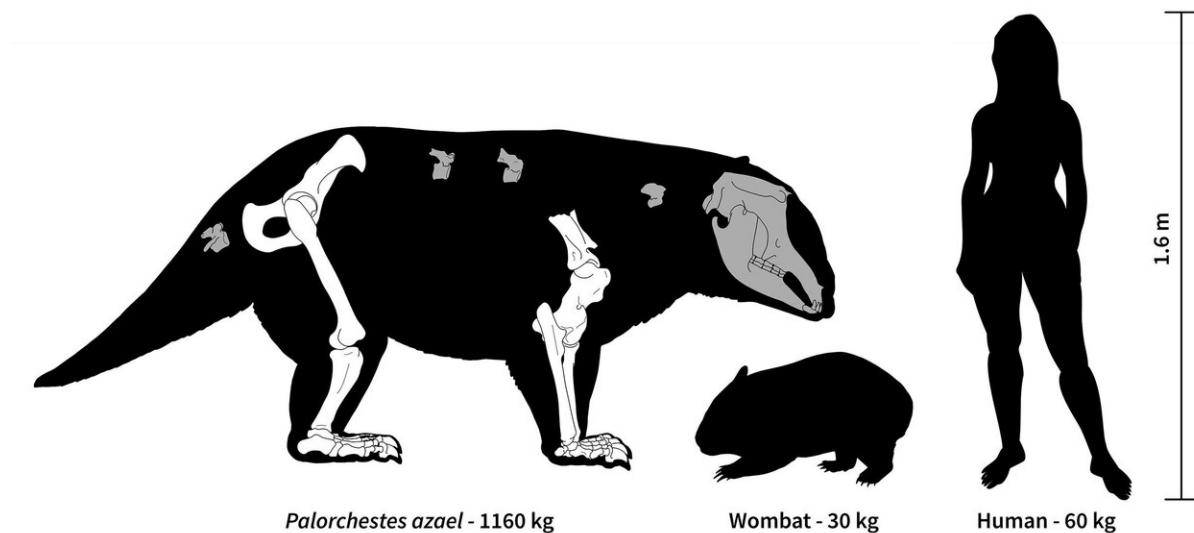


Ancient Australia was home to strange marsupial giants, some weighing over 1,000 kg

September 13 2019



Ancient Australia was home to strange marsupial giants, some weighing over 1,000 kg. Credit: Hazel Richards (2019)

Palorchestid marsupials, an extinct group of Australian megafauna, had strange bodies and lifestyles unlike any living species, according to a study released September 13, 2019 in the open-access journal *PLOS*

ONE by Hazel Richards of Monash University, Australia and colleagues.

For most of the last 25 million years, eastern Australia was home to a now-extinct group of marsupials called palorchestids. These animals are well known for their large size, strange tapir-like skulls, and large claws, but so far there has been no detailed study of their [limb](#) morphology. In this study, Richards and colleagues examined more than 60 fossil specimens of palorchestids of varying geologic ages to characterize the function and evolution of their arms and legs.

Over the course of their evolution, palorchestids grew larger and stranger. Using limb proportions as a proxy for [body size](#), these authors estimated that the latest and largest of the palorchestids may have weighed over 1,000kg. Furthermore, their forelimbs were extremely muscular and were likely adapted for grabbing or scraping at leaves and branches. Uniquely among known mammals, the elbow joints of the largest palorchestids appear to have been immobile and fixed at roughly a 100-degree angle, so that the arms served as permanently flexed food-gathering tools.

This study provides the first formal description of limb morphology in palorchestid marsupials and reveals a group of giant herbivores that probably filled a niche no longer occupied in modern Australian ecosystems. Fossil remains are still missing for certain parts of the palorchestid body, such as the shoulders and wrists, but the authors are hopeful that more material may be found in existing [museum collections](#).

The authors add: "This study has allowed us for the first time to appreciate just how huge these mega-[marsupial](#) palorchestids were, while also providing the first comprehensive view of a strange limb anatomy unprecedented in the mammalian world. This research reveals yet more about the diversity of unique large marsupials that once roamed

Australia not so long ago."

More information: Hazel L. Richards et al, The extraordinary osteology and functional morphology of the limbs in Palorchestidae, a family of strange extinct marsupial giants, *PLOS ONE* (2019). [DOI: 10.1371/journal.pone.0221824](https://doi.org/10.1371/journal.pone.0221824)

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