RESUMEN

Diplotaxis tenuifolia (L.) DC. "flor amarilla" (Fam. Brassicaceae) produce grandes volúmenes de miel monofloral en el sudoeste de la provincia de Buenos Aires, que fluctúan según los años. El estudio de la estimación de la productividad de recompensas florales permite la planificación del aprovechamiento de la flora apícola en una región determinada. El desarrollo de este tipo de investigaciones sienta sus bases en la biología reproductiva ya que el potencial de producción de recompensas florales de una especie puede estimarse a partir de la productividad de flores por metro cuadrado, la cantidad de recompensa por flor y los factores que modifican a estas variables. En este estudio se encontró que *D. tenuifolia* germina en un amplio rango de condiciones ambientales, y el óptimo de germinación en los 25ºC, con fotoperíodo corto (8:16h), y semillas vernalizadas. La floración está condicionada por la longitud del día por ello es clasificada como de día corto con requerimientos cuantitativos, presentando además, compensación entre la densidad poblacional y el número de racimos por planta. Se comprobó la autoincompatibilidad de las flores, que resultaron ser homógamas ya que comienzan a abrir al alba, e inmediatamente después de la aparición de los primeros rayos solares, liberan el polen y los estigmas se hacen receptivos. La senescencia ocurre 31 horas después de la antesis. La tasa diaria de producción de flores por racimo prácticamente no varía con las condiciones ambientales. En este estudio se cuantificó la producción de granos de polen por flor, la que resultó independiente de la época del año en que florece esta especie. Se determinó una eficiencia de cosecha de polen por *A. mellifera* aproximadamente del 80% que aumenta con la oferta de polen por unidad de superficie. El color de las cargas polínicas frescas y su contenido de humedad permitieron predecir el de las cargas secas ya que las variables R y G aumentan con el contenido de lípidos y G con el de proteína. Se determinó que el polen supera el 20% de proteína cruda y posee aminoácidos esenciales para el ser humano y la abeja melífera. Su contenido de lípidos resultó en 10,30 ± 0,52%, con gran cantidad de ácidos grasos poliinsaturados. La cantidad de lípidos y proteínas resultaron dependientes del contenido de fósforo en el suelo. Se estableció que la secreción de néctar comienza con

la antesis y cesa luego de 15 horas, mostrando un pico de producción en antesis máxima, y que la remoción del mismo disminuye su tasa de reabsorción. La humedad del suelo afectó la secreción de néctar sólo en condiciones extremas. La secreción de azúcar óptima (351,58µg; 29,07%) se produjo a 21,48°C y 100% de humedad relativa del aire. La eficiencia de pecoreo de néctar superó el 90%, no siendo afectada por la cantidad y concentración del mismo. Se encontró que el ancho de la lámina de los pétalos varió proporcionalmente al agua útil del suelo y la humedad relativa del aire, e inversamente con la temperatura. La humedad relativa aumentó la intensidad del color de los pétalos, que variaron de levemente verdosos a ligeramente anaranjados a medida que la temperatura disminuyó. El comportamiento de pecoreo de la abeja melífera fue diferente con cada una de las recompensas de esta especie. Se estableció que en las primeras horas de la mañana, *Apis mellifera* pecorea polen y néctar, sobre el mediodía la cosecha de polen disminuye considerablemente hasta cesar en horas de la tarde, registrándose solo visitas en busca de néctar. Se postula que las abejas optimizan la recolección de néctar maximizando el número de flores pecoreadas, disminuyendo la distancia entre las mismas. En cambio, en la recolección de polen, detectan flores con gran cantidad de esta recompensa, recorriendo mayores distancias.

SUMMARY

Diplotaxis tenuifolia (L.) DC. “wallrocket” (Fam. Brassicaceae) produces great amounts of monofloral honey in southwest Buenos Aires province, which fluctuate over the years. The study of the estimated productivity of floral rewards allows the planification of use the beekeeping flora in a certain region. The development of this kind of research is based on Reproductive Biology since the potential production of floral rewards of a species can be estimated from flower productivity per square meter, amount of reward per flower, and factors modifying these variables. In this study, it was found that *D. tenuifolia* germinates in a wide range of environmental condition, and its optimum is 25° C and short photoperiod (8:16h), with vernalized seeds. Flowering is conditioned by day length which places it under the quantitative requirements species classification, also showing compensation between population density and the number of racemes per plant. Flower self-incompatibility was confirm, and they turned out to be homogamous as they begin to open at dawn, and immediately after the occurrence of the first solar rays, release pollen and the stigmas become receptive. Senescence occurs 31 hours after anthesis. Daily rate of flower production per raceme does not vary with environmental conditions. Pollen grain production per flower was independent from the time of the year in which this species blooms. Pollen harvest efficiency by *A. mellifera* was approximately 80%, and this variable increased with pollen offer per unit area. The color of fresh pollen loads and its moisture content allowed predicting the color of dry ones since R and G variables increase with lipid content and G also raise with proteins. It was determined that pollen contains over 20% of crude protein and possesses essential amino acids for the human being and the honey bee. Its lipid content was 10,30 ± 0,52%, with a large amount of polyunsaturated fatty acids. Lipid and protein contents were dependent on the phosphorus in the soil. It was also established that nectar secretion begins with the anthesis and stops after 15 hours, showing a production peak in full anthesis, and that its removal decreases the resorption rate. Soil humidity affected nectar secretion only in extreme conditions. The optimum sugar secretion (351,58µg; 29,07%) occurred at 21,48°C and 100% relative humidity. Nectar forage efficiency exceeded 90% and was not affected by nectar amount or concentration. It was found that the width of petal blades varied proportionally with useful soil water and air

relative humidity, and inversely with temperature. Relative humidity increased the petal color intensity, which varied from faintly greenish to slightly orange as temperature decreased. Forage behavior of honey bee differed with each reward of this species. Settled in the early hours of the morning, *Apis mellifera* forages pollen and nectar, around noon pollen harvest decreases considerably until it stops in the afternoon, registering only visits in search of nectar. It is postulate that bees optimize nectar collection by maximizing the number of visited flowers, decreasing the distance between them. Instead, in pollen harvest, they detect flowers with large amounts of this reward, traveling longer distances.

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