

ISSN 1061-8503

# ARGIA

THE NEWS JOURNAL OF THE DRAGONFLY SOCIETY OF THE AMERICAS

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VOLUME 11

25 OCTOBER 1999

NUMBER 3

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PUBLISHED BY THE DRAGONFLY SOCIETY OF THE AMERICAS

# THE DRAGONFLY SOCIETY OF THE AMERICAS

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**ARGIA**, the quarterly news journal of the **DSA**, is devoted to non-technical papers and news items relating to nearly every aspect of the study of Odonata and the people who are interested in them. The editor especially welcomes reports of studies in progress, news of forthcoming meetings, commentaries on species, habitat conservation, noteworthy occurrences, personal news items, accounts of meetings and collecting trips, and reviews of technical and non-technical publications. Articles for publication in **ARGIA** should preferably be submitted as hard copy and (if over 500 words) also on floppy disk (3.5" or 5.25"). The editor prefers MS DOS based files, preferably written in **WORD**, **WORD** for **WINDOWS**, **WordPerfect**, or **WordStar**. Macintosh **WORD** disks can be handled. All files should be submitted **unformatted and without paragraph indents**. Each submission should be accompanied by a text (=ASCII) file. Other languages should be submitted only as text (=ASCII) files. Line drawings are acceptable as illustrations.

T. Donnelly (address below) is the interim editor of **ARGIA**.

**BULLETIN OF AMERICAN ODONATOLOGY** is devoted to studies of Odonata of the New World. This journal considers a wide range of topics for publication, including faunal synopses, behavioral studies, ecological studies, etc. The **BAO** publishes taxonomic studies but will not consider the publication of new names at any taxonomic level. Enquiries and submission of manuscripts should be made to **BAO** editor T. Donnelly, 2091 Partridge Lane, Binghamton NY 13903. Final submissions (after review) should be made on floppy disk, as above, with illustrations in final form and preferably adjusted to final size.

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The **BULLETIN OF AMERICAN ODONATOLOGY** is available by a separate subscription at \$15 for members and \$18.75 for non-members and institutions.

Cover: *Somatochlora hineana*, photo supplied by Tim Cashatt

# ARGIA - The News Journal of the D.S.A.

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## IN THIS ISSUE

This has been a punishingly hot and dry summer over much of the eastern United States. George Smolka phoned to say that Odonates in Indiana "crashed" this year. Several others in the Northeast reported similar declines in dragonfly activity. But in the humid Southeast ponds seemed to be more productive than ever. How do heat and drought affect Odonata populations? Certainly in Valentine last summer we were treated to one of our hottest outings ever - but the odonates were abundant! Were the odonates present this summer, but hiding in the bushes? This might be a good research topic.

We had one superb meeting this year and one very wet one. Ken Tennesen reports that the Tennessee meeting was a great success. Roy Beckemeyer finds kind things to say about the Annual Meeting in New York, but the sad truth is that it was cold and rainy. The "Donnelly Effect", otherwise known as Global Wetting, will probably exempt me from organizing any more field meetings in the near future.

The big news this season was finding Hine's Emerald (*Somatochlora hineana*) at several new localities. The best part of this news is the discovery of our only officially Endangered Odonate far from its usual haunts - in southern Missouri.

There has been a flood of new records. Several southern species are now found far north of their usual haunts. *Miathyria Marcella* and *Orthemis ferruginea* both turned up in Maryland, and *Dythemis velox* was found in Virginia. In the case of these southern species, one wonders if a series of warmer-than-normal winters have allowed the larvae of these species to thrive further north than previously. Another good research topic!

*Somatochlora georgiana* was found at a new Massachusetts site and also was found in Rhode Island. *Tramea calverti* turned up once again in Massachusetts. *Stylurus amnicola* and *laurae* were both added to the Ontario fauna. The first occurrence of *Libellula axilena* in Texas is an extension in a different direction.

The Massachusetts bunch, otherwise known as the "Somatochlora Swat Team", have been very active

this summer, with major forays in Maine and Massachusetts. It is a pity we couldn't have had better weather for them in New York. . . . But we did pretty well in New York anyway, thanks to the participants from the International Odonata Symposium and their eager nets.

There has been a lot of chat about the perching habits of dragonflies. Dennis Paulson summarizes a round of chat on his e-mail site. Ken Tennesen then confounds us all by showing that one of our heaviest species seems to be able to grab on to a twig with its hind legs alone!

Jose Ramos has sent in another contribution from Cuba. When the snows blow up here we will have warm thoughts about this sunny island and its interesting odonates.

There have been many e-mail accounts of migrating dragonflies this summer. I have distilled several accounts into a summary article. There is still lots to learn, and I do wonder why those *Sympetrum* seem to go over the ocean. And are they an important food item for salmon? Or just an occasional snack?

Dennis Paulson pleads for a protocol to establish records of dragonflies from photographs. This method is being used more and more, and his comments are well timed. Paul Brunelle and Dave Wagner have been featured in the popular press. Paul Catling announces a major effort under way to increase our knowledge of Ontario odonates. Finally, one of the major events of the summer is the appearance of Philip Corbet's magnificent new book, which should find a place on the shelf of any serious student of these insects.

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## WEST TENNESSEE REGIONAL MEETING A SUCCESS

### Ken Tennesen

Sixteen odonatologists not afraid of cottonmouth moccasins assembled in Bolivar, Tennessee for the Southeast Regional DSA Meeting in mid May, 1999. People came from Alabama, Arkansas, Florida, Kentucky, Missouri, Texas, and of course Tennessee. Our objective was to amass as many new county records of dragonflies as possible in

two plus days of collecting in this neglected part of the state. The results were phenomenal.

## 1999 DSA MEETING IN THE ADIRONDACKS AT PAUL SMITH'S COLLEGE AND ENVIRONS

Western Tennessee streams have been greatly altered by agriculture and logging activities, to an extent that one could be discouraged to search here. Our approach was to split up into teams and to sample streams that were relatively undisturbed, plus visit ponds and any other types of aquatic habitats we could find. After each day of field work, we met and recorded the species that everyone collected or sighted, tabulating new records on a large board where existing records were noted. We added over 100 new county records (mostly in Chester, Crockett, Fayette, Hardeman, Madison and McNairy counties)! We also added a new state record, *Ischnura kellicotti*, and confirmed that *Gomphus apomyius* occurs within the state (Carl Cook suspected the latter's occurrence based on a female sent to him with no specific locality data). This small clubtail flies low and fast over flowing water and is very difficult to follow by sight. The eyes of the males are blue.

### Roy Beckemeyer

Getting anywhere from Wichita, Kansas is a challenge, and New York is no exception. Since we had miles enough for free tickets on American, we first flew south to Dallas, then back north over Wichita up to Chicago before finally heading east to Syracuse. Getting off the plane in Syracuse, we ran into Dennis Paulson and Jim Johnson from Washington state. They immediately headed east to get in some collecting (ever mindful of the well-known "Donnelly effect" that might - heaven forbid - once again strike terror in the hearts of the many northeastern-bound Odonatists). We, on the other hand, gathered our luggage and went to rest in a motel in Syracuse for the night so as to be rested up for tomorrow's long day of driving and net-swinging (well, OK, mostly driving).

One day, Paul Miliotis helped me make a memorable catch. We spied a gomphid female fly high into a tree, too high for either of us to net, and we could not see it well enough with binoculars to identify it. Using our field ingenuity, we lashed a dead pine limb to the handle of my net using Paul's belt and the strap from my field pouch. A mighty swoosh of the contraption bagged a female of *Arigomphus villosipes*!

Thoughts of James Fenimore Cooper and Natty Bumppo came to mind the next morning as Pat and I drove through central New York state for the first time. We crossed the Erie Canal at Utica and just had to sing "Low bridge, everybody down, low bridge 'cause we're coming to a town..." (Did everyone in elementary school in the 40's and 50's learn that song, or was Illinois unique?) We headed up into the mountains in sunshine, but with cool weather, and literally no odonates in site at the few places we did stop. One of those stops was a hardware store in Old Forge, where, we were told, there was a bookstore where we would likely be able to find a field guide to New York wildflowers. Believe it or not, there was indeed a great book department as well as departments for almost anything else you could think of in that "hardware" store. We thoroughly enjoyed the drive through the cool mountains, having left flat-as-a-pancake Kansas and its 100+ degree weather, even though the New York dragonflies seemed to be hunkering down for the spell of damp, cool weather.

