ALLELOCHEMICAL SIDE EFFECT TESTING ON NON TARGET SOIL ARTHROPODS- REQUIREMENTS, INFLUENCING FACTORS AND APPLICABILITY

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Several allelochemical substances which were found to be produced by selected wheat varieties were tested for their effects on the soil non target organisms *Poecilus cupreus* (Coleoptera: Carabidae) and *Folsomia candida* (Collembola: Isotomidae) within the ecotoxicological studies of the EU-Project FATEALLCHEM QLK5-CT-2001-01967.

As well as for side effect testing with other compounds such as pesticides, various requirements should be fulfilled to ensure the suitability of the applied testing procedures.

First of all the choice of the test organism species should consider the agroecological importance, the extent of abundance and the simplicity of mass rearing, as well as the probability of exposure to the test compound. As for these criteria both selected test organisms fulfilled the demands and they are additionally found amongst the recommended standard test soil macro-organisms according to the Annexes to EU Council Directive 91/414/EEC(EC, 1991), for the authorisation of plant protection products.

Besides the applied methods should be standardised and validated (e.g. GLP standard), both to allow the detection of potential adverse effects of the test compounds on the test organisms and to avoid false positives. Furthermore the use of standardised and comparable methods for different test organisms could facilitate the production of test results which could be either applicable for the extrapolation of effects between species or between different test levels, or which could be used as data for other purposes e.g. for risk assessment calculations or for QSAR modelling.

Testing of compound effects on non target organisms in soil can be influenced by several factors, such as the composition of the test substrate in general, the characteristics of the test compound, the type of application of the test compound, the test duration, the test level and the developmental stage of the test organism, as well as its inherent properties.

In the present study the standard testing procedures for both test organisms produced valid test results with regard to the toxic reference compounds and were thus appropriate to detect effects of all tested allelochemical substances as well as of structure related pesticides. Test substrate with higher organic content than the standard test substrate lead to reduced effects of all test compounds in the carabid beetle test and for the majority of test compounds in the collembolan test. Topical application of selected test compounds on the standard substrate resulted in higher mortality rates of the *P. cupreus* larvae than after incorporation the test compounds into the substrate.

Nevertheless both applied test methods still have to be adapted as they include only one application of the test compounds during the test duration and therefore cannot be used to investigate the influence of a continuous influx of allelochemicals (simulating the exsudates of the plant) or other aspects of a dynamic, natural plant - soil system.

The implications of the test results for the registration of plant varieties with modified properties to produce enhanced amounts of allelochemicals are discussed.

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