Rock art project

The South African Waterberg is home to numerous rock art sites which remain largely understudied compared to other south African rock art cluster such as the Drakensberg or the southern and eastern Cape (Lewis-Williams and Lewis-Williams, 1983; Bonneau et al., 2012). Despite the extensive works being carried out on southern African rock art, pigments used to realize it remain partially unknown as the nature of the binder has only been studied sporadically (Denninger, 1971). Characterizing the pigments and binders used to perform the rock art can bring crucial information about past communities behaviours.

We want to investigate the pigments and binders used to perform some of the rock art at Kaingo reserve (Waterberg, South Africa). To do so, we would like to micro-sample (less than 1 mmx 1 mm) a white hippopotamus rock art figure. To ensure the identified compounds do correspond to the paint used to realize this figure, one micro-sample will be done on the paint and one on an undecorated area next to this hippopotamus figuration. Sampling will be done with a cleaned scalpel so that it does not alter the figure reading.

Micro-samples will then be analyzed at the Evolutionary Studies Institute, University of the Witwatersrand. They will be analyzed with scanning electron microscopy, infrared and Raman spectroscopy to determine the paint nature as commonly performed in rock art pigment studies (Bonneau et al., 2012 ; Chalmin & Huntley, 2017; Hoerlé et al., 2016). Binders characterization will then be completed by omic study carried out by liquid chromatography and tandem mass spectrometry as performed by Roldán and colleagues (2018). This will be the first time such a study will be implemented on southern African rock art, thus paving the way for future studies to understand better past communities behaviours and their connection to rock art.

Ochre survey

Ochre, a term referring to ferruginous coloring rocks, has been used since the Middle Stone Age for a large divsersity of uses such as hafting adhesive compound (Wadley, 2005), mosquito repellent (Rifkin, 2015), sun protection (Rifkin et al., 2015) or rock art pigment (e.g. Hughes and Solomon, 2000 ; Bonneau et al., 2012). Beyond its use, ochre also bears crucial information about past population mobility (Mathis et al., 2014 ; Mauran et al., 2021 ; Velliky et al., 2021). Much attention has been dedicated to ochre pieces recovered at Middle Stone Age sites, where it is often considered as a marker of modern human cognition (Hodgskiss, 2014). Studying the link between rock art pigment and ochre has a huge potential to provide us a better understanding of past populations spatial occupations, trade and ideological networks.

Numerous ochre fragments have been recovered from archaeological sites in the Waterberg: Oliebomspoort (Val et al., 2021), Red Ballon, North Brabant (Schoonrad and Beaumont, 1968). Contratry to other MSA southern african sites, the ochre assemblage at these sites are dominated by specularite, a grey shiny hematite (Thackeray et al., 1983). The predominance of the specularite in these archaeological assemblages is most probably due to a common local ochre procurement strategy. We want to investigate the ochre procurement strategies of the populations who occupied the Waterberg during the MSA.To do so, we are going to survey the Waterberg to find some potential ochre sources.

Geological and archaeological ochres from these different sites will be analyzed by elemental techniques (pXRF, non-invasive PIXE), mineralogical techniques (Raman, FTIR) and structural technique (SEM). Our study will pave the for further studies and the modern ochre will join the Leswika collection, a collection of geological ochres which will help provide a better understanding of prehistoric and historic procurement and use of ochre in southern Africa for future studies.

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