INFLUENCE OF HYDROGEN PEROXIDE ON *Litopenaeus vannamei* REARED IN BIOFLOCS TECHNOLOGY SYSTEMS

Wilson Wasielesky; Plinio S. Furtado, Gabriel F. Alves, Dariano Krummenauer* and Luís Poersch

Introduction

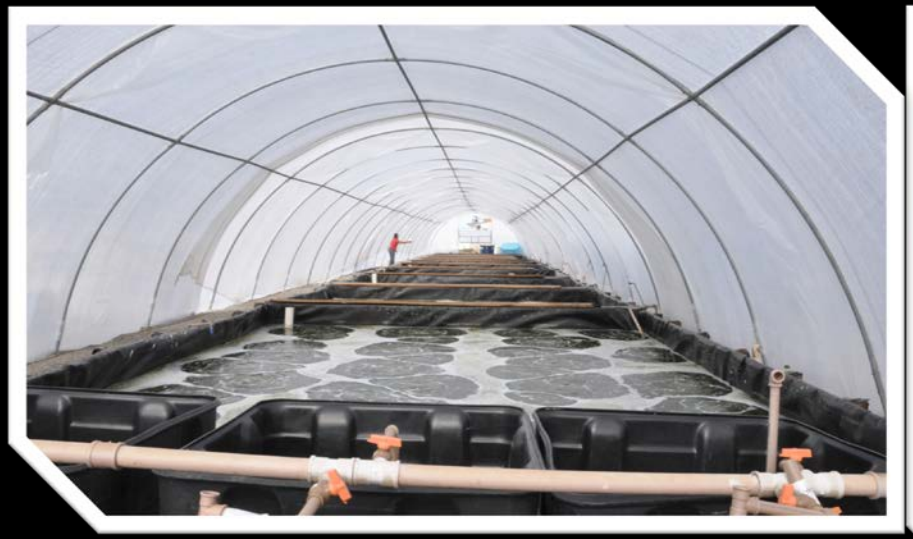
- In BFT system the oxygen demand is high, mainly due to the respiration of microorganisms present in the bioflocs and the high stocking densities of shrimp.

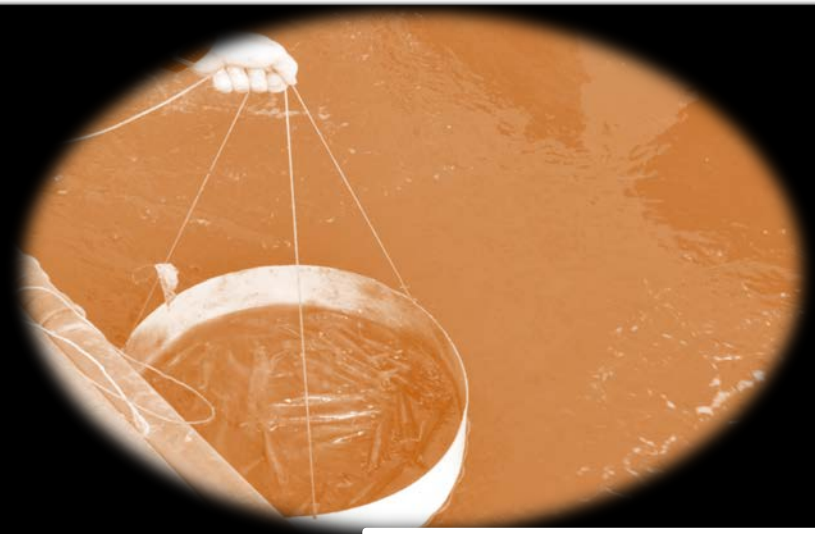
- Cuts of oxygen supply in the BFT system (electrical problems or equipment breaks), can lead to total mortality of shrimp in a short time.

Objective

- This study aimed to investigate the feasibility of use of the hydrogen peroxide as a source of rapid increase of the dissolved oxygen concentration levels (DO) in BFT system.

Materials and methods





BFT SYSTEM

Materials and methods

- **21 day-trial was conducted in six 300 L tank-BFT-system**
- **100% of mature biofloc;**
- ***L. vannamei* juveniles (1.3 g) where 300 juveniles.m^{-3} stocked;**

Materials and methods

- **Treatments:**
- **(T1) control, constant aeration during experimental period (aerotube + blower)**
- **(T2) 21 days - hydrogen peroxide permanent**

(which was simulated in a permanent culture with oxygen supplied through regular additions of hydrogen peroxide

(Pump to eliminate CO2 and mix the water!!!!).

