Modelling bee cognition and movement to better understand pollination

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Résumé

The ability to predict pollination patterns more accurately is a pivotal challenge for both conservation and sustainable food production. This task involves predicting pollen dispersal patterns mediated by nectarivore animals for most flowering plants. While most pollination models assume random pollinator movement, behavioural studies reveal that many pollinating insects, birds, and bats exploit their environment based on sensory cues, spatial learning, and memory. We developed an individual-based model of bee movements that incorporates these cognitive features and pollen dispersal. We aim to understand how such an integrated model can challenge and refine predictions regarding landscape-scale pollinator abundance and plant-level predictions on mating probability and fitness. Such crosstalk between animal behaviour and pollination ecology will likely become an important tool for predicting and acting on pollination in a looming crisis.

Mots-Clés: Pollinator, Agent Based Model, Behavioural Ecology, Cognition, Pollination

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