

IS THE FUNGICIDE TEBUCONAZOLE TOXIC FOR THE REPRODUCTION OF AQUATIC INVERTEBRATES?

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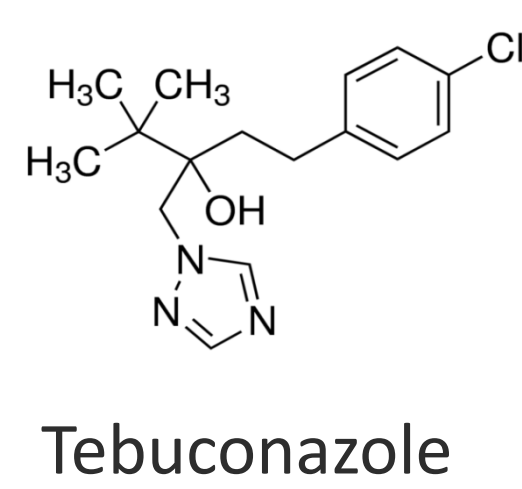
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Introduction

The triazole fungicide tebuconazole (TBZ) inhibits ergosterol biosynthesis. The substance is suspected to interfere with steroidogenesis and has been shown to be anti-estrogenically active.

As a potential endocrine disruptor, TBZ is likely to interfere with the reproduction of aquatic organisms, including invertebrates.



Materials & Methods

Potamopyrgus antipodarum Reproduction Test (Recently adopted OECD test guideline)

- 28 days, 16±1°C, 16:8 h light-dark cycle
- Six snails per replicate
- Six replicates per treatment

Daphnia magna Reproduction Test (OECD 211)

- 21 days, 20±1°C, 16:8 h light-dark cycle
- One daphnid per replicate
- Ten replicates per treatment



P. antipodarum



Male *D. magna*

Conclusion

The exposure to TBZ decreases the production of offspring in *P. antipodarum* and *D. magna*, but it does not induce the formation of male daphnids.

The comparable effect concentrations for both species support a non-endocrine mediated mechanism.

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Results

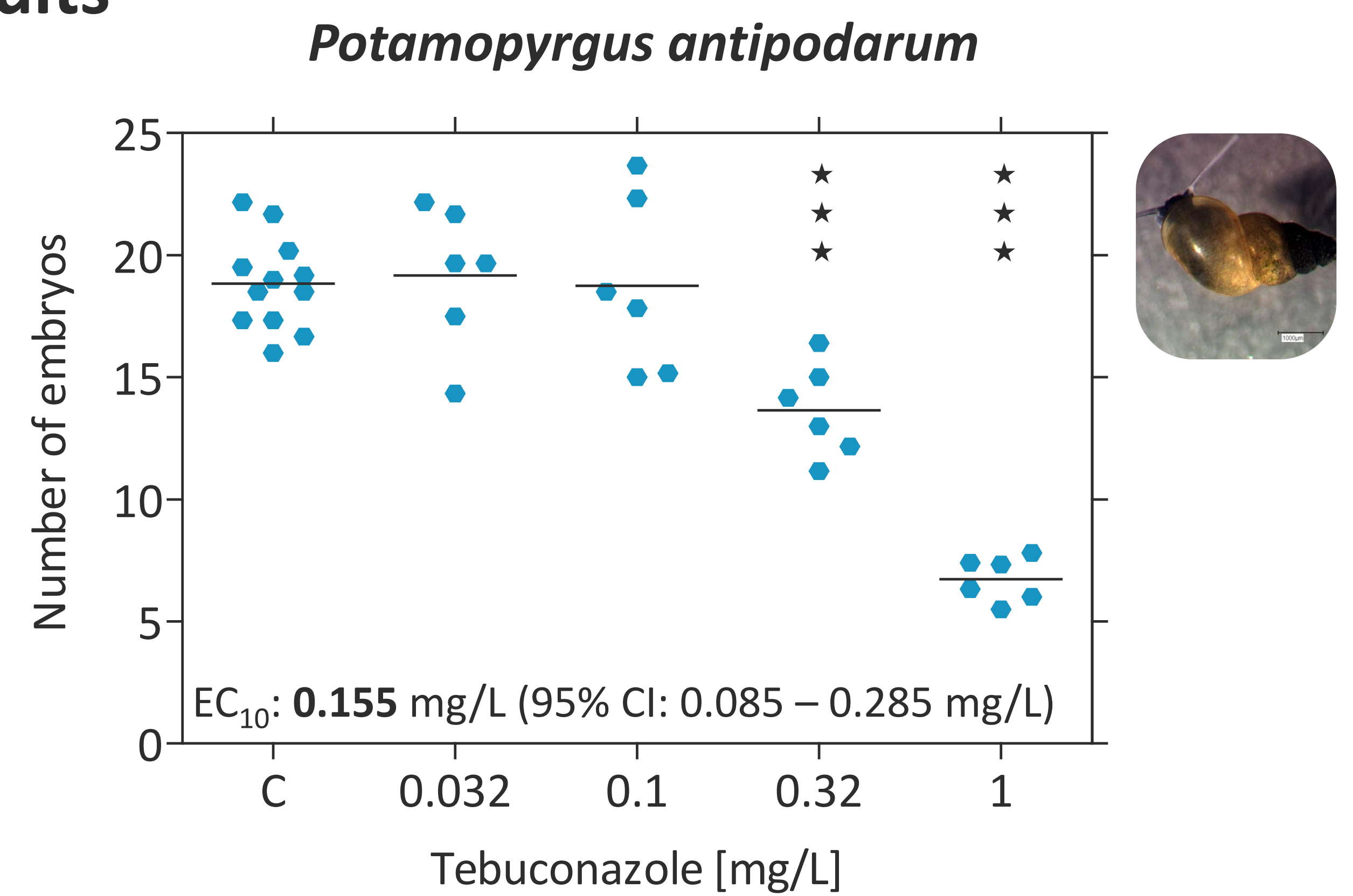


Fig. 1: *Potamopyrgus antipodarum*. Effect of tebuconazole on the production of embryos per snail. Each line indicates the mean value and each dot one replicate. Williams Multiple Sequential *t*-test. ★★p < 0.001.

