

Antidepressants stimulate population growth in the harpacticoid copepod *Nitocra spinipes*

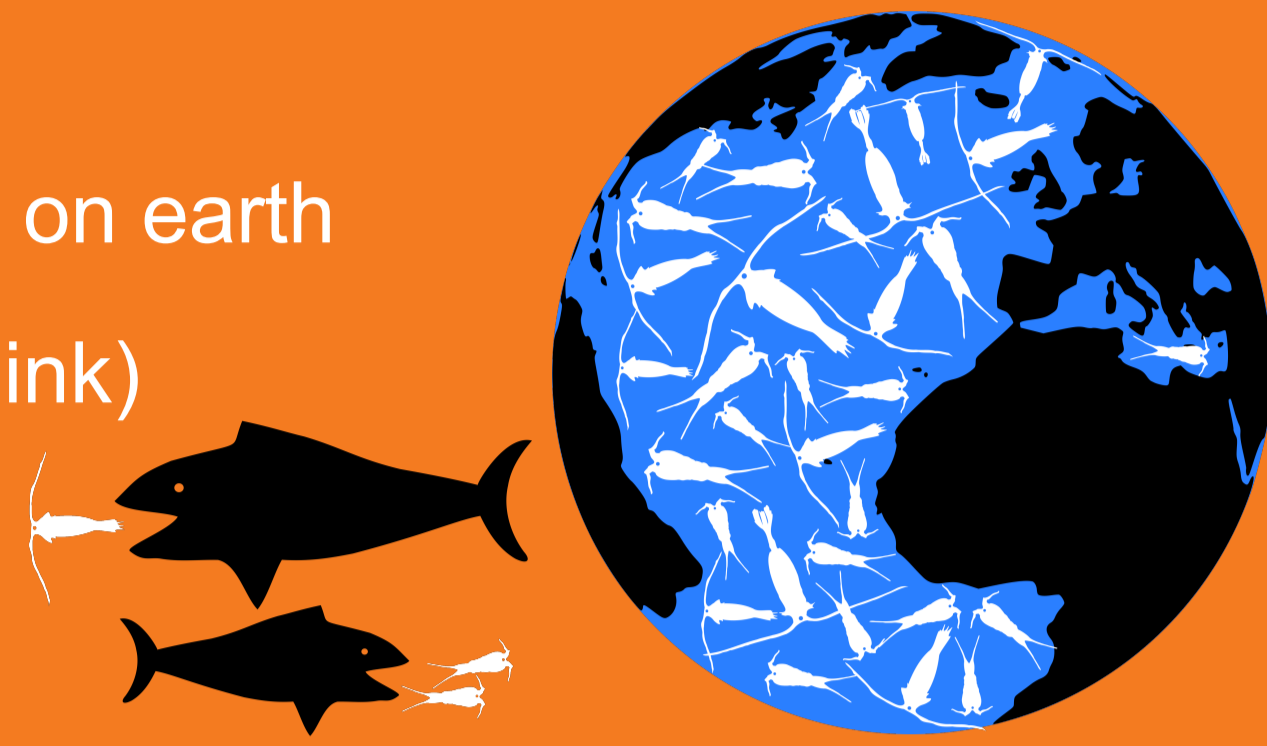
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Introduction

Copepods

- Potentially largest animal biomass on earth
- Important as prey for fish (trophic link)
- Small size and short life cycle
- easy lab culture & ecotox. testing



Antidepressants

- Widely used against depressive disorders
- Detectable in effluents
- Potential threat to biota?



