

NEVAEH WOODING, CHARLEIGH PRICE, & SAMIA HAMATI, School of Arts and Sciences, West Virginia University Institute of Technology, Beckley, WV 25801. Antibiotic Resistance Genes in Landfill Soil Microbiomes in Beckley, WV

Antibiotic resistance is becoming a global concern, largely driven by the widespread use and release of antibiotics into the environment. This promotes the emergence and spread of antibiotic resistance genes (ARGs) and resistant bacteria. ARGs are an increasing human health concern, as they have been detected in all environments, including natural and clinical settings, potentially limiting the effectiveness of antibiotics against human and animal pathogens. Our research investigates the presence of ARGs in a residential Municipal Solid Waste landfill. Landfills harbor distinct microbial communities and are considered hotspots for ARG proliferation due to bacterial inputs and horizontal gene transfer. These contaminants can potentially migrate through the environment via leachate, posing potential risks to groundwater systems and nearby waterways. We collected 15 soil samples from a clay cap layer at Raleigh County Landfill in Beckley, West Virginia, at depths of 0-20 cm. Environmental DNA (eDNA) was extracted from the soil samples and analyzed using polymerase chain reaction (PCR) to amplify targeted gene fragments. Our results indicate the presence of several ARGs in the soil samples collected. Ongoing analyses aim to further identify and characterize these genes and evaluate their distribution within the landfill environment. As the development of antibiotic resistance continues to outpace new antimicrobial treatments, landfills may represent a significant source of ARG contamination, with potential implications and long-term threat to public safety and agricultural systems by facilitating the widespread dispersal of resistance genes across multiple environments.