I want to thank each of the brave and hard-working participants: Shawn Chapman (TN), Carl Cook (KY), Jerrell Daigle (FL), Mary Steele (TN), Sid Dunkle (TX), George and Phoebe Harp (AR), Steve and Mary Jane Krotzer (AL), Paul Miliotis (TX), Bill Mauffray (FL), Jeanette Trombley (FL), Joe Smentkowski (MO) and Jane Walker (MO).

Arriving late in the afternoon at Paul Smith's College, we found that the DSA had taken over Currier Hall, and Ailsa Donnelly had the logistics all worked out and well under control. We quickly got down to the business of catching up on the latest news from dragonfly collectors and enthusiasts from across as well as from outside the country (Gerhard Jurzitza from Germany and Gordon Hutchings of Canada were in attendance to lend something of an international flavor to the

We decided that next year we will try to hold the Southeast Regional Meeting in the Great Smoky Mountains National Park as part of the Park's effort to inventory all species within its boundaries (this effort is the ATBI, which stands for All Taxa Biodiversity Inventory). If this works out, look for an announcement on dates and meeting place in a future issue of ARGIA.

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proceedings). I guess most meetings of specialists must sound every bit as esoteric as ours, but drifting off to sleep the first night at Paul Smith's to the sounds of several parking lot conversations made me wonder what the other folks around the campus would be making of our jargon, Greek and Latin-filled enthusiastic interchanges.

The next morning dawned gray-skied and damp, and poor Nick had to endure the sharp arrows and slings of "Donnelly effect" wielders as they stood hunch-shouldered in the parking lot looking for glimpses of blue sky between the clouds. Nothing really stops Odonatists, however, and after breakfast caravans were soon heading out for some truly impressive collecting sites. Over the 3 and a half days of the meeting we waded in the West Branch of the Ausable River and bog-hopped and slogged in some prime northeastern bogs: Bloomingdale and Hitchen's Pond Bogs were delightful. If the odonates were slow, there were orchids and other wildflowers to be checked out. To paraphrase a famous author, we weren't in Kansas anymore.

Collecting new species like *Nehalennia gracilis* and *Lanthus parvulus* (exuviae) and species I knew but hadn't seen for some time, like *N. irene*, *Ladona julia*, *Dodocordulia libera*, and *Leucorrhinia hudsonica* and *glacialis* was great fun, even though the numbers were a bit low. And the evening slide shows and discussions were once more eye-popping events, with slide shows of strange odonates (and other flora and fauna) from Malaysia and Australia and fantastic macro photos of European dragonflies in flight, and *Neurocordulia yamaskanensis* being snatched from the shore of Lower St. Regis Lake by Jeremiah Trimble and associates to round off the evening's entertainment.

One usually heads away from our yearly meetings happy to have been there, sad to see it all end, but this year the lucky ones of us had another week of Odonata, Odonata, Odonata in the form of the International Congress of Odonatology at Hamilton, N.Y. But that's another story for another time.

(A big and heartfelt thanks to Nick and Ailsa for arranging a lovely meeting in a delightful location. Having been through this last year, I now have a more finely-honed appreciation for the effort that goes into preparations for these annual events. On to British Columbia, Canada for 2000!)

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## NEW HINE'S EMERALD (*SOMATOCHLORA HINEANA*) DRAGONFLY SITES FOUND IN 1999

Tim Cashett

As the search for more populations of *Somatochlora hineana* continues and the recovery plan is near publication, several significant discoveries were made this year. The following is a summary of new localities found: Missouri, Linden Trial (1); Wisconsin, William A. Smith (1); Michigan, Wayne P. Steffens (3); and Illinois, Timothy E. Vogt (1); Ted Anchor and Don LaBrose (1).

**Missouri: Reynolds Co.** (29 June 1999, Linden Trial, prairie fen) It is difficult to rank the importance of these discoveries; however, I believe this one deserves a place at the top of the list. I have to give Tim Vogt credit for preaching about the virtues of the habitat in the Ozarks, but I believe that Linden Trial deserves the award for the Hine's Emerald dragonfly discovery of the year. Linden Trial, as a part of a state-wide dragonfly survey in Missouri, collected several *Somatochlora* sp. which she asked us to identify. Linden works for the Missouri Department of Conservation and has taken a recent interest in dragonflies. A male *S. hineana* specimen was found in the same area as *S. tenebrosa*, the sister species of *hineana*. This is the first documented case where the two species have been found flying together. This suggests that there may be more populations scattered through the southern part of the potential range (as we have it drawn in the recovery plan). A single specimen taken in 1978 from Jackson Co., Alabama specimen can no longer be assumed to be a vagrant, suggesting further investigations should be conducted in northeast Alabama. The nearest known population is about 500 km to the northeast, and the latitude for this site is roughly similar to the locality from northeastern Alabama. Total number of Hine's emerald localities in Missouri, 1.

**Wisconsin: Ozaukee Co.** (9 July, 1999; reported by William A. Smith) Two specimens (green-eyed, with some wear on rear edges of wings) were netted by students John Balaban and Fay Mayer in mid-afternoon while attending a dragonfly workshop conducted by Smith. The specimens were flying over an old field near a forest edge. Two individuals found in close proximity to one another strongly suggest the presence of a breeding population nearby. Plans were made to search for nearby breeding habitat. This site is approximately



upright angle while the hind wings remain flat and the abdomen is held at an upright angle.

*D. velox* is a species of the southern tier of states from Arizona to North Carolina, and in the plains states north to Kansas (Bick and Mauffray 1999). Whether this record represents a range expansion or not is conjectural. Carle (1982) predicted that *velox* "undoubtedly occurs in streams of the coastal plain and piedmont" of Virginia. But the species is conspicuous, has a long flight season, and is easily identifiable in the field, so it shouldn't be overlooked. There is a history of recent range expansion as in southern Louisiana (Mauffray 1997).

The record from Philpott Reservoir in Patrick County, Virginia is nearly contiguous with North Carolina records from the northern county of Rockingham (Carle 1982). But the Chesterfield County location is disjunct from previous records and represents a northern and eastern range extension. Since *D. velox* is not illustrated in any currently available field guide, observers unfamiliar with the species may want to consult the series of images available on Digital Dragonflies at <http://stephenville.tamu.edu/~fmitchel/dragonfly/Libellulidae/dythe.htm>

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#### FIRST TEXAS RECORD OF THE BAR-WINGED SKIMMER (*LIBELLULA AXILENA*) WESTWOOD

Robert A. Behrstock

The most recent accounting of Texas odonates was published by Abbott and Stewart (1998), and that specifically of the odonates of the Big Thicket Region by Abbott et al. (1997). County-level distribution maps of these records are available on the Internet (Abbott 1999). Based on these, Bar-

winged Skimmer (*Libellula axilena*), widespread in swampy woodlands of the SE United States and ranging north to Massachusetts (Bick and Mauffray 1999), is not known from Texas.

On 20 June 1999, I located a male *axilena* at the SE corner of the John H. Kirby State Forest, Tyler Co., Texas. It lies on the western side of U.S. 69/287, approximately 13.5 miles south of its intersection with U.S. 190. Tyler Co. comprises much of the northern half of the Big Thicket National Preserve (Abbott et al. 1997), the core of the Big Thicket Region, an area rich in odonates and odonate habitats, with more than 110 species recorded.

The skimmer was located along the edge of a sunny dirt road, perched ca. 1 m above a shallow ditch, at dense brushy forest edge. A small, partially shaded, tannin stained pool was present nearby. From approximately 11:30 a.m. to 12:15 p.m. CST, Linda Walsh (Houston, TX) and I observed the skimmer as it flew, took various perches, and interacted, usually as the subordinate, with three male Blue Dashers (*Pachydiplax longipennis*). Perches included vertical and leaning twigs and grass stems, as well as the tips of tall (2 – 3 m) dry stems. When perched, the dragonfly's body was always diagonal with the ground, generally parallel with the axis of the perch. We observed the skimmer to change perches more than 20 times, always returning to an area about 10 x 2 m; thus, it appeared territorial.

