EFFECT OF SOIL MANAGEMENT ON MITES AND SPRINGTAILS POPULATIONS IN AGROECOSYSTEMS FROM SANTA CLARA, CUBA

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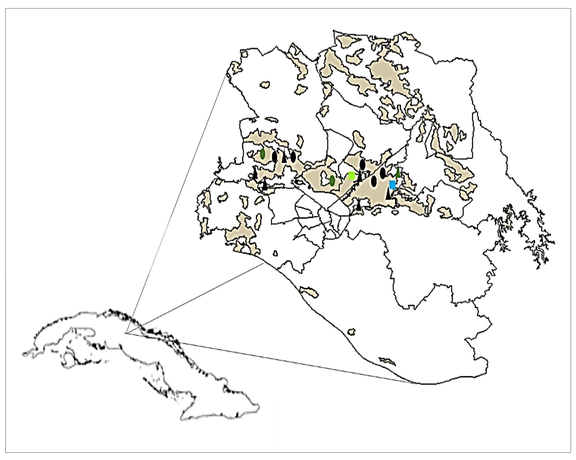
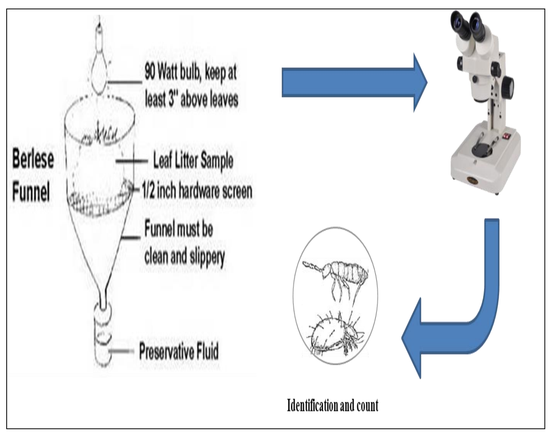
BACKGROUND

The impact of farm management on soil mesofauna individuals is not yet completely understood. Mites and springtails are key components of soil mesofauna with an important role in nutrient turnover and fast response to changes on soil properties; reason why have been recognized as possible useful bioindicators of soil quality (Marín *et al*., 2015, Parisi *et al*., 2005). In Cuba, there some few studies related to the effect on agricultural practices on mites and springtails (Socarrás y Robaina, 2011, Aguila et al., 2016, Valladares, 2016). The aim of this research was to assess the effect of conventional and organic management on soil mesofauna (emphasizing in mites and springtails) in agroecosystems from Santa Clara, Cuba.

MATERIALS AND METHODS



The selected areas were located in the north of Santa Clara city, with homogeneous climatic conditions, Santa Clara (the capital city of Villa Clara province, Cuba). All sites are located on brown calcareous soil (Orhti-Calcaric Cambisol (Hernández *et al*., 2005). The depth of sampling was 20 cm.



Mite and springtails were extracted by Bayer´s methodology (2006) using a Berlese funnel ((image adapted from website: http://osumarion.osu.edu/SpiderWeb/BerleseFunnel.htm).

Identification keys: Springtails using Collembolans of Cuba by Diaz (2003); Mites using Krantz (1978), Baker and Wharton (1964), Evans (1961), Hoffmann (2000), Doreste (1984), Bayartogtokh and Ryabinin (2012) and Almaguel (2004)

