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2023 SEA Symposium Abstract

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Discovering and Characterizing Mycobacteriophages Scrick (cluster B1) and Mudslide (cluster B4) at SJU.

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Mycobacterium phages Mudslide and Scrick were isolated and characterized by students in the SEA-PHAGES program at Saint Joseph’s University. Both bacteriophage Mudslide and Scrick were found to be related to other phages in cluster B that infect *Mycobacterium smegmatis* (mc2155), which is a non-pathogenic, soil-dwelling bacteria. Bacteriophage Mudslide was discovered after enriching a soil sample collected from damp and somewhat frozen soil at Anderson Farm Park, Collegeville, PA. Mudslide went through five rounds of purification, producing clear, small plaques after 48-hr incubation at 37°C. Through negative-staining transmission electron microscopy, Mudslide was classified as a siphovirus with a capsid head of 59 nm in diameter and a tail length of 299 nm. Mudslide has a circularly permuted genome with 71,342 base pairs with 67.4% G+C content which yielded 98 genes with known functions assigned to 28 of those. While Mudslide was most similar to other bacteriophages in subcluster B4, bacteriophage Scrick belonged to subcluster B1. Scrick was extracted from an enriched soil sample that was dry and collected near a creek in Nesquehoning, PA. Scrick went through three rounds of purification at 37°C. After a 24-hr incubation period, small, clear plaques appeared. Negative-staining transmission electron microscopy revealed a siphoviridae morphotype with 294 nm long tails and capsid heads of 54 nm in diameter. Scrick’s circulatory permuted genome has 68,701 base pairs with 66.4% G+C content. Scrick yielded 103 genes, of which 26 were assigned known functions. Because of their lytic nature, Scrick and/or Mudslide may be candidates for bacteriophage therapy in other closely related, pathogenic *Mycobacterium spp*.