagenaria siceraria					Calabash, 4g
Ee30	CRL	Protea species	1				Flower bud
Ee30	GL	Lagenaria siceraria					Calabash fragments, 4g
Ee30	GL	Unidentified Type 21	1				Species 135
Ff30	Thick Ash	Lagenaria siceraria					Calabash fragments, 3g
Ff30	SRB	Protea species	1				Flowerhead; worked heavily
Ff30	CRL	Lagenaria siceraria					Calabash fragments, 3g

Table B.7: Species Counts and Locations from Dg7, Historic Cave

Loc.	Level	Species (Scientific)	Count				Comments
			Tot.	F	Br	Bu	
T42	SS	Citrullus lanatus	3		2		Wild watermelon
T42	SS	Commiphora species	1	1			Corkwood species
T42	SS	Lannea discolor	2	1	1		Tree grape
T42	SS	Sorghum bicolor	2				Sorghum stalks, 4g

T42	SS	Sorghum bicolor	42	2	3		Sorghum seeds

Table B.8: Species Counts and Locations from Dg8, Historic Cave

Loc.	Level	Species (Scientific)	Count				Comments
			Tot.	F	Br	Bu	
V45	Surface	Lagenaria siceraria					Calabash, 17g
V45	Surface	Olea europaea subsp. cuspidata	1	1			African olive
V45	Surface	Pappea capensis	2				Jacket Plum
V45	Surface	Protea species	1	1			Flowerhead, drilled
V45	Surface	Sorghum bicolor	18	1			Sorghum seeds
V45	Surface	Vigna unguiculata	2				Cowpea
V45	Surface	Unidentified Type 37	1		1		
V45	SS	Sorghum bicolor	5				Sorghum seeds
V45	Ash layer	Commiphora schimperi	1	1			Velvet-leaved Corkwood
V45	Ash layer	Cucurbita maxima	1				Pumpkin
V45	Ash layer	Lagenaria siceraria					Calabash fragments, 7g
V45	Ash layer	Sorghum bicolor	35	1	4		Sorghum seeds
V45	Ash layer	Zea mays	1				Maize
V45	Ash layer	Unidentified Type 37	1				
V45	Thick Ash	Sorghum bicolor	6	1			Sorghum seeds
V45	Thick Ash	Zea mays	1				Maize
V45	RB	Lagenaria siceraria					Calabash fragments, <1g

Table B.9: Presence Analysis for Historic Cave

Species	M1	M2	M3	M4	M1/N1	N1/M1	N2	N2/N3	N3	N4	N2/O3	O1	O2	O3	O4	P1	P2	P3
BUXACEAE	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CUCURBITACEA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RUBIACEA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acacia species	1	1	1	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0
cf. Acacia ataxacantha	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cf. Acacia Species	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aloe species	1	1	1	1	0	1	1	0	0	1	0	1	1	1	1	1	1	1
cf. Aloe species	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Bridelia micrantha	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Cassia abbreviata subsp. beareana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chrysophyllum viridifolium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Citrullus lanatus	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1
cf. Citrullus lanatus	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Combretum species	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Commiphora schimperi	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Commiphora species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
Cucumis metuliferus	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Cucurbita maxima	1	1	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0	1
Cussonia species	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1
Dalechampia capensis	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diospyros lycioides	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
cf. Diospyros species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Englerophytum magalismontanum	1	1	1	0	1	0	0	0	1	0	0	1	0	1	0	1	0	0

cf. Englerophytum magalismontanum	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Elaeodendron transvaalense	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1
Euclea species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cf. Euclea species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Euphorbia species	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Ficus ingens	0	1	0	0	1	0	1	0	0	0	0	0	1	1	0	1	0	1
Friesodielsia obovata	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Ganoderma species	1	1	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0
cf. Ganoderma species	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Grewia bicolor	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grewia flava	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grewia monticola	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Grewia occidentalis	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Grewia species	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
cf. Hyaenanche globosa	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kirkia acuminata	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kirkia cf. acuminata	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Kirkia wilmsii	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lablab purpureus	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Lagenaria siceraria	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1
cf. Lagenaria siceraria	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Lannea discolor	1	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
cf. Lannea discolor	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lannea sweinfurthii var. stuhlmannii	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Mimusops zeyheri	1	1	1	0	1	1	0	0	1	0	1	1	1	0	0	0	1	0

Mimusops cf. zeyheri	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cf. Mimusops Zeyheri	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Momordica balsamina	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moringa oleifera	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Momordica balsamina	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Olea cf. capenis	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Olea europaea	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Olea europaea subsp. cuspidata	1	1	0	1	0	0	0	0	0	0	0	1	1	0	0	1	0	0
Olinia species	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pappea capensis	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cf. Pappea capensis	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cf. Phaseoulous vulgaris	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0
cf. Phoenix reclinata	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0
Pennisetum glaucum	1	1	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1
Podocarpus falcatus	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Protea species	1	1	1	1	1	0	0	0	1	0	0	1	1	1	0	0	1	0
cf. Protea Species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Schmidtia pappophoroides	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Sclerocarya birrea	1	1	1	1	0	0	0	0	1	0	0	0	1	0	0	1	0	1
cf. Sclerocarya birrea	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Searsia lancea	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0
Solanum species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Sorghum bicolor	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1
Vangueria infausta	1	1	1	0	1	0	1	0	1	1	0	1	1	1	0	1	0	1
cf. Vangueria infausta	1	1	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
Vangueria type	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Vigna radiata	1	1	1	1	1	0	1	0	0	0	0	1	0	0	0	0	0	0
Vigna species	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vigna subterranea	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vigna unguiculata	1	1	1	1	1	1	0	0	1	0	0	1	1	1	0	1	1	1
cf. Vigna unguiculata	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ximenia species	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0
Ximenia caffra	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Zea mays	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Ziziphus mucronata	0	0	0	0	0	0	1	0	0	0	0	1	1	1	0	0	1	0
Unidentified Type 1	1	1	1	0	0	1	1	0	1	1	0	1	1	1	0	1	1	0
Unidentified Type 2	1	1	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
Unidentified Type 3	1	1	1	1	0	0	0	0	1	0	0	1	0	0	0	1	1	0
Unidentified Type 4	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Unidentified Type 5	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 6	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0
Unidentified Type 7	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
Unidentified Type 8	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 9	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 10	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Unidentified Type 11	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 14	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
Unidentified Type 15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 16	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 17	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 18	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 19	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0

Unidentified Type 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Unidentified Type 21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 22	1	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
Unidentified Type 23	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 26	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Unidentified Type 28	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 29	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 31	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 32	1	1	1	0	1	1	0	0	1	0	0	0	0	1	0	0	1	1
Unidentified Type 33	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 34	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 35	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 36	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 37	1	1	1	1	0	0	1	0	1	0	0	1	1	1	0	1	0	1
Unidentifiable	1	1	1	1	0	0	1	0	1	1	0	1	1	0	1	1	0	1
TOTAL	59	65	35	16	15	12	17	3	17	6	5	32	27	18	7	25	18	19
Percentage	49.58	54.62	29.41	13.45	12.61	10.08	14.29	2.52	14.29	5.04	4.20	26.89	22.69	15.13	5.88	21.01	15.13	15.97

Table continued: Presence Analysis for Historic Cave

Species	P4	Q1	Q2	Q3	Q2-Q4	?4	Dg 2 Surf.	T9	U9	U10	V9	V10	Dg 3 Surf.	P13	Q13	Dg 4 Surf.	P21	P22
BUXACEAE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CUCURBITACEAE	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0

RUBIACEAE	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Acacia species	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
cf. Acacia ataxacantha	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cf. Acacia Species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aloe species	0	0	1	0	1	0	1	1	1	1	0	0	1	0	1	0	0	0
cf. Aloe species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bridelia micrantha	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cassia abbreviata subsp. beareana	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Chrysophyllum viridifolium	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Citrullus lanatus	1	1	1	0	1	0	1	1	1	1	0	0	0	0	0	0	1	0
cf. Citrullus lanatus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Combretum species	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Commiphora schimperi	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Commiphora species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cucumis metuliferus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cucurbita maxima	0	0	1	0	0	0	0	1	1	1	0	0	0	0	0	0	1	1
Cussonia species	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dalechampia capensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diospyros lycioides	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cf. Diospyros species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Englerophytum magalismontanum	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
cf. Englerophytum magalismontanum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Elaeodendron transvaalense	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Euclea species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cf. Euclea species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Euphorbia species	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ficus ingens	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Friesodielsia obovata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ganoderma species	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cf. Ganoderma species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grewia bicolor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grewia flava	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grewia monticola	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grewia occidentalis	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grewia species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cf. Hyaenanche globosa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kirkia acuminata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kirkia cf. acuminata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kirkia wilmsii	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lablab purpureus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lagenaria siceraria	0	1	1	0	1	0	1	1	1	1	0	1	1	1	0	1	1	1
cf. Lagenaria siceraria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lannea discolor	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cf. Lannea discolor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lannea sweinfurthii var. stuhlmannii	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mimusops zeyheri	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mimusops cf. zeyheri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cf. Mimusops Zeyheri	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Momordica balsamina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Moringa oleifera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Momordica balsamina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Olea cf. capenis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Olea europaea	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Olea europaea subsp. cuspidata	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Olinia species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pappea capensis	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cf. Pappea capensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cf. Phaseoulous vulgaris	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
cf. Phoenix reclinata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pennisetum glaucum	0	1	1	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0
Podocarpus falcatus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Protea species	0	1	1	0	0	0	1	0	1	1	0	1	0	0	0	1	0	1
cf. Protea Species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Schmidtia pappophoroides	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sclerocarya birrea	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
cf. Sclerocarya birrea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Searsia lancea	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Solanum species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sorghum bicolor	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1
Vangueria infausta	0	1	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0
cf. Vangueria infausta	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vangueria type	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vigna radiata	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Vigna species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vigna subterranea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vigna unguiculata	0	1	1	0	0	0	0	0	1	0	0	1	0	0	0	0	1	1
cf. Vigna unguiculata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Ximenia species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ximenia caffra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Zea mays	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Ziziphus mucronata	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 3	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 8	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 12	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0
Unidentified Type 14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 16	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 17	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 21	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 22	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 24	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 26	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Unidentified Type 27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 30	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 36	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 37	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Unidentifiable	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	5	36	24	1	4	4	8	8	12	7	2	5	3	1	1	3	7	5
Percentage	4.20	30.25	20.17	0.84	3.36	3.36	6.72	6.72	10.08	5.88	1.68	4.20	2.52	0.84	0.84	2.52	5.88	4.20

Table continued: Presence Analysis for Historic Cave

Species	Q20	Q21	Q/R20	R20	R21	Dg 5 Surf.	T18	T19	T20	Dg 6 Surf.	Ee29	Ee30	Ff30	T42	V45	Floor	Total	%
BUXACEAE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
CUCURBITACEA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
RUBIACEA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Acacia species	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	9	16.98
cf. Acacia ataxacantha	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1.89
cf. Acacia Species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Aloe species	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	26	49.06
cf. Aloe species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89

Bridelia micrantha	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	5.66
Cassia abbreviata subsp. beareana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Chrysophyllum viridifolium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Citrullus lanatus	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	1	34	64.15
cf. Citrullus lanatus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Combretum species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	9.43
Commiphora schimperi	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	5	9.43
Commiphora species	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	3	5.66
Cucumis metuliferus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3.77
Cucurbita maxima	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	16	30.19
Cussonia species	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	11	20.75
Dalechampia capensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Diospyros lycioides	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
cf. Diospyros species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Englerophytum magalismontanum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	20.75
cf. Englerophytum magalismontanum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Elaeodendron transvaalense	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	21	39.62
Euclea species	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1.89
cf. Euclea species	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	1.89
Euphorbia species	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	6	11.32
Ficus ingens	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	13.21
Friesodielsia obovata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3.77
Ganoderma species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	7	13.21
cf. Ganoderma species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3.77
Grewia bicolor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3.77

Grewia flava	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Grewia monticola	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	5.66
Grewia occidentalis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3.77
Grewia species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
cf. Hyaenanche globosa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Kirkia acuminata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Kirkia cf. acuminata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3.77
Kirkia wilmsii	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Lablab purpureus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Lagenaria siceraria	1	1	1	1	1	1		1	1	1	1	1	1	0	1	1	44	83.02
cf. Lagenaria siceraria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Lannea discolor	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	11	20.75
cf. Lannea discolor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3.77
Lannea sweinfurthii var. stuhlmannii	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3.77
Mimusops zeyheri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	22.64
Mimusops cf. zeyheri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
cf. Mimusops Zeyheri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	5.66
Momordica balsamina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	5.66
Moringa oleifera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3.77
Momordica balsamina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Olea cf. capenis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Olea europaea	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	4	7.55
Olea europaea subsp. cuspidata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	9	16.98
Olinia species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	7.55
Pappea capensis	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	5	9.43
cf. Pappea capensis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89

cf. Phaseoulous vulgaris	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3.77
cf. Phoenix reclinata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	5.66
Pennisetum glaucum	0	0	0	1	0	0	0	1	0	0	1	0	0	0	0	0	15	28.30
Podocarpus falcatus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Protea species	1	1	0	1	1	1	0	1	1	1	1	1	1	0	1	1	31	58.49
cf. Protea Species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Schmidtia pappophoroides	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Sclerocarya birrea	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	15	28.30
cf. Sclerocarya birrea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Searsia lancea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	9.43
Solanum species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3.77
Sorghum bicolor	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	48	90.57
Vangueria infausta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	30.19
cf. Vangueria infausta	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	11.32
Vangueria type	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	5.66
Vigna radiata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	18.87
Vigna species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Vigna subterranea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	5.66
Vigna unguiculata	0	1	0	0	0	0	0	1	1	0	0	0	0	0	1	0	24	45.28
cf. Vigna unguiculata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	9.43
Ximenia species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3.77
Ximenia caffra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Zea mays	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	6	11.32
Ziziphus mucronata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	11.32
Unidentified Type 1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	15	28.30
Unidentified Type 2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	7	13.21
Unidentified Type 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	18.87

Unidentified Type 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	11.32
Unidentified Type 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	5.66
Unidentified Type 6	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	5	9.43
Unidentified Type 7	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	6	11.32
Unidentified Type 8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	7.55
Unidentified Type 9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	5.66
Unidentified Type 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	5.66
Unidentified Type 11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3.77
Unidentified Type 12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3.77
Unidentified Type 14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	5.66
Unidentified Type 15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3.77
Unidentified Type 16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3.77
Unidentified Type 17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3.77
Unidentified Type 18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Unidentified Type 19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Unidentified Type 20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Unidentified Type 21	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	3.77
Unidentified Type 22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	9.43
Unidentified Type 23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Unidentified Type 24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Unidentified Type 26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3.77
Unidentified Type 27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Unidentified Type 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Unidentified Type 29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Unidentified Type 30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Unidentified Type 31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Unidentified Type 32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	18.87

Unidentified Type 33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Unidentified Type 34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Unidentified Type 35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1.89
Unidentified Type 36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	11.32
Unidentified Type 37	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	17	32.08
Unidentifiable	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	17	32.08
TOTAL	3	5	2	4	4	4	2	12	6	8	16	9	2	4	10	6		
Percentage	2.52	4.20	1.68	3.36	3.36	3.36	1.68	10.08	5.04	6.72	13.45	7.56	1.68	3.36	8.40	5.04		

Table B.10: Presence analysis by Excavation Area, Historic Cave

Species	Dg1	Dg2	Dg3	Dg4	Dg5	Dg6	Dg7	Dg8	Total	Percentage
BUXACEAE	1	0	0	0	0	0	0	0	1	12.50
CUCURBITACEAE	0	1	0	0	0	0	0	0	1	12.50
RUBIACEAE	1	0	0	0	0	0	0	0	1	12.50
Acacia species	1	1	0	0	1	0	0	0	3	37.50
cf. Acacia ataxacantha	0	0	0	0	0	1	0	0	1	12.50
cf. Acacia Species	1	0	0	0	0	0	0	0	1	12.50
Aloe species	1	1	1	1	1	1	0	0	6	75.00
cf. Aloe species	1	0	0	0	0	0	0	0	1	12.50
Bridelia micrantha	1	0	0	0	0	0	0	0	1	12.50
Cassia abbreviata subsp. beareana	0	1	0	0	0	0	0	0	1	12.50
Chrysophyllum viridifolium	1	0	0	0	0	0	0	0	1	12.50
Citrullus lanatus	1	1	0	1	1	1	1	0	6	75.00
cf. Citrullus lanatus	1	0	0	0	0	0	0	0	1	12.50
Combretum species	1	0	0	0	0	0	0	0	1	12.50
Commiphora schimperi	1	0	0	0	0	1	0	1	3	37.50

Commiphora species	1	0	0	0	0	0	1	0	2	25.00
Cucumis metuliferus	1	0	0	0	0	0	0	0	1	12.50
Cucurbita maxima	1	1	0	1	1	0	0	1	5	62.50
Cussonia species	1	0	0	0	1	1	0	0	3	37.50
Dalechampia capensis	1	0	0	0	0	0	0	0	1	12.50
Diospyros lycioides	1	0	0	0	0	0	0	0	1	12.50
cf. Diospyros species	1	0	0	0	0	0	0	0	1	12.50
Elaeodendron transvaalense	1	0	0	0	0	0	0	0	1	12.50
Englerophytum magalismontanum	1	1	0	0	0	0	0	0	2	25.00
cf. Englerophytum magalismontanum	1	0	0	0	0	0	0	0	1	12.50
Euclea species	0	0	0	0	0	1	0	0	1	12.50
cf. Euclea species	0	0	0	0	0	1	0	0	1	12.50
Euphorbia species	1	0	0	0	0	1	0	0	2	25.00
Ficus ingens	1	0	0	0	0	0	0	0	1	12.50
Friesodielsia obovata	1	0	0	0	0	0	0	0	1	12.50
Ganoderma species	1	0	0	0	0	0	0	0	1	12.50
cf. Ganoderma species	1	0	0	0	0	0	0	0	1	12.50
Grewia bicolor	1	0	0	0	0	0	0	0	1	12.50
Grewia flava	1	0	0	0	0	0	0	0	1	12.50
Grewia monticola	1	0	0	0	0	0	0	0	1	12.50
Grewia occidentalis	1	0	0	0	0	0	0	0	1	12.50
Grewia species	1	0	0	0	0	0	0	0	1	12.50
cf. Hyaenanche globosa	1	0	0	0	0	0	0	0	1	12.50
Kirkia acuminata	1	0	0	0	0	0	0	0	1	12.50
Kirkia cf. acuminata	1	0	0	0	0	0	0	0	1	12.50
Kirkia wilmsii	1	0	0	0	0	0	0	0	1	12.50

Lablab purpureus	1	0	0	0	0	0	0	0	1	12.50
Lagenaria siceraria	1	1	1	1	1	1	0	1	7	87.50
cf. Lagenaria siceraria	1	0	0	0	0	0	0	0	1	12.50
Lannea discolor	1	0	0	0	1	0	1	0	3	37.50
cf. Lannea discolor	1	0	0	0	0	0	0	0	1	12.50
Lannea sweinfurthii var. stuhlmannii	1	0	0	0	0	0	0	0	1	12.50
Mimusops zeyheri	1	0	0	0	0	0	0	0	1	12.50
Mimusops cf. zeyheri	1	0	0	0	0	0	0	0	1	12.50
cf. Mimusops zeyheri	1	0	0	0	0	0	0	0	1	12.50
Momordica balsamina	1	0	0	0	0	0	0	0	1	12.50
Moringa oleifera	1	0	0	0	0	0	0	0	1	12.50
Olea cf. capenis	1	0	0	0	0	0	0	0	1	12.50
Olea europaea	1	0	0	0	0	1	0	0	2	25.00
Olea europaea subsp. cuspidata	1	0	0	0	0	0	0	1	2	25.00
Olinia species	1	0	0	0	0	0	0	0	1	12.50
Pappea capensis	1	0	0	0	0	1	0	1	3	37.50
cf. Pappea capensis	1	0	0	0	0	0	0	0	1	12.50
Pennisetum glaucum	1	1	0	1	1	1	0	0	5	62.50
cf. Phaseoulous vulgaris	1	0	0	0	0	0	0	0	1	12.50
cf. Phoenix reclinata	1	0	0	0	0	0	0	0	1	12.50
Podocarpus falcatus	1	0	0	0	0	0	0	0	1	12.50
Protea species	1	1	0	1	1	1	0	1	6	75.00
cf. Protea Species	1	0	0	0	0	0	0	0	1	12.50
Schmidtia pappophoroides	1	0	0	0	0	0	0	0	1	12.50
Sclerocarya birrea	1	1	0	0	1	1	0	0	4	50.00
cf. Sclerocarya birrea	1	0	0	0	0	0	0	0	1	12.50

Searsia lancea	1	0	0	0	0	0	0	0	1	12.50
Solanum species	1	0	0	0	0	0	0	0	1	12.50
Sorghum bicolor	1	1	1	1	1	1	1	1	8	100.00
Vangueria infausta	1	1	0	0	0	0	0	0	2	25.00
cf. Vangueria infausta	1	0	0	0	0	0	0	0	1	12.50
Vangueria cf. infausta	1	0	0	0	0	0	0	0	1	12.50
Vangueria type	1	0	0	0	0	0	0	0	1	12.50
Vigna radiata	1	1	0	1	0	0	0	0	3	37.50
Vigna species	1	0	0	0	0	0	0	0	1	12.50
Vigna subterranea	1	0	0	0	0	0	0	0	1	12.50
Vigna unguiculata	1	1	0	1	1	0	0	1	5	62.50
cf. Vigna unguiculata	1	0	0	1	0	0	0	0	2	25.00
Ximenia species	1	0	0	0	0	0	0	0	1	12.50
Ximenia caffra	1	0	0	0	0	0	0	0	1	12.50
Zea mays	1	1	0	0	1	1	0	1	5	62.50
Ziziphus mucronata	1	0	0	0	0	0	0	0	1	12.50
Unidentified Type 1	1	0	0	0	0	1	0	0	2	25.00
Unidentified Type 2	1	0	0	0	0	1	0	0	2	25.00
Unidentified Type 3	1	0	0	0	0	0	0	0	1	12.50
Unidentified Type 4	1	0	0	0	0	0	0	0	1	12.50
Unidentified Type 5	1	0	0	0	0	0	0	0	1	12.50
Unidentified Type 6	1	0	0	0	1	0	0	0	2	25.00
Unidentified Type 7	1	0	0	0	0	1	0	0	2	25.00
Unidentified Type 8	1	0	0	0	0	0	0	0	1	12.50
Unidentified Type 9	1	0	0	0	0	0	0	0	1	12.50
Unidentified Type 10	1	0	0	0	0	0	0	0	1	12.50
Unidentified Type 11	1	0	0	0	0	0	0	0	1	12.50

Unidentified Type 12	0	1	0	0	0	0	0	0	1	12.50
Unidentified Type 14	1	0	0	0	0	0	0	0	1	12.50
Unidentified Type 15	1	0	0	0	0	0	0	0	1	12.50
Unidentified Type 16	1	0	0	0	0	0	0	0	1	12.50
Unidentified Type 17	1	0	0	0	0	0	0	0	1	12.50
Unidentified Type 18	1	0	0	0	0	0	0	0	1	12.50
Unidentified Type 19	1	0	0	0	0	0	0	0	1	12.50
Unidentified Type 20	1	0	0	0	0	0	0	0	1	12.50
Unidentified Type 21	1	0	0	0	0	1	0	0	2	25.00
Unidentified Type 22	1	0	0	0	0	0	0	0	1	12.50
Unidentified Type 23	1	0	0	0	0	0	0	0	1	12.50
Unidentified Type 24	1	0	0	0	0	0	0	0	1	12.50
Unidentified Type 26	1	0	0	0	0	0	0	0	1	12.50
Unidentified Type 27	1	0	0	0	0	0	0	0	1	12.50
Unidentified Type 28	1	0	0	0	0	0	0	0	1	12.50
Unidentified Type 29	1	0	0	0	0	0	0	0	1	12.50
Unidentified Type 30	1	0	0	0	0	0	0	0	1	12.50
Unidentified Type 31	1	0	0	0	0	0	0	0	1	12.50
Unidentified Type 32	1	0	0	0	0	0	0	0	1	12.50
Unidentified Type 33	1	0	0	0	0	0	0	0	1	12.50
Unidentified Type 34	1	0	0	0	0	0	0	0	1	12.50
Unidentified Type 35	1	0	0	0	0	0	0	0	1	12.50
Unidentified Type 36	1	0	0	0	0	0	0	0	1	12.50
Unidentified Type 37	1	0	0	0	0	1	0	1	3	37.50
Unidentifiable	1	0	0	0	1	1	0	0	3	37.50
TOTAL	113	17	3	10	15	22	4	10		
Percentage	94.96	14.41	2.54	8.47	12.71	18.64	3.39	8.47		