RESULTS

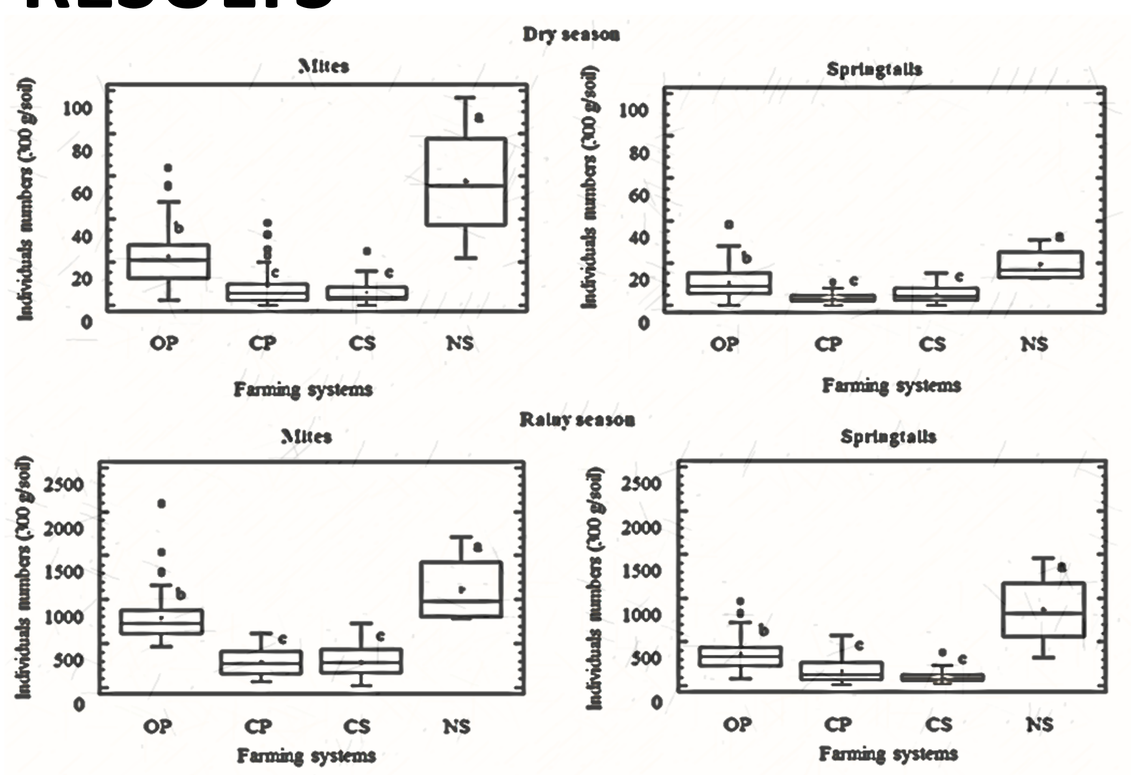


Figure 1. Effect of soil management on mites and springtails in dry and rainy season. Different letters indicate significant differences for LSD test (P<0.05). Legend: OP: private farms organically managed, CP: private farms conventionally managed, CS: state farms conventionally managed, and NS: natural ecosystem used as reference pattern.

