Which saproxylic beetles are colonizing log piles constructed for stag beetles (*Lucanus cervus*) in south-eastern Sweden?

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Background

- Veteran trees are keystone structures that provide unique ecological niches.
- Species that are dependent on veteran trees and dead wood have been negatively affected by modern forestry practices and agricultural rationalization.
- Log piles have been created to increase the amount of suitable habitat as well as bridging the gaps in a fragmented landscape.

Aim

- Have log piles been successful and which saproxylic beetles are colonizing them?
- Which variables have an effect on species richness, abundance and species composition?

Methods

In total, 31 log piles in 15 sites were studied (19, 6, and 6 log piles in the county of Östergötland, Kalmar and Blekinge, respectively).

Sampling methods:

- Surveys were conducted between April and August 2021.
- Collected using three methods – eclector traps (a), sieve samples (b) and pitfall traps (c).

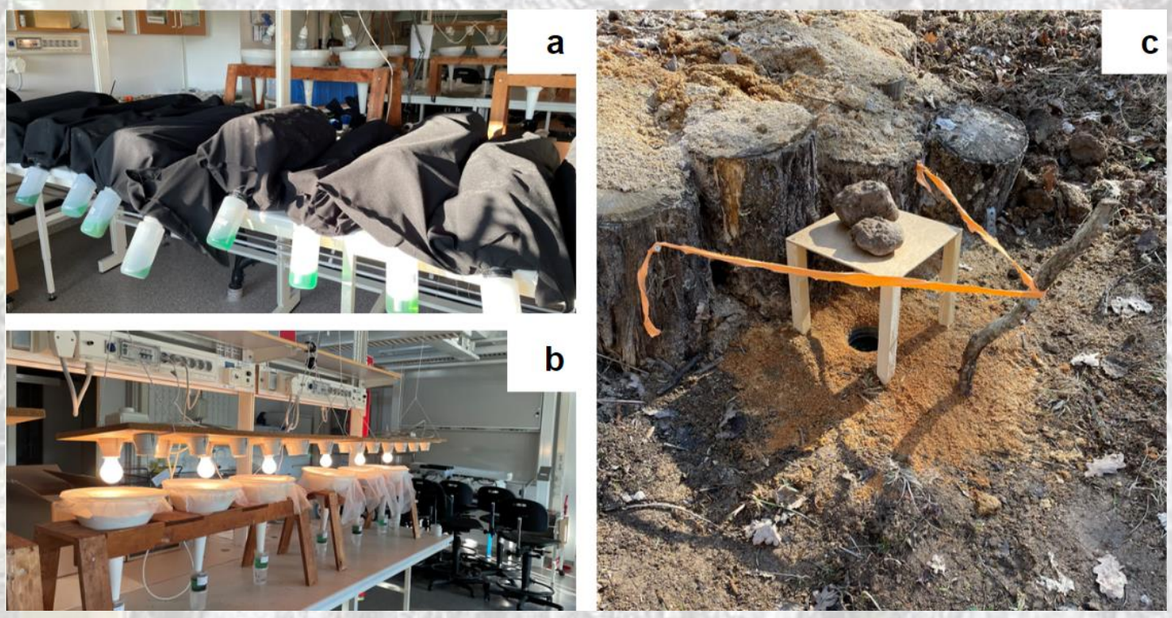

Figure 1. The three sampling methods used to collect data on saproxylic beetles. Eclector traps (a), Tullgren funnels (b) and a pitfall trap (c).

Results

- In total, 3720 individuals of 220 species were identified from 31 log piles constructed for stag beetles. Majority were obligate saproxylic (139 species) and all red-listed species were obligate saproxylic and consisted of 315 individuals of 18 species.
- Sandy soil had significant effect on species richness, abundance and species composition of obligate saproxylic beetles. The odds of recording a stag beetle were approximately 5 times higher when on sandy soil.
- The amount of large old oaks at 1000 m radius had a significant effect on species composition and abundance of obligate saproxylic beetles, while canopy openness and log volume (cm^3) had no significant effect.

