Archaeology

Ancient plant artefact reveals how humans reached Australia

Michael Marshall

A TINY chunk of plant resin shows that people were living on an island in eastern Indonesia at least 55,000 years ago – indicating the likely route that modern humans took when migrating to Australia.

We know that modern humans journeyed to Australia by heading south-east from mainland Asia, travelling through what is now Indonesia and many other islands of South-East Asia. The exact timing is contested, says Dylan Gaffney at the University of Oxford. Modern genetic evidence suggests humans arrived less than 50,000 years ago, but archaeological evidence points to an earlier arrival, "perhaps 65,000 or even 80,000 years ago", he says.

The exact route they took is also disputed because the geography of the region at the time was different. Earth was in a cold glacial period, so more water was locked up in ice sheets and sea levels were lower, meaning some landmasses that are now islands were connected to continents. In the western part of this region, Borneo, Sumatra and Java were all part of mainland Asia – while in the eastern part, New Guinea was joined to Australia.

This means there were two routes humans could have taken to reach Australia. The northern route heads east from Borneo to Sulawesi and on to New Guinea, then south into Australia. The southern route goes via Java, passing through Bali and Timor to northern Australia.

To help find out how people made the journey, Gaffney and his colleagues excavated Mololo cave on the island of Waigeo, one of the Raja Ampat islands just west of New Guinea and

DYLAN GAFFNEY/THE RAJA AMPAT ARCHAEOLOGICAL PROJECT

Recreation of a slice of tree resin (top) that may have been used to make fire on the island of Waigeo (below)

along the northern route. In the sediments on the cave floor, the team found evidence of human occupation, such as charcoal and a few stone flakes.

Gaffney's team also found a piece of resin 1.4 centimetres across. It has an angular shape, suggesting it was cut from a tree rather than pooling naturally. Radiocarbon dating indicates it is at least 55,000 years old (*Antiquity*, doi.org/ncqg).

The resin was probably used as fuel for fires, says Gaffney. "It is very flammable and is a good light source in caves." But there are other possibilities, such as fragrance or adhesive. Whatever its use, it shows that humans were on Waigeo at least 55,000 years ago. "We are demonstrating that people used the northern route," he says.

The work adds to evidence that people first reached Australia via the northern route, says Kasih Norman at Griffith University in Queensland, Australia. Geographical models always pointed to the northern route because the sea crossings are easier. "You have more water crossings between islands to do along the northern route, but the crossings themselves are shorter," she says, and "you can always see to the next island".

However, most archaeological excavations focused on the southern route, says Norman. Only in recent years have researchers begun exploring the northern option.

One key discovery, published in July, is that a cave painting of a pig found on Sulawesi, along the northern route, is 50,000 years old. Likewise, a study published in May found that there was no evidence of humans on Timor before 44,000 years ago, suggesting the southern route was only used later. ▮

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Zoology

Endangered skate saved by hatching eggs in captivity

James Woodford

ONE of the world's most endangered species of marine fish has been saved from extinction, thanks to researchers who captured wild specimens and helped them reproduce in captivity.

The Maugean skate (*Zearaja maugeana*) is found only in Macquarie harbour on the isolated south-west coast of Tasmania, Australia. The area is a naturally low-oxygen environment, making it difficult for fish to thrive, but salmon farming and river flow changes as a result of dams have made the situation worse.

Jayson Semmens at the University of Tasmania says while no one knows the exact population of these skates, a collapse between 2014 and 2021 saw it halve. There may now be just over 1000 individuals, he says, and they are now predominantly adults, meaning juveniles aren't reaching maturity.

To try to safeguard the skates from extinction, in December 2023 Semmens and his colleagues collected 50 eggs and saw over half of them successfully hatch in captivity. They also collected some adults, one of which laid eggs even though it was kept separate from the others. Semmens says this is because the skates are able to store sperm to fertilise eggs later. "We have over a hundred eggs from her now and the vast majority of them are looking like they're going to be viable," he says.

Team member David Moreno, also at the University of Tasmania, says captive breeding isn't the full solution, so the researchers are also working to reverse environmental issues in Macquarie harbour, including a trial of pumping oxygen into the water.

It will take four to five years before the captive-reared individuals reach maturity and could start contributing to the wild population when released. ▮