Leibniz Institute for Baltic Sea Research Warnemünde

IOW Press Release, March 12, 2018

Learning from our pollution history: a plea for a proactive approach to tackle microplastics

In a viewpoint paper recently published in the scientific journal "Environmental Science and Technology", two researchers from the Leibniz Institute for Baltic Sea Research Warnemünde (IOW) argue on why it is reasonable to work towards legislative steps, even though the toxicity potential that microplastics may have on nature environment is still not yet conclusively determined.

Alexander Tagg, environmental scientist, and Matthias Labrenz, environmental microbiologist, both specialised on microplastic biofilm dynamics, react to critics who commented the most recent legislative actions to ban microbeads in cosmetics as adverse moves triggered by a massive media coverage, but undoubtedly not suitable to solve the microplastic issue.

"Although in most environments microplastics are, according to our current knowledge, not yet occurring at toxic levels, it should not be considered poor policy to attempt to prevent microplastics reaching such toxic levels in the future." Matthias Labrenz is concerned about a variety of pathways microplastics might take into the aquatic environment beyond the already accepted source of effluent water released by municipal wastewater treatment plants (WWTP). Together with his colleague Alexander Tagg, he currently focuses on the agricultural use of WWTP sludge or biogas digestate as fertilizers. While the consequences of the first are already subject of investigation, the latter only recently became topical.

"If we look at compost-like outputs released on arable land, there are much more potential sources of microplastics than WWTP sludge alone", explains Alexander Tagg. "In addition to biogas digestate, contaminated by plastic packages of food waste used as co-substrate in biogas production to increase methane yields, we also must consider biodegradable plastics integrated into household compostable waste a major source of microplastics." These fabrics combine traditional non-degradable plastic polymers with natural degradable polymers like starch. As these quickly disintegrate, they release a huge amount of microplastics. Once these compost-like outputs are applied to the farmland, soil erosion might transport incorporated microplastic further into the aquatic environment.

"Monitoring and reporting environmental damages often are the normal business of environmental scientists, where developing tools to predict and prevent threats before they occur should be the favourable way", Alexander Tagg resumes. Existing models, such as soil erosion prediction models, could be used in such a way to prevent microplastic pollution. Tagg & Labrenz make a strong plea for closing possible exposure pathways of microplastics before damage is done. In their opinion, agricultural pathways are uppermost on the agenda of environmental politics, where management approaches should be proactive rather than reactive.

Reference:
Tagg, A. S. and M. Labrenz (2018). Closing microplastic pathways before they open: A model approach. Environ. Sci. Technol., https://doi.org/10.1021/acs.est.8b00961

Scientific experts:
Dr. Alexander Tagg (PhD) | +49 381 5197 315 | alexander.tagg@io-warnemuende.de
PD Dr. Matthias Labrenz | +49 381 5197 378 | matthias.labrenz@io-warnemuende.de

Press and public relation:
Dr. Barbara Hentzsch | +49 381 5197-102 | barbara.hentzsch@io-warnemuende.de

IOW is a member of the Leibniz Association with currently 91 research institutes and scientific infrastructure facilities. The focus of the Leibniz Institutes ranges from natural, engineering and environmental sciences to economic, social and space sciences as well as to the humanities. The institutes are jointly financed at the state and national levels. The Leibniz Institutes employ a total of 18.100 people, of whom 9.200 are scientists. The total budget of the institutes is 1.6 billion Euros. (www.leibniz-association.eu)