

Results of the Project

"Innovative Zeolite/Graphene Electrodes on Stone Paper for Pesticide Detection in Fruits and Vegetables" (acronym SMARTSENS)- Website: <https://www.itim-cj.ro/PNCIDI/smartsens/>

Project No. TE 153 / 2022, Project Code PN-III-P1-1.1-TE-2021-0358

Summary of Stage 3 (January 2024- May 2024)

The stage encompassed 3 activities, summarized below:

1. Pesticide Detection Testing:

- Tested electrodes based on zeolite/graphene-cobalt nanoparticles and gold-cysteine-cobalt nanoparticles for detecting pesticides (cymoxanil and glyphosate).
- Evaluated electrocatalytic efficiency for pesticide detection.

2. Sensor Calibration and Evaluation:

- Calibrated sensors for pesticide detection.
- Evaluated electroanalytical characteristics: sensitivity, detection limit, and linear range.
- Tested influence of anionic and cationic interferents on pesticide detection.

3. Complex Matrices Detection and Technology Validation:

- Detected pesticides in complex fruit and vegetable matrices.
- Validated laboratory technology for pesticide detection.
- Integrated all components of the mobile pesticide detection system: sensor, potentiostat, and controller (smartphone), ensuring ease of use.

The best electrode for the detection of cymoxanil is E-Gr-Z-CoNPs, while the best electrode for the detection of glyphosate is Au-CYS-CoNPs-H.

Results: - One ISI article.

- One international conference participation.
- One laboratory technology for pesticide detection.
- Three products: pesticide detection sensor, experimental pesticide detection device (sensor-portable device), smartphone detection system.

Project Director:

Dr. Codruța Mihaela Varodi