Field marks readily visible included the overall dark blue coloration, small pruinescent white patches at the base of the hind wings, paler dorsal areas on the thorax and anterior part of the abdomen, and a black band running down much of the dorsum of the abdomen. In camera lens and close-focusing binoculars, the following black areas of the wings were noted: narrow margin of the wing tip from the apex forward through the stigma, a bar on the leading edge of each wing between the stigma and the nodus, the nodus itself, and a bar at each wing base continuing distally as a thin line to the level of the nodus. Eleven slides depicting these features were taken. Voucher slides are on deposit with Sid Dunkle (Plano, TX), and John Abbott (Avondale, PA). Other odonates in the vicinity were: Swamp Darner (*Epiaschna heros*), Black-shouldered Spinylegs (*Dromogomphus spinosus*), Halloween Pennant (*Ceulethemis eponina*), Golden-winged Skimmer (*Libellula auripennis*), Slaty Skimmer (*L. incesta*), and Great Blue Skimmer (*L. vibrans*).





male Roseate Skimmer! It was frequenting the same shallow cove at the east end of the lake where we had found the Hyacinth Glider. The location of this second *Orthemis ferruginea* was 6.4 miles east of Font Hill Park at the shallow east end of 37 acre man-made Lake Elkhorn, constructed in 1974 in the village of Owen Brown on the east side of Columbia, Howard County, Maryland. The lake is located at 39° 11' 40" N and 76° 50' W at an elevation of about 300 feet. The three of us (Czaplak and the Solems) immediately went to Lake Elkhorn. When we arrived at the lake at 1:00 p.m., the dragonfly was still perched where Dave had last seen it on a twig (<0.5" diameter) extending a foot above the mud within easy sight of the footbridge, but out of net range. Both Dave and Bob photographed it.

Monday, 19 July the Roseate Skimmer appeared on its perch at 9:45 a.m. The abdomen looked even more intensely pink and it was easier to see that this individual's thorax had a lovely purplish sheen, something we had not detected on the Font Hill Wetland Park male. The face showed red against the deep red-brown of the eyes. We laid a path of dead branches across 15 feet of mud to get within netting distance, but we were unsuccessful in capturing the skimmer. After this disturbance *Orthemis ferruginea* disappeared. It was not seen again despite searching likely sites by us and Richard Orr on two successive days.

*Orthemis ferruginea* has been recorded in 15 states (Bick and Mauffray, 1997-1999). A sixteenth state record appears to be unpublished: A specimen was taken in South Carolina about 15 years ago (S. Roble, pers. comm.) Of special pertinence is the item by D. Czaplak (1998) in which he notes a sighting of *Orthemis ferruginea* at a pond at the National Arboretum in Washington, D.C. on 18 July 1998. The date falls within the same time span as the two Howard County specimens.

Our thanks to Charlie Peregoy, Howard County Department of Recreation and Parks, for supplying information about the ponds at Font Hill Wetland Park. Maud Banks, Owen Brown covenant administrator, provided information about Lake Elkhorn as did Columbia Association ecologist Charles Rhodehamel. We are grateful to both of them. To have Dave Czaplak verify our sight record with a second sighting and photographs was quite amazing. Richard Orr's enthusiasm, research, and support were much appreciated. We thank Steve Roble for unpublished records.

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## BIG NEWS FROM RHODE ISLAND

### e-mails from Ginger Carpenter

I've had a very interesting early odonate season and wanted to report some updates to you from the Rhode Island Atlas project. First, we have had four new species added to our list: *Epitheca canis*, *Gomphus spicatus*, *Lanthus vernalis*, and (finally!) *Cordulegaster obliqua* (a female ovipositing in water pooled in tire ruts). So many species are having huge years compared to the past 4 or 5: *Nasiaeschna pentacantha* is everywhere this year, as is *Dorocordulia lepida*, *Gomphaeschna furcillata*, *Basiaeschna janata*

I also have some great news from the Rhode Island Atlas: a female *Somatochlora georgiana* was taken last week on a small forested stream in southwestern Rhode Island (Washington Co.), not too far from the Connecticut border.

We have been hunting hard for *Enallagma pictum* records here. Prior to this year we had only three sites and all were in Washington County, in the southern part of the state. We have now added at least 8 new sites, and the species was taken from the northwest corner of Rhode Island on Sunday (adding Kent and Providence Counties) }

## ANOTHER SOMATOCHLORA GEORGIANA RECORD FROM MASSACHUSETTS

### e-mail from Blair Nicula

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The little-known Coppery Emerald (*Somatochlora georgiana*) has been found at another site in Massachusetts.





deposits. It is open, 5-10 yards across and occupies a largely wooded valley. On 1 August 1999, Riverine Clubtails could not be found at this location by P. Pratt, but males were seen flying at a location approximately 6 km downstream west of Straffordville (at approx. 42° 45' 45" N, 80° 50' 25" W). Here again the clear water was shallow, with enough flow to ripple the surface, and the depth was less than 1 foot. One male flew up and perched on a streamside shrub, but the others were constantly patrolling low over the surface of the creek, usually staying over open, shallow areas in mid-stream. These observations are of interest not only as new provincial records of an evidently rare Canadian species and a substantial range extension being 300 miles SW of the nearest Québec site (Pilon & Legacé 1998) and 200 miles NE of the nearest Ohio site (Glotzhober 1996), but also because the adults have not often been observed over water at the Canadian sites (Ménard 1996). Riverine Clubtails are rare in the area surrounding Ontario having been reported from only 3 counties in Ohio (Glotzhober 1996.), 2 counties in Pennsylvania (Beatty & Beatty 1971), 1 county in New York (Donnelly 1992) and 3 counties in Michigan (O'Brien, Kielb & Bright 1997). In Maine, where it is considered endangered, the species has only been collected as exuviae (MDIFW 1998). The occurrence of *Stylurus amnicola* in Ontario brings the list of Ontario Odonata to 166 taxa (Catling et al. 1998, Pratt 1999).

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**LAURA'S CLUBTAIL (*STYLURUS LAURAE*)  
NEW TO CANADA**

**Paul M. Catling** and **Cory H. Catling**, 2326 Scrivens Dr., RR 3 Metcalfe, Ontario K0A 2P0. Tel. 613-821-2064. email: [brownell@achilles.net](mailto:brownell@achilles.net)

On 23 Aug. 1999, we visited a portion of Big Otter Creek (42° 48' 44"N, 80° 45' 50"W) in Elgin County Ontario, just a few miles upstream from a place where we had found Riverine Clubtails (*Stylurus amnicola*) earlier in the year. This portion of the creek has a sandy bottom, moderate flow with riffles and pools, and is up to 3' deep. The creek is 15-20 ft wide and has wooded banks. Seven adults were observed flying within a few inches of the water, and occasionally rising quickly up to rest on overhanging foliage 5-20 ft above the water. One male and one female were captured and initially assumed to be Riverine Clubtails (*S. amnicola*), but later examination proved them to be referable to Laura's Clubtail (*Stylurus laurae*).

Laura's Clubtail is larger with a hindwing 33-42 mm whereas Riverine Clubtail has the hindwing 29-33 mm long. The Ontario specimens of Laura's Clubtail have slightly smokey instead of completely transparent wings (as in our collections of Riverine Clubtail). In addition the yellow cross stripe on the collar is interrupted with black in Laura's Clubtail instead of continuous as in the Riverine Clubtail. Laura's Clubtail also lacks the middorsal pale thoracic stripe. The vulvar lamina (subgenital plate) of Laura's Clubtail is very similar to that of the Riverine Clubtail, and the anterior hamule is also

similar but has a somewhat higher obtuse angle on the front and the terminal hook appears to be a little shorter and thinner (as illustrated by Needham & Westfall 1955, Figs. 147, 153).

The newly discovered Ontario population represents the first record for Canada and is the northern range limit of this species. Widespread in the southeastern United States (Needham & Westfall 1955), Laura's Clubtail has not been recorded in New England, Pennsylvania and New York. It is currently known from four Ohio localities (Glotzhober 1999) and two locations in southern Michigan (O'Brien, Kielb and Bright 1997). It is thus rare in the area surrounding Ontario. Laura's Clubtail appears to fly relatively late as well as early. The Ohio records include mid-June, late July and late August and early September (Glotzhober 1999).

