

# EFFECT OF PHOTOPERIOD ON JUVENILE REDCLAW (*CHERAX QUADRICARINATUS*) PERFORMANCE IN A CLOSED AQUACULTURE SYSTEM

T. Abeel, F. Vervloesem, J. Claeys, H. Arnouts and S. Aerts

Odisee University of Applied Sciences, Agro- and Biotechnology | Aqua-ERF

Hospitaalstraat 23, 9100 Sint-Niklaas, Belgium.

Contact: [thomas.abeel@odisee.be](mailto:thomas.abeel@odisee.be)

## Introduction

- There's an interest in intensive farming of redclaw crayfish in Belgium;
- Redclaws are fast-growing and they tolerate relatively high stocking densities, making them an interesting candidate for aquaculture;
- Optimal photoperiod for rearing redclaw crayfish in a closed system is unknown;
- In this study, the effects of photoperiod on growth performance and survival of juvenile redclaw were determined.

## Materials & methods

- 300 redclaw crayfish (initial body weight  $0.96 \pm 0.66$  g);
- Twelve polyester tanks (90 liter /  $0.5\text{m}^2$ ) connected to a RAS;
- Stocking density:  $50 \text{ crayfish} \cdot \text{m}^{-2}$ ;
- Water temperature :  $26.40 \pm 0.55$  °C;
- Dissolved oxygen:  $94.47 \pm 4.74$  % saturation;
- pH:  $8.73 \pm 0.23$ ;
- Feed: extruded trout pellet 2 mm (44 % protein, 22 % fat);
- Shelter: eight filter brushes (30 x 15 cm) per tank;
- Four groups where exposed to different photoperiods (in triplicate):

	1	2	3	4
hours light:dark	24:0	16:8	12:12	0:24

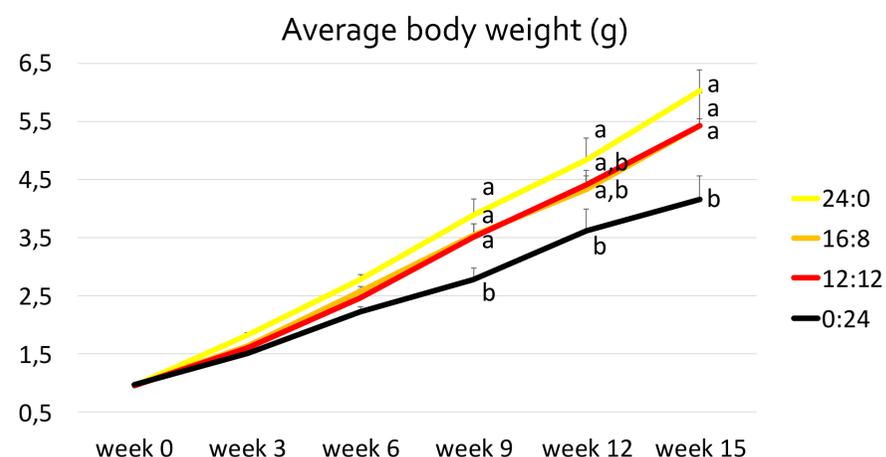
**Table 1.** Photoperiods used in the experiment.

