

Isolation of bacteriophages targeting enterotoxigenic *Escherichia coli* associated with post-weaning diarrhea in piglets

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Introduction

- Post-weaning diarrhea (PWD) is one of the most frequent diseases in pig production worldwide.
- It is mainly caused by **enterotoxigenic *E. coli* (ETEC)** producing fimbrial adhesins (F4, F6) and enterotoxins.
- PWD leads to severe dehydration, growth retardation and increased mortality, causing major economic losses.
- Colistin has been widely used, but its use raises **serious antimicrobial resistance concerns**.
- **Alternative therapies are urgently needed.**
- **Bacteriophages represent a promising alternative to antibiotics.**

Objective

- **The aim of this study is to isolate bacteriophages targeting ETEC strains associated with post-weaning diarrhea in piglets, as a first step toward phage-based therapeutic strategies.**

Materials and methods

Bacterial strains

- 16 porcine ETEC strains provided by ARSIA.
 - 12 F4-positive strains.
 - 4 F6-positive strains.

Sample collection

- 12 wastewater samples.
 - Collected from different wastewater treatment plants.
 - Provided by AIDE.

Phage isolation and purification

Figure 1: Filtration of sewage water

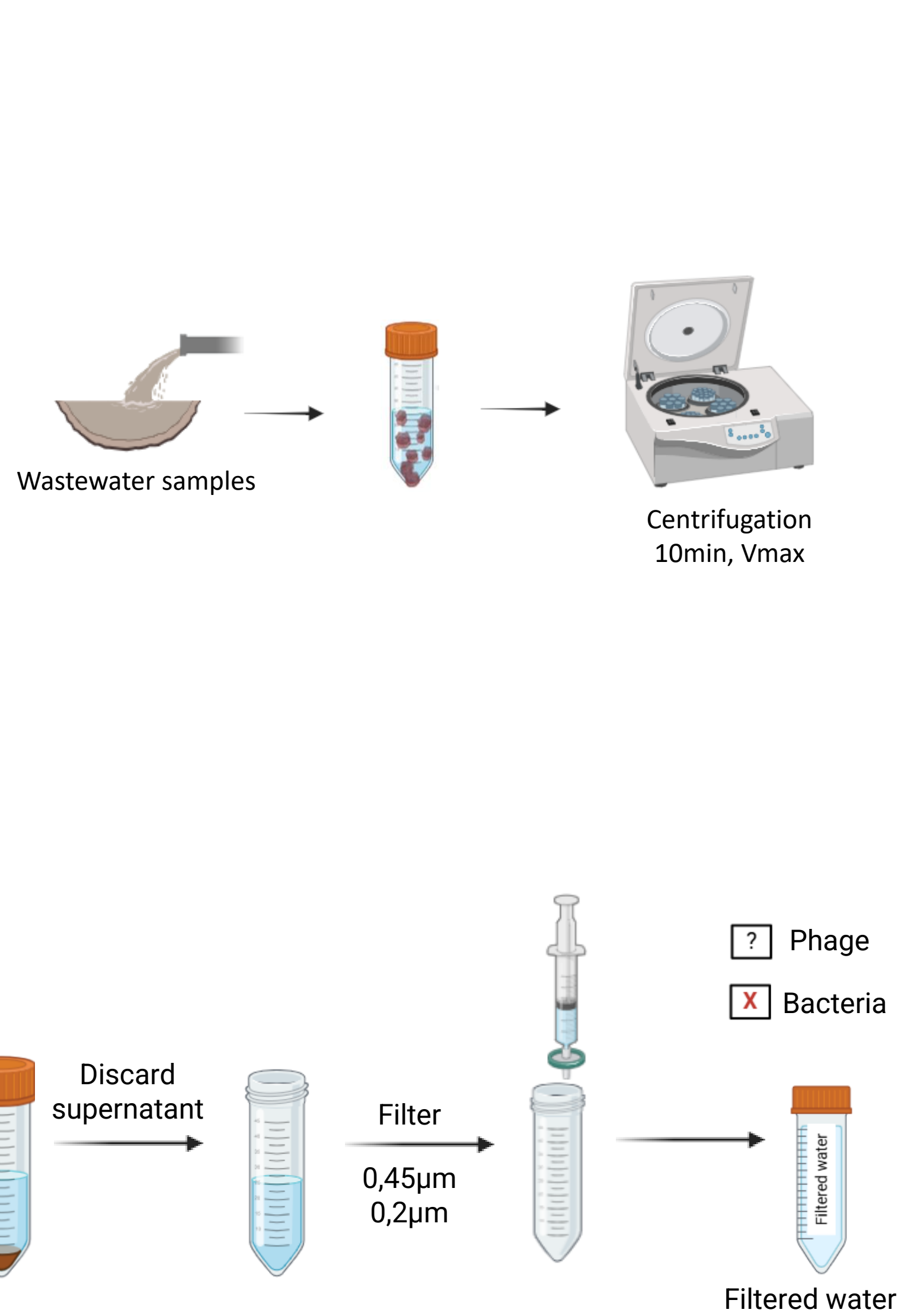


Figure 2: Isolation of bacteriophages from filtered water

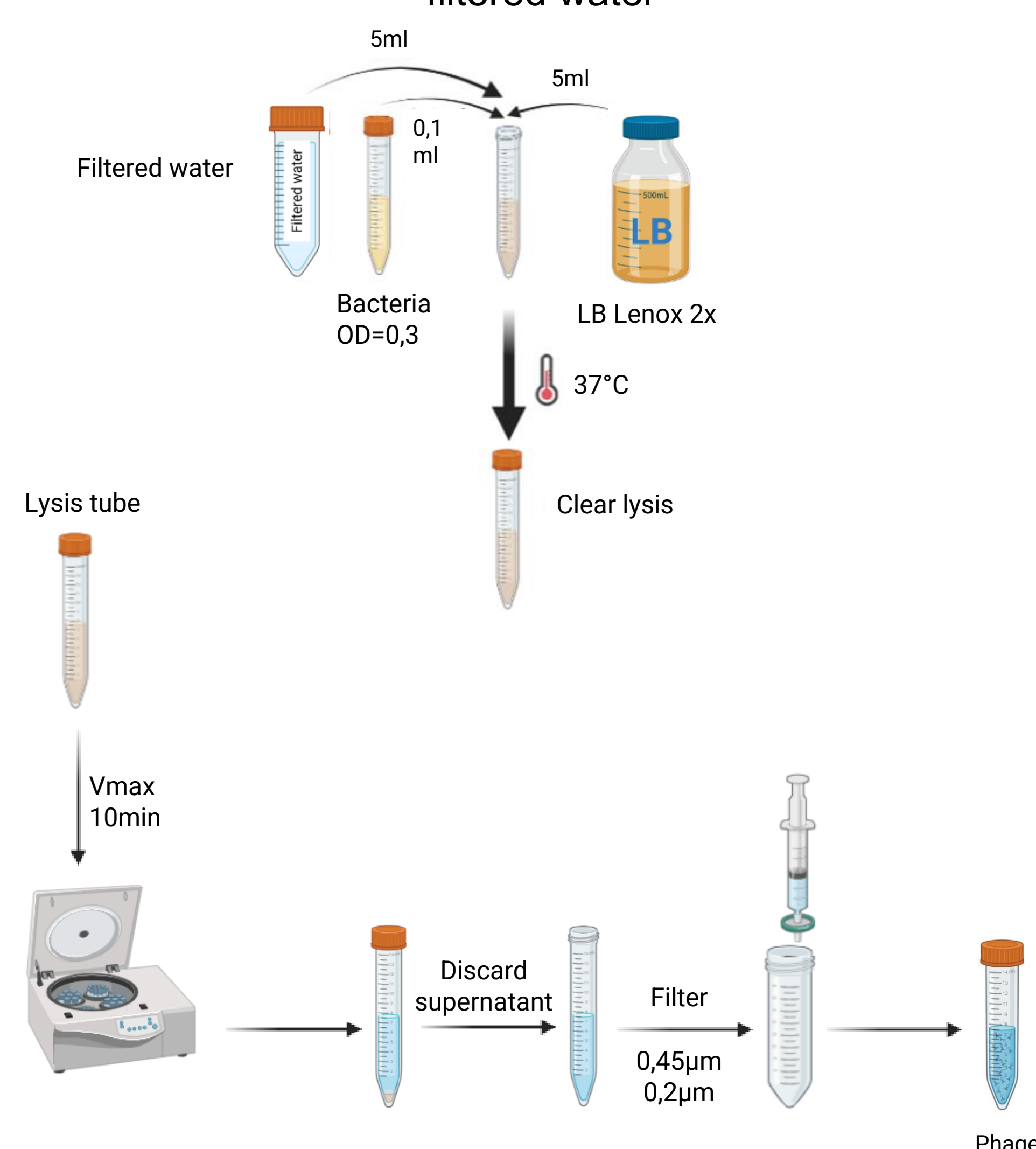
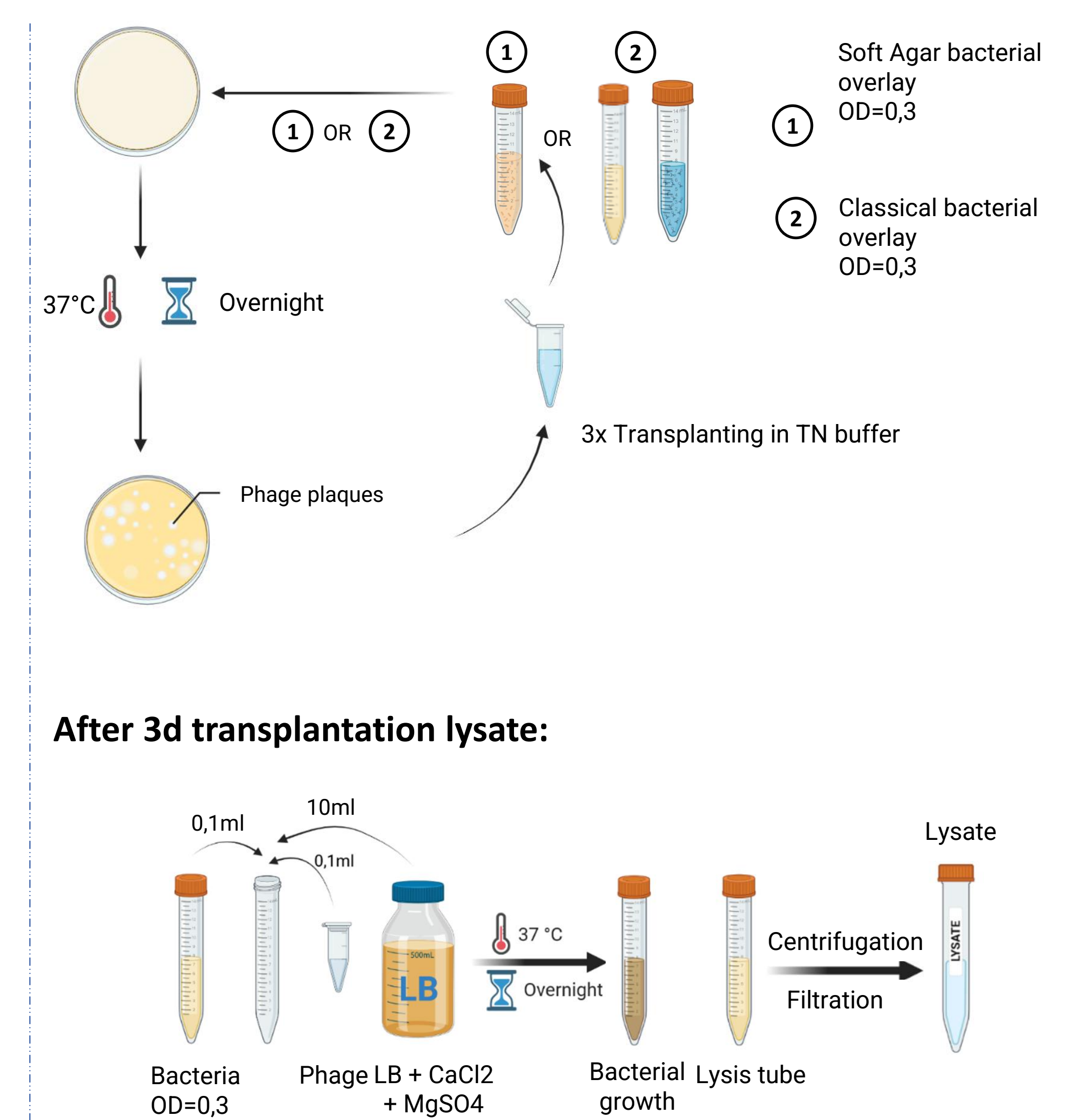


