HOW DO ENVIRONMENTAL CONDITIONS AFFECT THE DEADWOOD DECOMPOSITION OF EUROPEAN BEECH (*FAGUS SYLVATICA* L.)?

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Aims of the study

How environmental conditions (temperature, precipitation),

and qualitative properties of coarse woody debris (dimension, mortality agent, positon)

affect the decomposition rate?

Methods: Study sites

Region	Forest type	Study site	left to spontaneous development	altitude (m a.s.l.)
1	Fir-spruce-beech	Boubín	always	925-1105
		Milešice	1930	1070-1125
2	Beech dominated	Žofín	always	730-837
3	Fir-beech	Razula	1935	600-812
		Salajka	1930	715-820

Total observed area: 122.35 ha (5 nature reserves)

Spruce-fir-beech forest (Boubín)

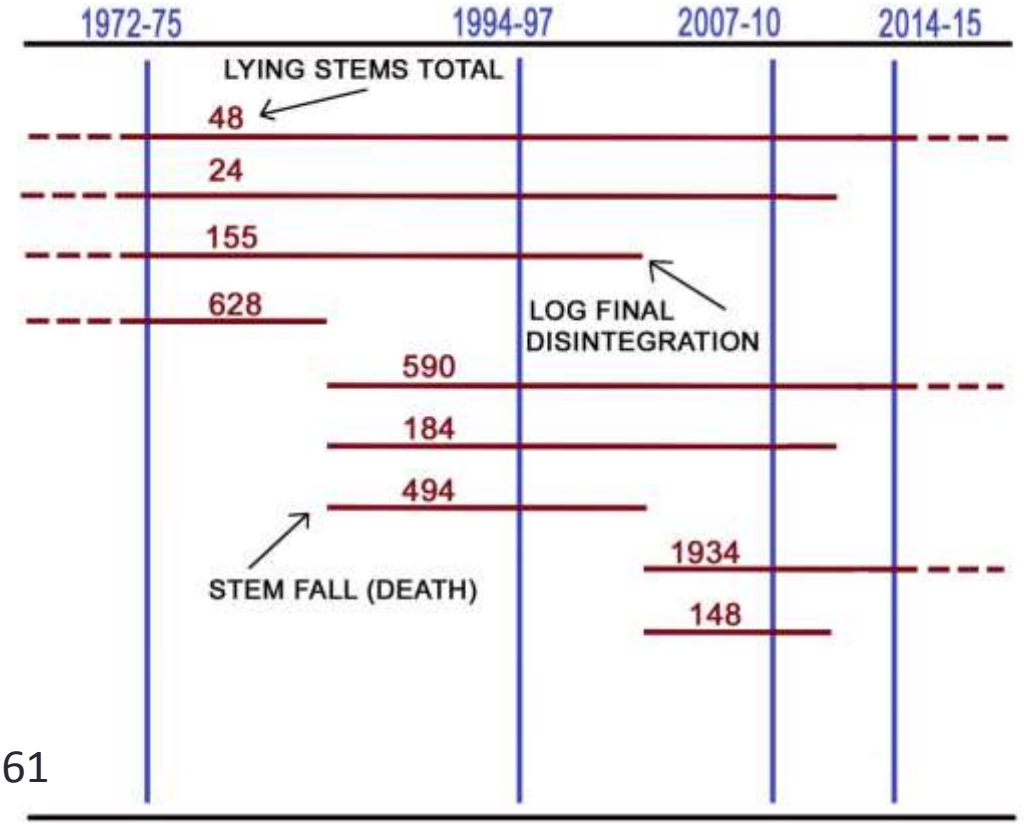
Beech dominated forest (Žofín)

Methods: data processing

- European beech (*Fagus sylvatica* L.) - downed logs
- Decay stages: 3 degree classification (hard, touchwood, disintegrated)
- Bayesian survival trajector
- Estimating age-specific sur data
- The method copes with lov unknown ages at death

