

# Variation in fur properties may explain differences in heat-related mortality among Australian flying-foxes

Himali Udeshinie Ratnayake , Justin Arno Welbergen , Rodney van der Ree and Michael Ray Kearney

*Australian Journal of Zoology* - <https://doi.org/10.1071/ZO20040>

Submitted: 1 June 2020 Accepted: 29 March 2021 Published online: 26 April 2021

## Abstract

Fur properties play a critical role in the thermoregulation of mammals and are becoming of particular interest as the frequency, intensity, and duration of extreme heat events are increasing under climate change. Australian flying-foxes are known to experience mass die-offs during extreme heat events, yet little is known about how different fur properties affect their thermoregulatory needs. In this study, we examined the differences and patterns in fur properties among and within the four mainland Australian flying-fox species: *Pteropus poliocephalus*, *P. alecto*, *P. conspicillatus*, and *P. scapulatus*. Using museum specimens, we collected data on fur solar reflectance, fur length and fur depth from the four species across their distribution. We found that *P. poliocephalus* had significantly longer and deeper fur, and *P. alecto* had significantly lower fur solar reflectivity, compared with the other species. Across all species, juveniles had deeper fur than adults, and females of *P. alecto* and *P. conspicillatus* had deeper fur than males. The biophysical effects of these fur properties are complex and contingent on the degree of exposure to solar radiation, but they may help to explain the relatively higher mortality of *P. alecto* and of juveniles and females that is commonly observed during extreme heat events.

**Keywords:** extreme heat events, flying-foxes, fruit bats, fur, hair, heat budget, heat stress, *Pteropus*