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Diversity of hoverflies (Diptera, Syrphidae) along different types of forest roads in Latvia

Dagmāra Čakstiņa, Santa Ieviņa, Līga Pentjuša, Zane Lībiete & Linda Gerra-Inohosa

Latvian State Forest Research Institute "Silava", dcakstina@gmail.com



Introduction

In Latvia, new forest roads are built and existing ones are reconstructed each year, creating roadside habitats that may support a distinct hoverfly community. Given the lack of previous research on this aspect, this study was conducted to evaluate hoverfly diversity along various types of forest roads.

Methods

The fieldwork was conducted at two sites in Latvia in the summer of 2024 (Jelgava) and 2025 (Kalsnava), representing three types of forest roads: two managed road types with different widths of verges (types 1 and 2) and one vegetation-covered road type (type 3) (Fig. 1).

Hoverflies were collected using white, blue, and yellow pan traps three times per summer: in May, June, and July, respectively. Flowering plant cover and richness were estimated for every sampling plot.



Verges more than 5 meters wide (type 1) | Verges less than 5 meters wide (type 2) | Vegetation-covered road, representing more natural road conditions (type 3)

Figure 1. The studied road types

Results

Overall, 96 hoverflies species (1625 individuals) from 46 genera were collected, representing about one-third of the hoverfly species recorded in Latvia. The genus *Cheilosia* spp. was not identified to the species level, so the actual count might be even higher. The most common hoverfly species were *Helophilus pendulus* (Linnaeus, 1758), *Xylota segnis* (Linnaeus, 1758), and *Neocnemodon pubescens* (Delucchi & Pschorn-Walcher, 1955) in the summer of 2024 and *Syrphus torvus* Osten-Sacken, 1875 and *Xylota segnis* in the summer of 2025. Furthermore, the new species for the fauna of Latvia was found *Philhelius dives* (Rondani, 1857).

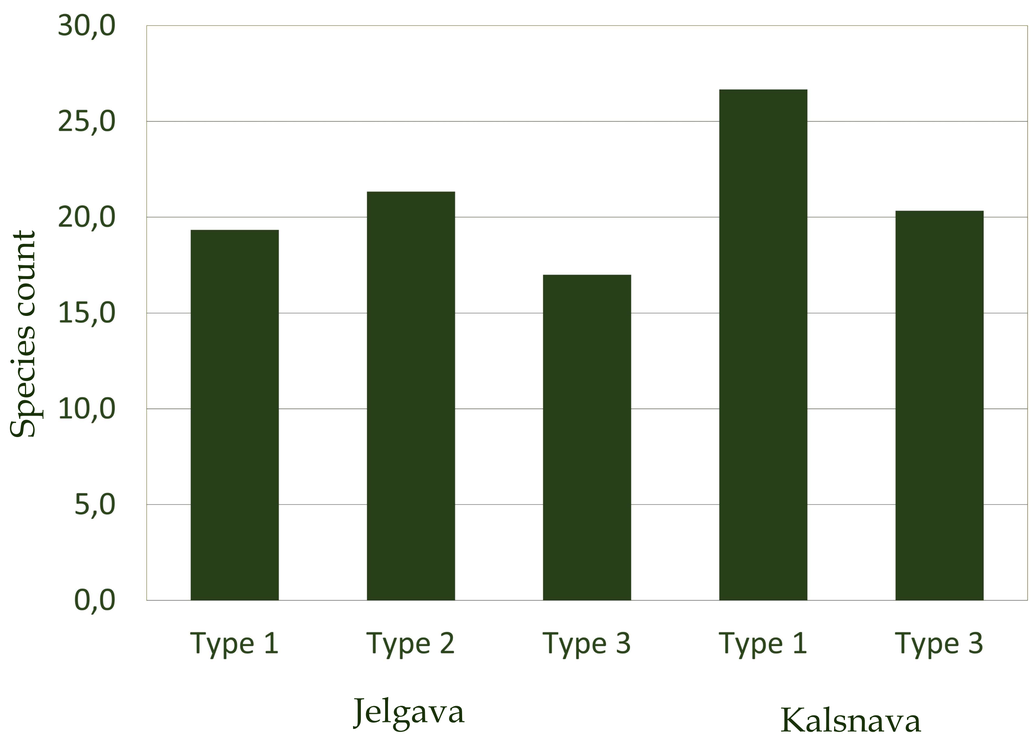


Figure 2. Average species count along different road types.

