



Conference Abstract

No evidence for decline of carabid beetles in European and North-American arable fields; a meta-analysis

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Abstract

Recent studies have shown dramatic decline in the abundance and diversity of insects over the last decades, including pollinators, lepidopterans, flying insects, parasitoids or epigeal predators, such as carabid and staphylinid beetles. Many of these studies are based on regional data, therefore it is hard to draw a conclusion about the generality of the reported effects across multiple groups and regions. In this paper we focus on testing the hypothesis of insect decline in annual arable crops over a wide geographical range, using meta-analysis of data on carabid beetles as a model group. We extracted pitfall trap catches and observed species richness from 105 independent publications originating from Europe and North America. Data were from a variety of arable annual crops in 22 countries, and spanned a period of 42 years. As sampling effort varied notably across studies, we standardized catches by trapping effort, and explored different options for calculating trapping effort from data. The data over time did not show any evidence of a decline in carabid numbers nor species caught over the 42 years covered by the dataset. A possible explanation for this finding is that carabid beetles living in these habitats are adapted to periodical disturbance by either withstanding these disturbances on site or by periodically re-colonizing fields from adjacent habitats. Although local decreases in carabid

populations are documented in the literature as a result of agricultural intensification or landscape simplification, at the broader geographical scale, such a decline is not supported by the data.

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