



Improving biodiversity in Central and Eastern European (CEE) domestic gardens needs regionally scaled strategies



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#rural-urban gradient – urban ecosystems – environmental consciousness – sustainable gardening – environmental sensitivity – urbanisation #

INTRODUCTION — Amid ongoing urbanisation and increasing anthropogenic activities, **domestic gardens**, while cannot replace natural habitats, play a crucial role in enhancing urban biodiversity by providing green areas and forming ecological corridors. Moreover, these biodiversity-friendly gardens also improve human well-being and foster a connection between nature and people. In this study, we investigated how the garden parameters, the gardening motivation of garden owners, their knowledge about wildlife in their garden, and their pesticide use habits depend on each other in nine CEE countries and explored the differences and similarities between gardens and gardening practices with a potential for maintaining high biodiversity.

Preprint

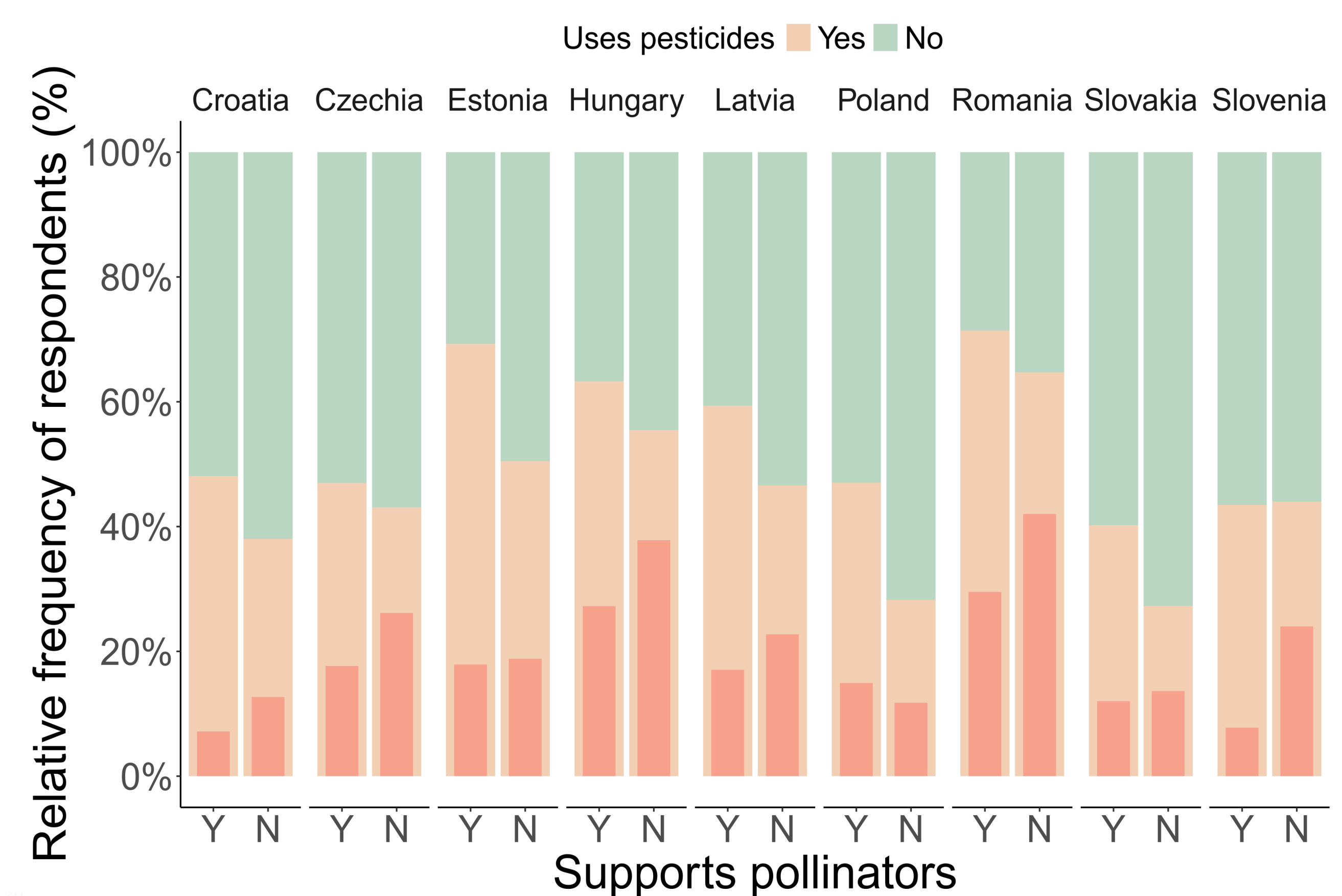


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METHODS — We circulated an online **questionnaire** in the nine participating countries to gather comprehensive data on garden characteristics, including location, socio-demographic factors, garden owners' motivations, cultivation habits, pesticide use, environmental awareness, and pollinator-friendly practices. We assessed the potential ecological value of the gardens (**garden index**), the owners' gardening motivations (**respondent index**), and **pesticide usage** (**pesticide index**) using an **answer-based scoring system**, where all indices were scaled between 0 (as the lowest) and 100 (as the highest) points.

(For details please see our [preprint](#).)

RESULTS — Altogether **5,255 garden owners** completed the questionnaire. The **average pesticide use** among the nine countries was **52.60%**, ranging from 38.88% in Slovakia to 69.59% in Romania. Except for Romania, there were significantly fewer pesticide users among those who support pollinators compared to non-supporters (Chi-square tests, $p < 0.001$) (**Fig. 1**). There were **significant differences in all three indices among the participating countries** (Kruskal-Wallis chi-squared = 290.85, 671.51, and 235.13, respectively, $p < 0.001$), and even within them, at a regional scale (**Fig. 2**).



