



## **Analysis of the site and soil factors affecting the abundance of *Lumbricus terrestris* L.**

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Deep-burrowing ('anecic') earthworms are considered to be 'ecosystem engineers' since their activities have far-reaching implications for many ecosystem functions and soil processes, such as rapid non-equilibrium water infiltration and solute transport through the unsaturated zone. Although anecic earthworms have been widely studied, and the factors controlling their abundance are understood in a qualitative sense, there have apparently been few efforts made to quantify or systematize this knowledge. We therefore conducted a meta-analysis of literature data using 'classification trees' to identify quantitatively the key site and soil factors affecting the abundance of the common anecic earthworm *Lumbricus terrestris* (L.), focusing on agricultural land. The final classification trees, which included data from 81 sites across Europe, identified several land use and management practices (cropping, tillage, manuring), and soil properties (pH, texture) as important controls. A classification tree that partitioned sites into high, medium and low abundance (>10, 4-10 and <4 individuals/m<sup>2</sup> respectively) on the basis of these factors, correctly classified 71% of cases. A simpler tree based on two classes (>4 and <4 individuals/m<sup>2</sup>) correctly classified 79% of cases. As an example of a potential application of this analysis, we show how we are making use of the simpler tree as part of a larger classification scheme developed to support the parameterisation of contaminant transport models in the unsaturated zone.