



## **Integrative taxonomy of two problematic genera of Collembola: *Orchesella* and *Isotomurus***

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Springtails (Collembola) are one of the most abundant and ecologically relevant soil arthropods, playing a key role in nutrient cycling and soil functioning. Despite their evolutionary success, species identification remains challenging due to the presence of cryptic diversity and the limited availability of high-resolution molecular data. This project focuses on the integrative taxonomy of two taxonomically problematic genera, *Orchesella* and *Isotomurus*, widespread in Europe and including several Italian endemic species. By combining morphological analyses (light and electron microscopy) with molecular approaches, including DNA barcoding (COI) and whole-genome sequencing (WGS), the study aims to improve species delimitation and clarify phylogenetic relationships. The integration of nuclear and mitochondrial markers will allow the identification of cryptic lineages and the assessment of the taxonomic reliability of morphological characters such as pigmentation patterns and chaetotaxy. This work represents one of the first phylogenomic investigations of these genera and is expected to provide a robust and reproducible framework for species identification. The results will contribute to a better understanding of soil biodiversity and will support future conservation and monitoring strategies.