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Potential impacts of climate change in larval development and oviposition choice of an aphidophagous hoverfly species *Episyrphus balteatus* (Diptera : Syrphidae)

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Numerous studies have shown that climate change could, directly or indirectly, contribute to disturb insect's biology and interactions with plants. An increase of mean temperatures and atmospheric carbon dioxide concentration is known to have various effects on insects-pests biology, behavior and communication. However, the impact of climate change on their natural enemies is still poorly understood. Following IPCC temperatures and CO₂ predictions for the next decades, we first investigated (i) the impact of an elevation of temperature, here 20°C, 23°C and 26°C on the weight, size, and consumption in aphid (*Acyrtosiphon pisum* Harris), of the larvae development of the hoverfly *Episyrphus balteatus* (De Geer). We also tested (ii) the hypothesis that a combination of CO₂ concentration (450 and 800ppm) and temperature (20 and 23°C) may affect the oviposition choice of *E. balteatus* gravid females on bean plant (*Vicia faba* L.) infested with aphids. Dual-choice bioassays were used for each temperature and CO₂ combination. We found that temperature has no effect on the larval development of *E. balteatus*, but has an effect on the weight and size of the final larval stage. Furthermore, contrary to CO₂ concentration, an elevation of temperature also has an effect on the site choice and number of eggs layed on the plants. Our results suggest that an elevation of temperature has an impact on hoverfly biology and oviposition. Temperature may impact plant volatile profile, as well as aphid honeydew, indirectly impacting hoverfly attraction. These outcomes offer new overview about multitrophic interactions under worldwide climate change.