

Description of Additional Supplementary Files:

Supplementary Data 1: Details of NCLDV genomes analyzed in this study.

Supplementary Data 2: Details of phage genomes analyzed in this study.

Supplementary Data 3: List of ARGs annotated in NCLDVs and their annotation details.

Supplementary Data 4: List of ARGs annotated in phages and their annotation details.

Supplementary Data 5: List of potential efflux pump genes annotated in NCLDVs.

Supplementary Data 6: List of potential efflux pump genes annotated in phages.

Supplementary Data 7: ARG-, MGE-, and VF-carriage of different NCLDV families.

Supplementary Data 8: ARG-, MGE-, and VF-carriage of different phage families.

Supplementary Data 9: Details of the two NCLDV *dfr* genes randomly selected for functional validation.

Supplementary Data 10: List of virulence genes annotated in NCLDVs and their annotation details.

Supplementary Data 11: List of virulence genes annotated in phages and their annotation details.