Quantification of the mesotrione's metabolites applied two Brazil soils by thin layer chromatography

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Mesotrione can be degraded by photolysis at the soil surface and is also known to undergo microbial degradation as it translocate deeper into the soil profile. Mesotrione is hypothesized to degrade to four main metabolites: 4-methyl- sulfonyl-2-nitrobenzoic acid (MNBA), b) 2-amino-4-methylsulfonyl benzoic acid (AMBA) – M1, M2, M3, M4, M3, and glutarate. Therefore, the aim of this study was to evaluate the metabolites formation of mesotrione applied to contrasting agricultural soils (Alfisol - Paleudult, sandy clay and Ultisol - Typic Hapludalf, sandy loam) by thin layer chromatography - TLC. Aliquots of the concentrated extracts (0.1 mL) were applied to TLC plates (60F254, EMD Millipore) with a micro syringe. TLC plates were then placed in a tank saturated with 100 mL of acetronitrile:water (70:30). The standard of the particular herbicide being investigated was also spotted concurrently. Spots detected and measured by TLC plate reading imaging plate scanners "radio scanners" (Packard, Cyclone - Perkin-Elmer) for 24 h. For each analysis the solvent front and the distances moved by the mesotrione and their know metabolites were measured, and these were used to calculate for the Rf (retention factor). From the 49 d laboratory incubation data, degradation of mesotrione occurred to form two metabolites, MNBA and AMBA. Mesotrione showed Rf = 0.59 (100/170); this means that the herbicide come up an average of 100 mm in the TLC plate and the solvent come up to 170 mm. MNBA showed Rf = 0.82 (140/170) and AMBA resulted Rf = 0.70 (120/170). MNBA which is a precursor AMBA was more frequently detected in the both soils. In the sandy loam occurred less formation of metabolites as compared to the sandy clay soil. Metabolites formation of mesotrione was strongly affected by soil texture.

Palavras-chave: extractable residues, degradation, retention factor, tri-ketone herbicide

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