Appendix C: BALERNO MAIN SHELTER RESULTS

T = total; F = fragmented; Br = broken; Bu = burnt

* Identified by staff at the C.E. Moss Herbarium

Table C.1: Species Count and Locations for Balerno Main Shelter

Loc.	Level	Species (Scientific)	Count				Comments
			Tot.	F	Br	Bu	
Line 14	Ash Interface	Mimosoideae (FABACEA)	4			4	
Line 14	Interface	cf. Citrullus lanatus	2				
Line 14	Interface	Grewia bicolor	2		2	2	White raisin
Line 14	Interface	Grewia flava	1		1		Brandybush
Line 14	Interface	Grewia species	2		2	1	
Line 14	Interface	Sclerocarya birrea	14	14	1	12	Marula nut
Line 14	Interface	Sclerocarya birrea	2				Marula plugs
Line 14	Interface	Sorghum bicolor	1				Sorghum seed
Line 14	Interface	Xanthocercis zambesiaca	3		1	3	Nyala berry
Line 14	Interface	Unidentified Type 37	1				
Line 14	Interface	Unidentifiable	8			5	
Line 14	B Rubble	CELASTRACEAE	1		1		
Line 14	Black Rubble	Mimosoideae (FABACEA)	20	3		20	
Line 14	B Rubble	Citrullus lanatus	13	7	4	7	Wild watermelon
Line 14	B Rubble	Grewia species	6	4	2	3	
Line 14	B Rubble	cf. Manilkara discolor	1			1?	
Line 14	B Rubble	Sclerocarya birrea	235	39	193	119	Marula nuts
Line 14	B Rubble	Sclerocarya birrea	69	23	6	57	Marula plugs
Line 14	B Rubble	Vangueria infausta	3	1	2		Wild medlar
Line 14	B Rubble	cf. Vigna unguiculata	1	1		1	
Line 14	B Rubble	Xanthocercis zambesiaca	99	1	81	45	Nyala berry, 2 possibly gnawed
Line 14	B Rubble	Unidentified Type 6	2			2	
Line 14	B Rubble	Unidentified Type 36	1		1		
Line 14	B Rubble	Unidentifiable 11	15			8	
Line 14	Rubble	Xanthocercis zambesiaca	9		9	5	Nyala berry
D19/D20	Hut collapse	Mimosoideae (FABACEA)	25	18	1	25	
D19/D20	Hut	Citrullus lanatus	2	1	1	1	Wild watermelon
D19/D20	Hut	Grewia bicolor	19	4	14	11	White raisin
D19/D20	Hut	Sclerocarya birrea	29	5	24	20	Marula nut
D19/D20	Hut	Sclerocarya birrea	19	5	1	19	Marula plugs
D19/D20	Hut	Unidentified Type 6	52	17	6	46	
D19/D20	Hut	Unidentifiable	48			44	
D20	Collapse	Citrullus lanatus	149	67	81		Wild watermelon
D20	Collapse	Sorghum bicolor	1				Sorghum stalk,

							<1g
D20	Collapse	Unidentified Type 3	1				
D20/E20	Collapse	Mimosoideae (FABACEA)	2			2	
D20/E20	Collapse	Citrullus lanatus	4	2	2		Wild watermelon
D20/E20	Collapse	Grewia bicolor	1		1	1	White raisin
D20/E20	Collapse	Sclerocarya birrea	7	1		5	Marula plugs
D20/E20	Collapse	Unidentified Type 6	2	1		2	
D20/E20	Collapse	Unidentifiable	12			11	
E16	White Ash?	Sclerocarya birrea	1	1		1	Marula plug
E16	White Ash?	Unidentifiable	1		1?		
E16	Collapse	Grewia bicolor	3	1	2	3	White raisin
E16	Collapse	Sclerocarya birrea	15	8		15	Marula plugs
E16	Collapse	Xanthocercis zambesiaca	1			1	Nyala berry
E16	Collapse	Unidentifiable	8			8	
E18	Collapse	Mimosoideae (FABACEA)	1	1		1	
E18	Collapse	Grewia bicolor	2		2		White raisin
E18	Collapse	Sclerocarya birrea	2	2		2	Marula plugs
E18	Collapse	Xanthocercis zambesiaca	1			1	Nyala berry
E18	Collapse	Unidentified Type 4	2	1	1	2	
E18	Collapse	Unidentifiable	1			1	
E18/19	Collapse	Mimosoideae (FABACEA)	3	1		3	
E18/19	Collapse	Citrullus lanatus	3	2		3	Wild watermelon
E18/19	Collapse	Sclerocarya birrea	5	1	1	5	Marula nuts
E18/19	Collapse	Sclerocarya birrea	3	1		3	Marula plugs
E18/19	Collapse	Xanthocercis zambesiaca	2			2	Nyala berry
E18/19	Collapse	Unidentified Type 6	1			1	
E18/19	Collapse	Unidentifiable	1			1	
E/F19	Black Rubble	Mimosoideae (FABACEA)	3			3	
E/F19	B Rubble	Bridelia micrantha	1	1		1	Velvet sweetberry
E/F19	B Rubble	Citrullus lanatus	11	3	8	6	Wild watermelon
E/F19	B Rubble	Grewia bicolor	6		6	6	White raisin
E/F19	B Rubble	Lagenaria siceraria					Calabash, <1g (burnt)
E/F19	B Rubble	Sclerocarya birrea	9	4	5	9	Marula nuts
E/F19	B Rubble	Sclerocarya birrea	18	5		16	Marula plugs
E/F19	B Rubble	Unidentified Type 5	1	1?		1	
E/F19	B Rubble	Unidentified Type 6	7			7	
E/F19	B Rubble	Unidentifiable	9			6	
F18	Collapse	Citrullus lanatus	9	2	7		Wild watermelon
F18	Collapse	Grewia bicolor	104	19	77	23	White raisin
F18	Collapse	Momordica balsamina	1	1		1	Balsam pear
F18	Collapse	Sclerocarya birrea	10	5	5	4	Marula nuts
F18	Collapse	Sclerocarya birrea	51	7		61	Marula plugs
F18	Collapse	Xanthocercis zambesiaca	4		4	3	Nyala berry
F18	Collapse	Unidentified Type 13	1	1?			
F18	Collapse	Unidentified Type 37	1				
F18	Collapse	Unidentifiable	23			13	
FED 3	Pit	Citrullus Lanatus	51	43	8		Wild watermelon
L14	Rubble	Mimosoideae (FABACEA)	2		1		
L14	Rubble	Citrullus lanatus	51	19	31		Wild

							watermelon
L14	Rubble	Grewia bicolor	4	3			White raisin
L14	Rubble	Grewia species	2		2		
L14	Rubble	Lagenaria siceraria					Calabash, <1g
L14	Rubble	Sclerocarya birrea	20	9	11		Marula nuts
L14	Rubble	Sclerocarya birrea	13	3			Marula plugs
L14	Rubble	Xanthocercis zambesiaca	2		2	2	Nyala berry
L14	Rubble	Unidentified Type 10	1				
L14	Rubble	Unidentified Type 11	3				
L14	Rubble	Unidentified Type13	3		1		
L14	Rubble	Unidentified Type 25	1		1		
L14	Rubble	Unidentified Type 37	2	1			
L14	Rubble	Unidentifiable	2				
O13	Base of Dung	Sclerocarya birrea	1	1			Marula nut
O13	BRA 45-50	Unidentifiable	1		1		
O20	Collapse	CELASTRACEAE	1	1			
O20	Collapse	Bridelia mollis	1	1			Velvet-leaved bridelia
O20	Collapse	Unidentifiable	1				
P14	Damp Grey	Unidentifiable	1		1		
P14	BRA 50-55	Mimosoideae (FABACEA)	1			1	
P14	BRA 50-55	Sclerocarya birrea	1			1	Marula plug
P15	Surface	Grewia bicolor	6	3	3		White raisin
P15	Surface	Momordica balsamina	1		1		Balsam pear
P15	Surface	Olinia species	1				Hard pear
P15	Surface	Sclerocarya birrea	2	1			Marula plugs
P15	Surface	Unidentified Type 5	1				
P15	Surface	Unidentified Type 37	2				
P15	Surface	Unidentifiable	1				
P15	Damp black dung	Unidentified Type 37	1		1		
P15	Damp black dung	Unidentifiable	1				
P15	Grey Brown Ash	Grewia bicolor	1		1		White raisin
P15	GBA	Sclerocarya birrea	1				Marula plug
Hut Rubble, Front Left	Under and In Rocks	Mimosoideae (FABACEA)	1			1	
Hut	Rocks	Cussonia species	1			1	
Hut	Rocks	Lannea sweinfurthii var. stuhlmannii	1				False marula
Hut	Rocks	Sclerocarya birrea	11	1	7	11	Marula nut
Hut	Rocks	Sclerocarya birrea	1			1	Marula plug
Hut	Rocks	Xanthocercis zambesiaca	10		1	10	Nyala berry
Hut	Rocks	Unidentified Type 6	5			5	
Back Right	Rubble	Acacia cf. davyi	1				
Back Right	Rubble	Commiphora cf. mollis	1				Corkwood
Back Right	Rubble	Unidentified Type 2	1				
Back Right	Rubble	Unidentified Type 13	1				
Loose Dung	Surface	Acacia cf. schweinfurthii	1				
WORN	LABEL	Mimosoideae (FABACEA)	1			1	
WORN	LABEL	Citrullus lanatus	3	1	1	3	Wild watermelon
WORN	LABEL	cf. Citrullus lanatus	1		1	1	

WORN	LABEL	Grewia bicolor	1			1	White raisin
WORN	LABEL	Sclerocarya birrea	1	1			Marula nut, discoloured
WORN	LABEL	Sclerocarya birrea	9	4		9	Marula plugs
WORN	LABEL	Xanthocercis zambesiaca	1			1	Nyala berry
WORN	LABEL	Unidentifiable	6			6	
NO	LABEL	Acrotome inflata*	1				Flowerhead
NO	LABEL	Sclerocarya birrea	16	5	11	16	Marula nuts
NO	LABEL	Unidentifiable	1		1	1	

Table C.2: Presence Analysis for Balerno Main Shelter

Species	Line 14	D19/20	D20	D20/E20	E16	E18	E18/19	E/F19	F18	FED3	L14
CELASTRACEAE	1	0	0	0	0	0	0	0	0	0	0
Mimosoideae (FABACEA)	1	1	0	1	0	1	1	1	0	0	1
Acacia cf. davyi	0	0	0	0	0	0	0	0	0	0	0
Acacia cf. schweinfurthii	0	0	0	0	0	0	0	0	0	0	0
Acrotome inflata	0	0	0	0	0	0	0	0	0	0	0
Bridelia micrantha	0	0	0	0	0	0	0	1	0	0	0
Bridelia mollis	0	0	0	0	0	0	0	0	0	0	0
Citrullus lanatus	1	1	0	1	0	0	1	1	1	1	1
cf. Citrullus lanatus	1	0	1	0	0	0	0	0	0	0	0
Commiphora cf. mollis	0	0	0	0	0	0	0	0	0	0	0
Cussonia species	0	0	0	0	0	0	0	0	0	0	0
Grewia bicolor	1	1	0	1	1	1	0	1	1	0	1
Grewia flava	1	0	0	0	0	0	0	0	0	0	0
Grewia species	1	0	0	0	0	0	0	0	0	0	1
Lagenaria siceraria	0	0	0	0	0	0	0	1	0	0	1
Lannea schweinfurthii var. stuhlmannii	0	0	0	0	0	0	0	0	0	0	0
cf. Manilkara discolor	1	0	0	0	0	0	0	0	0	0	0
Momordica balsamina	0	0	0	0	0	0	0	0	1	0	0
Olinia species	0	0	0	0	0	0	0	0	0	0	0
Sclerocarya birrea	1	1	0	1	1	1	1	1	1	0	1

Sorghum bicolor	1	0	1	0	0	0	0	0	0	0	0
Vangueria infausta	1	0	0	0	0	0	0	0	0	0	0
cf. Vigna unguiculata	1	0	0	0	0	0	0	0	0	0	0
Xanthocercis zambesiaca	1	0	0	0	1	1	1	0	1	0	1
Unidentified Type 2	0	0	0	0	0	0	0	0	0	0	0
Unidentified Type 3	0	0	1	0	0	0	0	0	0	0	0
Unidentified Type 4	0	0	0	0	0	1	0	0	0	0	0
Unidentified Type 5	0	0	0	0	0	0	0	1	0	0	0
Unidentified Type 6	1	1	0	1	0	0	1	1	0	0	0
Unidentified Type 10	0	0	0	0	0	0	0	0	0	0	1
Unidentified Type 11	0	0	0	0	0	0	0	0	0	0	1
Unidentified Type 13	0	0	0	0	0	0	0	0	1	0	1
Unidentified Type 25	0	0	0	0	0	0	0	0	0	0	1
Unidentified Type 36	1	0	0	0	0	0	0	0	0	0	1
Unidentified Type 37	1	0	0	0	0	0	0	0	1	0	0
Unidentifiable	1	1	0	1	1	1	1	1	1	0	1
TOTAL	17	6	3	6	4	6	6	9	8	1	13
Percentage	47.22	16.67	8.33	16.67	11.11	16.67	16.67	25.00	22.22	2.78	36.11

Table continued: Presence Analysis for Balerno Main Shelter

Species	O13	O20	P14	P15	Hut Rubble	Back Right	Loose Dung	Unknow n	**Total**	%
CELASTRACEAE	0	1	0	0	0	0	0	0	2	10.53
Mimosoideae (FABACEA)	0	0	1	0	1	0	0	1	10	52.63
Acacia cf. davyi	0	0	0	0	0	1	0	0	1	5.26
Acacia cf. schweinfurthii	0	0	0	0	0	0	1	0	1	5.26

Acrotome inflata	0	0	0	0	0	0	0	1	1	5.26
Bridelia micrantha	0	0	0	0	0	0	0	0	1	5.26
Bridelia mollis	0	1	0	0	0	0	0	0	1	5.26
Citrullus lanatus	0	0	0	0	0	0	0	1	9	47.37
cf. Citrullus lanatus	0	0	0	0	0	0	0	1	3	15.79
Commiphora cf. mollis	0	0	0	0	0	1	0	0	1	5.26
Cussonia species	0	0	0	0	1	0	0	0	1	5.26
Grewia bicolor	0	0	0	1	0	0	0	1	10	52.63
Grewia flava	0	0	0	0	0	0	0	0	1	5.26
Grewia species	0	0	0	0	0	0	0	0	2	10.53
Lagenaria siceraria	0	0	0	0	0	0	0	0	2	10.53
Lannea schweinfurthii var. stuhlmannii	0	0	0	0	1	0	0	0	1	5.26
cf. Manilkara discolor	0	0	0	0	0	0	0	0	1	5.26
Momordica balsamina	0	0	0	1	0	0	0	0	2	10.53
Olinia species	0	0	0	1	0	0	0	0	1	5.26
Sclerocarya birrea	1	0	1	1	1	0	0	1	14	73.68
Sorghum bicolor	0	0	0	0	0	0	0	0	2	10.53
Vangueria infausta	0	0	0	0	0	0	0	0	1	5.26
cf. Vigna unguiculata	0	0	0	0	0	0	0	0	1	5.26
Xanthocercis zambesiaca	0	0	0	0	1	0	0	1	8	42.11
Unidentified Type 2	0	0	0	0	0	1	0	0	1	5.26
Unidentified Type 3	0	0	0	0	0	0	0	0	1	5.26
Unidentified Type 4	0	0	0	0	0	0	0	0	1	5.26
Unidentified Type 5	0	0	0	1	0	0	0	0	2	10.53
Unidentified Type 6	0	0	0	0	1	0	0	0	6	31.58
Unidentified Type 10	0	0	0	0	0	0	0	0	1	5.26

Unidentified Type 11	0	0	0	0	0	0	0	0	1	5.26
Unidentified Type 13	0	0	0	0	0	1	0	0	3	15.79
Unidentified Type 25	0	0	0	0	0	0	0	0	1	5.26
Unidentified Type 36	0	0	0	0	0	0	0	0	2	10.53
Unidentified Type 37	0	0	0	1	0	0	0	0	3	15.79
Unidentifiable	1	1	1	1	0	0	0	1	14	73.68
TOTAL	2	3	3	7	6	4	1	8		
Percentage	5.56	8.33	8.33	19.44	16.67	11.11	2.78	22.22		

Table C.3: Presence Analysis per Occupation, Balerno Main Shelter

Species	Occupation 1	Occupation 2	Occupation 3	Occupation 4	Seed Sample	TOTAL	%
CELASTRACEAE	0	0	0	1	0	1	20
Mimosoideae (FABACEAE)	0	0	1	1	0	2	40
Acacia cf. davyi	0	0	0	1	1	2	40
Acacia cf. schweinfurthii	0	0	0	1	0	1	20
Acrotome inflata	0	0	0	0	0	0	0
Bridelia micrantha	0	0	0	1	0	1	20
Bridelia mollis	0	0	0	1	0	1	20
Citrullus lanatus	0	0	0	1	0	1	20
cf. Citrullus lanatus	0	0	0	1	0	1	20
Commiphora cf. mollis	0	0	0	1	0	1	20
Cussonia species	0	0	0	1	0	1	20
Grewia bicolor	0	0	0	1	0	1	20
Grewia flava	0	0	0	1	0	1	20
Grewia species	0	0	0	1	1	2	40
Lagenaria siceraria	0	0	0	1	0	1	20
Lannea schweinfurthii var. stuhlmannii	0	0	0	0	1	1	20
cf. Manilkara discolor	0	0	0	1	0	1	20
Momordica balsamina	0	0	0	1	1	2	40
Olinia species	0	0	0	1	0	1	20
Sclerocarya birrea	0	0	1	1	0	2	40
Sorghum bicolor	0	0	0	1	0	1	20
Vangueria infausta	0	0	0	1	1	2	40
cf. Vigna unguiculata	0	0	0	1	0	1	20
Xanthocercis zambesiaca	0	0	0	1	0	1	20
Unidentified Type 2	0	0	0	0	1	1	20
Unidentified Type 3	0	0	0	1	0	1	20
Unidentified Type 4	0	0	0	1	0	1	20
Unidentified Type 5	0	0	0	1	0	1	20
Unidentified Type 6	0	0	0	1	0	1	20
Unidentified Type 10	0	0	0	1	0	1	20
Unidentified Type 11	0	0	0	1	0	1	20

Unidentified Type 13	0	0	0	1	0	1	20
Unidentified Type 25	0	0	0	1	0	1	20
Unidentified Type 36	0	0	0	1	0	1	20
Unidentified Type 37	0	0	0	1	1	2	40
Unidentifiable	0	0	1	1	1	3	60
TOTAL	0	0	3	33	8		
Percentage	0.00	0.00	8.33	91.67	22.22		

Appendix D: BALERNO SHELTER 2 RESULTS

Table D.1: Species Counts and Locations for Balerno Shelter 2

Location	Level	Species (Scientific)	Count				Comments
			Tot.	F	Br	Bu	
H7	Grey-Brown 5-10	Citrullus lanatus	1		1		Wild watermelo n
H7	Grey-Brown 5-10	Unidentified Type 5	1	1			
H7	Grey-Brown 5-10	Unidentifiable	1		1		
I7	Grey-Brown 5-10	Momordica balsamina	1	1			Balsam pear
I7	Grey-Brown 5-10	Unidentifiable	1				

Table D.2: Seed Sample from area surrounding Balerno Shelter 2

Location	Level	Species (Scientific)	Count				Comments
			Tot.	F	Br	Bu	
Surrounding Area	Surface	Acacia cf. davyi	6				Seed Sample
		Bridelia mollis	2	2			Seed Sample, Velvet-leaved bridelia
		Citrullus lanatus	6	4	2		Seed Sample, wild watermelon
		Grewia bicolor	20		13		Seed Sample, white raisin
		Grewia species	1		1		Seed Sample
		Lannea schweinfurthii var. stuhlmannii	8		3		Seed Sample, false marula
		Momordica balsamina	6	1	5		Seed Sample, balsam pear
		Vangueria infausta	1		1		Seed Sample, wild medlar
		Unidentified Type 2	1				Seed Sample
		Unidentified Type 37	14		2		Seed Sample
		Unidentifiable	24				Seed Sample

Table D.3: Presence Analysis for Balerno Shelter 2

Species	H7	I7	TOTAL	%
Citrullus lanatus	1	0	1	50
Momordica balsamina	0	1	1	50
Unidentified Type 5	1	0	1	50
Unidentifiable	1	1	2	100

TOTAL	3	2	
Percentage	75	50	

Appendix E: Recorded Plant Uses of Recovered Plants

This appendix lists and illustrates the recorded uses for the plant species recovered at all three cave sites. The list is not exhaustive, but shows how important and well known most of these species are. The uses of species have been taken from multiple cultures and groups of people, not only those occupying the cave sites. This is for two reasons: ethnographical research into the plant use of people in the past has centred on some groups and not others, resulting in no plant-use background for any of the communities in the cave, and also because culture contact is suggested at all three cave sites; important plant uses may have been shared and known by multiple groups of people. The language of synonyms is indicated in brackets where known.

Anacardiaceae

The Anacardiaceae or Rhus or mango family is the fourth largest family of tree in southern Africa with a minimum of eighty native tree species (SANBI 2012; Hyde *et al* 2013a). This family includes many species with edible seeds and/or fruits but also includes species that have poisonous resins (for example, poison ivy) (Hyde *et al* 2013a). The family is represented by four species at Historic Cave.

Lannea discolor (Sond.) Engl

The wild grape, tree grape or live-long is a medium sized deciduous tree, sometimes with copperish bark (Tredgold 1986: 108; Hutchings 1996: 178; SANBI 2012; Hyde *et al* 2013a). The flowering period for this tree is between September and October (Hyde *et al* 2013a). Fruits appear between October and November (Tredgold 1986: 108). The fruit of the tree is black or purple, grape-like and edible (Tredgold 1986: 108; Long 2005; Hyde *et al* 2013a). These fruits are eaten fresh (Hyde *et al* 2013a). The hard skin of the grape-like fruits is usually discarded instead of eaten (Tredgold 1986: 108).

The timber of this tree can be used as poles and posts or as fuel for fires (Long 2005; SANBI 2012; Hyde *et al* 2013a). It is possible for fences made out of this wood to take root and thrive again, hence the 'live-long' common name (Tredgold 1986: 108; SANBI 2012; Hyde *et al* 2013a). The wood can be used to make utensils and the soft wood is pounded to make plates and spoons (Tredgold 1986: 108; Long 2005). The bark of the tree can be stripped for making twine (Tredgold 1986: 108; Long 2005). Red dye is another product of this tree's bark (Tredgold 1986: 108).

Medicinally, the bark and the roots of the wild grape can treat many ailments: abscesses, boils, bladder and bowel problems, convulsions and fits, diarrhoea, dizziness, sore eyes, female sterility, whooping cough and for children's disorders including fevers and constipation (Tredgold 1986: 108; Hutchings 1996: 178;Van Wyk *et al* 1997: 164; Long 2005; SANBI 2012; Hyde *et al* 2013a). The bark and the roots can prevent vomiting and the roots can help with diarrhoea (Hutchings 1996: 178; Van Wyk *et al* 1997: 164; Long 2005). Fibres and twigs can form bandages and splints for broken bones (Hutchings 1996: 178). Swazi people know this tree as the 'tree of forgetfulness' which harboured benevolent spirits (Tredgold 1986: 108). Enemies meeting there would reconcile their differences (Tredgold 1986: 108). These trees are the favourite trees of ancestors, according to Zambian people (Tredgold 1986: 108).

Lannea schweinfurthii (Engl.) Engl. var. stuhlmannii (Engl.) Kokwaro

The false marula is a small to medium sized tree with many cultural, religious and medicinal functions (Tredgold 1986: 108; Hutchings 1996: 178; Long 2005; Venter & Venter 2009: 206; Hyde *et al* 2013a). Similar to *Lannea discolor*, the tree is known to some as the 'tree of forgetfulness' and is said to harbour benevolent spirits to protect and to heal the people (Long 2005). Decoctions made out of the rootbark and a fungus that grows on the roots by the Venda help a family member forget a deceased relative; the decoctions can help someone forget any disagreeable event (Hutchings 1996: 178). The decoctions protect against sleeping sickness (Hutchings 1996: 178). Roots provide a snuff used to sedate patients and the leaves can be used as a dressing for boils and sores (Hutchings 1996: 178; Long 2005). The plant is used to treat abscesses, diarrhoea and sores (Hutchings 1996: 178; Van Wyk *et al* 1997: 164; Venter & Venter 2009: 206). Pregnant women can use the leaves to relieve stomach pain or apply leaf poultices to the abdomen to accelerate childbirth in Eastern Africa (Hutchings 1996: 178). The tree also provides a purple dye and the bark can be utilized in tanning processes (Long 2005; Venter & Venter 2009: 206). Timber is obtained from the tree (Long 2005; Venter & Venter 2009: 206). The purple fruit is edible (Tredgold 1986: 108-109; Long 2005; Venter & Venter 2009: 206). The false marula produces flowers between November and March (Tredgold 1986: 108; Long 2005; Venter & Venter 2009: 206; Hyde *et al* 2013a).

