

The Temporal Pattern of Bumble Bees in Plant Visiting

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Abstract : Pollination services are a vital service for the ecosystem to maintain environmental stability. The decline of pollinators can disrupt the ecological balance by affecting components of biodiversity. Bumble bees are crucial pollinators, playing a vital role in maintaining plant diversity. This study investigated the temporal patterns of their visitation to flowers in Kiasar National Park, Iran. Observations were conducted in Jun 2024, totaling 442 person-minutes of observation. Five species of bumble bees were identified. The study revealed that they consistently visited an average of 12-15 flowers per minute, regardless of species. The findings highlight the importance of protecting natural habitats, where their populations are thriving in the absence of human-induced stressors. This study was conducted in Kiasar National Park, located in the southeast of Mazandaran, northern Iran. The surveyed area, at an altitude of 1800-2200 meters, includes both forest and pasture. Bumble bee surveys were carried out on sunny days from June 2024, starting at dawn and ending at sunset. To avoid double-counting, we systematically searched for foraging habitats on low-sloping ridges with high mud density, frequently moving between patches. It recorded bumble bee visits to flowers and plant species per minute using direct observation, a stopwatch, and a pre-prepared form. Bumble bee identification relied on morphological indicators. Totalling 442 person-minutes of bumble bee observation. Five species of bumble bees were identified during the study. The results of this study showed that the visits of bumble bees to flower sources were not different from each other. In general, bumble bees visit an average of 12-15 flowers every 60 seconds. In addition, at the same time they visit between 3-5 plant bases. Finally, they visit an average of 1 to 3 plant species per minute. While many taxa contribute to pollination, insects—especially bees—are crucial for maintaining plant diversity and ecosystem functions. As plant diversity increases, the stopping rate of pollinating insects rises, which reduces their foraging activity. Bumble bees, therefore, stop more frequently in natural areas than in agricultural fields due to higher plant diversity. Our findings emphasize the need to protect natural habitats like Kiasar National Park, where bumble bees thrive without human-induced stressors like pesticides, livestock grazing, and pollution. With bumble bee populations declining globally, further research is essential to understand their behavior in different environments and develop effective conservation strategies to protect them.

Keywords : pollinator, pollination, bee, plant ecology, conservation

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