Citizens involvement in air biomonitoring with strawberry plants

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In Seixal, a densely populated urban-industrial municipality, with a high influence of traffic and industry (namely steelworks), occasional settled dust events have increased the population's concerns regarding the impacts of the air pollution on their health. Therefore, the need to pinpoint the sources of these events and to study the local air quality, has emerged among local authorities [1,2]. The present study aims to answer this problem by biomonitoring particulate air pollution using strawberry plants as biomonitors, in a citizen science project, aiming to map and identify pollution hotspots.

In order to engage the population with the biomonitoring program and increase air quality literacy, a local meeting was held with the population on February 1st, 2020, in order to explain all the phases of the study and the procedures expected from the participants for taking care of the strawberry plants during the exposure period. A total of 78 strawberry plants were distributed. From February 1st until June 16th, the strawberry plants were placed in the open air, in a ground or first floor of the volunteers' houses. At the end of the exposure period, the volunteers collected branches of each strawberry plant and sent them to the Lab, where leaves were lyophilized, grinded to powder and pelletized, for analysis by micro-X-Ray Fluorescence (micro-XRF) technique, to assess the concentration of 25 chemical elements. Afterwards, a GIS software was used for creating maps of the chemical elements' spatial distribution, allowing to pinpoint air pollution hotspots.


Sessão do Fórum Seixal em Aldeia de Paio Pires

População participa em Estudo sobre Poluentes Atmosféricos

Figure. Citizens' engagement in the biomonitoring project, for biomonitors exposure.

[1] Justino, R., et al., 2019. Contribution of micro-PIXE to the characterization of settled dust events in an urban area affected by industrial activities. J. Radioanal. Nucl. Chem., 322, 1953–1964;
[2] Abecasis, L., et al., 2022. Spatial Distribution of Air Pollution, Hotspots and Sources in an Urban-Industrial Area in the Lisbon Metropolitan Area, Portugal—A Biomonitoring Approach. Int. J. Environ. Res. Public Health 19, 1364.

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