



The Middle Stone Age human fossil record from Klasies River Main Site



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ARTICLE INFO

Article history:

Received 30 May 2016

Accepted 6 December 2016

Available online 28 January 2017

Keywords:

Human
Cranial
Vault
Postcranial
Adult
Juvenile

ABSTRACT

The paleoanthropological significance of Klasies River Main Site derives from its abundant Middle Stone Age (MSA) archaeological debris and the hominin fossils that have featured in discussions about modern human emergence. Despite their significance, the human remains have yet to be contextualized within the spatial, stratigraphic and geochronological framework of the site. We provide an updated overview of the stratigraphy and geochronology of the site, and review the human fossil record in this context. We also provide the first anatomical interpretations of many of the cranial vault fragments. Five hominin specimens derive from the Upper Member and six from the lowermost LBS Member. The vast majority – nearly 40 cataloged specimens – come from the SAS Member; many of these are from a single stratigraphic horizon in a relatively small area in Cave 1. There is a strong cranial bias to the sample; just over 70% of skeletal remains are from the skull. The postcranial skeleton is poorly represented. Excluding the three metatarsals, there are only three long bones in the sample – a clavicle, a proximal radius, and a proximal ulna. Remarkably, humeral, femoral and tibial diaphyses, which are the most durable elements in terms of cortical bone thickness and density, are absent. However, the proportional representation of hominin remains is reminiscent of the “Klasies Pattern” shown by the MSA large bovid skeletal parts. To some degree, this may reflect the excavation and recovery methods that were employed. The vast bulk of the human fossils represent adults. Only three undoubted juvenile individuals are represented – each by a deciduous tooth. This contrasts with other MSA sites along the southern coast of South Africa, where human remains are predominantly juvenile, usually in the form of (possibly exfoliated) deciduous teeth. However, this apparent dissimilarity may also reflect different excavation techniques.

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1. Introduction

The “site” of Klasies River, also referred to as Klasies River Mouth (Singer and Wymer, 1982), comprises five caves or rock shelters located along a 2.5 km stretch of the Tsitsikamma Coast in the Eastern Cape Province of South Africa (Fig. 1). Three of the caves preserve archaeological deposits. The westernmost Main Site (34°6′29.69″S, 24°23′25.95″E), which is situated approximately 0.5 km from the mouth of the Klasies River, was the focus of 14 months of intensive excavations by J. Wymer in 1967–1968 (Singer

and Wymer, 1982). It was subsequently excavated seasonally by H. Deacon from 1984 to 1995 (Deacon, 1989, 1995, 2001b; Deacon and Wurz, 2005), and one of us (SW) has been excavating the site since 2013. The Main Site preserves ca. 21 m depth of deposits spread across a series of interrelated recesses in the Table Mountain sandstone cliff that are referred to as Caves 1, 1A, 1B and 2 (Fig. 2). Most of the work has focused on the Cave 1 and Cave 1A deposits.

The palaeoanthropological significance of the Main Site derives from its abundant Middle Stone Age (MSA) archaeological debris and human fossils. These artifacts and faunal remains have featured prominently in discussions over the emergence of modern human behaviors (e.g., Klein, 1976, 1989; Deacon, 1989, 1992, 1993, 2001a; Klein and Cruz-Urbe, 1996; Milo, 1998; Wurz, 1999, 2002, 2008; Deacon and Wurz, 2001; McCall, 2006; Dusseldorp, 2010; d’Errico

