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CookieBear is a temperate phage that infects the soil microorganism Arthrobacter globiformis B-2979

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Bacteriophages (phages), viruses that infect bacteria, are gaining increased attention due to their host specificity and potential as alternatives to antibiotic treatments. Phages replicate within host cells through either the lytic (cell lysis) or temperate (genome integration) cycle. This study aims to characterize soil temperate phages, which are influenced by various environmental factors. Here, we describe the isolation and characterization of a phage, CookieBear, from soil using Arthrobacter globiformis 2979 as its host. CookieBear was identified through the Direct Isolation protocol and produces 2 mm cloudy plaques at 22°C. Infection studies demonstrated an optimal temperature range of 22°C–37°C, with minimal changes in plaque diameter. Based on these findings, we hypothesized that CookieBear is a temperate phage. To further investigate, CookieBear’s genome was sequenced and annotated using various bioinformatics tools. Its genome is 52,202 bp long, containing 93 predicted open reading frames (ORFs) and 1 tRNA. Comparative genomic analysis revealed high similarity to Cluster AY phages Raphaella (99%) and Auxilium (99.2%). The genome includes genes associated with both temperate (tyrosine integrase) and lytic (endolysin) life cycles, confirming its temperate nature. Ongoing research focuses on characterizing potential lysogens and comparing CookieBear’s genome to another Cluster AY phage, Anekin, which was isolated at Benedictine University. We acknowledge the HHMI SEA-PHAGES program for technical support, Dr. deCarvalho for transmission electron microscopy images, Dr. Poch and Shay-Baker Watson for laboratory assistance, our laboratory members for research discussions, and Benedictine University for funding support.