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#### OPHIOGOMPHUS COLUBRINUS ON THE AUSABLE RIVER

e-mail from **Dave Czaplak**

Sunday, July 11, the last day of the DSA meeting, was sunny but still on the cool side. There was not much odonate activity. I was fortunate to be able to stay over the next day, July 12, which was much warmer. At 9 AM I arrived at the Ausable River below the ski jump, and clubtails were already very active. Numerous *O. mainensis* and *G. adelphus* were perching on rocks in the river and on streamside vegetation. They were quite tame, and I was able to catch several of each. A few times I glimpsed *Ophiogomphus* which, through the binoculars, seemed to have black stripes across the frons. I guessed that they were *O. colubrinus*, but they were wary and not approachable. A single male *Stylurus scudderii* patrolled up and down at high speed. Sometimes it perched on rocks, just out

of net reach, showing its markings beautifully. I never got a swing at it. I was surprised to catch a single female *Gomphus borealis* in the vegetation. I thought that they preferred ponds. By noon, *Ophiogomphus* activity had died down, and more *Stylogomphus* came out. Many of the gomphids were observed flying up to perches high in the spruce trees. I went upstream a mile to a roadside pull off above the ski jump. Here *adelphus* and *mainensis* were still active, and I caught a few more. (Did they get a later start at this spot because the sun reached it later in the day?) I returned to the first spot, but it was now getting cloudy. By 3 PM I was about to quit. A final break in the clouds brought some sun, and a few gomphids came out. One of the stripe-faced jobs perched on a nearby rock, and this time it was not wary enough to escape the net. *colubrinus* at last! Thanks again to those who organized the meeting, and the members who shared so generously of their knowledge of dragonflies and the Adirondacks.

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#### THE SOMATOCHLORA SWAT TEAM VISITS MAINE

e-mail from **Blair Nicula**

Four of us (Jeremiah Trimble, Michael Veit, Rick Heil, and I) recently spent four days in north-central Maine chasing odonates, with considerable success. Foremost among the highlights, was a first U.S. record (to our knowledge) for *Somatochlora brevincincta* (Quebec Emerald)! The trip featured 14 species of gomphids, including *Ophiogomphus anomalus* (Extra-striped Snaketail) and 17 species of corduliids, including numerous adults of the new *Neurocordulia* sp. one evening.

Two *S. brevincincta* were netted (both by Jeremiah, of course), a male and a female, at a huge bog, the 1000 Acre Heath, southeast of Lee (Penobscot County). The male was flying in the lee (it was quite windy) of a small island in the bog, while the female was along a dirt road adjacent to the bog. Small numbers of *Somatochlora franklini* (Delicate Emerald) were present over the bog, and we saw a number of *Nannothemis bella* (Elfin Skimmer), but otherwise the bog was not too active. However, the long dirt road leading into the bog was alive with corduliids. We netted 8 species of *Somatochlora*; in addition to the *brevincincta*, there was *elongata* (Ski-tailed Emerald), *franklini* (several netted), *forcipata* (Forcipate Emerald), *kennedyi* (Kennedy's Emerald) *incurvata* (Incurvate Emerald), *walshii* (Brush-tipped

Emerald), and *williamsoni* (Williamson's Emerald). Small corduliids (especially *Epitheca cynosura* and *E.spinigera*) were abundant, and quite happily picked off black flies from the swarms around our heads! (At this same bog in August 1998, we found *incurvatâ* to be numerous, but found few other *Somatochloras*.)

We found single female *Ophiogomphus anomalus* at three sites: the Piscataquis River in Medford, the Pleasant River in Brownville, and the Mattawamkeag River in Mattawamkeag. (These are some of the same sites where Nick Donnelly, Sid Dunkle, and Jerrell Daigle found numbers of the species on about the same dates 12 years ago.) *Ophiogomphus carolus* (Riffle Snaketail) and *rupinsulensis* (Rusty Snaketail) were numerous at one or more sites, whereas *mainensis* (Maine Snaketail) was scarce.

At the Mattawamkeag River one evening, we caught 14 of the yet-to-be-described *Neurocordulia* discovered by Paul Brunelle a few years ago in New Brunswick. Most were females, and we were struck by the variation in the proportions among them. Some were extremely chunky at the base of the abdomen, giving them strikingly pot-bellied appearance, similar to those we caught in New Brunswick three years ago. Others, however are much more slender, with almost no expansion of the first two abdominal segments. We are puzzled by this variation, and have not seen anything comparable in any other species. However, I cannot find any other differences among these females and at this point presume they are all the same species (they are not *obsoleta* or *yamaskanensis*), though the situation certainly is intriguing. Additionally, all of these specimens from Maine are much darker in overall coloration than the several specimens I have from New Brunswick. We're eager to have Paul Brunelle look them over to see what he thinks.

The previous evening, we saw a number of *Neurocordulias* over the East Branch of the Penobscot River north of Medway, but conditions were very difficult and we were unable to net any.

At Hale Brook in Hersey, we found both *Lanthus parvulus* (Northern Pygmy Clubtail) and *vernalis* (Southern Pygmy Clubtail). Although these two species have been found to coexist at a few sites further south, as far as we know this is the only site in New England where they can both be found. It also represents the northernmost site known for *vernalis*.

Prior to meeting us at midday on 24 June, Michael Veit began the trip on an auspicious note by collecting a lovely male *Gomphus abbreviatus* (Spine-crowned Clubtail) on Twenty-five Mile Stream near Burnham, ME.

The deer flies and black flies were brutal, but were a small price to pay for a wonderful time in a still largely undisturbed part of the country.

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## THE SWAT TEAM GOES CANOEING

e-mail from Blair Nicula

Five of us (Fred Morrison, Michael Veit, Jackie Sones, Jeremiah Trimble, and I) spent the day Sunday (6/13) canoeing on the Connecticut River in Sunderland, MA. Although the day began rather gloomy, from late morning through mid-afternoon we had quite a bit of warm sun and some nice "big river" odonates.

Perhaps the most interesting find was of two male Spine-crowned Clubtails (*Gomphus abbreviatus*), to our knowledge only the third record for this species in the state, and a "lifer" for all of us. Almost as noteworthy was a single male Skillet Clubtail (*Gomphus ventricosus*), netted by Fred Morrison - another species that has been recorded very infrequently in the state. Four freshly emerged Riverine Clubtails (*Stylurus amnicola*) and at least nine Cobra Clubtails (*Gomphus vastus*) (including a pair) added to the state-listed gomphid mania. There were another 40+ gomphids patrolling over the river, most of which were probably more Cobra Clubtails. Other species of note included: Black-shouldered Spinyleg (*Dromogomphus spinosus*) (one emerging female), Rusty Snaketail (*Ophiogomphus rupinsulensis*), Prince Baskettail (*Epitheca princeps*), Illinois River Cruiser (*Macromia illinoiensis*), and Blue-fronted Dancer (*Argia apicalis*).

At dusk we capped off the day by visiting a dock on the river in Northampton where, within a few minutes, we were able to net seven Stygian Shadowdragons (*Neurocordulia yamaskanensis*). Although many exuviae of this species have been found on the river in recent years, these are the first adults recorded in the state (to our knowledge, at least).

On Monday, 6/13, despite peek-a-boo sunshine interspersed with showers, we were able to find a

few bugs in some areas near the river in Amherst and Hadley. Most notable, were at least five more Skillet Clubtails (*G. ventricosus*) in a small clearing on the road up Mt. Holyoke (about half a mile from the river). These were all mature males. At a very small, woodland stream in South Hadley, Jeremiah Trimble caught a Southern Pygmy Clubtail (*Lanthus vernalis*), a first for Hampshire County. We finished off the trip with another quick visit to the Northampton dock where we netted three more Stygian Shadowdragons (*N. yamaskanensis*) in as many minutes. A nice ending to a very productive two-day trip!

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## 1999 HAS BEEN A BUMPER YEAR IN NEW YORK

### Nick Donnelly

This was certainly a year to add county records to the New York list. Since my 1992 publication, there have been nearly 50% new county records!

One of the most satisfying county records in New York this year was also one of the easiest. One morning in June Ailsa walked out to get the newspaper, accompanied by Gerhard Jurzitza, who was staying with us for a few days. They came back with a dead *Gomphus vastus*, which was lying on the driveway! This species had been present in nearby Susquehanna County PA for three years in the late 60's, but it has not been seen around here since then.

The Adirondack gathering was wet and fairly unproductive, but on the last sunny day before the group assembled, Bill Mauffray took a *Somatochlora kennedyi* in Hitchins Pond Bog, Saint Lawrence County. Our records of this species had been limited to an incomplete male from Asbany County and an old record for "*semicircularis*" from Essex County. It is nice to put this species firmly on the New York list with a fresh specimen. At the same meeting, Jeremiah Trimble found a *Neurocordulia yamaskanensis* in the damp gloom of evening at Lake St. Regis. "Ya gotta get wet to get 'em."