Materials and methods

- The amount of hydrogen peroxide used was 1 mL (29%-liquid), to increase DO level in 0.85 mg/L in 150 L of tank water. Monitoring oxygen every 3 hours (14 μLH_2O_2(safe level);

Materials and methods

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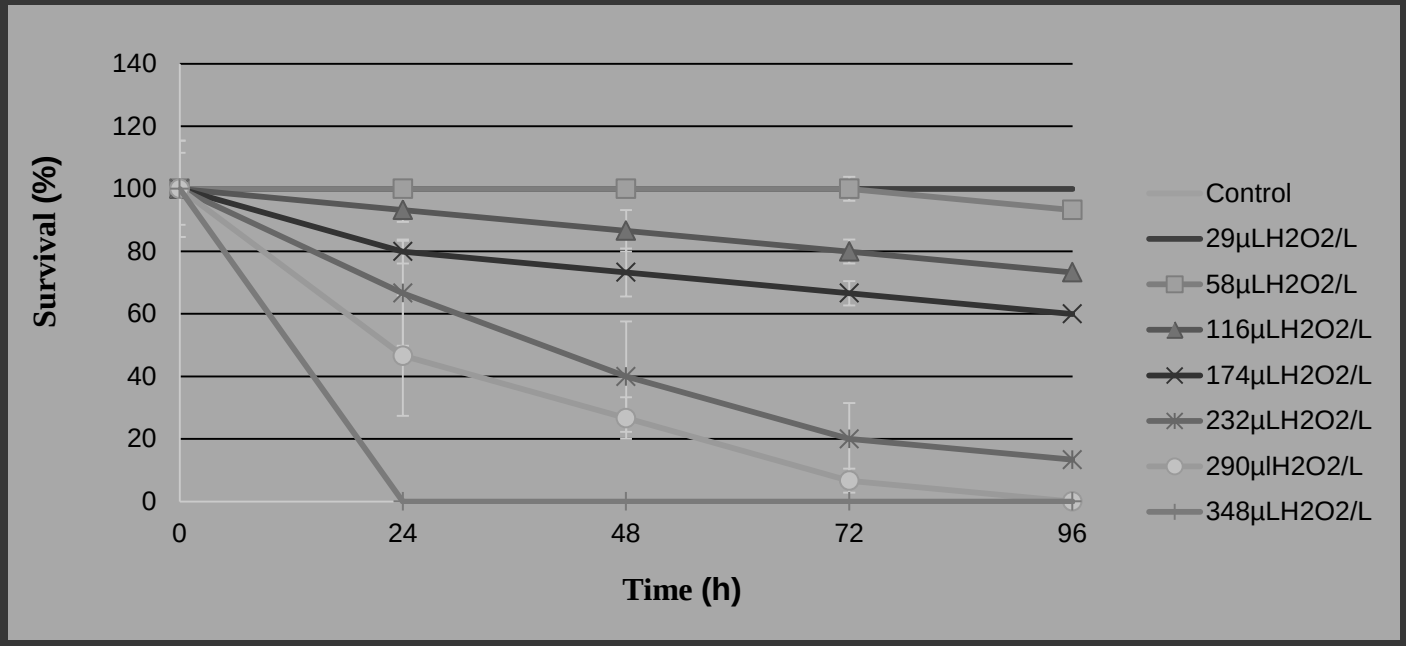

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Short communication: Acute toxicity of hydrogen peroxide in juvenile white shrimp *Litopenaeus vannamei* reared in biofloc technology systems

Plínio S. Furtado · Fabiane P. Serra · Luis H. Poersch · Wilson Wasielesky Jr.

Water Quality Parameters:

- **Temperature**
- **pH**
- **Oxygen**
- **Salinity**
- **Ammonia**
- **Nitrite**

Daily

- **Alkalinity**
- **Nitrate**
- **Volume of floc**

Twice a week

- Shrimp were fed two times/day with a commercial diet (38% CP (38% CP, 1.6 mm, Guabi™, Campinas, SP, Brazil) offered in feed trays.

- Daily feed was adjusted based on shrimp consumption and growth performance.

- At the end of experiment the remaining shrimp in each tank were weighed, using a digital scale and counted to determine the survival rate and growth each treatment.

Results

- The physical, chemical and biological water parameters monitored throughout the study remained in the range considered adequate for the development of *L. vannamei*.
- It was observed a decrease in pH levels between treatments ($p<0.05$).
- The ammonia concentrations were higher in treatment T2 than in T1 ($p <0.05$).
- Nitrite was significantly higher in T1 compared to T2 which showed a gradual decrease of concentrations of this compound along the experiment.

Results

Table 1. Mean values ± standard deviation of the water quality parameters during culture (21 days) of *L. vannamei* analyzing the effect of hydrogen peroxide.

	T1-Control	**T2-H_2O_2**
TA-N (mg L^{-1})	0.18 ± 0.38^{a}	0.63 ± 1.03^{b}
NO_2-N (mg L^{-1})	14.29 ± 5.13^{a}	2.76 ± 1.79^{b}
NO_3-N (mg L^{-1})	ND	ND
Alkalinity (mg L^{-1})	142.08 ± 10.9^{a}	163.75 ± 11.2^{b}
MFV (ml L^{-1})	60.82 ± 37.53^{a}	37.14 ± 20.1^{b}
pH	7.97 ± 0.10^{a}	7.12 ± 0.17^{b}
DO (mg L^{-1})	6.18 ± 0.49^{a}	6.48 ± 2.67^{b}
Salinity	33.5 ± 0.5	33.3 ± 0.50
Temperature (^{o}C)	28.40 ± 2.39	29.21 ± 2.28

The data correspond to the mean of 3 replicates ± standard deviation. Different superscripts in the same row indicate that the means, significantly, differ ($P<0.05$).

