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Reconstructing palaeoenvironments during the Middle Stone Age in the southern Cape, South Africa: stable isotope analysis of speleothems from the De Hoop Nature Reserve

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CHAPTER 1

INTRODUCTION

1.1 General introduction

The last 200 thousand years (kyr) of human evolutionary history falls within a period known as the Middle Stone Age (MSA). In South Africa, the key behavioural developments associated with the MSA appear to be concentrated in two distinct periods of technological development, namely the Still Bay (73.5 - 70.5 ka; Jacobs *et al.* 2008) and the Howiesons Poort (66 - 58 ka; Jacobs *et al.* 2008). These techno-traditions occurred during portions of the Last Glacial period that are correlated, respectively, with the transition from marine oxygen isotope stage (MIS) 5 to MIS 4 (74 ka) and the MIS 4/3 boundary (59 ka). The extent to which human behavioural developments during these periods were influenced by climatic change is the subject of ongoing research (*e.g.* Henshilwood & Marean 2003; McCall 2007; Jacobs *et al.* 2008; Bar-Matthews *et al.* 2010; Chase 2010). This study aims to elucidate the environmental conditions of the MSA/Still Bay occupations at Blombos Cave by contributing to the construction of high resolution palaeoenvironmental archives.

1.2 Aim

The focus of this project is to reconstruct the palaeoenvironment of the southern Cape during the Middle Stone Age (*c.* 100 ka – *c.* 75 ka) and Later Stone Age (*c.* 2 – 0.3 ka) occupations at Blombos Cave (*e.g.* Henshilwood *et al.* 2009; for a comprehensive description of the Blombos site see Henshilwood 2008a). In order to determine whether climate change influenced the behavioural developments of people at the site, speleothems from several caves located within the De Hoop Nature Reserve were sampled. The reserve is located 30 km west of Blombos Cave and approximately 270 km east of Cape Town. The intention is to link the dates obtained from a speleothem-based stable isotope record with those already known from Blombos Cave (*e.g.* Jacobs *et al.* 2003a, b, 2006; Tribolo *et al.* 2006).

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The results from this study will be used to answer three main questions:

1. Do the climate proxies from the speleothems support other palaeoclimate records (*e.g.* archaeological, geomorphological, *etc.*) from the region?
2. Do changes in speleothem growth rate (indicating changes in the amounts of precipitation) coincide with variations in the periods of occupation at Blombos Cave?
3. What implications does this have for issues of behavioural development *viz.* subsistence strategies, mobility and material culture production during the Middle Stone Age in the region?

1.3 Dissertation outline

This dissertation comprises 8 chapters. The first introduces the study. Chapter 2 places the study within an environmental context and focuses on the present-day climate and vegetation in the southern Cape and also explores the palaeoenvironmental changes in the region during the last 150 kyr. The discussion in Chapter 3 introduces the Middle Stone Age site of Blombos Cave and offers an overview of the excavation history, archaeological deposits and associated material culture. The background to the chosen methodology is presented in Chapter 4. The results of this study is summarised in Chapter 5. Chapter 6 explores the significance of the results within the context of the *c.* 100 ka M3 phase of Middle Stone Age occupation at Blombos Cave. Chapter 7 provides concluding remarks. A reference list is provided in Chapter 8.

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