

Effect of the endogeic earthworm *Aporrectodea tuberculata* on aggregation and carbon redistribution in uninvaded forest soil columns

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abstract

Earthworms are typically placed into ecological groups ([Bouche, 1977](#)), each group occupying a specific ecological niche and influencing soil aggregation and C turnover differently ([Dube and Brown, 1998](#)). Endogeic earthworms living and feeding in the mineral soil are the primary group of earthworms that affect ag-

more labile and non-protected ([Evans et al., 2001](#)). It is defined as any fraction that is lighter than the mineral fraction of the soil because the more recalcitrant SOM becomes intimately associated with mineral portions of the soil during the humification process ([Barrios et al., 1996](#)). Conversely, any fraction having a density less than the mineral fraction and that is not occluded within a mA, is assumed to be free LF, and more bio-available. In order to get a proper assessment of the amount of protected C found within the mA (fmA, mAsm, mA_{lg}), the between-mA LF must be removed prior to C analysis. The method for this process is outlined in [Six et al. \(1998\)](#), which was modified from [Elliott and Cambardella](#)

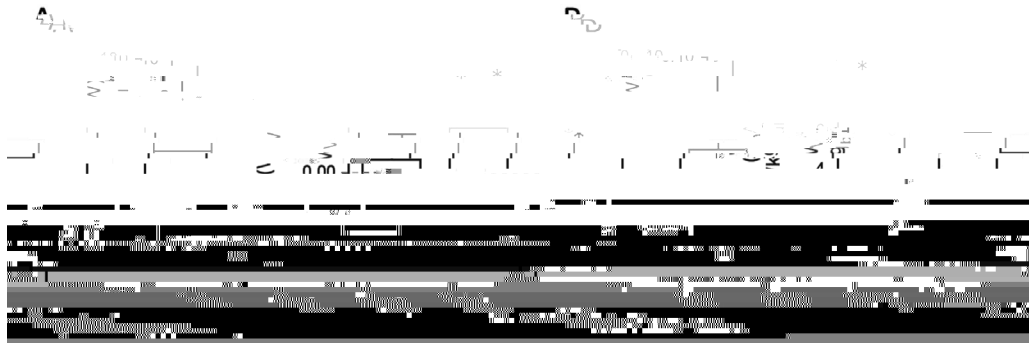


Fig. 4. A.) Difference in paired cores (WW-NW) of gC fraction kg bulk soil⁻¹. B.) Difference in paired cores (WW-NW) in the proportion of total soil dry mass g fraction kg bulk soil⁻¹. n = 5, (*) statistically significant

in just 100 g of mineral soil while [Bossuyt et al. \(2005\)](#) used 6 adult earthworms in just 150 g of mineral soil. In our paired study we placed 4 worms in approximately 1.5 kg mineral soil, which while three times the highest density seen in an extensive survey recently conducted in [Knowles \(2015\)](#), is about 10x less than the above mentioned studies, possibly explaining why we did not see the significant effects expected at 4 weeks. An alternative

explanation for the lack of effect after 4 weeks is that, even though endogeic, the worms could have initially been more active in the organic surface horizons of the intact cores, moving into the mineral soil later in the study. Another factor related to worm density is that even though an equal number of worms were placed in each experimental core (3 adult, 1 juvenile), the volume of soil was somewhat variable between pairs, and the level of earthworm

of earthworm presence ($0.347 \pm 0.015 \text{ kg}_{\text{mAlg}} \text{ kg}_{\text{IgMA}}^{-1}$, 0.285 ± 0.005
 $\text{kg}_{\text{mAsm}} \text{ kg}_{\text{smMA}}^{-1}$, $n = 40$, $P <$

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