The International Odonata Symposium in July at Colgate University brought a large number of Odonatists to upstate New York. Here they enjoyed our celebrated scenery and hospitality – not to mention a blazing hot, dry spell that left everyone a bit wilted in the summer sun. Nevertheless, all those eager nets found many new

records of interest. During lunch of the first day of the meeting, John Michalski and I wandered out for a noontime stroll. We quickly found *Somatochlora tenebrosa* flying around. When we returned with this information, several eager people tumbled out of the dining hall, nets in the hand and glimmers in the eye. The sight of Tim Vogt, uncharacteristically dressed in suit and tie, wielding his giant net on the hill, will linger for a long time. By the end of the week several people had collected this lovely insect, and a few came back with *S. walshii*, which was flying with it. Another emerald, *S. williamsoni*, was taken in no less than three new counties (Onondaga, Chenango, Madison) to add to our records of this genus. Another record which pleases me is *Argia apicalis* from Cayuga County – well north of anything heretofore in the state.

*Enallagma basidens* is increasing its range in New York. We have now doubled its counties to six, adding Onondaga (several participants at the Symposium found it), Chemung (Doug Bassett), and Westchester (Ken Soltesz).

Doug Bassett of Letchworth State Park has begun adding much-needed records for western New York. Among his more interesting finds are no less than three new county records for *Boyeria grafiana* (Broome, Steuben, Wyoming), extending its range well into the western part of the state.

Fred Sibley added another record of *Cordulegaster erronea* from Schuyler County, near Seneca Lake. This extends its range far to the west in the state. Ken Soltesz has an additional site for this rare species in Westchester County.

Ken also found a new record for *Gomphus fraternus* on the Wallkill River in Orange County. Curiously, he found exuviae with it that turned out to be *Gomphus vastus*. This is similar to the situation on the Connecticut River, where Dave Wagner takes almost entirely *fraternus* adults but finds almost entirely *vastus* exuviae. Yet another record for *Gomphus fraternus* was made by Martha Reinhart, who photographed one in Livingston County.

Finally, the Bobsey Twins of the New York *Ophiogomphus* world (*anomalus* and *howei*) continue to command our attention. Fred Saint Ours and his Dutch fellow collectors found lots of exuviae and one adult female of *anomalus* on the Moose River in Herkimer County, a new drainage for this elusive insect. Paul Novak found exuviae

of *howei* at two localities on the Schroon River in Warren County, another new drainage. And Paul found abundant *anomalous* and *howei* exuviae together on the Upper Hudson in Saratoga County far downstream of their previous finds. This last find is especially significant because it is below a dam, negating the notion that the larvae could have drifted down from an upstream locality.

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## ODONATA GLEANINGS - PHYLOGENY AND PERCHING BEHAVIOR

Dennis Paulson

A recent thread on the ODONATA (listbot.com) list involves looking more closely at dragonflies than we often do.

Two points were introduced in a discussion of the phylogeny of the genus *Libellula*, including *Ladona* and *Plathemis*.

First, it was noticed that *Ladona* and *Plathemis* perch commonly on the ground, while American species of *Libellula* do not. As there has been much debate about the relationship of these three taxa, and their relationship to the European species of *Libellula* (*depressa* and *fulva* as well as *quadrimaculata*), it was thought that perhaps this behavior might prove of interest in constructing a phylogeny of the *Libellula* group.

But that was not to be the case. European workers responded that neither *depressa* nor *fulva* regularly perch on the ground, so that behavioral trait can't be used to relate them to *Ladona* or *Plathemis*. Nevertheless, many genera appear to be characterizable as ground-perchers or not. In some genera, with *Libellula* the immediate example, different species may be ground-perchers or not. *Erythemis simplicicollis* and *E. collocata*, two very common North American species, both perch much of the time on the ground, or right at the water surface on fallen rushes and lily pads. This is so characteristic that the pruinose blue males of *Erythemis* and *Pachydiplax* can often be distinguished in the field just by where they perch.

Some other species of *Erythemis* are also thought to perch on the ground, but no one was able to characterize any of them by perch height. However, the largest species of the genus, the long-bodied *Erythemis vesiculosa* of the American tropics, typically perches up in the vegetation and only rarely on the ground. Perhaps perching on the

ground (and rocks and tree trunks) is more characteristic of wide-bodied than narrow- (and long-) bodied species, yet the very slender-bodied *Erythemis plebeja* also perches on the ground.

It may be simply a matter of the substrates from which a dragonfly forages. Perhaps the ground-perchers eat a lot of insects (damselflies were mentioned) that fly near the ground, thus they perch at the appropriate height to fly after them. But one would think that perching on the ground would allow foraging flights after any insect from the ground up, with the great vision possessed by dragonflies. So why do many species never perch on the ground? The dichotomy exists, and we should try to understand it. Are there differences in morphology that contribute to successful ground-versus twig-perching, such as leg length or eye structure, for example?

Another interesting dichotomy in libellulid perching involves how many legs are used. Species of *Libellula* commonly perch using only the last two pairs of legs, while most dragonflies use all three pairs. The closely related *Plathemis* and *Ladona*, perhaps because they perch on the ground a lot, seem more likely than *Libellula* (in the strict sense) to use six legs. *Tramea* is another genus that seems typically to perch with four legs, but they have been seen using six, especially when hanging (*Tramea* is one of the few genera -- perhaps the only genus? -- that commonly perches both horizontally and vertically). Perhaps the orientation of the body with regard to the perch is significant in determining the number of legs used.

It seems definite that libellulid genera may divide into those that more often use four and those that more often use six legs, but there is much variation, and much more study is needed to determine this. One hypothesis to be tested is that larger species tend to perch with 4 legs, smaller ones with 6, perhaps just the reverse of what one might expect!

Some gomphids also perch with 4 legs, so there may be similar dichotomies in this, the other main family of anisopteran perchers.

Although these differences are obvious when looking at dragonflies in the field, some of these comparisons have been made by looking at photos. Photos capture a brief moment in time, and many more systematic observations need to be made both within and between species and genera. Nevertheless, those with large collections of photographs have much to contribute to questions





Jiménez, 1970). This small territory was declared a "Reserva Natural" in 1966. Cayo Palma is much smaller and is located east of Cayo Caguanes, very close to the mainland. On both islands the predominant vegetation is semideciduous scrub forest on limestone.

Although the taxonomy of the Cuban odonate fauna is known relatively well (Alayo, 1968; Flint, 1996), there exists very little information on the geographic distribution of the species nor of the composition of odonate communities.

This report discusses the odonates collected in 1996 and 1997 on these islands. In the report, CC represents Cayo Caguanes and CP, Cayo Palma. The abundance of each species is given as "scarce" (present in less than 50 % of the collecting sites), "common" (more than 50 %), and "very common", (in all sites). The material examined is deposited in the author's collection. Only one species (*Anax junius*) was not captured and was listed solely on the basis of sight records.

24 species were found (30% of the Cuban fauna), belonging to three families and 14 genera (35 % of the total). All species were represented in Cayo Caguanes, but only 9 were found in Cayo Palma. Nevertheless, it is possible that these figures may increase with further collecting.

List of odonates, with distribution and abundance:

Suborder Zygoptera, Family Coenagrionidae

*Ischnura hastata* (Say). CC, mangrove and pasture; very common

*Ischnura ramburii* (Selys) CC, mangrove and pasture; common

*Telebasis dominicana* (Selys) CC, mangrove, scarce

*Leptobasis vacillans* Hagen. CC, mangrove, common

*Enallagma coecum cardenium* Hagen. CC, mangrove, common

Suborder Anisoptera, Family Aeshnidae

*Gynacantha nervosa* Rambur. CC, mangrove and semideciduous scrub, common

*Triacanthagyna septima* (Selys). CC, mangrove and semideciduous scrub, common

*Anax junius* (Drury). CC and CP, mangrove and semideciduous scrub, scarce

Family Libellulidae

*Dythemis rufinervis* (Burmeister). CC and CP, mangrove, common

*Erythemis vesiculosa* (Fabr.). CC and CP, mangrove and semideciduous scrub, common

*Erythemis plebeja* (Burmeister). CC, mangrove, scarce

*Erythemis simplicicollis* (Say). CC, mangrove and semideciduous scrub, scarce

*Erythrodiplax justiniana* (Selys). CC, mangrove and semideciduous scrub, very common

*Erythrodiplax fervida* (Erichson). CC and CP, mangrove and semideciduous scrub, very common

*Erythrodiplax umbrata* (Linn.). CC, mangrove, common

*Erythrodiplax berenice naeva* (Hagen). CC and CP, mangrove, very common

*Miathyria marcella* (Selys). CC and CP, mangrove, scarce

*Micrathyria hagenii* Kirby. CC, mangrove and semideciduous scrub, common

[*Orthemis ferruginea* (Fabr.)\*]. CC and CP, mangrove and semideciduous scrub, very common

*Pantala flavescens* (Fabr.) CC and CP, mangrove and semideciduous scrub, very common

*Tholymis citrina* Hagen. CC, mangrove and semideciduous scrub, very common

*Tramea abdominalis* (Rambur). CC, mangrove, common

*Tramea calverti* Muttkowski. CC and CP, mangrove, common

Acknowledgments. My most sincere thanks to Dr. Luis F. de Armas, of the Institute of Ecology and Systematics, Cuba, for reviewing the manuscript

and for his helpful suggestions; to Dr. Rodolfo Novelo Gutierrez of the Institute of Ecology, Veracruz, Mexico; and to Bill Mauffray of IORI, for the transmission of valuable literature.

