Urban wastewater bacterial communities show seasonal patterns

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Video Byte

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Abstract

Our urban sewer systems house - and feed - thriving communities of microorganisms. However, we currently know little about how these communities function. For example, do they differ across geography or respond to changing seasons? To begin to answer these questions, researchers characterized the bacterial communities from two wastewater treatment plants and several residential sewers in Milwaukee, WI, as well as from 77 other treatment plants across the US. In Milwaukee, as the wastewater moved from residential sewers to treatment plants, the human-associated bacteria decreased in abundance, and the sewer-associated bacteria increased. The human-associated community varied randomly over time, but the sewer-associated community cycled seasonally with changes in temperature. The wastewater bacterial communities from northern US cities mirrored the Milwaukee communities, while southern cities had distinct community compositions and seasonal patterns. These results show that despite being below ground, the bacterial populations in sewer pipes respond to seasonal environmental conditions, which leads to predictable seasonal and geographic differences in community structure. Further research is needed to determine if these seasonal differences affect human or environmental health risk during sewage release.