

# The Guardian



## Microplastics found in human stools for the first time

**Study suggests the tiny particles may be widespread in the human food chain**

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Microplastics have been found in human stools for the first time, according to a study suggesting the tiny particles may be widespread in the human food chain.

The small study examined eight participants from Europe, Japan and Russia. All of their stool samples were found to contain microplastic particles.

Up to nine different plastics were found out of 10 varieties tested for, in particles of sizes ranging from 50 to 500 micrometres. Polypropylene and polyethylene terephthalate were the plastics most commonly found.

On average, 20 particles of microplastic were found in each 10g of excreta. Microplastics are defined as particles of less than 5mm, with some created for use in products such as cosmetics but also by the breaking down of larger pieces of plastic, often in the sea.

Based on this study, the authors estimated that “more than 50% of the world population might have microplastics in their stools”, though they stressed the need for larger-scale studies to confirm this.

The Environment Agency Austria conducted the tests using a new procedure the researchers said shed fresh light on the extent of microplastics in the food chain. Samples from the eight subjects were sent to a laboratory in Vienna where they were analysed using a Fourier-transform infrared microspectrometer.

Philipp Schwabl, a researcher at the Medical University of Vienna who led the study, said: “This is the first study of its kind and confirms what we have long suspected, that plastics ultimately reach the human gut. Of particular concern is what this means to us, and especially patients with gastrointestinal diseases.”

Previous studies on fish have also found plastics in the gut. Microplastics have been found in tap water around the world, in the oceans and in flying insects. A recent investigation in Italy also found microplastics present in soft drinks. In birds, the ingestion of plastic has been found to remodel the tiny fingerlike projections inside the small intestine, disrupt iron absorption and add to stress on the liver.

“The smallest microplastic particles are capable of entering the bloodstream, the lymphatic system, and may even reach the liver,” said Schwabl, who will report on the study at UEG Week in Vienna on Tuesday. “Now that we have the first evidence for microplastics inside humans, we need further research to understand what this means for human health.”

Plastic particles in the gut could affect the digestive system’s immune response or could aid the transmission of toxic chemicals and pathogens, the researchers said.

The sources of the plastic found in the stool samples is unknown. The people studied kept a food diary that showed they were all exposed to plastics by consuming food wrapped in plastic or drinking from plastic bottles. None of those participating in the study were vegetarians, and six of the group ate sea fish.

Scientists still know little about the effects of microplastics once they enter the human body, though many studies have already found them present in foods such as fish that people are likely to eat. The UK government has launched a study of health impacts.

Plastic use is so pervasive in modern life that removing it entirely from the food chain would be extremely difficult. A million plastic bottles are bought around the world every minute and the number is expected to jump another 20% by 2021.

Steps are being taken to stem the rising tide of plastic pollution, for instance by the banning of microbeads in some jurisdictions. The 8m tonnes of plastic dumped in the sea each year is also the target of increasing campaigns, by the UN and others, mainly because of the dangers it poses to sea life. Many fish and other marine creatures consume the plastics, sometimes confusing them for food.

The authors of the new paper stressed the need to reduce plastic use, increase recycling and improve disposal where appropriate.

Pressure for action is growing. Earlier this year the European parliament voted for an EU-wide ban on microplastics in cosmetics. The European commission has also proposed a ban on single-use plastic products such as cotton buds and plastic straws and urged member countries to put the onus of cleaning up waste on producers in an effort to clean up oceans. By 2025, European nations are supposed to collect 90% of single-use plastic drink bottles.

Several nations have banned plastic bags completely, and a growing number of cities, including many in the US, are discussing moves to ban straws and other single-use items.

Following this lead, the British government on Monday announced a consultation on proposals to ban plastic straws, drink stirrers and cotton buds, which can turn into microplastics as they break down. The ban is expected to come into force by October 2020.

Critics, however, say such measures are late and inadequate to deal with a problem that has reached epic proportions.

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