

# New measuring method reveals there may be more plastic on than in your salad

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Credit: Pixabay

It's now possible to measure how many plastic particles there are in our food. Chinese scientists and Leiden University professor Willie Peijnenburg applied their new method to lettuce and wheat. Their results were published January 20 in *Nature Nanotechnology*.

Until now, scientists labeled micro- and nanoplastic [particles](#) with a special luminescent molecule. These labeled particles then ended up in, for example, a lettuce plant via its water. With a special kind of light, researchers could then see where in the lettuce plant they wind up. Peijnenburg, professor of Environmental Toxicology and Biodiversity at

the Centre for Environmental Sciences, says, "What you couldn't see was how many particles the plant had absorbed, while we'd like to know just that in order to get a better idea of the consequences of [plastic](#) in the [food](#) chain."

## **Simple analysis**

Peijnenburg and his colleagues in China, who also developed the described method with light detection, now label the plastic particles with a rare metal: Europium. "With that label you can easily measure with a traditional metal analysis how many plastic particles have entered an organism," Peijnenburg explains. "The metal doesn't occur in organisms naturally, so every europium particle you measure represents an ingested plastic particle."

## **Lettuce slurps up a lot, but takes up little plastic**

The researchers grew lettuce and wheat and gave the plants water containing different concentrations of labeled plastic particles. "Lettuce is known to be a real water guzzler, so if there's one crop in which a lot of plastic could end up, it's lettuce," Peijnenburg notes. But in both lettuce and wheat, the concentration of plastic remained ten times lower than in soil, and the particles remained mainly attached to the roots. "Only a small number of particles end up in the edible parts, and that applies only to the very smallest particles," says the environmental toxicologist.

He continues, "There is much more plastic on the food than in it. In allotment gardens here in Leiden I see how the gardeners protect their crops with a layer of plastic against cold or vermin. Particles of these end up on the crop, just like, for example, from packaging or from the air. Proper washing is the only thing you can do about it, even though

that doesn't get rid of everything either."

## Mapping out the entire food chain

With the new, relatively simple method, researchers can now determine in the lab for all crops and also for the rest of the food chain how much plastic they absorb at certain concentrations in water or [soil](#). Peijnenburg observes, "We are already working on this, for example, with insects that we feed to fish or mice."

## Is plastic in our food a problem?

It is not known to what extent the plastic in and on our food is a problem for us. "That's a follow-up step in researching plastic in the food chain," says Peijnenburg. He is also concerned with regulations on plastics. "Plastics are polymers, in other words long chains of molecules, and on that basis they are exempted from regulation altogether. Something the industry has somehow managed, to the dismay of scientists."

## Plastic should not be an exception

On this topic, Peijnenburg is working with Esther Kentin, a lecturer in Environmental Law at the Leiden Institute of Metajuridica. She does legal research on regulation and legislation with students and life scientists. Peijnenburg concludes, "We don't want this exceptional position anymore that plastic currently has. Regulation should be the same as for other substances, such as nanoparticles and all the substances that we now regard as worrying."

**More information:** Yongming Luo et al, Quantitative tracing of uptake and transport of submicrometre plastics in crop plants using lanthanide chelates as a dual-functional tracer, *Nature Nanotechnology*

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