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Conference Abstract

Modelling Asian hornet (*Vespa velutina*) population dynamics using citizen science data to inform management in Flanders

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Abstract

The invasive yellow-legged hornet (*Vespa velutina*), listed as a species of Union concern under Regulation (EU) No 1143/2014, has rapidly expanded across Europe since 2004. It impacts human health, biodiversity, and agriculture. Understanding its population dynamics is essential for designing effective management strategies. In recent years, citizen science initiatives have generated large datasets that can support quantitative modelling of the population.

We developed an individual-based population model for *V. velutina* using long-term data from the Vespa-Watch platform in Flanders (Belgium). The model was parameterized using annual counts of nests recorded since 2016. By simulating the life cycle of queens and their contribution to population growth, the model allows us to explore the effects of current management efforts on population development, as well as future population trajectories under different management scenarios across space (at level of Flanders, provinces or municipalities) and various intensities of nest removal.

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Our results highlight the value of citizen science data alongside the reporting of management interventions for modelling the dynamics of invasive species and for evaluating management strategies. The modelling framework provides a quantitative tool to assess the effectiveness of control measures and supports evidence-based management of *V. velutina* populations in Flanders and elsewhere in Europe.

Keywords

Invasion dynamics, individual-based modelling, evidence-based management, citizen science, *Vespa velutina*

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Conflicts of interest

The authors have declared that no competing interests exist.