Radiocarbon dating reveals a 20,000-year sequence of Australian Aboriginal Rock Art

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A decade long research project has revealed a chronological sequence of Australian Aboriginal rock art that spans, at least, 20,000 years.

The Kimberley region in north-western Australia is renowned for its rich concentration of rock art, traditionally believed to originate from the Pleistocene. Despite its cultural and historical importance, the direct radiometric dating of the older art is not possible as it was rendered using ochre pigment. Attempts to date the art, therefore, rely on establishing age constraints through the dating of material overlying or underlying the paintings. Until now, the scarcity of suitable material meant there was very limited geochronological evidence to support its Pleistocene antiquity and insufficient results to date the different styles of rock art.

Our research project developed techniques to radiocarbon date the more abundant, small mud wasp nests commonly found in contact with rock art. Employing statistical analyses, we determined that hundreds of wasp nest ages were necessary to confidently estimate the age span of the five main Kimberley rock art styles. Between 2015 and 2023, we collected over 600 mud wasp nest samples (median mass 260 mg). For the 565 samples prepared for AMS measurement, the median carbon mass was just 25 micrograms so the ability to reliably measure microgram-sized samples was crucial.

Our findings, based on 440 radiocarbon dated wasp nests in relation to rock art, establish a Kimberley stylistic sequence spanning at least 20,000 years. Notably, the great majority of the paintings in our study area date back to the period between 20,000 and 10,000 years ago, encompassing the Last Glacial Maximum to the terminal Pleistocene.

Student Submission

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