

## Moa Dung Reveals Diet

**A**nalysis of more than 1500 coprolites, or fossilised dung, has revealed the diet of several moa species, throwing light on the ecology of New Zealand prior to human settlement.

Moa dominated New Zealand prior to human arrival, with almost a dozen species making up virtually the entire local megafauna. The females of the largest moa species were 3 metres tall and weighed 250 kg. Some of the droppings studied were 15 cm long.

“Surprisingly for such large birds, over half the plants we detected in the faeces were under 30 cm in height,” says Dr Jamie Wood of the University of Otago. “This suggests that some moa grazed on tiny herbs, in contrast to the current view of them as mainly shrub and tree browsers.”

Dr Jeremy Austin of the Australian Centre for Ancient DNA says there is no satisfactory answer as to why species with few predators would need to grow so big if they were largely living off low-growing herbs. “It may be because if consuming fairly poor quality herbs and grass you need a large digestive system, or because to put enough investment in an egg it helps to get bigger and bigger,” he says.

“Ratites in general are large birds to begin with,” Austin adds, “and if you end up on an island with no predators and your ancestors are big maybe you just naturally end up big if you can find enough food”.

Many of the plants detected in the coprolites are now rare,



A researcher with fossilised dung of the extinct giant moa. Photo: Otago Times

“suggesting that the extinction of the moa has impacted on their ability to reproduce or disperse,” Wood says.

Austin acknowledges that changes resulting from species introduced by Europeans provide an alternative explanation for the decline of these plants, but says: “All over the world, herbivore species are known to alter the habitat through grazing pressure”. Austin thinks it is likely the Moa kept areas that might otherwise become woodland open to grasses and smaller herbs.

“New Zealand offers a unique chance to reconstruct how a ‘megafaunal ecosystem’ functioned,” says Prof Alan Cooper, Director of the Australian Centre for Ancient DNA. “You can’t do this elsewhere in the world because the giant species became extinct too long ago, so you don’t get such a diverse record of species and habitats.”

## Malaysian Tool Discovery Rewrites Human Prehistory

**T**he discovery of ancient stone tools in Malaysia has prompted a rethink of human arrival in our region, with possible implications for the evolution of the “hobbits” (*Homo floresiensis*) found on the Indonesian island of Flores.

The Centre for Archaeological Research Malaysia (CARM) announced the discovery of hand axes dated to 1.8 million years ago at Bukit Bunuh on the Malaysian Peninsula. CARM said that this pushes back the date at which the first humans are thought to have left Africa.

However, Prof Colin Groves of the Australian National University’s School of Archaeology and Anthropology thinks the real significance of the find lies elsewhere. “The early date for human occupation was to be expected,” Groves says. However, he points out that hand axes had not previously been found anywhere near this date east of the Movius Line running from India to Europe.

Since 1948 the line has been considered to mark the boundary of the presence of hand axes, with areas to the north and east

containing only chopping tools that are not considered true hand axes.

The hand axe was found, along with other stone tools, imbedded in a suevite rock. Suevite is formed by meteorite impact, and the rock has been dated to 1.83 million years.

However, the fission track dating method used has an error of 0.61 million years and Groves says: “The date should certainly be replicated using another method.” Appropriately, subsequent generations of humans used the suevite to make their own tools.

“It would be very nice to know who made these stone tools – *Homo erectus* or proto-floresiensis,” Groves says. Accurate dating could be crucial here. “*Homo erectus* is known from about 1.6 million years ago. *Homo floresiensis* represents what must be an earlier dispersal out of Africa.”

Groves says the original theory that the hobbits were dwarfed members of *Homo erectus* “is now mostly regarded as less likely”.