

Celithemis elisa Emergence Period in the Fingerlakes Highlands of New York State

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On 5 June, 2005, we couldn't help but notice a large number of dragonflies emerging from our pond. They were easily identified as *Celithemis elisa* by their blotchy wing pattern, soft golden-green body and deep red-brown eyes. Many more emerged the next day so, beginning on 7 June, we began a count.

On our first experimental pass around the pond we walked side-by-side counting emergers and teneral. They were thick enough that we had to tip-toe through the unmown grass and were overwhelmed at 560. We decided to conduct a count every day until they ceased to emerge.

Survey times varied, some days we counted as early as 8AM, other days as late as 11AM. We counted only once per day but passes made later in the day revealed more emerging, all day long. We estimate our count was merely a snapshot at what was many more per day.

The 2005 count continued until the last teneral was seen on July 19, a total of 40 days. Emergence began before first light and continued until mid-afternoon. At any given time during daylight hours, the sedges, cattails and grasses were festooned with teneral pennants. The summer of 2005 was very dry, with no rain to wash away exuviae, so every leaf and stem was littered with exuviae piled high one atop another.

The first week of the 2005 count produced the highest numbers.

June 7: 560

June 8: 356

June 9: 615

June 10: 172

June 11: 325

June 12: 62

Double digits maintained for a few days before dropping to single digits for the remainder of the period, which ended 19 July. The 2005 season total topped out at 2,455.

We considered this to be pretty impressive, so were anxious to repeat the count in 2006 and were watching for the first emerger. The weather this year was completely different, with rain and cold weather well into the season, but we watched anyway.

They began 1 June with 67. The next day we saw 319. As of that day we decided to split up, John going around the pond one way, me the other, to avoid possible double counting. Heavy rain slowed the next couple of days emergence but the biological clock prevailed and some emerged regardless. On 7 June we achieved our highest count. Our heads were spinning as we met on the opposite side of the pond. We saw stage 2 emergers thick as ants as far as 3 meters from the waters edge and everywhere in between. We added our totals...2,675. Emergence continued all day. We estimated 50 to the meter, from early light to around 4PM, to be 8,000 in that single day. For the next

two days teneral fluttered up from the grass with each baby step we took, akin to clouds of mosquitoes rearing up upon stepping into the Everglades.

The three biggest days of 2006 were:

June 7: 2,675

June 8: 839, cool and damp

June 9: 1,280, cool and drizzly

Cold drizzle fell the next day and temperatures were in the 40s for two more, but still, they came.

June 10: 27

June 11: 16

June 12: 80

June 13: 251, warmer but cloudy

June 14: 313, warm and sunny

Counts then continued in the hundreds. Whereas numbers in 2005 dropped to single digits by mid-June, in 2006 hundreds emerged every day, even in hard rain, until the end of June. Counts dropped into the double digits until 19 July, and into the singles until emergence ended on 2 Aug. The total count for 2006 was 10,944 over 63 days. Keep in mind that counts were made only once a day and emergence of this species carries on at a similar rate until mid-afternoon.

The favorite emergence area was a 2x3 meter patch of Spike Rush (*Eleocharis* sp.). Elsewhere, tall thick vegetation was slightly preferred over sparse low grasses and sedges. Cattails were quite popular, heavily utilized despite being in the shade. On average, when we met at the opposite side of the pond and added our totals, our numbers were about the same.

There were a considerable number of damaged teneral, most often from uninflated, unfurled wings. Occasionally the reason was evident, such as wind causing vegetation to strike a wing or a pounding by hard rain. Some remained in larval state, never opening at all, and will always be a mystery.

The first adult male showed up on 13 June, just 13 days after emergence began. By 19 June pairs were ovipositing by the dozens, and singles were swarming all over the pond. Meanwhile, the greatly outnumbered *Epithea canis* and *Cynosura* were trying valiantly to hang on to their territory. We even saw one resting!

On 26-28 June we had huge rains, with 4 inches over 3 days, flooding ponds, streams and rivers. Emergence continued in the hundreds even though it poured all day and all night.

By mid-July the local flock of Cedar Waxwings learned to associate our presence with an easy meal and began to exhibit learned behavior and cooperative hunting. They would hover 3 feet in front of us, waiting for us to flush teneral and showed considerable bravery by swooping in close to grab a meal. We watched them hover amongst the vegetation, zeroing in on individual stems looking for perched teneral, similar to behavior by adult damselflies hunting small insects. Sometimes they worked an area together, one beating its wings and hovering to flush out a teneral while another would zoom in and snatch it up.

No similar emergence phenomenon was detected in visits to nearby ponds of suitable habitat (there are 5 others on this 60 acre wildlife sanctuary) although adults dispersed to most other ponds in July. All ponds are under 10 years old, and have similar vegetation. This study pond is much deeper, so has more submergent aquatic vegetation (SAV), most of which is *Chara*.

Although similar in appearance to milfoil, *Chara* is technically not a plant but an alga. It quickly colonized all our ponds, covering the substrate within 3 years. Its dense structure provides sanctuary and hunting opportunities for a myriad of aquatic animals and absolute manna for Odonate larvae of all sizes and species.

The pond is 35X40 meters and 18 feet deep with very steep sides all the way around and is the home of a breeding population of *Anax longipes* and the study pond for *Anax junius*. It is 6 years old and is fully described in *Argia* 18(1): 12-13.

Celithemis elisa is known to be an early colonist of new ponds, and a few dutifully showed up the second year after the pond was dug. Numbers here were small until the flood gates opened in 2005. We wonder for how long it will continue to grow, when it will stabilize, will it fizzle out or even crash like the *Lestes unguiculatus* in 2004 and 2005 (*Argia* 16(4): 9-10 and 18(1): 14).

June weather of 2005 was warm and very dry, while in 2006 it was quite the opposite, cold and wet. Nonetheless, in comparing data from each year the highest percentage of emergence occurred during the same span of calendar days. In addition, field notes from 2004 mention many *Celithemis elisa* emerging over the period of June 1 through June 10. This leads us to believe weather above the water's surface has little effect on activity below and surmise photoperiod is the determining factor for this species. We will continue to monitor this pond as well as the others for as long as we can walk and count at the same time.