**Mosses and heavy metal pollution in Mediterranean environments**

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The role of mosses in biomonitoring of heavy metal deposition is widely known. In one hand, this group of plants is diverse and almost ubiquitous in terrestrial environments. In the other mosses are able to absorb atmospheric pollutants through their whole surface, and, as most species are perennials, they allow recording the deposition of pollutants over several years.

There are several programs in Europe using mosses in biomonitoring heavy metal pollution. However, both the methods and the species used have been standardized for North & Central European habitats. In the Mediterranean region, the applicability of these methods is frequently uncertain.

In order to assess the effect of heavy metals in Mediterranean areas, we are currently working on several lines, as follows:

- *In vitro* experiments to evaluate lead tolerance of moss species. We have detected significant differences between closely related species from rural and urban environments, as well as among different families. Besides, we have found that one of the urban species is able to germinate under extremely high concentrations of lead, a previously unrecorded tolerance in plants. Finally, we have also studied the ultrastructural effect of lead on spore germination, here we have found an exclusion mechanism in at least one of the species.

- Critical assessment of biomonitoring methods using moss communities to estimate the environmental impact of different human activities. We have established some guidelines for successful comparisons of moss diversity and abundance between urban settlements, validating our observations with official measurements of pollution levels. In addition, we have studied the effect of highways through sampling of terricolous mosses. We have evaluated to which extent they are applicable in highly fragmented, Mediterranean landscapes, and analyzed how the persistence of lead in soils contributes to the differences in community composition.

Currently, we are extending our studies to a wider spectrum of moss species and contamination sources, such as car batteries and metal mining.