SEARSIA LANCEA (L.F.) F.A. BARKLEY

The willow rhus or karee is a shrub or small- to medium-sized evergreen tree, depending on environmental conditions (Venter & Venter 2009: 262; SANBI 2012; Hyde *et al* 2013a). The flowering period for the willow rhus is usually between April and September, with fruits occurring between September and January (Venter & Venter 2009: 262; SANBI 2012; Hyde *et al* 2013a). The fruit is edible for humans (Venter & Venter 2009: 262; SANBI 2012). The fruits are an important ingredient in a honey beer which is possibly the origin for the common name of the tree (SANBI 2012). Dried fruits can be used to make tea (Venter & Venter 2009: 262).Tannins are found in the bark, twigs and leaves of the plant, making it useful for tanning (Watts & Breyer-Brandwijk 1932: 109: Venter & Venter 2009: 262; SANBI 2012). The wood of the karee has been used for fence posts, tool handles, bowls, tobacco pipes and bows in the past (SANBI 2012).

Ecologically, the willow rhus is useful for stabilising soil to prevent erosion and raising the underground water table (SANBI 2012). The tree provides both shade and food for local animals; bees and insects are attracted to the flowers (Venter & Venter 2009: 262; SANBI 2012). The fruit of the karee is eaten by some browsers and the fruit provides an important food source in times of drought (Venter & Venter 2009: 262; SANBI 2012). The leaves of this tree can also provide fodder for livestock (Venter & Venter 2009: 262; SANBI 2012). However, resins in the leaves can taint the flavour of the milk if the livestock browse the leaves extensively (Venter & Venter 2009: 262; SANBI 2012).

SCLEROCARYA BIRREA (A.RICH.) HOCHST. SUBSP. CAFFRA (SOND.) KOKWARO

The marula, or cider tree, is an incredibly useful plant, important in many cultures and almost every part of the tree has some function (Quin 1959: 86; Tredgold 1986: 120; Hutchings 1996: 177; Van Wyk *et al* 1997: 234; Long 2005; Venter & Venter 2009: 274; Operation Wildflower 2012; SANBI 2012; Hyde *et al* 2013a). It was a criminal offence to cut down a living marula tree in the former Venda homeland (SANBI 2012). This medium- to large-sized deciduous tree has edible fruit that is very nutritious and highly sought out by humans and animals alike (Quin 1959: 86; Tredgold 1986: 120; Hutchings 1996: 177; Venter & Venter 2009: 274; Operation Wildflower 2012; SANBI 2012; Hyde *et al* 2013a). Animals are known to become intoxicated after eating fruit that is fermented, usually on the ground (Tredgold 1986: 120). The fruits of the marula tree generally fall during autumn, between February and June, and turn from green to yellow as they mature on the ground (Quin 1959: 86; Venter & Venter 2009: 274; Operation Wildflower 2012; SANBI 2012). Some trees produce fruit that is more palatable than fruits on other trees (Quin 1959: 87). Marula trees produce large amounts of Vitamin C-rich fruit (Quin 1959: 87-89; Venter & Venter 2009: 274). The fruit can be eaten fresh or made into a type of jelly, added to porridge, condiments and relish (Quin 1959: 90; Tredgold 1986: 120; Venter & Venter 2009: 274; Operation Wildflower 2012; SANBI 2012).

The nuts and leaves are edible – the nuts can be eaten as they are or together with vegetables (Quin 1959: 90; Van Wyk *et al* 1997: 234; Long 2005; SANBI 2012). The embryos contained within the hard nut inside the fruit can be eaten (Venter & Venter 2009: 274; Operation Wildflower 2012; Hyde *et al* 2013a). Marula eyes, plugs or embryos are highly important and serving them is seen as a mark of respect to guests, due to the effort required to get them (Quin 1959: 90; Tredgold 1986: 120). The kernels can also be added to sliced meat to preserve it as a type of biltong (Tredgold 1986: 120). To obtain the plugs, the Pedi use a special tool which is made from the thorn of *Acacia karroo,* which is rounded off at the butt and shaved smooth (Quin 1959: 90). The marula is important for alcohol manufacture, for beer and liquors (Watts & Breyer-Brandwijk 1932: 107; Quin 1959: 90; Tredgold 1986: 120; Van Wyk *et al* 1997: 234; Long 2005; Venter & Venter 2009: 274; Operation Wildflower 2012; SANBI 2012).The nuts contain oil (Watts & Breyer-Brandwijk 1932: 107; Quin 1959: 89; Tredgold 1986: 120; Venter & Venter 2009: 274). Some nuts contain so much oil that they can be lit and burn almost like a candle (Tredgold 1986: 120).

The bark of this tree can treat diarrhoea, dysentery, fever, headaches, haemorrhoids, indigestion, malaria, rheumatism and stomach problems and to get rid of ticks (Watts & Breyer-Brandwijk 1932: 107; Quin 1959: 86; Tredgold 1986: 120; Hutchings 1996: 177; Van Wyk *et al* 1997: 234; Long 2005; Venter & Venter 2009: 274; SANBI 2012). Both the roots and the bark act as a laxative (SANBI 2012). A drink from the leaves of the tree is a treatment for gonorrhoea (SANBI 2012). Tea made from the bark is taken to strengthen the heart or to cleanse the blood before marriage (Hutchings 1996: 177). The tree is seen as an aphrodisiac and a cure for infertility or sterility (Quin 1959: 86; Hutchings 1996: 177). A cosmetic lotion is made from marula nuts (Quin 1959: 90; Tredgold 1986: 120). The powdered bark of this tree may be able to determine the sex of an unborn child – a preparation of the female tree is taken by the mother to ensure a daughter or a preparation from the male tree for a son (Tredgold 1986: 120-121; Hutchings 1996: 177; Long 2005; SANBI 2012). The bark can also eliminate bad luck (Long 2005). Zulu neonatal females and their mothers are washed in water that has been heated over a fire made from twigs off the tree (Hutchings 1996: 177). This is done so that the daughter will become fertile, mature early and be characterised by softness and tenderness (Hutchings 1996: 177). Marula nuts are sometimes used by traditional healers in divining (SANBI 2012). Fresh marula branches are used in some burial rites (Tredgold 1986: 120).

The wood of this tree is used as timber and firewood but also as flooring, household items, utensils and crafts, as the wood is difficult to crack (Quin 1959: 86, 136-137; Tredgold 1986: 121; Long 2005; Operation Wildflower 2012; SANBI 2012). The wood is usually only used for small items as it is not durable (Tredgold 1986: 121). Marula nuts can be embedded into mud floors as a decorative feature (Quin 1959: 90). They are used decoratively by Ndebele women on their doorsteps (Tredgold 1986: 120). The bark of the marula provides dye (Tredgold 1986: 121; Long 2005; Operation Wildflower 2012; SANBI 2012). Strong rope can be made out of the inner layer of bark (SANBI 2012). Ink can be made by combining soot with the tannin-rich gum of the marula tree (Tredgold 1986: 121; SANBI 2012). Marula nuts are sometimes used as counters in traditional games (Tredgold 1986: 120). Sclerocarya birrea is not used as firewood by the Pedi people, because of its importance and usefulness (Quin 1959: 133-134).The marula tree provides fodder and forage for animals, especially browsers (Long 2005; Venter & Venter 2009: 274; Operation Wildflower 2012; SANBI 2012). Elephants are known to strip the bark (Long 2005).

ANNONACEAE

The *Annonaceae*, or custard-apple, family comprises lianes, shrubs and trees (Hyde *et al* 2013a). The leaves of the plants in this family are aromatic when they are crushed (Hyde *et al* 2013a). The family includes 2 150 species within 112 genera across the world (Hyde *et al* 2013a). The plants in the family grow in the tropics (Hyde *et al* 2013a).

FRIESODIELSIA OBOVATA (BENTH.) VERDC

Friesodielsia obovata is also known as the northern dwaba-berry, savannah dwaba-berry, the bastard dwaba berry or monkey fingers (Tredgold 1986: 69; Van Wyk & Van Wyk 1997: 158; Hyde *et al* 2013a). The species has a scientific synonym, *Popowia obovata* (Benth.) Engl. & Diels (Tredgold 1986: 69; Hyde *et al* 2013a). Common names in other languages include Muchinga, Mushinga or Munyani (Shona) and Umkonzombo (Ndebele) (Hyde *et al* 2013a). The plant occurs as a scrambling shrub or as a small tree (Tredgold 1986: 69; Van Wyk & Van Wyk 1997: 158; Hyde *et al* 2013a). Flowers appear on the plant between November and February (Hyde *et al* 2013a). This species is found in a variety of environmental zones, but often in riverine zones (Hyde *et al* 2013a). The distribution of the northern dwaba-berry is concentrated north of the Limpopo Province, in northern Botswana, Mozambique, northern Namibia and Zimbabwe, among other countries (Van Wyk & Van Wyk 1997: 158; Iziko: Museum of Cape Town. n.d.).

The fruits, a cluster of between three and twelve scarlet berries, are edible (Tredgold 1986: 69; Van Wyk & Van Wyk 1997: 158). They remain on the tree for most of the year, but they are edible throughout the summer (Tredgold 1986: 69). These sour berries are eaten fresh, as jelly or stewed (Tredgold 1986: 69; Van Wyk & Van Wyk 1997: 158). The fruits can be fermented to make wine (Tredgold 1986: 69).

The wood of this species can be used for building huts and fences, as the wood is resistant to termites (Van Wyk & Van Wyk 1997: 158). Thin stems can be used to bind items together (Van Wyk & Van Wyk 1997: 158). The roots of the northern dwaba-berry can be used medicinally, but Van Wyk and Van Wyk (1997: 158) do not elaborate on how it is used.

ARALIACEAE

The Araliaceae, ivy or cabbage family is represented at Balerno Main Shelter and Historic Cave by the genus *Cussonia*. There are twenty-five species of *Cussonia* in southern and tropical Africa and in the Mascarene Islands near Madagascar (Hutchings 1996: 221; Hyde *et al* 2013a). These plants are either trees or shrubs, depending on the species (Hutchings 1996: 221; Hyde *et al* 2013a).

Cussonia

Important species to note in this genus include *Cussonia natalensis* which is used to provoke rain and the bark, roots and fruit have a part to play in inyanga and sangoma ceremonies (Long 2005). The bark of this species is used to bring luck in war or law-related situations and has medicinal applications too (Long 2005). *Cussonia spicata* is another important species as the roots of this plant are edible and able to quench one's thirst (Long 2005; Venter & Venter 2009: 118). Parts of the tree can combat fever, nausea, malaria, mental illness, skin irritation in new-born babies, stomach ulcers, uterine pain and venereal disease (Hutchings 1996: 221; Venter & Venter 2009: 118). Many other species of *Cussonia* have medicinal properties and some also have edible portions (Watts & Breyer-Brandwijk 1932: 131; Long 2005; Hyde *et al* 2013a). Plants in the genus are used as an emetic for biliousness, colic, painful menstruation, parasites, rheumatism and nervous and mental problems (Watts & Breyer-Brandwijk 1932: 131). Xhosa people have been known to eat the underground portions of *Cussonia spicata* as sugar cane, although the above-ground parts are recorded as being bitter (Watts & Breyer-Brandwijk 1932: 131).

Arecaceae

The palm family (Hyde *et al* 2013a), Arecaceae, is represented by a specimen that resembles *Phoenix reclinata* at Historic Cave. This is a fairly large family, with over 2 500 species in 201 genera across the world, but only a few of these are found in Africa; most species are found in more tropical and warm areas (Hyde *et al* 2013a).

PHOENIX RECLINATA JACQ

The wild date palm, coffee palm, feather palm or Senegal date palm is an evergreen tree found over much of Africa, from the Eastern Cape in South Africa to Egypt (Watts & Breyer-Brandwijk 1932: 7; Hutchings 1996:22; Long 2005; Venter & Venter 2009: 232; Plants for a Future 2012; SANBI 2012; Hyde *et al* 2013a). It flowers between August and November (Venter & Venter 2009: 232; SANBI 2012; Hyde *et al* 2013a). Fruits appear on the tree between February and April (Venter & Venter 2009: 232; SANBI 2012).

The fruits of the wild date palm are edible and are eaten either raw or cooked (Long 2005; Venter & Venter 2009: 232; Plants for a Future 2012; SANBI 2012; Hyde *et al* 2013a). They are orange when ripe and sweet (Hyde *et al* 2013a). The leaves of the palm are edible (Long 2005). The heart of the crown is edible, and is sometimes eaten (Venter & Venter 2009: 232; SANBI 2012). The sap can be made into an alcoholic drink, which is described as a beer, cider or a palm wine (Watts & Breyer-Brandwijk 1932: 7; Long 2005; Venter & Venter 2009: 232; Plants for a Future 2012; SANBI 2012). The beverage is normally drunk in the forest by some people (Long 2005). The roots produce a gum that is appealing to children (Venter & Venter 2009: 232; SANBI 2012). The roasted seeds can serve as a substitute for coffee (Hyde *et al* 2013a).

The spines of the palm may have some medicinal aspects, but their specific use is not described (SANBI 2012). Wild date palm thorns are added to portions of other plants as a Zulu remedy for chest and lung diseases (Hutchings 1996: 22). Xhosa boys wear specific skirts made out of the leaves of the wild date palm during their initiation (SANBI 2012).

The leaves can be used for weaving and basketry (Long 2005). Hats to protect from the sun can also be made out of the leaves (Long 2005; Venter & Venter 2009: 232; SANBI 2012). Brooms and brushes can be made out of the stems of the wild date palm (Venter & Venter 2009: 232; Long 2005). The dried inflorescences of the tree can also be made into brooms (Venter & Venter 2009: 232; SANBI 2012). Fish enclosures are constructed out of the frond midrib (SANBI 2012). Ecologically, the fruits provide food for birds, monkeys, baboons, bushpig and multiple buck species (Venter & Venter 2009: 232; SANBI 2012).

ASPHODELACEAE

The *Asphodelaceae* or aloe family is made up mostly of succulent perennial herbs (Hyde *et al* 2013a). Some of these herbs can grow to the same height as small trees (Hyde *et al* 2013a). The leaves of these plants are borne in rosettes and have hard-toothed or spiny edges (Hyde *et al* 2013a). The leaves end in a sharp point (Hyde *et al* 2013a). The seeds can be winged in some species (Hyde *et al* 2013a). There may be six genera in the family and roughly five hundred species (Hyde *et al* 2013a). They are found in the tropics, but are concentrated in Arabia, the Canary Isles, Madagascar and southern Africa (Hyde *et al* 2013a). Leaf remains from the aloe family were found at Historic Cave and belong to the aloe species.

ALOE L.

The *Aloe* genus is characterised by succulent perennials but it does include shrubs and small trees (SANBI 2012; Hyde *et al* 2013a). Other names of aloe include: Aalwyn (Afrikaans) or aalwee (Afrikaans and Dutch); hlaba or lekhala (Southern Sotho); icena (Ndebele); imboma (Zulu); emadzima, inhlaba and imfe yemacoco lemako (unknown language) (Long 2005; SANBI 2012). The description and the distribution of the genus are very similar to that of the family (SANBI 2012; Hyde *et al* 2013a). Roughly 155 species of aloe are found in South Africa (SANBI 2012). Most of the species in the genus have their flowers in winter, but some species flower in spring or summer instead (SANBI 2012; Hyde *et al* 2013a).

Aloes are well-known for their medicinal qualities (Hutchings 1996: 32-35; van Wyk & Gericke 2007: 120, SANBI 2012). Today, these medicinal qualities are a threat to the populations of some species (SANBI 2012). *Aloe ferox* is an especially helpful indigenous plant and is economically important today (Watts & Breyer-Brandwijk 1932: 15-16; Van Wyk *et al* 1997: 40; SANBI 2012). *Aloe ferox* is used medicinally for relief of pain, arthritis, strains and hypertension (Fawole *et al* 2010:236). The species specifically has very good anti-inflammatory properties and some antioxidant and antimicrobial value (Fawole *et al* 2010). It can be used in both human and animal treatments (Hutchings 1996: 32; Van Wyk *et al* 1997: 40). Aloes are known to have antioxidant, anti-inflammatory, antiviral and antiseptic qualities (Hutchings 1996: 32; Long 2005; SANBI 2012). Various portions of aloe plants can be utilised for treating abrasions, arthritis, blisters, burns, bruises, colds, small cuts, conjunctivitis, diabetes, eye problems, eczema, high blood pressure, hypertension, ringworm, roundworm, sinusitis, skin irritations, stomach ache or cramps, sunburn, tapeworms, toothache, tuberculosis, venereal disease and open wounds (Watts & Breyer-Brandwijk 1932: 14-17; Tredgold 1986: 79; Hutchings 1996: 32-35; Long 2005; SANBI 2012). Parts of various species can act as an oral contraceptive taken by Zulu women, a laxative or vermicide and can be used as snuff or enemas for children and adults (Watts & Breyer-Brandwijk 1932: 15-17; Hutchings 1996: 33-35; Van Wyk *et al* 1997: 40; Long 2005; SANBI 2012). Multiple *Aloe* species are said to make childbirth easier and (Hutchings 1996: 32-33; Long 2005). Aloe plants also have medicinal applications for animals and are known to help calves and domestic birds (Hutchings 1996: 32-35; Watts & Breyer-Brandwijk 1932: 14-17). Some species may be toxic or narcotic (Hutchings 1996: 33).

Some animals are able to eat aloe plants, despite the sharp leaves and bitter sap (SANBI 2012). *Aloe parvibracteata* is an example of aloe species that is consumed by animals (Long 2005). Aloes can be eaten by humans in the form of jams, marmalades and preserves (SANBI 2012). Parts of multiple aloe species are edible (Long 2005). *Aloe greatheadii* var. *davyana* and *Aloe cooperi* is treated as a vegetable (Watts & Breyer-Brandwijk 1932: 14; Tredgold 1986: 79; Long 2005). Flower buds from *Aloe greatheadii* are viewed as a delicacy by some, but care must be taken in their preparation, or they may cause vomiting (Tredgold

1986: 79). Boiled buds are used to flavour the cooked leaves of some cultivated plants (Tredgold 1986: 79).

Aloe variegata is planted on graves by some people to provide an eternal life and is consequently known in Afrikaans as the kanniedood ('cannot die') (SANBI 2012). The Dlamini group is known to do this with multiple species of aloes; they do not eat the species they plant on graves (Long 2005). *Aloe arborescens* is perceived to be lucky (Long 2005). *Aloe ecklonis* is seen as protective and forms a charm for girls (Long 2005). *Aloe tenuior* is also utilised as for protection (Long 2005). Multiple other species are seen as protective (Hutchings 1996: 33-35). *Aloe barberae* is planted around homesteads to protect the home (Long 2005). *Aloe latifola* is burnt, crushed, boiled and sprinkled around the village by the Sothos to protect it from lightning (Watts & Breyer-Brandwijk 1932: 15). Zulus sprinkle infusions of pounded *Aloe arborescens* leaves to protect against storms (Hutchings 1996: 32). Aloe species can be utilised during the tanning process (Watts & Breyer-Brandwijk 1932: 15).

The ash created by burning *Aloe castanea* leaves repels weevils (Quin 1959: 28; van Wyk & Gericke 2007: 12; SANBI 2012). This ash is used to protect *Sorghum bicolor* and *Vigna unguiculata* in particular (Quin 1959: 28, 40). *Vigna radiata* seeds are very susceptible to weevils and so they are threshed together with the aloe ash several times throughout the storage period (Quin 1959: 49). *Aloe cryptopoda* provides a dye for wool (Long 2005). Aloes can be used to create enclosures for livestock or to create other boundaries (SANBI 2012).

BURSERACEAE

The Burseraceae or myrrh family is a family usually found in northeast Africa and North America, focused at the tropics (Hyde *et al* 2013a). The family contains 18 genera and 17 species (Paraskeva *et al* 2008). The myrrh family is represented by three species of *Commiphora* at both Balerno Main Shelter and at Historic Cave. One species is identified as *Commiphora schimperi*, one species is identified as a species that resembles *Commiphora mollis* and the third is a species of *Commiphora* that was not identified.

COMMIPHORA JACQ

Species within the *Commiphora* genus are known as corkwoods or commiphoras (SANBI 2012). Southern Africa is home to thirty-eight species and sub-species of corkwoods (Paraskeva *et al* 2008, SANBI 2012). There are no protected species of *Commiphora* in South Africa as there are no current threats to the plants (SANBI 2012).

The *Commiphora* genus is a variable group of species and so the genus is difficult to describe at a general level (SANBI 2012). Corkwoods can occur as either trees or shrubs (Hutchings 1996: 154; SANBI 2012; Hyde *et al* 2013a). Commiphora fruits often have a fleshy or leathery skin with a single stone inside (Tredgold 1986: 97; SANBI 2012; Hyde *et al* 2013a). Fruit pulp from *Commiphora marlothii* is edible, fresh or as jelly or jam, and the roots are cleaned and chewed when raw for the sweet juice (Tredgold 1986: 97). All corkwoods excrete a milky or watery sap when they are damaged but in some species, the plants also release a gum-like resin that smells pleasant and has medicinal value (Tredgold 1986: 97; Hutchings 1996: 154; SANBI 2012). The gum and resin of *Commiphora africana* can be applied for fevers and repelling termites (Hutchings 1996: 154). Resin from *Commiphora merkeri* treats skin disease (Tredgold 1986: 97).

Besides the medicinal resin, corkwoods have other medicinal applications (SANBI 2012). Various parts of certain species are used medicinally such as the fruit of *Commiphora africana* for stomach problems or its bark for treating snake bites (Hutchings 1996: 154; Long 2005; Paraskeva *et al* 2008).Eating the berries of *Commiphora pyracanthoides* can result in a stinging feeling in the mouth and days of swelling and a burning sensation on the lips (Watts & Breyer-Brandwijk 1932: 92). Other medicinal applications include treatments for boils, chest problems, colds, eye inflammation; fever, gall bladder ailments, malaria, scorpion stings, skin infections, stomach aches, tumours, typhoid and wounds (Watts & Breyer-Brandwijk 1932: 92; Hutchings 1996: 154-155; Paraskeva *et al* 2008). The genus also has some anti-cancer, anti-inflammatory, antimicrobial, antioxidant and antiseptic properties (Paraskeva *et al* 2008).

Some species are able to store water in their roots, which can be accessed by humans by chewing and sucking on the roots (Long 2005; SANBI 2012). The heartwood of *Commiphora harveyi* is sometimes eaten in drought situations (Long 2005). Other species may be used as fence-posts, insecticides and provide food for beetles which have poisons for hunting (Long 2005; SANBI 2012). Poles made out of the wood are used in certain ceremonies (SANBI 2012). While the wood is soft, it is unsuitable for carving household items (SANBI 2012). *Commiphora harveyi* is forbidden inside the home by some cultures (Long 2005).

Commiphora trees are ecologically valuable as they provide food and water to animals in hot, arid landscapes (SANBI 2012). Many species of corkwood are able to store water in parts of their stems; animals browse on these parts for the moisture (SANBI 2012). Animals also browse on the leaves of the corkwood for food (SANBI 2012). Some species of this tree are especially attractive to elephants (SANBI 2012). Despite the gum having a strong taste to avoid excessive damage, corkwood trees can be extensively damaged by elephants (SANBI 2012). *Commiphora* trees in the Mapungubwe National Park are a good example of this occurrence (SANBI 2012).

COMMIPHORA MOLLIS (OLIV.) ENGL.

This small to medium-sized tree is known as the velvet-leaved corkwood, velvet commiphora or the soft-leaved commiphora (Tredgold 1986: 97; Hyde *et al* 2013a). This tree flowers in October and November (Hyde *et al* 2013a). Fruits of this tree are small, red when ripe and rounded (Hyde *et al* 2013a). These fruits are edible (Tredgold 1986: 97). Game and stock animals have been known to dig up the juicy roots to eat them (Tredgold 1986: 97).

Commiphora schimperi (O. Berg) Engl.

The glossy-leaved corkwood is a small tree but can also occur as a shrub (Hyde *et al* 2013a). Flowering occurs on this tree between August and October (Hyde *et al* 2013a). This corkwood produces small fruit that is a pale pink (Hyde *et al* 2013a).

Some portions of the plant are edible, but these parts are not specified by Plant Resources of Tropical Africa (n.d.). Masai are known to chew the resin that oozes from the bark (Plant Resources of Tropical Africa n.d.). The Masai also chew the roots of the younger plants due to their sweet taste, or for thirst (Plant Resources of Tropical Africa n.d.). Medicinally, the glossy-leaved corkwood can treat diarrhoea and digestive problems (Plant Resources of Tropical Africa n.d.). The roots are used as a tonic for adults and children (Plant Resources of Tropical Africa n.d.).

The tree can provide feed for animals (Plant Resources of Tropical Africa n.d.). The wood of the tree can be used for containers and household items (Plant Resources of Tropical Africa n.d.). The wood is very useful in starting fires through friction; *Commiphora schimperi* is used by the Pedi, together with *Grewia bicolor*, as soft and hard wood respectively to start fires this way (Quin 1959: 132; Long 2005; SANBI 2012; Plant Resources of Tropical Africa n.d.). The wood can also be used as fuel for these fires (Plant Resources of Tropical Africa n.d.). However, because of its multiple uses, the *Commiphora schimperi* tree is not used as fuel-wood by the Pedi people (Quin 1959: 133-134).

Buxaceae

As described in the previous chapter, *Buxaceae* seeds were recovered from Historic Cave. Plant species belonging to this family are used for their wood, which is used for carving and creating musical instruments (SANBI 2012; Long

2005). The wood of some species (e.g. *Buxus macowanii,* found in the Eastern Cape) can also be used for firewood (Long 2005).

