



Effectiveness of two monitoring methods (transect walk versus pan traps) in recording species richness of wild bees: A case study in Northern Serbia



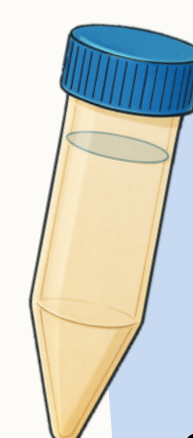
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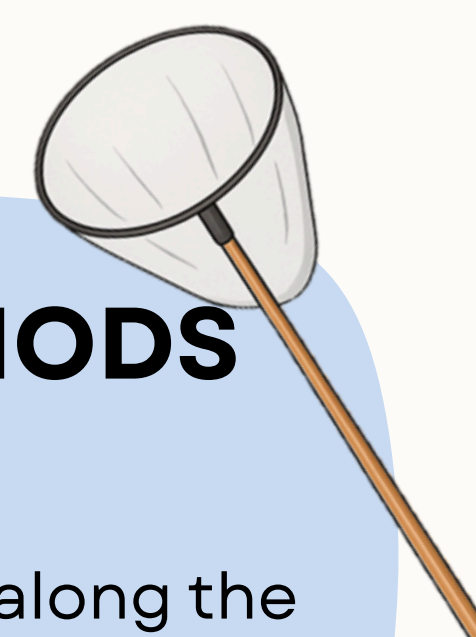
INTRODUCTION

Bees are considered the most important group of pollinators, playing a crucial role in maintaining ecosystem stability. A worldwide decline in the diversity of wild bees underlines the urgent need for their conservation. Addressing this challenge in Europe begins with the development and implementation of effective monitoring strategies (European Pollinator Monitoring Scheme - EUPoMS) (Potts et al. 2021). Together with transect walks, pan traps were initially used, but recently excluded from the EUPoMS core scheme for financial reasons, despite their advantages (Potts et al. 2024). The data collected during wild bee monitoring in grasslands and forest fragments in Vojvodina were used to evaluate the effectiveness of these two monitoring methods, as well as the performance of different pan trap colors in capturing species richness.



MATERIAL AND METHODS

- Transect walks** included walks along the transect route, which was 500 m in length and 2 m in width. The collection time along the transect at each locality was 60 minutes.
- Pan traps** filled with water and a drop of detergent were placed in ten clusters of three (blue, white and yellow) alongside the transect line, 50 m apart, and were left in place for 6 to 8 hours.
- Monitoring was conducted from March to September during 2022 and 2023, on nine sampling sites in Vojvodina, the northern province of Serbia.



RESULTS AND DISCUSSION

- A total of 199 wild bee species were recorded: 109 during transect walks (55%), 25 caught in pan traps (12%) and 65 species detected using both methods (33%)** (Figure 1). Although transect walks captured greater species richness across all bee families found in Serbia, pan traps remained a valuable complementary method. **Blue traps captured the most species (64), followed by white (52) and yellow (36)** (Figure 2).
- The correlation between flower cover and the number of wild bee species caught in pan traps was -0.3 ($p = 0.052$)**. This indicates that when floral cover increases, the number of species caught in traps tends to decrease. However, the connection is weak, suggesting that there are probably more factors that altogether affect the effectiveness of pan traps.

