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The Dragonfly Society Of The Americas

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Journals Published By The Society

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. Membership in DSA includes a subscription to **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.

Membership in the Dragonfly Society of the Americas

Membership in the DSA is open to any person in any country and includes a subscription to **ARGIA**. Dues for individuals in the US, Canada, or Latin America are \$20 US for regular membership and \$25 US for institutions or contributing membership, payable annually on or before 1 March of membership year. Dues for members in the Old World are \$30 US. The **Bulletin Of American Odonatology** is available by a separate subscription at \$20 US for North Americans and \$25 US for non-North Americans and institutions. Membership dues and BAO subscription fees should be mailed to Jerrell Daigle, 2067 Little River Lane, Tallahassee, FL, USA 32311

ARGIA and BAO Submission Guidelines

Digital submissions of all materials (via e-mail or CD) are much preferred to hardcopy. All articles and notes should be submitted in Word or Rich Text Format, without any figures or tables embedded. Only minimal formatting to facilitate review is needed. Photographs should be submitted as TIFF (preferred) or JPEG files with a minimum of 300 ppi at the intended print size. Charts, graphs, diagrams, and other vector graphics are best submitted in Illustrator format or EPS. If this is not possible, submit as PNG or TIFF at a minimum of 600 ppi at the intended print size. Charts and graphs may also be submitted in Excel documents. Tables may be submitted as Word or Excel documents. For more information see the entire guidelines at the end of this issue or visit <www.odonatacentral.com/dsa1/submission_guidelines.htm>. **ARGIA** submissions should be sent to John Abbott, Section of Integrative Biology, C0930, University of Texas, Austin TX, USA 78712, <jcabbott@mail.utexas.edu>; BAO submissions should be sent to Ken Tennessen, P.O. Box 585, Wautoma, WI, USA 54982, <ktennessen@centurytel.net>.

Front cover: *Gomphus kurilis* (Pacific Clubtail) and bullfrog showdown on the North Fork of the San Antonio River, Monterey County, California (see story on page 7). Photo by Don Roberson.

In This Issue

A number of us attended the 5th International Congress of Odonatology in beautiful Swakopmund, Namibia. Swakopmund is at the southern tip of the Skeleton Coast (part of the Namib Desert) and as joked on several occasions, a surprising location for a dragonfly meeting. The Symposium dinner was held in the local sand dunes and the group picture was taken in an area called the “moon-scape;” let’s just say freshwater and odonates were a bit scarce! None-the-less, the area was quite striking and we all had a great time. I think just about everyone that attended managed to spend a couple more weeks exploring southern Africa before returning home. Dennis Paulson will be presenting some of his explorations at the annual DSA meeting in Springerville, Arizona. For those of you who were not able to attend, Hidenori Ubukata has posted some photos from the symposium at http://nee.kus.hokkyodai.ac.jp/temporary/WDA_Namibia/.

There may not have been many dragonflies flying in the deserts surrounding Swakopmund, but the Namibia Postal system released a beautiful new series of stamps, “Dragonflies of Namibia” in honor of the event.

Frank Suhling and Andreas Martens also were signing copies of their new book, “Dragonflies and Damselflies of Namibia,” which was literally hot off the presses for the meeting (see New and Recently Received Books for details). This book proved to be an excellent resource while scouting odonates in Namibia.

Please note some updates to the annual DSA meeting in Springerville, Arizona, specifically with regard to the housing on the post-meeting field trip. I have also included abstracts of several of the talks that will be given in Springerville. It should be a great meeting.

Also in this issue, Jim Bangma reports on the successful Northeastern Regional DSA meeting and Jerrell Daigle



keeps us posted on his activities this spring in Florida.

Mark O'Brien reports that E.B. Williamson's correspondence and associated materials have moved to the University of Michigan's Bentley Historical Library. Mark gives us a quick glance into some of the treasures found

Calendar of Events for 2007

For additional information, see <http://www.odonatacentral.com/dsa1/meetings.htm>.

