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Earthworms in agroecosystems of Northern Paraná, Brazil

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Soil alterations, such as oscillations in temperature, moisture, and organic matter contents, mainly resulting from agricultural activity, have an impact on both the number and species of earthworms in the soil. The objective of this paper was to identify earthworm species in agroecosystems. The study was conducted in the cities of Rolândia and Arapongas - PR, Brazil, in five areas: 1) no-till (35 years); 2) subsoiled no-till; 3) pasture; 4) coffee plantation; and 5) native forest. In all areas the soil was classified as Typic Acrudox (Dystroferric Red Latosoil). Nine samplings were performed in each area during the dry period (winter), using the TSBF (Tropical Soil Biology and Fertility) methodology, which consists in removing 25 × 25 cm monoliths from the 0-30 cm layer. The earthworms were screened manually and preserved in 4% formaldehyde, and were then counted and separated into cocoons, juveniles, and adults and identified at the family, genus and specie levels. In order to calculate earthworm population densities, the following stages were considered: cocoons, juvenile, and adult individuals, while enchytraeids were disregarded (a separate calculation was made for this group). The population densities found in the various areas were very low: 0,014, 0,021, 0,083 and 0,090 individuals per m2, respectively, in the forest, no-till and coffee plantation, subsoiled no-till and pasture areas. Cocoons and one individual from the specie Pontoscolex corethrurus were found in the forest. All individuals were juveniles in the no-till and coffee plantation areas. However, population densities of 0,021 and 0,201 enchytraeid individuals of the genus Fridericia per m2 were found in these areas. Only a specie from de family Ocnerodrilidae was found in the subsoiled no-till area and enchytraeids with population density of 0,076 per m2. Of the earthworm total found in the pasture, 45% were cocoons; of the remaining 55%, 25% were juvenile individuals of family Glossoscolecidae, 25% were individuals of the genus Fimoscolex, and 50% were of the specie Glossoscolex colonorum. It is worth to point out that all adult and juvenile individuals found were in aestivation. This fact, as well as their low population densities can be explained by the prolonged drought period that occurred in the region (3 months). Evaluations during the rainy period are required to better understand the results obtained.
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