transect walk

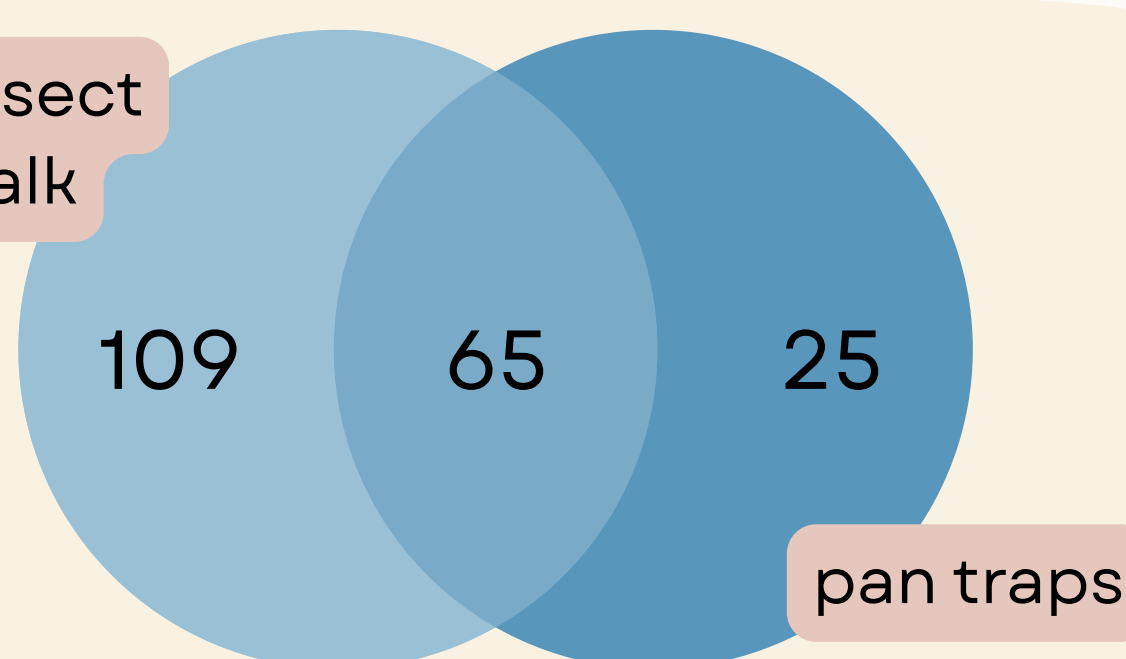
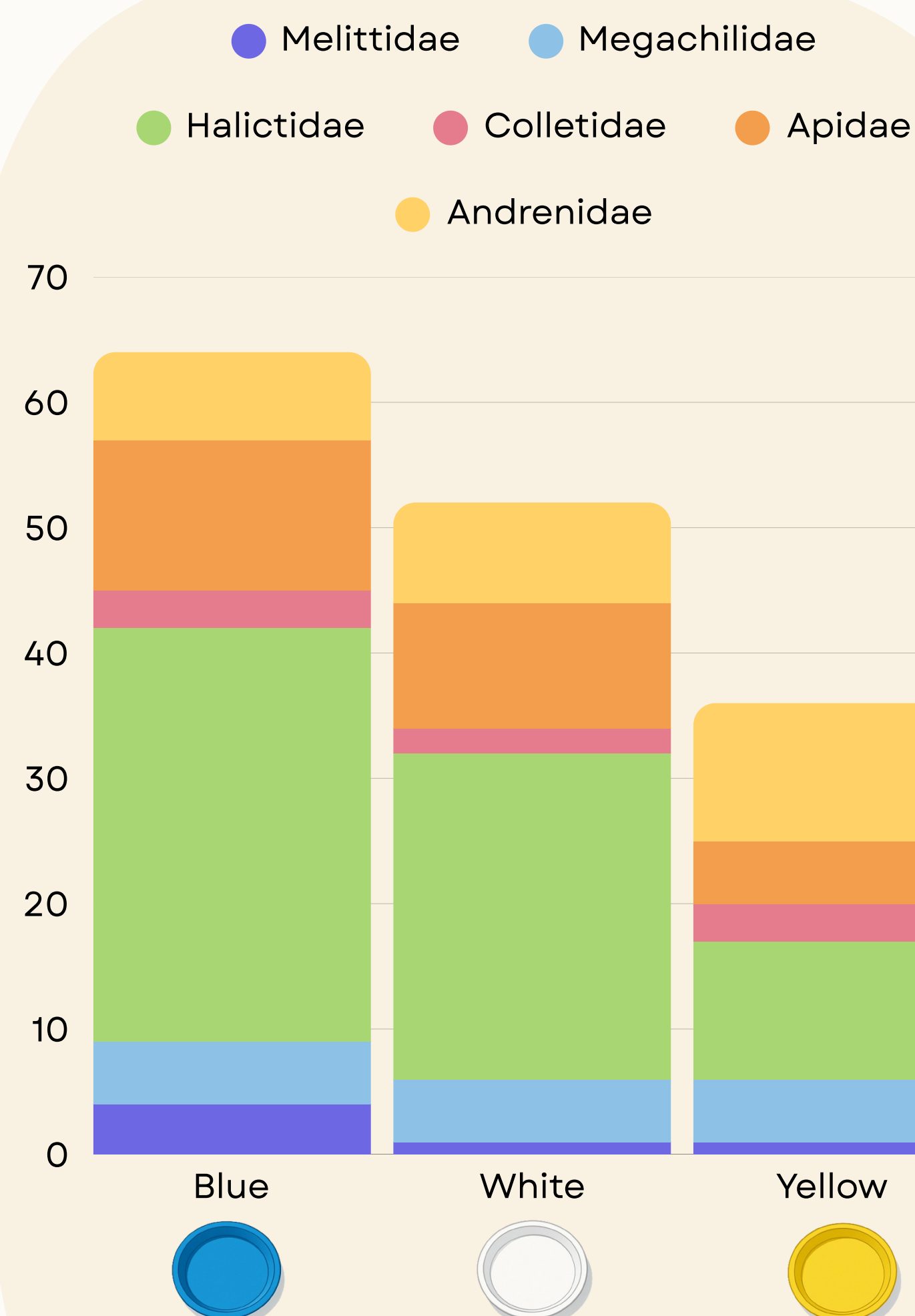


Figure 1. Graphic view of the number of species detected depending on the sampling methods

Figure 2. Species richness per pan trap color and bee family



CONCLUSION

Transect walks were more effective in capturing species richness, while pan traps still contributed significantly to the total number of species recorded. The use of both methods is recommended to obtain a more comprehensive understanding of wild bee communities. The weak negative correlation between floral cover and bee species caught in pan traps suggests that floral availability may influence trap effectiveness, but is likely not the sole factor.

REFERENCES:

Potts SG, Dauber J, Hochkirch A et al. 2021. Proposal for an EU Pollinator Monitoring Scheme. Publications Office of the European Union, Luxembourg.
Potts SG, Bartomeus I, Biesmeijer K et al. 2024. Refined proposal for an EU Pollinator Monitoring Scheme. Publications Office of the European Union, Luxembourg.

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