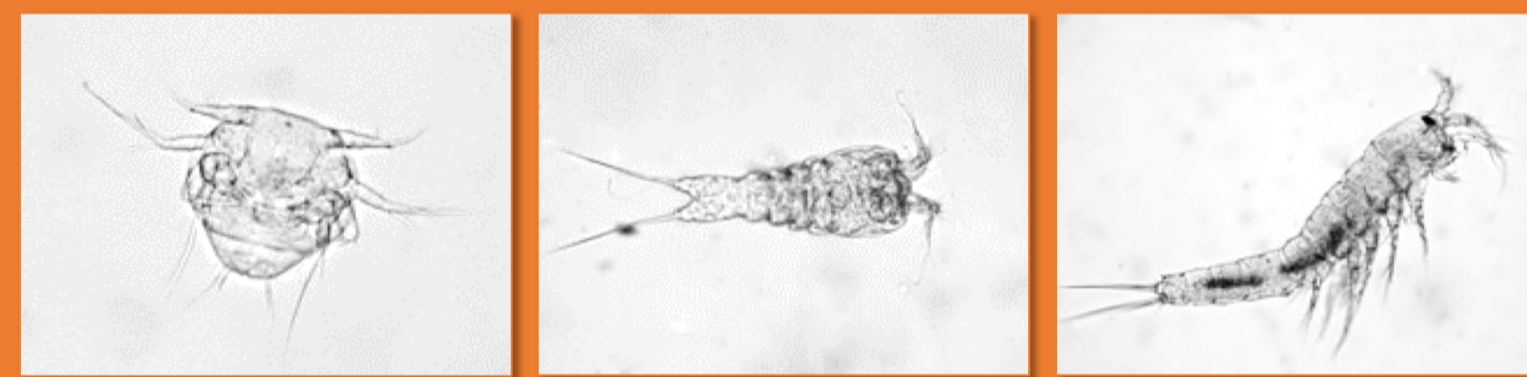
Population effects

- May disrupt ecosystem functioning
- Rarely investigated due to high cost and effort

Materials & Methods

Test species: *Nitocra spinipes*

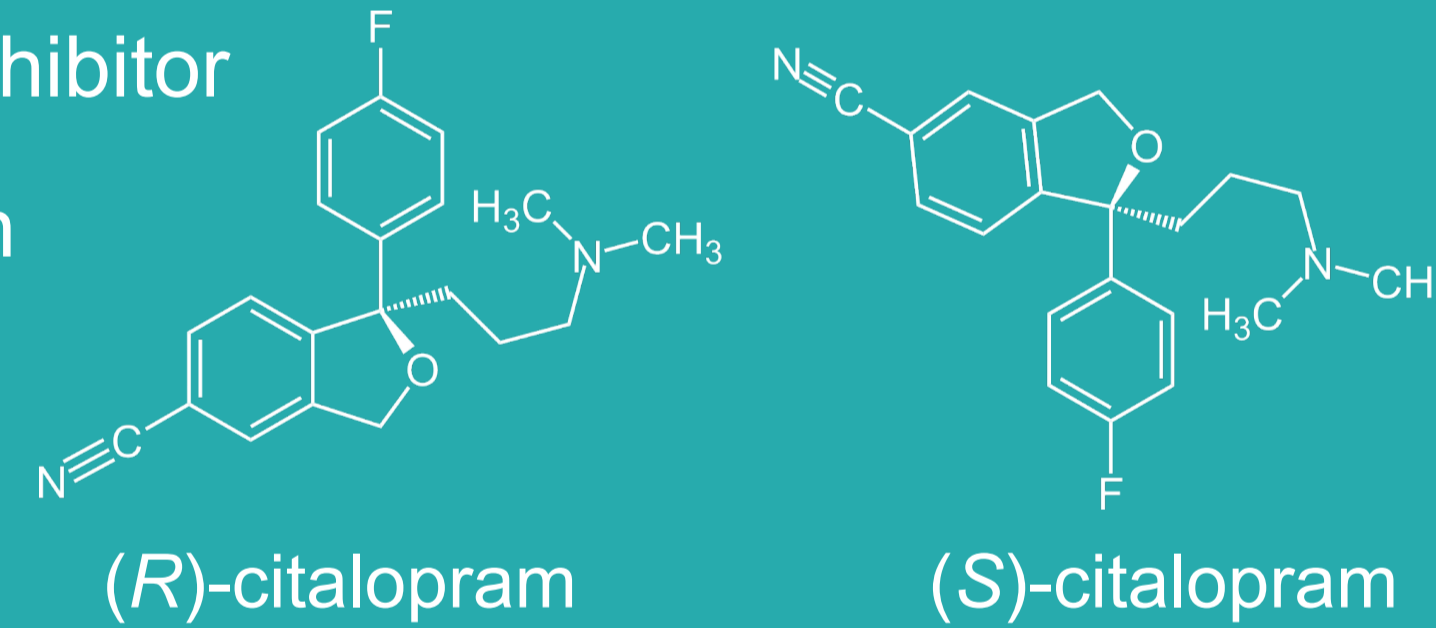
- Brackish water habitats
- Worldwide distribution
- Sexual reproduction
- Test species since 1970s^[1]



