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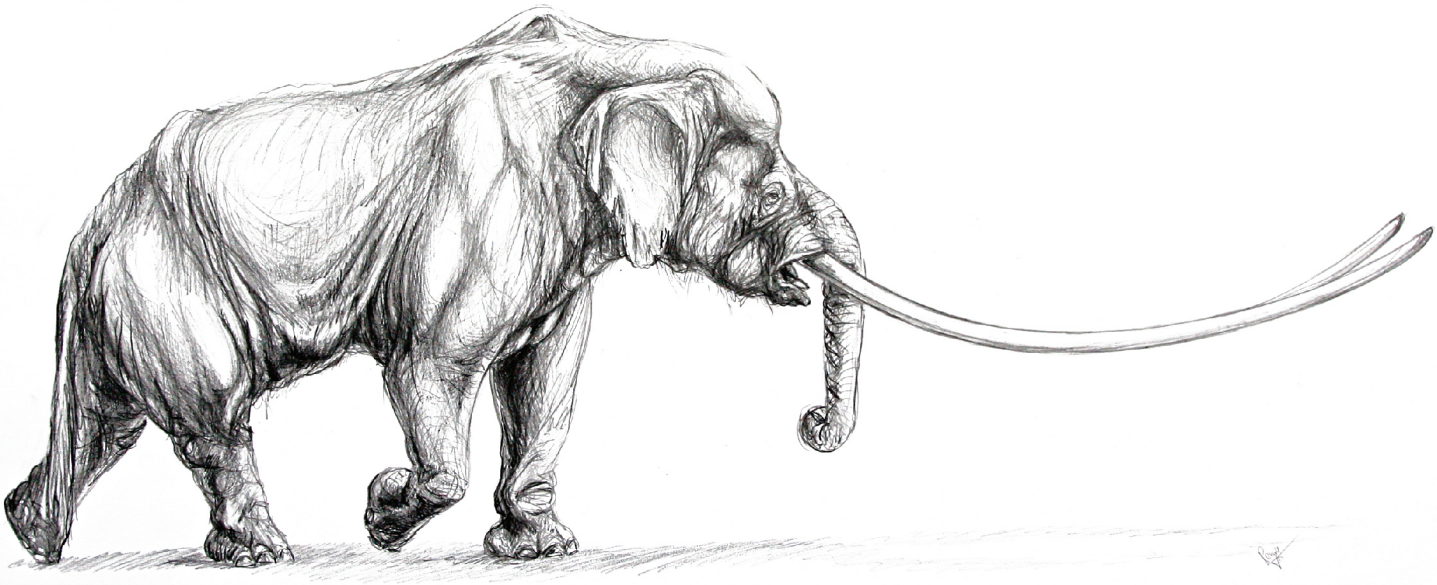

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ABSTRACT BOOK

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Taphonomy of *Stegodon florensis* remains from the early Middle Pleistocene archaeological site Mata Menge, Flores, Indonesia

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Mata Menge is an open-air fossil and stone artefact locality dating to the early Middle Pleistocene of Flores, Indonesia. It is situated on the western margins of the So'a Basin, a ~200 km2 depression in the central part of the island. The site forms part of an up to 100 m thick sequence of primary and secondary volcaniclastic and lacustrine deposits dated to between 1.8 and 0.65 Ma (Sondaar et al. 1994; O'Sullivan et al. 2001; Brumm et al. 2010). Current best age estimates for the Mata Menge fossil deposits were obtained using the fission-track method and fall between 0.88 and 0.8 Ma (O'Sullivan et al. 2001). Recent research suggests that hominin occupation of the basin extends back to at least 1 Ma (Brumm et al. 2010) and there is proxy evidence for hominins (stone artefacts) until ~700 Ka (O'Sullivan et al. 2001). In fact, the So'a Basin hominins are the most likely ancestral candidates for *Homo floresiensis*, the diminutive hominin from the Late Pleistocene of western Flores.

More than a decade of large-scale excavations at Mata Menge have yielded an insular vertebrate fauna consisting of the intermediate-sized *Stegodon florensis*, a giant rat (*Hooijeromys nusatenggara*), Komodo Dragon (*Varanus komodoensis*), crocodile, birds and frogs. To date, ~10,000 fossil elements have been excavated from the site. In addition, over 3000 stone artefacts were recovered in direct association with the fossils (Brumm et al. 2006; Aziz & Morwood 2009; van den Bergh et al. 2009). These artefacts provide clear evidence for hominin activity at Mata Menge. Despite this, it remains uncertain whether hominins played a significant role (or any role) in the accumulation of fossil fauna at the site, in particular *Stegodon*. The current research is aimed at addressing this problem.

The *Stegodon* bones are mainly concentrated in three successive sedimentary units: a homogeneous sandstone, fine-grained tuffaceous silts, and a cross-bedded fluviatile deposit. The majority of the *Stegodon* remains are highly fragmentary and none of the *Stegodon* bones were found articulated in the above-mentioned contexts. Previous studies have shown that fluvial transport has been responsible for selective loss of the smaller and easily transportable bones such as carpals (van den Bergh et al. 2009). No clear cut-marks have been found, and most of the bone breakage appears to have occurred postmortem on dry bone, although helicoidal fractures are also present. Bone preservation is highly variable, including well-preserved fresh bone appearances, but also rounding due to fluvial transport, presence of various stages of cortical bone weathering, rooting by plant roots and dissolution features.

