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ABSTRACT BOOK

PS3-64 Honey characterization and classification based on chromatographic profiles and antioxidant capacity

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Honey is a very appreciated product for its nutritional characteristics and its benefits for human health, comprising antioxidant, anti-inflammatory, antifungal, and antibacterial activities. These attributes depend on the specific composition of each honey variety, with the botanical origin as one of the distinctive features. Firstly, honey can be classified as honeydew and blossom honeys, depending on the raw material bees use to produce it. For honeydew honeys bees use plant secretions or sugar-rich materials that plant-sucking insects excrete. Contrary, the nectar of flowers is used to produce blossom honeys. Honeydew and blossom honeys show different physicochemical properties, being the antioxidant capacity, mainly relying on the phenolic compound content, one of the most important. In addition, within these two groups, honey from each specific botanical origin may have particular attributes relying on the honey composition.

In this work, honey samples were first characterized based on their bioactive compound contents. Different spectroscopic methods were used for the determination of total phenolic content (TPC), total flavonoid content (TFC), and antioxidant capacity. The Folin-Ciocalteu assay was used for the TPC determination. Regarding flavonoid content, two different methods, both based on the formation of aluminum chelates, were evaluated, observing that the response of compounds belonging to different flavonoid subfamilies depends on the experimental conditions. Lastly, the ferric reducing antioxidant power (FRAP) method was selected for determining the antioxidant capacity. Data obtained with these spectroscopic assays were treated by means of chemometric tools. As a result, a satisfactory discrimination (error 5%) between honeydew and blossom honeys were accomplished with the built partial least squares-discriminant analysis (PLS-DA) model. However, a complete classification of honeys according to their botanical variety was not fulfilled. Hence, for further characterization of the studied samples, a non-targeted C18 reversed-phase HPLC-UV-MS methodology was assessed. The obtained LC fingerprints were subjected to PLS-DA to evaluate their viability as sample chemical descriptors for classification purposes, obtaining good discrimination results between blossom- and honeydew-honey samples. In addition, the characterization and classification of honey samples according to their specific botanical origin was also achieved. Finally, several characteristic polyphenols of each botanical variety were tentatively identified by LC-MS/MS to propose possible honey markers for future experiments.

PS3-65 Dietary fatty acids as a new binding partner of C - phycocyanin: a fluorimetric study

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C-Phycocyanin (C-PC) is a phycobiliprotein from cyanobacteria, where it harvests light energy that is then transferred to chlorophylls during photosynthesis. It has an intense blue color due to a covalently bonded tetrapyrrole chromophore, and owing to this property is used in the food industry as a good natural alternative for food coloring. In addition to its coloring properties, C-PC has anti-inflammatory, antioxidant, anti-cancer, and immune-enhancing effects that qualify it as a dietary supplement already included in various formulations, mainly Spirulina extract powders. Since it is used as a food colorant and as a dietary supplement, it may interact with food ingredients, affecting its stability, digestibility, or antioxidant properties. Palmitic acid and linoleic acid (which can be metabolized to linolenic acid) are abundant in meat, milk, and edible oils, so that they could interact with C-PC. C-Phycocyanin isolated from the cyanobacterium Arthrospira platensis (Spirulina) was incubated with increasing concentrations of these three fatty acids, and its fluorescence intensity was monitored. Incubation resulted in a fluorescence quenching effect, indicating that binding had occurred. The binding equations indicated that the association constants were of the same order of magnitude and that the number of approximate binding sites was more than one ($Ka = 4.64 \times 10^4\ M^{-1}$, $n = 1.5$ for linoleic acid; $Ka = 2.88 \times 10^4\ M^{-1}$, $n = 1.9$ for linolenic acid; $Ka = 0.44 \times 10^4\ M^{-1}$, $n = 0.8$ for palmitic acid). This moderate interaction between C-PC and fatty acids could influence its behavior as a nutraceutical and food colorant.

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PS3-66 Determination of Veterinary Drug Residues in Foods of Animal Origin Using QuEChERS methology by LC–MS/MS

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The control of veterinary drug residues in food is of paramount importance for ensuring the quality and safety of food products in the European marketplace. Therefore, the European Parliament and of the Council the European Union have placed with the Directive 2019/06 a regulatory framework. This regulation lays down rules for the placing on the market, manufacturing, import, export, supply, distribution, pharmacovigilance, control and use of veterinary medicinal products [1]. The availability of safe and effective veterinary medicines is essential - to protect animals themselves, but also to protect humans from the transmission of diseases by animals, the so-called zoonoses [2, 3]. For industry and national regulatory laboratories, the challenges of controlling veterinary drug residues in food include the high number of drugs (antibiotics, antiparasitics, anti-inflammatory agents, etc.) and the diversity of foods of animal origin. It is critical to use an efficient sample pretreatment method for analyte extraction, concentration and matrix clean-up.

In this work, a sensitive QuEChERS method with an efficient cleanup for animal origin sample matrices like milk, eggs and beef was developed. The sample raw extract was purified with a cleanup-mix with customized composition. Sodium sulfate was used instead of traditionally used magnesium sulfate to allow establishing multi-residue methods because of certain veterinary drug groups tend to chelate with magnesium ions. High recovery rates of veterinary drugs like benzimidazoles, glucocorticoids and