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Field assessment of the impact of genetically modified (GM) corn cultivation and its associated agricultural practices on in-field invertebrate populations in the Philippines

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Simplified agricultural practices, involving no tillage, no insecticide inputs and lower human labor requirements, are now the preferred corn farming system and have been generally adopted in the Philippines. This system involves cultivation of genetically modified (GM) corn such as insect-resistant *Bacillus thuringiensis* (Bt) corn and Bt plus herbicide-tolerant (BtHT) corn. Adopting GM corn cultivation removes the need for insecticides and enables labor-intensive manual weeding to be replaced by methods involving herbicides. This is assumed to yield superior economic returns. Yet, the effect of GM corn on biodiversity is an as yet unresolved issue, especially in a biodiversity hotspot like the Philippines. The GM effects on biodiversity were studied in a six-hectare field experiment in Cabagan, Isabela, The Philippines, during the 2009 dry and wet cropping seasons, in order to evaluate the short-term effect of GM corn (i.e. Bt and BtHT) on the community of in-field invertebrates. Our findings showed that the total invertebrate abundance, surface dweller abundance and species richness of surface dwellers and soil dwellers were significantly higher in non-GM cornfields than in Bt and BtHT cornfields. Insecticide-sprayed non-GM cornfields harbored more invertebrates than unsprayed Bt or BtHT cornfields. Chemical weeding may adversely affect invertebrates in both glyphosate- and Gramoxone-sprayed fields. Higher number of invertebrates was found in fully weeded fields (100% weed cover). Finally, this study provides evidence that complex agricultural farming in non-GM cornfields is more favorable for in-field invertebrates than simplified farming systems involving GM corn.

Biography

Miladis M Afidchao completed her Masters degree in Biology at the Isabela State University (ISU), Echague, Isabela, Philippines. She took additional MSc coursework at the Conservation Biology Department (CBD) of Leiden University, The Netherlands where she did her PhD research at the same institution. On November 2013; she graduated her PhD and was accepted doctorate of the CBD, College of Science, Leiden University, The Netherlands. She has one international publication at the Pest Science Management Journal and a thesis book publication by Leiden University. She has two national and three local publications in the Philippines.

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