

TRILOBITES

Microplastics Find Their Way Into Your Gut, a Pilot Study Finds

Researchers looked for microplastics in stool samples of people from eight countries. “The results were astonishing,” they said.

By Douglas Quenqua

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In the next 60 seconds, people around the world will purchase one million plastic bottles and two million plastic bags. By the end of the year, we will produce enough bubble wrap to encircle the Equator 10 times.

Though it will take more than 1,000 years for most of these items to degrade, many will soon break apart into tiny shards known as microplastics, trillions of which have been showing up in the oceans, fish, tap water and even table salt.

Now, we can add one more microplastic repository to the list: the human gut.

In a pilot study with a small sample size, researchers looked for microplastics in stool samples of eight people from Finland, Italy, Japan, the Netherlands, Poland, Russia, the United Kingdom and Austria. To their surprise, every single sample tested positive for the presence of a variety of microplastics.

“This is the first study of its kind, so we did a pilot trial to see if there are any microplastics detectable at all,” said Philipp Schwabl, a gastroenterologist at the Medical University of Vienna and lead author of the study. “The results were astonishing.”

There are no certain health implications for their findings, and they hope to complete a broader study with the methods they have developed.

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Microplastics — defined as pieces less than 0.2 inches long, roughly the size of a grain of rice — have become a major concern for environmental researchers over the past decade. Several studies have found high levels of microplastics in marine life, and last year, microplastics were detected in 83 percent of tap water samples around the world (the highest contamination rate belonged to the United States, where 94 percent of samples were contaminated).

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Most microplastics are the unintended result of larger plastics breaking apart, and the United States, Canada and other countries have banned the use of tiny plastic beads in beauty products.

Researchers have long suspected microplastics would eventually be found in the human gut. One study estimated that people who regularly eat shellfish may be consuming as much as 11,000 plastic pieces per year.

The new paper, which was presented Monday at a gastroenterology conference in Vienna, could provide support for marine biologists who have long warned of the dangers posed by microplastics in our oceans. But the paper suggests that microplastics are entering our bodies through other means, as well.

“The fact that so many different polymers were measured suggests a wide range of contamination sources,” said Stephanie Wright, an environmental health scientist at Kings College London who was not involved in the study. Two of the eight participants also said they did not consume seafood.

To conduct the study, they selected volunteers from each country who kept food diaries for a week and provided stool samples. Dr. Schwabl and his colleagues analyzed the samples with a spectrometer.

Up to nine different kinds of plastics were detected, ranging in size from .002 to .02 inches. The most common plastics detected were polypropylene and polyethylene terephthalate — both major components of plastic bottles and caps.

Still, Dr. Schwabl cautioned against jumping to conclusions about the origins of the plastic.

“Most participants drank liquids from plastic bottles, but also fish and seafood ingestion was common,” he said. “It is highly likely that food is being contaminated with plastics during various steps of food processing or as a result of packaging.”

Whether microplastics pose a health risk to humans is largely unknown, though they have been found to cause some damage in fish and other animals.

Additionally, the microplastics detected in the current study are too large to be a serious threat, Dr. Wright said.

“But what may be of greater concern for these large microplastics is whether any associated chemical contaminants leach off during gut passage and accumulate in tissues,” she said.

The concentration of contaminants — 20 microplastic particles per 10 grams of stool — was relatively low, she said.

Nonetheless, Dr. Schwabl said the results were more than enough to investigate further.

“Now that we know there is microplastic present in stool, and we know how to detect it, we aim to perform a larger study including more participants,” he said.

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Correction: Oct. 23, 2018

An earlier version of this article gave the wrong measurement for a grain of rice. It is approximately 0.2 inches in size, not .02 inches.

A version of this article appears in print on Oct. 30, 2018, Section D, Page 2 of the New York edition with the headline: Gut Check: Plastics May End Up Not Just in the Trash, But in Your Stomach