Article title	Microbiology and Macrofaunal Activity in Soil beneath Shrub Canopies during Residue Decomposition in Agroecosystems of the Sahel
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Abstract	A major limitation for crop productivity in degraded Sahelian soils is the lack of organic inputs. *Piliostigma reticulatum* (DC.) Hochst and *Guiera senegalensis* J. F. Gmel. are unrecognized and unmanaged shrubs of the Sahel that coexist with crops and have potential to provide significant amounts of organic inputs to improve soil quality. However, conventional management involves coppicing and burning aboveground biomass every spring before crop plantings. Therefore, the objective of this study was to develop fundamental microbial information about nonthermal decomposition of these residues as influenced by the shrub canopy, litter, and root system. An experiment was done for *P. reticulatum* or *G. senegalensis* that had a 2 by 3 by 2 factorial design with two soil treatments (beneath and outside the influence of the shrub), three residue amendments (leaf, stem, and leaf + stem), and two litterbag mesh size treatments (plus, >2 mm, or minus macrofauna). Litterbags were destructively sampled at 15, 30, 60, 120, and 210 d after the first rain. At each sampling, litter mass was determined, and the soil beneath the litter bag was assessed for microbial properties and inorganic N. The presence of macrofauna stimulated mass loss, microbial biomass carbon (MBC), enzyme activities, and inorganic N. Rates of decomposition and microbial response with soils beneath were higher than outside the canopy. The results provide a basis for developing improved, non-thermal management of coppiced shrub residue while still allowing preparation of favorable seedbeds for row crops. Previous research has shown that these shrubs can do hydraulic redistribution (HR) of water from wet subsoil to dry surface soil. The higher soil moisture beneath shrubs in our experiment indicates that HR is a contributing factor to drive decomposition and nutrient mineralization in the dry season.
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