

NECTARING BY NOCTURNAL VELVET ANTS
(HYMENOPTERA: MUTILLIDAE)

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ABSTRACT—Velvet ants (Hymenoptera: Mutillidae) are a conspicuous component of the fauna of Nearctic deserts, but little is known about their natural history. We observed an aggregation of female velvet ants on the dune-restricted plant *Croton californicus* var. *mohavensis* (Euphorbiaceae). We collected 44 female velvet ants on or directly beneath a group of male and female plants during 2 nights. Some individuals were on flowers drinking nectar. The discovery of nocturnal velvet ants on *C. californicus* marks the first record of nectaring in nocturnal female velvet ants.

RESUMEN—Las hormigas aterciopeladas (Hymenoptera: Mutillidae) son un componente conspicuo de la fauna de los desiertos Neárticos, pero su historia natural es poco conocida. Observamos una agregación de hembras de hormigas aterciopeladas en *Croton californicus* var. *mohavensis* (Euphorbiaceae), una planta de sólo dunas de arena. Colectamos 44 hembras de hormigas aterciopeladas sobre o directamente debajo de un grupo de plantas machos y hembras durante 2 noches. Algunos individuos estuvieron en las flores consumiendo néctar. El descubrimiento de avispa aterciopeladas en *C.*

californicus en la noche constituye el primer registro de hembras nocturnas de hormigas aterciopeladas consumiendo néctar.

Velvet ants (Hymenoptera: Mutillidae) are major components of the Nearctic fauna. Despite their abundance, however, little is known of their natural history. While diurnal velvet ants have conspicuous aposematic color patterns, such as those in the genus *Dasymutilla*, nocturnal species are small and inconspicuous. Male nocturnal velvet ants are winged, and commonly are collected passively in light traps. Females, which lack wings and are much less vagile, are collected most commonly by visually searching potential habitat with a flashlight or by using pitfall traps. It is common to collect >500 individual males in a single night at one light, although <10 females may be found by searching. While these methods are sufficient means of collecting velvet ants, they do not facilitate observations of their behaviors. Passive methods of collection, such as light and pitfall traps, preclude behavioral observations, and the light from a flashlight often disrupts foraging by females.

Field observations of velvet ants are rare, especially for nocturnal forms. Previous observations on the biology of nocturnal velvet ants are limited to three Nearctic species, *Sphaerophthalma unicolor*, *S. orestes*, and *S. blakeii* (Mickel, 1938; Ferguson, 1962), and one African species, *Pseudophotopsis continua* (Mellor, 1927). None of these observations record any interactions of plants and velvet ants. Observations of feeding behavior in Nearctic forms include drinking of liquid sugars provided by researchers in a laboratory setting, and drinking from wounds in larvae of hosts caused during parasitism (Ferguson, 1962). Observers of the African species of *Pseudophotopsis* noted that female velvet ants wound adults of their host, a species of *Bembix* (Hymenoptera: Crabronidae), and drink liquid from the wounds (Mellor, 1927). Nearctic velvet ants may feed similarly on resting adults of their hosts, but no observation has been made (Ferguson, 1962). Here we present the first observations in the field of feeding behaviors by adult, nocturnal velvet ants.

On 4–5 September 2008, while collecting on a small sand dune 15 km ESE Saint George, Washington County, Utah, we observed an aggregation of nocturnal female velvet ants on *Croton californicus* var. *mohavensis* (Euphorbiaceae). *Croton californicus* var. *mohavensis* is a

dioecious perennial shrub that grows exclusively in loose sandy soils of the Mojave Desert (Baldwin et al., 2002). This plant blooms late summer-autumn, but no detailed information is available concerning its requirement for pollinators. We collected 44 female velvet ants on or directly beneath a group of male and female plants during 2 nights. When lights were shone on shrubs in an attempt to observe behaviors of female wasps, most wasps dropped from branches to the ground and either ran away, or remained cryptically immobile in the sand.

After initial observations, we returned to the shrubs to observe wasps using lights with red filters. Velvet ants did not seem to be affected by our presence or that of the light. We observed many individual wasps running up and down stems and leaves of male and female plants. Some individuals were on flowers drinking nectar. Additionally, we noted that while velvet ants were extricating nectar from a flower, they came in contact with the anthers. Because of the large number of individuals on an individual plant (>15), and proximity of male and female plants (<0.5 m), velvet ants moving from one flower to another in search of nectar may transfer pollen from male to female plants. Pollination services offered by nocturnal velvet ants to *C. californicus* may be mitigated, however, by their poor dispersal ability, and the supposed infrequency with which they visit flowers. Velvet ants primarily are predators of other Hymenoptera and, consequently, spend the majority of their time searching for suitable hosts. Additionally, *C. californicus* may be serviced by other pollinators, as its flowers also are open during the day.

Following their collection, female velvet ants were sorted to genus and morphospecies at Utah State University. Four morphospecies were in the genus *Odontophotopsis* and one morphospecies was in the *Sphaerophthalma hyalina* species-group. Hosts for these species are unknown, but each species had a well-defined pygidial plate. This trait is characteristic of velvet ants that parasitize ground-nesting bees and wasps. Twig-nest parasitoids often have a smooth, undefined pygidium (Pitts and Manley, 2004; Pitts et al., 2004). This supports our assertion that velvet ants on *C. californicus* were nectaring, rather than searching for hosts. This is the first behavioral observations for the genus,

whose females were only recently discovered (Pitts and Parker, 2003; Pitts et al., 2007). Aside from nesting aggregations of hosts (Ferguson, 1962), this is the largest concentration of nocturnal female velvet ants to be recorded.

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