

An Anisoptera Surveillance of the UNDERC property: Collection and Photography

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INTRODUCTION

The environment we live in is fragile and complex. As the human population continues to increase exponentially it is taking advantage of its environment to the point of inevitable destruction. Through the science of biology, more specifically environmental science, we are just beginning to learn about the Earth we live on so that we may eventually treat it in the proper manner. The first step to solving our environmental problems is undoubtedly to delve into the world around us and learn as much as possible. For this reason, surveillances of species that exist in a particular area is integral to our understanding of the environment we live in. Only with the knowledge of what particular species exist around us can we monitor their abundance from year to year and attempt to protect them from our intrusion into their world.

This summer at the University of Notre Dame's Environmental Research Center(UNDERC) I took a survey of the Anisoptera that inhabit the region of the Upper Peninsula of Michigan. My project consisted of collecting the dragonflies that cruised around UNDERC as well as preserving them with an acetone treatment. Once preserved, the dragonflies were photographed and labeled. For the first time, however, I took this one step further. I ventured out into the world of the dragonfly in order to capture their movements and energy on film. This was the most exciting and rewarding aspect of my project and has changed my concept of photography as an art. With the hours spent out in the field photographing came the realization that photography of such vigorous and

swift insects as dragonflies requires patience, skill and an understanding of their way of life and behaviors. Once I began to achieve these qualities, the excitement and challenge of insect photography thoroughly enveloped me.

MATERIALS AND METHODS

Dragonflies were caught with a large sweep net. After the capture, which was always a challenge, the dragonflies were placed in wax envelopes and refrigerated. To preserve the lively colors of the dragonflies an acetone technique was used. The first step was placing the dragonfly in acetone to kill it. Next, the dragonfly was placed carefully in a wax envelope with slits on the edges for circulation of the acetone. Wings and legs were spread with forceps for proper display of the insect in a collection. The envelopes were placed in a pan with acetone for eight to twenty four hours depending on the size of the insect. After the acetone had evaporated and the envelopes were crunchy, the dragonflies were removed from the envelopes and placed in a clear envelope with an identification card. Dragonflies were identified using wing venation as a primary characteristic. A photo album consisting of pictures from previous years was used as a reference for proper identification.

Photographing out in the field was completed three times throughout the summer at Forest Service Bog, Ed's Bog and Boulder Bog. A Minolta 2xi was used with diopters +1, +2 and +4. All dragonfly shots were taken with the three diopters on the lens to increase magnification. A flash was used at all times for clarification and correct exposure. All f-stops and shutter speeds were chosen manually with the direction of the light meter reading found in the viewfinder. Fast speed Kodak film was chosen to decrease the graininess of the picture(100-200).

Pictures of the preserved dragonflies were taken outside with a white posterboard as a backdrop. A tripod, flash and diopteras were used at all times. Because of cloud cover and movement f-stop and shutter speed had to be checked and adjusted quite frequently . All pictures were labeled and put in the photo album for future reference.

Behavioral observations were taken for one week out of the summer between July 17-21. Observations were taken for one hour at noon each day for five days. All observations were entered into a field notebook for later reference in this report. Additionally, a simple experiment was conducted to add to the information collected through observations. This experiment consisted of marking three dragonflies, *Ladona julia*, with a felt tip permanent marker. Three dragonflies were labeled with the numbers one through three and then released in the same area of capture. Observations were planned on being taken the next day of the same dragonflies. Unfortunately, the same dragonflies were never to be spotted again.

DISCUSSION

Different techniques were used for the successful capture of the dragonflies. The first few weeks a canoe was used to peruse Brown Creek and catch the dragonflies that inhabited that area. Without the help of my fearless and energetic partner, Heather Dodds, this technique would not have been possible. One person rowed the canoe and the other sat at the front of the canoe with a net in hand ready for the next swift dragonfly to fly by. This technique, although successful, was somewhat dangerous. Excitement over catching the dragonfly tended to overshadow the fact that we were in a boat that was easily capsized. A few close calls occurred but the only time we really ever got wet was to move the canoe over the infamous beaver dams that hindered our journey.

