



# Stability evaluation of a bee bread and honey mixture



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## 1. Introduction

Bee bread is a bee product prepared in honeycombs by fermenting bee pollen collected and partially processed by bees. The interest in bee bread is justified by the fact that it is a nutritionally rich food with potential biological activity, often being classified as a functional food. However, due to the difficulty normally associated with its production, beekeepers have not properly valued bee bread.

## 4. Results and Discussion

The physicochemical parameters showed no significant differences over time, except for water activity, which increased from 0.54 at T0 to 0.56 after 1 and 3 months of storage. Considering the small extent of this increase and also that the water activity values were lower than 0.60, it is plausible to assume that the recorded increase in water activity values will not have a relevant impact on the mixture stability. Regarding the microbiological parameters, only the sulfite-reducing clostridium spore count showed a significant decrease from 0.82 CFU/g at T0 to undetectable after 1 and 3 months of storage.

## 5. Conclusions

Overall, the results of the physicochemical and microbial analyses showed that the bee bread and honey mixture remained stable over a 3-month storage period at room temperature, making this innovative product a viable approach to simultaneously preserve and add value to bee bread.

## Acknowledgements

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## 2. Materials and Methods



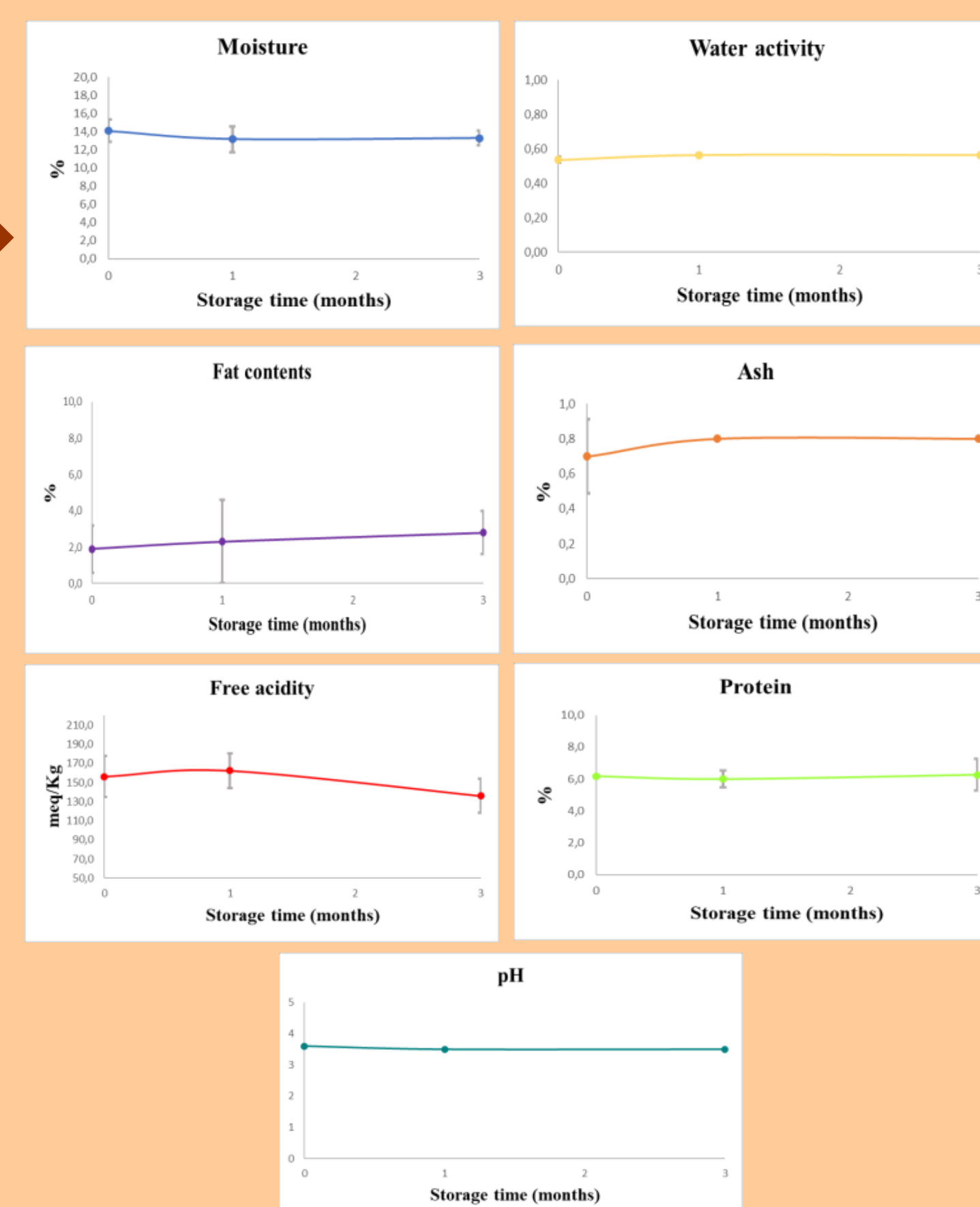
### Physicochemical analysis

**Water activity** – Dew point method;  
**Moisture** – Infrared balance at 105 °C;  
**Ash** – Incineration at 550 °C;  
**Protein** – Quantification of total N by Kjeldahl method;  
**Fat contents** – Soxhlet extraction method (petroleum ether as solvent);  
**pH** - Determined by potentiometry.  
**Free acidity** – Determined by automatic titrimetry.

