

City slickers: poor performance does not deter *Anolis* lizards from using artificial substrates in human-modified habitats

Jason J. Kolbe, Andrew C. Battles, and Kevin J. Avilés-Rodríguez

How do lizards adjust to life in the city? Urbanization transforms natural environments into a mix of buildings, roads, parks and natural habitats. Through this process, humans are creating novel environments for other organisms. For example, we add artificial substrates, such as buildings, fences, posts, and walls, which become part of the structural habitat of a city. Lizards may use these novel substrates as they do trees in natural forests, but their performance ability on these substrates may be altered.

In this study, we tested how lizards run on substrates that differ in inclination and roughness. We compared rough surfaces like the trunks and branches of trees in the forest to the smooth and vertical surfaces typical of posts and walls in the city. Then we investigated whether lizards use artificial substrates when they are available in human-modified areas. Lizards living in natural environments tend to use habitats in which they perform better. In contrast, lizards in human-modified areas do not avoid the artificial substrates on which they perform poorly. Lizards run slow as well as slip and fall on smooth, vertical surfaces, yet they often use posts and walls when available in human-modified areas. Despite their poor performance, lizards with longer limbs run faster and fall less when moving on smooth, vertical surfaces. From this relationship we predict that natural selection will favor lizards with longer limbs when they use artificial substrates in cities.



A male Anolis cristatellus feeding while perched at the top of a brick wall. Photo by Jason J. Kolbe.

Human-induced global change such as biological invasions and urbanization may fundamentally alter the ecological relationships found for organisms living in natural environments. This makes predicting the consequences of global change extremely difficult. Moreover, human-altered environments are likely to be strong sources of natural selection for the organisms that can persist there.