The other technique used was simply wading in the bogs and the periphery of the bogs to catch the dragonflies spotted. This was a difficult but rewarding task that only required one person to be present.

For preservation of the dragonfly's vivid colors, the acetone technique used was very successfully but took time to perfect. Over-acetoning resulted in a crinkled dragonfly whereas under-acetoning resulted in a dragonfly that would lose its color within days. Placement of the dragonflies in the wax envelope was tricky and took practice. The wings and legs of the dragonfly were spread for educational and identification purposes.

Photography of the odonates out in the field was the most invigorating and enlightening part of my research project. At first, the task seemed impossible and futile. After spending time in the field and learning their behavior first hand, the task became feasible and eventually successful. Using the dioptera add-ons required that I be within three inches of the insect being photographed. Consequently, about ninety percent of the time the subject of my photo would become frightened and fly away. The other ten percent of the time, however, the inquisitive dragonfly would remain on a leaf or cattail to allow for its picture to be taken. It was within this ten percent that I took advantage of my opportunity and snapped away. With time and three rolls of film I managed to capture the dragonfly's personality and movements on film. Furthermore, the bright colors displayed by the live dragonflies were truly vivid compared with the photos taken of the preserved dragonflies.

The technique used for taking pictures of the dragonflies cannot quite be explained in words-it was more of a feeling and an instinct than a technique. One thing I

noted, though, was that the dragonflies were less likely to zoom away if I moved around the bog on my knees rather than standing up(a very interesting way to travel!) . In this way, my shadow and movements did not disturb them. Evenso, this method was not always effective.

The week observational notes taken of the dragonflies at Tuesday Lake allowed me to learn much about my insect companions. The dragonflies I observed were *Ladona julia*. Through their movements and actions I concluded that the species is most definitely territorial . Males of this species are territorial while the females remain somewhat in the backdrop. Males would fly around and survey the area but would always return to the same twig or leaf, unless thoroughly disturbed. When approached by other males, the territorial dragonfly at its homebase would fight them off and always win. The typical territory of *Ladona julia* was about five feet by five feet . Over the course of the week the territories altered a little but for the most part remained the same.

The dragonflies were constantly on the lookout for another meal and were especially attracted to the deer flies around my head! The interactions of the male dragonflies with the female dragonfly was minimal and I cannot conclude much from the observations made throughout the week. Mating was spotted several times but whether or not the same female mated with a particular male was not discovered.

The attempt to follow the patterns of the same three dragonflies through marks on their wings was a vain attempt. Once the dragonflies were caught and marked all three flew away in the complete opposite direction of their territory. Thus, I concluded that when severely disturbed the dragonfly will abandon his territory and escape for cover in

the brush. Whether or not the same territory was reestablished later on in the summer is unknown.

CONCLUSION

My project was inclusive of many different aspects of the dragonfly: labeling to species, preserving, photographing and observing behaviors. In future years, however, I suggest that an approach similar of that found in Dragonflies and Damselfies of Cape Cod be taken. In this book, a compilation of drawings(or photography), physical descriptions, flight period, behavioral characteristics and other pertinent comments constitutes an interesting and educational reference for the odonates of Cape Cod. The information found this year and in the future years at UNDERC can be compiled to design a book that describes the odonates in a way similar to that of the book above. In this way, a reference would be handy for scientists as well as non-scientists to learn about the dragonflies and damselfies of Gogebic County.

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Table 1: Anisoptera Collection at UNDERC for 1995

SPECIES

Gomphidae:

Gomphus exilis

Gomphus spicatus

Gomphus (Dromogomphus) spinosus

Gomphus grasiellus

Aeshnidae:

Anax junius

Aeshna juncea

Basiaeschna janata

Corduliidae:

Cordulia shurtleffi

Epitheca cynosura

Epitheca spinigera

Libellulidae:

Celithemis elisa

Ladona julia

Leucorrhinia intacta

Leucorrhinia glacialis

Leucorrhinia frigida

Libellula pulchella

Libellula quadrimaculata

Nannothemis bella

Plathemis lydia

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