

RESEARCH NOTES

DRAGONFLY PREDATION UPON *PHIDIPPUS AUDAX* (ARANEAE, SALTICIDAE)

Dragonfly adults are aerial predators capable of capturing prey in the air or from exposed surfaces. Spiders that hunt on exposed surfaces or that balloon from prominences should be potential prey for dragonflies. A review of the predators of spiders (Bristowe 1941) indicates that dragonflies are very seldom recorded capturing spiders, with only three observations listed from British Guiana, Costa Rica, and India. Reviews of the known prey of adult dragonflies (Corbet 1962, 1980), reveal only one record of predation on spiders, that of a *Megalagrion* sp. removing a salticid from a fern leaf in Hawaii (Williams 1936). Members of the Salticidae may be more exposed to dragonfly predation than other spiders that hunt in the canopy of the herbaceous layer, due to their general lack of crypticity as compared to the Thomisidae and to their relatively active mode of hunting. The Salticidae literature is equally depauperate in records of dragonfly predation. In a review of the ecology of *Phidippus* spp. in eastern North America, Edwards (1980) reports his own observation of an adult *Erythemis simplicicollis* (Say) (Libellulidae) preying upon an immature *Phidippus pulcherrimus* Keyserling.

Apparently there is some risk associated with a dragonfly attempting to capture a jumping spider. Fitch (1963) observed an adult *Phidippus audax* (Hentz) jumping several inches into the air in unsuccessful attempts to capture adult dragonflies overhead and on other occasions observed *P. audax* carrying dragonflies. Edwards (1980) presents two additional records of *P. audax* and *P. otiosus* (Hentz) capturing adult Libellulidae. The purpose of this report is to document the behavior of a salticid in the presence of patrolling adult dragonflies and to record an instance of successful spider capture by an adult dragonfly.

During the period 15-29 October 1986, visual censuses of foliage arthropods were conducted daily in a 0.1 hectare plot in Washington County, Mississippi (Young in Prep.). This plot contained a variety of weed species and three rows (length = 25 m) of nectaried cotton that had not been picked and was reflowering. Each day several individuals of *Epiaeschna heros* Fab. (Aeschnidae) were observed patrolling lengthwise the rows of cotton, flying 0.3-0.7 m directly above each row. Individuals of *P. audax* on many occasions were also observed near the very top of these cotton plants, usually in a position that gave them some protection from the rear and that allowed them to view an adjacent plant and some of the leaf surfaces below them. Individuals of *P. audax* seemed to be quite capable of detecting an approaching dragonfly at a distance of approximately 3 m, perhaps aided by a moving silhouette of the dragonfly against a bright sky background. At that distance, the spider oriented its body so as to be directly

facing the oncoming dragonfly and assumed a position indicating a readiness to jump. Dragonflies were not observed to alter their flight path when approaching and passing over *P. audax* individuals, and the spiders were not observed to jump. On several occasions when a dragonfly seemed to be moving rather slowly along the row, *P. audax* individuals continually reoriented themselves so as to be facing the dragonfly at all times.

On those warm and sunny days in which the wind exceeded approx. 3 mph, *P. audax* individuals frequently occurred at the top of plants in a ballooning posture. During one census of a single cotton row (25 m), 17 of 21 *P. audax* were at the top of plants spinning silk lines for either ballooning or for traverse lines to adjacent plants. The typical posture involved the downward inclination of the cephalothorax 40-80° below the horizontal, with the abdomen pointed upward in a near vertical position. When *P. audax* assumes this position an aerial predator, approaching from the spider's rear or ventral side, might be able to avoid detection and affect capture.

At 1000 hours, 19 October 1986, an adult female *P. audax* was in a ballooning posture on top of a seedhead of Johnson-Grass (*Sorghum halepense*) at a height of 2 m. The wind was from the west and the spider was positioned such that the ventral side of its abdomen was facing west. An adult of *E. heros* was observed approaching the spider from the west at a height of 2 m and was first seen by us when it was 5 m from the spider. The dragonfly flew in a straight line to the spider, grabbed it in its legs, and continued flying in the same direction and at the same height until it was out of sight at a distance of approx. 75 m. The body length of the *E. heros* was probably in the range of 82-91 mm with a wing span > 110 mm (Needham and Westfall 1955). The body length of the *P. audax* female was probably about 13 mm, based on an average value from 15 adult females captured and measured during the census period.

Our observations on the response of *P. audax* to foraging dragonflies and the successful capture of *P. audax* by *E. heros* lead us to believe that dragonflies in late summer and fall may be significant predators on spiders attempting to disperse.

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