



PARAMETERS RESULTING FROM NON-INVASIVE AND INVASIVE BIOMONITORING RESEARCH ON PLANTS

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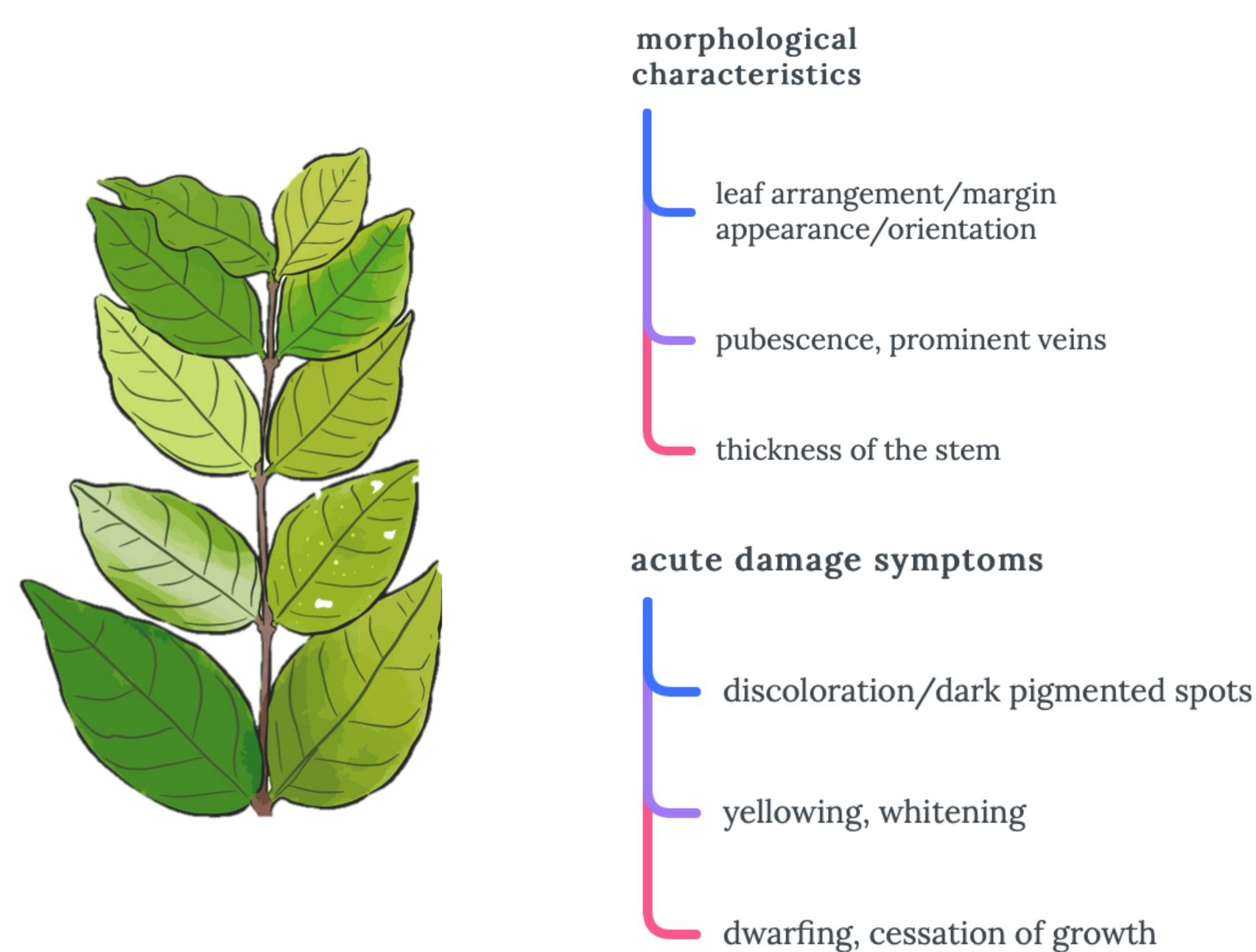
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Abstract: Currently, air pollution is one of the main environmental problems. Biomonitoring is a common and feasible method for air quality assessment in different environments. In monitoring plants in urban environments, it is essential to identify and evaluate the right parameters to give us a complete and detailed picture of their state of health and evolution. This review paper aims to mention the parameters that respond as bioindicators in the monitoring of plant organisms to reveal relevant data regarding the environmental quality of their habitat, considering both invasive and non-invasive methods. To achieve the most exhaustive classification of plant parameters, various evaluable plant characteristics, morphological, morphometric, biochemical, and physiological aspects were considered, thus providing a solid basis for data analysis and interpretation.

