Abstract

This study focuses on the formation and transformation of the Oldowan artefact-bearing deposits in the eastern portion of Member 5 (M5) at Sterkfontein Caves. Karst systems can be naturally complex in their formation and deposition, and since 1936 much research has taken place at Sterkfontein to clarify the stratigraphy of the site's sedimentary genesis. In order to explain aspects of the site formation I first mapped the current M5 deposits and features exposed at surface and through excavations using a Geographic Information Systems (GIS) programme. This is now the most up-to-date plan for this part of the Sterkfontein site. The Oldowan assemblage in Member 5 East (M5E) has been published as the most intact examples of this early industry in southern Africa, which also has a large small flaking debris (SFD) component, as well as other lithic types, which served as the basis for this study.

I developed the first whole tool abrasion index for very small lithics by using a Micro Computerized Tomography (Micro-CT) scanner. I was able to produce Three-Dimensional (3D) geometries of over 400 SFD pieces, as well as 300 other lithics in different categories. I used statistical analysis to quantify the abrasion on an entire tool's surface mesh, thereby creating a new technique for edge angle analysis. My approach does not depend on a tool's orientation, unlike other existing and often problematic edge angle techniques. I compared SFD from the M5E Oldowan assemblage with SFD that originated in M5E but that had been shown to have winnowed down into a separate and lower chamber of the cave system called the Name Chamber. Using my method, I was able to quantify the different degrees of abrasion that had occurred within the M5E Oldowan and the underlying Name Chamber assemblage to assess the effects of reworking within the cave system. This study shows that the Sterkfontein Oldowan assemblage has not been significantly altered, despite its secondary context within an underground karst cave infill. Both my abrasion index and spatial plan should equip future researchers with tools for better understanding the intricate site formation at Sterkfontein Caves.