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23404 | Improving honey authentication: Electrochemical genosensors for the detection of *Erica arborea* in commercial honey

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Background & Aim: Monofloral honeys, like heather honey, are a highly sought-after ingredient. However, food safety concerns have emerged due to the number of adulterated honeys found in the global market [1,2]. Thus, this work aimed to develop an electrochemical genosensor capable of detecting the residual DNA of *Erica arborea* (heather flower) in commercial honey samples. **Methods:** Analyzing public databases, a 98-mer *E. arborea* DNA-target probe and its complementary sequence were selected and designed. The developed genosensor was constructed on screen-printed gold electrodes. The electrochemical signal resulted from the sandwich-format hybridization reaction between the DNA-target and its complementary probe, previously cut into a 28-mer DNA-capture probe and a 70-mer DNA-signaling probe labeled with a fluorescein. Honeys samples were acquired from the local markets and their DNA extracted and amplified using DNA kits. **Results:** Employing chronoamperometry, a linear correlation was obtained in a 0.03 to 2.00 nM concentration range. The DNA from the purchased honey samples were successfully extracted and applied to the genosensor. **Conclusions:** The developed electrochemical genosensor was able to detect the presence of *E. arborea* in the analyzed honey samples. This device is a promising analytical tool to combat honey fraud, facilitate honey authenticity and promote food safety.

Keywords: Eletrochemical genosesnsors, *Erica arborea*, Food safety, Honey authentication.

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References:

[1] C. Brooks, L. Parr, J.M. Smith, D. Buchanan, D. Snoich, A. Hebishy. A review of food fraud and food authenticity across the food supply chain, with an examination of the impact of the COVID-19 pandemic and Brexit on food industry. *Food Control*, **2021**, 130, 108171.

[2] S. Soares, F. Rodrigues, C. Delerue-Matos. Towards DNA-Based Methods Analysis for Honey: An Update. *Molecules*, **2023**, 28(5), 2106.