The potential of the Amazon River microbiome to degrade rainforest organic matter

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Video Byte

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Abstract

Rainforest rivers receive large amounts of terrestrially derived organic matter (TeOM) and carry it to the ocean, which plays a major role in linking terrestrial and marine ecosystems. Degradation of TeOM relies on river microbes capable of breaking down difficult-to-digest material. Unfortunately, many of the genes involved in this process are unknown. A recent study sought to better understand the genomic machinery of these microbes in one of the largest rivers in the world – the Amazon River. By analyzing 106 metagenomes from 30 sampling points along the river, researchers constructed the Amazon River basin Microbial non-redundant Gene Catalogue, or AMnrGC, including 3.7 million non-redundant genes, most of which belong to bacteria. Bacterial genes from the Amazon were substantially different than those found in other rivers and rainforest soil, and different TeOM degradation pathways were enriched at different sampling points along the river, suggesting a model where cellulose and lignin degradation occur in different sections, allowing for a priming effect. While further research is needed to measure the expression levels of the genes identified, these results provide important insight into how river microbes digest rainforest organic matter.