## Results

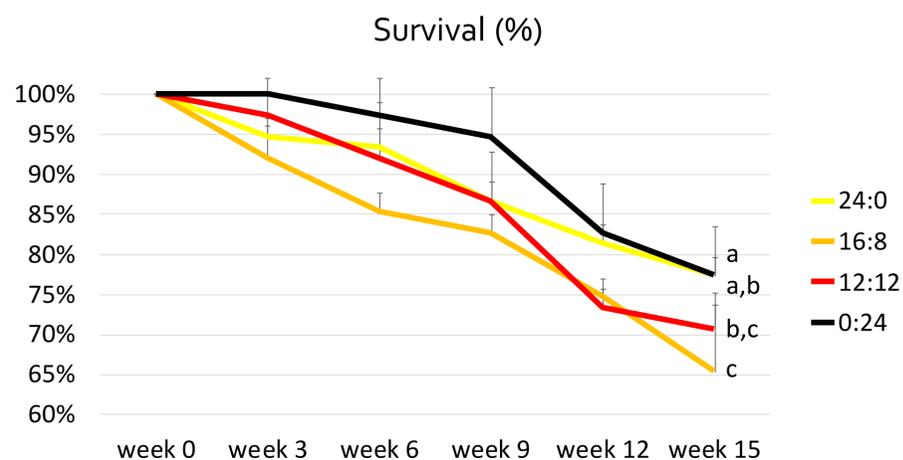
- Final body weight was significantly lower for crayfish reared in constant darkness (0:24) compared to crayfish reared in 12:12 ( $p=0.024$ ), 16:8 ( $p=0.014$ ) and 24:0 ( $p<0.000$ ) (see fig. 1);
- Photoperiod affected mortality ( $p=0.0035$ ). Highest survival rates were achieved in 24:0 and 0:24 (see fig. 2).

## Discussion

- Highest average body weight was observed in crayfish reared in constant light (24:0). However, growth did not statistically differ from the 16:8 and 12:12 treatments;
- The absence of a natural day-night cycle (24:0 and 0:24) led to higher survival rates. This effect might be caused by altered activity and moulting patterns, possibly reducing interactions and cannibalism.



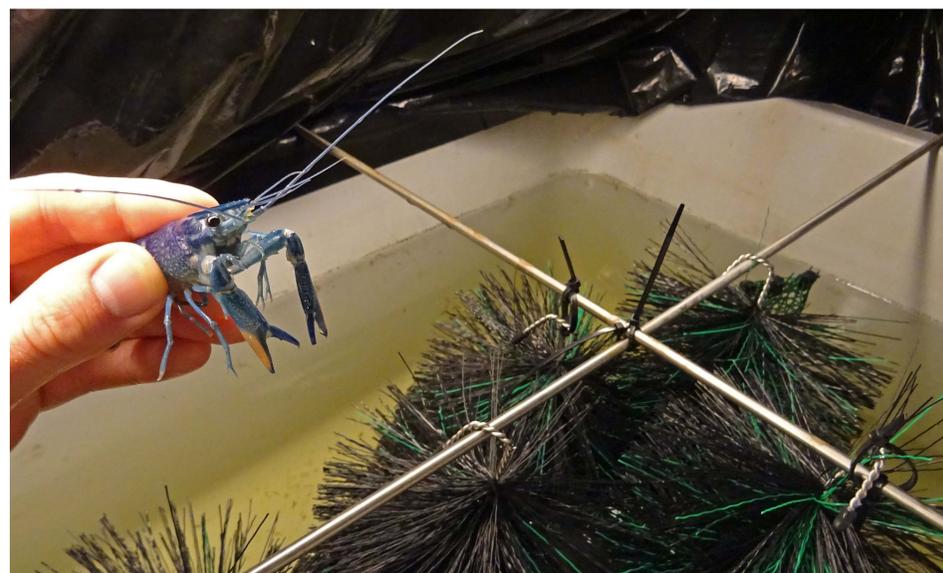
**Fig 1.** Effect of photoperiod on average body weight (mean  $\pm$  stdev). Different superscript letters indicate statistical significance.



**Fig 2.** Effect of photoperiod on survival rate (mean  $\pm$  stdev). Different superscript letters indicate statistical significance.

## Conclusion

- Photoperiod affects both growth and survival of redclaw juveniles;
- The absence of light stunts growth in redclaw juveniles;
- Based on growth and survival rates, highest productivity is achieved by rearing redclaw juveniles in constant light.



**Fig 3.** Redclaw crayfish *Cherax quadricarinatus* in front of an experimental tank.

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