

The hills are alive with the signs of plastic: even Swiss mountains are polluted

Major study finds microplastics in soil across Switzerland and scientists warn urgent research is needed into impacts on food safety as other countries may be worse affected

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Fri 27 Apr 2018 13:16 BST

Last modified on Fri 27 Apr 2018 22:00 BST



Micro plastic soil contamination was found even in remote areas, leading scientists to conclude it must be windborne. Photograph: Blickwinkel/Alamy

Microplastic pollution contaminates soil across **Switzerland**, even in remote mountains, new research reveals. The scientists said the problem could be worse in other nations with poorer waste management and that research was urgently needed to see if microplastics get into food.

In the first major study of microplastics in soil, the researchers analysed soil samples from 29 river flood plains in nature reserves across Switzerland. They found microplastics, fragments under 5mm in size, in 90% of the soils. The scientists believe the particles are carried across the country by the wind.

Research on microplastic pollution to date has largely concentrated on the oceans, in which it is found across the globe, **including the Arctic**. The particles have been shown to harm marine life and can absorb toxins from the water.

Record levels of microplastics were **revealed in rivers** by research released in March and last year **tap water around the world** was found to contain plastic fibres. Other studies have found microplastics in **bottled water**, which prompted the World Health Organization to launch a review, as well as in beer, honey and **salt**. However, almost no research has yet been done on whether the particles end up being widely consumed by people and whether they are harmful.

Michael Scheurer and Moritz Bigalke at the Geographical Institute of the University of Bern, conducted the new research, which is published in the journal **Environmental Science and Technology**. “These findings are alarming,” Scheurer said. “For example, new studies indicate that microplastics in the soil can be harmful to and even **kill earthworms in the soil**.”

Microplastics were found even in remote mountain regions that can only be reached by foot. “We were really surprised,” said Bigalke. “All the areas were in national parks. We thought we might find one or two plastic particles, but we found a lot.”

Between 70-80% of the particles found were smaller than 0.5mm and the researchers said they are most likely to be blown across the country. “We think it has to be transported by the wind,” said Bigalke. “There is no other explanation – there are no settlements there [in the mountains], no tourism.”

Almost 100% of the plastic used in Switzerland is either recycled or incinerated, the highest rate in **Europe**. In places where waste management is poorer and more plastic enters the environment, soil contamination could be higher, Bigalke said: “The problem could be even worse in other countries.”

“There is a need for research into the question of how microplastics affect food production, and whether it can get into the food

chain,” he said.



Remains of a balloon – that will eventually break down into microplastic particles – found in a floodplain soil in the Vallée de Joux in the Canton of Vaud. Photograph: Institute of Geography, University of Bern

Microplastic contamination in agricultural soils could be even worse, said Bigalke. They are known to be present in the sewage sludge produced at water treatment plants and this sludge is sometimes used as fertiliser on fields. Another new study found **microplastics in fertiliser** produced from food and garden waste.



Plastic fibres found in tap water around the world, study reveals
<https://www.theguardian.com/environment/2017/sep/06/plastic-fibres-found-tap-water-around-world-study-reveals>

Bigalke said it was estimated that the application of sewage sludge to arable land alone could transport more could microplastics into the soil than that entering the world’s oceans.

One of the very few studies into microplastics in food examined **backyard chickens in Mexico**. The researchers found 57 particles per gramme in the gizzards of the chickens. “Chicken gizzard is a specialty in the Mexican kitchen and the intake of the present plastics form a strong risk for human health,” the scientists said.