CELASTRACEAE

The *Celastraceae,* spindle-tree or spike thorn family (SANBI 2012; Hyde *et al* 2013a) is represented by two species, one at Historic Cave and the other at Balerno Main Shelter. This latter species could be identified to the family only, and not a genus or species within the family– it was originally identified as a species of *Cassine* but this is a genus of synonyms for other species. Therefore, this plant specimen was assigned to one of the *Elaeodendron*, *Mystroxylon* or *Cassinopsis* genera (Hyde *et al* 2013a, 2013b). The *Elaeodendron* genus is made up of glabrous trees or shrubs (Hyde *et al* 2013a). The genus is made up of fifteen species in the Old World tropics, Central America, the West Indies and South Africa (Hyde *et al* 2013a).

The family contains 88 genera and 1 300 species worldwide (Hyde *et al* 2013a). It comprises of woody climbers, shrubs and trees (Hyde *et al* 2013a).

ELAEODENDRON TRANSVAALENSE (BURTT DAVY) R.H. ARCHER

The anthill saffron, Transvaal saffronwood or bushveld saffron is found as a small tree or as a shrub (Van Wyk *et al* 1997: 72; Hyde *et al* 2013a). The plant flowers between December and April (Hyde *et al* 2013a). The bushveld saffron produces edible yellow fruits (Hyde *et al* 2013a). The bark of the tree is used as traditional medicine for venereal disease, stomach cramps, diarrhoea, fever, haemorrhoids and intestinal cramps (Hutchings 1996: 186; Van Wyk *et al* 1997: 72; van Wyk & Gericke 2007: 122). The tree can be used as an astringent and a stomach cleanser (Van Wyk *et al* 1997: 72).

A species of *Elaeodendron* was used in present-day Zimbabwe in trials to find if someone was guilty of an action– part of the plant is ingested and, if the suspect becomes rapidly unconscious and doesn't regurgitate, he or she is seen as guilty (Watts & Breyer-Brandwijk 1932: 111). Vomiting and purging occurs later when the subject of the trial recovers (Watts & Breyer-Brandwijk 1932: 111).

COMBRETACEAE

This family, the combretum family, is made up of five hundred species within twenty genera distributed across the tropics and warm regions (Hutchings 1996: 213; Hyde *et al* 2013a). It is represented here by the *Combretum* genus, which includes 25 species itself (Hyde *et al* 2013a).

COMBRETUM

Plants in the *Combretaceae* family, bushwillows, are trees, shrubs or woody climbers (Hyde *et al* 2013a). Bushwillows have a variety of uses, from food to medicinal and cultural (Long 2005; Venter & Venter 2009: 102-111). Some bushwillow species have edible portions, including gum and fruit, and the leaves of *Combretum hereroense* are used as a substitute for tea (Long 2005; Venter & Venter 2009: 102-111). Medicinally, many parts of the various species are used to treat ailments including abortion, bleeding after childbirth, colds, conjunctivitis, constipation, convulsions, coughing, dysentery, eye problems, fever, heart disease, infertility, nose bleeds, bodily pains, snake bites, stomach problems, wounds, 'weakness of the body' in females and venereal disease and to stimulate the appetite (Watts & Breyer-Brandwijk 1932: 128; Hutchings 1996: 213-215; Long 2005; Venter & Venter 2009: 102-111). Some species may be toxic (Watts & Breyer-Brandwijk 1932: 128; Hutchings 1996: 213). Due to their medicinal properties, some *Combretum* species are avoided as firewood by the Pedi people (Quin 1959: 133-134).

Multiple combretum species provide fodder for animals (Hutchings 1996: 214; Long 2005; Venter & Venter 2009: 102-111). Ash made from *Combretum imberbe* is sometimes used as toothpaste (Long 2005). The wood of many species can be used as timber in different ways because the wood is hard and borer resistant (Hutchings 1996: 214; Long 2005; Venter & Venter 2009: 102-111). The roots of *Combretum erythrophyllum* provide a brown dye and *Combretum molle* a red dye (Long 2005). *Combretum apiculatum* subsp. *apiculatum* and *Combretum zeyheri* are used in Incwala ceremonies and funerals (Long 2005). The Hereros believe that *Combretum imberbe* trees are their ancestors (Long 2005). Zulu people sometimes use the plant as a charm to impair a rival (Hutchings 1996: 214).

CUCURBITACEAE

Multiple examples of Cucurbitaceae have been identified at all three sites. This family is also known as the cucumber or pumpkin family, and there are many edible species within it (Quin 1959; SANBI 2012; Hyde *et al* 2013a). Many species within this family are important economically and in terms of food plants to people (Quin 1959; SANBI 2012).

CITRULLUS LANATUS (THUNB) MATSUM. & NAKAI

In South Africa, the tsamma melon flowers between January and April and produces fruit during February to May, although this is influenced by the rainfall or lack thereof (SANBI 2012). The shape and size of the fruit varies but they are usually oval and mottled or striped green and cream in colour (Tredgold 1986: 3).Wild plants are found in the Kalahari region but the plant is cultivated all over the world (Quin 1959: 49; Hyde *et al* 2013a). The tsamma melon is drought tolerant, often thriving when other species die off, but it is vulnerable to frost (Quin 1959: 49; Plants for a Future 2012; SANBI 2012). It is common in South Africa and is found in the Northern Cape, Northwest Province and Limpopo (Operation Wildflower 2012). The fruit has a history of being cultivated, usually together with other crops such as sorghum and maize (Quin 1959: 50; Tredgold 1986: 3; SANBI 2012).

The bitter, tsamma, water or stock melon is an important species as it can provide both food and water to humans and animals (Watts & Breyer-Brandwijk 1932: 180; Quin 1959: 49; Tredgold 1986: 3; Long 2005; Operation Wildflower 2012; Hyde *et al* 2013a). According to MacCrone (1939, quoted in Quin 1959:73), SANBI (2012) and Operation Wildflower (2012), humans may be able to survive for multiple weeks on nothing but the tsamma melon in a desert environment. The raw fruit is edible for humans (Tredgold 1986: 3; Operation Wildflower 2012; Plants for a Future 2012; SANBI 2012; Hyde *et al* 2013a). The whole fruit can be roasted in the sand under hot coals, which may make the fruit more palatable (SANBI 2012). Flesh from the fruit can be sundried and eaten (Quin 1959: 51). The flesh of the fruit may be combined with maize meal and cooked to produce a porridge (Quin 1959: 51; Tredgold 1986: 3; SANBI 2012). The tsamma melon has a large water content – over 90% in some instances (Quin 1959: 50; Plants for a Future 2012; SANBI 2012). To drink the pulp, a hole is cut into the fruit, the middle portion of the fruit is eaten and the pulp that is left is ground into a watery pulp (SANBI 2012). The seeds are usually set aside for other uses when the pulp is drunk (SANBI 2012). The seeds can be pounded, steeped in boiling water and then cooled to create a fruity drink (Tredgold 1986: 3). The seeds can be dried, roasted, winnowed and then ground and stored as a nutritious food or they can simply be ground into a meal, or a flour for making bread (Watts & Breyer-Brandwijk 1932: 180; Quin 1959: 51; Tredgold 1986: 3; Operation Wildflower 2012; Plants for a Future 2012; SANBI 2012; Hyde *et al* 2013a). The flour from the seeds can also be used as a detergent as it contains saponin and can be used to make soap (Plants for a Future 2012; SANBI 2012). Seeds can be eaten as is (Tredgold 1986: 3). The seeds from the bitterest varieties of the tsamma melon are still edible (SANBI 2012). When young and tender, the leaves and fruit can be cooked as green vegetables or used as pot-herbs (Quin 1959: 51; Tredgold 1986: 3; Plants for a Future 2012; SANBI 2012). Jam can be made out of the fruit of the melon (Tredgold 1986: 3; Operation Wildflower 2012; Plants for a Future 2012; SANBI 2012). The juice of the melon can be used to make a syrup (Plants for a Future 2012).

The melon is also used to make a cream for the skin (Operation Wildflower 2012). The hollowed out fruit can be used for storage or as a cooking vessel (SANBI 2012). Matured wild fruits remain fleshy and intact for up to a year after they have been removed from the parent plant; these fruits can also be stored underground for long periods of time (Quin 1959: 51; SANBI 2012).

The more bitter fresh fruits have medicinal qualities and can be used as a diuretic or an effective purgative, especially to expel accumulations of fluid in the body (Watts & Breyer-Brandwijk 1932: 180; Tredgold 1986: 3; Plants for a Future 2012; SANBI 2012). The fruit contains lycopine which helps protect against heart attacks. The rind of the melon can be prescribed against alcohol poisoning and diabetes (Plants for a Future 2012). When eaten fully ripe or overripe (almost to the point of putrefaction) it may reduce fevers (Plants for a Future 2012). The root of the tsamma melon is a purgative and can be used to induce vomiting in a patient (Plants for a Future 2012). The seeds contain vitamin C as well as oil which can be used for cooking (Tredgold 1986: 3; SANBI 2012). This oil is a vermicide that can be used to expel parasites and can paralyze tapeworms and roundworms (Plants for a Future 2012; SANBI 2012). Juice from pounded leaves which has been added to some water can be applied to sores on domestic animals (Tredgold 1986: 3).

CUCUMIS METULIFERUS E.MEY. EX NAUDIN

The African horned cucumber, spiny cucumber, jelly melon, spiny cucumber or bitter melon is a climbing herb with edible fruits that are covered in fleshy spines (Tredgold 1986: 4; Long 2005). Fruits therefore need to be handled with care (SANBI 2012). The African horned cucumber flowers between December and roughly May (Long 2005; SANBI 2012). Fruit occurs from about January to July (Tredgold 1986: 4; SANBI 2012). The fruits are usually mottled and grey-green to orange-yellow in colour, turning a bright shade of orange or red when they are ripe (Tredgold 1986: 4; Long 2005; SANBI 2012). The fruits of the African horned cucumber range from not bitter at all to very bitter; the latter fruits are very unpalatable and are possibly poisonous (Tredgold 1986: 4; SANBI 2012). Cooking these bitter fruits should remove the toxicity (SANBI 2012). However, tasting the fruits is the only way to distinguish between the bitter and non-bitter fruits (SANBI 2012).

The fruit is more often eaten in times of scarcity rather than as a stable food source (Plants for a Future 2012; SANBI 2012). The fruit can be eaten raw, like a cultivated cucumber, or the flesh of the fruit can be scooped out from inside (Tredgold 1986: 4; Plants for a Future 2012; SANBI 2012). The flesh of the fruit can be made into a jam, pickled in vinegar, or split open and dried in the sun for storing (Tredgold 1986: 4; SANBI 2012). The fruit can also be eaten after it has been cooked – the Khoisan have been known to roast it and then strain the flesh of the fruit (SANBI 2012). Unlike today's cultivated cucumbers, the African horned cucumber has no layer of firm flesh and so has a higher water content (SANBI 2012). This species is an important source of water for both people and animals in arid places (SANBI 2012). The leaves of the spiny cucumber are edible (Long 2005; Plants for a Future 2012). Watts and Breyer-Brandwijk (1932: 182) report that the leaves could be poisonous. The leaves can be cooked in the same way as spinach, with or without the addition of ground nuts, or they can be added to maize meal (Tredgold 1986: 4; SANBI 2012). The seeds can be eaten raw (Plants for a Future 2012).

The plant has medicinal and insecticidal properties (Long 2005). The melon contains saponin which has many medicinal properties but it can also be toxic (SANBI 2012). The root is also medicinal – a decoction of the root can be used to lessen the pain after childbirth and the boiled root can be used as a cure for gonorrhoea (Tredgold 1986: 4; SANBI 2012). The jelly melon seeds are medicinal (Plants for a Future 2012). They are ground up into a flour and water is added to create an emulsion which is eaten (Plants for a Future 2012). Taken with a purgative, this expels tapeworms and other parasites from the body (Plants for a Future 2012). Some people in the Okavango region mix roots that have been pounded with fat and smear this mixture onto their bodies to prevent ghosts or spirits entering their house (SANBI 2012).

Cucurbita maxima - Duchesne. ex Lam.

The winter squash or pumpkin is an annual climber that is known for its edible fruit (Tredgold 1986: 4; Plants for a Future 2012). The fruit of the plant is important, as it is a source of many vitamins and protein when not many other such sources are available (Tredgold 1986: 5). Some varieties of this squash can be stored, either raw or cooked, for up to nine months (Tredgold 1986: 5; Plants for a Future 2012). The fruit is usually eaten cooked and can be added to porridges (Tredgold 1986: 5-6; Plants for a Future 2012). Both the seeds and the fruit can be ground very finely (the fruit must be dried first) and combined with cereals for baking (Plants for a Future 2012). The seeds can also be eaten, either raw or cooked, and contain an edible oil (Tredgold 1986: 5; Plants for a Future 2012). Young flowers, leaves and stems can all be eaten cooked, although the young flowers can also be eaten raw (Tredgold 1986: 5; Plants for a Future 2012). The young leaves contain some protein (Plants for a Future 2012). The leaves can be dried and stored for some time (Tredgold 1986: 5). The leaves are popular in Zimbabwe and are often added to relishes (Tredgold 1986: 5).

The winter squash has some medicinal uses too (Plants for a Future 2012). As with *Cucumis metuliferus*, the seeds and husks of the squash can be used with a purgative to expel parasites; they are ground into flour, mixed with water and eaten (Plants for a Future 2012). This vermicide is less effective than that of other plant species, but it is safe for children, pregnant women and weakened patients to use (Plants for a Future 2012). The seeds are a diuretic and the oil can also be used as a nerve tonic (Plants for a Future 2012). The pulp of the fruit can be used to soothe burns, boils and other inflammations (Plants for a Future 2012). The fruit can be used to make a face-mask to treat dry skin (Plants for a Future 2012). Slow-growing crops are believed to be the work of chameleons (Tredgold 1986: 6).

*L*AGENARIA SICERARIA *(M*OLINA*) S*TANDL*.*

Known as the wild melon, bottle gourd and calabash, this plant is an annual climbing herb with green, hard-shelled fruits (Long 2005; SANBI 2012; Hyde *et al* 2013a). The calabash flowers during April and May, with fruit appearing from April to July (SANBI 2012). The fruit matures into a yellow or pale brown colour; when ripe, the flesh of the fruit dries out completely, leaving almost nothing but the seeds encased in a thick, hard and hollow shell (SANBI 2012).

This particular plant has a wide variety of uses, from food and medicine to storage and other utilitarian uses (Quin 1959: 53-55; Long 2005; SANBI 2012). The fruit of the wild melon is edible (Long 2005). As in other Cucurbitaceae, bitter and poisonous fruits grow alongside the edible, non-bitter fruits (SANBI 2012). Young, green fruits of the calabash are edible, eaten as a cooked vegetable (Quin 1959: 53-54; Plants for a Future 2012; SANBI 2012). However, some people consider the fruits a famine or emergency food (SANBI 2012). After they have been boiled to eliminate the toxins, young gourd leaves are edible (Long 2005). They are commonly eaten as a vegetable or used as potherbs (Quin 1959: 54; SANBI 2012). They can be added to maize porridge when they are still fresh or they can be made into a relish (SANBI 2012). The leaves can be dried and stored for later use (Quin 1959: 53-54; SANBI 2012). The seeds of this plant are edible when roasted (Long 2005). The seeds can also be made into a vegetable curd similar to tofu and the oil from the seeds is useful for cooking (Quin 1959: 54; Plants for a Future 2012).

The body of the fruit can be used for storage containers and non-bitter fruits are used for storing liquids suck as milk, water and beer (Quin 1959: 53-54; Long 2005; SANBI 2012). The hard-shelled fruits are used as bottles, bowls, and musical instruments and in making utensils including dishes, scoops, ladles urns and flasks (Quin 1959: 53, 135; Long 2005; SANBI 2012).

Medicinally, gourd can be used to treat stomach aches and swollen glands (Long 2005). Globally, various medical applications have been recorded for the leaves, seeds and the fruit (SANBI 2012). The pulp surrounding the seeds is a purgative and induces vomiting and the seeds themselves are used as a vermicide (Plants for a Future 2012). Leaves can be crushed to form a poultice for treating headaches (Plants for a Future 2012). Boiled seeds can be applied as a poultice to treat boils (Plants for a Future 2012). The stem bark, fruit rind and fruit are diuretic (Plants for a Future 2012). The fruit is also antilithic (which prevents and treats kidney and bladder stones) and a refrigerant (removes heat from the body and refreshes the patient) and can induce regurgitation (Plants for a Future 2012). The juice of the calabash fruit is used to treat stomach ailments, such as indigestion and ulcers (Plants for a Future 2012). The flowers act as an antidote to poison and extracts of the plant may have antibiotic properties (Plants for a Future 2012).

This species is found in woodland and savannah biomes together with Acacia trees and *Colophospermum mopane* trees, among other species and is also cultivated alongside sorghum and maize (SANBI 2012). *Lagenaria siceraria* is found in contexts including all four of these species at Historic Cave and Balerno Main Shelter; although no mopane remains were retrieved, it is the dominant species surrounding Balerno Main Shelter. *Lagenaria siceraria* is found in areas that receive 400 to 600mm of rain annually (SANBI 2012).

MOMORDICA BALSAMINA L.

This perennial climber is known as the bitter gourd, bursting beauty or balsam pear (Quin 1959: 72; Hutchings 1996: 304; Long 2005; SANBI 2012; Hyde *et al* 2013a). The whole plant has been described as smelling unpleasant, especially if bruised (SANBI 2012). *Momordica balsamina* bears flowers and fruit throughout the year, but especially from October through May (SANBI 2012). The plant is found in a range of rainfall zones, from 200 to 1 200mm per year (SANBI 2012).

The seeds of the balsam pear are covered in edible, sweet, sticky red flesh that is reported to taste like watermelon, although others have described fruit of the bitter gourd as possibly poisonous (Watts & Breyer-Brandwijk 1932: 179; Quin 1959: 72; Long 2005; SANBI 2012). The toxicity of the green and the ripe fruits is debated (SANBI 2012). Any toxins in the fruit are destroyed through cooking (SANBI 2012). The leaves and green fruit of the bitter gourd are edible if they are boiled and both parts are eaten as spinach is (Long 2005). The cooked leaves and young fruit are sometimes mixed with groundnuts or with porridge (SANBI 2012). The leaves are used as potherbs by the Pedi (Quin 1959: 72).

Medicinally, the fruit is a purgative, antispasmodic, causes vomiting and is used to improve digestion and appetite (Hutchings 1996: 304; Long 2005). Infusions of the plant are used to treat boils, earache, high blood pressure, stomach and intestinal problems and as a poultice for burns (Watts & Breyer-Brandwijk 1932: 179; Hutchings 1996: 304; SANBI 2012). The plant may be able to treat diabetes (Hutchings 1996: 304; SANBI 2012). Leaf infusions are used as anti-emetics to prevent vomiting (Hutchings 1996: 304; SANBI 2012). The Pedi add leaves of this plant to potherbs containing pumpkin leaves to negate the effects of eating premature pumpkin leaves (Quin 1959: 72). In the Okavango Delta, the plant is also used for abortions, chapped hands and feet, frostbite, haemorrhoids, headaches and sores (SANBI 2012). Also in the Okavango Delta, the fruit can be used to curse an enemy to cause the victim's stomach to burst open as the balsam pear's fruit does (SANBI 2012). The leaf sap can clean metal fairly effectively (SANBI 2012).

EBENANCEAE

The *Ebenanceae* or ebony family occurs as shrubs or trees and usually produces fruit in the form of a berry (Hyde *et al* 2013a). The family is made up of two genera which include a total of 485 species (Hyde *et al* 2013a). The seeds recovered from Historic Cave that belong to this family were identified as the genera *Diospyro*s and *Euclea*.

DIOSPYROS L.

The *Diospyros* genus includes trees and shrubs (Hyde *et al* 2013a). The plants in the genus produce berries, with two or more seeds included in the fruit (Hyde *et al* 2013a). Globally, there are 475 species in the genus (Hyde *et al* 2013a). The species are found in the tropics (Hyde *et al* 2013a). Fourteen *Diospyros* species are found in South Africa (SANBI 2012). Two species were identified at Historic Cave by G. Hall; one species was identified only to a species resembling the genus and the other as *Diospyros lycioides*.

Many species of *Diospyros* produce edible fruits (Tredgold 1986: 98-99; SANBI 2012). The Latin name means 'plant with edible fruit' (SANBI 2012). *Diospyros batocana* fruits are eaten only in times of famine (Tredgold 1986: 98). Seeds from *Diospyros whyteana* can substitute as coffee (Tredgold 1986: 99). The acidic fruits of Diospyros caffra are enjoyed by children (Tredgold 1986: 98-99). The fruits make for good jam and jelly and can also be pickled (Tredgold 1986: 99). Many other fruits are used in preserves, jam and jelly (Tredgold 1986: 98-99).

The wood of *Diospyros mespiliformis* is hard, durable and termite-resistant, making it useful for household items (Tredgold 1986: 98). The same tree can be used medicinally to treat dysentery, fevers, leprosy, ringworm and wounds (Tredgold 1986: 98). Other species have medicinal properties as well. The bark of *Diospyros pallens* is used to treat dysentery (Hutchings 1996: 234). Other species treat fractured bones, stomach and intestinal complaints, irritating skin rashes and strains (Hutchings 1996: 234). *Diospyros villosa* leaves or roots are bruised and applied to painful areas for up to an hour to soothe fixed internal pain of any kind (Hutchings 1996: 234).

DIOSPYROS LYCIOIDES DESF.

This tree is known as the monkey plum, blue bush, eastern blue-bush and red star apple (Tredgold 1986: 98; Hutchings 1996: 234; SANBI 2012; Hyde *et al* 2013a). Common names in other languages include: bloubos (Afrikaans); Mumbune, Mushawa, Mushumadombo, Musvotamhungu, Mutsvirikiti, Mutsvitsva or Nyatsvipa (Shona); Umbongisa, Umqathuva, or Umsungampule (Ndebele); Muthala (Venda); Lethanyu (Tswana); Monkga-nku (Southern Sotho); Mtloumana (Northern Sotho); Umbhongisa (Xhosa); Umbulwa (Zulu) and Umcafudane (Swati) (SANBI 2012; Hyde *et al* 2013a). The name 'bloubos' refers to the bluish colour of the leaves and has apparently been the basis for the names of certain towns in the Free State, including Bloubosdrift, Bloubospan, Bloubosdorn and Blouspoort (SANBI 2012). *Royena sericea* Bernh is a synonym for the scientific name (Hyde *et al* 2013a). There are four sub-species of *Diospyros lycioides* (SANBI 2012). The differences between the sub-species are in their distribution and characteristics of the leaves (SANBI 2012).

The plant occurs as a shrub or small tree that grows up to 6m tall and is deciduous (SANBI 2012; Hyde *et al* 2013a). The plant is found across South Africa in a wide variety of habitats between altitudes of 700 and 1740m above sea level (SANBI 2012; Hyde *et al* 2013a). Flowers are produced between September and December (SANBI 2012; Hyde *et al* 2013a). Fruit occurs between January and May (SANBI 2012).

The fruit produced by this tree contains sweet and edible pulp (Tredgold 1986: 98; SANBI 2012). The fruit stays on the tree until the following fruiting season begins (Tredgold 1986: 98). Fruits are eaten by multiple bird species, dassies (rock hyrax), monkeys and humans (SANBI 2012). The fruits can be used to make beer and the seeds, once roasted and ground, were used as a coffee substitute in the past (SANBI 2012).

The frayed ends of twigs or chewed roots can be used as a toothbrush (Tredgold 1986: 98; Hutchings 1996: 234; SANBI 2012). The black roots of the monkey plum are sometimes eaten after a meal and they turn the mouth red (Tredgold

1986: 98). When mixed with sheep's fat, the roasted and powdered roots make a plaster for thorns and can also relieve pains in the body (SANBI 2012). Nama people in Namibia believe that the tree could be used as an emetic to induce vomiting if the tree was cut with an upward stroke; a downward stroke would result in a purgative (SANBI 2012). *Diospyros lycioides* is used to treat epilepsy and bloody stool (Hutchings 1996: 234).

The wood of the blue bush can be used in hut construction or to make household utensils (SANBI 2012). Dye can be produced from the roots and the bark can be used for tanning (SANBI 2012).

EUCLEA

These plants are identified as either shrubs or trees and are usually evergreen (Hyde *et al* 2013a). There are 12 species of *Euclea* and they are found in Africa, Arabia, Socotra in the Indian Ocean and the Comoro Islands east of Mozambique (Hutchings 1996: 232; Hyde *et al* 2013a).

Species of *Euclea* have multiple purposes, especially medicinal purposes (Long 2005). Various portions of these plants are used to treat abdominal complaints, chest pains, coughs, children's constipation, convulsions, diabetes, epilepsy, headaches, heart disease, infertility, measles, muscular rheumatism (when it is perceived as having been caused by witchcraft), pneumonia, skin lesions caused by leprosy, sores, stomach complaints, swellings, syphilis, toothache and wounds (Watts & Breyer-Brandwijk 1932: 138; Hutchings 1996: 232-233; Van Wyk *et al* 1997: 128; Long 2005). Many species are administered as enemas (Hutchings 1996: 232-233). The plant can also be used to cause vomiting, to purge the body and to prevent miscarriages (Watts & Breyer-Brandwijk 1932: 138; Hutchings 1996: 232-233; Tredgold 1986: 67; Van Wyk *et al* 1997: 128; Long 2005). *Euclea* have anti-inflammatory and pain relieving properties (Van Wyk *et al* 1997: 128).

