

Highland amphibians and extremely diluted thyroxine – pre-experiment storage at low temperature (4°C)

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SHORT COMMUNICATION

Introduction

In the course of more than two decades of experimental work on a model with amphibians and extremely diluted thyroxine, one experiment in particular, investigating the effect of an ultra-high dilution of thyroxine (T30x) v analogously prepared water (W30x) in amphibians from highland biotopes, was found to be reproducible. A total of 22 experimental runs were performed between 1990 and 2011, 15 by the initial researchers and 7 by altogether 5 independent researchers (Endler et al. 1991, Zausner et al. 2002, Interuniversitäres Kolleg 2010, Harrer 2013).

In most of these (the sole exception being two performed and reported by the initial team) a trend was found of T30x-animals developing more slowly than W30x-animals. Pooled T30x values obtained by the initial team were 10.1% lower than W30x values (100%) ($p < 0.01$), and pooled T30x values from the 5 independent researchers were 12.4% lower ($p < 0.01$).

Animals were transferred from their highland habitats (where temperature was 15-17°C) to the respective laboratories (19-27°C) at room (car-, train-, respectively) temperature; only in one case (Harrer 2013), they were stored at 8°C for several days prior to the experiment. Cooling here seemed to be a promising means of facilitating the transport of the highland larvae to laboratories and of synchronizing the start of experimental work. The purpose of this study was to test the hypothesis that storage of the animals at 4°C for several days prior to the experiment does not influence (i.e. inhibit) the effect of T30x on metamorphosis.

Methods

The ultra-high dilution of thyroxine (T30x) and analogously prepared water (W30x) was obtained by 30 successive steps of tenfold dilution according to instructions of homeopathy. *Rana temporaria* were taken from an alpine biotope and were stored at 4°C for 4 days. When they had reached a defined 2-legged stage, animals were distributed over the experimental basins (water temperature 20°C throughout the experiment) and were treated with T30x or W30x by adding 3µL of probe dilutions per animal to the basin water at intervals of 48h. Entry into the 4-legged stage was considered as the endpoint. 200 animals (20 animals per basin) were involved per group (10 basins per group). The experiment was performed blind. Chi square tests (Yates corrected) were used to compare T30x and W30x values at successive measuring intervals.

Results

In contrast to the majority of previous experiments, no clear trend was found of T30x values being different from W30x values, i.e. of animals developing more slowly under the influence of T30x. The relative speed of development of the two groups varied, as can be seen from the intertwining curves in figure 1. S.D. was 0.4 – 1.8 in the T30x and 0.5 – 3.0 in the W30x group. Any differences were not statistically significant ($p > 0.05$).

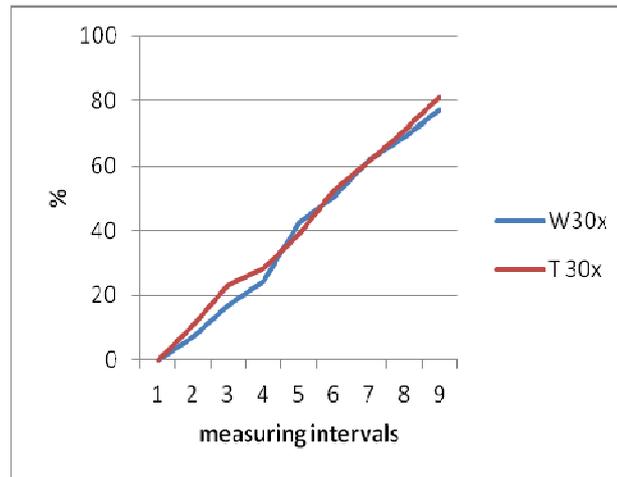


Fig. 1: Highland Rana temporaria stored at low temperature prior to the experiment, and extremely diluted thyroxine. For explanation see text.

Conclusion

This experiment failed to reproduce the previously observed inhibiting effect of ultra-high diluted thyroxine on highland amphibians. The hypothesis that storage of the animals at 4°C prior to the experiment does not influence the effect of T30x could not be proven; in contrast, it may be that this intermediate cooling down of the larvae is responsible for the failure of the replication.

References

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