

Editorial

Special Issue on Propolis and Other Bee Products: Beneficial Effects on Health and Processing Technology

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Bee products are some of the most useful natural products and are favoured by natural medicine scientists for their possible pluripotent nutritional and biotic applications. They have been implemented in medicine since ancient times. Honey, propolis, bee pollen, royal jelly, beeswax and bee venom represent pluripotent raw materials that are also leading pharmaceuticals. The aforementioned raw materials are characterised via the active substances' unique contents/compositions, which are responsible for their specific therapeutic properties. The functional and health properties of bee products depend not only on the contents of bioactive substances but also on the technological processes used to develop them.

This Special Issue aims to present new perspectives on the chemical and functional properties of bee products and opportunities for different preparation technologies in order to increase the effectiveness of the biological properties of raw materials. The processing technology used may influence the different physical–chemical characteristics, chemical contents, and biological properties of bee products, which can potentially be implemented in foods, food supplements, and medicines, as well as hygiene and cosmetic products.

A total of five papers (four research papers and one review paper) addressing different types of propolis formulations and modified methods of assaying active compounds and the biological properties of bee products are presented in this Special Issue. Four articles concern propolis, and one article focuses entirely on honey.

Perak Junaković E. et al. [1] reported the encapsulation of a propolis extract with the carrier 2-hydroxypropyl- β -cyclodextrin. Scientists proposed cyclodextrins as biocompatible and non-toxic cyclic amylose-derived oligomers that may be useful in the creation of a complex with propolis. The authors highlighted propolis's potential biological properties, which depend on the polyphenolic fraction's synergy and bio-accessibility profile. Therefore, the authors used in vitro models which allowed for the evaluation of the gastrointestinal stability and bio-accessibility of the propolis complex, which may be used in supplements as well as pharmaceutical products. The researchers emphasized that the complex containing propolis and 2-hydroxypropyl- β -cyclodextrin is stable and resistant to acid–base conditions, as well as the compounds of digestive fluids.

The second article provides a perspective on different propolis extract formulations, including their encapsulation, and is presented by Zamarrenho et al. [2]. The researchers evaluated the immunomodulatory and anti-inflammatory effects of propolis in selected propolis formulations. These studies are essential and valuable for selecting the best option for suitable propolis formulation. Moreover, the scientists indicated that the anti-inflammatory effect of propolis may vary according to the process of manufacturing and concentrating propolis extracts.

The third article focuses on a different type of propolis which is unique to Brazil; in this paper, Baretto G. et al. [3] reported a red propolis extract and demonstrated its



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biological activity and chemical profile. The scientists paid attention to the efficiency of its extraction and emphasised the unique chemical composition of Brazilian red propolis. The researchers indicated formononetin and kaempferol as the main components of red propolis. Its antioxidant activity and antibacterial action are related to the contents of the mentioned compounds.

The fourth article concerns propolis and its antibacterial effect in the treatment of oral cavity infections. Otręba M. et al. [4] demonstrated that propolis from different locations possesses intense antibacterial activity. Based on a systematic review, propolis appears to be a promising product for treating bacterial infections of the oral cavity. This review paper is vital because propolis may be helpful in the prevention and treatment of various oral cavity conditions.

Another research article in this Special Issue focused on the analysis of honey. Lozada Lawag I. et al. [5] reported the modification of the traditional Folin–Ciocalteu method for evaluating the total phenolic contents in honey, with an emphasis on minimising the sugar matrix effect.

Although submissions for this Special Issue have been closed, more in-depth research in the field of bee product technologies and the biological activity of bee products is needed. Studies focusing on bee products should be continued to fully understand the mechanism of the activity of bee products, which will allow for their broader use in medicine and the pharmaceutical and cosmetic industries.

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