

Poster No. 1682

ABSTRACT (edited)

Background

In 2017, WHO published a list of 'priority pathogens'; antibiotic-resistant bacteria which posed the greatest threat to human health. Among them, A. baumannii was recognized as a critical priority pathogen due to its significant role in nosocomial infections. There was a growing call for new avenues in antimicrobial therapy. One such endeavour was to revisit an old therapeutic option against MDRO, viz. bacteriophage therapy.

Methods

A total of fifty (50) multidrug resistant isolates of *A. baumannii* were collected. We attempted to isolate bacteriophages from hospital sewage water, against these collected strains, using standard procedure. Then the host range of the isolated phages were analysed against those 50 collected isolates. The lytic activity was confirmed using spot and plaque assays, following the techniques used by Newase et al, with some modifications. The isolated phages were then purified and stained, and visualised by a ThermoScientific Talos L120C transmission electron microscope (TEM).

Results

A total of three (3) bacteriophages were isolated from the hospital sewage, and their lytic activity against A. baumannii strains were confirmed by the spot assay which showed clear zones on bacterial lawns. The phages showed central clear zones surrounded by halos, in the plaque assay. Finally, all 3 bacteriophages were visualised by TEM, and two of them had morphology suggestive of siphoviridae family, with long tails, while the third had a short stubby tail, characteristic of the podoviridae family.

Conclusion

The study concludes that 3 novel bacteriophages were isolated from sewage water, all of which were active against MDR A. baumannii strains.

INTRODUCTION

The modern advances in the fields of Medicine and Surgery depend entirely on our ability to treat and prevent infections. However, the rising incidence of antimicrobial resitance in both community and hospital settings has proved to be increasingly challenging. Of them, probably of paramount clinical importance is the rise of CRAB. A long forgotten mode of therapy has thus gained popularity in therapy: Bacteriophage therapy. Numerous instances of successful phage therapy have already been published, with many more becoming available each day.

METHODS

A total of fifty (50) multidrug resistant isolates of *A. baumannii* were collected. Then the host range of the isolated phages were analysed against those 50 collected isolates. The lytic activity was confirmed using spot and plaque assays, following the techniques used by Newase et al, with some modifications. The isolated phages were then purified and stained following methods of Ellis et al, with some modifications, and visualised by a ThermoScientific Talos L120C transmission electron microscope (TEM).

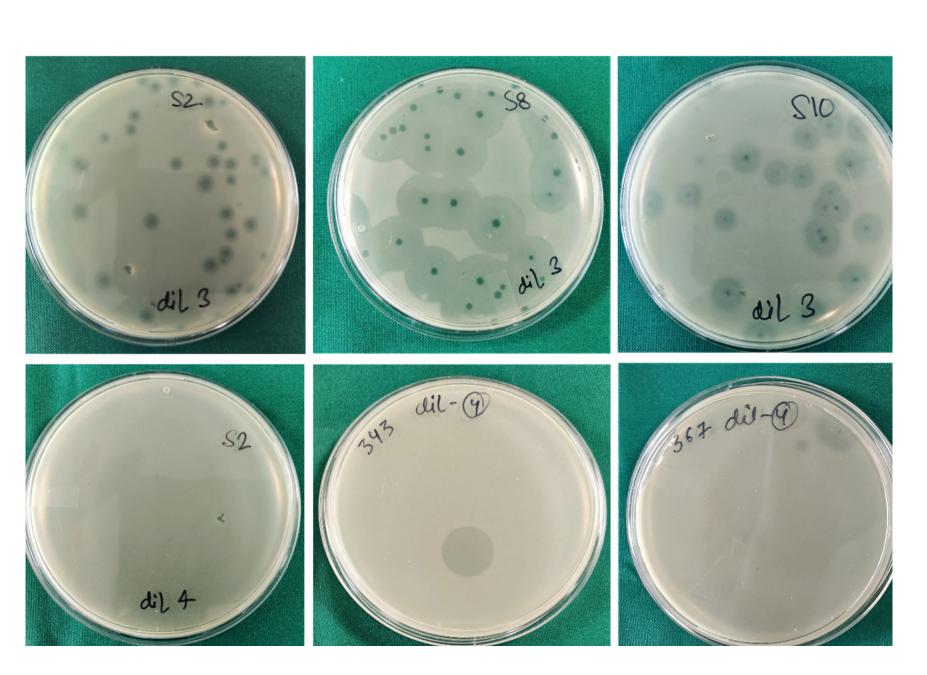


Figure 1. Plaque Assay of the isolated bacteriophages

An Exciting New Approach: Isolation and characterisation of bacteriophages against MDR Acinetobacter baumannii

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A total of 3 novel bacteriophages active against MDR strains of Acinetobacter baumannii were isolated from hospital sewage.