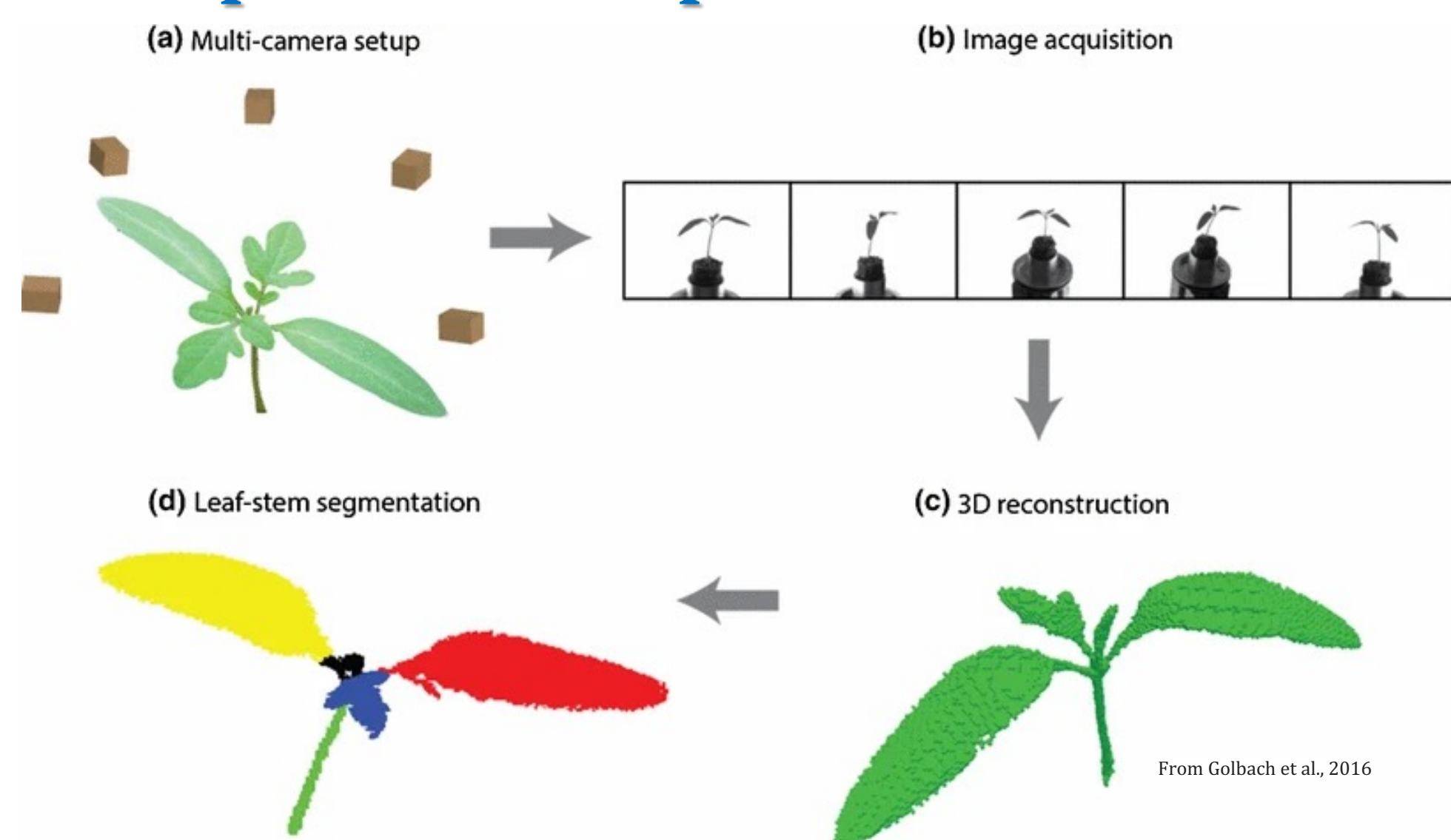
• Introduction

This paper aims to mention parameters that act as bioindicators in monitoring plant organisms to unveil pertinent data regarding the environmental quality of their habitat, both using invasive and non-invasive methods.

