

Biodiversity Assessment of Disused Railway Areas in Vienna

Combining Floristic and Ecophysiological Aspects

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INTRODUCTION

Floristic investigations on railway areas have a long tradition. This study combines floristic and plant-ecophysiological investigations in order to characterize disused railway areas in Vienna (Fig. 1) from an integrated point of view.

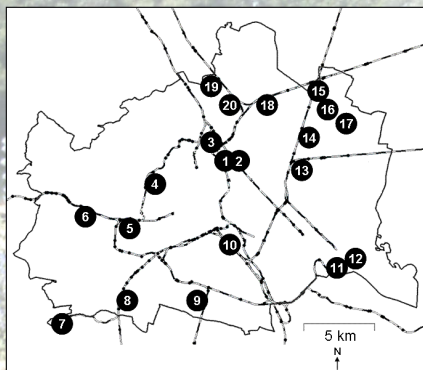


Fig. 1: Main railway lines and disused railway sites investigated in the urban area of Vienna

1 Frachtenbahnhof Wien-Nord I, 2 Frachtenbahnhof Wien-Nord II, 3 NW-Bahnhof, 4 Hernals, 5 Cumberlandstraße, 6 Hütteldorf, 7 Kaltenleutgeben, 8 Liesing, 9 Inzersdorf, 10 Frachtenbahnhof Wien-Süd, 11 Frachtenbahnhof Albern, 12 Lobau, 13 Stadlau, 14 Kagran, 15 Süssenbrunn, 16 Campingplatzweg, 17 Breitenlee, 18 Paukerwerkstraße, 19 Langenzersdorf, 20 Neujedlersdorf (© ÖBB, Stadt Wien)

FLORISTIC INVESTIGATIONS

On 20 disused railway areas of different size and of different age examined within the urban area of Vienna, 516 vascular plant species – or 23.5 % of the total number of vascular plants growing in Vienna – were found.

19.8 % of these 516 species are named in the Austrian Red List of endangered plant species (Niklfeld & Schratt-Ehrendorfer 1999), neophytes come to 19.4 % (details Fig. 2).

Furthermore, 42 moss species and 8 lichen species, but no ferns were found on the investigation sites.

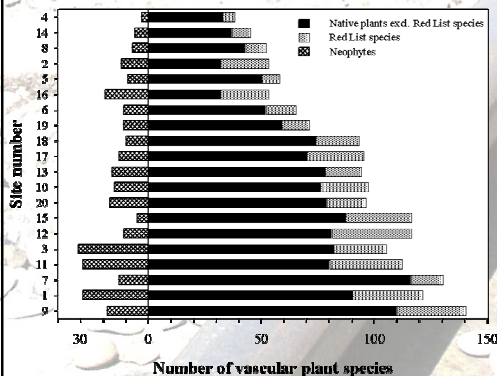


Fig. 2: Number of alien and native plant species found on disused railway sites

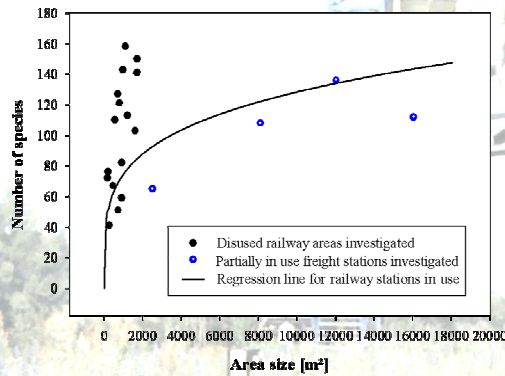


Fig. 3: Relation between area size and species number of disused railway areas in Vienna

For comparison, the correlation between area size and species richness of railway stations in use [$y = -128.47(x/10000)^{0.2351}$] according to Brandes (2005), is shown.

ECOPHYSIOLOGICAL INVESTIGATIONS

Microclimatic measurements reveal the extreme climatic conditions existing on fallow railway areas (Fig. 5). Plants growing on disused railway areas have to deal with stress inducing factors such as low relative humidity, higher temperatures and dryness.

As adaptation to these habitat conditions, the investigated plants show high heat resistance (Fig. 4), high diffusion resistance and transpiration limitation during the summer (see Fig. 6).

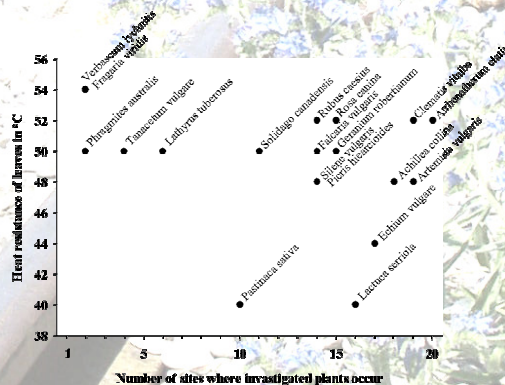


Fig. 4: Maximum heat resistance (August 2004) of selected plants in relation to abundance

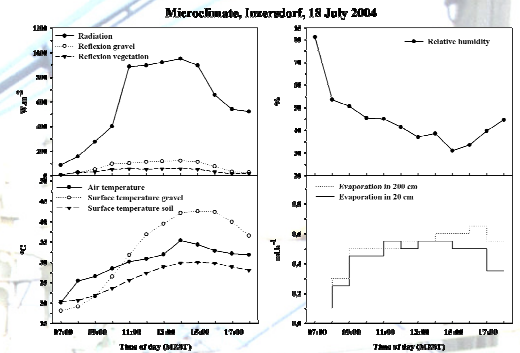


Fig. 5: Microclimatic conditions and evaporation on the disused railway area Inzersdorf, July 2004

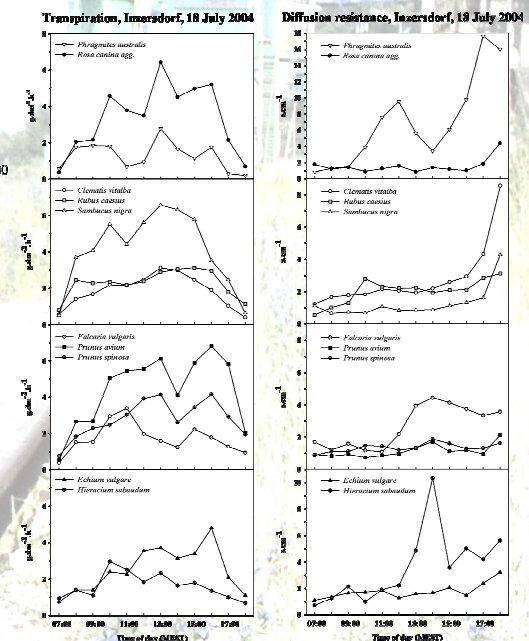


Fig. 6: Transpiration and diffusion resistance during the course of the day of selected plants growing on the disused railway area Inzersdorf, July 2004

CONCLUSIONS

Disused railway areas in Vienna cover only a small part of the urban area, nevertheless they offer a great number of plants and animals growing space and refuge. The high diversity of the fallow railway sites investigated results from several factors:

- high variety of micro-habitats,
- different age of the fallow land and therefore different succession stages,
- disturbances occur from time to time,
- spreading of species is supported by the linking character of railway lines,
- different ecophysiological adaptation strategies of plants to their habitat.

REFERENCES

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ACKNOWLEDGEMENTS

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