

The effect of the antiparasitic drug teflubenzuron on the non-target species European lobster

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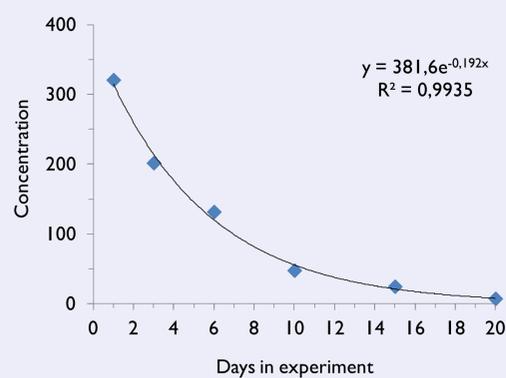
Introduction

- Flubenzurons were in use in Norway during late 1990`s until 2001, for delousing salmon infested with sea lice.
- From 2002, emamectin, cypermethrin and deltamethrin were the compounds of choice, but due increased instances with reduced sensitivity, flubenzurons were reintroduced in 2008. A total consumption of teflubenzuron was 3441, 2919 and 730 kg active compounds for 2009, 2010 and 2011, respectively.
- Teflubenzuron is relatively non-toxic to most marine species, but is potentially high toxic to any species that undergo moulting within their life cycle including commercially important species like lobster, crab, and shrimp.

Aim

Examine the effect of teflubenzuron on juvenile lobster

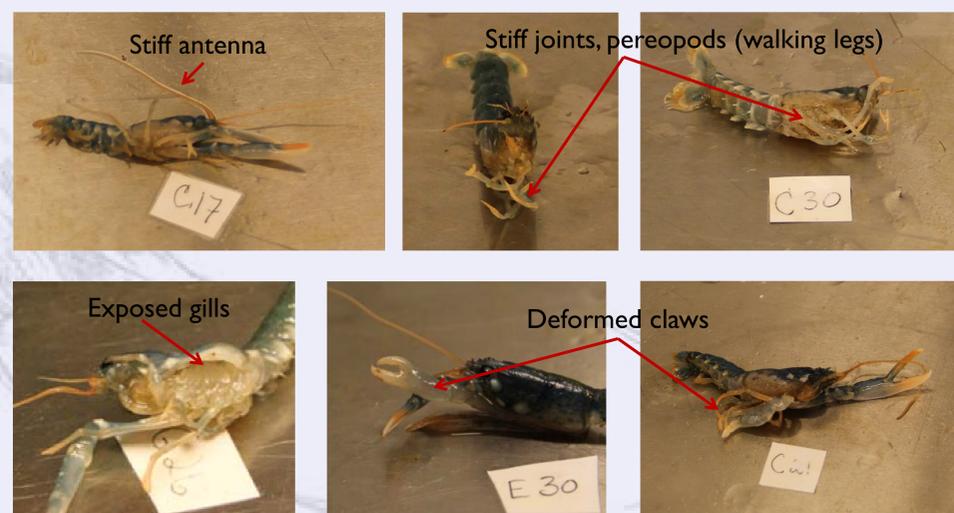
Results – EXP 2 Elimination



- Calculated half-life is 3.6 days
- Calculated Cmax: approximately 400 ng/g

Senescent damages

- Deformed claws, carapace deformed leaving gills exposed, stiff antennas, stiff joints, part of tail fan vanished
- Occurred from 16 to 33% in exposed groups only (none in control)



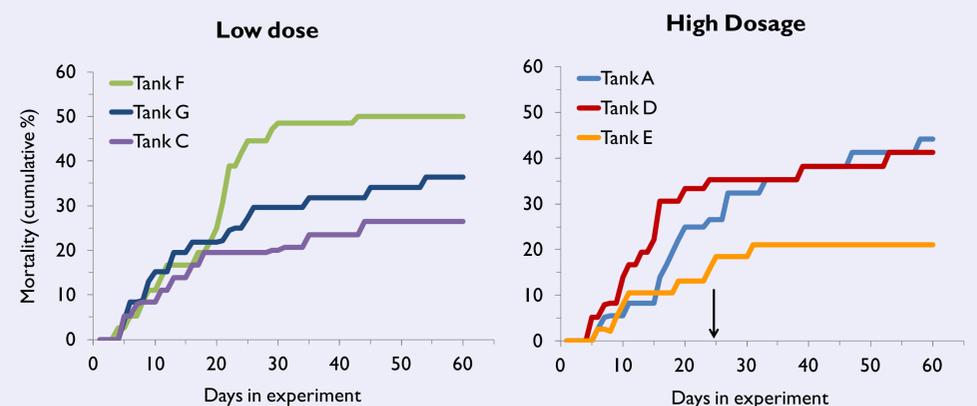
Future work needed

- Effects of a long-term exposure to low concentration of the drug
- Test other pesticides as e.g. slice
- Effects on other shellfish as shrimp, Norway lobster and edible crab

Material & Methods

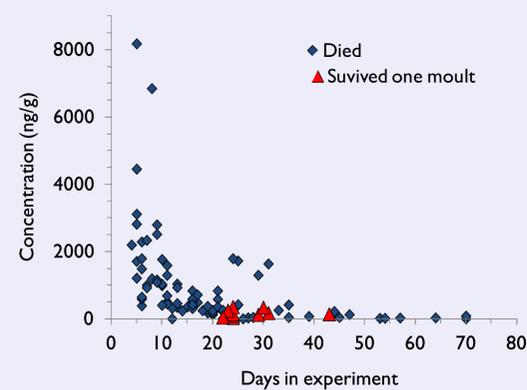
- Two experiments were made to examine the effects of teflubenzuron.
- EXP 1; estimate mortality in juvenile lobster exposed to two doses of concentration. Low dose=concentration of teflubenzuron in salmon feed. High dose=concentration in faeces. We simulated a “normal” delousing period at a farm i.e. 7 days of exposure. 38 juveniles were used in three tanks at each dose (+ two tanks with control).
- EXP 2; estimate the elimination rate. 40 juveniles were fed 1 pellet of high dose. Sampling was made at 1, 3, 6, 10, 15 and 20 days following administration.

Results – EXP 1 Mortality



- Total mortality was on average 37.6 % and 36.8 % in low and high dose, respectively (medication was given at day 1 to 7)
- First successful moulting after 23, 30 and 31 days in low dose tanks, and after 24 days in high dose (indicated by arrow on the graphs)

Results – EXP 1 Concentration of teflubenzuron



- Concentration after 7 days of medication was reduced considerably after 20 days
- Average concentration in the first 12 successfully moulted juveniles was 152 ng/g (range: 26-351 ng/g)

Conclusions

- Substantial mortality in all treated groups (average 33 %)
- No significant differences in mortality between the two dosages
- Concentrations in lobster higher than those found in muscle of Atlantic salmon (2000 ng/g)
- Half life in muscle in Atlantic salmon is 4.8 days at 10°C, comparable to 3.6 days found in lobster in this study
- Mean value of first survivors was 152 ng/g