Twigs from some *Euclea* trees can be used as toothbrushes and in other dental care practices (Tredgold 1986: 67; Hutchings 1996: 232; Long 2005). Dyes can be produced from species of this genus (Long 2005). *Euclea* species produce small, edible fruits (Tredgold 1986: 67; Van Wyk *et al* 1997: 128; Long 2005). Of the twelve species that produce edible fruits in Zimbabwe, only the fruits of *Euclea crispa* are eaten (Tredgold 1986: 67).The fruits of *Euclea divinorum* specifically can be used to make beer (Long 2005). Reports on the fruits of *Euclea natalensis* vary, as some say the fruit is poisonous rather than edible (Watts & Breyer-Brandwijk 1932: 138; Long 2005). *Euclea undulate* provides fodder for livestock (Long 2005).

Wood from these plants can be used in household crafts, as timber or as firewood (Long 2005). The wood of *Euclea divinorum* is described as having supernatural powers and is therefore never used for fires by some people (Long 2005). Good luck charms can include branches from this species (Long 2005). Conversely, wood from *Euclea undulata* is forbidden in the home by some cultures (Long 2005).

EUPHORBIACEAE

This family includes a range of plants – herbs, shrubs and trees, armed or unarmed, sometimes succulent and sometimes with a milky latex (Hyde *et al* 2013a). These various features all combine to form 313 genera comprising of over eight thousand species known as the Euphorbia family (Hyde *et al* 2013a). These plants are found all over the world (Hyde *et al* 2013a). Some species and genera of *Euphorbiaceae* have been placed into other families, such as *Phyllanthaceae* and *Picrodendraceae* which are described below, under the relevant headings.

DALECHAMPIA CAPENSIS A. SPRENG.

The wild hop (Long 2005) was recovered from Historic Cave. The plant is mentioned as having medicinal properties, but these are not described by Long (2005).

EUPHORBIA L.

The genus *Euphorbia* includes herbs, shrubs and trees, some of which are succulent (Hyde *et al* 2013a). The genus includes roughly 2 000 species and, while it is as cosmopolitan as its family is, these plants are usually found in warmer regions (Iziko: Museum of Cape Town n.d.; Hyde *et al* 2013a). There are 280 species of *Euphorbia* that are native to southern Africa as well as eleven naturalised species and sixteen cultivated species within southern Africa (Iziko: Museum of Cape Town n.d.).

The species labelled as '*Euphorbia* species' was originally assigned to *Euphorbia marginata*. *Euphorbia marginata* is also known as the mountain snow and is generally found in central North America, but can also be found in south-eastern Europe (Plants for a Future 2012). The sap of this plant contains a poisonous latex that also causes irritation, photosensitive reactions and severe inflammation upon contact with the skin and eyes (Plants for a Future 2012).The latex is carcinogenic over time (Plants for a Future 2012). Despite its toxicity, the plant is used medicinally to treat leucorrhoea and women's ailments and is used as an astringent (Plants for a Future 2012). Milk production in nursing mothers can be increased through an infusion of this plant (Plants for a Future 2012). An infusion of the crushed leaves is used to treat swellings (Plants for a Future 2012). An edible gum is produced by the mountain snow (Plants for a Future 2012).
Some parts of *Euphorbia* species are edible (Watts & Breyer-Brandwijk 1932: 104). Flowers from *Euphorbia inaequilatera* can be eaten as a relish and the green pods as a vegetable (Watts & Breyer-Brandwijk 1932: 104).

Euphorbia species have many medicinal values (Watts & Breyer-Brandwijk 1932: 104-106). Some species are used as an emetic to treat stomach problems (Watts &

Breyer-Brandwijk 1932: 104). Dried *Euphorbia inaequilatera* is used as a powder applied to the skin or wounds on infants, to relieve itching (Watts & Breyer-Brandwijk 1932: 104). Strips of the inner root-bark of the same species are tied around the abdomen of an infant to treat constipation (Watts & Breyer-Brandwijk 1932: 104). *Euphorbia restituta* is used to quicken long childbirth (Watts & Breyer-Brandwijk 1932: 105). Other species can treat cracked or swollen feet, leprosy, skin problems, sores, sore nipples when breastfeeding, toothache and warts (Watts & Breyer-Brandwijk 1932: 104-105). The latex of the plants can be used as violent emetics and purgatives to cure constipation and painful indigestion (Watts & Breyer-Brandwijk 1932: 104).

The genus includes multiple poisonous species (Watts & Breyer-Brandwijk 1932: 104-106). Many *Euphorbia* species produce a toxic latex that can cause blistering and skin irritation (Watts & Breyer-Brandwijk 1932: 104-105). *Euphorbia ingens* is sometimes used in small doses as a drastic purgative but this often leads to the death of the patient (Watts & Breyer-Brandwijk 1932: 104). The latex was used by Sothos to cure dipsomania (an irresistible craving for alcohol) and cancer (Watts & Breyer-Brandwijk 1932: 104). Poisonous latex from multiple species is used to tip arrows (Watts & Breyer-Brandwijk 1932: 104-105).

FABACEAE

Fabaceae, or *Leguminosae*, is made up of three sub-families – *Caesalpinioidea*, *Mimosoideae* and *Papilionoideae* (Hutchings 1996: 119; Hyde *et al* 2013a). The three sub-families are each distinct and so they are often dealt with separately (Hutchings 1996: 119; Hyde *et al* 2013a).

MIMOSOIDEAE (FABACEAE)

Mimosoideae includes trees and shrubs (Hyde *et al* 2013a). Species in this sub-family are found in mostly tropical areas (Hyde *et al* 2013a). Sixty-four genera and 2 950 species make up this sub-family, which is also known as the mimosa family (Hyde *et al* 2013a).

One species of seed found at Balerno Main Shelter was identified to this sub-family, as it could be one of two species: a species of *Albizia* or a species of *Acacia*.

ALBIZIA

Albizia are usually unarmed trees or shrubs, although some species have small prickles or spines (Hyde *et al* 2013a). Seeds of the species in this genus are usually flat and are stored in pods (Hyde *et al* 2013a). There are 118 *Albizia* species and they are found in the warmer parts of Africa, Asia and America (Hyde *et al* 2013a).

Species from Zimbabwe have a wide range of uses (Hyde *et al* 2013a). *Albizia adianthifolia* is a particularly useful tree (Venter & Venter 2009: 40; SANBI 2012). Timber is used in carving, drum-making, construction and for firewood (Venter & Venter 2009: 40; Hyde *et al* 2013a). The leaves of *Albizia adianthifolia* var. *adianthifolia* can be used as sponges for washing (Hyde *et al* 2013a). The root and bark of *Albizia versicolor* can be used in place of soap (Hyde *et al* 2013a). *Albizia* species are used to treat abdominal discomfort, abscesses, backaches, coughing, epilepsy, fever, headaches, inflammation of the eye, gonorrhoea, rheumatism, scabies, skin diseases, stomach aches, swelling, tapeworms and uterine problems and to cleanse the blood (Watts & Breyer-Brandwijk 1932: 63-64; Hutchings 1996: 119-120; Van Wyk *et al* 1997: 36; van Wyk & Gericke 2007: 120; Venter & Venter 2009: 40-45; Hyde *et al* 2013a). Lotion made from the roots and bark of *Albizia adianthifolia* relieves eczema and itchy skin (Hutchings 1996: 119; van Wyk & Gericke 2007: 120; Venter & Venter 2009: 40). The bark of *Albizia anthelmintica* is used to avoid conception (Hutchings 1996: 120). Various parts of the plants also act as vermicides and can also lower cholesterol (Hutchings 1996: 119 – 120; Hyde *et al* 2013a). Some species, including *Albizia adianthifolia* var. *adianthifolia* and *Albizia versicolor,* are poisonous (Hutchings 1996: 119-120; Venter & Venter 2009: 42-45; Hyde *et al* 2013a). The pods and leaves of *Albizia harveyi* are poisonous to cattle and sheep (Hyde *et al* 2013a).

There are many cultural beliefs attached to *Albizia* species (Hyde *et al* 2013a). *Albizia adianthifolia* var. *adianthifolia* clarifies dreams, helps in communicating with ancestors and stops bad spirits (Hyde *et al* 2013a). *Albizia versicolor* is used to gain metaphysical powers, to 'make mischief' with other people and by sangomas in cleansing ceremonies (Hyde *et al* 2013a). *Albizia forbesii* is used by the Zulu, together with the roots of a species of *Acacia*, to repel mischievous sprites (Hutchings 1996: 120). The seeds of *Albizia adianthifolia* var. *adianthifolia* are edible and are made into a sauce (Hyde *et al* 2013a).

ACACIA

Acacia, or thorn trees, can occur as either trees or shrubs (Hutchings 1996: 121; Hyde *et al* 2013a). Native trees are armed with thorns; unarmed trees are usually species that have been introduced or they are very old trees (Tredgold 1986: 82; Hyde *et al* 2013a). Acacia trees are found in a wide variety of environmental zones and occur as one of 1 200 species worldwide (Hyde *et al* 2013a). Many of these species occur in the broad region around Historic Cave and the Balerno Shelters (Long 2005; Venter & Venter 2009: 14-35). Seeds are found at Balerno Main Shelter which may represent this genus and at thorns representing one (or more) species of this genus were recovered at Historic Cave.

Some *Acacia* species have edible portions (Long 2005; Venter & Venter 2009: 14-35). Many produce an edible gum; *Acacia senegal* has gum that is commercially important today, *Acacia karroo* produces a chewable gum between December and April, and the gum from *Acacia nilotica* subsp. *kraussiana* is suitable in making confections (Tredgold 1986: 81; Long 2005; Venter & Venter

2009: 14-35). Some Acacias produce edible fruits while the fruits of other species are poisonous (Long 2005). The seeds of *Acacia karroo* or *Acacia erioloba* can be treated as coffee if they are roasted (Tredgold 1986: 81; Long 2005; Venter & Venter 2009: 14-35).

Many *Acacia* trees provide timber for building, fencing, household crafts, tobacco pipes and furniture (Long 2005; Venter & Venter 2009: 14-35). The wood also provides fuelwood for fires (Long 2005; Venter & Venter 2009: 14-35). Gum from *Acacia karroo* is adhesive and can be used to repair pots and calabashes (Tredgold 1986: 81). Thorns from the same species are used as sewing needles in Zimbabwe (Tredgold 1986: 81). The bark of some species is utilised in the making of baskets, ropes and twine (Tredgold 1986: 81; Long 2005; Venter & Venter 2009: 14-35). The seeds of *Acacia natalitia* are used in making necklaces and other ornaments (Long 2005). A decoction of the bark of *Acacia benthami* produces ink (Watts & Breyer-Brandwijk 1932: 64). Some species produce dyes and can be used in tanning (Watts & Breyer-Brandwijk 1932: 64; Tredgold 1986: 81; Hutchings 1996: 121-125; Van Wyk *et al* 1997: 24; Long 2005). Some *Acacia* species can provide fodder for animals, but *Acacia caffra* may poison the animals (Watts & Breyer-Brandwijk 1932: 64; Tredgold 1986: 81; Hutchings 1996: 124; Long 2005; Venter & Venter 2009: 14-35). *Acacia polyacantha* subsp. c*ampylacantha* is said to repel snakes and crocodiles (Long 2005). Roots of various species are included in love charms (Hutchings 1996: 121).

Medicinally, the bark of *Acacia caffra* can be used to cleanse the blood and for abdominal complaints in infants and *Acacia gerrardii* is used to treat gastroenteritis (Watts & Breyer-Brandwijk 1932: 64: Long 2005; Venter & Venter 2009: 16). Various parts of *Acacia karroo* is used to treat colic in babies, dysentery and diarrhoea as well as mouth ulcers and thrush in the throat (Watts & Breyer-Brandwijk 1932: 64; Tredgold 1986: 81; Van Wyk *et al* 1997: 24; Long 2005). The gum of *Acacia karroo* and *Acacia nilotica* subsp. *kraussiana* is believed to delay puberty (Long 2005). Other medicinal uses of the *Acacia* genus include a diuretic, an astringent, an emetic to induce vomiting and an analgesic for pain relief, as well as treatments for abdominal pain, acne, asthma, back problems, chafed skin, coughs, colic in infants, dry coughs, eye problems, fatigue, fevers, hernias, malaria, tuberclerosis, and bacterial and fungal infections of the skin and mouth (Watts & Breyer-Brandwijk 1932: 64-65; Hutchings 1996: 121-125; Van Wyk *et al* 1997: 24; Long 2005; Venter & Venter 2009: 16-35). The roots of *Acacia robusta* are used to increase stamina (Long 2005). *Acacia xanthophloea* has been incorrectly associated with malaria (Long 2005). Decoctions made of the bark of *Acacia karroo* are taken to cure ailments that are believed to have supernatural origins (Hutchings 1996: 121). *Acacia karroo* can also be used to treat cattle that have eaten a poisonous plant known as 'tulp' (*Morea* species) (Tredgold 1986: 81; Venter & Venter 2009: 22). Parts of some species may be toxic (Hutchings 1996: 121-125).

ACACIA ATAXACANTHA DC.

Seeds of an acacia that resembles this species is found at Historic Cave. It is widespread in South Africa (Hyde *et al* 2013a). *Acacia ataxacantha*, or the flame thorn, is a scrambling or climbing shrub (Long 2005; Hyde *et al* 2013a). It can also be found as a small tree, but only rarely (Hyde *et al* 2013a). The flame thorn flowers during December to March (Hyde *et al* 2013a). Other names for this species include Muchanga, Mugowa, Mukakanyuro, Mukombokunono, Mukomborakombora, Musavahanga or Rukato (Shona); Ulutatu, Umbambangwe, Umqaqawe or Uthathawu (Ndebele); funuzumhole, lugagane, magucu, migamandi, sitfwetfew and umkhaya (unknown languages) (Long 2005; Hyde *et al* 2013a).

The flame thorn provides timber for making fences and branches for making baskets, among other items (Long 2005). The bark of the shrub is used to take care of abscesses (Long 2005).

ACACIA SCHWEINFURTHII BRENAN & EXELL

Acacia schweinfurthii, or the river climbing acacia or brack thorn, is a shrub that often forms very dense thickets or climbs into large trees (Long 2005; Hyde *et al* 2013a). The pods of this species are very large, growing up to 20cm in length (Hyde *et al* 2013a). Flowers occur on this shrub between December and February (Hyde *et al* 2013a).

PAPILIONOIDEAE (FABACEAE)

The pea and bean family, the second of the sub-families of *Fabaceae*, encompasses 313 genera totalling 8 100 species (Hyde *et al* 2013a). These species are usually found as herbs but can also occur as trees, shrubs or climbers (Hyde *et al* 2013a). This sub-family is very cosmopolitan and is found all over the world (Hyde *et al* 2013a).

LABLAB PURPUREUS - (L.)SWEET

The genus *Lablab* includes climbing herbs (Hyde *et al* 2013a). The seeds in this genus are ovoid and flat with a long, usually brightly coloured and fleshy hilum (Hyde *et al* 2013a). Globally, there is only one species that originated in West Africa (Hyde *et al* 2013a). This highly variable species is widely cultivated across the tropics (Hyde *et al* 2013a).

Lablab purpureus is a climbing plant that can grow up to 2m tall (Tredgold 1986: 11; Plants for a Future 2012; Hyde et al 2013a). The species is known as the lablab bean or hyacinth bean (Tredgold 1986: 11; Hyde et al 2013a; Andersson *et al* n.d.). Synonyms for the scientific name include *Dolichos lablab* L., *Lablab niger* Medic. and *Lablab vulgaris* Sav (Hyde et al 2013a). The plant is considered 'green manure' as bacteria that grow on the roots enrich the soil the plant grows in (Plants for a Future 2012). *Lablab purpureus* is found in a variety of habitats, but is usually found in wet or riverine habitats (Tredgold 1986: 11; Hyde et al 2013a). The bean grows in areas with between 750mm and a maximum of 2500mm of rainfall per year, but it can grow with an annual rainfall of just 400mm (Andersson *et al* n.d). It grows in the summer months, but, if it matures late, the plant can help bridge the gap between summer and winter crops (Andersson *et al* n.d). Flowers appear on the climber between August and March (Hyde et al 2013a). The fruit, flat pods encapsulating red, brown or black oval seeds, are edible in the late summer months (Tredgold 1986: 11). The hilum of the seed is usually long and white (Andersson *et al* n.d). The bean can grow alone, or it can be sown together with widely-spaced maize or sorghum (Andersson *et al* n.d).

The hyacinth bean is a food crop, cultivated across Africa (Andersson *et al* n.d). Multiple parts of the plant are edible – the flowers, cooked leaves, roots and seedpod are all edible (Plants for a Future 2012). The dried seeds are poisonous, but if they are cooked carefully, they are then edible (Plants for a Future 2012). The hard beans should be soaked in water and then boiled for up to eight hours; they are usually boiled twice and then added to maize and boiled again (Tredgold 1986: 11). Young beans are cooked in their skins, the older ones without their skins (Tredgold 1986: 11). Beans can also be roasted, pounded, ground into fine particles and winnowed to create flour which is then boiled (Tredgold 1986: 11). Immature plants can be eaten raw or cooked, as can the young pods; they are treated as green vegetables (Plants for a Future 2012). The bean is rich in protein and can become a staple food (Plants for a Future 2012). The beans can be treated as soybeans are in Japan and can be made into a type of tofu (Plants for a Future 2012). The beans can be left to sprout and the sprouts can be eaten raw in a way similar to mung bean sprouts (Plants for a Future 2012). Leaves can be dried and stored for future use but they must be cooked before they are eaten; the leaves are treated as spinach (Plants for a Future 2012). Young leaves are made into relishes (Tredgold 1986: 11).

Medicinally, the plant is an antidote to many poisons and can lower cholesterol levels and sugar levels in the blood and works as an anti-coagulant (Plants for a Future 2012). Unspecified parts of the hyacinth bean can treat alcohol addiction and intoxication as well as gastrointestinal problems (Plants for a Future 2012).

Hyacinth bean is also used to treat cholera, diarrhoea, gonorrhoea, vaginal disease and vomiting (Plants for a Future 2012). Dried and roasted mature seeds work as an antispasmodic, aphrodisiac and vermicide and can reduce pain and fevers (Plants for a Future 2012). They can also aid digestion and improves stomach function (Plants for a Future 2012). The fully mature seeds can treat abdominal pain, arsenic in the system, inflammation of the intestine, nausea and vomiting and sunstroke (Plants for a Future 2012). Juice from the pods is used to cure inflammation in ears and throats (Plants for a Future 2012). Women in Zimbabwe drink an infusion of lablab bean leaves and wear a rope of twisted leaves around their waists at the same time to prevent miscarriages (Tredgold 1986: 11). The lablab bean can be used for hay or silage for animal feed, but can alter the taste of milk and cause cattle bloat if it is the sole plant used in the feed (Andersson *et al* n.d).

PHASEOLUS VULGARIS L.

This species is known as the common bean, the green bean or the kidney bean (Wortmann *et al* 2004; Encyclopaedia of Life 2013). The species originated in Central and South America but today is cultivated around the world and has a large number of varieties (Encyclopaedia of Life 2013). The bean was most likely introduced to eastern Africa during the sixteenth century (Wortmann *et al* 2004: 3). The plant was brought into the African interior by Arab slave traders and Swahili traders after it was introduced at the coast, at Sofala, Mombasa and/or Zanzibar, most likely by the Portuguese (Wortmann *et al* 2004: 3). The species appears to have been cultivated as a food crop before the start of the colonial period (Wortmann *et al* 2004: 3). As the common bean is grown across the country and in the Limpopo Province today (Wortmann *et al* 2004: 9-10), it is possible that the crop there in the past too. Common beans are usually sown between November and December, but in some areas, two cycles per year are not uncommon, especially in central and eastern Africa (Wortmann *et al* 2004: 34). Beans are often double-cropped together with other cultivated species, especially maize (Wortmann *et al* 2004: 34).

Phaseolus vulgaris is an annual herb or climber (Encyclopaedia of Life 2013). The beans can be eaten when they are immature and in the pod or dried and shelled when mature (Encyclopaedia of Life 2013). The beans contain fibre and large amounts of protein and multiple vitamins (Encyclopaedia of Life 2013). The beans can be included in a variety of foods, including stews and soups (Encyclopaedia of Life 2013).

VIGNA

The genus *Vigna* is represented by herbs or sub-shrubs that produce pods (Hutchings 1996: 146; Hyde *et al* 2013a). Eighty species make up this genus and they are usually found in the tropics (Hyde *et al* 2013a). Four species have been identified from Historic Cave as well as another unknown species from the genus.

VIGNA RADIATA

Vigna radiata, or the mung bean, has a history of cultivation, especially along the eastern coast of Africa (Quin 1959: 47). It is an important plant food and, in some areas of southern Africa, it threatened to replace the cowpea (Quin 1959: 47). The Pedi people in the northern part of South Africa traditionally cultivated only the green varieties of the mung bean (Quin 1959: 49). The beans are consumed in stew (Quin 1959: 49).

VIGNA SUBTERRANEA (L.) VERDC. VAR. SUBTERRANEAN

Vigna subterranea var. *Subterranean* is the accepted name for a synonym, *Voandzeia subterranea* L. (Tredgold 1986: 16; Hyde *et al* 2013b). The Bambara nut, round nut or *njugo* bean appears to be a traditional food crop within southern Africa, although there has been some confusion regarding the names of the plant (Quin 1959: 44-45; Tredgold 1986: 16). The plant is an annual and is a cultivated crop (Tredgold 1986: 16). The bean is harvested when the leaves and the stems of the plant begin to die off; this usually happens in March to May (Quin 1959: 46; Tredgold 1986: 16). The plants can mature in as little as three months if they are planted to coincide with the rainy season (Tredgold 1986: 16). They are then stored in grass baskets or in granaries (Quin 1959: 47; Tredgold 1986: 16). These beans are susceptible to weevils and so they are mixed with ash when they are stored (Tredgold 1986: 16). They are eaten fresh as a vegetable or in stews, added to porridge or as a relish or side-dish (Quin 1959: 47; Tredgold 1986: 16). The nuts can be boiled together with maize meal to create a stiff dough (Tredgold 1986: 16). This dough is used to make cakes which are salted and can then keep for several days (Tredgold 1986: 16).

There are multiple taboos associated with this plant: if a drought is forecast by a witchdoctor, for example, the Pedi will not plant the seed (Quin 1959: 45). In the case of a prolonged drought, Bambara nut plants that are already established would be uprooted and destroyed (Quin 1959: 45-46). The plants will not be planted at any time during the season if the chief dies before the start of the planting season (Quin 1959: 46). The Bambarra nut is sometimes used as a counter in a traditional game involving spinning nuts (Tredgold 1986: 16). The nuts that are used as counters must never be eaten however, as eating them will result in giddiness (Tredgold 1986: 16).

VIGNA UNGUICULATA

The cow pea is grown commercially today, but has been an important food crop in South Africa for some time (Quin 1959: 39; Tredgold 1986: 17; Long 2005). The leaves, pods and seeds are edible (Quin 1959: 40; Long 2005). The pods are eaten as vegetables, often in stew (Quin 1959: 40-43; Tredgold 1986: 17). The leaves are often dried as they are harvested and stored as balls or parcels, or sown together and hung from the roof, to be used as necessary (Quin 1959: 40-43; Tredgold 1986: 17-18). These leaves are cooked by boiling or steaming them; *Aloe greatheadii* buds are sometimes added for flavour (Tredgold 1986: 18). The leaves are used as pot-herbs (Quin 1959: 40-43). The seed is consumed in porridge, stew or a relish (Quin 1959: 43; Tredgold 1986: 17). Cowpeas cannot be stored for long periods of time (Mzezewa & Gwata 2011: 101).

The seeds are used medicinally to treat burns, chest pains, epilepsy, fever, headaches and menstruation and in childbirth (Hutchings 1996: 146; Long 2005). The plant is used as a love charm in some cultures (Hutchings 1996: 146; Long 2005). Cowpeas are used in and subjects of multiple ceremonies in southern Africa (Quin 1959: 40). The Bemba of Zambia make a sauce of the beans and pour it over the body of a recently deceased chief (Quin 1959: 40). The cowpea is regarded by many as the most important legume in southern Africa (Quin 1959: 40).

XANTHOCERCIS ZAMBESIACA (BAKER) DUMAZ-LE-GRAND

The *Xanthrocercis* genus contains only two species, both of which are found in southern Africa (Hyde *et al* 2013a). The genus is made up of trees that produce solitary seeds with black seed coats (Hyde *et al* 2013a).

