Title: COMPARISON OF METHODS AIMING BIOPROSPECTING OF FIPRONIL DEGRADATION BACTERIA.

Author (s): Achiles, C.C.P. [1]; WERLANG, M. N. S. [1]; GUARNIER, L. P. [1]; CAMPANARI, M. F. Z. [1] ; Bonfá, Maricy R.L.[1]

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

ABSTRACT

Due to the importance of agriculture in Mato Grosso do Sul state, the use of pesticides is increasing. Owing to its function as a broad spectrum insecticide Fipronil is used in many plantations, especially corn and sugarcane. The presence of aromatic ring in the fipronil and elements: S (sulfur), N (nitrogen) and especially Cl (chlorine), the molecule becomes toxic and carcinogenic to the fauna and flora. Moreover, because of the problems caused by this pesticide contamination it is necessary to study its biodegradation. Thus, two methodologies of bacteria bioprospecting capable of metabolizing fipronil as the only source of carbon and nitrogen were performed with soil samples from the experimental farm of UFGD history pesticide use. Two different strategies for enrichment were used: 1) Liquid Enrichment – 10 g of soil history fipronil use in 90 ml saline solution (0.9%) containing 200 $ug.kg^{-1}$ fipronil; 2) Microcosm - Preparation of a soil microcosm with history fipronil use, with 10% humidity and weekly additions of 200 $ug.kg^{-1}$ of Fipronil solution.

Comparing the two methods, different results were found. In experiment 1, the 12 isolated bacterial colonies showed the following results: All rod cells and Gram-negative bacteria, oxidase positive in 96% of them, and 4% negative oxidase. In experiment 2, the 13 isolated bacterial colonies, showed the following results: sporulated gram-positive rods, all catalase-positive. It is important to emphasize the difference of the experiments, even though it has been occurred at the same soil site and same sampling day it was greater the presence of Gram negative when the enrichment was carried out in liquid cultivation than in microcosm in which the presence of bacteria Gram-positive sporulated was noted. The presence of sporulated Gram-positive bacteria in experiment 2 reveals an unfavorable environment, which allowed only bioprospecting sporulated microorganisms (cell type resistance). In experiment 1 with enrichment in liquid medium, only Gram-negative bacteria were isolated, whereas these bacteria are less adapted to hydric stress.

Keywords: fipronil, bioprospecting, soil, microorganisms, metabolism.

Acknowledgments: UFGD and CNPq