



Exploring Antimicrobial Activities of Isolated Bacteriophages from Water Contaminated by House Fly (*Musca domestica*)

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Introduction: The AMR Phenomenon

Antimicrobial resistance (AMR) is a growing global challenge that threatens the effectiveness of existing antibiotics. The overuse and misuse of antibiotics have accelerated the emergence of multidrug-resistant pathogens, necessitating the exploration of alternative strategies to combat infections. Bacteriophages, as viruses that infect and kill bacteria, present a promising avenue for combating this issue.

Exploring Alternative Antimicrobial Factors

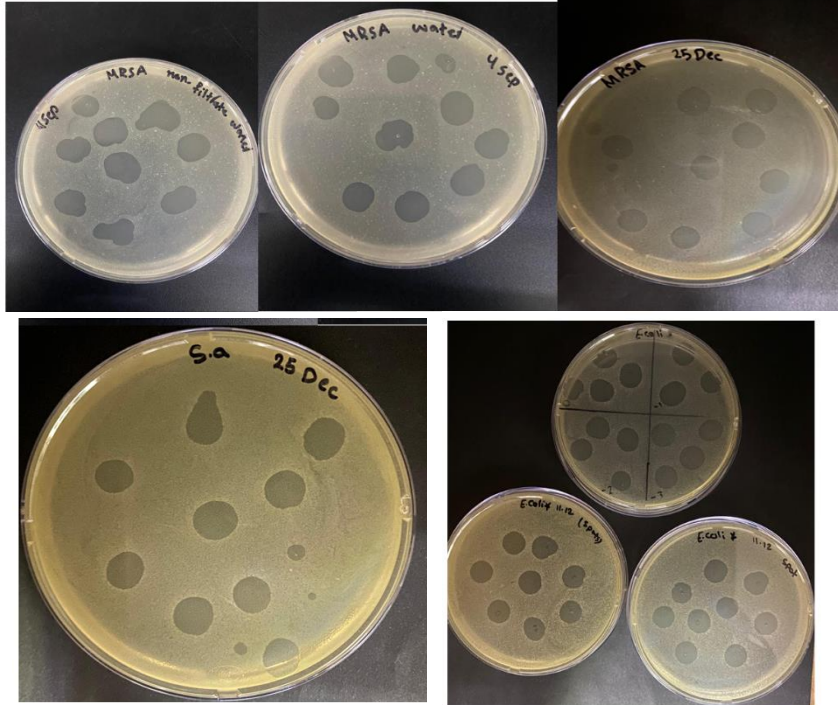
Building on the findings of Baeshen et al. (1990), which highlighted the potential antimicrobial agents within house flies (*Musca domestica*), this study focuses on utilizing water contaminated by house flies as a novel source of bacteriophages. House flies were trapped and dipped in sterile water to collect microbial and viral elements, aiming to isolate bacteriophages that could serve as alternative antimicrobial agents. This work extends previous research and explores the diversity and potential applications of bacteriophages as targeted solutions to the AMR crisis.

Methods and Results

Methods

1. **House Fly Collection:** Flies were collected from different environments.
2. **Sample Processing:** Flies were dipped in sterile water, and the resulting samples underwent filtration, DNA/RNA extraction, and analysis.
3. **Analysis Techniques:**
 - **Shotgun Metagenomics:** Samples are currently being analysed using shotgun metagenomics to identify bacteriophage genomes and their bacterial hosts.
 - **Spot Assays:** Conducted to assess the antimicrobial activity of isolated bacteriophages against bacterial strains, including *E. coli*, *S. aureus*, and MRSA.

Results



- Preliminary spot assay experiments demonstrated inhibitory effects of isolated bacteriophages on *E. coli*, *S. aureus*, and MRSA.
- Shotgun metagenomics analysis is ongoing to further characterize the diversity and potential applications of bacteriophages from these samples.

Conclusion

Bacteriophages isolated from house fly-contaminated water show promise as viable alternatives to conventional antibiotics. This approach could play a critical role in addressing the AMR crisis by providing sustainable and targeted solutions for controlling pathogenic bacteria. Ongoing experiments will further explore their clinical applications and limitations.