Due to the large amount of fossil material, we conducted a preliminary taphonomic study on a sub-sample of the fossil assemblage, consisting only of the *Stegodon* dental

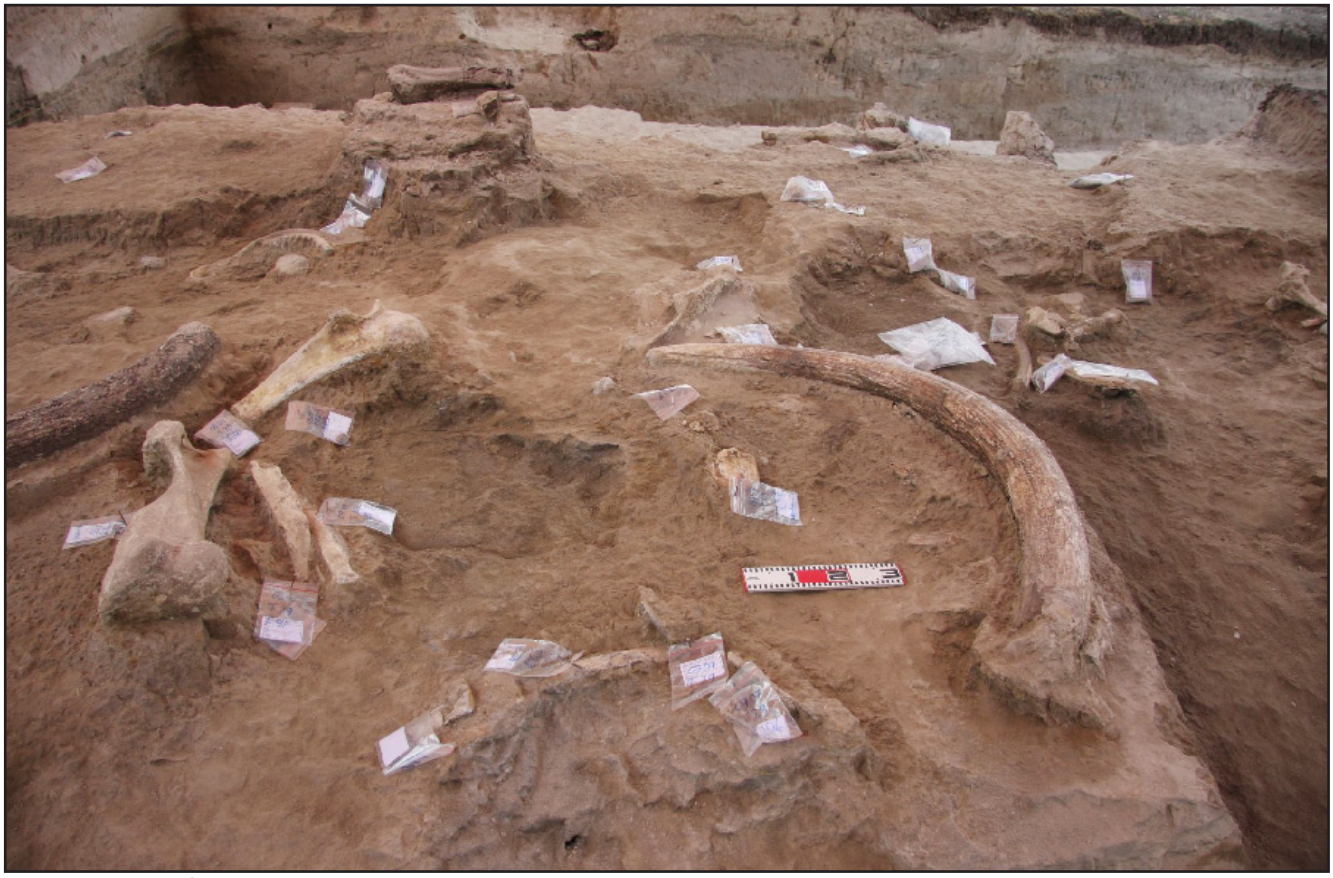

Fig. 1. *Stegodon florensis* bone accumulation at Mata Menge.

material from Mata Menge (excluding tusks and numerous smaller tusk fragments), as well as all mandible and maxilla material. Earlier work at Mata Menge indicated that the dental remains provide the best estimate of the Minimum Number of Individuals (MNI) (van den Bergh et al. 2009) as the dental enamel is more resistant to post-mortem alteration.

Analysis of the dental remains indicates an MNI of at least 120 individuals of all ages. The larger males could be distinguished from the more abundant female adult individuals based on the size differences of mandibles. The age profile of the death assemblage (based on molar wear stages) corresponds with that of a living population, indicative of non-selective mortality affecting individuals of all size classes. This usually points to a catastrophic event that killed-off an entire population. Although some evidence for this is provided by the volcanic origin of the surrounding deposits, Mata Menge lacks primary volcanic units that could have caused mass-death events, such as pyroclastic flows or air-fall tephra deposits.

Our results suggest that *Stegodon* carcasses at the site were probably not entirely covered over with volcanic tuff, but seem to have been exposed on the surface for extended periods and later transported by flowing water prior to their final burial. *Stegodon* carcasses lying about on the surface may have attracted hominins and the top reptilian predators in the basin (Komodos and crocodiles), but so far there is no clear evidence that hominins butchered *Stegodon* remains. Importantly, the stone artefacts, of which ~35% are slightly abraded and 13% heavily abraded (Brumm et al. 2006), have largely been transported by the same agents as the bones, although the occurrence of larger stone tools in fine-grained tuffaceous silt deposits would be harder to reconcile with fluvial transport.

In sum, we cannot rule out the possibility that hominins played a role in the accumulation of fossil remains at Mata Menge, but our findings suggest – somewhat counter-intuitively – that this was unlikely. It may be the case that the spatial juxtaposition of stone artefacts and *Stegodon* remains at the site was largely accidental. Further research is needed to explore the link between *Stegodon* fossils and hominin activities at Mata Menge.

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