Multi-omic evidence of plastic debris degradation by marine microorganisms

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Video Byte

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Abstract

Plastics have countless uses. However, the mismanagement of plastic waste has resulted in widespread ocean pollution, which could persist in the marine environment for hundreds of years. But growing research suggests that certain microorganisms could be harnessed to break down this waste. The key is verifying whether plastic-degrading microorganisms actually occur in the biofilms that colonize the surfaces of plastic particles, or the "plastisphere", and understanding their temporal characteristics. Recently, researchers found a high diversity of microbes that varied in their community composition over time when cultured on different types of polyethylene terephthalate (PET) plastic. They also found evidence of PET degradation by these microorganisms based on a combined proteogenomic and metabolomic approach, which confirmed that two newly identified isolates from these communities are able to degrade PET using different pathways, one of which may be novel. Although future work is needed to determine exactly how plastic degradation is carried out by these microbes and to what extent such degradation occurs in the environment, this work represents an important step forward in the understanding of marine plastic degradation and demonstrates the potential for harnessing nature to combat worldwide pollution.