



Luminescence- and Infrared-Radiofluorescence dating of the Acheulean- to Middle Stone Age sedimentary sequence at Montagu Cave, Western Cape Province, South Africa

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Montagu Cave is an archaeological site located on the edge of the Langeberg mountain range, about 160 km NE of Cape Town, in South Africa. The archaeological and sedimentary units at Montagu Cave comprise two Acheulean sequences which are separated from one another by a substantial archaeological hiatus. There is an additional Middle Stone Age sequence which overlies the Acheulean horizons, and contains layers attributed to the Howiesons Poort, as well as multiple other Middle Stone Age sub-stages. Hence, Montagu Cave provides a unique opportunity to investigate quite complex population level questions concerning the behavioral differences between modern and pre-modern populations in southern Africa.

However, thus far, the chronological context of the sediment-layers at the site remains unclear. It is therefore critical to provide a resilient chronological framework for the timing of human activity at the site.

This study concerns the potential of luminescence dating for the sedimentary sequence preserved at Montagu cave.

The collected samples are tested on their quartz- and feldspar luminescence signal properties.

Various optical dating techniques (quartz OSL; pIRIR290) will be applied, and the results of each compared in order to obtain information on the suitability of the material for luminescence dating, and to establish a chronological framework for this important archaeological site.

Furthermore, the infrared-radiofluorescence (IR-RF) signal behavior will be tested on potassium feldspars, as IR-RF is a method being able to date back up to > 600 ka. IR-RF therefore has the potential to cover the expected time-frame of the sediments at Montagu-cave.