



# Observer bias and its causes in botanical records on summits

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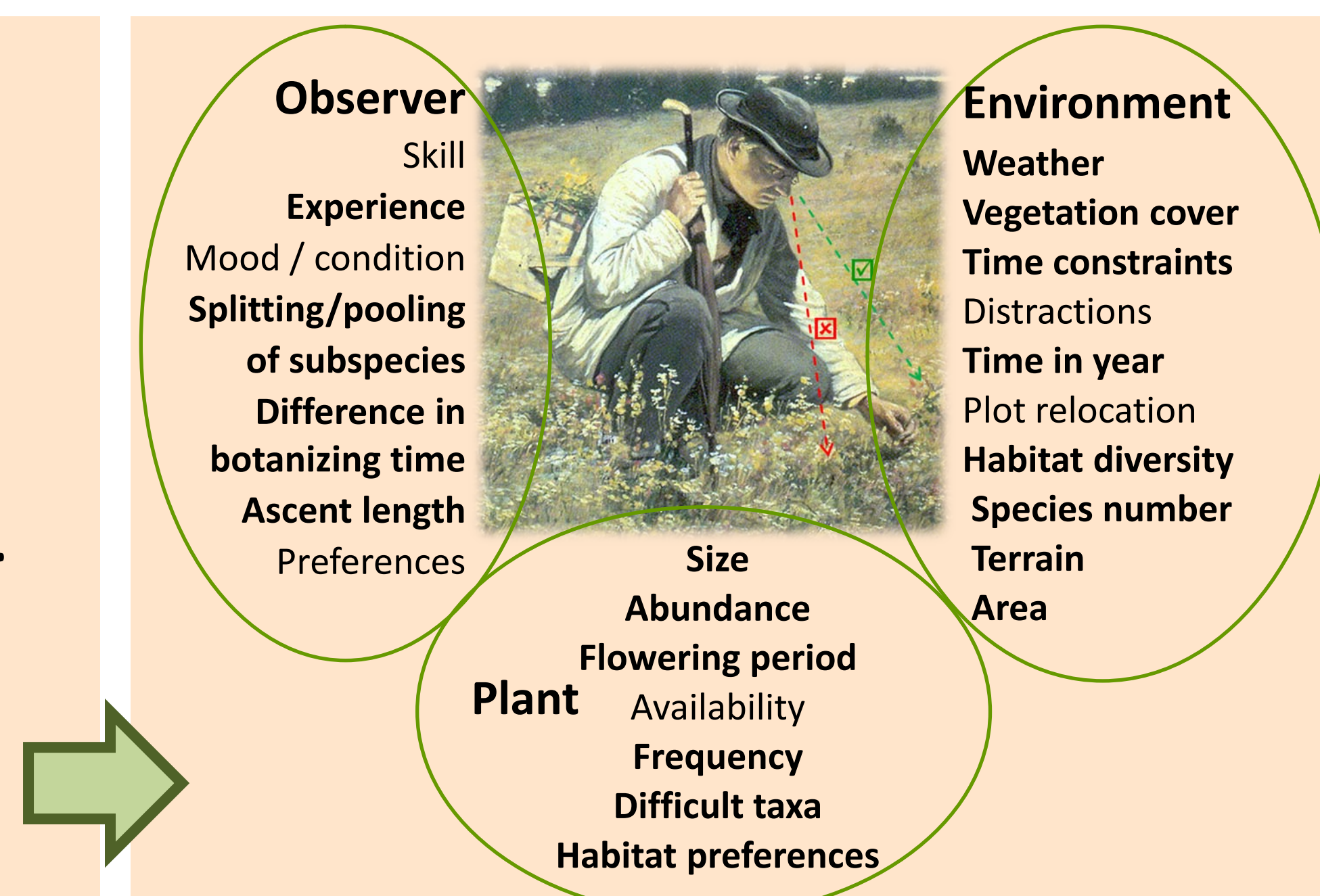
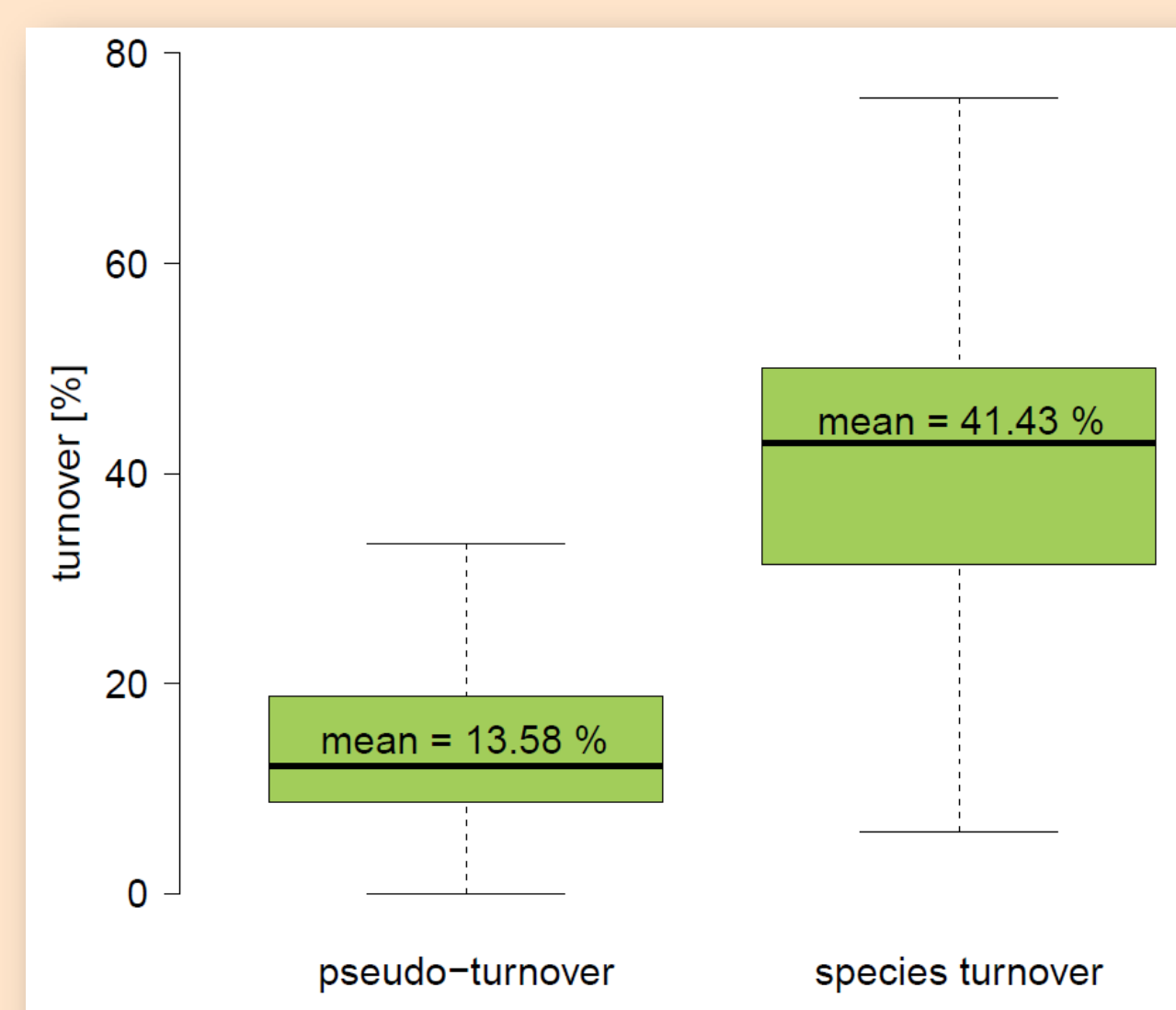
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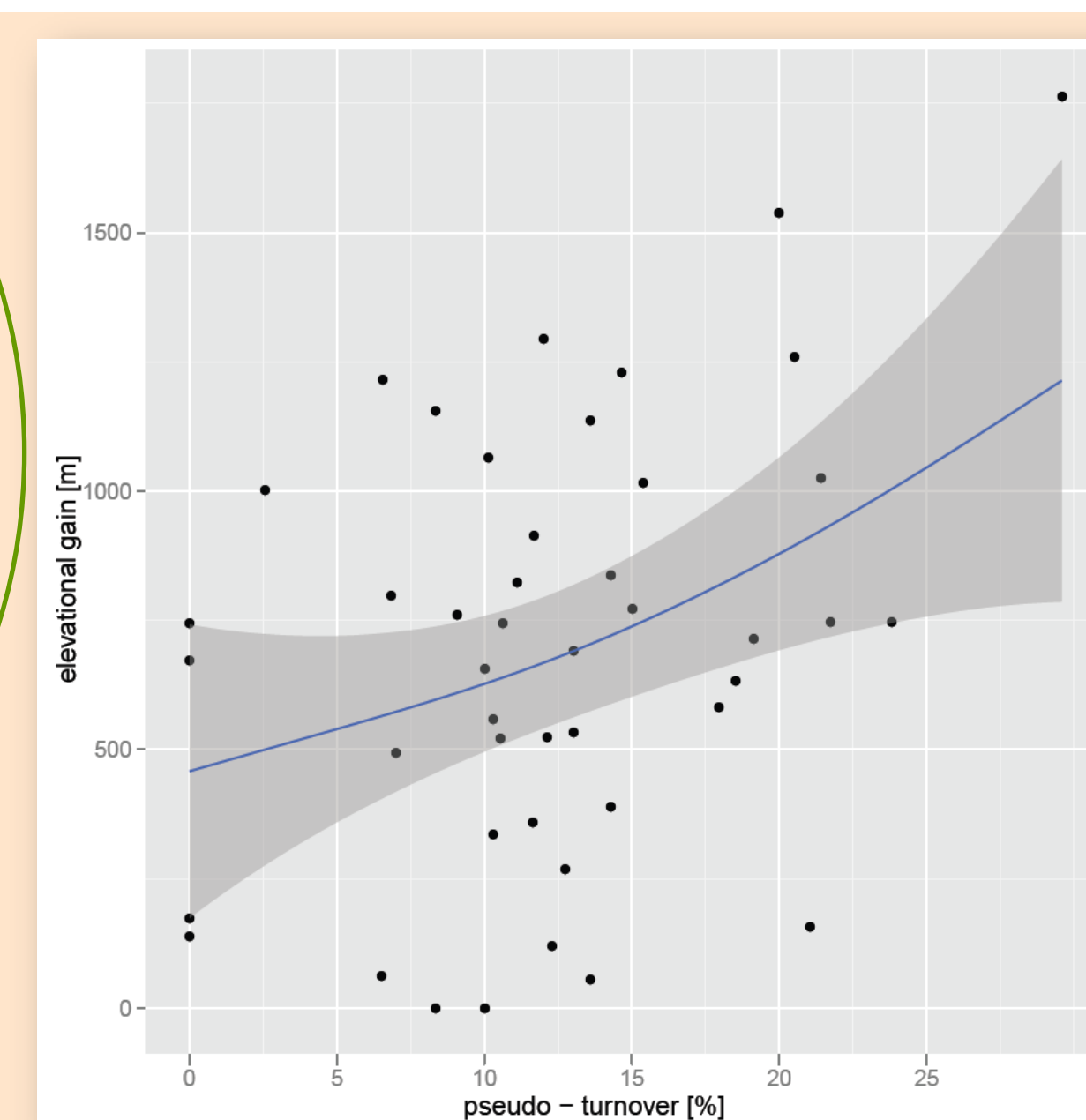
Quality and reproducibility of vegetation records are influenced by the fact that two observers don't always see the same species. But what are the really important factors causing observer bias? What is the influence of botanizing circumstances, mountain characteristics, the plant species or the observer himself? I calculated pseudo-turnover for 48 summits in eastern Switzerland where two independent observers made a record on the same day. A large variety of possible causal factors were tested for influence on pseudo-turnover. Species characteristics of 252 species found on 120 summits were analyzed to determine why some species are more often overlooked than others.

