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生命科學全英文 碩士學位學程

The Effects of Probiotic Addition on Biofloc Culture in White Shrimp (*Litopenaeus vannamei*)

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Introduction

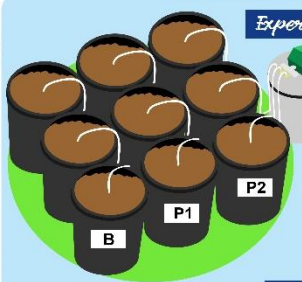
- The white shrimp (*Litopenaeus vannamei*) was the most popular culture species and its production was about 53% of the world shrimp production in 2018 and still keep increasing up to now(1).
- The decline of the aquatic environment during culture process the emergence of pathogens and diseases of shrimp Resulted in death of shrimps and economic losses for farmers (2).
- Vibriosis disease infect and result in death of about 70% to 80% of shrimps in ponds (3).
- Biofloc was develop alternative technology that provide benefits includes low infected diseases, high density, and also low water exchange (4).
- Another alternative is application of probiotic to improves survival, growth rates, and FCR of shrimp (5).

Aim

To evaluate the effect of two groups of commercial probiotics added in the biofloc treatment and also monitoring water quality, growth, and survival of white shrimp (*L. vannamei*). In addition, the resistance of white shrimp when challenge by *Vibrio harveyi* were also evaluated.

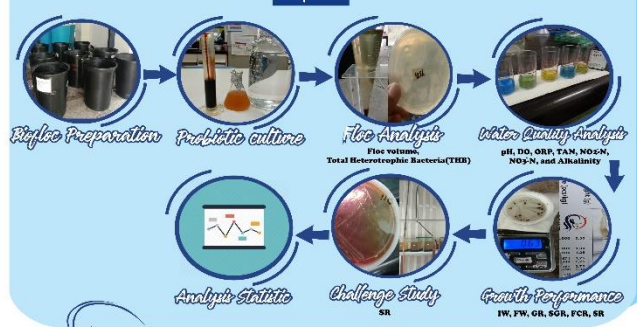
Methodology

Experiment Design



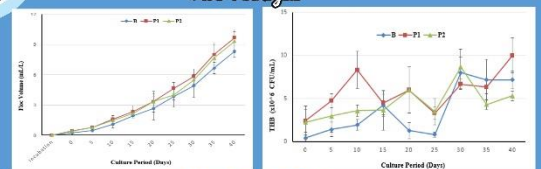
The study was conducted in indoor biofloc systems
Treatments :
 - B: Biofloc no probiotic)
 - P1: (Yongstrong Probiotic/ *Bacillus amyloliquefaciens* Ba-BPD1)
 - P2: (BioMixin Aquaid Probiotic/ *Bacillus amyloliquefaciens*).
 - C/N ratio 15:1 & with three replicates.

Steps :



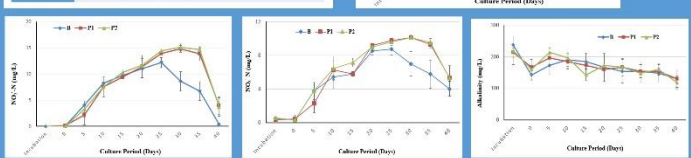
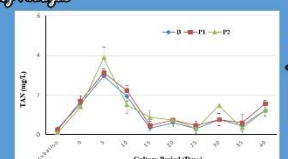
Result

Floc Analysis



Water Quality Analysis

Treatments	Parameters		
	pH	DO (mg/L)	ORP (mV)
B	8.107 ± 0.1 ^b	7.29 ± 0.026 ^a	162 ± 7.7 ^a
P1	8.119 ± 0.1 ^{ab}	7.27 ± 0.027 ^a	148.6 ± 3.5 ^a
P2	8.126 ± 0.1 ^a	7.26 ± 0.023 ^a	138.7 ± 2.8 ^a



Growth Performance

Parameters	Treatments		
	B	P1	P2
FW(g)	0.06 ± 0.0 ^a	0.06 ± 0.0 ^a	0.06 ± 0.0 ^a
FW(g)	0.20 ± 0.03 ^a	0.25 ± 0.04 ^a	0.21 ± 0.0 ^a
Weight(g/day)	0.115±0.013 ^a	0.137±0.015 ^a	0.118±0.008 ^a
FCR	1.42 ± 0.3 ^a	1.03 ± 0.11 ^a	1.34 ± 0.17 ^a
SGR (%)	2.93 ± 0.004 ^a	3.47 ± 0.005 ^a	3.0 ± 0.002 ^a
SR (%)	35.11 ± 0.1 ^a	34.89 ± 0.12 ^a	28.22 ± 0.07 ^a

Challenge Study

Treatments	Survival Rates (%)
B	90 ± 0.17 ^a
P1	90 ± 0.1 ^a
P2	80 ± 0.1 ^a

Conclusion

- The addition of probiotic significantly increase the nitrite and nitrate, but not significant to reduce the TAN than the control.
- The addition of probiotic resulted in higher floc volumes, THB, and growth performance than control, but insignificant in survival in all groups.
- After challenge study, the addition of probiotic has no significant effect on survival rate than the control.

References :

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- (3) Chandrakala, N.A.P.S., 2017. Vibriosis in Shrimp Aquaculture A Review. Engineering and Technology 3, 27-33.
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