Study of the bio monitoring potential of acclimated Tillandsia species in Occitanie for metal air pollution

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Introduction

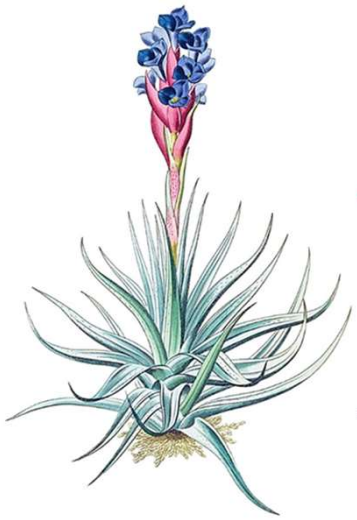
Tillandsia genus belongs to the Bromeliaceae family and is distributed from the South of the United States to the South of Argentina. More than 700 species are listed worldwide[1,2]. Among the 350 different species cultivated at *Tillandsia* PROD plant nursery, the studied *Tillandsia* species for this PhD (*T. aeranthos* and *T. bergeri*) are acclimated to the Occitanie region.

Tillandsia aeranthos

Tillandsia bergeri

Bio monitoring is the study of the pollution of a region helped with a plant able to accumulate pollutants[3]. In our case, we focus on air pollution and *Tillandsia*, commonly known as "air plants" could be, referring to the bibliography, interesting bio indicators for the monitoring of air pollution[4]. *Tillandsia aeranthos* and *Tillandsia bergeri* have never been studied for their ability to accumulate pollutants from the air. Thus, this study is of interest because *Tillandsia* are epiphytic plants, independent from the soil, growing by up taking nutrients from the air or the rainwater.

Study of the bio monitoring potential for metal air pollution



Tillandsia acclimated in Occitanie

Determination of control values from unpolluted area →  → Sampling area

Exposition of *Tillandsia* to city and industrial pollution → Monitoring of bio accumulation in *Tillandsia* on 6 exposure sites. Evaluation of the accumulation as a function of the time.

Laboratory experimentation in a controlled atmosphere[5] → Determination of maximum metal accumulation capacity of *Tillandsia*. **Soaking method**

Primary results for 1 exposure site (in ppm and ppb)

As	Ba	Pb	Pd	Pt	Co	Cr	Cu	Fe	Mn	Ni	Sn	Ti	Zn
0,247	0,043	0,013	0,057	0,018	0,055	0,028	0,012	0,600	0,039	0,013	0,187	0,055	0,123

Results were obtained by ICP-OES and ICP-MS analysis with calibration curves of the 14 studied metals

Conclusion and perspectives

Exposure of *Tillandsia* acclimated in Occitanie and study in a controlled atmosphere allow the evaluation of the accumulation and bio indication ability of metals air pollution by *Tillandsia* over time.

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References

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