Are natural fibres really better for the environment than microplastic fibres?

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Researchers from the University of Nottingham have found a much higher percentage of 'natural' fibres than microplastic fibres in freshwater and atmospheric samples in the UK.

The findings, which are released ahead of World Water Day, raise the question of whether we know enough about the environmental threat of some of the plastic-alternatives we are turning to, to help save the planet.

Over a 12-month period, experts from the University's School of Geography and the Faculty of Engineering Food, Water, Waste Research Group, collected 223 samples from 10 sites from the River Trent, the River Leen and the River Soar, and four roofs of the University's UK teaching campuses, and found that 'natural' textile fibres rep

Microplastic textile fibres, such as polyester and nylon, were absent from 82.8% of samples, whereas 'natural' textile fibres were absent from just 9.7% of samples.

The results of the project are published in the journal *Science of the Total Environment*, titled "Freshwater and airbourne textile fibre populations are dominated by 'natural,' not microplastic, fibres."

Microplastic pollution has garnered a great deal of scientific, political and media attention in recent years, leading to widespread concern. As the impact of plastic and microplastic pollution has grown, many people and companies have made a considerable effort to minimise the amount of plastic they use in their day-to-day lives.

For some, this has included an increase in the use of plastic alternatives, such as 'natural' fibres including cotton and wool, the environmental impacts of which are not always considered and are rarely rasied in the debate on plastic pollution.

The potential role of natural textile fibres like cotton and wool, as an environmental pollutant, has been speculated on by some environmental scientists, but there has been a general consensus that their biodegradability reduces their environmental threat (in comparison to

that of plastic).

However, 'natural' textile fibres are the product of multiple potentially hazardous processes, and are inherently 'unnatural." For example, the commercial production of cotton fibres requires large quantities of water, pesticides and herbicides and the wastewaters of the textile industry have also been long recognised as sources of chemical pollutants.

Whilst these risks remain poorly understood, this new research from the University of Nottingham has found high concentrations of so-called 'natural' fibres in samples of river water and atmospheric deposition.

Tom Stanton, lead researcher on the study and Papplewick Pumping Station Water Education Trust Scholar, said: "One of the most prevalent forms of plastic pollution, and one that has been widely reported in the media, is synthetic textile fibres such as polyester, nylon and acrylic. These fibres are made from plastic polymers and enter the environment in a number of ways, but most infamously in washing machine effluent. Concern over this emission of microplastic pollution has led some to favour clothing made from natural fibres such as cotton and wool.

"However, whilst they may not be plastic, 'natural' textile fibres are far from a solution to the textile industry's contribution to plastic pollution. The production of cotton is incredibly water intensive, and the methods used to process natural fibres often introduce a myriad of harmful chemicals into waters used for bathing and drinking. Moreover, the processing of natural fibres is often carried out in dangerous, exploitative working conditions."

Tom adds: "As our research shows, there is a high percentage of natural fibres in our water – and we don't really understand what impact this might have on the environment. What do we really know about the

alternatives we are using in our efforts to curb plastic pollution? Much more needs to be done, before we can confidently say which of the alternatives available to us are the best for our planet."

More information: Thomas Stanton et al. Freshwater and airborne textile fibre populations are dominated by 'natural', not microplastic, fibres, *Science of The Total Environment* (2019). DOI: 10.1016/j.scitotenv.2019.02.278

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