

Jackrabbits with higher variability in color genes may be better prepared for snow loss due to climate change

March 24 2023, by Bob Yirka



Winter white white-tailed jackrabbit. Credit: Amedeo Cortese (used with permission)

A team of climate scientists and biologists from Universidade do Porto, in Portugal, working with colleagues from the University of Montana and the Denver Museum of Nature & Science, both in the U.S., has

found that jackrabbits living in mountainous areas, such as the Rockies, that have higher variability in color genes may be better prepared for snow loss due to climate change. In their study, reported in the journal *Science*, the group compared coat color variability and genetic predisposition in white-tailed jackrabbits living at different elevations.

White tailed jackrabbits, like many other [animal species](#), undergo a change in coat color due to changes in the seasons. They are mostly white during the winter to help them blend in with background snow. When spring arrives, they shed their [white coat](#) and replace it with one that is a mix of browns, reds, yellows and blacks to help them blend in with their mountainous environment. The reverse takes place in the fall.

In this new effort, the research team wondered how jackrabbits might fare in the coming years as the climate changes—in the mountains, snow persisting on the ground is expected to begin later and end sooner. This, the researchers note, could leave white-tailed jackrabbits mismatched with their environment and more exposed to predators.



Zoom of dorsal region of winter-brown white-tailed jackrabbit. Credit: Denver Museum of Nature & Science (used with permission)



Zoom of dorsal region of white-tailed jackrabbit with intermediate winter coat color. Credit: Denver Museum of Nature & Science (used with permission)



Zoom of dorsal region of winter-white white-tailed jackrabbit. Credit: Denver Museum of Nature & Science (used with permission)

To find out, the group started by studying museum specimens dating back several decades. This allowed them to see how quickly the jackrabbits were able to adapt as the snow season grew shorter. Next, they conducted a DNA analysis of the species and discovered the three genes responsible for determining coat color.

They also found that coat color is determined by the ratio of pigments in the skin of the jackrabbits as determined by their [genetic makeup](#). For example, jackrabbits that live at lower altitudes, which have shorter snow seasons, have different ratios than jackrabbits that live higher up where the snow remains on the ground much longer.

The researchers suggest that jackrabbits with the highest degree of variability in their color genes are likely the group that will be able to adapt better and survive as the planet grows warmer.



Habitat of winter brown white-tailed jackrabbits, near Saguache, Colorado, USA. Credit: Mafalda Ferreira (used with permission)



Habitat of winter white white-tailed jackrabbits, near Gunnison, Colorado, USA.
Credit: Mafalda Ferreira (used with permission)

More information: Mafalda S. Ferreira et al, The evolution of white-tailed jackrabbit camouflage in response to past and future seasonal climates, *Science* (2023). [DOI: 10.1126/science.ade3984](https://doi.org/10.1126/science.ade3984)

© 2023 Science X Network

Citation: Jackrabbits with higher variability in color genes may be better prepared for snow loss due to climate change (2023, March 24) retrieved 25 April 2024 from <https://phys.org/news/2023-03-jackrabbits-higher-variability-genes-loss.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private

study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.