Landscape factors influencing urban wasteland's flora
The case of 2 middle-sized cities: Tours & Blois, Centre region, France

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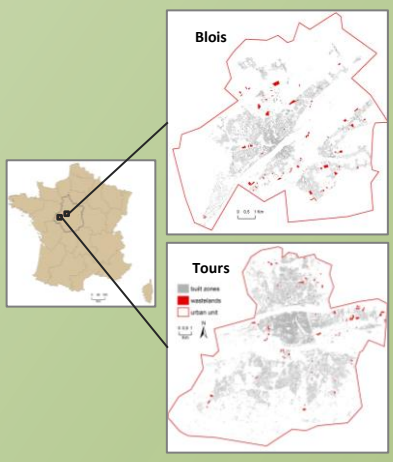
Urban wastelands

- Abandoned lands where plant species grow without human control
- Reservoir of biodiversity
- Uniformly distributed in cities
- Lack of management: species directly influenced by urban landscape

What is the influence of urban landscape on floristic diversity and functional composition?

Hypothesis

- Has a negative impact on species richness
- Promotes exotic and/or invasive species
- Filters species specifically adapted to urban conditions



Methods and data

City scale :
Corine Biotope context (*activities / urban / open*), distance to the center of the city (*center_dist*), population density (*pop_den*)

Neighborhood scale (200 m around sites):
% built-up area (*built_pr*), mean height of buildings (*height*)

Local scale (Wasteland characteristics):
age, area, past use (*agricultural / stock / built-up / green space*)

Impacts?

- Floristic diversity: Species richness, % of exotic species
- Floristic & functional composition

Land-use characterization:
From orthophotos + geographic database (IGN)
Photo-interpretation of land-use patterns 500 m around wastelands

179 wasteland inventoried:
Sampled by photo-interpretation
Within the urban unit and accessible

Vegetation sampling:
10 quadrats of 2m² per wasteland
Presence / absence of each species

Results

Wasteland flora:

544 species (26% of regional pool)
Average : 58,6 species per wasteland
105 exotic species (49% of regional pool)
including 21 invasive
1 protected at European scale
12 protected at regional scale

Urban environment has an effect on:

➢ **Floristic composition :**
Floristic distance among wastelands is significantly **correlated with environmental distance**
(Mantel test; r=0,31; P=0,004)

➢ **Floristic diversity :**
Species richness ↗ when:
distance to the center ↗ (glm; P=0,001)

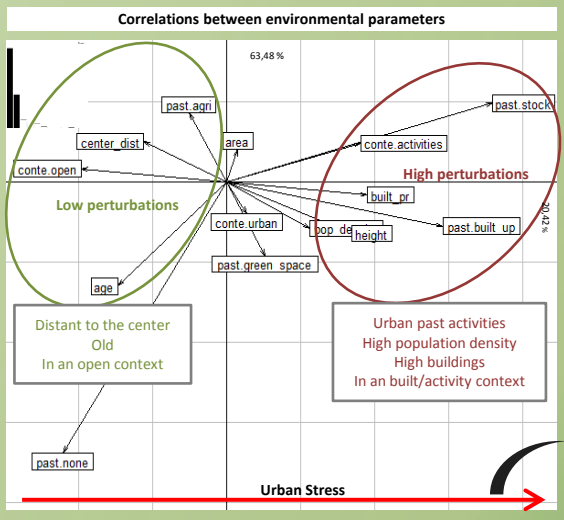
% of exotic species ↗ when:
- mean height of buildings ↗ (P=0,001)
- human population density ↗ (P=0,0001)
- distance to the center of the city ↘ (P=0,002)
- wasteland area ↘ (P=0,013)

Urban environment filters species with urban functional traits:

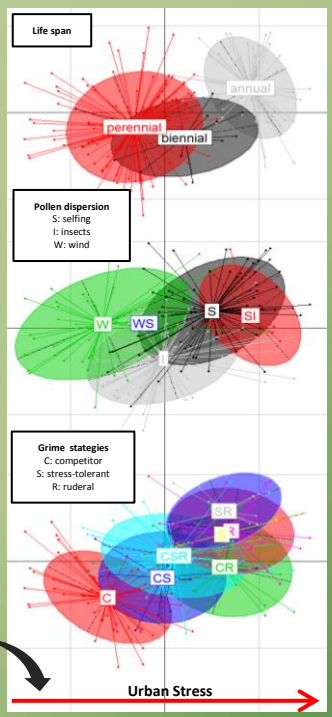
RLQ Analysis: study relationships between species traits (Q) and sites parameters (R) using the species/sites link tab (L). Each species is represented by a point and ellipses are groups of species.

In urban stress conditions, plants are significantly more annual, ruderal & stress-tolerant, and have a less long distance dispersion (selfing and insect pollination).

Correlations between environmental parameters



Relationship between groups of functional traits and environmental parameters



Environmental parameters are related to the 1st axe of the analysis, and represent a perturbation gradient inducing stress

Conclusion and perspectives

- **Urban environment :**
induces stress
filters adapted plant communities

- **Under urban stress conditions:**
exotic species favored
plants show typical urban functional traits

Urban wastelands:
Contributes to urban floristic diversity
Often neglected in urban biodiversity planning & by city dwellers

What next?

Potential role in urban planning projects :
- Diachronic study to understand the development of wasteland sites
- Investigations concerning green space managers and owners

Research project DUE « Contribution des délaissés urbains à la Trame Verte et Bleue : leur rôle pour le déplacement des plantes en ville »

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