

Isolation study and selection of bacteriophages specific to *Burkholderia cepacia* complex for potential use in clinical applications.

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Introduction: The *Burkholderia cepacia* complex (Bcc) comprises conditionally pathogenic bacteria, with inherent antibiotic resistance, often involved in nosocomial infections, especially severe in cystic fibrosis patients. Bacteriophages represent a promising alternative for treating such drug-resistant infections. Due to limited data on effective Bcc phages, this study aimed to isolate and characterize novel Bcc-specific bacteriophages with therapeutic potential.

Material & Methods: Bcc strains were isolated from clinical and environmental samples and identified by sequencing the conserved *recA* gene (1). Antibiotic susceptibility of Georgian Bcc isolates to seven antibiotics was tested according to CLSI guidelines (2). Standard phage methodologies were used for isolation, characterization, and lytic activity assessment (3).

Results: Thirty-one Bcc strains (19 clinical, 12 environmental) showed 3–95% resistance to seven antibiotics, with significantly higher resistance in clinical isolates. Two novel Myoviridae phages, vB_Bm-S567 and jumbo phage vB_BoMT-1/77 with genome sizes 48.5 kbp and 250 kbp respectively were isolated from soil samples on clinical Bcc isolates (*B. multivorans* LMG 13010 and *B. orbicola* Meg 77). Both adsorbed within 15 minutes, with burst sizes of 65 PFU/mL (vB_Bm-S567) and 50 PFU/mL (vB_BoMT-1/77). Phages remained stable in liquid media at 4 °C and 25 °C for 3 months, and survived 1 h exposure to pH 2–12 and temperatures below 70 °C. Lytic activity in liquid culture was maintained at MOIs of 100–0.01 for 48 hours. Individually, they lysed 64% and 50% of Bcc strains, while their combination resulted in enhanced effectiveness, lysing 79% of Bcc strains.

Conclusion: This study demonstrated the *in vitro* effectiveness of bacteriophages against antibiotic-resistant Bcc strains. Their favorable biological properties highlight their potential as therapeutic agents. Further preclinical testing in *C. elegans* is planned to assess their efficacy *in vivo*.