Researchers from Western Sydney University have led a pioneering new study, finding that flying-foxes, the largest of the bats, use torpor in the
wild—a vital energy-saving state previously observed only among much smaller bat species.

Published in the *Proceedings of the Royal Society B: Biological Sciences*, the study recorded natural patterns of body temperature regulation in male gray-headed flying-foxes (Pteropus poliocephalus) in southern Australia.

It was found that *torpor* was used during cold and *wet weather* in winter, suggesting it was important for survival during a period of high energy expenditure and low food availability.

Associate Professor Christopher Turbill, lead author from the School of Science and Hawkesbury Institute for the Environment at Western Sydney University, highlighted the implications of the discovery for understanding the distribution, behavioral ecology, and life-history of flying-foxes.

"Our study is the first to measure body temperature in a wild-living flying-fox (Pteropus spp.) and the first to record torpor use by a fruit bat (Pteropodidae) under natural conditions," said Associate Professor Turbill.

"Our findings significantly expand the known size range of bat species utilizing torpor, now encompassing one of the world's largest bats thereby extending the observed use of this energy-saving strategy across all bat superfamilies."

The study found that male gray-headed flying-foxes used torpor while roosting during cold and wet conditions in winter, with body temperatures reaching as low as 27°C—well below a threshold of 32°C used to define a state of torpor.
Interestingly, torpor was employed selectively during adverse weather conditions, rather than being used routinely while roosting as found in much smaller bats.

"Given that torpor has now been recorded across the full range of body masses and phylogenetically distant genera within the Pteropodidae family, it is likely a shared ancestral trait among all pteropodids, and, potentially, all bats," said Associate Professor Turbill.

The study also highlighted how biologging in wild animals can challenge longstanding beliefs about animal physiology that were previously based on studies conducted in captivity.

Associate Professor Turbill explained that these novel insights into a species' natural physiological capacities are crucial for accurately predicting ecological outcomes in the face of current environmental conditions and future climatic changes.

"Our findings provide new insight into the biology of flying-foxes and fill a key gap for understanding the expression and evolution of torpor among bats and all mammals," he said.


Provided by Western Sydney University
