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**Discipline of Apiculture and Sericulture Technologies**

**Editors: Otilia BOBIȘ, Daniel S. DEZMIREAN**



**6th INTERNATIONAL  
SYMPOSIUM  
ON BEE PRODUCTS AND  
ANNUAL MEETING OF  
INTERNATIONAL  
HONEY COMMISSION**

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# WORKING-GROUP 8: POLLEN

## COMPARATIVE ANALYSIS OF BEE POLLEN QUALITY FOLLOWING DIFFERENT STORAGE TECHNIQUES

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**Introduction:** Bee pollen is acknowledged as a versatile natural food valued for its nutritional and medicinal benefits, attributed to its rich chemical composition boasting notable bioactivities like antioxidant and antimicrobial.

**Aims:** This study aims to investigate the most effective conservation process (drying, pasteurization and high-pressure pasteurization) for bee pollen and its impact on individual constituents over a two-month period.

**Materials and Methods:** Monofloral bee pollen samples were subjected to the different storage processes and analysed at intervals of one and two months to assess changes in fatty acid amino acid content, as well as microbial contamination.

**Results:** The results indicate that dried samples exhibited primarily the lower fatty acid and amino acid content <sup>[1]</sup>. Among the preservation techniques, high-pressure pasteurization was the most effective, maintaining protein, amino acid and lipid characteristics of bee pollen while minimizing microbial contamination. Additionally, this technique outperformed drying and pasteurization methods in preserving phenylalanine, alanine, glycine, valine, hydroxyproline, serine, tyrosine, arginine and lysine <sup>[1]</sup>.

**Conclusion:** This study underscores the significance of storage methods in preserving the nutritional value and integrity of bee pollen. High-pressure pasteurization stands out as the optimal technique, offering superior preservation of essential nutrients and microbial stability over time with nutritional benefits for consumers.

**Keywords:** *Bee Pollen, drying, high-pressure pasteurization, pasteurization*

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## References

[1] Anjos O., Seixas N., Antunes C.A.L., Campo M.G., Paula V., Estevinho L.M. 2023. Food Research International. 170 (2023) 112964

# SPOROPOLLENIN MICROCAPSULES FROM BEE POLLEN: A STUDY ON FABRICATION, CHARACTERIZATION AND DRUG DELIVERY

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**Introduction:** Bee pollen holds historical significance due to its diverse nutritional content but also to the bioactive compounds that may contribute to overall health and well-being. Beyond its role in human consumption, there is potential to use bee pollen as a micro-sized drug delivery system through materials engineering techniques. The outer layer of the pollen grain, known as the exine, is particularly noteworthy. Comprising a biopolymer of sporopollenin, it possesses unique features, including mechanical robustness, chemical inertness, biocompatibility, a porous surface structure, and a species-specific size distribution. Despite the existing recognition of these properties, microcapsules derived from pollen have traditionally been produced directly from plants.

**Aims and methods:** Herein, we describe a novel approach, elucidating the production of sporopollenin microcapsules (SMCs) using bee pollen pellets. This method ensures the fabrication of SMCs with diverse morphologies and sizes swiftly, requiring minimal labour and equipment. To further investigate these microcapsules, we explore the loading of SMCs with the anticancer drug 5-Fluorouracil using three distinct loading techniques and the release behaviour of the drug-loaded SMCs through in vitro simulations of the gastrointestinal tract (GIT) and colonic fermentation.



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