Important considerations for gardeners when choosing a pesticide.

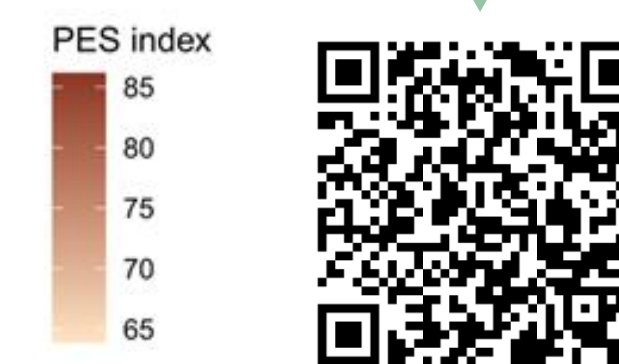
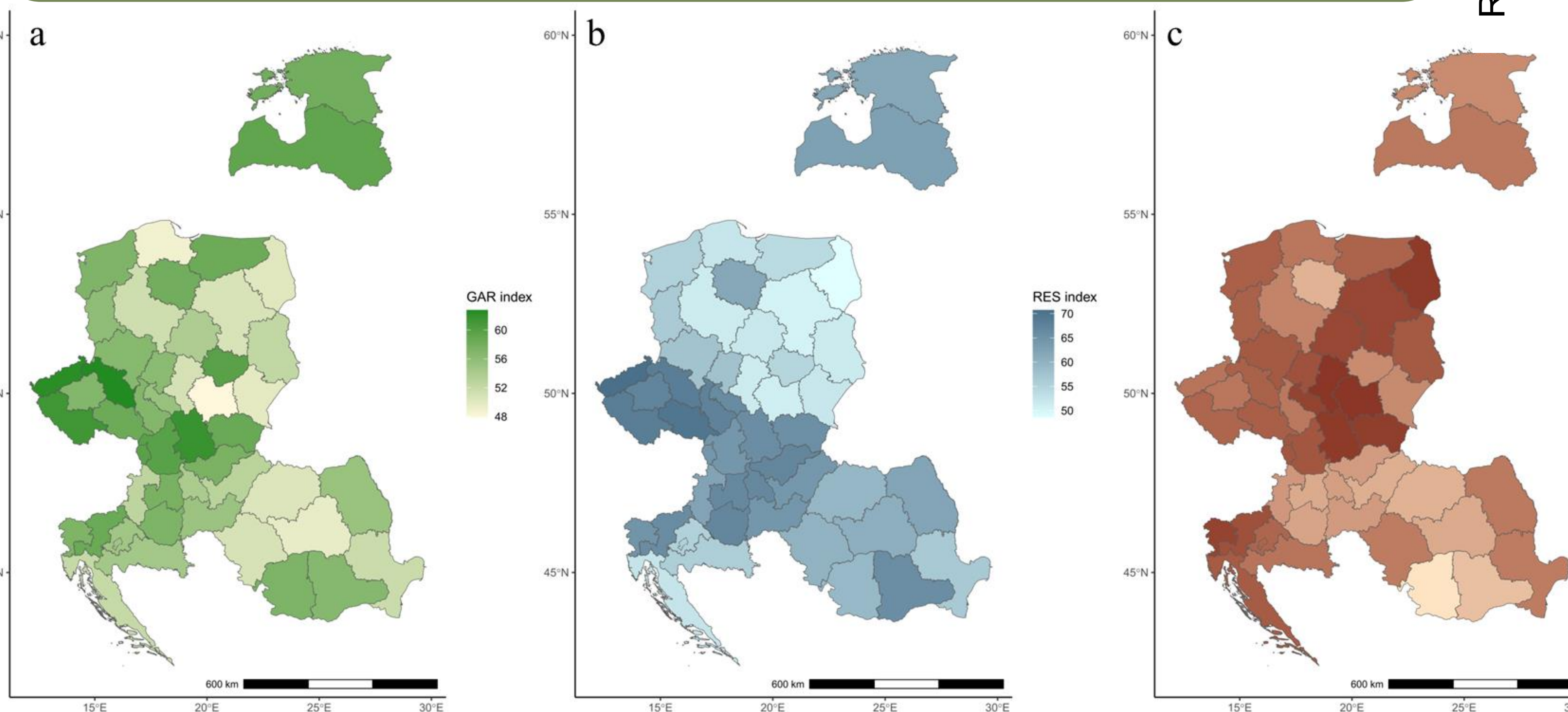


Fig. 1: Relative frequency of all garden owners according to whether they support pollinators (Yes/No) and whether they **use plant protection products** (highlighted **synthetic pesticides**) or **not**.

Fig. 2: The **garden** (a), **respondents** (b) and **pesticide** (c) indices in the nine participating countries. The colour depth of the maps indicates the mean of the indices calculated for each territorial unit area.



CONCLUSION — Active pollinator support does not necessarily coincide with pesticide-free gardening. To maximise conservation efforts, **region-specific approaches are needed** rather than unified regulations across European countries. **Effective environmental education programs and tailored strategies** should be developed to address local needs and provide comprehensive biodiversity-related information, **reaching all levels of society**. Besides serving as a proxy to indicate **gardens' environmental quality**, our **study** also highlights the potential of these gardens in designing eco-networks of biodiversity-friendly spaces. This approach can inform decisions on optimal strategies to enhance the environmental benefits of domestic gardens.