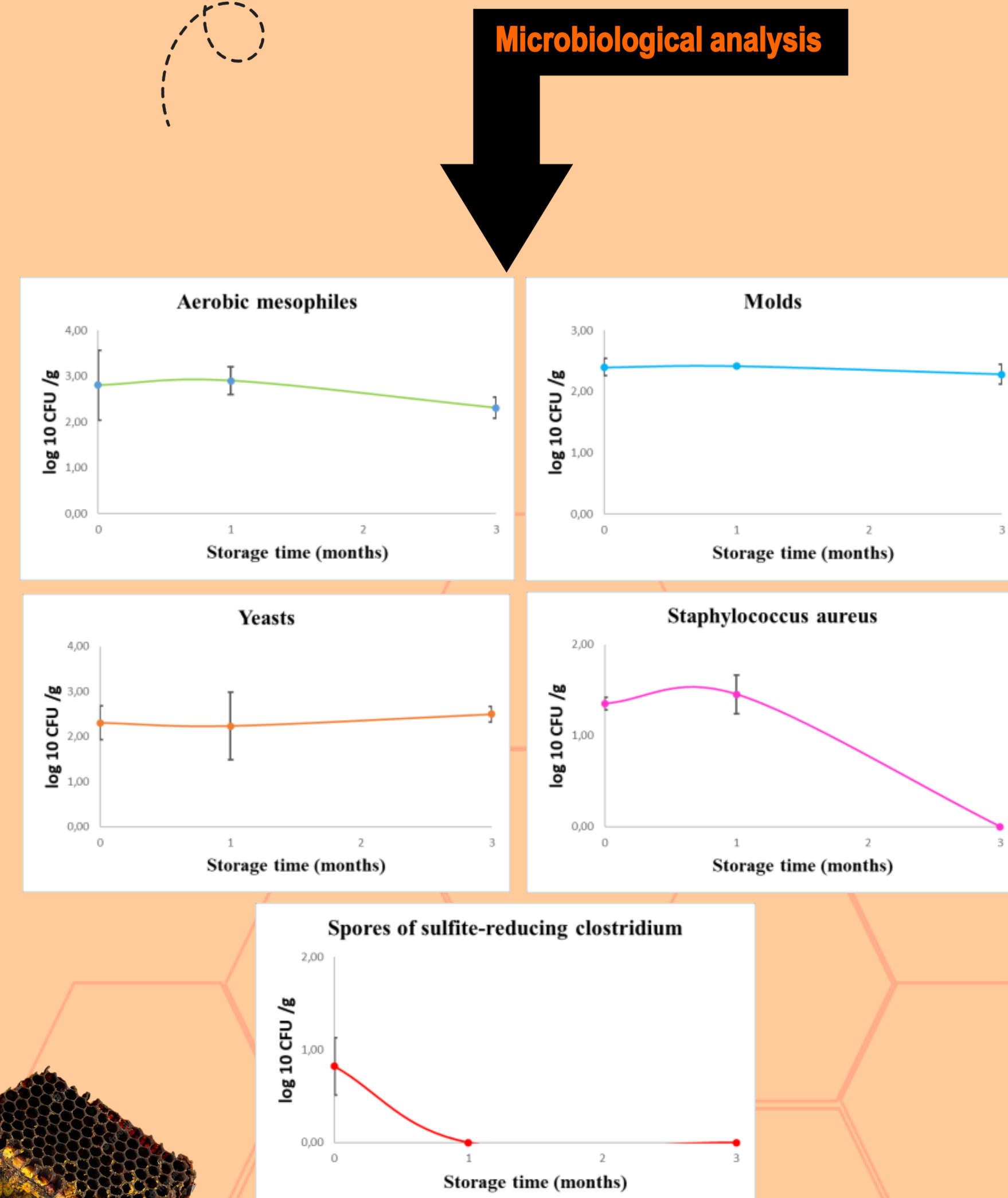
### Microbiological analysis

**Aerobic mesophiles** - described in ISO 4833:2003;  
**Yeasts and molds** - described in ISO 21527-2:2008;  
**Lactic acid bacteria** - described in ISO 15214:1998;  
**Spores of sulfite-reducing clostridium** - described in ISO 15213:2003;  
**Coliforms and E. coli** - Compact Dry EC (r-biopharm);  
**Staphylococcus aureus** - Compact Dry S-XA (r-biopharm).

## 3. Results



### Microbiological analysis



### Physicochemical Analysis

