

Nematicidal activity of oxygen-containing compounds against the root lesion nematode

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Abstract

The root lesion nematode, *Pratylenchus penetrans*, is a serious threat to agricultural crops worldwide, being extremely difficult to control with common pest management practices. New EU commission policies on the development of plant protection products restrict the application of synthetic nematicides. Aiming at the development of a sustainable and environment friendly approach for nematode control, 20 oxygen-containing compounds were evaluated, at 2 mg / mL, for their: (1) nematicidal activity by direct contact assays for 24 h, (2) minimum time period required to reach > 99% mortality, and (3) nematicidal activity by indirect contact (fumigant) for 24 h. All bioassays were performed using acetone as negative control and Oxamyl (a systemic nematicide) as positive control. Overall, *P. penetrans* was remarkably resistant to the tested compounds, except for benzaldehyde, carvacrol, 3-octanol and thymol, which were able to achieve > 99% mortality, surpassing the activity of the positive control Oxamyl. For these compounds, after ca. 60 min a 50% mortality was recorded, while at 18 h mortality was already > 99%. Using the indirect contact method, mortality was < 65% for the tested compounds (benzaldehyde > 3-octanol > thymol > carvacrol). Ongoing research is testing the effectiveness of these compounds against *P. penetrans* parasitizing potato, one of its main hosts. Simultaneously, the mode of action is being studied using a transcriptomic approach.

Funded by National Funds through FCT to PB by SFRH/BD/134201/2017, to JMSF by 2022.00359.CEECIND (NemACT) and projects PratyOmics (PTDC/ASP-PLA/0197/2020) + UIDB/05183/2020 to MED, UIDP/50017/2020+UIDB/50017/2020 + LA/P/0094/2020 to CESAM.