Event	Date	Location	Contact
Ohio Dragonfly Conference	21-22 Jul	Wooster, Ohio	Jim McCormac <jim.mccormac@dnr.state.oh.us>
DSA Annual	27-31 Jul	Springerville, Arizona	Jerrell Daigle <jdaigle@nettally.com>
CalOdes Blitz III	11-12 Aug	Owens Valley, California	Kathy Biggs <biggsnest@sonic.net>
Aeshna Blitz	24-26 Aug	McKenzie Pass, Oregon	Steve Valley <svalley2@comcast.net>



in this collection from one of North America's giants in odonatology.

Dennis Paulson has apparently discovered the secret to finding and photographing the elusive Pygmy Snaketail (*Ophiogomphus howei*) and he shares it with us! Don Roberson recounts another story about photographing clubtails that goes along with this issue's front cover.

Fred Sibley contributes two articles this issue. One of these is an interesting article about the colonization of the British Virgin Islands by odonates. This is a great article that should get us all thinking about how some of these remote and seemingly barren islands come to be populated by dragonflies. Along the same lines Juerg De Marmels outlines how *Hemianax ephippiger* (Vagrant Emperor) likely arrived in the Caribbean, probably in October of 1988.

Chad Edgar is working on a study of the dragonfly larvae in headwater streams of Lake County, Ohio. He presents some preliminary results and is soliciting feedback from the membership.

Nick and Ailsa Donnelly recently returned to Guatemala to find substantial changes since their last trip. It is really sad to think about all the habitat loss and destruction that is occurring around the world and the impact it is having on odonates; especially in the tropics.

Tony Gallucci contributes two articles on the predation of odonates. One involves an insect predator and the other bird predators. I've noticed quite a bit of interest in this topic lately, no doubt due to the increasing number of birders getting interested in odonates. Investigations like this will build


on Clarence Kennedy's seminal 1950 work on the topic.

We have several new and interesting species to report from California, New Mexico, Florida, Baja California Sur and Martinique. Check the articles by Richard Bledsoe, Dennis Paulson, François Meurgey, and myself for details. The most interesting report this issue though is by Rich Bailowitz and Doug Danforth. They found the little known *Argia harknessi* (Harkness' Dancer) in southeastern Arizona! I'm sure many attending the DSA Springerville meeting will be interested in this discovery.

Richard Groover provides us with his blueprints for a dragonfly vivarium he plans to use in his research. Carl Cook was kind enough to show me his famous outdoor vivarium at the Kentucky meeting last year. If his successes are any measure, we should all be building one of these in our backyards!

Scott Young is not only a dragonfly enthusiast, but also a bank note collector. Do you know which country has the only bank note with a dragonfly on it? Check out Scott's note and let us know if anyone has seen other examples in their travels.

Mark McPeck and Ken Tennesen both have requests for collectors this dragonfly season. I mention several recent books that have been published and Nick Donnelly reviews the new *Dragonflies of North America Coloring Book* by Kathy Biggs and Tim Manolis.

Finally, please notice we are selling back issues of ARGIA at a reduced rate. It is time to clean house and these previous issues will no longer be available in print form, so complete your series now if you are interested. 

The 2007 Annual DSA Meeting in Arizona

Jerrell J. Daigle, 850-878-8787, <Jdaigle@nettally.com>

The 2007 Annual DSA meeting will be held in Springerville, Arizona 27–30 July with the business meeting set for Saturday, 28 July. We have reserved a block of 30 rooms at the America Best Value Inn (928-333-2655), formerly Super 8, in Springerville. We have negotiated a rate of \$68.00 including taxes and they will hold the rooms until 30 days before the meeting. Ask for Raj and tell them you are with the Dragonfly Society of the Americas, Inc. and mention my name. Please reserve your room as soon as possible. For more about this hotel, check its web site at <www.americasbestvalue.com> and navigate to Arizona. For more about Springerville, go to <www.springerville.com> for more information about other motels, activities, campgrounds, and restaurants. By plane, Phoenix and

Albuquerque, New Mexico are about the same distance (3–4 hours). We recommend flying in on 26 July and taking your time sightseeing on the way to Springerville.

The business meeting will be held at the Round Valley School District Boardroom in Springerville. This place is air-conditioned with facilities. Please let me know of any items for the agenda, and if you want to schedule a presentation or workshop. Let me know of any presentation needs or if you are bringing your own projectors.

