Evaluation of a *Vibrio*-targeting Bacteriophage Cocktail and a Biosurfactant-type Postbiotic for Microbial Control and Growth Performance in Shrimp Culture

Songphon Buddhasiri[1] and **Ekasit Tiyanun**[2]

[1] Faculty of Veterinary Medicine, Chiang Mai University, Chiang Mai, Thailand
[2] Research and Innovation Unit, AimGen Innotech Co., Ltd., Thailand

Faculty of Veterinary Medicine
Chiang Mai University

Background

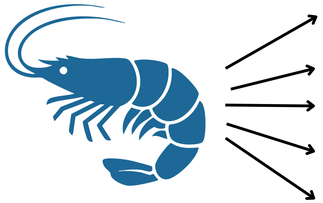
Antibiotic-resistant *Vibrio* spp., particularly *Vibrio parahaemolyticus*, are a major problem in shrimp aquaculture. Alternative non-antibiotic strategies, such as bacteriophages and postbiotics, may help reduce *Vibrio* contamination and improve shrimp health.

Objective

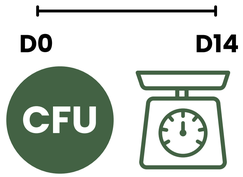
To evaluate the efficacy of a *Vibrio*-targeting bacteriophage cocktail and a biosurfactant-type postbiotic, applied individually or in combination, for reducing presumptive Vibrio spp. and improving shrimp growth performance.

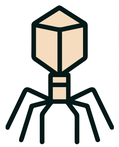
Methodology

Shrimp aged 63 days (~120 shrimp/kg) were randomly assigned to five groups, with three replicates per group and 15 shrimp per tank. All groups received a commercial basal diet.



- **Control,** Basal diet only
- **T1,** Postbiotic 1 g/kg
- **T2,** Phage cocktail 5 g/kg
- **T3,** Phage cocktail 10 g/kg
- **T4,** Phage cocktail + Postbiotic



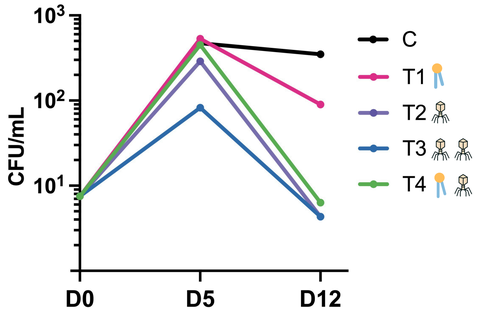


Phage cocktail: *Vibrio*-targeting phages (*V. parahaemolyticus*, *V. harveyi*, and *V. alginolyticus*, each at ≥ 1.0 × 10^9 PFU/g.)



Postbiotic: *Bacillus subtilis*-derived biosurfactant-type postbiotic

Results



Colonies on TCBS agar were evaluated on Days 0, 5, and 12 as presumptive *Vibrio* spp. By Day 5, phage-treated groups (T2 and T3) showed lower CFU than the control and T1 groups. The reduction was stronger by Day 12, with the phage-only groups showing the greatest reduction, especially T3, followed by T2, suggesting a dose-dependent phage effect. T1 and T4 showed moderate effects.

Growth performance analysis showed that shrimp in the phage-treated groups, particularly T2 and T3, achieved higher final body weights than those in the control group, whereas T1 and T4 showed intermediate values.

Group	Body Weight at D14
C	11.52 g
T1	11.58 g
T2	11.62 g
T3	11.60 g
T4	11.59 g

Conclusion

The phage cocktail effectively reduced presumptive *Vibrio* spp., with the strongest effect observed in T3, followed by T2, suggesting a dose-dependent response. Phage-treated shrimp also showed better growth performance than the control group. Overall, the phage cocktail has potential as a non-antibiotic strategy for controlling *Vibrio* spp. in shrimp culture.

Acknowledgements

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Contact: Songphon.bu@cmu.ac.th