Figure 3: Purification of bacteriophages



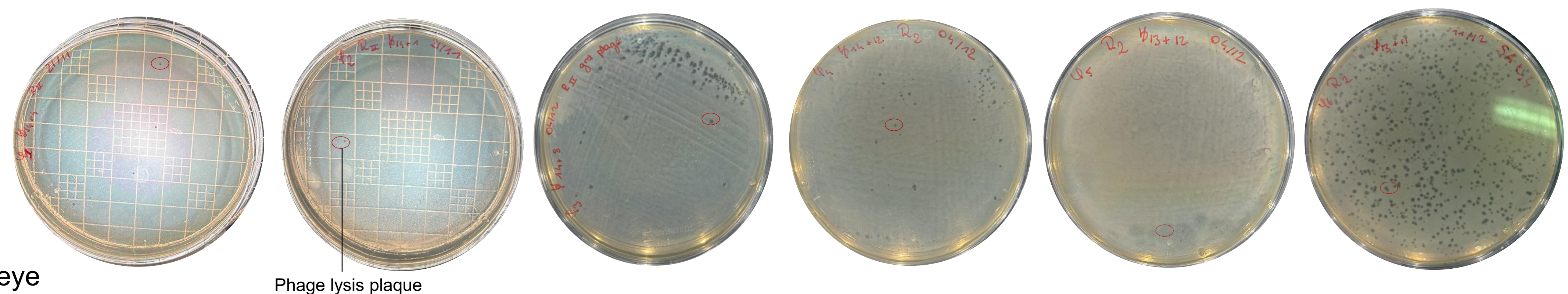
Results

Phage isolation

- 6 bacteriophages isolated.
- From 5 wastewater samples.
- 4 phages active against **F4-positive ETEC**.
- 2 phages active against **F6-positive ETEC**.

Sites: Awans, Fontin, Sclessin, Grosses-Battes, Oreye

Figure 4: Plaque morphology of ETEC bacteriophages at second replating. Phages 1 to 6.



Conclusion and perspectives

- This study demonstrates the **isolation of six bacteriophages** targeting **porcine ETEC** strains associated with post-weaning diarrhea.
- Phages active against both **F4- and F6-positive ETEC** were recovered from **wastewater samples**, highlighting the diversity and availability of phages in environmental reservoirs.
- **Further characterization of the isolated phages, including host range, cycle type, and genomic analysis, will be essential to evaluate their suitability for future therapeutic applications.**

Acknowledgments

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