

Does Photoperiodism Affect on the Mating Behavior of Earth Bumblebee (*Bombus terrestris*)?

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Laboratory studies were conducted to investigate the mating propensity of *Bombus terrestris* by applying different photoperiodic regimes. Five different age groups of bumblebees were reared in constant darkness (L0:D24), short day (L8:D16), long day (L16:D8) and constant light (L24:D0) conditions. Among the age groups, 3 days old queens reared in all photoperiodic regimes showed the lowest mating propensity and a tendency to increase their mating propensity as they got older. Constant dark treated bumblebees accounted the highest mating propensity (68.33%) by 9 days old queens. Whereas, L8:D16, L16:D8 and L24:D0 treated bumblebees resulted highest mating propensity by 7 days old queens, and the observed mating propensities were 83.33%, 93.33% and 77.92%, respectively. Therefore, bumblebees grown in long and short day conditions were selective and more prone to mate than those which were held both constant dark and constant light conditions. Queen and male ratio considered to explore the maximum courtship behaviour. Short day and long day treated 1:2 ratio queen and male revealed significantly higher mating propensity than in 1:1 and 1:1.5 ratio. The relationship among pre-mating survival, mating propensity and post-mating survival of 7 days old queens ascribed in all photoperiodic regimes were significantly different. The maximum post-mating queen survival (96.67%) was found in short day reared conditions, and lowest (60.83%) in constant light conditions. This different response pattern indicates that light regimes have a positive assortative effect on the mating propensity of *B. terrestris*.

Key words: *Bombus terrestris*, photoperiod, mating