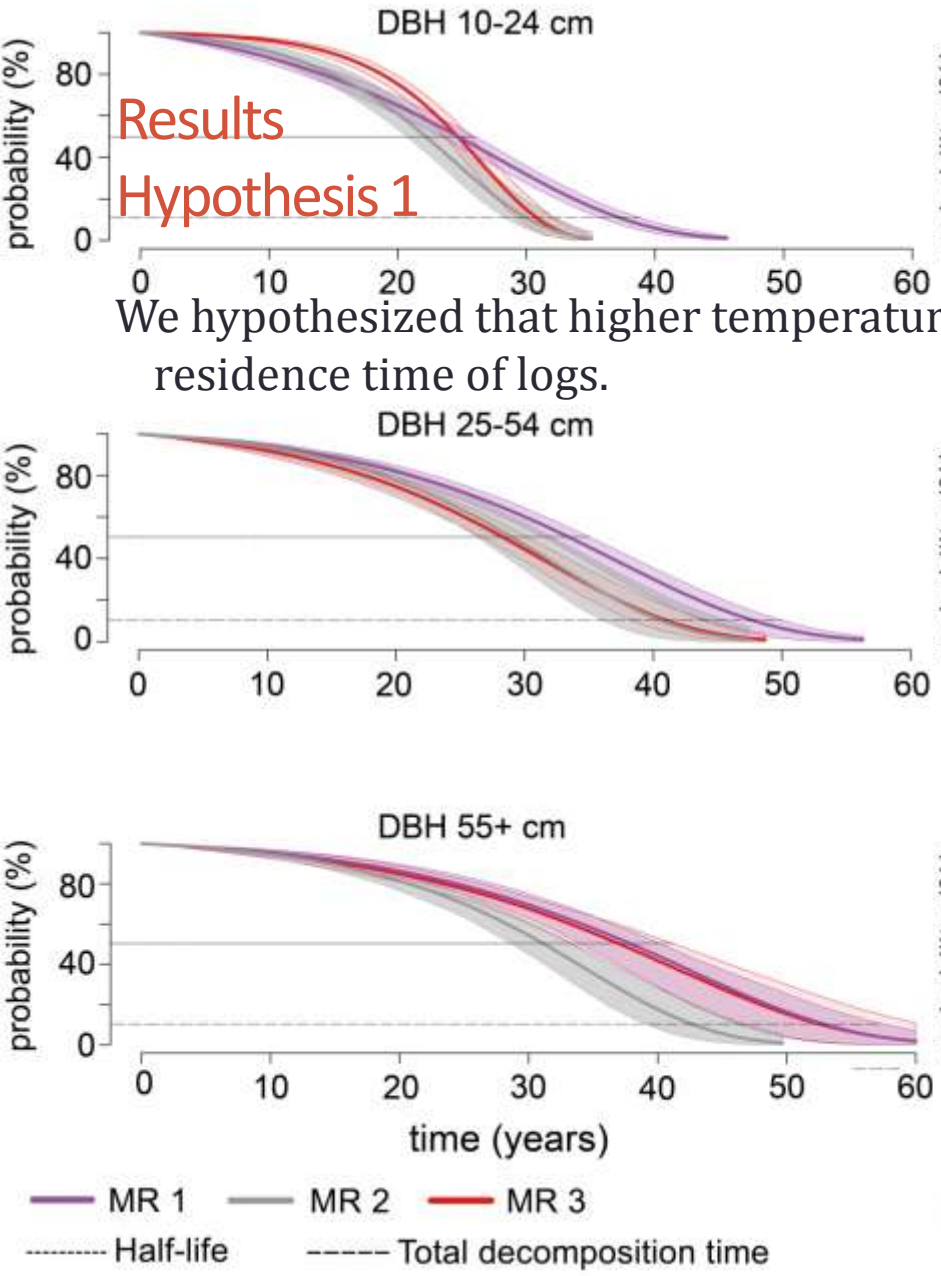
(Colchero et al., 2012)

