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# Hilltopping by Males of *Eupeodes Volucris* (Diptera: Syrphidae)

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# HILLTOPPING BY MALES OF *EUPEODES VOLUCRIS* (DIPTERA: SYRPHIDAE)

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ABSTRACT

Hilltopping, station taking, territoriality, and possibly lek formation are combined to form the mate-locating strategy of *Eupeodes volucris*.

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On 25 May 1964, I found a loose assemblage of many males of *Eupeodes volucris* Osten Sacken (Diptera: Syrphidae) at Sand Ridge State Forest in central Illinois, about 20 km NE of Havana. The flies were near the base of a fire tower that was then atop the highest hill in the vicinity. From 1300–1400 h CDT, I took 22 males from this assemblage, and from 1745–1800 h I took another 12. All collected flies were males; no females were collected or seen. I have seldom taken *E. volucris* under other circumstances, either at Sand Ridge or in other parts of central Illinois. Although I have collected here for many years, I have taken only five other specimens of *E. volucris* in central Illinois, all from flowers: two males from the blossoms of *Rosa* spp. and one male and two females from the blossoms of *Pastinaca sativa*, all between mid-May and early July.

The hilltop tower at Sand Ridge was surrounded by open woodland. Medium-sized oaks provided a loose canopy, but there was little or no underbrush. On the day the collection was made, it was clear and hot. The sun shone through the canopy, and the ground beneath was a mosaic of shaded and sun-lit areas.

The males hovered beneath the canopy, usually over a narrow dirt track or other bare areas between the trees. A few hovered as low as ca. 60 cm above the ground, a few as high as ca. 6 m, but most of them hovered at elevations of about 1.5 m to 2.5 m. The horizontal distance between neighboring males varied, but they were generally separated by at least 1 m and seldom by more than 2 m or 3 m. Since the flies generally maintained their positions relative to the ground, it is probable that they were taking a visual fix on some stationary marker either above or below them. The edge of one of the bare areas seems too extensive to have served as the sole marker, but no other tangible markers such as stones or other obects were evident on the ground. It may be that a cluster of leaves or a sunlit spot served as a marker, but the pattern of leaves above the flies and the mosaic of light and shade beneath them were too complex to permit ready identification of either as markers.

Males occasionally interacted with each other. If one male approached another, there was brief contact, but they soon separated and resumed hovering. On occasion, as many as four males came together in an apparently aggressive encounter.

Among the behaviors involved in mate location by insects are: station taking, in which a male watches for females from a vantage point such as a leaf or the trunk of

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a tree or as it hovers over or under some visible marker (Downes 1969); territoriality, in which a male defends the area around his station from conspecific males or insects of other species (Wellington and Fitzpatrick 1981, Fitzpatrick and Wellington 1983); hilltopping, in which both sexes orient to some high topographic feature, and the males take stations there (Alcock 1987) (Hilltopping by other Syrphidae was described by Chapman [1954].); and lek formation, in which several males compete for females as they defend small territories within an arena that offers the females no resource other than the males themselves (Alcock 1981). The observations reported above suggest that these behaviors, with the possible exception of lek formation, are combined in the mate locating-strategy used by *E. volucris*. Whether or not lek formation was involved depends upon whether or not this hilltop area offered female *E. volucris* some resource other than conspecific males. Pollen and nectar were virtually absent because there were almost no blossoms on the hilltop. Whether or not oviposition sites were present is not known.

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