

MEETING ABSTRACTS

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BeSafeBeeHoney - BeeForward: Exploring Beekeeping Innovations and Science

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Exploring Beekeeping Innovations and Science: Proposals and Conclusions from the 2nd Conference in Sarajevo

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On 6 and 7 May 2025, the COST Action BeSafeBeeHoney held its 2nd International Conference — BeeForward: Exploring Beekeeping Innovations and Science, at the Hollywood Hotel, Sarajevo, Bosnia and Herzegovina. As in 2024, the event was once again a success: around a hundred researchers, beekeepers and policy makers discussed the latest challenges and opportunities for bee health, honey quality and agricultural sustainability.

The Conference reaffirmed its interdisciplinary nature, successfully uniting stakeholders across the beekeeping and bee product value chain. The event provided a platform for presenting both scientific research and professional practice, while fostering dialogue among veterinarians, food technologists, nutritionists, medical doctors, agronomists, pharmacists, experienced beekeepers, and related professionals. Discussions highlighted the critical role of beekeeping as a driver of rural development, poverty reduction, and youth engagement, while emphasizing the need for innovation, competitiveness, and harmonization with European regulations.

Key recommendations addressed pressing challenges in legislation, standardization, and quality assurance of bee products. Participants underlined the importance of strengthening surveillance for bee health, providing institutional support for queen rearing, and

promoting high-value products such as royal jelly, propolis, and geographically designated honeys. Greater attention was also called to organic production pathways, the adoption of good beekeeping and manufacturing practices, and the development of harmonized sensory evaluation methodologies to ensure consumer trust and market differentiation.

The conference further emphasized the need for standardization and evidence-based validation of apitherapy, recognizing its potential to support pharmaceutical, cosmetic, and related industries. Education emerged as a central theme, underscoring the necessity of continuous training for beekeepers and professionals across the production, processing, and distribution chain to enhance sustainability, quality, and innovation.

By bringing together diverse expertise and perspectives, the Second Conference provided a comprehensive set of recommendations toward advancing beekeeping practices, protecting bee health, and improving the competitiveness of bee products in both domestic and international markets.

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Tackling honey fraud together: how to detect adulteration with syrups using portable devices

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Honey fraud has a significant impact on the beekeeping sector. It is estimated that around half of the samples available on the market derive from illicit activities such as adulteration with exogenous syrups or origin falsification. Honeys produced in countries with inadequate



P27**Evaluation of the presence of heavy metals in beebread samples obtained from ten different countries and health implications**

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Cadmium (Cd), lead (Pb), arsenic (As), mercury (Hg) belongs to the groups of the so-called heavy metals. They can enter the food chain through various pathways, including anthropogenic activities like industrial emissions, agricultural practices, urbanisation, and including natural sources such as geological erosion and atmospheric deposition. Their ingestion could cause important health issues, including cardiovascular, neurological, renal, disease. They can accumulate in human organs such as the liver, kidneys, and bones, leading to chronic health conditions and increased mortality risk. Therefore, it is very important to control their presence in all food products including beebread. The objective of this work is to evaluate the presence of Cd, Pb, As and Hg in beebread samples obtained from COST members from 10 different countries. Bee bread samples were extracted from the combs manually or with the help of an extractor. Lyophilized samples were homogenized, and after microwave digestion, mineral content was analysed by ICP-MS. Additionally, if the levels of As and Hg were high, a differentiation between organic and inorganic species was conducted. Health risk evaluation was also conducted, and a comparison of the data between the countries is included.

P28**Beebread samples a possible source of macroelements, microelements and trace elements**

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Bees are animals from which different food products can be obtained, including honey, royal jelly, pollen, and propolis, all of which are well known. Bee bread is a bee product that is starting to gain interest. It is a combination of pollen, nectar, and bee saliva, and bees store it in the honeycomb cells. After undergoing lactic fermentation by various bacteria and yeast, which could take several weeks, the product is ready.

From a nutritional point of view, bee bread contains, in addition to carbohydrates, protein, lipids, bioactive compounds such as vitamins and polyphenols, and macro-, micro-, and trace elements.

The objective of this work is to evaluate the presence of minerals in bee bread samples obtained from COST members from 10 different countries. Bee bread samples were extracted from the combs manually or with the help of an extractor. Lyophilized samples were homogenized, and after microwave digestion, the mineral content was analysed by ICP-MS. The evaluation of the health benefits based on the consumption of bee bread regarding mineral levels and daily dose recommendations for different population groups is also presented.

P29**NMR metabolomics of honeydew honey**

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Honeydew honey is obtained from secretions of parts of living plants or excretions onto them produced by sap-sucking insects. It is held in high esteem by the general public due to its perceived beneficial effects on human health, which are considered to exceed those of floral (nectar) honey. However, the differentiation of honeydew honey is not an easy task. The existence of multiple types of honeydew honey, the lack of sufficient studies, and the absence of a universally accepted definition are significant challenges. An NMR-based approach for differentiating EU honeydew honeys of different geographical origin has been studied. Preliminary chemometrics analysis reveals the necessity of further studies to surely identify the biological and geographical origin of these types of honey.

P30**Occurrence of acaricide residues in bee products**

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The parasitic mite *Varroa destructor* is one of the main concerns for beekeeping. Faced with the challenges caused by this ectoparasitic mite, beekeeping has become dependent on management techniques to control mite infestations, with bee acaricides playing a major role. Sometimes, this situation has led to the application of doses higher than those recommended by legislation, which has resulted in the existence of acaricides in beehive products. This study aims to provide a comprehensive overview of the occurrence of acaricide residues in bee products based on the collection and comparison of data from peer-reviewed research performed across European countries and Turkey. A literature search for the six-year period (2019-2024) was conducted using databases PubMed, Scopus and Web of Science. The specific sequence of keywords, including types of bee products, country, type of study and type of acaricides, was used. The selection of the articles was made according to the year of publication, country, and number of samples. Merely original research articles written in English were taken into consideration. In the selected publications the acaricide residues were determined in different matrices: honey, beeswax, bee bread, pollen and honeybees healthy or poisoned. Only validated analytical methods were taken into consideration. A well-established methodology mainly based on LC-MS/MS and GC-MS/MS instruments was most frequently used. In the selected publications,