Taxon-specific temporal shifts in pollinating insects in mass-flowering crops and field margins in Ireland

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Many insect pollinators are at risk due to the combined effects of several threats. One of the main stressors affecting insect communities is habitat degradation, which is often associated with a decrease of floral resources. In this sense, the Irish intensive agricultural landscape can constitute a threat for pollinating insect communities. In such a habitat, the vegetation present on field edges and margins can be considered an important semi-natural element, which can sustain pollinators during nutritional gaps that occur after the blossoming of mass-flowering crops. To study the impact of the local landscape on insect communities, we surveyed the field margin vegetation and five groups of insect pollinators (honey bees, bumble bees, solitary bees, hover flies, butterflies) associated with two mass-flowering crops (apple and oilseed rape) between April and August 2019. Our results suggest a parallel shift in the structures of the pollinator and plant communities as the season progresses. There was a higher abundance of hover flies and butterflies in the field margins than in the centre of the crops during all periods, suggesting that the field margins provide important resources for some groups of pollinators, even during the blossoming of the mass-flowering crops. We found no relationships between insect abundance and the abundance of field margin flowers, although positive correlations were found between bumble bee abundance and total insect abundance with floral diversity. Our findings provide further evidence of the importance of field margins for insect pollinators, but highlight taxon-specific differences in the responses to this habitat and to the floral resources it contains.

A red-tailed bumble bee (*Bombus lapidarius*) feeds on an oilseed rape flower (*Brassica napus*).