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\* In the Antilles the very common skimmer which has been called *Orthemis ferruginea* apparently belongs to an undescribed species. Ed.

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#### MIGRATION OF DRAGONFLIES A MOVING TOPIC IN 1999

I have distilled several accounts of migrations from e-mail messages. Some of these have been edited.

The migration reports started this year with Bob Barber reporting on 27 July, "A small number of Spot-winged Glider (*Pantala hymenaea*) were seen migrating northward past my workplace on the Delaware Bay yesterday. This morning, beginning around 0700, it started again and very large numbers are passing as I write. There are also large numbers of Wandering Glider (*Pantala flavescens*), and small numbers of Black Saddlebags (*Tramea lacerata*), Swamp Darner (*Epiaeschna heros*) moving with them." The next day he again reported, "The flight of *Pantala hymenaea* (Spot-winged Glider) up the Delaware Bay shore peaked about mid-morning with up to 30/min passing a fixed point. After about 1100 there was a lot of milling and active feeding around the buildings and salt marsh, although they were still moving in a northward direction. Between 1200 and 1300, numbers declined rapidly, and by 1430 few were seen, and they appeared to be feeding only. I could only check what was going on periodically (I was working) but numbers of

*Pantala hymenaea* were certainly many thousands, and *Pantala flavescens* many hundreds. *Epiaeschna heros* (Swamp Darner) was in small numbers, as was *Anax junius* (Green Darner) and *Tramea lacerata* (Black Saddlebags). A few *Libellula pulchella* (Twelve-spot Skimmer) and *Pachydiplax longipennis* (Blue Dasher) appeared to be moving with the others as well."

On 8 September Terry Morse reported, "We're in the season of mass directional flights of *Sympetrum corruptum* on the central Oregon coast, USA. I observed a modest flight (ca. 1.5 dragonflies/minute) on 27 August 1999. On the morning of 2 September, I noticed a sudden influx of *S. corruptum* in Newport. On the morning of 3 September, they appeared to be gone. Although no one appears to have observed it, there may have been a flight on the 2nd. This morning, there was a more extensive flight (ca. 8-9 dragonflies/minute) along the central Oregon coast. The flight seems to have ended by about 10 a.m., but numerous *S. corruptum* remained in vacant lots and other vegetated areas, so there may be additional flights within the next few days. . . . Of 9 perched individuals I got a good look at today, 6 were males. Two of the males showed significant red coloration; the remainder were yellow with the usual *S. corruptum* markings. If generally accurate, this suggests that the dragonflies emerged fairly recently. The direction of the flights is southward. We don't know where the dragonflies are coming from, or where they are going. I've never seen *S. corruptum* mating or emerging on the Oregon coast. However, my observations are limited to the Newport area, so they might be reproducing elsewhere on the coast. "

On 10 September Tim Cashatt passed along this tidbit from Jill Niland, reporting from the Chicago area: "Last night at 7:30 from my neighborhood (southeast Ravenswood in Chicago) I saw a migration of perhaps 20 nighthawks but hundreds/thousands of dragonflies--there were at least a dozen or so buzzing around in every yard I passed in a 12 square block area. This A.M. at Montrose Jeff Sanders reported a mass migration of dragonflies along the Skokie Lagoons last night, and other birders had seen the dragonflies near the lakefront as well. Good for the nighthawks but a bad coincidence perhaps for the insects. I didn't know dragonflies migrated . . . first time I'd seen this behavior."

movements, probably of *Anax junius*, in Iowa and Missouri, about Sept. 4-6."

On the same day David and Yvette Bree reported from southern Ontario, "Today at Sandbanks Prov. Park on the west shore of Prince Edward County, Ontario there were a number of what I take to be migrating dragonflies. There was a strong west wind blowing off Lake Ontario, and just back of the fore dunes in some shelter were pockets of large dragonflies, mostly *Tramea lacerata*. Over 50 seen today but the largest single group was about 15-20. Also present were 5-8 *Pantala flavescens*, and 3-4 *Anax junius*. Also present in the area were 5-6 *Libellula pulchella* (12-spot Skimmer), mostly males but 1 female seen, and a few *Sympetrum* . . . The *Tramea* were foraging over open areas at heights of 2 feet to ten+ feet, but never going very high. I was able to catch two (and very proud of that modest effort too!). One was male, and one was female and both were new and fresh looking. From modest range visual inspection the *Pantala* and 12-spots too looked like near teneral."

More from Terry Morse,

"11 September 1999. While walking to work from the vicinity of Yaquina Bay Bridge in Newport to Yaquina Head Outstanding Natural Area (YHONA) at the north end of Newport, I encountered a modest number of *S. corruptum* on the ground or perched in low vegetation. . . A sudden increase in the number of *S. corruptum* on the ground seems to precede a mass flight by one to several days. At 1021 hours, I saw one *S. corruptum* on a bush in the JC Market parking lot, 107 N. Highway 101. The sky was clear, temperature 60 degrees F, and the wind calm. I also saw one *S. corruptum* flying approximately east or northeast across Hwy. 101 at about 6th Street. . .

" At 1043 hours, I saw a moderate number of *S. corruptum* on the lawn between Hwy. 101 and the Wal-Mart parking lot at 25th St. and N. Hwy 101. I saw no indication of a flight in progress. In an unrelated but interesting note, there was a large emergence of winged termites at YHONA in the early evening (between at least 1930 and 2030 hours, probably longer).

"12 September 1999. At 0830 hours, I woke up and saw large numbers of *S. corruptum* streaming past the window of my apartment. Clearly, a significant flight was in progress. . . At around 0840, I counted 112 *S. corruptum* flying south across an observation line perpendicular to the direction of

flight in a period of 3 minutes (37.3 per minute). . . I observed dragonflies flying from approx. 3 inches above the ground to as much as 10 meters or more up, though most I could see were within ca. 5 meters of the ground. At 0903, I counted 137 *S. corruptum* in 5 minutes flying south across a different observation line, about half a block south of Bay St. on SW 10th St. The bearing of the flight was ca. 162 degrees, slightly east of south. This is a rough approximation, . . .and the flight path was somewhat erratic as the dragonflies maneuvered around obstacles and over the buildings. Length of line was again approximately 40 meters, also facing east. Height above the ground still ca. 3 inches to 10+ meters. I also saw one larger dragonfly, possibly an *Aeshna* sp., during the count. . . .

"1004 hours: Walking to work along Hwy 101. Temperature . . . was 73 degrees F. The wind was from the east, gusting to about 9 mph . . . The flight bearing was approximately 173 degrees. I didn't have time to take a count, but *S. corruptum* were flying steadily past me.

"1040 hours: Lighthouse Rd. and Hwy 101 in north Newport. *S. corruptum* still flying steadily south. Between N. 25th St. and Lighthouse drive, I saw dragonflies flying east across the highway wherever there was a break in the woods on the west side of Hwy. 101(i.e., wherever a road intersected the highway, creating a break in the trees), but almost none flying above the level of the tall trees lining the road between breaks. Turning west onto Lighthouse Rd., I entered Yaquina Head ONA.

"At 1119 hours, I saw substantial numbers of *S. corruptum* flying east into the wind along the south side of the headland, where the road down to Quarry Cove intersects Lighthouse Drive. Many *corruptum* were "stacked up" in the lee of a ca. 10-meter tall spruce at the intersection of Quarry Cove road and Lighthouse Drive (SE corner), before continuing east into the wind. Dragonflies were sparse along Lighthouse Drive west of Quarry Cove road, though I did see 1 flying approximately south at the entrance to the Interpretive Center parking lot, more than halfway to the tip of the headland. 1215 hours. Now, by Yaquina Head Lighthouse at the tip of the headland, I saw large numbers of *S. corruptum* flying east past the lighthouse. I counted 40 in 5 minutes along a 15-meter observation line, between ground level and ca. 3 meters above ground, facing south on the south side of the lighthouse. It was difficult to see the lower-flying dragonflies against the background vegetation, so this is doubtless an undercount. [There were



there are many readily apparent reasons why a specimen is more valuable than a photograph. However, today's trends indicate we will be depending upon photographic vouchers more and more and therefore should develop some protocols for them.