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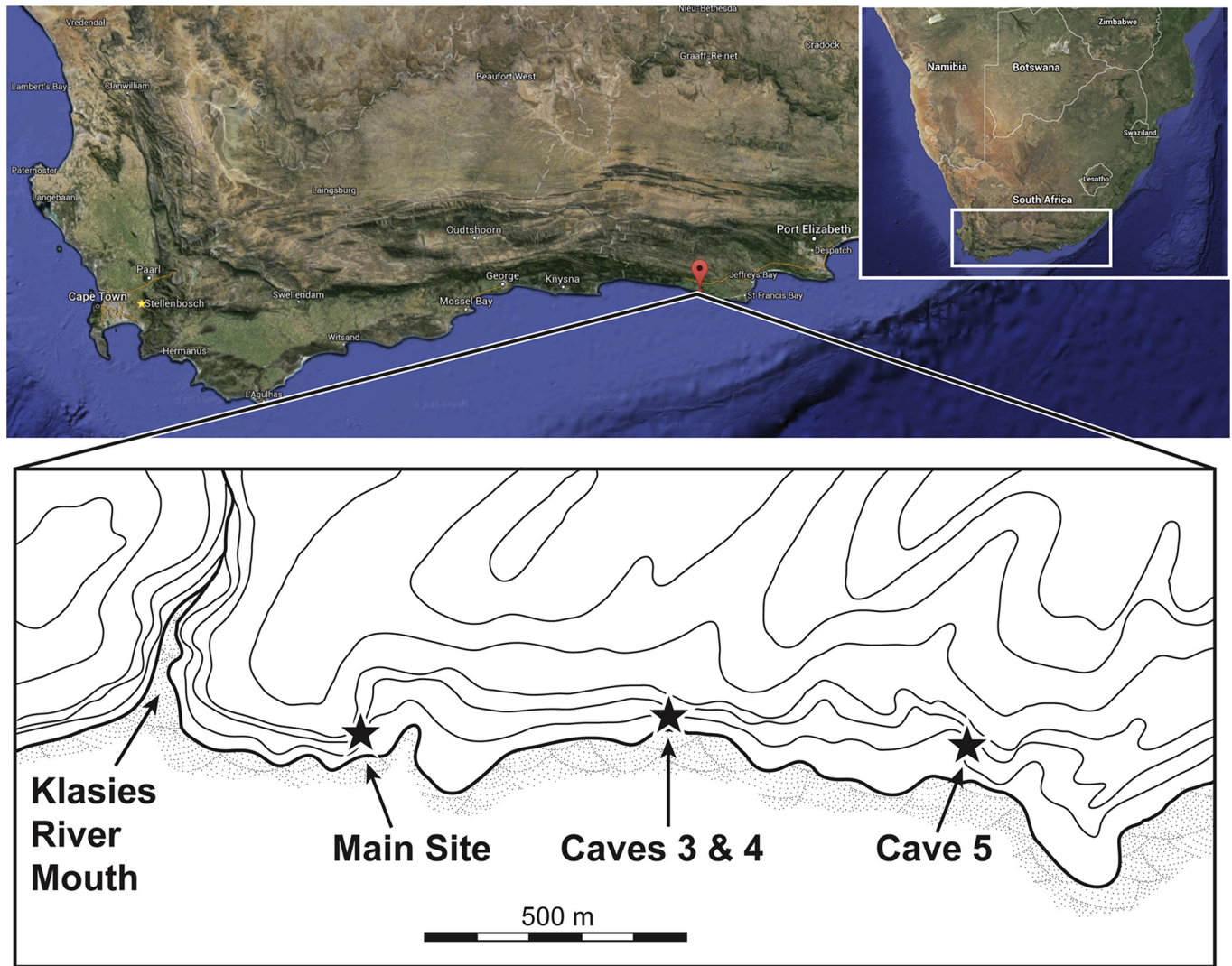


Figure 1. Location of the Klasies Main Site. Inset = Google Map satellite image of southern Africa; top = Google Map satellite image showing the location of the site (red balloon); bottom = contour map of the Eastern Cape coast east of the Klasies River Mouth to Druipkelder Point; stippling = beach sand (modified from Deacon and Geleijnse, 1988: fig. 1). (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

et al., 2012). Despite their generally fragmentary nature, the hominin fossils have played a significant role in interpretations of *Homo sapiens* evolution (e.g., Singer and Wymer, 1982; Bräuer et al., 1992; Smith, 1992; Frayer et al., 1993; Stringer and Bräuer, 1994; Bräuer and Singer, 1996a, 1996b; Churchill et al., 1996; Lam et al., 1996; Ahern and Smith, 2004; Royer et al., 2009; Dusseldorp et al., 2013; Grine, 2016).

Wymer's initial excavations resulted in the recovery of the bulk of the human fossils – nearly 40 specimens – that have been found to date, and most of these were documented to some degree by Singer and Wymer (1982). Four others (a lumbar vertebra, a fragment of temporal bone, a partial atlas, and a left hallucial metatarsal) were identified subsequently by Richard Klein from among the faunal remains recovered from those excavations. These have been documented by Grine et al. (1998) and Rightmire et al. (2006). Deacon's excavations resulted in the discovery of another dozen human fossils. These have been described by Rightmire and Deacon (1991, 2001), Bräuer et al. (1992), Churchill et al. (1996), Rightmire et al. (2006) and Grine (2012).

Although some of these hominin fossils display manifestly modern morphologies, others exhibit somewhat more archaic traits, and the degree of size dimorphism seems unmatched

among recent human populations (Royer et al., 2009). While it is possible that these specimens do not derive from a single population or lineage, but rather represent different, unrelated populations who utilized the site at different times, it is also possible that some of the differences might relate to the temporal depth of the sample, which spans most of Marine Isotope Stage (MIS) 5 and all of MIS 4 (Grine, 2016). However, it is perhaps worth noting that some of the most dimorphic fossils derive from the same or adjacent levels. Overall, the evidence, albeit limited, seems to suggest a pattern of general but incomplete morphological modernity. As observed by Smith (1992: 148), the “somewhat primitive aspects of certain features in some specimens” might be expected in an otherwise morphologically modern population of this geological antiquity.

Despite the significance that the Klasies Main Site hominin fossils have assumed in the interpretation of human evolution and the observations that some appear to possess somewhat more archaic morphologies than others, they have yet to be contextualized within the spatial and strato-chronological framework of the site. Moreover, while several of the pieces of cranial vault have been positioned anatomically (e.g., the KRM 16425 frontal, the KRM 15397 temporal, and the KRM 41658 fronto-parietal fragments) by

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