Success of coordinated treatments for *Caligus rogercresseyi*: importance of the monitoring and treatment timing in relation to the progression of developmental stages of the parasite.

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1 INTRODUCTION

Coordinated treatments for sea lice consist in simultaneously treating all farms within a management area during a restricted time period in order to interrupt the sea lice life cycle. This should minimize exchange of larvae among farms after treatments, and maintain low parasite abundance over time (Ritchie & Boxaspen, 2011).

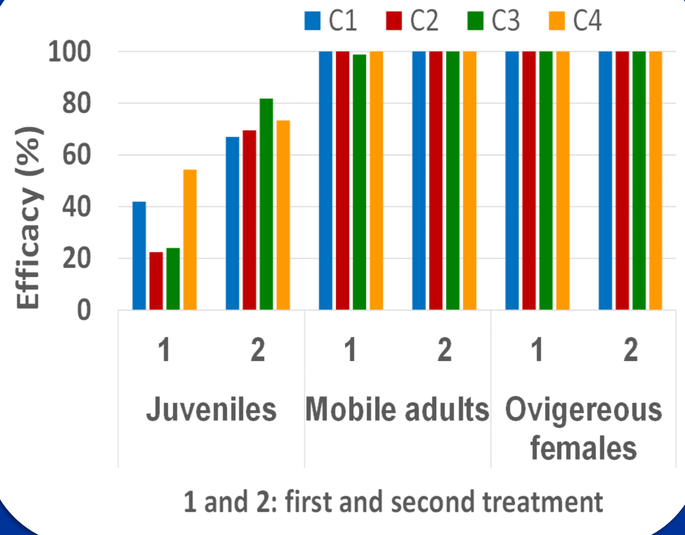
Coordination in Chile consists in applying two treatments to adult stages, the second at al later date when juveniles have reached the ovigerous stage. This study focused on determining the best time to apply a second treatment by evaluating the progression of developmental stages of *C. rogercresseyi* during the time interval between the two treatments. *C. rogercresseyi* during the time interval between the two treatments.

2 MATERIAL AND METHODS

- Fish were treated on the farm with azamethiphos (100 ppb) for 30 min on October 15 and November 15.
- Ten fish from 4 fixed salmon cages were monitored weekly to count the number of juveniles (all chalimus stages, JU), mobile adults (males+non-ovigerous females, MA), ovigerous females (OF). Efficacies were estimated for each developmental stage (% of abundance reduction respect to pre-treatment).
- The first sampling was performed 1 day previous to first treatment (prft) and the last one 72 h post second treatment (pst).
- Five fish were euthanized 24 h post first treatment (pft) to determine condition of the parasite attached to the fish.

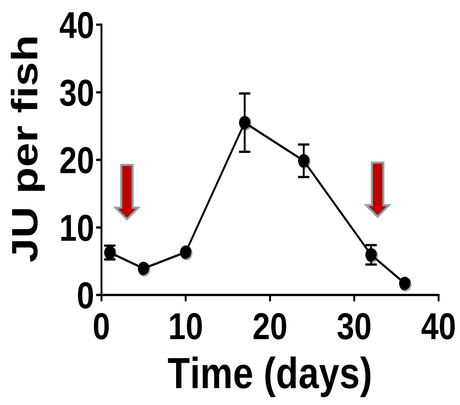
3 RESULTS

Only JU were observed 24 pft in the 5 fish analyzed. Abundance varied between 5 and 11, and dead individuals were more frequent (58.5%) than moribund (26.5%) and alive (15.0%).

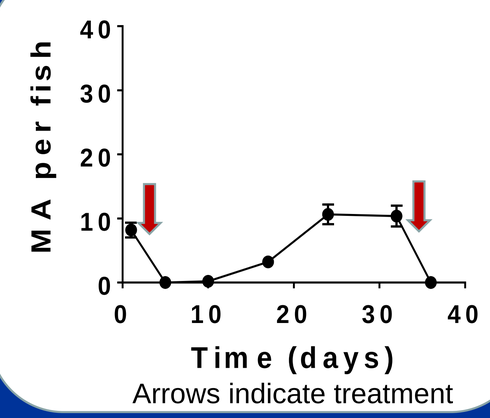


First treatment efficacy: 22.4-54.3% for JU, 98.8-100% for MA, and 100% for OF.

Second treatment efficacy: 66.9-81.8% for JU and 100% for both MA and OF.

