INTERACTIONS BETWEEN THE DRAGONFLY *HAGENIUS BREVISTYLUS* SEL. AND THE DAMSELFLY *CALOPTERYX MACULATA* (P. DE BEAUV.) (ANISOPTERA: GOMPHIDAE; ZYGOPTERA: CALOPTERYGIDAE)

Observations during the summer of 1984 revealed that the gomphid dragonfly *Hagenius brevistylus* is not only a significant predator of *Calopteryx maculata* but that its mere presence may interfere with feeding, mating, and thermoregulatory behavior of the damselfly.

The interactions were noted while I was observing the feeding behavior of female *C. maculata* on Moore Creek, a tributary of the New River in southwest Virginia. On five occasions during the summer of 1984 *H. brevistylus* was observed capturing and consuming *C. maculata*. Three females and two males of the latter species were captured. Of particular interest were the interactions observed on July 9. At 09.27 h I had begun recording the feeding behavior of four female *C. maculata* in a streamside aggregation. This species captures very small flying insects on short flights, usually less than a meter from the perch. Females often retain the same feeding perch for several hours, and in some instances return to the same perch on successive days. All females in the aggregation were feeding regularly and exhibiting the characteristic wingclapping behavior between each feeding flight. At 09.55 h *H. brevistylus* flew into the vegetation among these perched females, and it adopted a cryptic head-up tail-down posture on a stem approximately one-half meter above the stream bank. Significantly, all *C. maculata* in the immediate area ceased feeding and wingclapping. *H. brevistylus* remained motionless as did all of the female *C. maculata*. At 10.14 h a new female *C. maculata* entered the area and began feeding flights about 1.5 m from *H. brevistylus*. On the third feeding flight *H. brevistylus* attacked her but missed. The escapee then remained on a perch and neither fed nor wingclapped. At 10.34 h another *C. maculata* arrived and was immediately

captured by *H. brevistylus*. The captured individual was carried to a blackberry cane above the stream and was consumed over a period of 25 minutes. All *C. maculata* in the area continued to remain motionless. At 11:08 h a third female *C. maculata* arrived in the area and began to feed and wingclap. This individual too was captured by the *H. brevistylus* and consumed on the branch of a small locust tree. (On all occasions on which *H. brevistylus* was observed feeding on prey, it was perched on a thorny branch, such as that of blackberry, wild rose, or locust).

Throughout a two and one-half hour period during which *H. brevistylus* was present, the only *C. maculata* to feed or wingclap were new arrivals that apparently did not detect the predator until after an attack. At 12.32 h the *H. brevistylus* captured a large lepidopteran and left the area. Within thirty minutes after its departure, all female *C. maculata* had resumed feeding and wingclapping.

Although this was an isolated incident involving but one individual of *H. brevistylus*, the uniformity of response among the female *C. maculata* was compelling. These observations suggest that *H. brevistylus* may negatively affect *C. maculata* through more than predation. In this instance the mere presence of *H. brevistylus* during the feeding and mating periods seemed to prevent *C. maculata* females from engaging in these activities. Moreover, insofar as wingclapping may reduce heat stress (C.J. Erickson, in prep.) the cessation of this activity under midday sunlight may place an additional cost on *C. maculata*.

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