Microplastic pollution impairs seabird gut health

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Plastic-infested digestive tracks from two species of Atlantic seabirds, northern fulmars and Cory's shearwaters, showed a decrease of mostly beneficial 'indigenous' bacteria and more potentially harmful pathogens.

Scientists have long known that wild seabirds ingest bits of plastic pollution as they feed, but a study Monday shows the tiny particles don't

just clog or transit the stomach but can subvert its complex mix of good and bad bacteria too.

Plastic-infested digestive tracts from two species of Atlantic seabirds, northern fulmars and Cory's shearwaters, showed a decrease of mostly beneficial "indigenous" bacteria and more potentially harmful pathogens.

There was also an increase in antibiotic-resistant and plastic-degrading microbes, researchers reported in the journal *Nature Ecology & Evolution*.

Certain types of microplastic, the findings suggested, may be leeching chemicals that disrupt the birds' so-called gut microbiome.

Microplastics—produced when plastic products break down in the environment—are directly and indirectly ingested across most animal food chains.

They can be found in every corner of the world, from the deepest oceans trenches to top of Mount Everest.

In humans, they have been detected in the blood, breast milk and placentas.

The new study supports previous findings that prolonged ingestion of microplastics causes an imbalance of healthy and unhealthy bacteria in the stomach, a condition known as gut dysbiosis.

The implications are far-reaching.

Like humans, birds have evolved with a vast network of microbes, including bacteria, that live in our bodies in communities called microbiomes.

Some microbes cause diseases, but most exist as "friendly" bacteria with a critical role in digestion, immune response and other critical functions.

"There's a symbiosis that goes on—and that's the case in the seabirds as well as in humans," lead author Gloria Fackelmann of Ulm University in Germany told AFP.

Little is known about the effects of individual microbes on the body.

But overall, a growing body of research points to the harmful impacts of microplastics on animal health.

The tiny particles—less than five millimeters in diameter—can cause cell death and allergic reactions in humans.

Chemicals in microplastics have also been linked to increased risks of cancer, reproductive problems, and DNA mutations.

The authors hope the findings in seabirds will spur related studies for humans.

"If this manmade substance could alter our microbiome, I think that should make people think," said Fackelmann.

More information: Gloria Fackelmann et al, Current levels of microplastic pollution impact wild seabird gut microbiomes, *Nature Ecology & Evolution* (2023). DOI: 10.1038/s41559-023-02013-z