



Geoarchaeological studies of the Yalibirri Mindi rock shelter, Weld Range, Wajarri Yamaji Country, Western Australia

Matthias Leopold (1), Vivienne Brown (2), Anneliese Carson (3), Belinda D'Ovidio (1), Emielda Yusiharni (1), and Vicky Winton (2)

(1) University of Western Australia, School of Agriculture and Environment, Crawley, AUSTRALIA (matthias.leopold@uwa.edu.au), (2) Archaeology, School of Social Sciences, University of Western Australia, Crawley, AUSTRALIA, (3) Archaeology and Anthropology, Western Australian Museum, Welshpool DC, AUSTRALIA

Understanding of past environmental conditions can be used to answer archaeologically based questions. Geoarchives such as soils and sediments inside rockshelters store information about chemical and physical processes from their time of formation thus allowing the reconstruction of the past. This study seeks to understand the sediment and soil formation factors at the 'Yalibirri Mindi' rock shelter, located in the Weld Range in the country of the Wajarri Yamaji Aboriginal people of Mid West Western Australia. The project is part of the 'federally funded Weld Range Web of Knowledge Project'. The aim of the work is to evaluate the origin of dated carbon material and associated sediments. Rockshelter sediments as well as two soil profiles outside the shelter were characterized using a series of different laboratory techniques such as pH and EC, nested particle sieving, ICP-OES, XRD, XRF, CN and radiocarbon analysis as well as magnetic susceptibility. An additional heating experiment was performed to simulate the influence of frequent fire on the magnetic properties of the sediments to evaluate potential anthropogenic origin of fire remains (charcoal).

Pleistocene age estimates were obtained for some of the charcoal found in association with Aboriginal flaked stone artefacts. The lowest layer containing Aboriginal artefacts was dated to $29,089 \pm 132$ years uncal. BP providing the first evidence for Pre-Last Glacial Maximum occupation of the inland Mid West in Australia.

Sediment analyses indicate that the rockshelter sediments are the result of in-situ weathering with contemporaneous human occupation rather than transport from outside. Gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$), which is not part of the natural environment in the surrounding area was identified in the rockshelter sediments and might be indicative of heating and evaporation during wood fire burning. Human induced fires had also altered the magnetic susceptibility of the sediments. Sedimentological analyses strongly support the anthropogenic origin of the dated material and thus human occupation of the region as early as 33,644–32,875 cal BP, which is the oldest known for this region.