Predation rate of pests and natural enemies in crops across nine European case studies: the role of semi-natural habitats

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Abstract

Ecosystem service provision such as pollination of crops and pest control may depend on the quantity and quality of semi-natural habitats (SNH) in the agricultural landscape. This overall hypothesis has been investigated across case studies of the European FP7 project QuESSA. More precisely, three main hypotheses were identified: (1) the ecosystem service provision is higher/better as the proportion of semi-natural habitats (SNH) increases in the surroundings of the crop field (1 km radius), the ecosystem service provision depends on (2) the SNH type directly adjacent to the crop field, and on (3) the management intensity of the crop field. In this paper, we focus on the rate of predation and parasitism of crop specific pests in six different crops (vine, oil seed rape, wheat, olive, pumpkin) in 9 case studies. Data on abundance of ecosystem service providers and pest density have been collected as well, and are used to clarify the SNH contribution. Hypotheses testing involve analyses across the case studies and consider the use of generalized linear mixed models. Results show that SNH proportion in the agricultural landscape as well as the adjacent SNH, or in interaction, significantly influence the predation rate of pests, but this depends on the pest and the crop.

Keywords: pests, seminatural habitats, ecosystem service

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