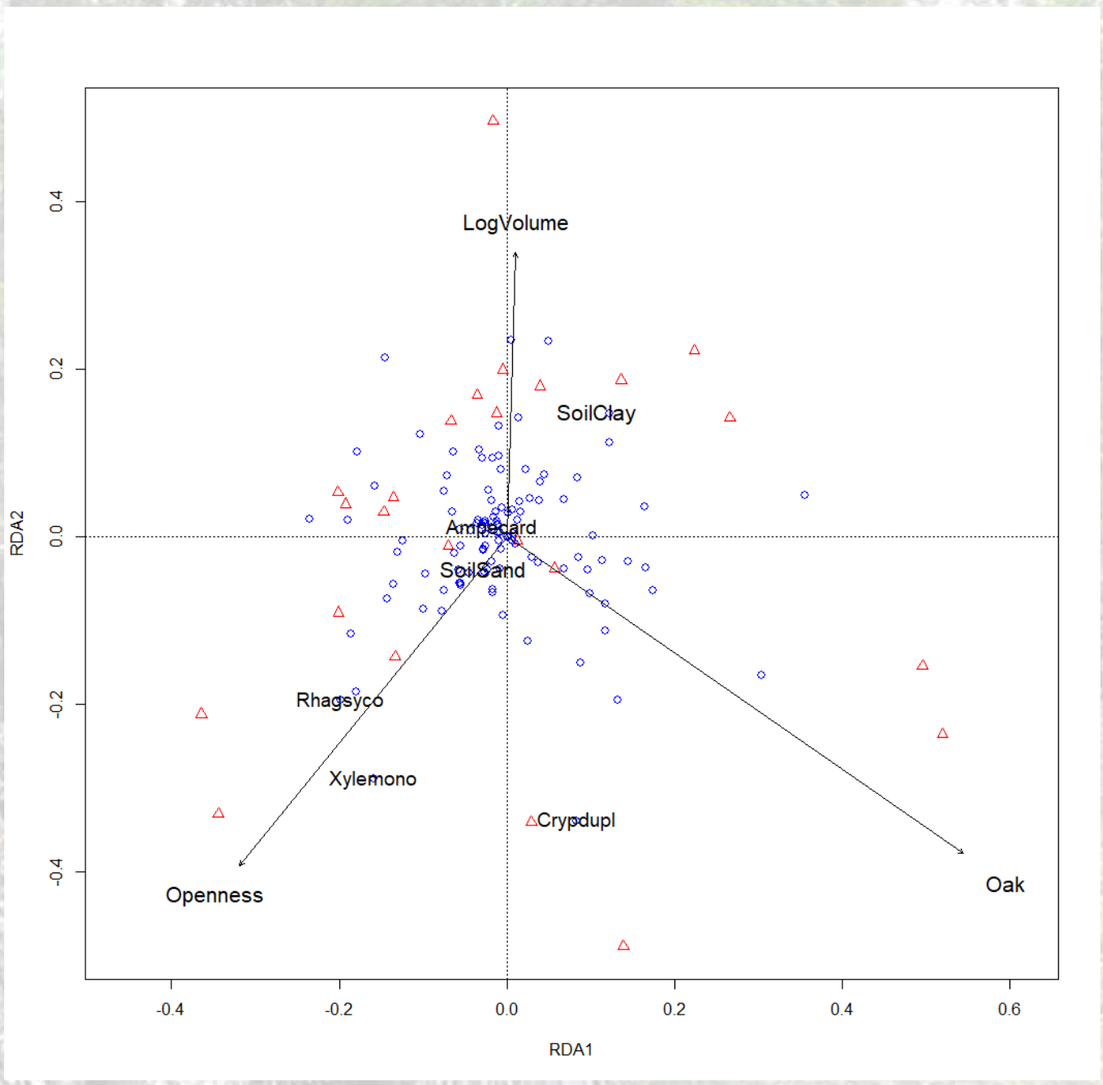

Figure 2. Correlation between species composition and the landscape and site factors at log piles. Obligate saproxylic beetles are visualised by blue circles, while new log piles are visualised by red triangles. Oak refers to the amount of large old oaks at 1000 m radius and openness refers to canopy openness.

Conclusions

- Log piles have been a successful implementation in nature conservation projects and a large number of saproxylic beetles are utilising them as suitable habitat.
- The habitats are utilised primarily by obligate saproxylic beetles and a considerable number of red-listed species.
- Log piles should be built on sandy soil and in areas where they will act as bridges between areas of high conservational value to ease the dispersal of saproxylic beetles.