Analyzing species richness across individual road types over the three-month period, a slightly higher average count of species (21) was observed along type 2 roads in Jelgava. In both study areas, the lowest species richness was recorded along type 3 roads, with average species count of 17 in Jelgava and 20 in Kalsnava (Fig. 2).

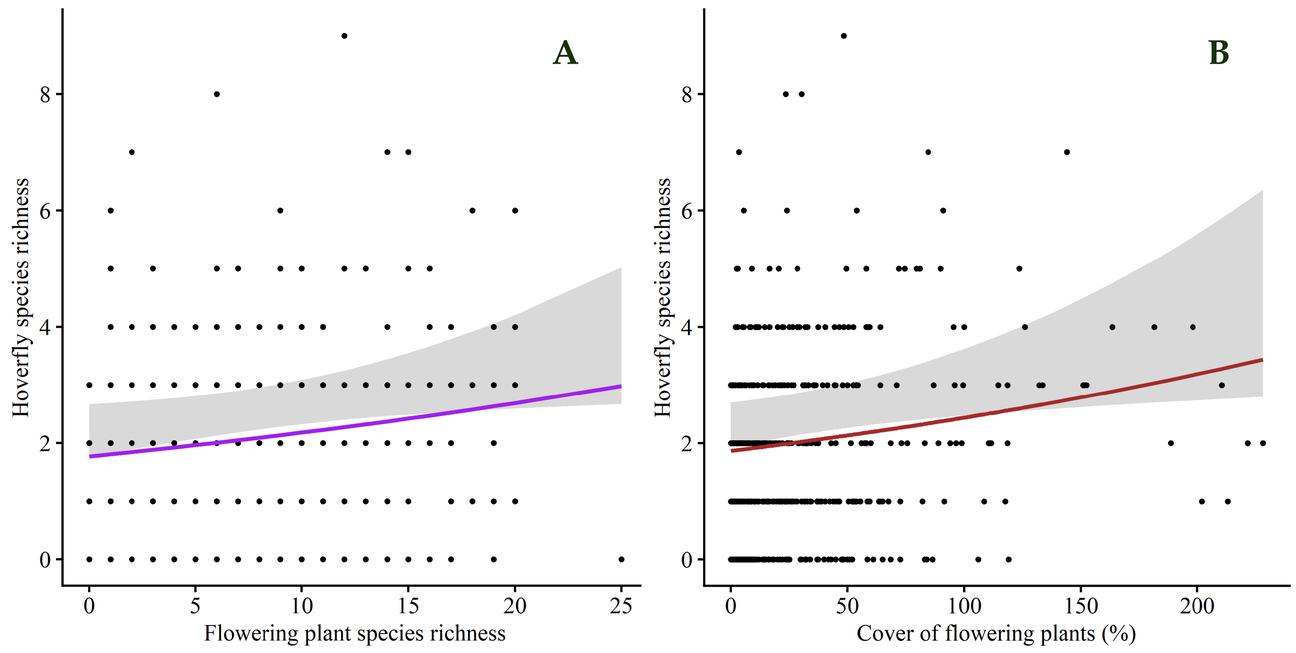


Figure 3. Relationship between hoverfly species richness and flovering plant species richness (A) and cover (B).

A generalized linear mixed model (GLMM) indicated a significant effect of flowering plant species richness ($\chi^2 = 6.46$, $p < 0.01$) and flowering plant cover ($\chi^2 = 9.13$, $p < 0.003$) on hoverflies species richness (Fig. 3).

Conclusion

Results show that forest roadsides support a certain diversity of hoverflies, which is positively influenced by both cover and species richness of flowering plants. Consequently, road verges may play a role in maintaining a syrphid diversity.

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