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ELECTROCHEMICAL SENSORS FOR PESTICIDE RESIDUE DETECTION IN FOOD

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Pesticide residues are becoming a greater concern to ecosystems and human health as a result of the widespread use of pesticides in vectors (insects, larvae, fungi, etc.) to fulfill the worldwide demand for agricultural food. Due to several benefits, such as high robustness, reliability, cost-effectiveness, on-site application, systematic manufacturing approach, simplicity of detection, sensitivity, and selectivity, electrochemical sensor platforms have emerged as strong analytical tools for pesticide detection. Furthermore, portable electrochemical devices have been fabricated recently for point-of-care and on-site detection of pesticides residues. Electrochemical detection focuses on the measurement of the electrical quantity arising from the interactions and interfaces between the detection electrode and the target analyte, such as potential, current or charge, associated with a chemical, biological or biochemical reaction. These processes occur at an auxiliary electrode, a working electrode, and a reference electrode. With increasing demands for applications in the food industry, the expectation and requirements on sensor performance, such as high detection, accuracy, stability, analyte compatibility, promote gradual expansion in scientific research. Therefore, several challenges are presented to promote the improvement of sensors, paving the way for technologies related to sensors that use biodegradable polymers. Natural polymer-based substrates are economical, available, biodegradable, and biocompatible, consisting of macromolecules derived from animals or plants, which contain repeating units of proteins (silks and gelatins) and polysaccharides (cellulose, sodium alginate, chitin, and chitosan). Due to the different chemical structures and physical properties, natural polymers can be applied in the field of sensors. This study's dissemination will be a valuable asset and tool for scientific and technological knowledge, understanding characteristics of electrochemical device fabrication, electrochemical detection strategies for rapid on-site detection of pesticides, and promoting new developments in agricultural science, electrochemical science, and food science and technology.

Referências bibliográficas:

Raymundo-Pereira, P. A., Gomes, N. O., Shimizu, F. M., Machado, S. A. S., & Oliveira, O. N. (2021b). Selective and sensitive multiplexed detection of pesticides in food samples using wearable, flexible glove-embedded non-enzymatic sensors. *Chemical Engineering Journal*, *408*, 127279. https://doi.org/10.1016/j.cej.2020.127279

Silva, R. R., Raymundo-Pereira, P. A., Campos, A. M., Wilson, D., Otoni, C. G., Barud, H. S., Costa, C. A. R., Domeneguetti, R. R., Balogh, D. T., Ribeiro, S. J. L., & Oliveira Jr., O. N. (2020). Microbial nanocellulose adherent to human skin used in electrochemical sensors to detect metal ions and biomarkers in sweat. *Talanta*, *218*, 121153. https://doi.org/10.1016/j.talanta.2020.121153

Spangenberg, B. (2012). Standard addition method for the quantification of paraquat, diquat, difenzoquat, mepiquat, and chloromequat in water by thin-layer chromatography. *Journal of Planar Chromatography – Modern TLC*, *25*(3), 262–268. https://doi.org/10.1556/JPC.25.2012.3.13

Tang, F. H. M., Lenzen, M., McBratney, A., & Maggi, F. (2021). Risk of pesticide pollution at the global scale. *Nature Geoscience*, *14*(4), 206–210. https://doi.org/10.1038/s41561-021-00712-5

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