## Pseudo – turnover vs. real turnover

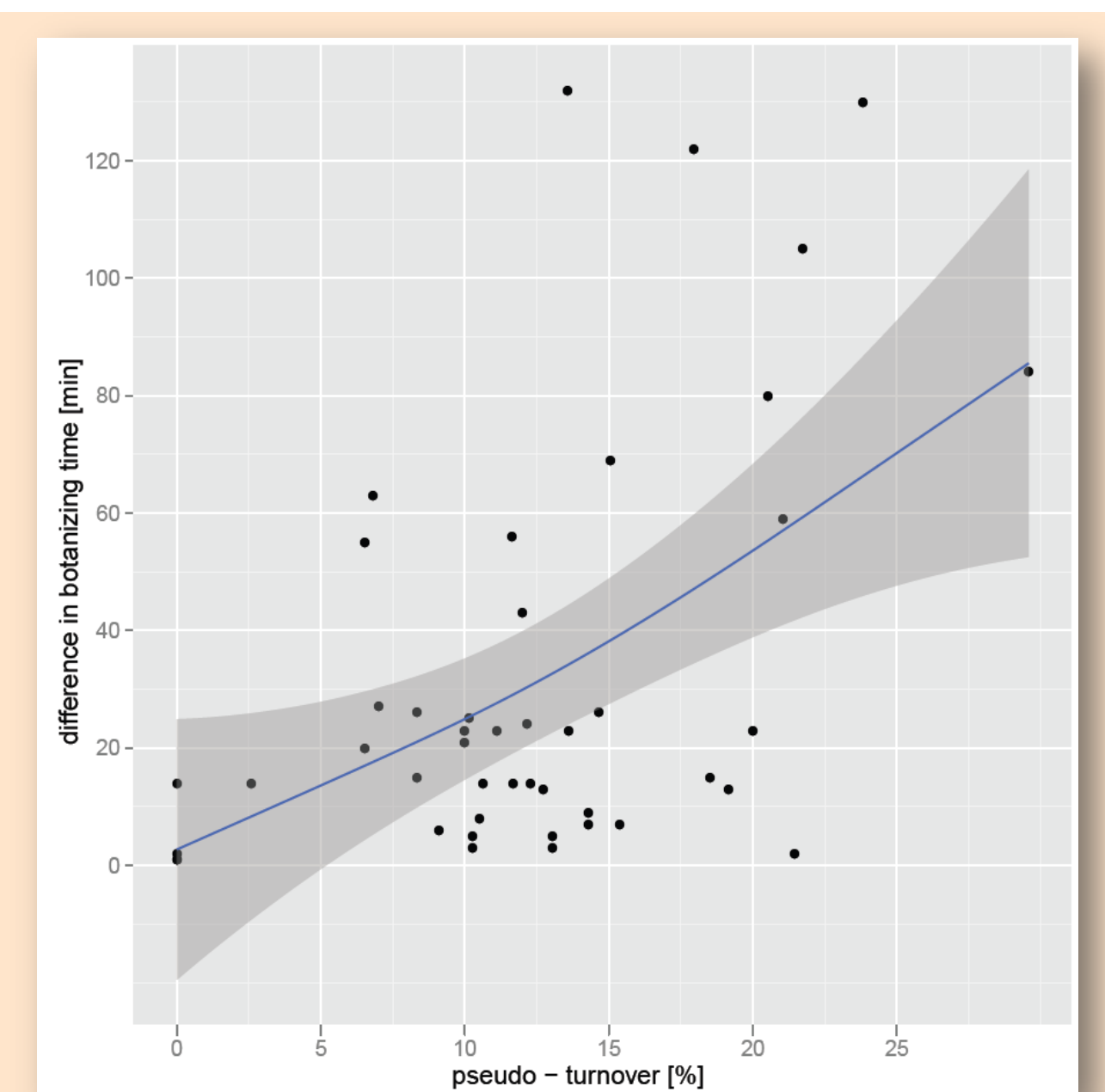
Within the „Summit Flora Project, historical records were repeated and the species turnover calculated. Pseudo – turnover is small compared to the species turnover. Remains the question, what is hidden behind those 13.58% of pseudo – turnover ?



