

Habitat Loss and Pesticide Impacts on Honeybee (*Apis mellifera*) Populations: Evidence from Botoșani, Romania

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INTRODUCTION & AIM

Honeybees (*Apis mellifera*) serve as critical pollinators that sustain both global biodiversity and agricultural productivity. Despite their importance, populations are facing a global decline driven by anthropogenic factors. This study aims to evaluate the primary drivers of this decline specifically habitat loss and pesticide exposure while integrating local observations from an apiary in Botoșani, Romania, to provide a comprehensive understanding of these threats at a regional level.

Furthermore, the prevalence of neonicotinoids and systemic pesticides has been identified as a major impairment to bee navigation, immunity, and reproduction. Climate variability further complicates these issues by disrupting seasonal foraging patterns, creating a precarious environment for colony survival. The findings underscore that local practices, such as integrated pest management and the creation of pollinator-friendly habitats, are vital for enhancing resilience.

METHOD

The research employs a conceptual review of global honeybee decline drivers combined with direct local observations from a specific apiary located in Botoșani. The analysis focuses on the impact of landscape changes, such as habitat fragmentation and urban expansion, alongside the biological effects of systemic pesticide exposure. Challenges including limited monitoring and climate variability were also factored into the assessment.

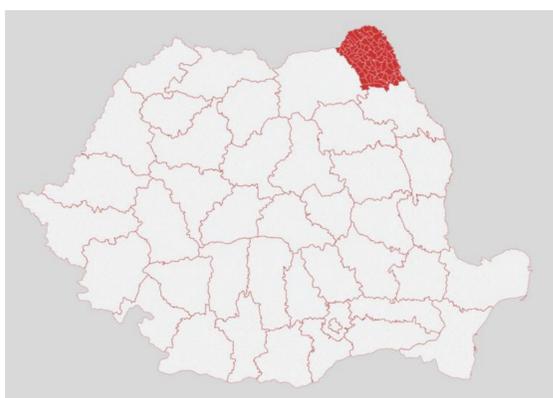


Figure 1. Geographical focus of the conceptual review, highlighting the Botoșani region, Romania



Figure 2. Typical landscape in Botoșani: intensive monoculture farming adjacent to apiaries, illustrating habitat fragmentation and potential pesticide exposure pathways



Figure 3. Honeybee (*Apis mellifera*) swarm in Botoșani, representing the biological resilience needed to sustain pollination services in changing environments

CONCLUSION

The synergy between habitat loss and chemical exposure remains the primary threat to honeybee populations in Botoșani. Collaborative efforts among scientists, policymakers, and local farmers are essential to implement organic farming practices and sustain pollination services. Protecting these populations is a mandatory step for maintaining ecosystem stability both locally and globally.

RESULTS & DISCUSSION

Observations in Botoșani indicate local colony losses that align with international trends, confirming that regional populations are not immune to global stressors. Intensive monoculture farming and urban sprawl have significantly reduced floral resources, forcing bees to forage more over fragmented landscapes.

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