

Dense Darner Swarm in Algonquin Provincial Park: Observations and Questions

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At approximately 7 pm on August 1, Sachi Gibson and I encountered a dense darner swarm on the Carcajou Creek to Carcajou Bay portage (45.8345 N, -77.7773 W), on the east side of Algonquin Park. I consider fall darner swarms to be one of the season's highlights, and have encountered them previously in Algonquin, as well as in southern Ontario, but this swarm was different.

First, the majority of the darners were flying at head height, or lower. Second, they were incredibly dense. The swarm occupied approximately 20-30 cubic metres (around three metres across and two metres high), and in that space were at least 100 individuals. They were flying so tightly that once or twice a minute two would fly into each other (it always happened quickly—we would hear their wings hit each other, and then the two darners would separate). During the 20 minutes that we observed the swarm, we captured 38 *Aeshna canadensis*, four *Aeshna tuberculifera*, three *Aeshna clepsydra*, and two *Aeshna interrupta*, and we would have caught many more if we had had two nets! We held on to the *A. tuberculifera* and *A. clepsydra* individuals we captured, only releasing them as we were departing, but some of the tallied *A. canadensis* represent recaptured individuals.

Also, unlike other odonate swarms I've witnessed, the cause of this one was clear: in the centre of the swarm was a rock from which one or two winged ants would launch themselves each second. The ants flew up, nearly vertically, and the darners sliced back and forth across their flight path like strafing aircraft. I would estimate that only one ant in three successfully completed the four foot trip to the safety of the cover of a nearby tree.

Some questions:

(1) How are such large numbers of darners able to locate a food source so rapidly? When we had first

passed by this location, about an hour earlier, and during the rest of our day's canoe, we saw only scattered darners. Never were there more than three of four in sight, even over a sedge meadow greater than a hectare in size. This swarm, conversely, formed over a very small space, and was quite sheltered from sight (surrounded by trees on two of three sides). How did they find their prey so effectively?

(2) Why was the swarm composed as it was? All the odonates present were *Aeshna*, despite the fact that *Epitheca princeps* and *Libellula incesta* were locally more common, before the swarm, than the darners were, and *Dromogomphus spicatus*, *Hagenius brevistylus* and *Somatochlora williamsoni* were also present earlier (as were some species with specialized feeding behavior, like *Boyeria vinosa*). Even among the darners, *Aeshna umbrosa* was conspicuously absent, and *Aeshna interrupta* substantially under-represented (both are locally common). Is "swarming after ants" a behavior limited to certain species?

(3) Are the more common, looser swarms also focused feeding events? The tight composition of this swarm may have been due to the circumstances: there was only a relatively short space in which the ants were vulnerable to air attack (although I'm sure they felt otherwise) before they reached the shelter of the overhanging vegetation. If the ants (or other insects) had been less constrained, presumably the darner swarm would have been less dense?

(4) The selection on these ants (and, presumably, the competition between the darners) was intense. Do ants have any mechanisms by which to reduce their exposure to odonate swarms? Conversely, how effectively can odonates utilize this resource (none of the darners gleaned any of the ants off the grass or the rock, for example, despite the fact that they were abundant there)?