Number of logs: 4261

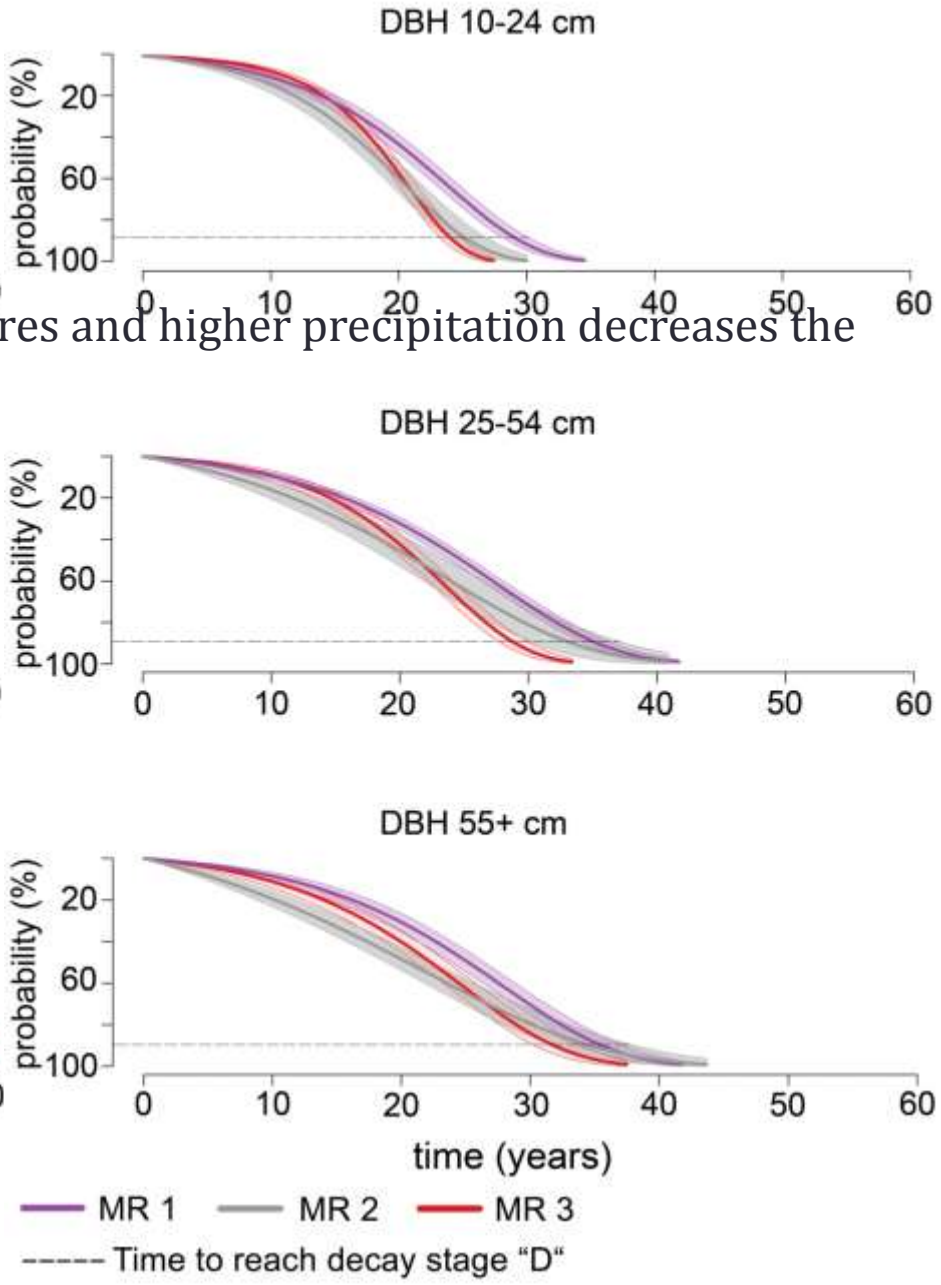


Results
Hypothesis 1

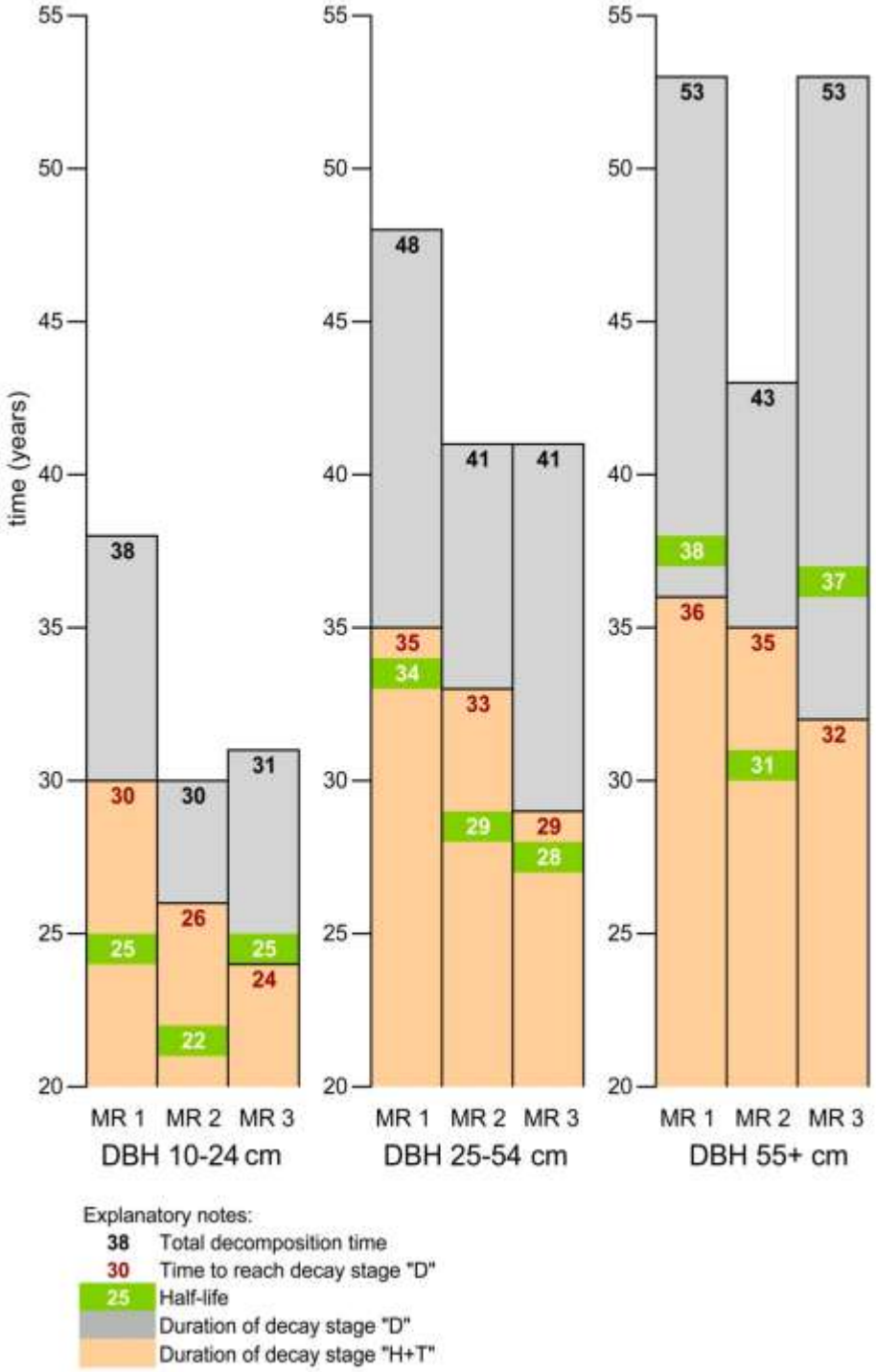
We hypothesized that higher temperatures and higher precipitation decreases the residence time of logs.



