

BOOK OF ABSTRACTS



28th INTERNATIONAL SYMPOSIUM ON

ADVANCED IN EXTRACTION TECHNOLOGIES

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The ExTech symposium series (International Symposium on Advances in Extraction Technologies)

The ExTech symposium series (International Symposium on Advances in Extraction Technologies) is the premier international event in analytical chemistry, focusing on the areas of sampling and sample preparation. The idea of creating this worldwide conference started in 1999 by Professor Janusz Pawliszyn (University of Waterloo, Canada).

Since then, the symposium has travelled annually around the world.

Its program covers all aspects of sampling and sample preparation, including fundamentals, new materials & technologies, miniaturization, automation & robotics, quality assurance, sustainability assessments, and a wide range of applications. In 2026, we anticipate a focus on hyphenated techniques and direct MS, as well as on the increased role of Artificial Intelligence in the analytical workflow.

The symposium will be held in the historical site of the Gembloux Agro-Bio Tech faculty, a beautiful old abbey that now hosts a vibrant research environment. Besides the scientific program, we will offer you plenty of possibilities to network with colleagues in a cosy atmosphere and with amusing social events.

We are excited to welcome you at EXTECH2026!

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Mat-02: Integrated Cyclodextrin-Assisted Extraction And Spray-Drying Encapsulation For Stabilization Of Feverfew (*Tanacetum Parthenium* L.) Bioactives

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Abstract

The development of stable plant-based bioactive ingredients requires integrated technological strategies that improve extraction efficiency while protecting sensitive compounds during processing. Feverfew (*Tanacetum parthenium* L., Asteraceae) is a medicinal plant known for its anti-inflammatory and anti-migraine activity, mainly attributed to the sesquiterpene lactone parthenolide (PAR), together with a complex mixture of polyphenolic compounds. However, the relatively low natural abundance of PAR, together with the high costs and the use of toxic organic solvents (e.g., methanol and acetonitrile) in conventional extraction procedures, underscores the need for environmentally friendly, non-toxic, and cost-effective extraction and encapsulation strategies capable of improving recovery while preserving PAR stability. This study investigated a dual technological approach combining cyclodextrin-assisted extraction and spray-drying encapsulation using hydroxypropyl- β -cyclodextrin (HP β CD). Feverfew extracts were obtained by maceration and ultrasound-assisted extraction (UAE) using water and ethanol–water mixtures (50 and 70%, v/v) with or without HP β CD. Extraction efficiency was evaluated by determining PAR, total polyphenols (TPC), and total flavonoids (TFC). The optimal extraction conditions (UAE with 50% ethanol–water and 0.05% HP β CD) yielded the highest PAR content (6.3 mg/g dry biomass), together with elevated levels of polyphenols (~73 mg gallic acid/g) and flavonoids (~23 mg catechin/g). The optimized extract was subsequently converted into dry powders by the spray drying technique, producing a carrier-free extract (FWE) and a cyclodextrin-based formulation containing 40% HP β CD (FWE+CD). After drying, the FWE powder contained 7.63 mg PAR/g, while the FWE+CD formulation contained 5.95 mg PAR/g due to the dilution effect of the carrier, while still maintaining a high retention of bioactive compounds. Structural characterization (FTIR, SEM, XRD) confirmed predominantly amorphous systems and suggested partial inclusion complex formation between feverfew bioactives and HP β CD. Overall, the results demonstrate that HP β CD can act as a multifunctional excipient enabling enhanced extraction and stabilization of feverfew bioactives, supporting the development of stable plant-derived powders for pharmaceutical and nutraceutical applications. Acknowledgment This research was supported by the Science Fund of the Republic of Serbia, Grant No 17475, Green Innovation: Unlocking the Bioactive Potential of Biomass for Enhanced Pharmaceuticals and Foods through Eco-Friendly Sustainable Technologies – VIVENDI.

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