I have started keeping a file of photographs that document new state and county records from some of the western states. Most of these are being sent to me by others, as "jpegs" of the original photos. I then use PhotoShop to print the species name, locality, date, and photographer right on the photo itself. I print out the photo on a color printer and store it in a file folder as part of a photo archive.

The big question then becomes what to do with these photos. I think they should be treated as specimens, which means they should be carefully curated and donated to a collection either at a museum or intended for one. They can then be examined just as specimens can be examined by researchers as a source of records. It makes sense to store regional records of interest in the state or province of origin, but there may not always be a dragonfly collection or anyone interested in curating the photos in that area. I hope those interested in odonate distribution are already setting up such regional files, but I am willing to archive any photos of interest as a temporary expediency while searching for a more appropriate repository.

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**ODONATISTS IN THE NEWS**

**BRUNELLE FEATURED IN CANADIAN GEOGRAPHIC-** For those of you who can find a copy of Canadian Geographic, there is a very nice article (with good pictures) about Paul-Michael Brunelle and the Broad-tailed Shadow Dragon in the Sept/Oct 1999 issue. Very nice to see Paul-Michael get wider recognition and to see some good coverage of dragonflies. And there is a gorgeous picture of Canoose Stream.

**WAGNER SUBJECT OF ARTICLE IN CONNECTICUT PAPER-** Dave Wagner is the subject of a feature article in the Hartford [Connecticut] Courant for 6 October. Steve Grant, a writer for the paper, has written a very engaging article about the recent increase in popularity of dragonflies.

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**ONTARIO SUMMARY AND SURVEY**

In 2000 the Toronto Entomologists' Association will produce an annual summary of 1999 Odonata observations along with other information on Ontario Odonata. In addition an Ontario Odonata Survey has been initiated centered at CNC in Ottawa. More information is available from the news journal of the Toronto Entomologists' Association (vol. 4(3): 48-52. 1999) or from the provincial compiler (Paul Catling, 2326 Scrivens Dr., R.R. 3 Metcalfe, Ontario K0A 2P0, tel.: 613 821 2064, Email: brownell@achilles.net).

This survey is an ambitious undertaking that seeks to develop a better understanding of the seasonal and geographic distribution of damselflies and dragonflies in Ontario. It will also contribute to the monitoring of species and allow changes in overall and local distribution to be detected, and it will also assist with the protection of vulnerable, threatened, and endangered species by providing the accurate information needed for status reports and recovery plans.

Potential contributors are invited to communicate with Paul Catling to receive the protocols which will be used in this survey.

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**DRAGONFLIES: BEHAVIOR AND ECOLOGY OF ODONATA, by Philip S. Corbet.** Comstock Publishing Associates, Ithaca, NY. 1999. 829 pp., 248 figs., 96 color photos, 95 tables, 95 appendix tables. Price \$95.

Reviewed by **Dennis R. Paulson**

This book (DBEO), the magnum opus of the dean of odonatology, has been longer awaited than all the Star Wars movies put together. I remember seeing the first of that series, during the SIO meeting in Gainesville in 1977, and even then we anticipated a revision of Philip Corbet's **A Biology of Dragonflies** (1963). His *Biology of Odonata* (1980), published in the Annual Review of Entomology, brought us up to date with a supplement describing an additional decade of work. Now another two decades of intense study of the biology of dragonflies have passed, and we have another update.

But "update" isn't the word for this book. "Encyclopedic" describes its scope but doesn't do justice to its quality. "Superb" isn't quite there, and "magnificent" is more like it. Finally, because

encyclopedias aren't usually the work of one person, "astonishing" must be added. This book will stand as the paradigm of a definitive summary of the biology of an insect order.

What is in DBEO? Just about everything, I would say, following the dragonfly on a logical procession from habitat selection and oviposition through larval and adult life to reproductive behavior, beginning the cycle again. Not surprising, the final chapter is on conservation, sorely needed everywhere wetlands are threatened -- that is, everywhere. Each of the 12 chapters has an overview or synopsis or both, and reading those sections would provide an instantaneous Odonata education. The 96 well-chosen color photos add a very nice touch and could stand alone as a pictorial guide to dragonfly biology.

The amount of raw material presented by DBEO is staggering. Despite four decades dedicated to learning about dragonflies, I can find something new on just about every page. And supplementing the written accounts are the tables--190 of them. The tables contain so much information that it is almost beyond comprehension how the author was able to invest the time and intellectual resources necessary for such a compilation. Think of any aspect of odonate behavior or ecology that interests you, and you'll find a table or two dealing with it, unless it is quite inadequately studied. It helps to know worldwide dragonflies, as the tables don't just list examples of better-known taxa or from more-studied faunas--they are virtually comprehensive guides to published research.

And beyond the tables are the references. Corbet cited about 500 references in his 1963 book and 230 additional references in the 1980 supplement to it. In contrast, DBEO cites over 4,000 references, with a supplementary list of 96 references that were published too late to be included in the text. A unique attribute of DBEO is the number of references attributed to personal communications, perhaps 5-10% of the total. This is the only aspect of the book that I would criticize, as it is frustrating to learn something but not to be able to expand on it or even to be able to confirm it. Nevertheless, it is clear that much information is in this book only because of the author's long friendships with many odonatologists willing to contribute their unpublished observations to the cause.

What big gaps in our understanding of odonates are pointed out by this book? For one thing, we still do not have a soundly based phylogeny of

dragonflies, the result of molecular as well as morphological data, to place ecology and behavior clearly in an evolutionary context. For another thing, our knowledge of many phenomena is based on a smattering of species in a few well-studied families, with few or no representatives from the many tropical zygopteran families. Some subjects stand out as being inadequately studied, for example dragonfly coloration. Its sparse treatment in the book underscores the crying need for research in this area. Finally, only just over 900 species are mentioned, 17% of the total diversity of the order.

Readers should be aware that a work of this scope cannot be error-free, for example the caudal appendage of *Mecistogaster modesta* in Figure 4.6 attributed to *M. ornata*, and dusk-flying of *Epitheca sepia* (p. 310) attributed to *E. stella*. I have been informed that the author welcomes corrections, and I hope anyone coming across a discrepancy of any sort will make it known to him.

As I first browsed through this book, I wondered if perhaps there wasn't enough Corbet in Corbet, that the author had minimized his own speculations to report objectively on the voluminous published literature (in which of course his own work features prominently). But with further perusal, I found more and more occasions of his own syntheses to be among the major contributions of the book. For example, look at the elegant classifications of larval morphology/behavior, life cycles, adult behavior, types of flights, mating success, and mating systems. All of these are models to be tested as well as classifications. Furthermore, there are not only haiku scattered through the text but also snippets of subtle humor, if one looks for them. For example, "In view of the involvement of ducks as predators of dragonfly larvae, it is reassuring to the tidy-minded comparative ecologist to learn that larvae feature also in the food of the duck-billed platypus . . ." (p. 137).

Above all, the finest thing about DBEO will be its influence on dragonfly research to come. Its treatment is so comprehensive that it is just about safe to say that if it isn't in Corbet, it hasn't been done. A summary of what we know to date, crisply organized and including all pertinent references, is there for the taking. A proliferation of graduate theses on the Odonata should follow. And think of the 4,500 species not even cited in the book!

We can only hope that Philip Corbet now has in mind another book oriented more toward the

general naturalist and written in a less formal style, more like his chapters in the classic Dragonflies, by Corbet, Longfield, and Moore (1960). With the recent surge of amateur interest in dragonflies, we badly need that popular book. Until then, Peter Miller's Dragonflies (1995) is a good primer for the beginner, and the interest piqued by that book will be fulfilled by acquiring a copy of Corbet (1999), a treasure of dragonfly knowledge and a fitting monument to its author and to the study of these extraordinary animals.

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**CORRIGENDA FOR "DRAGONFLIES: BEHAVIOR AND ECOLOGY OF ODONATA"**

**Philip S. Corbet, Crean Mill, Crean, St. Buryan, Cornwall, England TR19 6HA**  
**pscorbet@creanmill.u-net.com**

This book was published by Cornell University Press in June 1999. Checking the text was a major task and some mistakes escaped detection before publication. It would help all users of this book if I could be informed promptly of any errors that are noticed. I shall then publish a list of them in a Corrigenda that will appear in **ARGIA**, probably in early 2000.