MULTIVARIATE ANALYSES

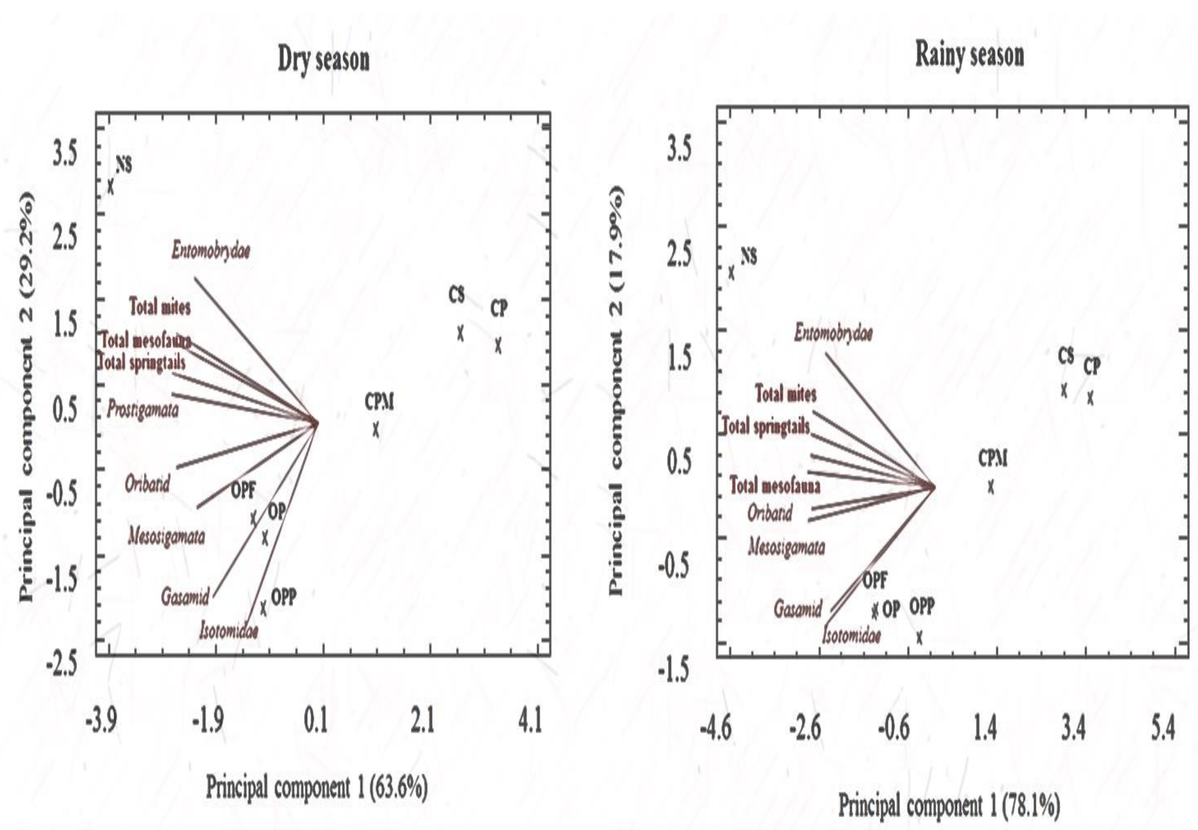


Figure 3. Bi-plot of first two component PCA analysis on soil mesofauna components and farms per season (dry and rainy). Black crosses represent fields with different management and vectors represent mesofauna components.

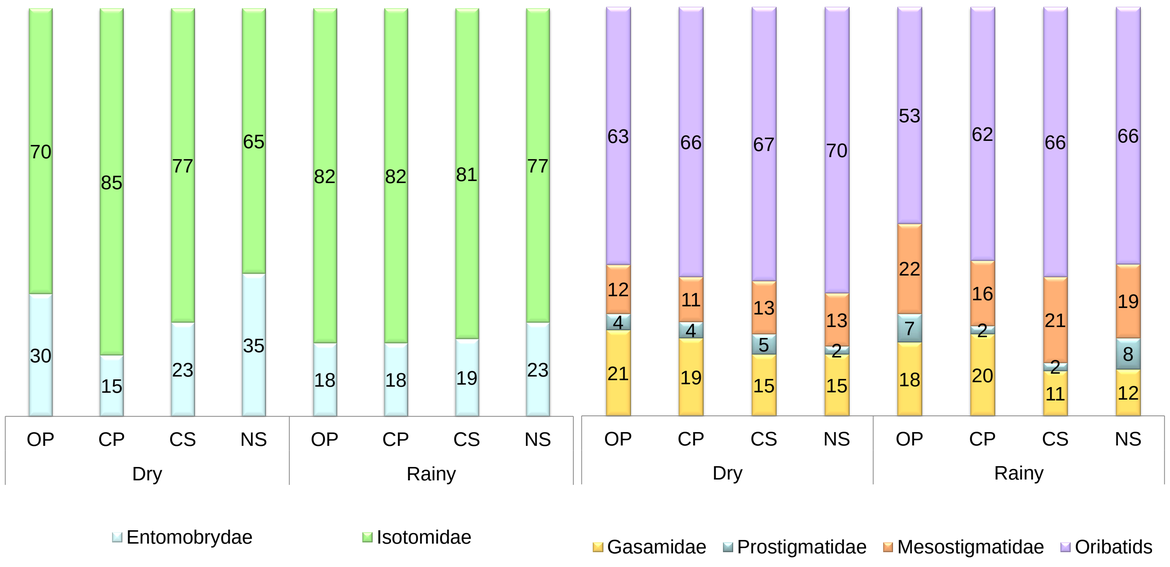


Figure 2. Representative proportions of the main mite´s and springtail´s groups by farming systems in dry and rainy season. Legend: OP: private farms organically managed, CP: private farms conventionally managed, CS: state farms conventionally managed, and NS: natural ecosystem used as reference pattern.

CONCLUSION

Farm practices influences on mites and springtails populations; since both groups showed a depletion of their communities in all agricultural areas compared to the natural ecosystem. In the conventionally managed farms, populations of both groups were lower than those from the under organic management. Oribatids were the most abundant mite group; meanwhile Prostigmatide had the lowest populations in all farms, but also in the natural ecosystem. In the springtails, Isotomidae was more abundant than Entomobrydae. Organic management enhance the population growth of mite´s and sprintail´s.