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Mechanisms Influencing the Population Dynamics of the Cassava Green Mite *Mononychellus Tanajoa* (Acari: Tetranychidae) and the Predatory Mite *Amblyseius Largoensis* (Acari: Phytoseiidae)

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Abstract

The landscape of the Northeastern Brazilian state of Maranhão is dominated by small-holder agriculture. Slash and burn management practices are still used by the majority of local farms to cultivate several crops including cassava (*Manihot esculenta*). The cassava green mite *Mononychellus tanajoa* is an important pest of cassava and may be kept in check by naturally occurring predatory mites of the family Phytoseiidae. In addition to predatory mites, environmental variables may also contribute to regulate pest populations in the field. All experiments were conducted in four study sites located around the city of Miranda do Norte, Maranhão State, Brazil. We evaluated the population dynamics of *M. tanajoa* and the most common predatory mite found in the study region, *Amblyseius largoensis* (Acari: Phytoseiidae), over the cultivation cycle (11 months) of cassava. Moreover, we determined the relative contribution of the abiotic environmental variables (rainfall, temperature and relative humidity) to the abundance of *M. tanajoa* and *A. largoensis*. The influence of *M. tanajoa* and *A. largoensis* on each other's abundance was also determined. The abundance of *M. tanajoa* was high and increased whereas the abundance of *A. largoensis* was low and remained constant throughout time. Hierarchical partitioning analyses revealed that the variance for the abundance of *M. tanajoa* was explained by rainfall and relative humidity followed by *A. largoensis* abundance and temperature. Temperature, *M. tanajoa* abundance and rainfall followed by relative humidity explained the variance for the abundance of *A. largoensis*. We conclude that the predatory mite *A. largoensis* may contribute to regulate populations of the cassava green mite in the field. In addition, abiotic environmental variables were the main mechanisms explaining population dynamics of both the pest mite *M. tanajoa* and the predatory mite *A. largoensis*.

Keywords: Biological control, Environmental variables, Predatory mites