

Homes in wealthier neighborhoods found to harbor more arthropod species

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Credit: David Wagner/public domain

(Phys.org)—A team of researchers from the California Academy of Sciences and North Carolina State University has found that homes in wealthy neighborhoods tend to harbor more arthropod species than do homes in places that are less affluent. In their paper published in the

journal *Biology Letters*, the team describes how they conducted an arthropod survey of homes from a variety of locations throughout the Raleigh, North Carolina area, what they found and possible reasons for the differences.

Most people know that sometimes [bugs](#) get into their houses—flies, ants, mosquitoes and other insects are quite common, though most people do their best to get rid of them. What most people probably do not know is that a lot of other types of bugs live in their home as well—most of which they never see. Many of these bugs are arthropods—invertebrate animals such as spiders, crustaceans and other insects. In this new effort, the researchers sought to learn more about the diversity of these bugs in homes. They note also that prior studies had found that richer neighborhoods tended to have more plant and animal diversity in areas outside of the home. For this study, they wanted to know what was going on inside.

As the researchers also note, few studies have looked at biodiversity in the home, which is unfortunate as people spend on average 90 percent of their time indoors—which means sharing space with a plethora of other creatures. To gain some perspective, the researchers fanned out across the city of Raleigh asking homeowners if they would allow a survey to be conducted—the team wound up gaining access to approximately 50 homes, all within forty miles of the downtown area, from a variety of neighborhoods.



A common arthropod scientists encounter in the home: the carpet beetle. Credit: © Matt Bertone and North Carolina State University

In studying the numbers, the researchers found that the average [home](#) in a wealthy neighborhood had approximately 100 different species of arthropods in it, whereas those in less expensive neighborhoods had roughly half that number. The researchers suggest the discrepancy is due to differences in the environment outside of the homes. Richer neighborhoods tend to have houses with lush gardens and parks and the people that live there tend to expend more time and money on them resulting in more places for bugs to breed.



Urban ecologists have been observing how socioeconomics impact species diversity for nearly two decades. Previous studies have determined that higher affluence is frequently associated with more biological diversity across species of plants, birds, bats, and lizards--a phenomenon coined the "luxury effect." Scientists have only recently begun examining the relationship between socioeconomics and arthropods, a group that includes insects and their close relatives. Arthropods can have six legs (like moths), eight legs (like spiders), or sometimes one hundred legs (like centipedes), and fly or wander from the outside environment into the indoor world. The image above highlights an arthropod often identified indoors: the book louse."The biodiversity of the indoor environment is still a relatively unexplored area of research," says Michelle Trautwein, co-author and curator of entomology at the Academy. "Our houses are really permeable and dynamic. Through our studies, we hope to inspire citizens all over the globe to get curious about the species in their everyday lives. We still have so much to learn about indoor ecology and the ever-evolving relationship between humans and arthropods." Credit: © Matt Bertone

of North Carolina State University

More information: Misha Leong et al. Exoskeletons and economics: indoor arthropod diversity increases in affluent neighbourhoods, *Biology Letters* (2016). [DOI: 10.1098/rsbl.2016.0322](https://doi.org/10.1098/rsbl.2016.0322)

Abstract

In urban ecosystems, socioeconomics contribute to patterns of biodiversity. The 'luxury effect', in which wealthier neighbourhoods are more biologically diverse, has been observed for plants, birds, bats and lizards. Here, we used data from a survey of indoor arthropod diversity (defined throughout as family-level richness) from 50 urban houses and found that house size, surrounding vegetation, as well as mean neighbourhood income best predict the number of kinds of arthropods found indoors. Our finding, that homes in wealthier neighbourhoods host higher indoor arthropod diversity (consisting of primarily non-pest species), shows that the luxury effect can extend to the indoor environment. The effect of mean neighbourhood income on indoor arthropod diversity was particularly strong for individual houses that lacked high surrounding vegetation ground cover, suggesting that neighbourhood dynamics can compensate for local choices of homeowners. Our work suggests that the management of neighbourhoods and cities can have effects on biodiversity that can extend from trees and birds all the way to the arthropod life in bedrooms and basements.

[Press release](#)

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