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**Első szerző:** Erős-Honti Zsolt

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**Összefoglalás:**

Morphological and molecular characterization of *Humaria* and *Genea* ectomycorrhizae from Hungarian deciduous forests

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The ectomycorrhizae (EM) of *Humaria* and *Genea*, two closely related genera of the Pyronemataceae (Ascomycetes), were regularly found in different deciduous forests of Hungary. In the present paper, the morphology and anatomy of these EM are described in detail, including morphometric analyses. Identification of the EM was carried out by molecular taxonomic analyses of the nrDNA ITS sequences obtained from mycorrhizae, herbarium ascomata, and public databases. The anatomy of the EM, examined during this work, was almost identical. They possessed angular outer and epidermoid inner mantle layers and warted, thick-walled emanating hyphae. Ten of our EM sequences grouped into the clade of *Humaria hemisphaerica* sequences and one into the genus *Genea*. Both molecular taxonomic analysis and morphometry differentiated three sub-groups within the clade of *Humaria*, and these methods also clearly separated the EM of *Genea* from those of *Humaria*. We may suppose that the previous morphological-anatomical descriptions, lacking molecular taxonomic identification, do not concern the denominated taxa. As a consequence, we stress the importance of reevaluating the literature data, based on morphotyping of *Humaria* and *Genea* EM, to prevent misidentification in future studies. The presented work demonstrates that combining molecular and morphological analysis is essential for the unambiguous identification of the EM formed by problematic taxa.

**Megjegyzések:**

Morphological and molecular characterization of *Humaria* and *Genea* ectomycorrhizae from Hungarian deciduous forests

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Tartalom:

Introduction

Materials and methods

Sampling sites

Sampling

Characterization of EM morphology and anatomy

Study design and statistical analysis in morphometry

Herbarium samples

Molecular analysis

DNA extraction

PCR and sequencing

Phylogenetic analyses

Results

Common morphological-anatomical features of the EM

Phylogenetic inference

Morphometric analysis

Discussion

Acknowledgements

Appendix

References

Ectomycorrhiza, Genea, Humaria, Anatomy, Morphometry, Phylogenetic analysis

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