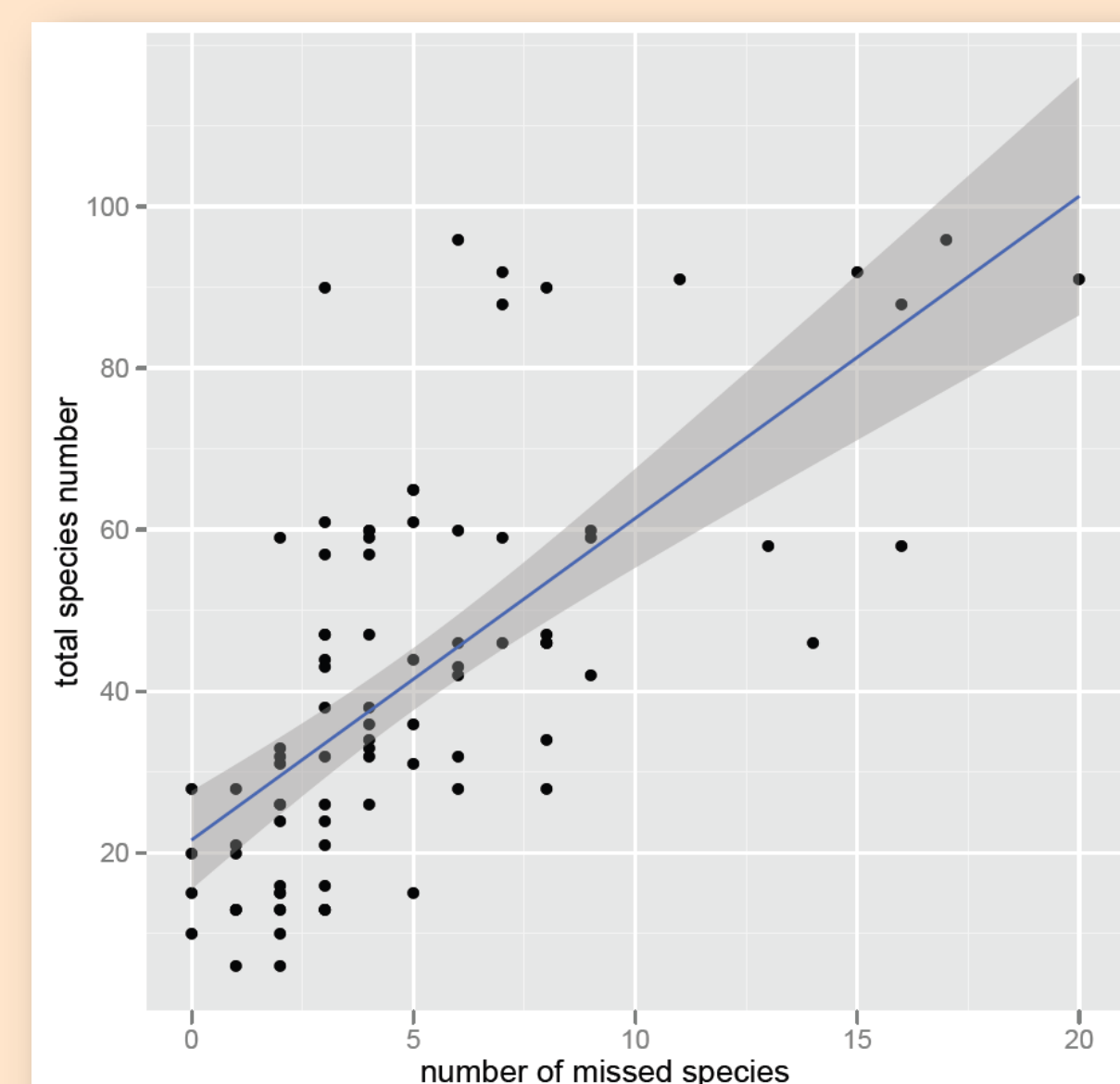
Factors included in the models are printed in **bold**



