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# Chemical relationships in earthworm casts of two urban green spaces indicate the earthworm contribution to urban nutrient cycles

MADALINA IORDACHE<sup>1,2\*</sup>, IACOB BORZA<sup>3</sup>, VALENTINA ANDRIUCĂ<sup>4</sup>

<sup>1</sup>Department of Sustainable Development and Environmental Engineering, Faculty of Agriculture, University of Life Sciences “King Mihai I”, Timisoara, Romania

<sup>2</sup>Research Centre of Bioresources, Environment and Geospatial Data, University of Life Sciences “King Mihai I”, Timisoara, Romania

<sup>3</sup>Department of Soil Science, Academy of Agricultural and Forestry Sciences “Gheorghe Ionescu-Șișești”, Bucharest, Romania

<sup>4</sup>Department of Agronomy and Environment, Faculty of Agricultural, Forestry and Environmental Sciences, Technical University of Moldova, Kishinev, Republic of Moldova

\*Corresponding author: [mada\\_iordache@yahoo.com](mailto:mada_iordache@yahoo.com)

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**Abstract:** Due to the earthworms' implications in nutrient cycles through their burrowing and casting activity, earthworms are worth considering when urban biogeochemical cycles are analysed. Several chemical parameters and their relationships were analysed in earthworm casts of two urban parks, namely the pH, total organic carbon (TOC), total nitrogen (Nt), plant available phosphorus (P), plant available potassium (K), and calcium water soluble (Ca). It was statistically significantly found that the TOC, Nt, P and K are reciprocally determined in the earthworm casts: 74.4% of the pH variability is co-determined by the N, P, K, TOC, and Ca contents; 95.9% of the Nt variability is co-determined by the pH, P, K, TOC, and Ca contents; 95.4% of the P variability is co-determined by the pH, N, K, TOC, and Ca contents; 94.5% of the K variability is co-determined by the pH, N, P, TOC, and Ca contents; 86.6% of the TOC variability is co-determined by the pH, N, P, K, and Ca contents. This study revealed the complexity of the chemical relationships inside earthworm casts, their reciprocal dependencies, and highlighted the complexity of the earthworms' contribution to biogeochemical cycles in urban areas. Our findings propose earthworms as indicators of the integrative conservation management of urban ecosystems.

**Keywords:** biogeochemical; indicator; Oligochaeta: Lumbricidae; urban park; urban sustainability

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