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Characterization of Arthrobacteriophage MrAaronian

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*Arthrobacter globiformis* is a common soil bacteria with the ability to degrade pollutants. Further characterization of bacteriophages that infect *Arthrobacter* could have potential applications in selective bioremediation. Arthrobacteriophage MrAaronian was directly isolated by Madison Arrighi and Angelica Coronel-Galindo from Marist College by washing moist soil from a flowerbed in Poughkeepsie, New York with peptone-yeast-calcium (PYCa) liquid media, passing the supernatant through a 0.22 μm filter, and incubating with a host culture of *A. globiformis* B-2979. Following two rounds of serial dilutions and plaque assays on PYCa agar plates to isolate the bacteriophage, MrAaronian formed small, lytic plaques. Negative-staining transmission electron microscopy showed MrAaronian has siphovirus morphology with an approximate tail length of 285 nm and capsid diameter of 67.5 nm. Bacteriophage DNA was extracted and sequenced to 1,325-fold genome coverage by the Pittsburgh Bacteriophage Institute using Illumina Next-Generation Sequencing to determine a double-stranded DNA genome of 54,509 base-pairs containing a 9-base sticky overhang. Whole-genome sequence analysis using Starterator, GeneMark, and Phamerator software revealed MrAaronian has 51.7% G+C content and 86 protein-coding genes transcribed rightwards. Using HHPred and BLASTp database queries, putative functions for genes encoding structural proteins, an endolysin, and nucleases including three HNH endonucleases, VRR-Nuc domain protein, and a Cas4 exonuclease were determined. MrAaronian is a cluster AW bacteriophage and most closely related to Microbacteriophages Michelle and Stayer.