

## ***Effect of cocoa pod decomposition on earthworm density in agroforestry systems of the Dominican Republic***

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Cocoa-based agroforestry systems (Cocoa AFS), that combine at least one crop in association with cocoa trees, often aim at optimizing ecological and economical interactions among their components. Cocoa AFS have been widely described in the literature for their high taxonomic and functional diversity, including the soil biota. However, in these agroecosystems the interactions between agricultural practices and earthworm communities are poorly documented. A common harvesting practice all over cocoa producing countries consists in piling the harvested cocoa pods on a determined area of the plantation floor before opening them. The cocoa beans are extracted and carried out of the plantations for further post-harvesting processes, but pod husks remain and decompose on the ground. We compared earthworm densities and some morphological traits (length and body mass) under cacao pods and leaf litter in 42 cocoa AFS distributed among 4 age classes: 0-3, 4-10, 11-25 and > 70 years in the Dominican Republic. The TSBF method was implemented: extraction of 25 x 25 cm, 20 cm depth soil monolith and hand sorting of earthworms (total of 120 TSBF). Earthworm densities were calculated and morphological traits measured. Earthworm densities were significantly higher under cacao pods than leaf litter. Earthworm lengths were slightly higher under cacao pods than under leaf litter in 11-25 years age class. Cocoa pods decomposition lead to earthworm densities increasing and, consequently, to a stimulation of ecological functions that they provide. Further studies are needed to confirm these results, that could lead to a recommendation to spread pod husks over the plantation floor when harvesting cocoa, taking into account the current sanitary recommendations for harvesting.

*keywords: Agroforestry; cacao; cocoa pods, earthworms, harvesting practices*