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2021 SEA Symposium Abstract

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Comparative Genomics of a 2000 bp Insert in A6 Mycobacteriophages

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Mycobacteriophage Newrala was isolated in the Fall of 2020 as part of the SEA-PHAGES program at The College of St. Scholastica. Genome sequencing revealed a 52566 bp genome belonging to the A6 subcluster. Preliminary genome annotation identified 95 protein coding genes and 3 tRNAs. Intra-cluster comparative genomics identified an approximately 2000 bp insertion/deletion in the right arm of the genome present in some, but not all members of the subcluster. In Newrala, this regions contains the coding potential for 11 genes, including the putative immunity repressor. Phages Jewelbug and Jeffabunny do not have this insert or its associated immunity repressor. The lack of this insert and its associated genes, in addition to the absence of an integrase, likely requires this sub group of phages to use the *parABS* system to maintain a temperate life style. Related to this, we are currently investigating the appearance and frequency of stoperator sequences in this subcluster. In Newrala, we have identified 23 putative stoperators with a consensus sequence of GCGATGTCAAG. Investigations of stoperators in other A3 subclusters is on-going. In addition, we are currently working on the origins of this insertion/deletion event though the development of a phylogenetic tree of the subcluster and others.