

TITLE: BIOPROSPECTING OF FIPRONIL DEGRADING BACTERIA IN MICROCOSM SOIL

Authors: Campanari, M. F. Z.¹, Guarnier, L. P.¹, Bonfá, M. R. L.¹

Institution: ¹UFGD – Universidade da Grande Dourados, Rodovia Dourados/Itahum Km 12, Cidade Universitária, Dourados, Mato Grosso do Sul.

Abstract:

Bioprospection of agrochemical degrading bacteria is an important area in biotechnology thanks to the increasingly amounts used in Brazil, who currently ranks as first in the amount of compounds used for pest and disease management. Therefore, our work looked for obtaining such microorganisms with degradation potential, looking forward to add knowledge to fipronil degradation through bacteria metabolic pathways. Fipronil is a compound of the Phenylpyrazole chemical family and it is vastly used in sugarcane cultures. This compound is highly toxic and its half-life is very long (persisting up to 7 months in soils), and this makes it interesting in bioremediation studies. Two soils were sampled from the regions of Dourados and Ponta Porã, Mato Grosso do Sul state, with collaboration of *EMBRAPA (Agropecuária-Oeste)*. These soils had historic of both Fipronil and Atrazine application. For bioprospecting fipronil degrading bacteria we used a minimal salts medium *MSM* adapted (concentration in g.l-1 - Na₂HPO₄ (2,4); KH₂PO₄ (2,0); MgSO₄.7H₂O (0,01); CaCl₂.2H₂O (0,01)), added with 1% agar to solid media, adjusted pH to 6.5 with a 1N NaOH solution, and added 1% Fipronil and 0,001% Atrazine as sole sources of Carbon and Nitrogen. Dilutions were realized with range of 10⁻¹ to 10⁻⁴, streaking only the two less diluted. Plates were incubated at 30±2°C for a total of 5 days. It was isolated six metabolically active bacteria, one Gram-negative rod and oxidase negative; five sporulated rods Gram-positives and catalase positive. Most likely, this is due to the fact that in experiments of soil microcosms is common a lower humidity than in a liquid experiment, providing an inhospitable environment. This scenario provides a greater presence of sporulated bacteria, since spores are a cell resistance and favoring their survival in a medium (soil) most inhospitable and also due to the presence of pesticide.

Keywords: Metabolism, biodegradation, fipronil, bioprospecting, microcosm

Funding agency: UFGD – Universidade Federal da Grande Dourados