Xanthrocercis zambesiaca, or the nyala berry (Tredgold 1986: 137; Hyde *et al* 2013a), was recovered from Balerno Main Shelter. This evergreen tree can grow to between 15 and 25m (Tredgold 1986: 137). The nyala berry produces flowers from September to December and produces berry-like yellowish brown fruits, which are unusual for its family (Tredgold 1986: 137; Hyde *et al* 2013a). These fruits are edible (Tredgold 1986: 137; Schmidt *et al* 2002: 226; Eco Travel Africa n.d.). The fruits are green but become dark in March (Tredgold 1986: 137Eco Travel Africa n.d.). They are found on the tree almost year-round (Eco Travel Africa n.d.). The fruits are edible between November to December (Tredgold 1986: 137). They are eaten fresh or can be dried to turn into a meal or added to porridge after they have been buried for a few weeks (Tredgold 1986: 137; Schmidt *et al* 2002: 226; Eco Travel Africa n.d.). They can also be roasted (Tredgold 1986: 137). The nyala berry fruits are seen as famine food in Zimbabwe (Tredgold 1986: 137). Animals including multiple buck species, baboons and birds enjoy the fruits of these trees (Tredgold 1986: 137). The wood is suitable for working but it does sometimes cause irritation in the throat and nose while it is being worked (Tredgold 1986: 137).

CAESALPINIOIDEAE (FABACEAE)

The senna family is the third of the *Fabaceae* subfamilies (Hyde *et al* 2013a). Trees or shrubs make up much of this family, although climbers and herbs are also included within the 153 genera and 2 175 species (Hyde *et al* 2013a). These species are mostly found in tropical areas (Hyde *et al* 2013a).

CASSIA ABBREVIATA OLIV. SUBSP. BEAREANA (HOLMES) BRENAN

The genus *Cassia* is characterised by unarmed shrubs or trees that produce pods between 30 and 60cm long (Hyde *et al* 2013a). The genus is pan-tropical and includes roughly thirty species (Hyde *et al* 2013a). The sub-family and genus are represented at Historic Cave by the only species that is found naturally in South Africa, *Cassia abbreviata* subsp. *beareana*. Also known as the marama bean, sjambok pod or long-tail cassia, this species is a small to medium deciduous tree that generates sweet-smelling flowers (Long 2005; Venter & Venter 2009: 92; SANBI 2012). These flowers occur in August through to October and are followed shortly thereafter by long cylindrical pods (Venter & Venter 2009: 92; SANBI 2012). It can take up to a year for the pods to ripen, when they change from being light green to dark brown in colour (SANBI 2012).

The tree has a variety of medicinal uses (Long 2005; Venter & Venter 2009: 92; SANBI 2012). The roots are used to treat toothache and the seeds are used as a tonic (Watts & Breyer-Brandwijk 1932: 68; SANBI 2012). The plant works as an aphrodisiac when an infusion of the roots is drunk (Long 2005; SANBI 2012). The smoke from burning twigs can be inhaled to treat headaches (Venter & Venter 2009: 92; SANBI 2012). Various other parts of the plant are used to tend to toothaches, stomach aches and blackwater fever and can be used to induce abortions (Long 2005; Venter & Venter 2009: 92; SANBI 2012). The marama bean is also believed to have magical properties and meat is cooked over the wood of the tree to bring a successful hunt (Long 2005).

GANODERMATACEAE

One species in this family was found at Historic Cave

GANODERMA

The genus belongs to *Ganodermataceae* in the order *Polyporales* (Muthelo 2009: 4). The family includes eight genera (Muthelo 2009: 4). In China, the family contains about forty species that occur in a variety of colours (Jong & Birmingham 1992: 102). The genus Ganoderma is divided into two sub-genera – *Ganoderma* and *Elfvingia* (Muthelo 2009: 4). More than 250 species of Ganoderma have been described across the world (Muthelo 2009: 5). The taxonomy of many of these species is uncertain because of problems including a lack of type specimens, incorrect names being used and the nature of the similarities and differences between the species (Muthelo 2009: 5). The Ganoderma genus is currently poorly defined, especially in South Africa, as there are several synonyms and species complexes included in the genus (Muthelo 2009: 2-4). Misidentification of the species is very possible, due to the way the species have been identified and described in the past (morphological features which are now known to be related to environment and growth of fungus) (Muthelo 2009).

Ganoderma is a genus that comprises of fungi that forms on wood, including a variety of monocots, dicots and gymnosperms (Muthelo 2009: 2-4). The fungi often lead to the affected trees dying (Muthelo 2009: 2-4). The genus occurs globally and the plant species it can affect vary greatly, depending on where the fungus occurs (Muthelo 2009: 2-4).

The species is edible (Jong & Birmingham 1992: 116; Ms. R. Reddy and Mr. D. McCallum, C.E. Moss Herbarium staff, *pers. comm.* 2012). Multiple *Ganoderma* species are well known in multiple Asian countries for their medicinal properties (Jong & Birmingham 1992; Muthelo 2009: 2). The mushrooms, collectively referred to Lingzhi in Chinese, vary in their medicinal value depending on the species, the environment and the growth stage of the specific fungus (Jong & Birmingham 1992: 108). The mushrooms have a long history of application in a variety of ways in China to treat: anorexia, arthritis, asthma, fatty substances in the blood (hyperlipemia), bronchitis, chronic fatigue and general body pains, diabetes, hardening of the arteries, hepatitis, hypertension, insomnia, kidney disease, liver diseases, poisoning through other mushroom species, prolonged illness, tumours, low white blood cell counts and stomach ulcers (Jong & Birmingham 1992). The fungus has anti-inflammatory properties and can increase nervous system and liver function and prevent liver damage (Jong & Birmingham 1992). Ganoderma may also be used to relieve pain (Jong & Birmingham 1992).

Kirkiaceae

The kirkia family is a small family of trees (Hyde *et al* 2013a). It contains only two genera with four species that are found in tropical and southern Africa (Hyde *et al* 2013a). Two species of a genus in this family, *Kirkia*, are found at Historic Cave.

Kirkia acuminata Oliv

The white seringa (or syringa) is a medium-sized deciduous tree that produces fruit in the form of a thin woody capsule with four valves (Venter & Venter 2009: 202; SANBI 2012; Hyde *et al* 2013a).The capsules split into four seed pods when they become mature and each pod contains a seed (SANBI 2012). The tree comes into flower from October to December (Venter & Venter 2009: 202; Hyde *et al* 2013a). Fruit appears on the tree mostly between January and April (Venter & Venter 2009: 202).

Furniture, household utensils such as bowls and spoons is all made from the wood of the white seringa (Long 2005 Venter & Venter 2009: 202). The roots of the white seringa can accumulate water which is consumed in dry times (Long 2005; Venter & Venter 2009: 202). The tree's bark can be used for weaving or making rope (Venter & Venter 2009: 202; SANBI 2012). The powdered root can be used as a remedy for toothache (Venter & Venter 2009: 202). In some areas of Zimbabwe, the white seringa is considered a sacred tree (SANBI 2012). White seringa trees are planted to form kraals for livestock in the Gauteng area (Venter & Venter 2009: 202; SANBI 2012).

Kirkia wilmsii Engl.

The mountain kirkia, mountain seringa or wild pepper tree is a deciduous medium-sized to large tree (Venter & Venter 2009: 204; SANBI 2012). Similar to the white seringa, this tree produces thin woody capsules with four valves (Venter & Venter 2009: 204; SANBI 2012). Flowers appear from spring into summer (Venter & Venter 2009: 204; SANBI 2012).

The mountain seringa is also able to store water in its roots, as the white seringa does, and this water can be accessed when needed by humans (Venter & Venter 2009: 204; SANBI 2012). The root forms a toothache remedy (Venter & Venter 2009: 204). The bark and roots, as well as young shoots, of this tree are strong and can be utilised for weaving (SANBI 2012). The leaves are used as fodder for goats (SANBI 2012). Elephants enjoy the leaves of this tree, although most browsers do not (SANBI 2012).

Lamiaceae

Laminaceae, or the mint and basil family, is composed of trees, shrubs and herbs (Hyde *et al* 2013a). The leaves of this family are usually aromatic (Hyde *et al* 2013a). Fruit is in the form of four dry nutlets with one seed inside (Hyde *et al*

2013a). The plants belonging to this family are found all over the world and the family totals 6 700 species across 251 genera (Hyde *et al* 2013a). One species of this family was recovered from Balerno Main Shelter.

ACROTOME INFLATA BENTH.

The genus *Acrotome* is made of herbs and sub-shrubs (Hyde *et al* 2013a). The genus contains eight species that are found in tropical and southern Africa (Hyde *et al* 2013a). *Acrotome inflata* is an erect annual herb that grows to roughly 1m tall (Hyde *et al* 2013a). It is used by Sotho people for blackleg in cattle (Watts & Breyer-Brandwijk 1932: 156).

MORACEAE

The fig and mulberry family contains trees, shrubs and one genus with herbs (Operation Wildflower 2012; Hyde *et al* 2013a). Sap from these plants is usually milky but can occasionally be watery (Hyde *et al* 2013a). The family contains 38 genera and 1 100 widely distributed species (Operation Wildflower 2012; Hyde *et al* 2013a). One species from this family was recovered from Historic Cave.

FICUS INGENS (MIQ.) MIQ

The genus *Ficus* includes shrubs, trees, lianes (woody climbing vines) and epiphytes (a plant that grows on another plant or object but not as a parasite) (Hyde *et al* 2013a). These plants commonly have a milky sap; a watery sap does occur but is rare (Hyde *et al* 2013a). There are roughly 750 species in the genus (Hyde *et al* 2013a). They are found in tropical and warm areas (Hyde *et al* 2013a). Of these species, 27 are indigenous to southern Africa (SANBI 2012).

Ficus ingens, or the red-leaved rock fig, is a plant with multiple uses (Hutchings 1996: 75; Long 2005; Venter & Venter 2009: 164; SANBI 2012; Hyde *et al* 2013a). It occurs as a semi-deciduous tree of variable size, but can also occur as a shrub in cold regions, and is known to split rocks with its roots (Venter & Venter 2009: 164; Operation Wildflower 2012; SANBI 2012; Hyde *et al* 2013a). Flowers are produced between November and March (Hyde *et al* 2013a). This species produces fruits that turn from a creamy green to pink, purple or red when ripe (Operation Wildflower 2012; Hyde *et al* 2013a). The fruits take a long time to ripen – the process lasts from winter throughout the summer at a minimum (Venter & Venter 2009: 164; Operation Wildflower 2012). Fruits are found on the tree throughout the year, but fruit production peaks in the summer (SANBI 2012).

The fruit of the red-leaved rock fig is edible, but, according to some, it is unpalatable and is generally infested with small insects (Long 2005; Venter & Venter 2009: 164; Operation Wildflower 2012; SANBI 2012). The latex produced by this plant is a disinfectant and can substitute for iodine (Hutchings 1996: 75; Long 2005; SANBI 2012). The bark of this plant can treat diarrhoea and anaemia (Watts & Breyer-Brandwijk 1932: 35; Hutchings 1996: 75; Long 2005; Venter & Venter 2009: 164). It has also been used to treat cows that have poor milk production (Watts & Breyer-Brandwijk 1932: 35; Hutchings 1996: 75; Operation Wildflower 2012; SANBI 2012). Livestock sometimes browse the leaves of this tree in drought, however the leaves or the milky latex exuded from all parts of the tree may cause illness in these animals (Operation Wildflower 2012; SANBI 2012). The leaves of this species are toxic (SANBI 2012).

MORINGACEAE

Moringaceae is a family with only one genus and twelve species (Hyde *et al* 2013a). These plants occur in semi-arid Africa to Asia, but appear to have been introduced from northwest India where they naturalised to southern Africa (Hyde *et al* 2013a). The family consists only of trees, which frequently have swollen trunks (Hyde *et al* 2013a). One species resembling a member of this family was recovered at Historic Cave.

MORINGA OLEIFERA LOUR

Moringa oleifera is also known as the moringo or as a horse-radish tree, presumably because the rootstock of the trees in *Moringaceae* smells faintly of horse-radish (Hyde *et al* 2013a). This tree is small and has been cultivated for its roots and leaves, both of which are edible (Hyde *et al* 2013a).

OLACACEAE

The *Olacaceae* or sourplum family consists of trees or shrubs which are sometimes armed (Hyde *et al* 2013a). Fruit occurs as a drupe containing one seed (Hyde *et al* 2013a). The family is found in tropical and South Africa and encompasses 27 genera with 180 species (Hyde *et al* 2013a). Seeds from an unknown species in one of the genera in this family were recovered at Historic Cave.

XIMENIA

There are eight species of *Ximenia* which are found in the tropics (Hyde *et al* 2013a). *Ximenia* species are small trees or shrubs and usually have spines on them (Quin 1959: 81; Hyde *et al* 2013a). Fruit in these species occurs as a drupe with a large stone inside (Hyde *et al* 2013a).

The fruit of the *Ximenia* species is generally edible (Quin 1959: 81; Long 2005). The fruit of *Ximenia americana* can be made into beer and the fruit of other species into jams and jellies (Watts & Breyer-Brandwijk 1932: 39; Long 2005).

Medicinally, the plants can remedy infant ailments, asthma, coughs, fevers, flu, inflamed eyes, snake bites, weight loss and wounds (Watts & Breyer-Brandwijk 1932: 39; Hutchings 1996: 82-83; Long 2005). The roots of *Ximenia americana* are used by some peoples in Zimbabwe to treat diarrhoea in calves and sores and fleas on domestic animals (Watts & Breyer-Brandwijk 1932: 39; Hutchings 1996: 82). Some species produce oil from the seeds that can be used cosmetically and that softens leather; the oil is used for making traditional Pedi aprons (Watts & Breyer-Brandwijk 1932: 39; Quin 1959: 81; Hutchings 1996: 82; Long 2005). *Ximenia americana* is utilised for its timber (Quin 1959: 81).

XIMENIA CAFFRA SOND.

Ximenia caffra is known as the sourplum or large sourplum (Hutchings 1996: 83; Venter & Venter 2009: 296; SANBI 2012; Hyde *et al* 2013a). In other languages, the species is known as grootsuurpruim (Afrikaans); umThunduluka-obmvu (Zulu); Munhengeni, Mutengeni or Mutsvanzva (Shona); Umthunduluka (Ndebele); morokologa (Pedi) and Morokologa (Northern Sotho) (Venter & Venter 2009: 296; Operation Wildflower 2012; SANBI 2012; Hyde *et al* 2013a). The species occurs as a deciduous tree, or a large shrub, which grows up to six metres (Venter & Venter 2009: 296; Operation Wildflower 2012; SANBI 2012; Hyde *et al* 2013a). There are two variations of *Ximenia caffra*, the difference between them being their distributions (Operation Wildflower 2012; SANBI 2012; Hyde *et al* 2013a). Flowers occur from August to October (Venter & Venter 2009: 296; SANBI 2012; Hyde *et al* 2013a). *Ximenia caffra* fruit matures around January and bears many fruits for its size (Quin 1959: 81; Venter & Venter 2009: 296).

The fruits of the large sourplum are edible and have a tart flavour; the nuts are edible too (Venter & Venter 2009: 296; Operation Wildflower 2012; SANBI 2012; Hyde *et al* 2013a). The fruits are enjoyed by different birds and animals (Venter & Venter 2009: 296; Operation Wildflower 2012; SANBI 2012). They have a high Vitamin C content and contain potassium and some protein as well (Venter & Venter 2009: 296; SANBI 2012). The fruits are best eaten when they are overripe (SANBI 2012). The fruits can be added to porridge or they can be made into jam, jelly or desserts (Quin 1959: 81; Operation Wildflower 2012; SANBI 2012). The Pedi use only the dried fruits of the *Ximenia caffra* plant (Quin 1959: 81). The fruits are left out to dry in the sun and can be stored for months after they are dried (Quin 1959: 81-82).

The single large seed within the large sourplum fruit contains a significant amount of oil, which is used to soften the skin and animal hides (Operation Wildflower 2012; SANBI 2012). The oil can be used in lamps (Venter & Venter 2009: 296; SANBI 2012). In some cultures, the oil is used to anoint a widow at the beginning of the mourning period (Quin 1959: 81; Venter & Venter 2009: 296;). The oil can treat chapped feet (Venter & Venter 2009: 296).

Medicinally, the sour plum can treat abdominal pain, bilharzias, diarrhoea, dysentery, inflamed eyes, fever, headaches, indigestion, infertility, malaria, tonsillitis and venereal disease (Hutchings 1996: 83; Venter & Venter 2009: 296; Operation Wildflower 2012; SANBI 2012). Powdered roots are taken to quicken the healing process or added to soup or beer as an aphrodisiac (Venter & Venter 2009: 296; SANBI 2012). The powdered leaves act as a vermicide (SANBI 2012). Pregnant women can combat nausea by eating a porridge made with a decoction of the roots once daily (SANBI 2012). It is believed in some cultures that mixing the ground up roots of *Ximenia caffra* with cow dung and spreading the mixture over floors will fend off witches (Hutchings 1996: 83; Long 2005). Due to its medicinal and food-providing duties, the *Ximenia caffra* tree is generally not used as firewood by the Pedi people (Quin 1959: 133-134).

OLEACEAE

The olive family is made of shrubs, trees and climbers (Hyde *et al* 2013a). Twenty-four genera and 600 species belong to this family and are found all over the world (Hyde *et al* 2013a). One species, one sub-species and a species that is similar to a further species of *Olea* represents this genus at Historic Cave.

The genus *Olea* includes trees and shrubs (Hyde *et al* 2013a). The distribution of the genus is limited to the Old World, where its 30 species are found in the tropics and warm temperate zones (Hyde *et al* 2013a). Four species of *Olea* are found in South Africa (SANBI 2012).

Olea capensis

A species of *Olea* resembling *Olea capensis* was recovered at Historic Cave. The rock ironwood is known for many things (Long 2005). Its fruit is edible and the subspecies *macrocarpa* is known to produce enormous quantities of the fruit (Long 2005). While difficult to work with, the wood of this species is widely used and can be made into furniture (Long 2005). The wood is also used for fires (Long 2005). The bark of the rock ironwood is used to treat indigestion (Long 2005). Forage for animals is provided by this plant (Long 2005).

Olea europaea - L.

The olive tree is usually found in the Mediterranean region (Plants for a Future 2012). It is an evergreen tree which produces flowers between August to September (Plants for a Future 2012).

The olive fruits are edible and are widely used (Plants for a Future 2012). They can be eaten raw, pickled or sun-dried and can also be eaten as a relish or flavouring for food (Plants for a Future 2012). The fruit is also known for its edible non-drying oil which can be used to cook multiple foods (Plants for a Future 2012).

The plant also has medicinal properties and can be used to treat hyperacidity, stings, burns, pain and inflammation, peptic ulcers, dandruff, fevers, hypertension, malaria and abrasions (Hutchings 1996: 235; Plants for a Future 2012). Olives were used in the Cape for pain relief and diarrhoea (Watts & Breyer-Brandwijk 1932: 139; Hutchings 1996: 235). The oil of the plant can be used as a base for applying ointments and liniments (Plants for a Future 2012). Olive leaves can be applied as an antiseptic, sedative or astringent (Plants for a Future 2012). Various parts of the plant are able to decrease blood sugar levels, promote bile production, moisturise the skin and act as a laxative (Plants for a Future 2012).

Olive trees are also known for their wood, which is consumed for many items and has a slight fragrance (Plants for a Future 2012). The fruits provide multiple colours of dye (Plants for a Future 2012). The non-drying oil from the seeds can be made into soap and is used as a lubricant (Plants for a Future 2012).

OLEA EUROPAEA L. SUBSP. CUSPIDATA (WALL EX G. DON) CIF.

The African olive or wild olive is a small to medium evergreen tree or a shrub (Hutchings 1996: 235; Long 2005; Venter & Venter 2009: 220; SANBI 2012; Hyde *et al* 2013a). The fruit that this tree produces is red to purple-black when ripe (SANBI 2012; Hyde *et al* 2013a). This species is closely related to the commercial olive (*Olea europaea* subsp. *europaea*) but the African olive has smaller fruits (SANBI 2012; Hyde *et al* 2013a). The wild olive is in flower between October and February and produces fruits between March and August (Venter & Venter 2009: 220; SANBI 2012; Hyde *et al* 2013a).

Parts of this plant can be used for treating eye problems in humans and animals, bladder and urinary infections, colic, bleeding in the nose, headache and sore throats and can lower blood pressure and improve kidney function (Hutchings 1996: 235; Venter & Venter 2009: 220; SANBI 2012). The fruit was used by early Cape settlers to treat diarrhoea (SANBI 2012). The Masai drink tea made from the heartwood of the tree to cleanse the blood (Hutchings 1996: 235).

Wood of this tree is used for furniture, utensils, fences and ornaments (Venter & Venter 2009: 220; SANBI 2012). Ink can be made from the juice of the fruits (Venter & Venter 2009: 220; SANBI 2012). Tea can be made from the leaves of the wild olive (Venter & Venter 2009: 220; SANBI 2012). The wild olive is very hardy and makes an important fodder tree for animals, especially in very dry areas, and the leaves are browsed by livestock and game animals (Venter & Venter 2009: 220; SANBI 2012). Parts of the tree are used as charms to protect against lightning (Hutchings 1996: 235).

OLINIACEAE

Olinia was previously within its own family, Oliniaceae, but it has since been moved to Penaeaceae (SANBI 2012; Iziko: Museum of Cape Town. n.d.). The *Oliniaceae*, olinia or hard-pear family has only one genus, *Olinia*, and eight to ten species which are found in eastern and southern Africa (Schmidt *et al* 2002: 446; Hyde *et al* 2013a; Iziko: Museum of Cape Town. n.d). The family includes trees and shrubs (Hyde *et al* 2013a). Five or seven species are found in southern Africa (Schmidt *et al* 2002: 446; Iziko: Museum of Cape Town. n.d.). One species from this family is found at both Balerno Main Shelter and Historic Cave.

OLINIA

Multiple species of trees and shrubs occur in southern Africa (Schmidt *et al* 2002: 446; Hyde *et al* 2013a; Iziko: Museum of Cape Town. n.d.). Flowers occur on the *Olinia emarginata* plant during spring and summer; small fruits follow the flowering period and are available during much of the winter season (Venter & Venter 2009: 222; SANBI 2012). *Olinia emarginata* leaves contain cyanide and produce a faint almond-like smell when they are crushed (SANBI 2012).

Olinia ventosa wood is strong and hard and so, in the past, it has been used for fencing, musical instruments and even in wagons (SANBI 2012). The wood is used for furniture making today (SANBI 2012).

PHYLLANTHACEAE

This family was a sub-family of Euphorbiaceae (known as Phyllanthoideae) until recently, when it was separated into a family by itself (Hyde *et al* 2013a). Globally, this new family contains 54 to 60 genera and roughly 2 000 species (Hyde *et al* 2013a). These species are mostly pan-tropical but are also found in temperate regions (Hyde *et al* 2013a). One species of one of the genera in this family are found at Historic Cave and Balerno Main Shelter, and another species of the same genus is also found at Balerno Main Shelter.

BRIDELIA MICRANTHA (HOCHST.) BAILL

The genus includes shrubs and small trees (Hutchings 1996: 164; Hyde *et al* 2013a). Fruits produced by these plants are either drupes or smooth berries (Hyde *et al* 2013a). The genus includes 60 species which are found in the tropics in the Old World (Hyde *et al* 2013a).

This species is found at Balerno Main Shelter and Historic Cave. *Bridelia micrantha* is known as the velvet sweetberry or mitzeerie in English (SANBI 2012; Hyde *et al* 2013a). Other names include: Mitzeeri (English), bruin stinkhout (Afrikaans), motsere (Sotho), ndzerhe (Tswana); Mudzinza, Mufukusi Mukodokodo, Mukwandu, Mushungunu, Mutorarwizi, Mutsetsauta or Mutugusi (Shona); Imphisimakhata, mahlombe, umhlalamagwababa and umhlalamahubulu (language unknown) (Long 2005; Venter & Venter 2009: 78; SANBI 2012; Hyde *et al* 2013a). The mitzeerie is a variably-sized deciduous tree with spikes on young branchlets and occasionally blunt thorns on older trees (SANBI 2012; Hyde *et al* 2013a). Berries from this tree are edible and a blackish colour when ripe (Tredgold 1986: 90; Long 2005; Venter & Venter 2009: 78; SANBI 2012; Hyde *et al* 2013a). The leaves of the tree are edible too (Long 2005). Flowers appear on the tree between September and December and fruit between January and April (Tredgold 1986: 90; Venter & Venter 2009: 78; Hyde *et al* 2013a).

This tree can be used to treat asthma, burns, coughs, diabetes, diarrhoea, pain in the lungs, tapeworms, toothache and venereal diseases and serves as an emetic (Hutchings 1996: 165; Long 2005; Venter & Venter 2009: 78; SANBI 2012). The leaf sap can be used to cure sore eyes (Tredgold 1986: 90; Long 2005; Venter & Venter 2009: 78; SANBI 2012). The root can treat stomach pains and the powdered root can relieve headaches when mixed with oil and fat (Tredgold 1986: 90; Hutchings 1996: 165; Long 2005; SANBI 2012). The wood of this species is durable and borer-resistant and so is used for furniture and in the construction of kraals (Tredgold 1986: 90; Long 2005; Venter & Venter 2009: 78; SANBI 2012).

Bridelia mollis Hutch.