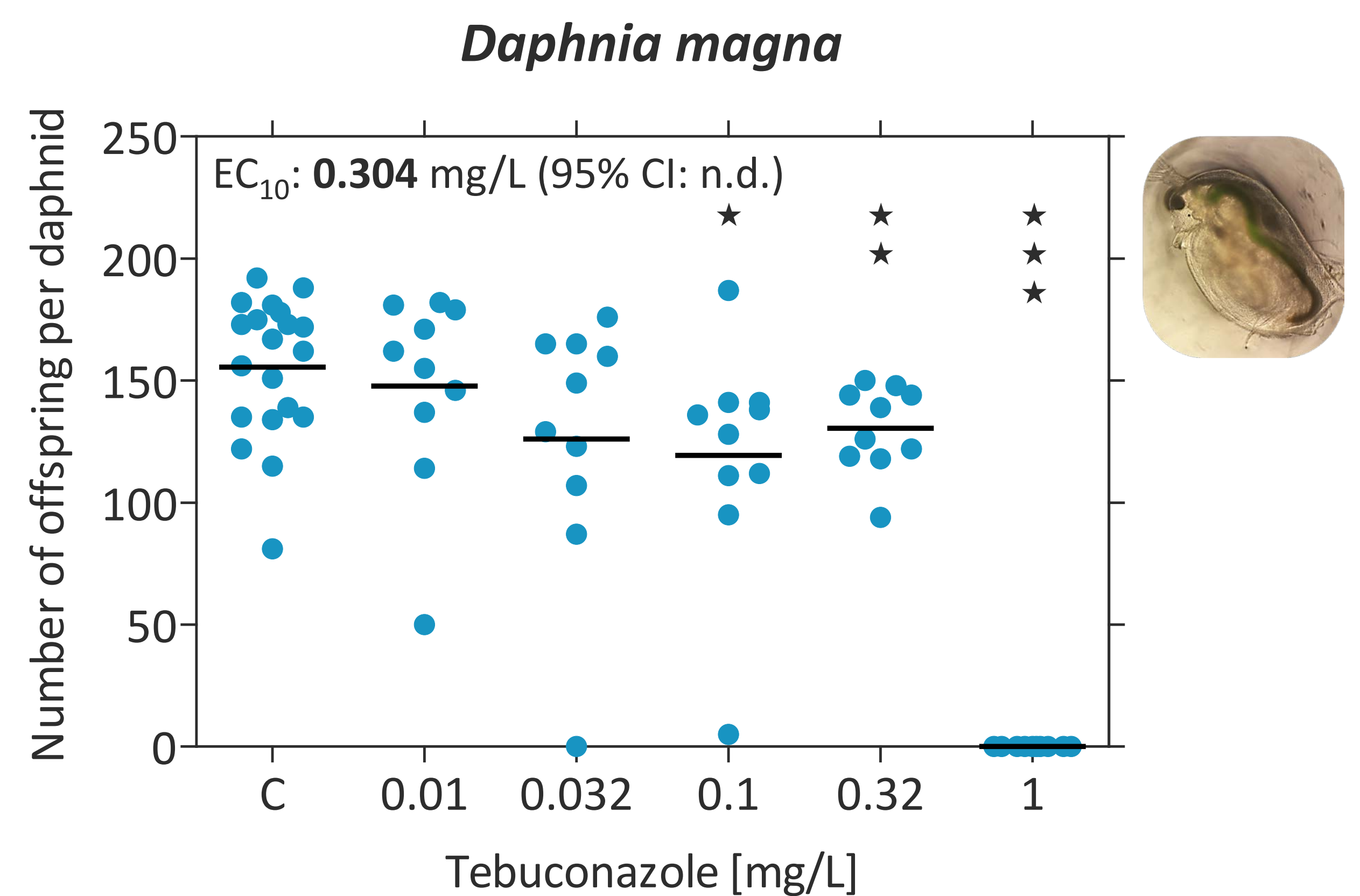


Fig. 2: *Daphnia magna*. Effect of tebuconazole on the production of offspring per surviving daphnid. Each line indicates the mean value and each dot one replicate. Step-down Jonckheere-Terpstra test. ★p < 0.05; ★★p < 0.01; ★★★p < 0.001.

Daphnia magna – formation of males

Tab. 1: *Daphnia magna*. Effect of tebuconazole (in mg/L) on the incidence of male offspring (in %, mean ± SEM) in the 1st, 3rd, and 5th brood. No significant differences between the control and treatments (One-Way ANOVA with Dunnett’s post hoc test).

	C	0.01	0.032	0.1	0.32
Males in %	0.357 ± 0.165	1.36 ± 0.645	0 ± 0	0.482 ± 0.326	1.39 ± 0.758

The exposure to TBZ did not induce the formation of male daphnids.