

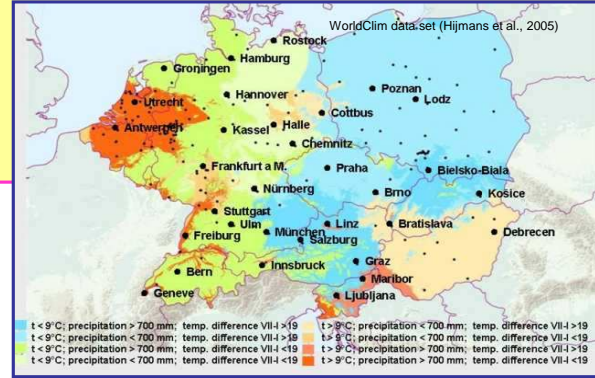
# Diversity of Central European urban land snails

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Effect of urban habitats on species composition and diversity of land snails was assessed in 32 large cities of 10 countries in Central Europe.

In each city, species composition was recorded in seven 1-ha plots:



## Historical city square

usually with pre-19th century houses, and with paved or sealed area > 90%



*Zonitoides arboreus* (0.31)

## Residential area with compact building pattern

consisting of family houses at least 50 years old and private gardens



*Alinda biplicata* (0.24), *Limax maximus* (0.22), *Cepaea hortensis* (0.21)

## City park

with old deciduous trees (tree cover 20–50%) and frequently mown lawn



*Arion distinctus* (0.21)

## Residential area with open building pattern

consisting of blocks of flats built in the 1960s–1980s, with lawns and scattered trees and shrubs



*Deroceras reticulatum* (0.22), *Cochlicopa lubrica* (0.21), *Arion distinctus* (0.21)

## Boulevard

with 19th century houses, lines of trees, small lawns, and paved or sealed area < 70%



## Mid-successional site

abandoned for 5–15 years, dominated by perennial grassland with scattered shrubs and trees



*Succinella oblonga* (0.46), *Vitrina pellucida* (0.45), *Monacha cartusiana* (0.44), *Urticicola umbrosus* (0.37), *Succinea putris* (0.34), *Fruticicola fruticum* (0.34), *Monachoides incarnatus* (0.33), *Euomphalia strigella* (0.28), *Cepaea vindobonensis* (0.26), *Arion lusitanicus* (0.24), *Helicodonta obvolvata* (0.23), *Trochulus hispidus* (0.23)

## Early-successional site

recently disturbed sites with prevailing bare ground and vegetation cover < 20%, usually in or around construction sites

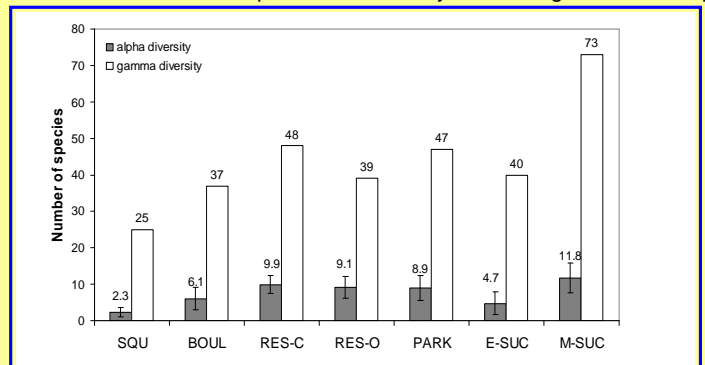


Association of species with particular habitats was determined using the phi coefficient of association. Species are listed by decreasing values of the phi coefficient (in brackets). Only snail species with  $\Phi > 0.2$  are shown.

A total of 87 snails were recorded. Both habitat types and climate had significant effects on species composition with no shared variation between these two predictors.

	Habitat type	Climate
Unadjusted R <sup>2</sup> (%)	10.7	7.8
Adjusted R <sup>2</sup> (%)	8.2**	6.3**

Total explained variation, pure effect of urban habitat types, climate and their shared effect on the composition of land snail assemblages in Central European cities. Significances of adjusted R<sup>2</sup> values were tested using permutation tests (999 permutations). Calculations for plants were based on presence-absence data; for snail on log-transformed abundance data, but results for presence-absence data were almost identical (not shown), \*\* = P < 0.01.



Numbers of species per plot (alpha diversity) and total number of species found in particular urban habitats (gamma diversity). For alpha diversity mean and standard deviation is given. The same letters indicate groups of habitats with no significant difference in alpha diversity according to Tukey post-hoc tests, P < 0.05