All 3 were lytic phages, and had good spectrum of activity

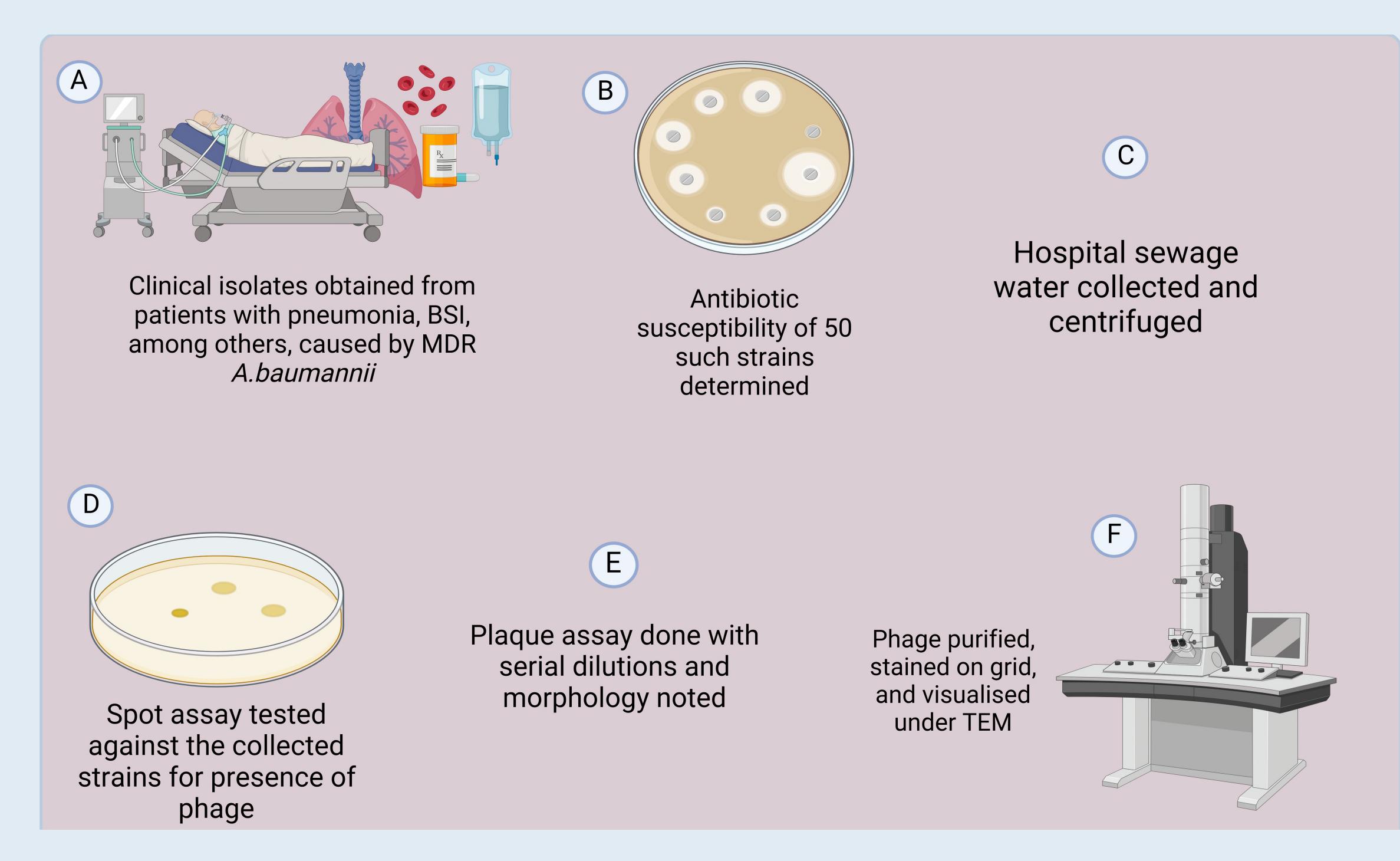
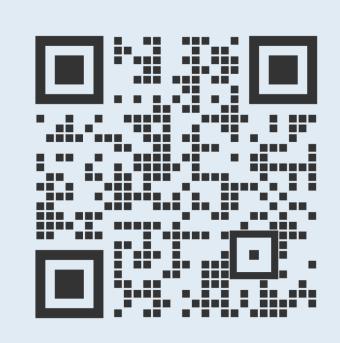
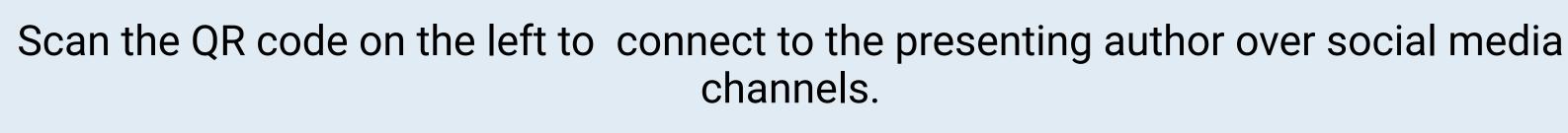


