

Bee pollen nutritional value and microbiological stability: influence of preservation techniques

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INTRODUCTION

Bee pollen is an important beehive product, with a rich chemical composition and biological properties, which vary according to the region of production, plant age and agroecological conditions. Its moisture content may vary from 18 - 25%, depending on the technique and the time of collection [1]. Bee pollen is subject to proliferation of microbiological contamination that can make its consumption and commercialization unfeasible when not properly preserved, its nutritional value can be rapidly reduced due to Maillard reactions [2].



METHODOLOGY

Bee pollen samples from Northeast Portugal (Bragança) collected in July 2018 were preserved by: freezing at -20 °C, oven-drying at different temperatures (35 °C for 15 hrs., 40 °C for 7 hrs.30 min., and 45 °C for 5 hrs.50 min.) and lyophilisation. Dried and lyophilised samples were then stored at room temperature, while the remaining samples were kept frozen at -20 °C. Bee pollen samples were evaluated in triplicate for chemical parameters (moisture, ashes, protein, fat, and sugars) [3] and microbial loads (aerobic mesophiles, lactic acid bacteria, yeasts and molds), before the treatments and after 0, 1, 3 and 6 months of preservation.

RESULTS

CHEMICAL PARAMETERS

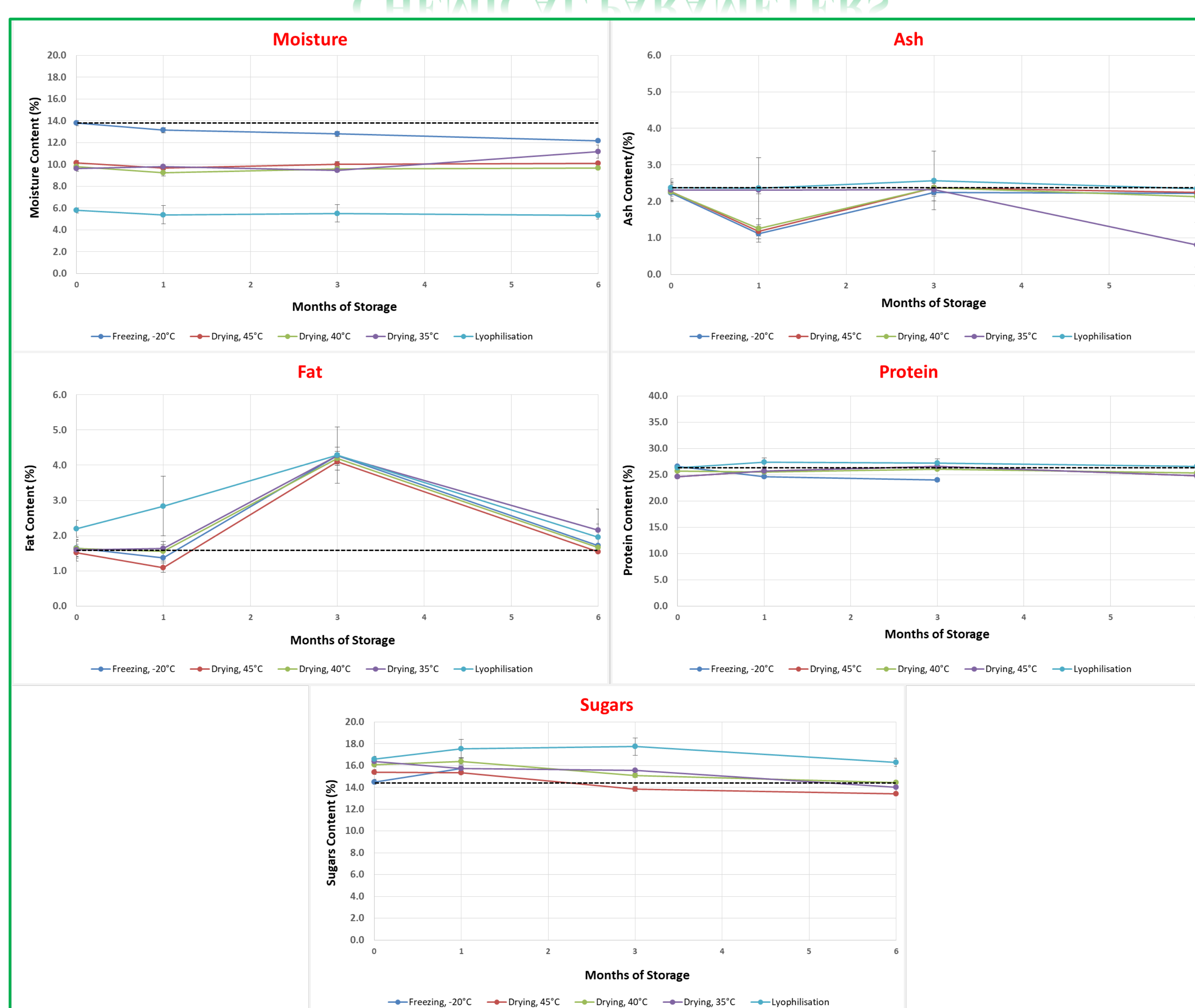


Figure 1. Values of the evaluated chemical parameters (moisture, ash, fat, protein, and sugars) over a storage period of 6 months (dashed line: value before applying the preservation method).

