# How invasive earthworm feces is altering US soils

November 6 2018

Soil before worms. Credit: Geological Society of America

Asian jumping earthworms are carving out territory all over the U.S. Midwest and East Coast, leaving in their wake changed soils that are just beginning to be studied.

The invasive earthworms are native to eastern Asia and are known by several names: Jumping worms, crazy worms, Alabama jumpers and snake worms. They have been making inroads into soils of North America since the 19th century, according to an information page by the Wisconsin Department of Natural Resources. They were first detected in Wisconsin in 2013.

"The way that these worms change the soil is something new. You can see very clearly that they have been there," said geoscientist Jenelle Wempner of the University of Wisconsin in Madison. "They leave little balls of soil. Imagine a soil surface covered with coffee grounds."

The little balls, or aggregates, left behind by the Asian earthworms are essentially worm feces, and they are a target of Wempner's research.

"A lot of soil I look at is worm poop," she said. How the worm droppings transform the soils they invade is important not only for understanding the effects of the worms on the land—like increasing erosion—but could potentially help in controlling the invasive worms.

"These soil aggregates lock up nutrients and chemically alter the soil composition," Wempner said. Her team used a scanning electron microscope to examine the minerals in the aggregates. Their preliminary data show a sharp increase in heavy metals (iron and aluminum) and nutrients like potassium and calcium in the aggregates, which makes them less accessible to plants.

They also examined the cocoons that the adult worms produce each year as they mature. They found that the cocoons have an outer layer with

selective permeability—something that can be taken into account when developing chemical treatments to control worm populations.

"We have some answers," said Wempner, but it's just a start on studying the physical effects of the worms. "There is an adequate amount of support on ecological side of the research. But not so much on the physical science." Her work is supported by the University of Wisconsin.

Wempner will be presenting a poster about the ongoing research at the annual meeting of the Geological Society of America in Indianapolis, on Wednesday, November 7, 2018.

**More information:** Land Use Implications of Mineralogical and Structural Alterations of Soil Aggregates under Asian Earthworms gsa.confex.com/gsa/2018AM/webp … ram/Paper319380.html

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