• Morphological parameters

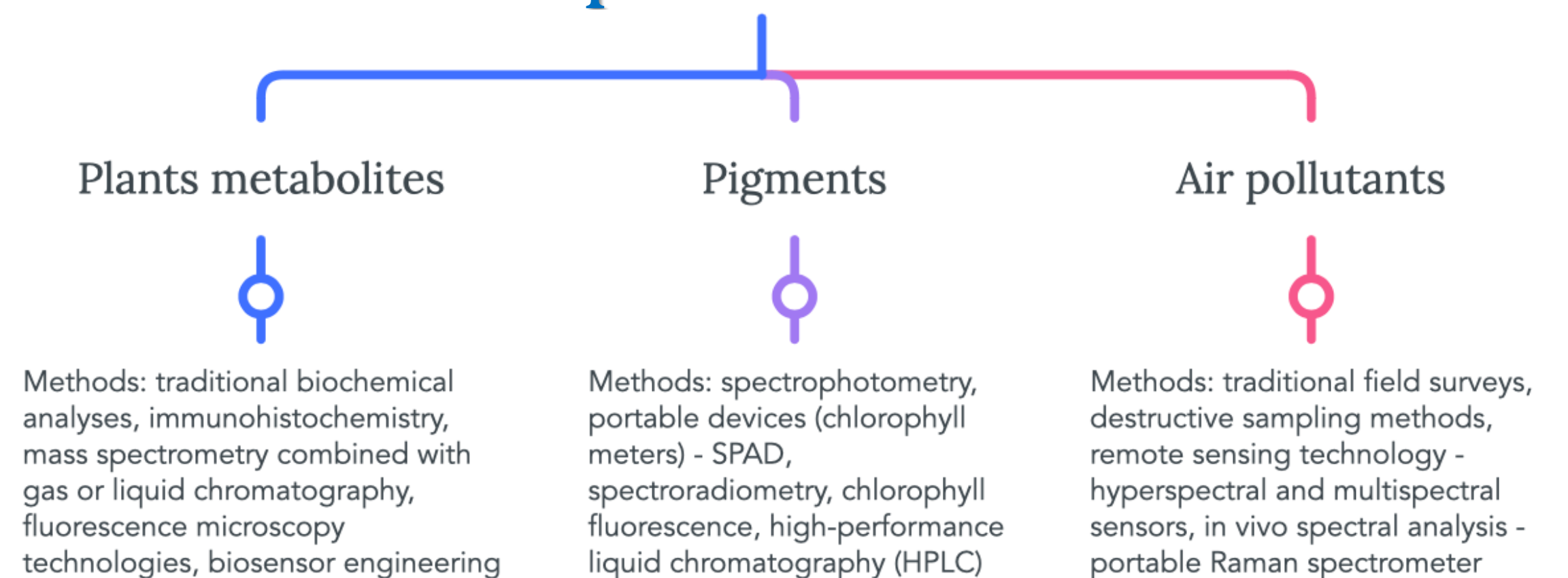


• Morphometric parameters

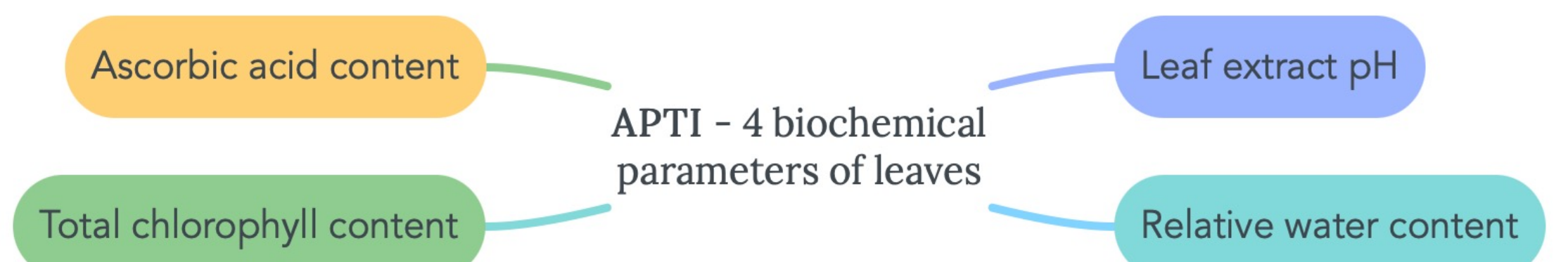


Plant phenotyping using 3D point cloud measuring techniques – non-invasive laser triangulation, structure from motion, light field cameras. Calculations at various stage of plants development.

• Biochemical parameters



• Biomonitoring through APTI and API



APTI - effectively used to identify bioindicators (tolerant or sensitive plant species) to be used in polluted environments. API - the combination of APTI values and relevant biological and socio-economic characteristics.

• Physiological parameters

| Parameter | Methods |
|-------------------------------|--|
| Water content | Fresh/dry matter ratio, remote sensing (MIR/NIR) |
| Photosynthetic activity | Gas exchange measurement, portable devices |
| Respiration and Transpiration | Gas flux measurements in field |
| Stomatal Function | Non-invasive pressure probes |
| Temperature | Thermographic images |

• Conclusions

- Biological monitoring of urban habitats is necessary to assess the additive effects of pollutants on living organisms. Techniques that use non-destructive methods are becoming increasingly important over chemical-analytical methods.
- Efficient and precise monitoring requires the identification and evaluation of suitable parameters, thus providing a solid foundation for data analysis and interpretation. Non-invasive

Bibliography

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