



Tropentag, September 16-18, 2015, Berlin, Germany

“Management of land use systems for enhanced food security:
conflicts, controversies and resolutions”

Control of Immature *Bemisia tabaci* Stages by Natural Enemies on Cassava in Eastern DR Congo

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Abstract

Cassava is the main food crop in DR Congo and is produced, processed and consumed in all provinces of the country. Nevertheless yield remains low due to multiple factors, of which cassava mosaic disease (CMD) and cassava brown streak disease (CBSD) are among the greatest threats. Resistant varieties are highly effective in controlling CMD, but these varieties, like local landraces, are infested by super-abundant populations of the whitefly vector, *Bemisia tabaci*, and are susceptible to CBSD. In attempting to search for an alternative control method for whiteflies and the viruses they transmit, a survey investigating the impact of native natural enemies on the mortality of younger whitefly stages was conducted from February to April 2010. The survey sites were the Ruzizi Plain, Kabare and, Walungu in South Kivu; Lwama, Katako, Wamaza and Kalima in Maniema; and Rutshuru and Beni in North Kivu. Cassava fields aged between 3 and 9 months were sampled. Plants bearing whitefly larvae were selected. From the top of the plant, the youngest leaf carrying whitefly pupae and all older leaves were picked, placed in plastic bags and then in a cool box. Using a stereo microscope, we distinguished third and fourth instar larvae, pupae and exuviae. A portion of the leaves carrying parasitized pupae were incubated until hatching occurred. Larvae were recorded as healthy, dead, parasitized or predated. Healthy larval instars were more abundant compared to predated, dead or parasitized instars. Parasitism was the main cause of death with 28.5% of larvae being parasitised, 7.8% being dead and 7% predated. Adults of two genera of aphelinid parasitoids emerged from parasitized whitefly pupae. The most frequent were those from the genus *Encarsia*, followed by *Eretmocerus* individuals. In conclusion, the mortality of whiteflies caused by native natural enemies in cassava fields is low and thus unlikely to reduce the spread and impact of CMD and CBSD. There is likely to be merit, however, in exploring measures that would enhance levels of parasitism, or alternatively identifying and introducing other parasitoid species that are more efficient in controlling cassava *B. tabaci* than the presently occurring species.

Keywords: Biological control, cassava mosaic disease