The easiest way for me to receive notification of mistakes is for each error to be specified by page number, column (L or R), and line, together with a description of the nature of the error, unless it is obvious.

I thank all readers in advance for any help of this kind they are able to provide.

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**THAILAND BOOK AVAILABLE**

**ATLAS OF THE DRAGONFLIES OF - THAILAND. DISTRIBUTION MAPS BY PROVINCES**, by **Matti Hämäläinen & Bro. Amnuay Pinratana**. Format: 26.5 x 19.0 cm; Hardback, **vi + 176 pages; including 28 pages of color photographs**

This book contains distribution maps for the 315 species of Odonata known from Thailand, and 153 color photos of 124 of these species. It is essential for travelers to Southeast Asia. Copies are available from T. Donnelly, 2091 Partridge Lane, Binghamton NY for \$33, which includes postage and handling.

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**UPDATED MANUAL OF THE DRAGONFLIES OF NORTH AMERICA: EXPECTED WINTER 1999-2000**

**DRAGONFLIES OF NORTH AMERICA**, by James G. Needham, Minter J. Westfall, Jr., and Michael L. May 2000 ca. 650+pp. ca.

**Bill Mauffray**, International Odonata Research Institute, Gainesville FL, **iori@afn.org**

The long-awaited monographic revision of the classic **"Manual of the Dragonflies of North America"**, by Needham and Westfall (1955) is expected in Winter of 1999-2000. It will include numerous additional species described, or discovered within the area treated, since 1955, including northern Mexico and the West Indies. A total of about 360 species will be treated. Revised keys to species and revised diagnoses will allow identification of all adults and known larvae of these important aquatic insects. Revised by Westfall and May, this work is the companion volume to the new book on damselflies of North America, published in 1996. Numerous new illustrations are included for all added species, plus several pages of color plates. The work will include a revised checklist to species, an extensive bibliography, glossary and index.

The IORI, by special arrangement with the publisher, is **now taking advance orders** at a reduced rate from the estimated publication price of \$80.00. The special advanced order rate is now \$77.50 in the U.S. and \$80.00 outside the U.S. This includes shipping and handling. There is a chance that page and production cost will drive the cost up, and postal rates may also go up; but, if you order in advance, you will be protected from the potential price increase. This offer is valid until, Nov 30, 1999. All profits go to IORI to cover operating expenses, web site, salaries, etc. The I.O.R.I. is a not for profit organization under section 501-C-3 of the Internal Revenue Code. for more info :[www.afn.org/~iori/](http://www.afn.org/~iori/)

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Please be sure to include your mailing address, phone number and e-mail address. Your copy(s) will be shipped within a week of receiving them from the publisher.

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**DRAGONFLIES OF WASHINGTON**, by  
**Dennis Paulson**  
Seattle Audubon Society, 8050 35<sup>th</sup> Ave. NE,  
Seattle WA 98115 (206-523-4483); price \$6.50

Reviewed by **Nick Donnelly**

This is a 32-page paper-back guide to the Odonata of Washington. Although aimed at beginners, it is of high quality and will be useful to veteran students of Odonata. At first glance, it reminds one of the superb two-number set by Roy Beckemeyer for Kansas Dragonflies and Damselflies. There are more similarities than differences, and I hope that these two authors will now start towards a more complete coverage of the United States.

Beginners over a wide range of the western United States will find this guide invaluable. There are very good color photographs of almost all the species that occur in the state. A person working in northern California or Idaho will find most of his/her species illustrated here. A few species, especially some of the damselflies, will not be identifiable from these photos, and Paulson has

provided some line drawings and textual clues for their identification.

This is an attractive guide and it should find wide usage among a large audience.

**BOOK NOTICE: CHECKLIST OF NORTH AMERICAN ODONATA**, by **D.R. Paulson** and **S. Dunkle**, available from Dennis Paulson, Slater Museum of Natural History, University of Puget Sound, Tacoma WA 98416. Paperback, price \$7.50.

#### ARTICLE NOTICES

The dragonflies and damselflies of Cranesville Swamp, Garrett County Maryland, and Preston Co, West Virginia. Richard Orr, *The Maryland Naturalist*, 42(3-4): 52-59, 1998

Distribution of damselflies and dragonflies of Maine, United States. Paul Brunelle, *Northeastern Naturalist*, 6(2): 95-118, 1999

## TRAMEA

**Nick Donnelly**

Antoine van der Heijden has a website with information about European odonates, including pictures. There are also several pictures from Indonesia and India. The URL is <http://fly.to/dragonflies>

A stunning picture of *Brachytron pratense* taking off is at <http://dSPACE.dial.pipex.com/town/place/xcj80/brachy.htm>

Gaylor Mink has taken still images from video footage of dragonflies taking off and landing. His sequence of *Sympetrum corruptum* (variegated meadowhawk) is especially good. <http://www.angelfire.com/wa/minkgi/index2.html>

You can download many of Jurg DeMarmel's papers, a few in English, on Venezuelan Odonata from this website: <http://www.redpav-fpolar.info.ve/entomol>

Steve Valley has added to his superb Oregon website with information of migrations of western Odonates: [http://www.ent.orst.edu/ore\\_dfly/migrate.htm](http://www.ent.orst.edu/ore_dfly/migrate.htm)

Bob Behrstock has sent along the following information for Texas:

Digital Dragonflies (Texas A&M) grows and grows. It is full of good information and scans at <http://www.dragonflies.org/>

For a list of prizes this site has (very deservedly!) won, and URLs to other good insect sites, visit

<http://stephenville.tamu.edu/~fmitchel/damselfly/awards/index.html>

John Abbott's dot maps for Texas (and neighboring states) are available at:  
<http://www.esb.utexas.edu/jcabbott>

Until recently, Texas Gulf Coast naturalists have relied almost exclusively on Florida Odonate guides written by Sidney Dunkle. Currently, Internet access is the most powerful tool for viewing images of East Texas Odonates and learning about their local ranges. Based on new records provided by its authors (Richard Orr, Bob Honig, and Bob Behrstock), Webmaster Melinda Parmer has extensively revised THE DRAGONFLIES AND DAMSELFLIES OF HOUSTON, TEXAS, AND VICINITY: (Harris, Galveston, Chambers, Brazoria, Fort Bend, Waller, Montgomery, San Jacinto and Liberty Counties). The updated Houston area site may be accessed directly at <http://www.io.com/~pdhulce/dragon.html>



Group photo of the Adirondack meeting. Photo by Blair Nicula, who pasted himself in.



Momentary pause in the rain at an Adirondack Bog. Beckemeyer, Abbott, Trimble, Dunkle, Hutchings. Nicula photo.

## BACK ISSUES OF ARGIA AND THE BULLETIN OF AMERICAN ODONATOLOGY

The editor is able to provide back issues of **ARGIA**. Please contact T. Donnelly, 2091 Partridge Lane, Binghamton NY 13903. The present price schedule takes into account the different costs of duplication of each number of **ARGIA**. In the event that an issue becomes exhausted, then xerox copies will be sent. Prices are \$2.00 per issue; these do not include postage; see below.

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4(4) The Dragonflies of Washington, Dennis R. Paulson p. 75-90	\$1.50
5(1) The Dragonflies and Damselflies (Odonata) of Louisiana, Bill Mauffray p. 1-26	sub*
5(2) The Odonata of the Cayman Islands: a Review, R.R. Askew, R. Prosser, and P.S. Corbet p. 27-32	sub*
TAXONOMIC AND Population Studies of British Columbia <i>Aeshna</i> species, G. Peters p. 33-42	
5(3) Adapting the Townes Malaise Trap for Collecting Live Odonata, Robert C. Glotzhober & Dan Riggs, p. 43-48	sub*
<i>Archilestes grandis</i> (Great Spreadwing) in Central New Jersey, with Notes on Water Quality, David P. Moskowitz and David M. Bell, p. 49-54	
Variation in Head Spines in Female <i>Ophiogomphus</i> , with a Possible Example of Reproductive Character Displacement (Anisoptera: Gomphidae), Dennis R. Paulson, p. 55-58	
5(4) The Odonata fauna of Connecticut, David L. Wagner and Michael C. Thomas, p. 59-85	sub*

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# ARGIA

Vol. 11, No. 3, 25 October 1999

Binghamton, New York  
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