

Effects of nematicidal phytochemicals on potato germination

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INTRODUCTION

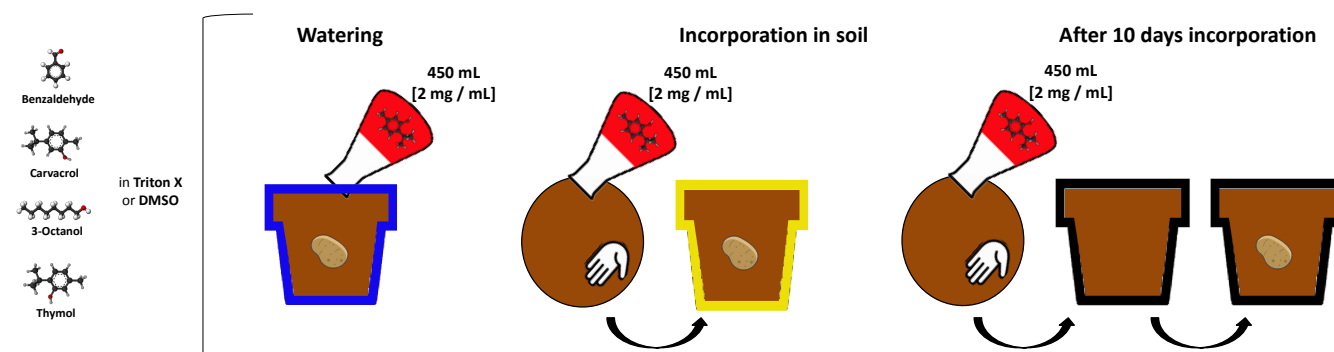
Plant parasitic nematodes are responsible for significant productivity losses in the potato crop. Among them, the root lesion nematodes (RLN), ranks 3rd in terms of induced damage. Integrated in a wider study that aims to replace the common application of synthetic compounds for the control of potato nematodes by environment safe plant secondary metabolites, this study intended to evaluate potato seed germination under the effect of compounds previously evaluated as nematotoxic. Preliminary *in vitro* experiments assessed the nematicidal activity of 35 standards of naturally occurring phytochemicals at 2 mg/mL for 24 h. Only 4 tested compounds achieved >99% mortality: benzaldehyde, carvacrol, octanol and thymol.

METHODOLOGY

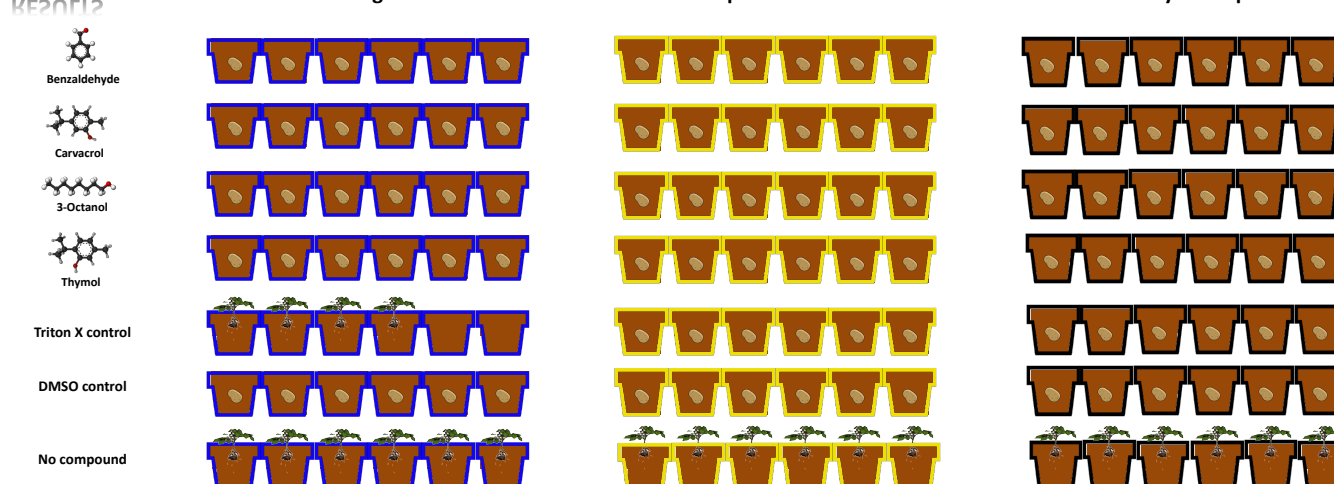
For each of the mentioned compounds, 450 mL of a 2 mg/mL solution in TRITON-X 5 mg/mL were poured in 2.6 kg of pine forest sand and composted pine bark. Six 'Agria' variety potato seeds were placed in each pot and placed in an Aralab[®] D1200PLH chamber. The previous steps were redone, but each compound solution instead of being pored were hand mixed into the substrate, containing a potato seed. The methodology was then repeated, but the seed was added to the substrate 10 days after the compound. The same methodology was employed replacing TRITON-X by 10 % DMSO. Control treatments (without any compound, with 10% DMSO and with TRITON-X 5 mg/mL) were performed with six potato seeds.

Growth chamber conditions

day: 14 hours night: 10 hours	day: 50% night: 70%	day: 23 °C night: 13 °C	basal fertilization	3 times per week watering	7 cm seed depth (Agria variety)
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RESULTS



- In the 10% DMSO control, 4 out of 6 seeds germinated (shorter and pale green when compared with the control with no compounds).
- All tested compounds and TRITON-X inhibit potato development.
- Broadly, same results when compounds were incorporated in the soil and "10 days application".

Benzaldehyde, Carvacrol, Thymol were purchased from Sigma-Aldrich. 3-Octanol from Supelco. Acetone (purity 99.8%), DMSO (purity ≥99.8%) and Triton X 100 from Carl Roth GmbH+Co. KG