The velvet sweetberry or velvet-leaved bridelia (Tredgold 1986: 90; Hyde *et al* 2013a) is found at Balerno Main Shelter. It occurs as a shrub or small tree and produces sub-spherical berries which are black when ripe (Tredgold 1986: 90; Hyde *et al* 2013a). These berries are edible (Tredgold 1986: 90; Hyde *et al* 2013a). Flowers occur on this tree between November and February (Hyde *et al* 2013a).

Picrodendraceae

This family was also part of the *Euphorbiaceae* but was recently separated into its own family (SANBI 2012; Hyde *et al* 2013a).

Hyaenanche globosa (Gaertn.) Lamb. & Vahl

A seed that looks very similar to this species was recovered at Historic Cave. According to the Plant List (2010), this species is the only species in the genus. This plant is called the hyena-poison (Watts & Breyer-Brandwijk 1932: 100; SANBI 2012). It is a large evergreen fynbos evergreen shrub or small tree endemic to the Gifberg in the northern part of the Western Cape (SANBI 2012). This plant’s fruit is a rounded capsule with three or four lobes (SANBI 2012). Up to six seeds can come from one capsule; these seeds are big, black and shiny (SANBI 2012). Flowers appear on this plant during October and November (SANBI 2012).

Fruits of the hyenas-poison are highly poisonous (Watts & Breyer-Brandwijk 1932: 100; SANBI 2012). In the past, they were used by the San to tip their arrows and more recently have been used by farmers to kill hyenas (Watts & Breyer-Brandwijk 1932: 100; SANBI 2012).

POACEAE

The *Poaceae*, or grass family, is a family of annual or perennial herbs that are rarely woody but which often have rhizomes or stolons (Hyde *et al* 2013a). Species of this family are found all over the world, but mainly in tropical regions and temperate sub-arid areas in the northern hemisphere (Hyde *et al* 2013a). There are 9 500 species in this family, divided across 668 genera (Hyde *et al* 2013a). Four species represent this family at Historic Cave and one species represents the family at Balerno Cave as well.

PENNISETUM GLAUCUM (L.) R. BR

Pennisetum contains 130 species of annual or perennial herbs found in tropical and warm places (Hyde *et al* 2013a). *Pennisetum glaucum* is known as pearl millet or bulrush millet and is often cultivated (Quin 1959: 29-30; Tredgold 1986: 26; van Wyk & Gericke 2007: 9, 12; Mzezewa & Gwata 2011: 104; Plants for a Future 2012; Hyde *et al* 2013a). The grass is generally cultivated in areas that are too dry to grow maize (Tredgold 1986: 26). The seeds are edible and can be eaten either raw or cooked (Quin 1959: 30-32; Plants for a Future 2012). The crop is eaten as plain porridge or as porridge with numerous foods added to it, or with fresh or sour milk (Quin 1959: 31-32; Tredgold 1986: 26; van Wyk & Gericke 2007: 12). Pearl millet can be eaten as gruel or as bread (Quin 1959: 32; van Wyk & Gericke 2007: 12). Pearl millet can also be made into beer, sometimes with other cereals (Watts & Breyer-Brandwijk 1932: 4; Quin 1959: 30; Tredgold 1986: 26; van Wyk & Gericke 2007: 9).

Medicinally, pearl millet can treat heart disease and has been recorded as removing facial pimples or acne (Plants for a Future 2012). The plant can also be used as a tonic and to stimulate the appetite (Plants for a Future 2012). The grain can also provide feed for animals (Mzezewa & Gwata 2011: 104).

SCHMIDTIA PAPPOPHOROIDES STEUD. EX J.A.

Evidence of *Schmidtia pappophoroides* was recovered from Historic Cave. The *Schmidtia* genus includes annual and perennial grasses (Hyde *et al* 2013a). There are two species in the genus that occur in Africa, the Cape Verde Islands and in Pakistan (Hyde *et al* 2013a). *Schmidtia pappophoroides* is also known as African finger millet or sand quick (Long 2005; Hyde *et al* 2013a). It is a perennial tufted grass that grows to roughly 1m tall (Hyde *et al* 2013a). The grass flowers from October to June (Hyde *et al* 2013a). It is known for providing fodder and grazing for animals (Long 2005).

SORGHUM BICOLOR (L.) MOENCH

The genus *Sorghum* consists of robust annual or perennial grasses (Hyde *et al* 2013a). Twenty three species found in the warmer regions of the Old World and an additional species found in Mexico make up the genus (Hyde *et al* 2013a).

Sorghum bicolor is found at both Historic Cave and Balerno Main Shelter. The species today includes all cultivars and the semi-wild types which are often regarded as weeds (SANBI 2012). *Sorghum bicolor* is a crop from an African background which has since adapted to multiple regions (van Wyk & Gericke 2007: 14; SANBI 2012). It has been cultivated in southern Africa for more than three thousand years (van Wyk & Gericke 2007: 14; SANBI 2012). Commonly referred to as sorghum, this annual grass can grow up to 6m tall and looks cane-like (Tredgold 1986: 27; SANBI 2012). Individual grains, measuring 3 to 4mm in diameter, cluster together in branches (Tredgold 1986: 27; van Wyk & Gericke 2007: 14; SANBI 2012). The grains differ in colour, from a pale yellow to a reddish-brown or to dark brown (SANBI 2012). The crop is edible between April and July (Tredgold 1986: 27).

Sorghum is mostly known as a food plant (Quin 1959; Tredgold 1986: 27; Long 2005; van Wyk & Gericke 2007: 14). Mzezewa & Gwata 2011: 104; Plants for a Future 2012; SANBI 2012). Sorghum has been a very important food crop for many cultures across South Africa for a long time (Quin 1959). Its seeds are utilised in ways similar to rice and can be eaten raw or cooked (Long 2005; Plants for a Future 2012; SANBI 2012). The seeds can be ground into a very white flour which can be used in baking a variety of goods (Plants for a Future 2012). The seeds can also be eaten after they have been fermented or they can be eaten after they have sprouted (Plants for a Future 2012). Sorghum is eaten as porridge with sour milk, fruit or vegetables, as beer, bread, malted meal, in stew or as a vegetable itself (Quin 1959: 29; Tredgold 1986: 27-28; van Wyk & Gericke 2007: 14). It can also be eaten as flat cakes or gruel (Tredgold 1986: 27). The stalks of the grass are edible, but are usually only eaten as an emergency food (Long 2005). The stems are usually cooked (Plants for a Future 2012). Sorghum can also be used in the brewing of beer (Tredgold 1986: 28; Long 2005; van Wyk & Gericke 2007: 14; Mzezewa & Gwata 2011: 104; SANBI 2012). Sorghum sap can be very sweet and is sometimes used as a sweetener, made into a sweet drink or can be eaten as sugar cane (Quin 1959: 28; Tredgold 1986: 27; Plants for a Future 2012).

Sorghum bicolor also has some medicinal applications (Plants for a Future 2012). A decoction of the seeds can be used to treat kidney and urinary complaints as it is a diuretic and a demulcent to soothe the mucous membranes (Plants for a Future 2012). The inflorescences are haemostatic and can be used as an astringent (Plants for a Future 2012). The stem of the grass has some value in construction, weaving, making brooms, fencing and as firewood (Plants for a Future 2012; SANBI 2012). The whole grass can provide forage, silage or hay for animals (Mzezewa & Gwata 2011: 104; SANBI 2012).

The immature grass is poisonous, especially if it is wilted or damaged (Watts & Breyer-Brandwijk 1932: 2; Plants for a Future 2012). These toxic plants contain hordenine and hydrogen cyanide (Watts & Breyer-Brandwijk 1932: 2; Plants for a

Future 2012). Hydrogen cyanide has been known to improve digestion and respiration in small doses and may even be able to treat cancer, but in any larger doses, it causes respiratory failure and can lead to death (Plants for a Future 2012). These toxins are neutralised if the plants are dried or turned into silage (Plants for a Future 2012). Quin (1959: 25) makes brief mention of some ceremonial applications of sorghum when burying chiefs or kings.

ZEA MAYS – L.

Zea is a small genus of four species which were originally found in Central America (Hyde *et al* 2013a). In southern Africa, it is characterised by robust annual grasses (Tredgold 1986: 29; Hyde *et al* 2013a).

Zea mays, or sweet corn, mealies (mielies in Afrikaans) or maize, is an annual that very quickly grows up to 2 or 3m tall (Quin 1959: 32; Tredgold 1986: 29; van Wyk & Gericke 2007: 16; Plants for a Future 2012). This grass is well known for its edible seeds and today it is one of the most commonly grown foods worldwide (Plants for a Future 2012). Mealies are very important food plants and are a staple in some areas (Tredgold 1986: 29; van Wyk & Gericke 2007: 9, 16). In Zimbabwe, the crop is cultivated everywhere except for low rainfall regions; this is usually the same areas as *Cucurbita* maxima and groundnuts are cultivated in (Tredgold 1986: 29). The seeds can be eaten raw or cooked, or they can be dried and processed into a flour with many uses (Tredgold 1986: 29-30; van Wyk & Gericke 2007: 16; Plants for a Future 2012). Maize can be eaten as bread, cake, as a vegetable, porridge, gruel or in stews (Quin 1959: 37; Tredgold 1986: 29-30). A very watery and thin porridge made from maize is given to babies (sometimes from birth), elders and those who are sick, as it is digested easily (Tredgold 1986: 29). Sweet drinks can be made from the stems or left-over porridge (Tredgold 1986: 30). Potash is created by burning used cobs and sheaths and either allowing water to seep through the remains, or by putting water and the ash into a container and allowing the mixture to stand so the water and ash separate (Tredgold 1986:

30). The water is used to soften and to add flavour to cooked leaves (Tredgold 1986: 30).

The Pedi, amongst other groups, avoid maize meal made with yellow maize as this meal is believed to result in an over-secretion of bile and is said to 'bite [the eater's] innards' (Quin 1959: 37). Maize can be used in the production of beer; it is never the sole ingredient but is often added to sorghum for beer manufacture (Quin 1959: 37; Tredgold 1986: 30). This beer often has ritual and ceremonial connections (Tredgold 1986). The flowering parts of the cob, the silks, can be eaten fresh (Plants for a Future 2012). Oil can be removed from the seeds; this oil is edible and can be used in many ways (Plants for a Future 2012). Roasted sweetcorn seeds can substitute for coffee (Plants for a Future 2012). The pith of the stem can be chewed as sugar cane is and can be made into syrup (Plants for a Future 2012). If the pollen of the plant is harvested, it can improve the fertilisation of the seeds and the pollen is used for soups by some (Plants for a Future 2012). Mealies are stored on the cob until they are needed (Quin 1959: 37).

Sweetcorn has some medicinal properties and the plant may have anti-cancer properties (Plants for a Future 2012). It is experimentally considered to be hypoglycaemic and hypotensive (Plants for a Future 2012). The leaves and roots can be used in decoctions to cure bladder ailments, kidney problems and painful urination (Plants for a Future 2012). A decoction of the cob treats nosebleeds and menorrhagia (Plants for a Future 2012). Stored corn silks can become purgatives; fresh corn silks can get rid of bile, heal the sinuses, treat gastro-urinary issues, destroy kidney or bladder stones and lower high blood pressure and are diuretics and mild stimulants (Watts & Breyer-Brandwijk 1932: 2; Plants for a Future 2012). Fresh corn silks are able to lower blood sugar levels and treat diabetes mellitus as well as cystitis, gonorrhoea and gout (Plants for a Future 2012). The seeds act as a mild stimulant and a diuretic and contain substances known to speed up the healing process (Plants for a Future 2012). The seeds are used to treat cancer, rheumatic pains, swelling, tumours, ulcers and warts (Plants for a Future 2012).

Traditionally, maize husks are dried and can be used to construct baskets hats, and mats (Tredgold 1986: 30). The husks can also be used for decorations and toys (Tredgold 1986: 30). The entire maize plant can provide silage or fodder for stock animals (Tredgold 1986: 30). *Zea mays* has many other uses, most of which are applicable only to recent times (Tredgold 1986: 30-31; Plants for a Future 2012). Sweetcorn seeds contain starch which is used in glue and cosmetics and a semi-drying oil with many industrial uses today (Plants for a Future 2012). Fibre harvested from the stems and husks in late summer, after the seed is harvested, is used to make paper (Plants for a Future 2012). The dried cobs are used as fuel and the pith of the stems is used as packing material (Plants for a Future 2012). Corn spathes are useful for paper production and making of articles such as straw hats and baskets (Plants for a Future 2012).

PODOCARPACEAE

The yellow-wood family is a family of evergreen trees or shrubs (Hyde *et al* 2013a). Seventeen genera and 168 species add up to this family (Hyde *et al* 2013a). These species and genera are found across the southern hemisphere as well as in Japan, Central America and the tropical African mountains (Hyde *et al* 2013a). One species was found at Historic Cave from this family.

PODOCARPUS FALCATUS (THUNB.) R.BR. EX MIRB

The genus is made up from 94 species that occur from temperate zones in the southern hemisphere to tropical highlands, West Indies and to Japan (Hyde *et al* 2013a). *Podocarpus falcatus* is also known as the Outeniqua yellowwood (Venter & Venter 2009: 238; SANBI 2012). This evergreen tree is very tall and can grow up to 45m in nature (Venter & Venter 2009: 238; SANBI 2012). This tree is protected in South Africa (SANBI 2012). The Outeniqua yellowwood produces large yellow fruit that takes a year to ripen (SANBI 2012). Fruit occurs on the tree all year round, but the peak period for production is between December and

January (Venter & Venter 2009: 238). The fruits hang off the branches of the tree in clusters (SANBI 2012). These fruits are edible when ripe (Long 2005; Venter & Venter 2009: 238; SANBI 2012).

The wood of this tree is used for furniture and construction; the wood is especially well known for boat construction (Long 2005; Venter & Venter 2009: 238; SANBI 2012). Bark from the tree can be used for tanning leather (Venter & Venter 2009: 238; SANBI 2012). The bark is burned in the cattle kraal by Zulu people to prevent cattle from straying (Hutchings 1996: 14). Parts of the tree are used in traditional medicine; the sap specifically is used for chest complaints (Long 2005; Venter & Venter 2009: 238; SANBI 2012).

PROTEACEAE

The protea family contains a variety of trees and shrubs (Hyde *et al* 2013a). There are 77 genera and 1 600 species in the protea family (Hyde *et al* 2013a). Members of the family are found in tropical and sub-tropical areas of the world, but especially in the southern hemisphere (Hyde *et al* 2013a). South Africa and Australia have a large portion of this family (Hutchings 1996: 79; Hyde *et al* 2013a). Multiple flowerheads from a species within the genus were excavated at Historic Cave (Hyde *et al* 2013a).

PROTEA

Protea includes shrubs and trees which can grow up to 8m tall (Hyde *et al* 2013a). Flowers cluster in dense heads which are surrounded by bracts which are arrange in spirals around the flowerhead (Hyde *et al* 2013a). These bracts can be very small to as large as the flowers and, in some species, are brightly coloured (Hyde *et al* 2013a). There are roughly 100 species within this genus, located in the tropics and in South Africa (Hyde *et al* 2013a).

Protea species are known for their medicinal qualities (Watts & Breyer-Brandwijk 1932: 37; Hutchings 1996: 79-80; Long 2005). Multiple species are used traditionally for assisting conception, coughing, deworming, diarrhoea, dizziness, dysentery, lung complaints, bleeding ulcers, urethral discharges and for psychosis (Watts & Breyer-Brandwijk 1932: 37; Hutchings 1996: 79-80; Long 2005). *Protea mellifera* makes a good astringent (Watts & Breyer-Brandwijk 1932: 37). *Protea caffra* is used on calves to treat bloody diarrhoea and *Protea welwitschii* for diarrhoea and dysentery (Hutchings 1996: 79-80). The bark from some species is employed for tanning leather and proteas can also make for good firewood (Watts & Breyer-Brandwijk 1932: 37; Long 2005). Protea species are also seen as protective and are used by traditional healers to defend people and places (Esterhuysen *pers. comm.* 2010). The flowerheads are worn on necklaces around the necks of diviners as they carry out their duties, as seen in Figure E.1 below (Esterhuysen *pers. comm.* 2010).

Figure E.1: Protea Head Amulet. Photo by A. Esterhuysen

RHAMNACEAE

The *Rhamnaceae* or buffalo-thorn family includes trees, shrubs and lianes (Hyde *et al* 2013a). The family is found all across the world, but mostly in tropical and warm regions (Hyde *et al* 2013a). There are 49 genera in the family and 900 species (SANBI 2012; Hyde *et al* 2013a). One species from this family was found at Historic Cave.

ZIZIPHUS MUCRONATA WILLD

The *Ziziphus* genus contains trees and shrubs with spines that are usually paired (Hyde *et al* 2013a). The fruits of these trees and shrubs come in the form of a drupe and usually contain two seeds (Hyde *et al* 2013a). There are eighty-six species of *Ziziphus* and they are found in tropical and warm areas (SANBI 2012; Hyde *et al* 2013a).

Ziziphus mucronata or the buffalo thorn or wait-a-bit tree (*wag-'n-bietjie*) is a small to medium sized deciduous tree (but can occur as a shrub too) that produces fruit as reddish-brown spherical drupes (Hutchings 1996: 193; Tredgold 1986: 137; Van Wyk *et al* 1997: 286; Venter & Venter 2009: 296; Operation Wildflower 2012; SANBI 2012; Hyde *et al* 2013a).The species is sometimes referred to as *Ziziphus mucronata* subsp. *mucronata* (Tredgold 1986: 138). Its fruits can stay on the tree after the leaves have fallen in winter, between February and August (Tredgold 1986: 138; Venter & Venter 2009: 296; Operation Wildflower 2012; SANBI 2012). The most recognisable feature of the buffalo thorn is its spines, which occur in pairs of one straight and one curved spine (Tredgold 1986: 138; Van Wyk *et al* 1997: 286; Venter & Venter 2009: 296; Hyde *et al* 2013a).

The buffalo thorn has many uses (Long 2005; Venter & Venter 2009: 296; Operation Wildflower 2012). The seeds of the plant can be eaten fresh and green or dried and matured (Operation Wildflower 2012). The fruits are edible (Watts & Breyer-Brandwijk 1932: 114; Tredgold 1986: 138; Venter & Venter 2009: 296; SANBI 2012). Eaten fresh, the fruits can quench thirst and are sweet and mealy (Tredgold 1986: 138). The seeds and fruits can be made into porridge or liquor, or they can be roasted for coffee, although they are not a very good substitute (Watts

& Breyer-Brandwijk 1932: 114; Tredgold 1986: 138; Venter & Venter 2009: 296; Operation Wildflower 2012; SANBI 2012). The seeds are usually used as a famine food or to supplement the diet (Operation Wildflower 2012). Young leaves can be cooked and eaten as a nutritious, although unpalatable, vegetable (Venter & Venter 2009: 296).

Timber from the tree can be used in construction and for fencing posts (Long 2005; SANBI 2012). The wood is slightly elastic which makes it well suited to making bows and handles for tools (Long 2005; SANBI 2012). The wood can also be used as firewood, but in some cultures, it is forbidden to burn the wood (Long 2005; Venter & Venter 2009: 296). The branches of this tree are sometimes used to make kraals as the thorns protect livestock from predators (SANBI 2012). Buffalo thorns provide fodder and browsing for livestock and game animals; the fallen leaves in winter are usually favoured by cattle and some game (Tredgold 1986: 138; Long 2005; Operation Wildflower 2012). Medicinally, the plant can be used for boils, chest complaints, colds, coughs, dysentery, glandular swellings, gonorrhoea, infertility, lumbago, measles, pain relief, pneumonia, respiratory problems, scarlet fever, skin infections, snake bites, sores, syphilis and wounds (Watts & Breyer-Brandwijk 1932: 114; Tredgold 1986: 138; Hutchings 1996: 193; Van Wyk *et al* 1997: 286; Long 2005; Venter & Venter 2009: 296; Operation Wildflower 2012; SANBI 2012;). Bark used in a steam bath can improve one's complexion (Hutchings 1996: 193; SANBI 2012).

There are many cultural practices and beliefs associated with the tree (Long 2005; SANBI 2012). The buffalo thorn is used to bear the corpse at a funeral and is also taken when a corpse is collected from the scene of an accident (Long 2005).Traditionally, a buffalo thorn tree used to be planted on the grave of Zulu kings as a symbol of where the king lay (Hutchings 1996: 193; SANBI 2012). A buffalo thorn twig can be used to carry the spirit of a deceased person to their new resting place (Hutchings 1996: 193; SANBI 2012). If a stock owner passed away and was buried in a cattle or goat kraal, branches of the tree were put over the grave (Hutchings 1996: 193; SANBI 2012). This was done so that the animals ate the twigs and leaves and, in doing so, the animals would understand that the owner had died (SANBI 2012). Swazi people used branches from the buffalo thorn tree to protect their graves from wild animals (Tredgold 1986: 138).

The tree is said to have magical properties to repel evil and evil spirits (Long 2005; SANBI 2012). It was also believed to be immune from lightning – a person standing underneath the tree would be protected during a storm (Tredgold 1986: 138; Hutchings 1996: 193; SANBI 2012). Drought, lightning or hail would follow if a buffalo thorn was cut down in the summer (Tredgold 1986: 138; SANBI 2012). A buffalo thorn tree is said to indicate the presence of water underground (SANBI 2012).

The buffalo thorn tree is seen by some as a metaphor for life: the year-old branches zigzag, signifying that life is not always straightforward, and the pairs of thorns symbolise direction – the thorn facing backwards shows where we have been and the thorn that points forwards symbolises where we are going (SANBI 2012).

RUBIACEAE

The *Rubiaceae*, gardenia or coffee family is made up of trees, shrubs, herbs and climbers (SANBI 2012; Hyde *et al* 2013a). Fruit can occur as a berry, a capsule or a drupe (Hyde *et al* 2013a). Globally, the family includes 630 genera and 10 200 species that are found all over the world, but mostly in tropical and warm areas (Hyde *et al* 2013a). Roughly 30 species within the family are used as medicine by the Zulu (Hutchings 1996: 293). The family is represented by three species at two cave sites – one species that could only be identified as *Rubiaceae*, a species that resembles the *Vangueria* species (labelled *Vangueria* type) and *Vangueria infausta* at both Balerno Main Shelter and Historic Cave.

VANGUERIA INFAUSTA BURCH.

Certain seeds from Historic Cave resemble seeds from the *Vangueria* genus. The genus consists of shrubs or small trees with fleshy fruits (Hyde *et al* 2013a). There are roughly fifteen species of *Vangueria* and they are found in tropical Africa as well as in Madagascar (Hyde *et al* 2013a).

Vangueria infausta is also known as the wild medlar, false medlar or velvet wild medlar (Watts & Breyer-Brandwijk 1932: 175; Quin 1959: 84; Tredgold 1986: 133; Hutchings 1996: 298; Long 2005; Venter & Venter 2009: 288; Operation Wildflower 2012; Hyde *et al* 2013a). It occurs as a small deciduous tree which grows to between two and seven metres in height (Quin 1959: 85; Venter & Venter 2009: 288; Operation Wildflower 2012; SANBI 2012; Hyde *et al* 2013a). The large, yellow-brown to light brown, soft fruit that this tree produces appears on the tree in summer and into autumn, between November and April (Venter & Venter 2009: 288; Operation Wildflower 2012; SANBI 2012). These fruits contain three to five seeds within the pulp (Operation Wildflower 2012; SANBI 2012). The fruits can sometimes be infested by insects (Operation Wildflower 2012). Flowers appear on the tree between September and November (Venter & Venter 2009: 288; Hyde *et al* 2013a). Fruit is ripe on the tree between January and April (Quin 1959: 85; Tredgold 1986: 133). Fruit is ripe when it is about to fall off the tree or has fallen off already (Tredgold 1986: 133).

The fruits of the wild medlar are edible and contain lots of Vitamin C (Watts & Breyer-Brandwijk 1932: 175; Quin 1959: 85; Long 2005; Venter & Venter 2009: 288; SANBI 2012; Hyde *et al* 2013a). It is normally eaten raw, but can be dried and stored for times of need (Tredgold 1986: 133; Venter & Venter 2009: 288; SANBI 2012). If the fruit stays on the tree long enough, it becomes desiccated (Quin 1959: 85). This form of the fruit is highly valued by the Pedi (Quin 1959: 85). Fresh fruit can be eaten as is or in a relish, or the fresh or dried fruit can be added to porridge (Quin 1959: 85). The fresh fruit is used by some to make an alcoholic beverage or a non-alcohol drink (Tredgold 1986: 133; Long 2005; Venter & Venter 2009: 288; Operation Wildflower 2012; SANBI 2012). The fruit can be mashed into an apple sauce substitute (Tredgold 1986: 133; Venter &

Venter 2009: 288; Operation Wildflower 2012; SANBI 2012). The fruit is sometimes mashed or squeezed out in water to create a fruit juice which is used to flavour porridge (Tredgold 1986: 133; SANBI 2012). Kernels within the seeds can be extracted and eaten fresh (Tredgold 1986: 133). The kernels can be pounded a bit and then used in relishes (Tredgold 1986: 133). Seeds are eaten after they are roasted in coals (Venter & Venter 2009: 288).

