

**EFFECTS OF WHEAT ALLELOCHEMICALS ON COLLEMBOLA
AS STANDARD NON TARGET SOIL TEST ORGANISM****Idinger J.***Austrian Agency for Health and Food Safety (AGES), Institute for Plant Health,
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The lethal and sublethal effects of the allelochemical DIMBOA (2,4-Dihydroxy-7-methoxy-2H-1,4-benzoxazin-3-one) and of three of its degradation products as well as of four metabolites of DIBOA (2,4-Dihydroxy-2H-1,4-benzoxazin-3-one) were tested on juvenile and adult *Folsomia candida* (Collembola: Isotomidae) in laboratory trials. Treatments included the two reference pesticides Betanal plus (a.i. phenmedipham) as toxic standard and Perfektion S (a.i. dimethoate). The tests were carried out in standard soil substrate according to the international standard ISO 11267 (1999). A range finder test (duration: 14 days) was conducted to choose appropriate sublethal concentrations for the final test (duration: 28 days). The results revealed that *F. candida* was susceptible towards DIMBOA, MBOA (6-Methoxy-benzoxazolin-2(3H)-one) and BOA (Benzoxazolin-3(3H)-one) (test rates: 0.05 – 50 mg/kg dry soil mass) at about the maximum estimated field rate of 2 mg/kg dry soil mass, both with regard to lethal and sublethal effects. In contrast the majority of the other tested metabolites caused higher mortality rates than DIMBOA, MBOA and BOA already at test rates < 2 mg/kg dry soil mass. The DIMBOA metabolites MBOA, AMPO (2-Amino-8-methoxyphenoxazin-3-one) and AAMPO (2-Acetamido-8-methoxyphenoxazin-3-one) were more toxic than DIMBOA at test rates < 50 mg/kg dry soil mass, whereas BOA metabolites (APO (2-Aminophenoxazin-2-one), AAPO (2-Acetamidophenoxazin-2-one) and HPAA (2-Acetamidophenol) resulted in lower sublethal effects than BOA at test rates < 2 mg/kg dry soil mass.

The reference substances Betanal plus (test range: 5 – 150 mg/kg dry soil mass) and Perfekthion S (test range: 0.01 – 5 mg/kg dry soil mass) had significant lethal and sublethal effects on *F. candida* at test rates of 10 mg/kg dry soil mass (Betanal plus) and of 0.05 mg/kg dry soil mass (Perfekthion S) respectively. In general, the test results showed that *F. candida* is more susceptible with regard to reproduction than with regard to mortality.

This study was carried out with a standardized test method and permitted to produce effects of allelochemicals within a standardized soil laboratory test system on *F. candida*. However, questions like the effects of the accumulation of substances or of mixtures of substances in the soil under field conditions or the influence of other soil organisms e.g. microorganisms could not be addressed. The obtained results will be considered in a preliminary risk assessment, but it is evident that testing under more realistic field conditions would be necessary to make a more comprehensive statement on the effects of allelochemicals on Collembola.

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REFERENCE

ISO 11267 INTERNATIONAL STANDARD: Soil quality — Inhibition of reproduction of Collembola (*Folsomia candida*) by soil pollutants. International Organization for Standardization, Case postale 56, CH-1211 Genève 20, Switzerland. 16 p., 1999.