

CEFood 2026

CONGRESS



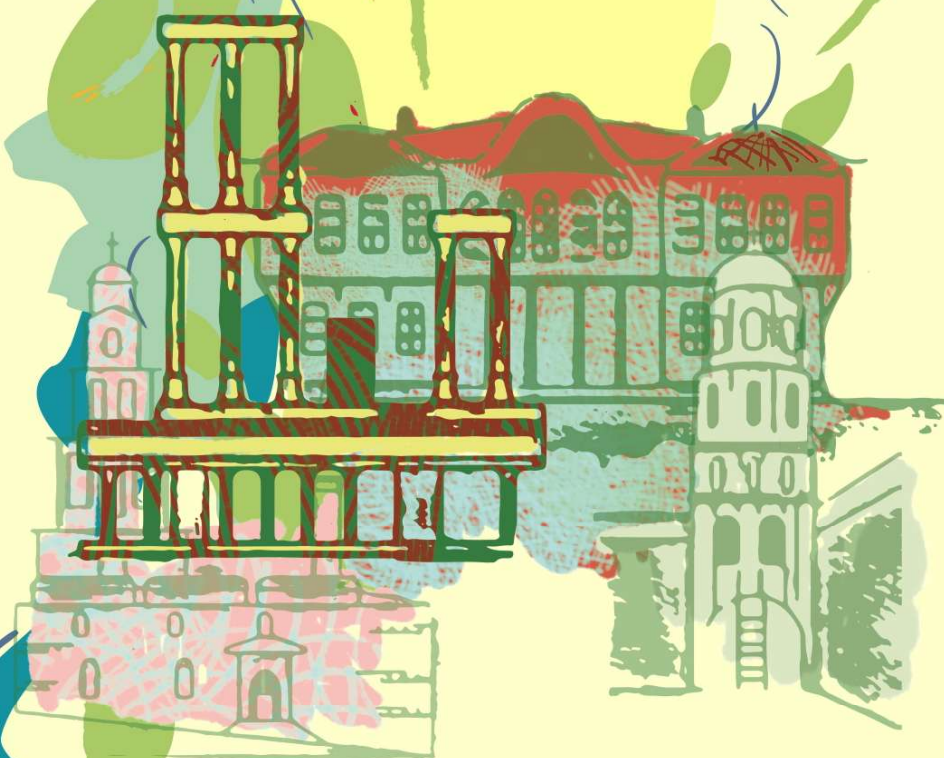
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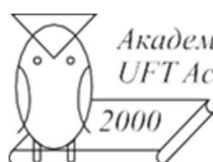
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Book of abstracts

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Compositional Evaluation of *Lemna minor* Biomass as a Novel Ingredient for Functional Food Applications

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Background: The growing demand for sustainable, nutrient-dense foods has increased interest in alternative high-value biomasses. *Lemna minor*, a fast-growing aquatic plant with a favorable protein composition and the ability to accumulate minerals and bioactive compounds, has emerged as a promising candidate for food applications. Its rich nutrient composition, combined with the presence of functional components such as fibers, phenolics, and photosynthetic pigments, positions this biomass as a potential multifunctional ingredient for the development of nutritionally enhanced and functional food systems.

Aims: This study aimed to provide a comprehensive characterization of *L. minor* biomass obtained under different cultivation conditions and evaluate its potential as a functional food ingredient through chemical and nutritional analyses.

Methods: Proximate chemical composition and total dietary fiber (soluble and insoluble fractions) were determined using standard methods. Mineral content was analyzed using atomic absorption spectrophotometry to assess nutritional value and potential safety constraints. Antinutritional factors were quantified to evaluate potential limitations for food applications. Bioactive compounds were investigated through food-grade extraction (aqueous and hydroethanolic systems), followed by spectrophotometric determination of total phenolics and flavonoids. Pigments (chlorophylls and carotenoids) were analyzed spectrophotometrically under controlled extraction conditions.

Results: Both samples exhibited a favorable nutritional profile, primarily due to their protein content (~25-30 %), along with a high total dietary fiber content (~50 %), dominated by insoluble fiber (~40-45 %) and a lower soluble fraction (~8 %). Iron content was notably high (~500 mg/kg), indicating potential as a plant-based iron source. Antinutritional factors were detected within ranges reported in the literature. Polyphenolic analysis indicated that the overall content of total polyphenols was moderate. The ethanolic extract contained a higher level of total polyphenols, with flavonoids identified as the dominant polyphenolic group. Pigment analysis revealed chlorophylls as the dominant pigments, consistent with the intense green coloration of the biomass.

Conclusions: Both samples of *Lemna minor* demonstrated a favorable nutritional profile, characterized by high protein and dietary fiber content and significant iron levels. Despite moderate polyphenolic content, the biomass shows strong potential as a multifunctional ingredient. The observed variability between samples highlights the influence of cultivation conditions and underscores the importance of controlled growth parameters to ensure consistent composition, safety, and functionality.

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