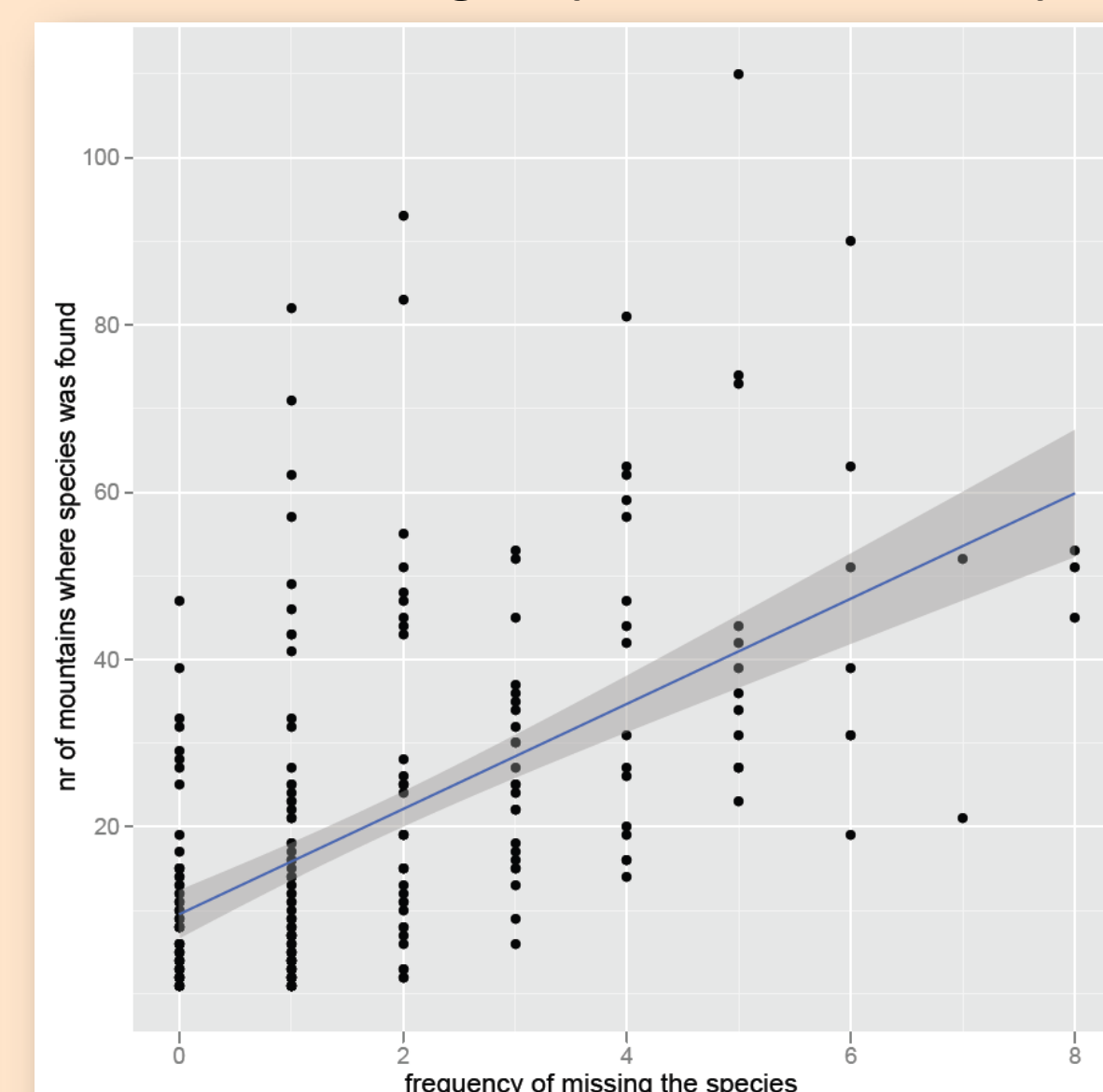
Pseudo turnover increases with elevational gain (duration of ascent)



