

APPLICATION OF AN ENZYMATIC METHODOLOGY IN THE MULTIRESIDUAL DETERMINATION OF PESTICIDES IN AGRICULTURAL AREAS UNDER MONITORING IN THE SÃO LOURENÇO STREAM MICRO BASIN, NOVA FRIBURGO, RJ, BRAZIL.

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Introduction: The São Lourenço stream micro basin situated at the Serra do Mar mountain range, in the municipality of Nova Friburgo. This area is the world's largest cauliflower producer, and is divided into small farms based on family production. As a hydrographic basin this area requires monitoring of residue levels of agricultural chemicals (pesticides and fertilizers), due to the dynamics of water drainage and the presence of large areas of environmental preservation. Enzymatic techniques have proven to be an alternative to the analysis of a wide range of substances, meeting the demands of environmental monitoring projects by lowering cost demands but still maintaining the quality of the analysis. **Objective:** This study aims to evaluate the use of an enzymatic method developed at the Laboratory of Toxicological and Environmental Studies (LEATox) in monitoring this study area, by the determination of pesticide residues in various environmental matrices (plants, water and soil) during tomato farming. **Methodology:** Samples of water, vegetables (from crops and native vegetation) and soil of farmland and non-farmland areas underwent extraction of the main pesticides used in the basin [Faria, 2003]. The determination of pesticide levels was conducted by incubation with semi-purified acetylcholinesterase (AChE) extract. The following compounds were evaluated: acephate, methyl parathion, methamidophos, methomyl, Cartap, Paraquat dichloride and deltamethrin. **Results/conclusion:** The samples of agricultural areas showed pesticides levels starting at 5 mg kg⁻¹, for soil, and 13 mg kg⁻¹ for samples from tomato crop areas. The pesticide levels in samples from rivers in the area showed the influence of the management of cultivated areas, with the use of different levels of pesticides, depending on the time of irrigation, crop periods and the frequency and volume of rainfall. These results indicate the necessity of seasonal monitoring, obeying rainfall regimes and winds in the area, besides obeying the several crop stages involved, between land preparation, sowing and the different crop phases that receive different pesticide inputs. Therefore, the use of the acetylcholinesterase enzyme was found to be a more rapid and cost-effective in the detection of pesticide, allowing for adequate analytical sensitivity.

References: [1] Peres, F. and Moreira, J.C. 2003. Avaliação de ambientes e produtos contaminados por agrotóxicos. In: É veneno ou é remédio?, pp. 177-209. Ed. FIOCRUZ, RJ.