



Monitoring the impact of Bt maize events on the rhizosphere microbial communities cultivated in Brazil

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Genetically modified (GM) maize expressing the insecticidal protein from *Bacillus thuringiensis* (*Bt*) has been commercially cultivated in Brazil since 2008. The monitoring of transgenic plants after commercial release should be done in order to assess and evaluate possible environmental effects on non-target organisms. Microorganisms in soil can be into contact with *Bt* proteins when they are released from root exudates of *Bt* maize or from decomposing plant tissue, and the impact of these proteins on the composition of the root-associated microbiota is still poorly understood. The objective of this study is to evaluate the impact of commercial events of transgenic maize expressing *Bt* proteins on the rhizosphere soil bacterial community. To this end, the transgenic maize MON 810, *Bt* 11, Herculex, MON 89034, VTPro II and Viptera, their respective isogenics treated and not treated with chemical insecticides were assessed using Biolog EcoPlates™ and DGGE (Denaturing Gradient Gel Electrophoresis). The rhizosphere soil was collected at 30 and 60 days after germination in two environments (Sete Lagoas and Janaúba - MG), for three consecutive years (2010/2011, 2011/2012 and 2012/2013), under field conditions. The activity and metabolic diversity evaluated using the Biolog EcoPlates™, after 72 h of incubation, showed no differences between transgenic and non-transgenic maize. The values of Shannon diversity index demonstrated a high level of diversity in the rhizosphere bacterial community for all the treatments. However, the statistical analysis indicated no significant differences among transgenic, isogenic counterparts and samples sprayed with chemical insecticide. The DGGE analysis also did not show difference between transgenic and non-transgenic treatments, but the samples were grouped by environment, showing the importance of soil modulating the microbial community. In conclusion, these results demonstrated that the events of maize *Bt* cultivated in Brazil showed no significant impact on the soil bacterial community structures based on the parameters studied.