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2024 SEA Symposium Abstract

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Isolation and Characterization of B1 Bacteriophages: Dice, Olak, Orefu, Pacifista, Ricotta, and Selr12.

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Bacteriophages, also called phages, are viruses studied for their ecology and epidemiology. The characterization of novel *Mycobacterium* bacteriophages may advance the development of therapeutics for *Mycobacterium leprae* and *Mycobacterium tuberculosis* infections. Students at Howard University from the SEA-Phages 2023-2024 class isolated the bacteriophages Dice, Olak, Orfeu, Pacifista, Ricotta, and Selr12. These bacteriophages were purified using standard procedures from enriched soil samples collected from the Howard University environment. *Mycobacterium smegmatis* mc2 155 served as host . All six phages are of the Siphoviridae morphotype. Illumina sequencing revealed that the sample phages belonged to cluster B and subcluster B1. The genome lengths for all the phages are between 68337bp and 69100 bp, with GC content ranging from 66.4% to 66.5%. Annotation was carried out using PECAAN, HHpred, and BLASTp analyses with a cutoff E-value of 10−4. All six phages had unique tail lengths: Dice 294.375 nm, Olak 309.375 nm, Orfeu 313.125 nm, Pacifista 315.8 nm. Ricotta 302.5 nm and Selr12 312.5 nm with an average capsid diameter ranging from 69-73.8 nm. The genome organization across all 6 phages were consistent with other members of the sub cluster.

Key words: Mycobacteriophages, Soil, *Mycobacterium smegmatis* and Siphoviridae