

Preference-performance testing in the aphid parasitoid *Diaeretiella rapae*

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Eligible for student prize

Parasitoids make mating and oviposition decisions during foraging, and encounter trade-offs while making decisions to maximise fitness. The aim of this study was to test how the three aspects of the reproductive choice - (1) oviposition vs. mating choice, (2) mate selection and (3) host selection - affect the reproductive performance in a parasitic wasp, a cabbage aphid parasitoid *Diaeretiella rapae*. The reproductive output was quantified as the number of progeny produced and the progeny sex ratio. Protandry (the majority of males emerge before females) and haplodiploidy in *D. rapae* give females the opportunity to choose between ovipositing and mating when they first emerge. When the choice was given to female *D. rapae* in laboratory conditions, most of them preferred to spend time searching for mates and parasitise the hosts after mating, even though they were more likely to encountering hosts than potential mates. The females which chose to mate before oviposition eventually produced more female offspring. Female *D. rapae* are monandrous (mate only once). In mate choice experiment, the female *D. rapae* rejected the multiple-mated males, and preferred to mate with virgin males, which resulted in more female offspring. Females that mated with multiple-mated males became sperm depleted. When given hosts of various sizes, females preferred larger hosts to oviposit fertilised eggs even though the females had to spend more time and energy (stings) to parasitise them. The offspring that emerged from larger hosts developed quicker, larger in body size, lived longer and themselves produced more offspring than offspring produced from small host. Results of this study, therefore, suggest that parasitoids make their foraging decisions to maximise their reproductive performance.