MICROBIAL LOADS

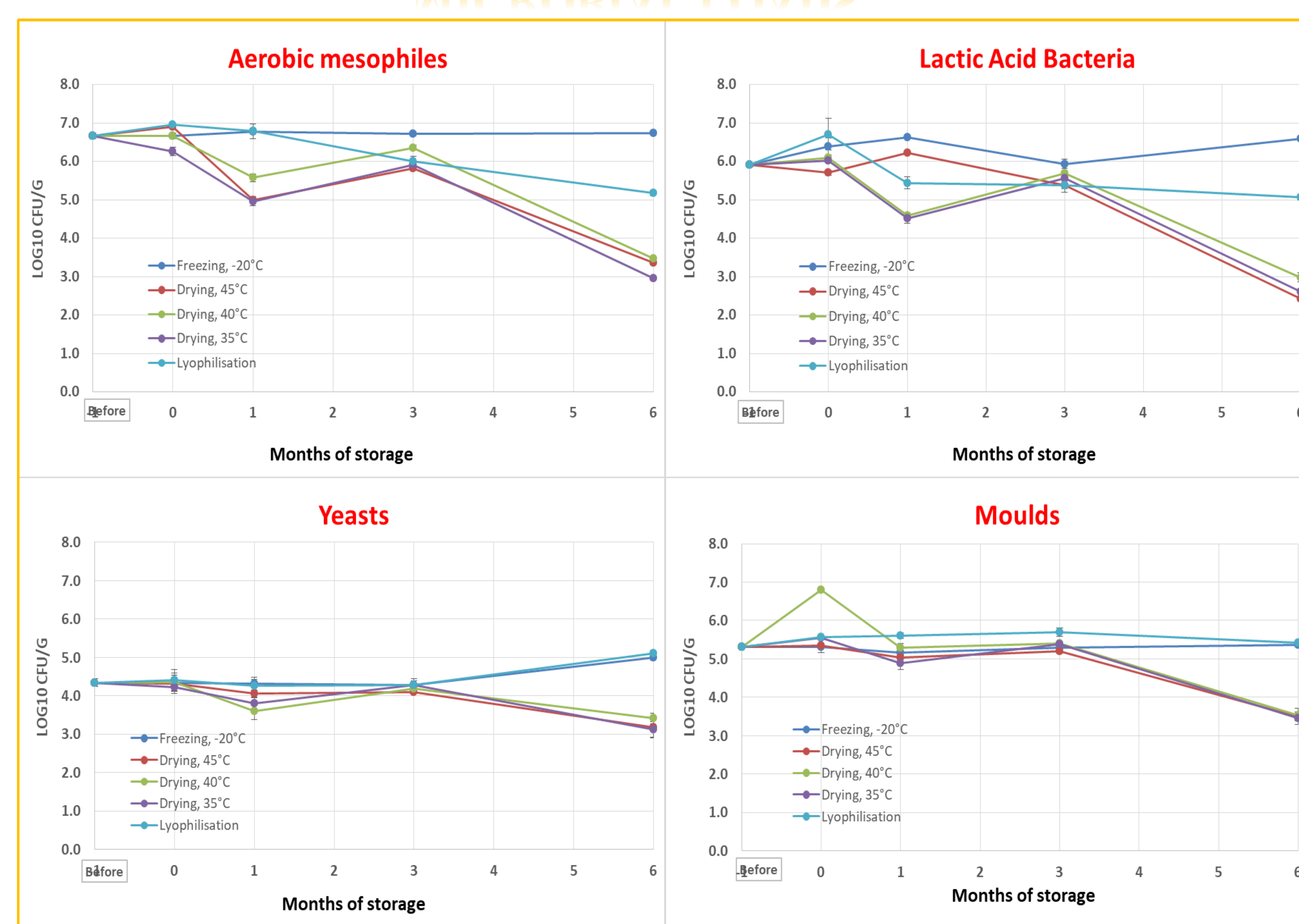


Figure 2. Values of the evaluated microbial parameters (aerobic mesophiles, lactic acid bacteria, yeasts and moulds) before applying the treatments and over a storage period of 6 months.

CONCLUSIONS

The various preservation techniques under evaluation did not seem to have a negative impact on the nutritional value of the bee pollen samples throughout the 6 months of storage period. Moreover, the oven-drying technique (independently of the binomium *temperature x time* used) caused a decrease in the microbial loads after a storage period of 3 to 6 months. Therefore, the oven-drying techniques can be considered as adequate, easy and inexpensive preservation techniques, providing bee pollen with the desired microbiological stability without compromising its nutritional value. The study of the impact of these preservation techniques on the biological activity of bee pollen is underway.

References

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