First Isolation and Characterization of Bacteriophages "Liamboii" and "Ostambo" Infecting Streptomyces antibioticus

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The bacteria Streptomyces antibioticus produces several industrially important antibiotics, but the species is difficult to culture and therefore to effectively discover antibiotics in. To fully understand the roles of the species' genes, a potential approach is to identify gene regions involved in bacterial defense, of which antibiotic production and bacteriophage host range are involved. In this study, two new phages, Liamboii and Ostambo, were isolated from Denton soil and found to infect S. antibioticus UNT16f3, a locally sourced strain. The phages were characterized through plaque morphology, spot tests for quantification, lysogeny, other Streptomyces host range, and soon, microscopy. Methods to more efficiently culture S. antibioticus were derived through the use of the polymer polyethylene glycol (PEG), and from here, the phages' DNA was isolated and preserved for sequencing. The phages were found to also infect S. tricolor. A paired BLAST search between the two species, as well as a Phamerator BLAST with tricolorphage Rusticus, identified conserved genomic regions--novel candidates for further screening for host range and antibiotic production in both bacterial strains and phages. These findings can be applied to developments like phage therapy, discovery of new antimicrobial compounds, and even CRISPR. These phages are the first ever to be cultured to infect S. antibioticus, and were registered in the National Actinobacteriophage Database.

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