

# Invasive Japanese barberry drives down invertebrate richness and abundance

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Since its first introduction to the U.S. from Asia in the late 1800s, [Japanese barberry](#) has become one of the most dominant and widespread woody plants in Northeastern forests. Its allelopathic properties, shade tolerance, and resistance to deer browsing allow it to turn forest understories into near-monocultures of the invasive plant at the expense of native shrubs and regenerating trees. Yet, little remains known about the effects of Japanese barberry on native wildlife and forest ecosystem function. A [new study](#) from Washington State University (Pullman, WA) and Great Hollow Nature Preserve and Ecological Research Center (New Fairfield, CT) has shown that forest patches that have been heavily invaded by Japanese barberry have a significantly lower abundance and species richness of leaf-litter and foliage-dwelling invertebrates than areas of the same forest that are relatively free of Japanese barberry, which could trigger cascading impacts up the food web to numerous other species.

Non-native, [invasive plants](#) can impact foliage-dwelling invertebrates through plant-herbivore relationships, but they can also affect invertebrate communities on and below the [forest](#) floor by altering soil chemistry and the decomposition of organic matter. Working in a forest in the lower Hudson Valley of New York State, the researchers therefore wanted to not only compare arthropods on Japanese [barberry](#) to those on native host shrubs, but to also compare leaf-litter arthropod assemblages in forest patches with high Japanese barberry densities to those with little to no Japanese barberry present. The results were more striking than they expected. The estimated species richness of foliage-dwelling arthropods

on Japanese barberry was only 77% of that on native shrubs, while the estimated species richness of leaf-litter arthropods in barberry-invaded areas was only 72% of that in areas composed of mostly native vegetation. Japanese barberry was associated with a significantly lower abundance of arthropods in both communities, which was largely driven by a dramatic reduction in the number of predators. Ants, in particular, were five times more abundant in the leaf litter around native plants and 10 times more abundant on native shrubs than on Japanese barberry. However, the study found no difference in the total biomass of either foliage-dwelling or leaf-litter arthropods between heavily and lightly invaded areas because of the taxa associated with Japanese barberry tending to be larger-bodied.

"We saw a clear and concerning pattern of community simplification and trophic downgrading in areas that have been heavily invaded by Japanese barberry" said Dr. Chad Seewagen, one of the authors of the study. "How these changes in [arthropod](#) community structure affect food availability, and the composition and quality of the diet of insectivores, like many [species](#) of birds, is something we don't know yet. Much more work is needed to understand the full ecological impacts of this non-native plant that has overtaken so many forests in the eastern U.S."

**More information:** Clark, R.E. and C.L. Seewagen. Invasive Japanese barberry, *Berberis thunbergii* (Ranunculales: Berberidaceae) is associated with simplified branch-dwelling and leaf-litter arthropod communities in a New York Forest. *Environmental Entomology* (2019). [doi.org/10.1093/ee/nvz095](https://doi.org/10.1093/ee/nvz095)

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