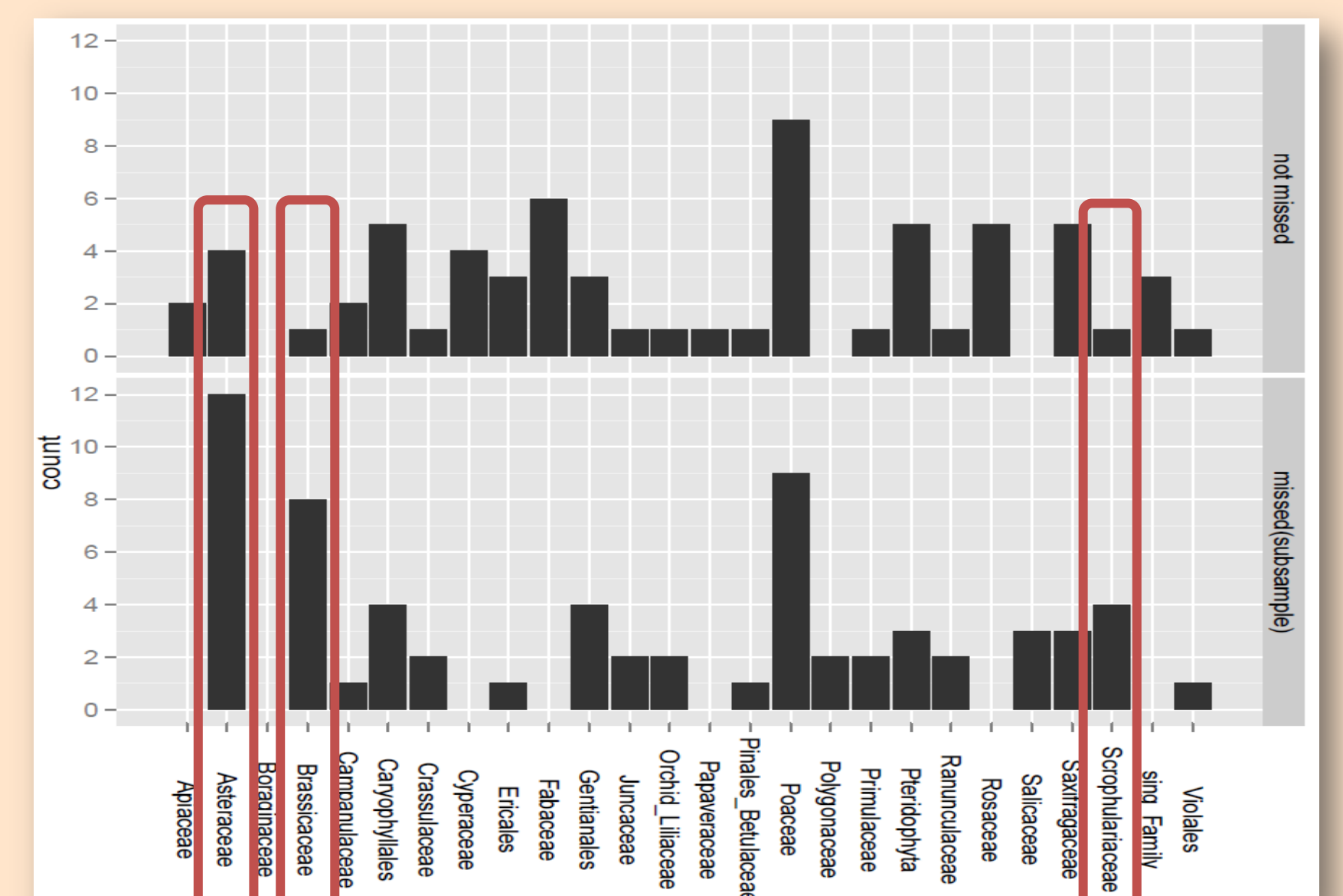
Pseudo turnover increases with difference in botanizing time between observers



