

# Genetic tests show Central Australian palm trees diverged from Northern trees more recently than thought

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Central Australian Cabbage Palm (*Livistona mariae*), Palm Valley, Finke Gorge National Park, Northern Territory, Australia. Image: Wikipedia.

(PhysOrg.com) -- For years, tourists visiting central Australia's famous Alice Springs have been told that the palm trees in the area are relics left over from the days millions of years ago when Australia's interior was a tropical zone. Unfortunately, evidence has shown that the old story just isn't true. Instead, the red cabbage palm, as it's known locally, came via seeds somehow carried south nearly 1000 kilometers from palms that grow in the north. Now new evidence from a group of Australian and

Japanese researchers shows that the red cabbage palm has been diverging from its northern parents for just 15,000 to 30,000 years. They have published their findings in the *Proceedings of the Royal Society B*.

Prior research had shown that the [palm trees](#) in Australia appeared to have come from some ancient ancestor in Southeast Asia and that the palm trees in Alice Springs were genetically identical to the palm trees that grew farther north. This new research looked at microsatellite markers in both groups of trees, which focuses on the parts of DNA that evolve the most quickly. In so doing, the team was able to pin down which group of palms in the north (the *Livistona* palm from Mataranka) the palms in the south came from. But more importantly, they were able to see that the divergence had begun as recently as 15,000 to 30,000 years ago.

Other research has shown that the ancestors of modern indigenous Australian people arrived some 40 to 45 thousand years ago and had migrated south 20 to 30 thousand years ago, which would have them migrating during the time when the palm seeds were also moving south. Thus, it seems likely that it was those early settlers that carried the seeds to Alice Springs which resulted in the trees that are seen today. As for why they might do so, it has been noted that red cabbage palm tree fronds are one of the few native food sources that would have been available to early travelers.

Others are still not convinced it was people that carried the seeds, however, after all, if early humans carried the [seeds](#) south why aren't there more stands of red cabbage palms in other places besides just Alice Springs? Some say they could have just as easily been spread by birds, despite the lack of evidence for that. In any case, the one thing that is certain is that they are not holdovers from the time fifteen million years ago when Australia was covered in tropical vegetation which means the story told to tourists will have to be changed.

**More information:** Not an ancient relic: the endemic *Livistona* palms of arid central Australia could have been introduced by humans, *Proceedings of the Royal Society B*. Published online before print March 7, 2012, [doi: 10.1098/rspb.2012.0103](https://doi.org/10.1098/rspb.2012.0103)

## Abstract

*Livistona mariae* is an endemic palm localized in arid central Australia. This species is separated by about 1000 km from its congener *L. rigida*, which grows distantly in the Roper River and Nicholson–Gregory River catchments in northern Australia. Such an isolated distribution of *L. mariae* has been assumed to have resulted from contraction of ancestral populations as Australia aridified from the Mid-Miocene (ca 15 Ma). To test this hypothesis at the population level, we examined the genetic relationships among 14 populations of *L. mariae* and *L. rigida* using eight nuclear microsatellite loci. Our population tree and Bayesian clustering revealed that these populations comprised two genetically distinct groups that did not correspond to the current classification at species rank, and *L. mariae* showed closest affinity with *L. rigida* from Roper River. Furthermore, coalescent divergence-time estimations suggested that the disjunction between the northern populations (within *L. rigida*) could have originated by intermittent colonization along an ancient river that has been drowned repeatedly by marine transgression. During that time, *L. mariae* populations could have been established by opportunistic immigrants from Roper River about 15 000 years ago, concurrently with the settlement of indigenous Australians in central Australia, who are thus plausible vectors. Thus, our results rule out the ancient relic hypothesis for the origin of *L. mariae*.

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