LACTIC ACID BACTERIA ABILITY TO DEGRADE THE PESTICIDE CHLORPYRIFOS.

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RESUMO: Pesticides are mainly classified for their chemical structure and one of these classes is that of the organophosphorus. In this group, one of most commonly used is chlorpyrifos. Its toxicity is due to the capacity of inhibiting the activity of fundamental enzymes for maintenance of organism and, therefore, causing neurological damage. Some microorganism, as bacteria and yeasts have ability for degraded this residue and its believed that it occurs due to enzyme production. In case of organophosphorus group, the major enzyme accountable for this degradation is alkaline phosphatase. The purpose of the current work was to evaluate the ability of six lactic acid bacteria to grow in the presence of chlorpyrifos, evaluate the secretion of alkaline phosphatase enzymes and quantify pesticide degradation by these bacteria, including *Enterococcus faecium* 86, *Lactococcus lactis* 11454, *Lactobacillus rhamnosus GG* 53103, *Leuconostoc lactis* 19256, *Leuconostoc mesenteroides* 8293 and *Pediococcus pentosaceus* 43200. The secretion of alkaline phosphatase was evaluated by colorimetric method utilized ρ–nitrophenyl phosphate. The degradation rate of chlorpyrifos was evaluated by mass spectrometry coupled to gas chromatography. We observed that all strains were able to grow in the presence 500 mg.L-1 of the pesticide and there was no difference in secretion of alkaline phosphatase among the different lineages. The amount of this enzyme secreted to the medium ranged from the 0.0200 0.0226 U.mL-1.min-1. All strains were able to effectively degrade the pesticide, with a minimun percentage of degradation of 80.3%. After 48 hours of incubation, the *Pediococcus pentasaceus* strain tested had pesticide concentrations below the detection limit, possibly indicating complete degradation of the pesticide. The six strains of lactic acid bacteria tested were able to degraded this pesticide quickly and effectively, even in high concentrations, making technically feasible their application for removal of chlorpyrifos contamination in food.

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Palavras – chave: Pesticide; Lactic Acid Bacteria; Bioremediation