Residence probability



Probability of duration in decay stages H+T



Interpretation:

- Clear effect of DBH on residence time
- Higher DBH mean longer duration of decay stage disintegration
- In total decomposition time differencies between regions are influenced by other factors

Total decomposition time, duration of d.c. H+T and half-life – in relation to macroclimatic regions and groups of DBH classes

Results
Hypothesis 1

Region	mean annual temperature (°C)	mean annual precipitation [mm]	DBH 25 – 54 cm	
			Duration of d.c. H + T (years)	Total decomp. Time (years)
Region 1	4.0	867	35	48
Region 2	6.2	866	33	41
Region 3	5.4 - 7.4	1057-1144	29	41

Higher temperature
+ higher precipitation
=
shorter residence time

Here differencies between regions are influenced by other factors

Hypothesis 2

- We hypothesized that logs in the air have extended residence time because of its lower water availability.

Region	Duration of d.c. hard + touchwood (years)	
	In the air	On the ground
1	53	38
2	38	29
3	44	32

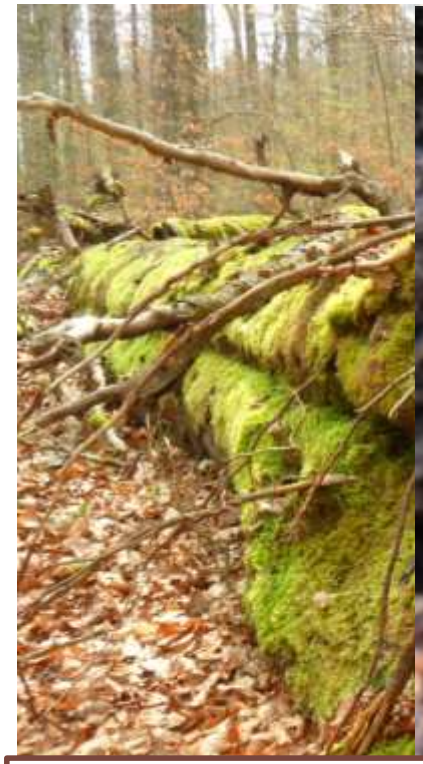
References

- Colchero, F., Jones, O.R., Rebke, M., 2012. BaSTA: an R package for Bayesian estimation of age-specific survival from incomplete mark–recapture/recovery data with covariates. Methods Ecol. Evol. 3, 466–470.

- Přívětivý, T., Janík, D., Unar, P., Adam, D., Král, K., Vrška, T., 2016. How do environmental conditions affect the deadwood decomposition of European beech (*Fagus sylvatica* L.)? Forest Ecology and Management. Under review.

- Photos by Tomáš Přívětivý

Discussion



Fomitopsis pinicola (Žofín)

Salamandra salamandra (Razula)

Thank you for your attention