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Key Findings from a meta-study on the environmental fate, microplastic formation and potential toxicity of PLA – and implications for other biodegradable plastic polymers

A recent meta-study completed by HYDRA Marine Sciences assessed the current state of knowledge in the publicly available scientific literature and in institutional and corporate reports on polylactide or polylactic acid (PLA), focusing on the potential formation, persistence and effects of PLA microplastics in the open environment. PLA is known as an industrially compostable plastic polymer, but knowledge about its fate in the environment is scarce. Several studies have assumed that PLA is not biodegradable under ambient conditions, and the unique mechanism of degradation of PLA compared to other bioplastic polymers has rarely been considered, but mostly ignored. The Holland Bioplastics Association commissioned an independent meta-study from HYDRA Marine Sciences to gather scientific evidence to answer the following questions: How long is the persistence of PLA in the environment? What does this mean in terms of the degradation processes, the degradation products, the formation of micro- and nanoplastics, the lifetime in the environment and the potential impact on organisms and the ecosystem? The results of our meta-study provide clarity on what is known and where the gaps in knowledge lie in order to put the discussions on a sound scientific basis. Regulatory procedures, material selection and further innovation decisions should be made with this in consideration to fully exploit the potential of PLA and extended it to other biodegradable plastic polymers.