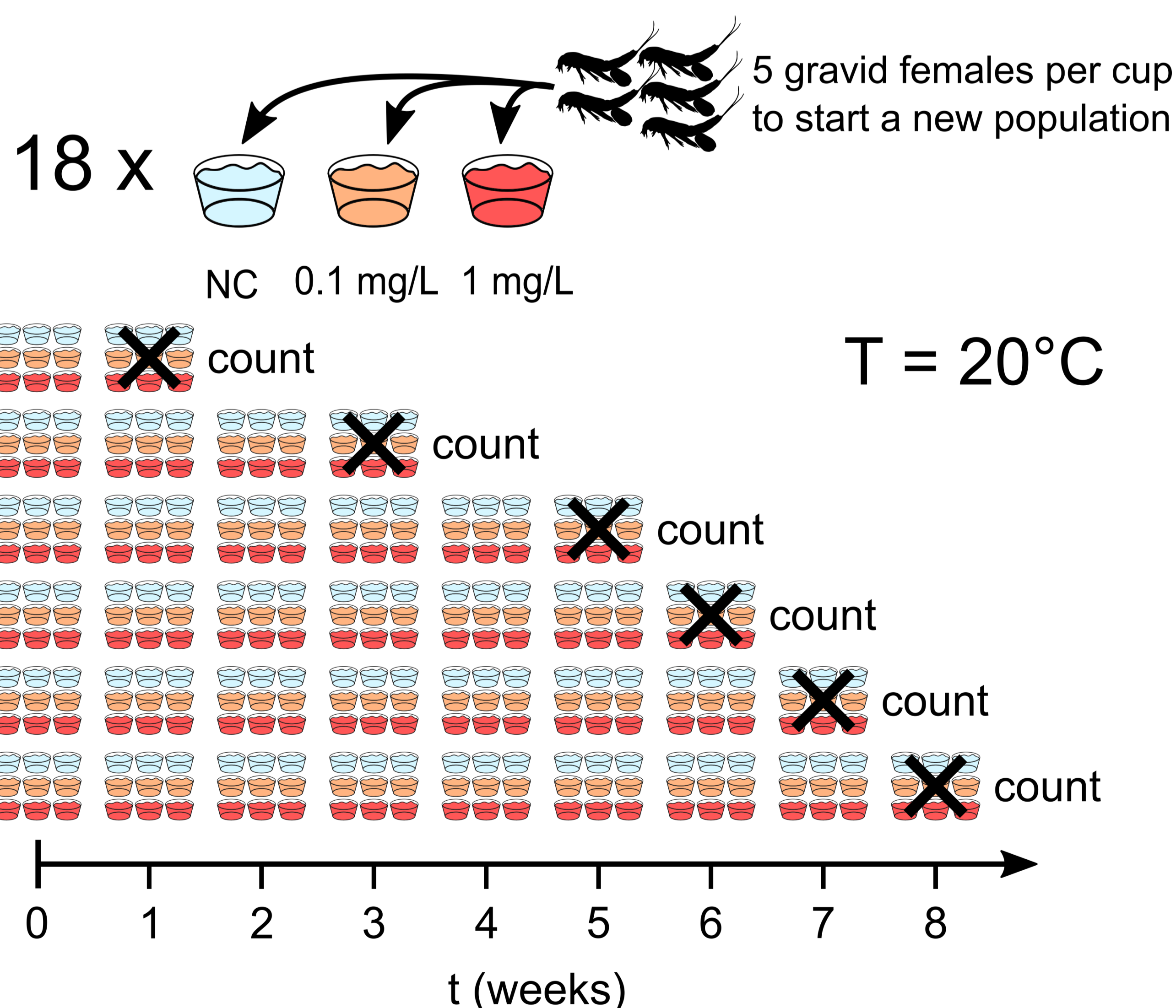
Nauplius Copepodite Adult

Test compound: Citalopram hydrobromide

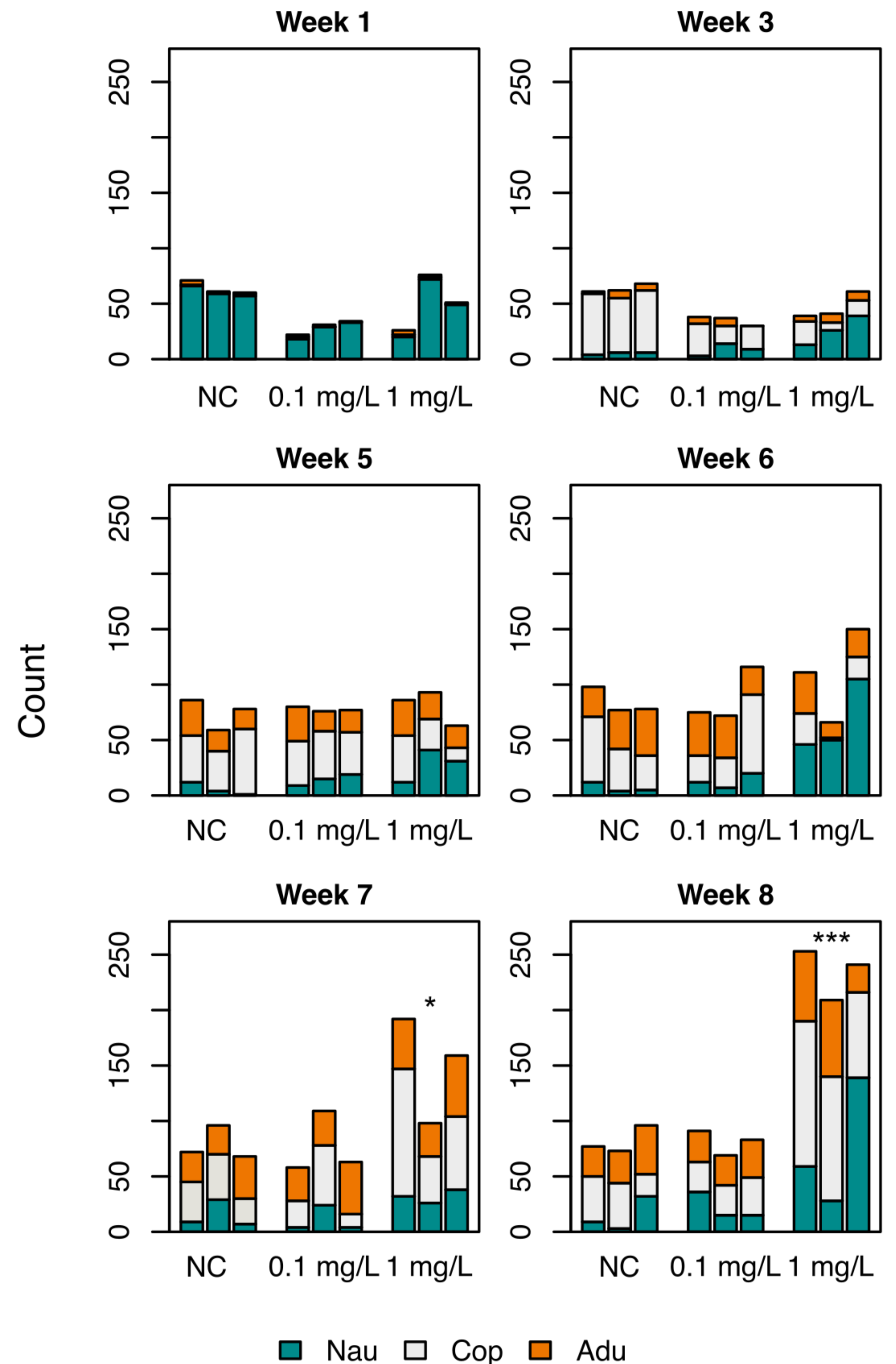
- Selective serotonin re-uptake inhibitor
- Among the antidepressants with the highest environmental concentrations (up to 10 µg/L)^[2]



Population test setup



Results



One-tailed Dunnett's test; H_0 : Treatment \leq NC; *** $p < 0.001$, * $p < 0.05$

Discussion

- Population stimulation effects were found after 7 weeks at 1 mg/L
- The results are in line with sublethal reproduction promoting effects observed in individuals in a preceding life history experiment^[3]
- Whether the stimulation effects are beneficial to the population health in the long term should be further investigated

Conclusions

- Population experiments add realism to ecotox. testing since they integrate both lethal and sublethal effects
- Effects were only observed at a factor 100 above environmentally relevant concentrations

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References

- [1] Bengtsson, B.-E., 1978. Use of a Harpacticoid Copepod in Toxicity Tests. Mar. Pollut. Bull. 9, 238-241.
- [2] Fong, P.P., Ford, A.T., 2014. The Biological Effects of Antidepressants on the Molluscs and Crustaceans: A Review. Aquat. Toxicol. 151, 4-13.
- [3] Koch, J., Janssen, C.R., De Schampelaere, K., 2017. Harpacticoid copepods in risk assessment - Combining life cycle experiments with population modeling. SETAC Brussels - Poster Presentation.