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# Landscape and local drivers influence on syrphids of fennel crops in Provence and implications for its yield

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## Abstract

In the context of insect decline(1), their importance for food production is well-known(2–5) but the insect-pollinator dependence for aromatic plants remains piecemeal. Aromatic fennel (*Foeniculum vulgare*) is cultivated for the trans-anethole essential oil used in anise drinks. We characterized the dependence of fennel crops on insect pollination and fruit set, essential oil and trans-anethole yield according to insect presence, abundance and richness.

In a comprehensive study, we first showed that, at the crop level, insect pollination improved the reproduction and the amount of trans-anethole in fennel. We showed that the amount of essential oil per hectare increased with the richness of insects. We investigated the influence of landscape and agricultural practices on fennel-flower-visitors and found that landscape configuration and proximity to semi-natural habitat were the main drivers of their richness. Once again, our results underline the importance of preserving insect biodiversity to enhance food production and meet food security, which are key challenges of our century(6,7).

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