The higher the species number on a summit, the more species get overlooked

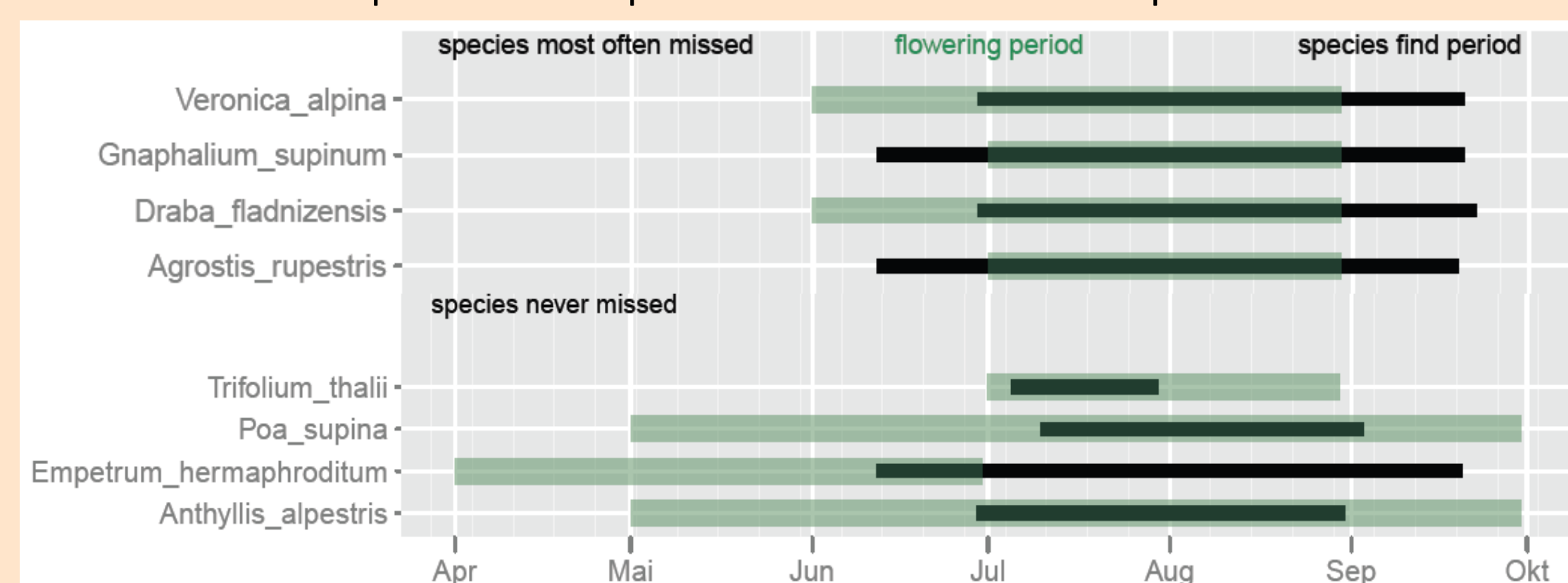


The higher the frequency of a species, the higher the probability for it to be overlooked.



Taxonomic affiliation has a significant influence on detectability

## Most often missed species, the „winners“:



## Pseudo turnover increases / more species are overlooked if:

- ⇒ the difference in botanizing time between the observers is high
- ⇒ the ascent is long (high elevational gain)
- ⇒ the summit has a high species number

## A species has a lower detectability if:

- ⇒ it occurs on many mountains (frequency)
- ⇒ it is small (minimal size)
- ⇒ belongs to certain taxonomic groups (Asteraceae, Brassicaceae (Draba), Scrophulariaceae (Veronica))
- ⇒ it has a low abundance (few individuals on a summit)
- ⇒ its flowering period is short

- ⇒ With a longer botanizing time, an observer may find more species ⇒ pseudo – turnover increases with a larger difference in botanizing time (generally, time needed for a record decreases with growing experience)
- ⇒ A long uphill hike may lead to time stress and lack of concentration ⇒ higher pseudo-turnover
- ⇒ the chance to overlook or misidentify a species is higher, if a species occurs on many mountains, but in a low abundance, if it is small and belongs to difficult taxonomic groups and has a short flowering period.

Data are preliminary

