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Biological quality of the rhizosphere of transgenic maize expressing proteins Cry1F and CryAb

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In Brazil, the area planted with GM maize has increased from 4.9% initially in 2009 to 69.4% of the total area in 2011. This area is cultivated with plants expressing proteins of the bacterium *Bacillus thuringiensis* (Bt) to control insect pests (*Spodoptera frugiperda*). Important factors in the use of transgenic crops are related to the possible indirect effects of transgenic plants on populations of non-target organisms and losses in the final grain production. It is essential monitoring the exposure on key organisms, in order to determine how microbial communities and mediated processes in the soil will be affected. However, these studies are still incipient in the tropics. The objective of this study was to evaluate the impact of transgenic maize expressing Bt toxins on soil microbes of maize rhizosphere, in soils from "Cerrado". Three different genotypes were tested: one original non-transgenic isolate and two transformed isolines, one expressing the Cry1Ab protein and the other one expressing the Cry1F protein. The experiment was carried out in a Red Latosol, "cerrado" phase and, in the lowland, hydromorphic soil, in a randomized block design and four replications. Samples of rhizosphere and non-rhizosphere soil were collected at the flowering stage and analyzed for the metabolic diversity using the BIOLOG (Ecoplates®), and for the activity of the enzymes urease, arginase, acid phosphatase and alkaline phosphatase. No significant differences were detected between genotypes, independent of the variables and the type of soil. Differences were observed between the non-rhizosphere soil and the rhizosphere soil samples, which showed higher microbial activity. These results indicate that the genotypes containing the Cry protein did not cause negative impacts on soil biological quality, based on the parameters studied.

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