PP-297 [Beekeeping Technology and Quality]
Exploring bee products on the preservation of artisanal cheeses: the perspective of BEE4CHEESE project

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Honey, bee pollen, and propolis are among the primary products derived from beekeeping, with globally recognized commercial value. While honey remains the most prominent hive product in the Portuguese market, there is a need for a paradigm shift to enhance the dynamism and socio-economic value of other bee products by developing innovative applications. Portugal has a strong tradition of producing artisanal cheeses, which are distinguished by their cultural significance and unique flavor, serving as both a national and international reference. The BEE4CHEESE project addresses the need to maintain these traditions by combining natural products such as bee pollen and propolis to preserve artisanal cheeses from Portugal's inland regions, enhancing and adding value to all those products. Within the project, propolis will be extracted through more efficient techniques such as ultrasound and subcritical water procedures. Afterward, bee pollen biocapsules will be produced and loaded with propolis extracts to develop protective coatings and incorporate them into traditional cheese-making. The evaluation of the antifungal and antibacterial activity of the bee pollen biocapsules incorporated with propolis and the functional coating, as well as their effectiveness as preservative agents in food, particularly in cheese, will be evaluated. The application of artificial intelligence will be a valuable tool to assess the impact of propolis compositional heterogeneity on its biological activity, particularly its antifungal and antibacterial effects. This innovative application of bee products in biocapsules and edible coatings may promote sustainability through the use of novel, low-cost, and environmentally friendly processes, representing a significant strategy to reduce the use of synthetic additives for cheese preservation and the dependence on plastic coatings while promoting beekeeping economy.

Acknowledgments: This work received financial suport from Promove program, financed by Fundação La Caixa, BPI, and FCT, through the project BEE4CHEESE (PL24-00071). National funding by FCT- Foundation for Science and Technology, through the institutional scientific employment program contract with Soraia I. Falcão and through the Individual Call to Scientific Employment Stimulus with Andreia F. Peixoto (2021.00771.CEECIND/CP1662/CT0007).