Various parts of the wild medlar can be helpful in treating abdominal problems, bloody stool, coughing, diarrhoea, malaria, menstrual problems, pneumonia and other chest problems, snakebite, swelling of the limbs and toothache, and is a purgative and remedy for worms (Watts & Breyer-Brandwijk 1932: 175; Tredgold 1986: 133; Hutchings 1996: 298; Long 2005; Venter & Venter 2009: 288; SANBI 2012). The wood of the wild medlar can be employed for crafts (Tredgold 1986: 133; Long 2005). Due to its medicinal and food providing duties, *Vangueria infausta* is not used as firewood by the Pedi people as a rule (Quin 1959: 133-134). Sticks from the tree can be used as a 'male' component for starting a fire by friction, as with *Grewia bicolor* is (Tredgold 1986: 133).

There are many cultural beliefs surrounding this tree, as the term '*infausta*' suggests – the name means 'bad luck', 'unlucky' or 'disastrous' (Tredgold 1986: 133; Venter & Venter 2009: 288; Operation Wildflower 2012; SANBI 2012; Hyde *et al* 2013a). The tree itself is perceived to have evil powers, or bring bad luck, and some groups of people avoid utilizing, eating or burning parts of the tree (Tredgold 1986: 133; Long 2005; Venter & Venter 2009: 288; SANBI 2012). Some are confident that the wild medlar can affect cattle, making all their offspring to be male (SANBI 2012). Pegs made from this tree are believed to provide protection from lightning when placed around the homestead (Long 2005). Venda use sticks from the wild medlar in fence posts as a protective charm (Hutchings 1996: 298). The plant is still utilized fairly extensively, even with all these negative connotations (SANBI 2012).

SAPINDACEAE

Climbers, shrubs and trees are all found in the *Sapindaceae*, soap-berry or litchi family (SANBI 2012; Hyde *et al* 2013a). These plants are distributed mostly within tropical and warm areas, but some are found in temperate zones (Hyde *et al* 2013a). The family includes 131 genera and 1 450 species (Hyde *et al* 2013a). One species from the family was recovered at Historic Cave.

PAPPEA CAPENSIS ECKL. & ZEYH

Pappea appears to contain only one species (Hyde *et al* 2013a). This species is very flexible species and is found in eastern and southern Africa; the variations between regions can be very pronounced (Operation Wildflower 2012; SANBI 2012; Hyde *et al* 2013a). In the past, *Pappea capensis* was divided into multiple sub-species but have since been combined into one species (SANBI 2012). It occurs as a tree or as a shrub (Hyde *et al* 2013a).

Pappea capensis or the jacket plum, bushveld cherry, judgment tree or indaba tree is deciduous, usually a medium-sized tree, and can reach up to 10m (Tredgold 1986: 114; Hutchings 1996: 189; Venter & Venter 2009: 224; Operation Wildflower 2012; Long 2005; SANBI 2012; Hyde *et al* 2013a). Small green or red fruits are produced by the tree and contain a small black seed (SANBI 2012; Hyde *et al* 2013a). Flowers can be found on the jacket plum between January and July (Tredgold 1986: 114; Venter & Venter 2009: 224; Hyde *et al* 2013a). Fruit can be found between December and July (Venter & Venter 2009: 224; Operation Wildflower 2012). The small fruits are edible (Tredgold 1986: 114; Long 2005; Venter & Venter 2009: 224; Operation Wildflower 2012; SANBI 2012). This fruit is easy to harvest and can be collected in large numbers fairly quickly (Deacon 1979). They are eaten fresh or can be made into a fruit drink (Tredgold 1986: 114). They can be made into an alcoholic beverage, a jelly or vinegar as well (Tredgold 1986: 114; Long 2005; Venter & Venter 2009: 224; Operation Wildflower 2012; SANBI 2012).

The indaba tree is a very important species, and is important for traditional medicine even today (Long 2005; Hyde *et al* 2013a). Portions of the tree are used to treat baldness, chest complaints, eye infections and pain, nosebleeds, ringworm and venereal disease (Tredgold 1986: 114; Hutchings 1996: 189; Long 2005). Aromatic, non-drying oil, produced by the seeds, acts as a purgative although it is edible; the oil is used for baldness and ringworm (Watts & Breyer-Brandwijk 1932: 112; Tredgold 1986: 114; Venter & Venter 2009: 224; Operation Wildflower 2012; SANBI 2012). The root works as a purgative for cattle and the plant is used medicinally for calves by the Zulu (Tredgold 1986: 114; Hutchings 1996: 189; SANBI 2012).

The wood of the jacket plum is very hard and tough and so the timber is very useful (Tredgold 1986: 114; Long 2005). It can be made into kitchen utensils, cattle yokes, furniture and poles (Tredgold 1986: 114; SANBI 2012). The wood can be used for fires (Long 2005). Pink dye is created from the fruits (Tredgold 1986: 114). The oil from the seeds has a number of applications around the house, including lubrication, oiling rifles and making soap (Tredgold 1986: 114; Long 2005; Venter & Venter 2009: 224; SANBI 2012). This oil appears to be the sought-after part of the plant, as evidenced by hunter-gatherer material at Boomplaas Cave in the Cango Valley, Oudtshoorn (Deacon 1979). *Pappea capensis* provides valuable browsing for livestock as well as game animals, although this value may be region specific (Operation Wildflower 2012; Long 2005). Birds and animals alike enjoy the fruits (SANBI 2012).

Roots of the jacket plum are used as good luck charms by sangomas (Long 2005). When sprinkled onto the ground, the bark is a protective charm (SANBI 2012). The Masai have been described as eaten the fruit of the jacket plum to gain courage and to strengthen the blood; the fruit also acts as an aphrodisiac (Tredgold 1986: 114; Hutchings 1996: 189; Operation Wildflower 2012; SANBI 2012).

SAPOTACEAE

Sapotaceae, or the milkwood family, is characterised by trees and shrubs that produce milky latex (Hyde *et al* 2013a). Fruit is in the form of a berry with pulp that is often edible (Hyde *et al* 2013a). Seeds have a shiny coat and are relatively flat to ellipsoid in shape (Hyde *et al* 2013a). The family contains 53 genera with 975 species (Hyde *et al* 2013a). Few of these species are found in temperate regions, most species occur in tropical areas (Hyde *et al* 2013a). Four species are found in the cave sites, 3 in Historic Cave and 1 in Balerno Main Shelter.

CHRYSOPHYLLUM VIRIDIFOLIUM J.M. WOOD & FRANKS

Chrysophyllum comprises of forty-three species of trees that produce fleshy berries for their fruit (Hyde *et al* 2013a). These trees are found in tropical, America, Australia and Africa, from Indomalesia to Madagascar (Hyde *et al* 2013a).

Chrysophyllum viridifolium, or the fluted milkwood, is an evergreen tree (Hyde *et al* 2013a). Flowers occur during January and February (Hyde *et al* 2013a). The tree produces yellow fruit up to 3.5cm in diameter (Hyde *et al* 2013a). When ripe, the fruit is edible (Long 2005; Hyde *et al* 2013a).

In KwaZulu-Natal, *Chrysophyllum viridifolium* is harvested for its wood; today this depends on the size of the tree as only the larger trees are harvested (Boudreau *et al* 2005).

ENGLEROPHYTUM MAGALISMONTANUM (SOND.) T.D. PENN.

Englerophytum includes both trees and shrubs (Hyde *et al* 2013a). Fruit is a berry that contains a single seed (Hyde *et al* 2013a). There are between five and ten species of *Englerophytum* and they are found in the tropical regions of Africa (Hyde *et al* 2013a).

The Transvaal milkplum, wild plum or stem-fruit (also well-known by its Afrikaans name, stamvrug) is a small to medium-sized evergreen tree, but can also occur as a shrub (Quin 1959: 82; Tredgold 1986: 88; Hutchings 1996: 230; Venter & Venter 2009: 146; Operation Wildflower 2012; SANBI 2012; Hyde *et al* 2013a). Flowers appear between June and December (Venter & Venter 2009: 146; Operation Wildflower 2012; SANBI 2012; Hyde *et al* 2013a). Fruit ripens between December and February, and the fruit can be found on the tree at the same time as the flowers (Quin 1959: 82; Tredgold 1986: 88; Venter & Venter 2009: 146; SANBI 2012). The fruit from this tree is fleshy and bright red when it is ripe (Hyde *et al* 2013a).

The fruit is edible and contains loads of Vitamin C (Quin 1959: 82; Tredgold 1986: 88; Long 2005; Venter & Venter 2009: 146; Operation Wildflower 2012; SANBI 2012;). The Pedi only eat this fruit fresh (Quin 1959: 82). The fruit can be made into jam, jelly, syrup or alcohol (Tredgold 1986: 88; Long 2005; Venter & Venter 2009: 146; SANBI 2012). The plant is known as a thirst quencher in the veld (SANBI 2012). According to Quin (1959: 82) the fruit is best when it is over-ripe and tastes similar to a litchi. Many fruits can be picked from a medium-sized tree but, because of the competition with various animals for the fruit, the harvesting period is usually very short (Quin 1959: 82).

The wood from this tree makes good timber for building and can also be consumed as firewood (Long 2005). Due to its medicinal and food providing duties, the stamvrug tree is not used as firewood by the Pedi people (Quin 1959: 133-134). Infusions of the root and the fruit can treat abdominal pain and epilepsy (Tredgold 1986: 88; Hutchings 1996: 230; Long 2005; Venter & Venter 2009: 146; SANBI 2012). Incisions are made into the forehead and the powdered roots of the Transvaal milkplum are rubbed into these incisions to cure headaches or rheumatism (Watts & Breyer-Brandwijk 1932: 137; Tredgold 1986: 88; Hutchings 1996: 230; Long 2005; Venter & Venter 2009: 146; SANBI 2012). The root is then burnt in a container and the part of the body affected by the rheumatism is heated and smoked over the smouldering ashes (Watts & Breyer-Brandwijk 1932: 137; Hutchings 1996: 230).

MANILKARA DISCOLOR (SOND.) J.H. HEMSL.

Trees and shrubs make up the *Manilkara* genus (Hyde *et al* 2013a). There are roughly fifty species in the genus and they are found in the tropics (Hyde *et al* 2013a).

Remains from a species that takes after *Manilkara discolor* were recovered from Balerno Main Shelter. This medium-sized to large tree is known as the forest milkberry or red milkwood (Hutchings 1996: 231; Long 2005; Hyde *et al* 2013a). It produces green fruits which turn yellow when they are ripe (Hyde *et al* 2013a). Flowers appear on the tree between June and September (Hyde *et al* 2013a).

The fruits of the forest milkberry are edible (Long 2005). The wood of this tree is valuable for timber as the wood is said to be termite proof and can also work as firewood (Hutchings 1996: 231; Long 2005). Medicinally, this species is used by Zulu people for brittle bones and as an enema for back pain (Hutchings 1996: 231).

MIMUSOPS ZEYHERI SOND

The *Mimusops* genus has both trees and shrubs (Hutchings 1996: 230; Hyde *et al* 2013a). The fruit is a berry that can have one or multiple seeds (Hyde *et al* 2013a). There are between twenty and thirty species that occur in tropical Africa and in tropical Asia (Hyde *et al* 2013a).

Mimusops zeyheri, or the Transvaal red milkwood, or simply the red milkwood (Tredgold 1986: 109; Long 2005; Venter & Venter 2009: 212; Operation Wildflower 2012; SANBI 2012; Hyde *et al* 2013a), was excavated from Historic Cave. It is a shrub or small to medium sized evergreen tree (Tredgold 1986: 109;

Venter & Venter 2009: 212; Operation Wildflower 2012; Hyde *et al* 2013a). There are four large examples of this tree in the Great Enclosure at Great Zimbabwe (Tredgold 1986: 108; Hyde *et al* 2013a). Flowers occur on the tree between October and March (Venter & Venter 2009: 212; SANBI 2012; Hyde *et al* 2013a). Fleshy fruits which turn bright orange when ripe appear between April and October (Tredgold 1986: 109; Venter & Venter 2009: 212; Operation Wildflower 2012; SANBI 2012; Hyde *et al* 2013a). The fruits are mealy when they are ripe, but otherwise they tend to be sticky (Tredgold 1986: 109; Venter & Venter 2009: 212).

The fruits are edible and store a lot of Vitamin C in them (Tredgold 1986: 109; Long 2005; Venter & Venter 2009: 212; SANBI 2012). Many animals eat and enjoy these fruits both on the tree and on the ground (Tredgold 1986: 109; Venter & Venter 2009: 212; SANBI 2012). The wood of the tree is good for general purpose timber, however it may cause sneezing in the person working the wood (Tredgold 1986: 109; Long 2005; Venter & Venter 2009: 212).

SOLANACEAE

Solanaceae includes herbs and shrubs, and rarely trees (Hutchings 1996: 275; Hyde *et al* 2013a). This family is also known as the potato family (Hyde *et al* 2013a). Fruit on these plants are either a capsule or a berry (Hyde *et al* 2013a). There are ninety-four genera and 2 950 species in this family (Hyde *et al* 2013a). These plants are found all over the world, but especially in South America (Tredgold 1986: 54; Hyde *et al* 2013a).

SOLANUM

Plant remains from Historic Cave were identified as *Solanum*. *Solanum* is also known as the nightshade genus (Hyde *et al* 2013a). The genus includes 1 700 species from warm countries across the world (Hyde *et al* 2013a). The Latin name was given to the genus because the plants within it are known for their sedative properties (Hyde *et al* 2013a). Many of the species are known as the poison apple (Long 2005). Fruits from these plants are usually spherical berries (Hyde *et al* 2013a).

Solanum species have a variety of medicinal uses and can treat abdominal problems in adults and infants, barrenness, blackwater fever, back pain, bladder complaints, body pain, boils, colic, coughs, dysentery, earache, eye complaints, fevers, haemorrhoids, impotence, indigestion, lumbago, malaria, pneumonia, rheumatism, ringworm in people and animals, sandworm, skin infections, snake bites, sore throats, sores on animals, sterility, syphilis, toothache, ulcers, urinary disease, venereal disease, warts and wounds (Watts & Breyer-Brandwijk 1932: 163-166; Tredgold 1986: 54; Hutchings 1996: 275-279; Long 2005). Burnt and powdered *Solanum aculeastrum* fruits are eaten on toasted millet grains to prevent vomiting (Hutchings 1996: 276). Leaves from *Solanum giganteum* have an application as a healing ointment (Long 2005). Seeds with medicinal properties come from *Solanum anguivi, Solanum capense* and *Solanum tomentosum* var. *coccineum* (Long 2005). Green berries from *Solanum nigrum* are applied to meat that has come into contact with anthrax to disinfect it (Hutchings 1996: 278; Watts & Breyer-Brandwijk 1932: 163).

Many of the nightshades are poisonous or have poisonous components (Watts & Breyer-Brandwijk 1932: 163-166; Tredgold 1986: 54; Hutchings 1996: 275-279; Long 2005). *Solanum aculeastrum*, for example, has poisonous seeds (Long 2005). Green fruits from *Solanum lichtensteinii* are poisonous (Long 2005). Other species, such as *Solanum giganteum*, have edible fruits and seeds (Long 2005). *Solanum macrocarpon* has edible fruit and leaves (Long 2005). *Solanum nigrum*, black nightshade, produces black berries that are edible and are especially attractive to children (Watts & Breyer-Brandwijk 1932: 163; Quin 1959: 74; Tredgold 1986: 54; Hutchings 1996: 275). The fruits are edible during the rainy season, but the berries must be black in colour before they can be eaten (Tredgold 1986: 54). Green berries are known to contain toxins which have been fatal to sheep specifically (Quin 1959: 74; Hutchings 1996: 275).The leaves of the black nightshade are used in potherbs, especially sweeter potherbs when the nightshade leaves provide a savoury flavour (Quin 1959: 74). Young shoots and sometimes the leaves of *Solanum nigrum* are cooked as spinach (Watts & Breyer-Brandwijk 1932: 163; Tredgold 1986: 54). In the dry season, the leaves must be cooked in two changes of water, as water from the first boiling becomes bitter (Tredgold 1986: 54).This plant is eaten by both the Pedi and the Zulu (Quin 1959: 74, 79).

TILIACEAE

The *Tiliaceae* or linden family is made up from herbs, lianes, shrubs and small trees (Hyde *et al* 2013a). There are 46 genera and 680 species in the family (Hyde *et al* 2013a). These plants are found all over the world (Hyde *et al* 2013a).There has recently been a move to add this family to Malvaceae instead of remaining separate (SANBI 2012; Hyde *et al* 2013a). However, this move has been argued against and so many choose to keep the families distinct in the meantime (Hyde *et al* 2013a). One genus represents the family at two cave sites. One species from the family was found at Balerno Main Shelter and four from Historic Cave. Another species was found at Historic Cave, but was identified only as a *Grewia* species.

GREWIA

The genus *Grewia* is characterised by shrubs and small trees (Hutchings 1996: 197; Hyde *et al* 2013a). There are 150 species found in the warmer parts of the Old World (Hutchings 1996: 197; Hyde *et al* 2013a).

Most, if not all, *Grewia* species have edible fruits; some species also have edible leaves (Long 2005). The fruit of *Grewia hexamita* is the largest *Grewia* fruit and can be made into alcohol (Long 2005). Many *Grewia* species have medicinal applications (Long 2005). They can be used for bladder complaints, impotence, sterility and wounds (Hutchings 1996: 197; Long 2005). Some species can cause vomiting; some act as aphrodisiacs (Long 2005).

The wood of some species can be used to make assegai handles, bows and arrows and walking sticks (Long 2005). The stems of *Grewia caffra* are used to make animal traps (Long 2005). *Grewia flavescens* provides general purpose timber (Long 2005). The same tree also provides forage and fodder for animals (Long 2005). *Grewia bicolor* is used by the Pedi, together with *Commiphora schimperi*, as hard and soft wood respectively to start fires by friction (Quin 1959: 132).

GREWIA BICOLOR JUSS.

The white-leaved raisin, donkey berry, white raisin or bastard brandybush is usually found as a multi-stemmed shrub but it can be found as a small tree at times (Tredgold 1986: 70; Operation Wildflower 2012; SANBI 2012; Hyde *et al* 2013a). It was recovered at Historic Cave. The plant flowers between October and January (Hyde *et al* 2013a). The fruit from the white-leaved raisin is either spherical or has two lobes and is reddish-brown in colour (SANBI 2012; Hyde *et al* 2013a). They appear in autumn and last into winter (Operation Wildflower 2012). These fruits are edible, both when ripe and if they have been dried (Tredgold 1986: 70; Operation Wildflower 2012; Long 2005; Hyde *et al* 2013a).

Medicinally, the plant can be used as an astringent (Operation Wildflower 2012). The roots can be used for chest complaints and to induce vomiting (Long 2005; SANBI 2012).

The bark of the white-leaved raisin is utilised for its fibre and can be made into rope or baskets (Operation Wildflower 2012; Long 2005; SANBI 2012). The wood is made into axe handles and similar products (Long 2005; SANBI 2012). The shrub is used by livestock and game to browse (Operation Wildflower 2012 SANBI 2012).

GREWIA FLAVA DC.

This multi-stemmed shrub usually reaches two metres in height (Hyde *et al* 2013a). *Grewia flava* can occur as a slightly larger, but still relatively small, tree as well (Hyde *et al* 2013a). It is known as the velvet raisin, brandybush or velvet brandybush (Tredgold 1986: 70; Long 2005; Venter & Venter 2009: 180; Hyde *et al* 2013a). Flowering takes place between October and March (Venter & Venter 2009: 180; Hyde *et al* 2013a). The plant produces fruit that is slightly larger than that of the white-leaved raisin above (Hyde *et al* 2013a). The fruit is spherical or it can have two lobes; it turns reddish brown when it is ripe (Venter & Venter 2009: 180; Hyde *et al* 2013a). This fruit is edible and consumed as porridge (Tredgold 1986: 70; Long 2005; Venter & Venter 2009: 180; Hyde *et al* 2013a). The fruit can also be fermented to make brandy or beer (Watts & Breyer-Brandwijk 1932: 116; Long 2005; Venter & Venter 2009: 180). The fruits can be dried and ground into a powder; mixed with dried locusts, this produces a local Zimbabwean delicacy (Tredgold 1986: 70).

The bark of the velvet brandybush is used for its fibre (Long 2005). Brachlets are utilised to make baskets, bowls and for toothbrushes (Long 2005). Medicinally, the roots cause a patient to regurgitate (Long 2005). Pegs made out of the wood of the brandybush are said to repel lightning (Tredgold 1986: 70; Long 2005). Some burial rites include small pieces of wood from this plant (Tredgold 1986: 70).

GREWIA MONTICOLA SOND.

Grewia monticola is known as the assegai wood, donkey berry, cross berry, raisin bush, grey raisin or silver raisin (Tredgold 1986: 69; Venter & Venter 2009: 184; SANBI 2012). Common names also include: vaalrosyntjie (Afrikaans); umsiphane (Swazi); nsihana (Tsonga); mogwanakgômo or mogwana (Tswana); Ngiri (Tonga); Mubura, Muguramhanda, Munjiri, Mupimbiri, Mutewa or Mutongoro (Shona); Sihane (Hlengwe); Ibusu, Umhlampunzi, Umpumpulwane or Umtewa; and umlalampunzi, isiphane or umdliwampunzi (Zulu) (Venter & Venter 2009: 184; SANBI 2012; Hyde *et al* 2013a). Synonyms include *Grewia cordata* N.E. Br. and *Grewia obliqua* Weim (Hyde *et al* 2013a).

The plant occurs as a tree or as a shrub, gaining a height of up to four to ten metres (Tredgold 1986: 69; Venter & Venter 2009: 184; SANBI 2012; Hyde *et al* 2013a). The plant is adaptable and hardy and requires little water (SANBI 2012). It is widely spread but thrives particularly in mountain environments (Hyde *et al* 2013a). Flowering occurs between October and March; fruit forms on the plant between February and August (Tredgold 1986: 69; Venter & Venter 2009: 184; SANBI 2012; Hyde *et al* 2013a). Birds are attracted to this fruit (SANBI 2012).

The fruit, fleshy drupes, are edible, dry but sweet, and are usually eaten together with the stone (Tredgold 1986: 69-70; Venter & Venter 2009: 184; Hyde *et al* 2013a). The fruits can be eaten fresh, sundried and ground into meal for porridge or fried in oil (Tredgold 1986: 70; Hyde *et al* 2013a). Beer can be made from the fermented berries (Tredgold 1986: 70; Hyde *et al* 2013a). Slightly bitter tea can be made from the leaves (Venter & Venter 2009: 184).

The wood can be worked, but only small pieces are obtainable from the tree or shrub and so the wood is only suitable for small items (Tredgold 1986: 70). The wood is often used for assegai or walking sticks and ornaments (Venter & Venter 2009: 184; SANBI 2012). Game and stock animals are known to browse the leaves of the species (Venter & Venter 2009: 184; SANBI 2012).

GREWIA OCCIDENTALIS L. VAR. OCCIDENTALIS

This species of *Grewia* was recovered at Historic Cave. It is known as the bow-wood, button-wood, four-corner or cross-berry (Watts & Breyer-Brandwijk 1932: 116: Tredgold 1986: 70; Venter & Venter 2009: 186; Operation Wildflower 2012; SANBI 2012; Hyde *et al* 2013a). It is a shrub or a small tree that produces the largest fruit out of the specific *Grewia* species mentioned above (Operation Wildflower 2012; SANBI 2012; Hyde *et al* 2013a). These fruits are reddish-brown when ripe, between January and May (Venter & Venter 2009: 186; SANBI

2012; Hyde *et al* 2013a). They can remain on the tree for some time (SANBI 2012). Flowers appear between October and January (Venter & Venter 2009: 186; Operation Wildflower 2012; Hyde *et al* 2013a).

The fruits are edible (Watts & Breyer-Brandwijk 1932: 116; Tredgold 1986: 70; Venter & Venter 2009: 186; SANBI 2012). The ripe fruits can be made into beer (SANBI 2012). In some area, there is more sugar in the fruits which enables them to be dried and stored (Venter & Venter 2009: 186; SANBI 2012). These dried fruits are sometimes boiled in milk and drunk, almost like a milkshake (Venter & Venter 2009: 186; SANBI 2012). The leaves are edible too (Long 2005).

The bark of the cross-berry is used to dress wounds (Watts & Breyer-Brandwijk 1932: 116: Hutchings 1996: 198; Long 2005; Venter & Venter 2009: 186; Operation Wildflower 2012; SANBI 2012). Other medicinal uses include treating barrenness, bladder problems, boils, sores and impotence and assisting with childbirth (Watts & Breyer-Brandwijk 1932: 116; Hutchings 1996: 198; Long 2005; Operation Wildflower 2012; SANBI 2012). Pounded bark was said to avoid the hair going grey when used regularly as shampoo (Hutchings 1996: 198; SANBI 2012).

The wood can be made into traditional weapons, including assegais, bows and spear shafts (Watts & Breyer-Brandwijk 1932: 116; Long 2005; Venter & Venter 2009: 186; Operation Wildflower 2012; SANBI 2012). The leaves are eaten by browsers and stock animals (Long 2005; Venter & Venter 2009: 186; SANBI 2012).