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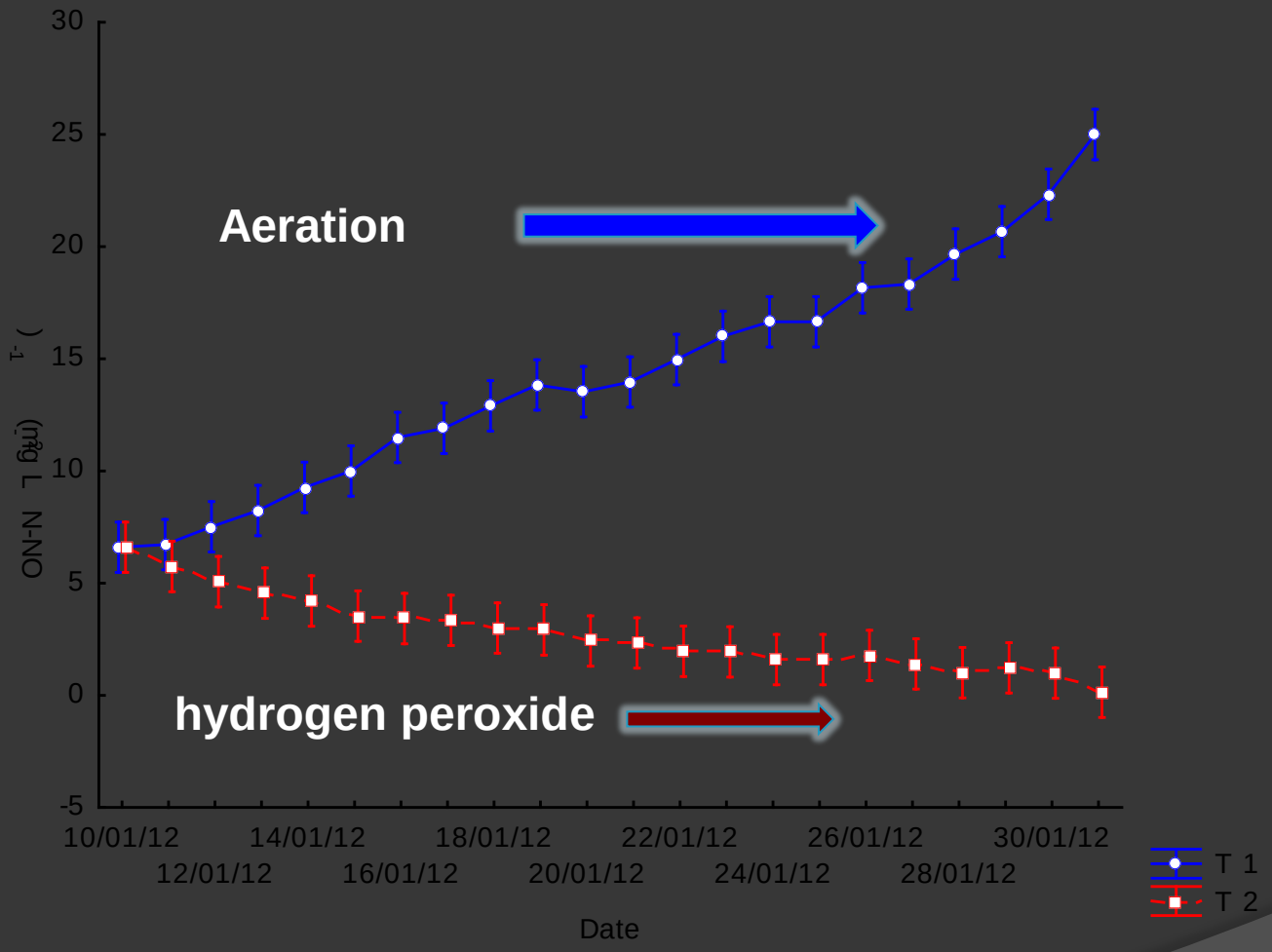

Figure 1. Mean values ± standard deviation of the levels nitrite ($N\text{-}NO_2^-$) during culture (21 days) of *L. vannamei* analyzing the effect of hydrogen peroxide.

Results

Table 2. Mean values ± standard deviation of the performance parameters during culture (21 days) of *L. vannamei* analyzing the effect of hydrogen peroxide.

	T1-Control	T2-H_2O_2
Initial weight (g)	1.33±0.39	1.33±0.39
Final weight (g)	3.03±0.51	2.97±0.33
WGR (g)	0.55±0.12	0.51±0.16
Survival (%)	91.13±4.07	93.61±6.67

Conclusions

- The results from this study suggest that the use of hydrogen peroxide as alternative systems for emergency supply of dissolved oxygen, it is possible for the rearing of *Litopenaeus vannamei* in BFT system.

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