1. BACKGROUND: Particulate Matter (PM) and Green Roofs

Particulate matter (PM) is a mixture of both solid and liquid compounds that can be found suspended in the air. PM 2.5 (≤2.5 µm) is the most hazardous portion as it can penetrate to the gas-exchange region of the lung. “Respiratory diseases and dysfunctions are the main concern to the increasing PM concentration in dense cities.”

Micro and macro morphological characteristics of vegetation like roughness, epidemical and cuticular features, and leaf arrangement design are key factors that determine their potential as PM retention surfaces. However, weather conditions like precipitation and wind speed can remove a 48% to up to a 36% of the retained PM on leaf surface of urban vegetation. “Up to 50% of the impervious city surface is rooftops” By making use of this unexploited space, non-cultivable surface in cities would be transformed into atmospheric PM sinks. Green roofs (GR), with all their benefits to human and environmental health, are a smart design solution to use up this forgotten urban space.

3. HYPOTHESES

“Grosses, with their parallel grooves and blade-like macro morphology, together with hairy leaf species, will presumably retain higher amounts of atmospheric PM. A loss of PM is expected to be found after rainy and windy events, being of a higher or lesser importance depending on leaf wax content and leaf micro and morphological characteristics.”

4. MATERIALS AND METHODS

4.1. Material

“Sedum Mix” "Lavandula dentata" "Festuca glauca"

4.2. Methods

PM quantification

5. EXPECTED RESULTS

5.1. Expected results

“Different retention rates according to micro and macro morphological characteristics of selected species”

6. TIME TABLE

6.1. Time Table

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct</td>
<td>Nov</td>
</tr>
<tr>
<td>GrB installation</td>
<td>Leaf sampling period</td>
</tr>
</tbody>
</table>

TOTAL 59,000€

Equipment (GrB, Weather Station) 7,200€

Materials (PM filters, grb) 3,200€

Personnel expenses 43,200€

Travel expenses 5,400€

References: