

Establishment of an EC50 database of pesticides using *Vibrio Fischeri* bioluminescence method

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Introduction

Due to the influence of instrumental conditions, the laboratories involved in research on pesticide toxicity should possess their database of EC 50 and curve of dependence of toxicity versus concentration. The toxicity will be determined by using *Vibrio Fischeri* bioluminescence method (1), (2).

Material and methods

Toxicity measurements were performed, according to the international procedure (DIN/EN/ISO 11348-2) - *Vibrio Fischeri* luminescent bacteria test LCK 487 LUMISTOX (Dr Lange, Germany), with a luminometer LKB 1250, thermostated at 15 °C. Pesticides of analytical grade and commercial formulations were used to establish the database. All measurements were done on pesticide and blank organic solutions (1 mL of ethanol-acetone-water 1/3/97 v : v : v containing 2% NaCl). The pH value of the samples was 7,0 ± 0,1. Bioluminescence measurements were performed after 5 and 15 min exposure of the *Vibrio Fischeri* marine bacteria to the pesticide solutions. The EC 50 was calculated from the standard curve created from serial dilutions of each pesticide (Fig.1).

Results and discussion

The EC50 database includes standard pesticides (chlorothalonil, cyprodinil, dichlobenil, α -endosulfane, trifluraline, dimethoate, glyphosate, 2,4-dichlorophenoxyacetic acid (2,4-D), tebuconazole and clomazone), and commercial formulations (thiomethoxam-Actara, clomazone-Gamit, difenoconazol-Difcor, carbamat fam.-Methomil, tebuconazole-Acord). The EC 50 values are between 0.0009– 0.37 mg/L for standard pesticides, and between 0.23– 740 mg/L for commercial formulations.

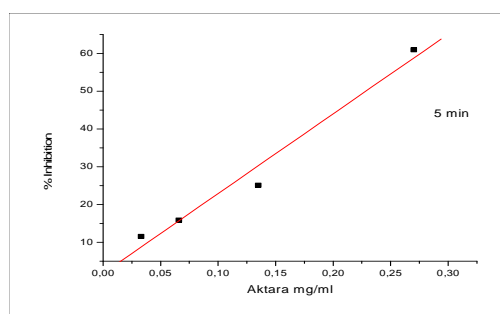


Figure 1. Inhibition of *V. fischeri* activity (%) vs Actara concentration (mg/L) , after 5-min exposition on Actara..

Conclusion

These EC50 values constitute very important and irreplaceable data to estimate the global and individual toxicity of pesticides present in environment.

Bibliography

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