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Editorial

Special Issue Editorial: Biomonitoring of Atmospheric Pollution

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Despite the introduction of cleaning technologies in industry, energy production and transport, air pollution remains a major health risk; nonetheless, achieving a good air quality is a necessity for human health and ecosystems. Before taking actions to improve air quality, efforts should be made to understand pollutant spatial and temporal dynamics and realize adequate solutions for their constant monitoring. The automatic devices used nowadays for air monitoring are accurate but too limited in number (due to their excessive costs) to describe the spatial-temporal trends of pollutants. Biomonitoring is an effective alternative technique to acquire data about pollution, but to date, there are still several open issues needing exploration by the scientific community involved in this field. In this Special Issue, our aim is to evaluate and collect contributions based on new biomonitoring techniques or on the improvement of already existing methodologies. This Special Issue consists of four articles concerning different aspects of biomonitoring techniques using cryptogams and higher plants.

In the first article, Fortuna and co-workers reported results concerning five biomonitoring surveys performed in the proximity of a waste incinerator over a 16-year period. The Hg emission was monitored by means of both native and transplanted biomonitors based on three biomonitors (i.e., two epiphytic lichens: *Pseudevernia furfuracea* and *Xanthoria parietina*; one vascular plant: *Robinia pseudoacacia*). The research revealed that Hg concentrations observed in biomonitor samples varied according to the species (*P. furfuracea* accumulates three times more Hg than the other biomonitors) and to the status of the waste incinerator plant (active vs. inactive). The results showed that both native and transplanted biomonitors are efficient tools to provide a reliable estimation of the spatial changes of Hg concentrations in the environment.

In the second article by Cecconi and co-workers, a new dimensionless, species-independent "bioaccumulation scale" for native and transplanted lichens is proposed. The interpretation of lichen bioaccumulation data is of paramount importance in environmental forensics and decision-making processes. The proposed scale, based on the ratios between experimental and benchmark values, overcomes most critical points affecting previous scales. In the third article by Varela, the authors evaluate the potential use of glutathione as a biomarker. They quantified the concentrations of glutathione in the terrestrial moss *Pseudoscleropodium purum* growing in industrial environments characterized by high atmospheric levels of Cd, Ni and Pb. The authors evidenced the existence of a glutathione threshold response, which was significantly correlated with metal pollution level. Therefore, although future studies are needed, total concentration of glutathione in *P. purum* could be used as a biomarker in air pollution biomonitoring. The fourth and last article accepted in this Special Issue is the work by Mejía-Echeverry, in which the authors proposed a novel methodology based on magnetic parameters and an epiphytic biomonitor (*Tillandsia recurvata*) of air pollution in order to implement the air pollution monitoring network at low cost. The proposed methodology allowed them to validate the magnetic biomonitoring methodology in high-precipitation tropical cities and identify the most polluted areas in the Metropolitan Area of Aburrá Valley.

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