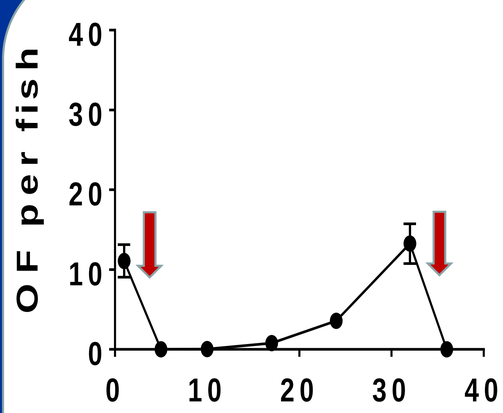


Juvenile abundance showed a slight reduction after treatment. By day 8 pft abundance had increased to similar values as pre-treatment, and continued to increase up to day 15 pft. Then abundance reduced to 6, and pst it was further reduced to 2.



Arrows indicate treatment

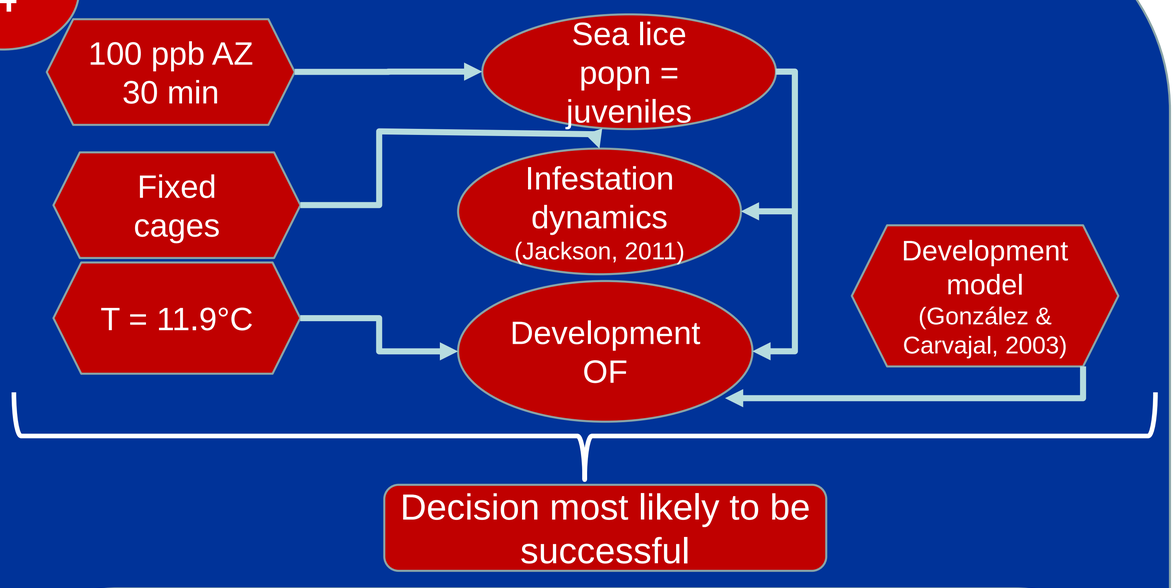
Mobile adults increased from day 10 pft up to day 21. The largest mean abundance was 10 individuals per fish, similar to that observed prft (8). Abundance decreased to zero after the second treatment.



Arrows indicate treatment

Ovigerous females increased rapidly from day 22 pft. A small fraction of females developed egg strings between days 15 and 22, but most of them appeared with egg strings on day 30 pft. The maximum abundance of OF was similar to that observed pre-treatment. Abundance decreased to 0 after the second treatment

4 DISCUSSION AND CONCLUSION



- There was no evidence of a sustained infestation of the fish at the site, suggesting an interruption of copepodid supply during the second half of the study period.
- Egg hatching at the end of the monitoring period may have occurred since temperature may have allowed egg maturation around 6 days from time of egg string observation. The second treatment may therefore have being applied late if the interruption of copepodid supply was to be maintained.
- To make better decisions regarding timing for applying a coordinated two-treatment regime, monitoring should be rigorous in terms of counting and stage identification, spaced at regular time interval and include fixed and random cages. Data should be analyzed as they are collected, and to support data analysis, the developmental stage model for *C. rogecresseyi* (González & Carvajal, 2003) should be used.

5 References

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