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BEE POLLINATORS ENHANCE B-ONION SEED PRODUCTION IN THE DRY ZONE OF SRI LANKA

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Production of B-onion (*Allium cepa* L.), a key cash crop in Sri Lanka, falls short of consumer demand due to limited quality seeds and high-cost of commercial seeds. This study investigated the role of insect pollination on B-onion seed production in the dry zone, Sri Lanka, focusing on key pollinators, seed yield, dry weight and germinability. Six experimental plots with B-onion (local breed, 72 plants) were established in a home garden (~112 ft^2), Sigiriya. A total of 50 umbels were randomly selected; 25 open to insects and 25 individually covered with meshed nets. Observations were made on diurnal insect visits, and their floral resources. Seed yield and germinability were compared between open and covered flowers. Germinability test was conducted using the Petri dish method and the Envelop method. After eight days, germination percentages and seedling lengths were recorded. The pollen bee, *Halictus lucidipennis*, was the most frequent visitor, followed by the honeybees, *Apis cerana* and *A. florea*. Nesting sites of *H. lucidipennis* were observed within the plots. The overall diurnal visiting pattern of bees revealed a peak around 8:00 – 9:00 a.m., and this matched with their peak pollen-collecting time, while nectar collection remained throughout the day. The species-specific foraging patterns highlighted distinct preferences: *H. lucidipennis* and *A. cerana* being more active in the morning (8:00 – 9:00 a.m.) for pollen foraging, while *A. florea* preferred midday (12:00 – 1:00 p.m.) for nectar foraging. Further, *A. cerana* preferred nectar foraging during evening (4:00 – 5:00 p.m.). Open umbels had significantly higher seed number (opened: 537±33, closed: 134.2±15.0, $p < 0.05$) and weight (opened: 2.105±0.130 g, closed: 0.534±0.064 g, $p < 0.05$) than covered umbels. A higher germination percentage of seeds developed in open umbels than in closed umbels resulted from both the Petri dish (opened: 89.33%, closed 79.33%, $p < 0.05$) and the Envelop method (opened 93.33%, closed 72.67%, $p < 0.05$) showed a significant difference with longer seedlings. These findings highlight the crucial role of bee pollinators in enhancing B-onion seed production and quality. Future research should assess the vigor of the next generation plants and the efficiency of different pollinators on seed set.

Keywords: B-onion seed production, Germinability, *Halictus lucidipennis*, Insect pollination, Visiting pattern