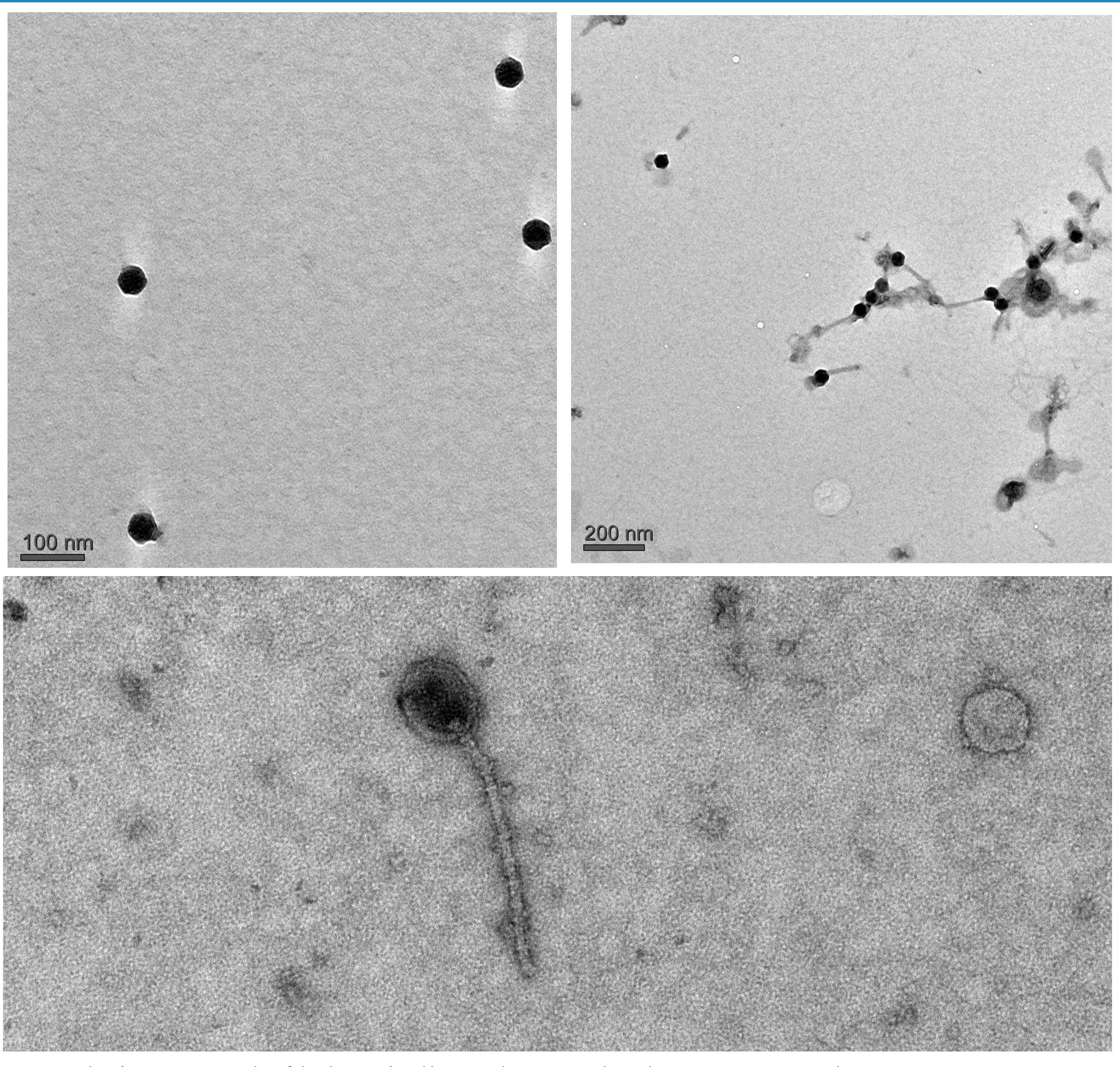
Figure 2. A graphical depiction of the workflow for the study



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A total of 3 novel bacteriophages active against MDR strains of *Acinetobacter baumannii* were isolated from hospital sewage. Their activity spectrum were determined through spot and plaque assay, and their morphology were characterised by electron microscopy. This provides impetus to further research towards phage therapy as a novel therapeutic option against MDROs.

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RESULTS

Figure 3. The Electron Micrographs of the three isolated bacteriophages, named vB_AbaS_SRNAIIMS002, vB_AbaS_SRNAIIMS008 and vB_AbaP_SRNAIIMS010; two of them had morphology suggestive of siphoviridae family, with long tails, while the third had a short stubby tail, characteristic of the podoviridae family.

CONCLUSION