

## Effects of mate choice and mate density on mating success in *Diaeretiella rapae* (Hymenoptera: Aphidiidae)

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Intrasexual competition and intersexual selection are important drivers in the evolution of mating system in parasitoids, in which only female offspring are produced from fertile eggs. Effects of mate age, mating status, body size, density and sex ratio on mating success were investigated in aphid parasitoid *Diaeretiella rapae* by giving mate choices. Females were found more selective than males. Virgin female *D. rapae* preferred to mate with virgin males, while males were rejected by mated females. In terms of mate body size, large males did not discriminate the females on their body size when offered a large and a small female, and more than 40% them mated with both females. More matings were observed between larger females and larger males despite the higher courtship display by smaller males. In mate-age choice, younger males mated with younger females. However, older males and females did not show age preference in choosing mates. Increase in male density caused mating interferences, and decreased the mating probabilities of *D. rapae*. Furthermore, multiple mating in males changes female-biased population sex ratio to male-biased operational sex ratio which increases male-male competition, and eventually causes mating delay and decreases mating success. In the female-biased sex ratio, females became less selective and accepted males mating attempts. Male-male courtship in *D. rapae* was observed in the absence of females. This study supports the intrasexual competition among males where *D. rapae* males eliminate other males from competition by mounting on them, which reduces the other male's courting and future mating probabilities.

