Influence of Bee Species (Hymenoptera: Apiformes) with Contrasting Behaviors on Pollen Movement in a Mustard, Brassica rapa (Brassicaceae) and the Muskmelon Cucumis melo (Cucurbitaceae)

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Pollen removal and deposition to two crop species are measured as a preliminary screening tool to compare pollination by two commercially available bee species. The ratio of pollen deposited to pollen removed offers a rough estimate of pollinator effectiveness per visit. Differences among pollinators in these measures can help direct future study. Compared was the pollen deposition and removal by Apis mellifera (Linnaeus 1758) and Bombus impatiens (Cresson 1863) for a mustard (Brassica rapa Linnaeus 1753 [Brassicaceae]), and muskmelons (Cucumis melo Linnaeus 1753 [Cucurbitaceae]). As in some other systems, bumble bees and honey bees provided similar pollen transfer when they adopted the same behaviors; differences in pollen-transfer efficiency arose primarily when the bees adopted different behaviors. In B rapa, B impatiens and A mellifera deposited similar amounts of pollen on stigmas, with pollen-collecting visits resulting in more pollen deposited than nectar-collecting visits for both species. A mellifera removed significantly more pollen from B rapa flowers than B impatiens, largely because B impatiens removed little while nectar collecting. The greater deposition:removal ratio of B impatiens suggests it is a better pollinator at least when visits are frequent, because it removes less pollen from circulation per visit. In C melo, the reverse was found: the two bee species differed little in pollen deposition, but B impatiens removed significantly more pollen. The ratio of deposition:removal was higher for A mellifera, suggesting it is a better pollinator than B impatiens. When visits are infrequent, however, B impatiens is likely to mobilize more pollen and be a more effective pollinator.

Key words: Apis mellifera (Linnaeus 1758) – Bombus impatiens (Cresson 1863) – bumble bee – crop pollination – foraging behaviour – honey bee – pollen deposition – pollen flow – pollen removal – pollen transfer

Se midió la recolección y depósito de polen de dos cultivos como una forma de comparar preliminarmente la polinización de dos especies de abejas comerciales. La relación de polen depositado/recolectado muestra una idea aproximada de la efectividad del polinizador por visita.