

# Scientists make plea for greater focus on natural textile fibers

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A King's researcher has urged environmental scholars to give greater focus to the environmental sustainability issues associated with natural textile fibers used in fashion, highlighting key areas to address.

Natural fibers, such as cotton and wool, are derived directly from an animal or plant. Despite a general sense that they are more environmentally friendly than synthetic fibers due to their natural origins, studies have found they are extremely prevalent and represent more than 70% of all fibers found in the environment. This highlights, on one hand, that [natural fibers](#) may be less biodegradable than expected and, on the other hand, that they may significantly impact the health of ecosystems.

[Writing](#) to *Environmental Science & Technology*, academics including Dr. Matteo Gallidabino, Lecturer in Forensic Chemistry, King's Forensics, call for changes to the way research is conducted into fiber and textile pollution.

Dr. Matteo Gallidabino said, "Despite the fact that [synthetic fibers](#) have developed enormously in recent years and, to date, approximately represent two thirds of all fibers used in the textile sector, natural fibers are still abundant in environmental samples where they typically account for the majority of the fibers recovered.

"The problem is that we still know very little about their [environmental impact](#), including their toxicity. This shows a clear misalignment between the current research in microfibers and textile pollution, which mainly focuses on plastic materials, and the actual prevalence of the problem.

"How can we be sure that environmental natural fiber levels are not as harmful as, or more harmful than, synthetic fiber levels? Simply: we cannot, at least for the moment."

The authors criticize the "half told story" of the environmental footprint of natural fibers built on unqualified assumptions that they are inherently more sustainable. While natural polymers are more biodegradable than [synthetic polymers](#), modifications to natural fibers for textile

applications can alter their chemical structure. This can result in a slower rate of biodegradation or run the risk of chemicals leeching into the environment. Therefore, they ask that potential risks associated with the persistence, toxicity, and chemical load of natural fibers is explored at scale.

The authors also highlighted that assessing the sustainability of natural fibers will require interdisciplinary academics collaborations, as well as integration of expertise from outside environmental science. It is important that this interdisciplinary research encompasses the field of forensic science and forensic fiber specialists, who have optimized methods for the comprehensive characterization of single microfibers in complex situations.

The scientific community will also need to work on standardizing terminology. While categories exist for the different fiber types—namely, natural, synthetic and regenerated fibers—these definitions are not consistent within research literature. The authors argue that environmental scholars need to consistently use industry-standard definitions to make knowledge exchange easier and more transparent.

"Nine years since a letter to the same journal asked if natural fibers represent a missing link in our understanding of [textile](#) fiber pollution, we argue that they continue to represent a missing thread in sustainable fashion debates—a thread that requires concerted [interdisciplinary research](#) approaches. Exclusion of natural fibers in fiber pollution research risks promoting misinformed sustainability policies and messages. We implore the scholarly community to continue to develop and diversify natural fiber research," said Dr. Tom Stanton, Lecturer in Geography, Loughborough University (first author).

The letter was created by scientists contributing to the IMPACT+

project—a major collaborative project seeking to examine how the environmental effects of the fashion industry are measured.

**More information:** Thomas Stanton et al, Natural Fibers: Why Are They Still the Missing Thread in the Textile Fiber Pollution Story?, *Environmental Science & Technology* (2024). [DOI: 10.1021/acs.est.4c05126](https://doi.org/10.1021/acs.est.4c05126)

Provided by King's College London

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