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Evidences of ecological segregation between wild and managed bees in an intensive cereal farming system

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European Ecological Federation



ASOCIACIÓN ESPAÑOLA
DE ECOLOGÍA TERRESTRE



Sociedade Portuguesa de Ecologia

12th European Ecological Federation Congress

25-29 September 2011, Ávila, Spain

"Responding to Rapid Environmental Change"

10th Annual Conference of the
Spanish Association for Terrestrial Ecology

13th Annual Meeting of the
Portuguese Ecological Society

3rd Iberian Congress of Ecology

ABSTRACT BOOK

12th European Ecological Federation Congress
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S.02-08-O

Pesticides, drivers of pollinators decline in private gardens?

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Private gardens are important refuges for pollinators in urban areas. However, little is known about the effects of gardening practices, in particular the use of pesticides, on this refuge effect. To address this issue, we analyzed data from two citizen science programs on butterflies and bumblebees, monitoring respectively 591 and 130 gardens located in the Parisian region. We assessed the landscape effects as well as local garden organization and gardening practices, including pesticides use (bordeaux mixture, anti-slug, herbicides, insecticides, fungicides), on the abundance and richness of pollinator communities. As already known for agricultural systems, landscape scale effects and the availability of floral resource at the local scale were the strongest predictors of pollinator diversity and abundance. Surprisingly, our results suggested a limited impact of pesticide use on pollinator communities. However, the use of Bordeaux mixture was associated with higher abundance of pollinators and the use of insecticides was associated with a decreased abundance of bumblebees but an increased abundance of butterflies. It seems thus that pesticides are not a key factor in explaining the pollinator decrease in urban areas, and unexpected results could illustrate indirect effect of gardener's spirit. This was confirmed by a punctual study on the plant communities which revealed a great effect of the gardener spirit on the floristic diversity, the food resource for pollinators. "Leisure gardens" showed significantly higher plant diversity than "aesthetic gardens". These results point out that, in urban environments, gardener practices have an impact on how pollinator friendly is a garden but pesticide use alone has a relatively limited impact.

S.02-09-P

Evidences of ecological segregation between wild and managed bees in an intensive cereal farming system.

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Honey bees and wild bees are important pollinators of both crops and wild plants. The last thirty years have witnessed substantial bee population and diversity declines in many European regions. The loss of semi-natural habitats in intensive agricultural systems is considered as one of the main causes responsible for this pervasive decline. Semi-natural habitat remnants provide wild bees with specific nesting opportunities as well as diversified steady state, pollen and nectar resources. By contrast, most cultivated areas are unusable by bees, except mass-flowering crops that offer big-bang, temporarily available floral resources. The objective of this study was to document the relative use of mass flowering crops and wild floral resources by foraging honey bees, bumble bees and solitary bees in an intensive cereal farming system in western France. We counted foraging bees along walking transects within the main flowering crops (oilseed rape and sunflower) as well as in a variety of semi-natural habitats (grasslands, field margins, hedgerows). We found evidence of ecological segregation among bees. Honeybees favoured mass flowering crops when available while solitary bees foraged mostly on wild plants. Bumblebees had an intermediary strategy, with a ubiquitous behaviour. Between periods when mass flowering occurred, all three groups were found foraging in remnants of semi-natural habitats, and so potentially engaged in increased competition for floral resources at this time. This stresses the importance of developing floral enhancements at a landscape scale for promoting bee diversity and sustains their population during periods of food shortage in intensive agricultural areas.