# Spatial Interactions Between Earthworm Abundance and Tree Growth Characteristics in Western Niger Delta

**Authors :** Olatunde Sunday Eludoyin, Charles Obiechina Olisa

**Abstract :** The study examined the spatial interactions between earthworm abundance (EA) and tree growth characteristics in ecological belts of Western Niger Delta, Nigeria. Eight 20m x 20m quadrat were delimited in the natural vegetation in each of the rainforest (RF), mangrove (M), fresh water swamp (FWS), and guinea savanna (GS) ecological belts to gather data about the tree species (TS) characteristics which included individual number of tree species (IN), diversity (Di), density (De) and richness (Ri). Three quadrats of 1m x 1m were delineated in each of the 20m x 20m quadrats to collect earthworm species the topsoil (0-15cm), and subsoil (15-30cm) and were taken to laboratory for further analysis. Descriptive statistics and inferential statistics were used for data analysis. Findings showed that a total of 19 earthworm species was found, with 58.5% individual species recorded in the topsoil and 41.5% recorded in the subsoil. The total population ofEudriliuseugeniae was predominantly highest in both topsoil (38.4%) and subsoil (27.1%). The total population of individual species of earthworm was least in GS in the topsoil (11.9%) and subsoil (8.4%). A total of 40 different species of TS was recorded, of which 55.5% were recorded in FWS, while RF was significantly highest in the species diversity(0.5971). Regression analysis revealed that Ri, IN, DBH, Di, and De of trees explained 65.9% of the variability of EA in the topsoil, while 46.9 % of the variability of earthworm abundance was explained by the floristic parameters in the subsoil.Similarly, correlation statistics revealed that in the topsoil, EA is positively and significantly correlated with Ri (r=0.35; p<0.05), IN (r=0.523; p<0.05) and De (r=0.469; p<0.05) while DBH was negatively and significantly correlated with earthworm abundance (r=-0.437; p<0.05). In the subsoil, only Ri and DBH correlated significantly with EA. The study concluded that EA in the study locations was highly influenced by tree growth species especially Ri, IN, DBH, Di, and De. The study recommended that the TSabundance should be improved in the study locations to ensure the survival of earthworms for ecosystem functions.

**Keywords :** interactions, earthworm abundance, tree growth, ecological zones, western niger delta

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