We will be conducting Odonata inventories for nearby Lyman State Park (Big Lake) and Sitgreaves National Forest. Hopefully, we will see *Aeshna interrupta interna*

(Variable Darner), *A. persephone* (Persephone's Darner), *Oplonaeschna armata* (Riffle Darner), *Cordulegaster diadema* (Apache Spiketail), *Ophiogomphus arizonicus* (Arizona Spiketail), *Amphiagrion abbreviatum* (Western Red Damsel), and *Argia tonto* (Tonto Dancer).

We will leave the morning of 31 July for the post-symposium field trip to Safford, Arizona, about 80 miles south of Springerville. The odonata community here should be different, especially with the many species of *Argia* (dancers). We have reserved a block of 20 rooms at the Days Inn (928-428-5000) 31 July to 2 August. We have negotiated a rate of \$75.00, not including taxes and they will hold the rooms until 30 days before the meeting. Ask for Vanessa and tell them you are with the Dragonfly Society of the Americas, Inc., and mention my name. Please reserve your room as soon as possible. There are other similarly priced motels in Safford like the Econo Lodge (928-348-0011). If you have any questions, please let me know. Also, check out our web site at <www.odonatacentral.com> to register, view a list of participants, and see the meeting agenda. Thanks! Hope to see you there!

Update: Cabins at Roper Lake in Safford. The post-meeting field trip is scheduled to be a three day outing to the Safford area in the Gila River Valley. Most of us will be staying in one of several motels along the main drag within the town of Safford but there is a second, slightly more rustic option available as well. Roper Lake State Park, one of the excellent odonate destinations in the region, is located about five miles southeast of Safford. It has recently completed construction on eight new cabins available to campers. Electricity is set to be installed late this spring and should be ready by the summer meeting. I've seen these cabins from the outside and they are attractive and large enough for two people, perhaps more. The State Park System is willing to provide whichever cabins have not been rented by the late July time period to our members for the three nights of the post-convention *gratis*. As of late April, it is not known whether bedding is provided so a sleeping bag would be prudent. This would be the perfect set-up for birders who would like to take advantage of a dawn excursion through this Sonoran/Chihuahuan Desert vegetation mix and along an established lakeshore. If you are interested in this possibility, please contact Rich Bailowitz at <raberg2@earthlink.net> or talk to me at the meeting in Springerville. The cabins will be available on a first come, first serve basis.

Planned Talks and Presentations

Taxonomy and Phylogeny of *Celithemis*. George Baskinger, Mike May <may@aesop.rutgers.edu> and Jessica Ware, Rutgers University

The dragonfly genus *Celithemis* consists of eight species, some of them common and brightly colored, that are confined largely to eastern North America. Several species have been used in behavioral, ecological, and morphological studies, but their intrageneric phylogeny is unclear. In this paper we provide a phylogeny based on morphology and on data from mitochondrial and nuclear DNA sequences of multiple individuals of each species. The genus appears to be monophyletic, with one nested species pair (*C. amanda* + *C. martha*) receiving strong bootstrap support by both parsimony or maximum-likelihood criteria as well as high Bayesian posterior probability. A second group (*C. bertha*, *C. elisa*, *C. ornata* and *C. fasciata*) is well-supported in Bayesian analysis but only weakly by parsimony and maximum-likelihood bootstrap values. *Celithemis verna* and *C. eponina* are probably basal to both these groups, but their relationship to each other is unclear. All individuals assigned to a species recognized on morphological grounds were recovered as monophyletic. The problematic taxa, *C. monomalaena* and *C. bertha leonora*, are shown definitively to be synonyms of *C. fasciata* and *C. bertha*, respectively.

Rare and New Odonata from Guadeloupe with Comments on *Orthemis macrostigma* and *Orthemis schmidtii*. Jerrell Daigle, <jdaigle@nettally.com>

Photos of endemic and rare odonates such as *Protoneura romanae*, *Enallagma coecum*, *Brechmorhoga archboldi*, and *Macrothemis meurgeyi* were taken on a recent survey to Guadeloupe in the Lesser Antilles in the Caribbean. Comments on their status and field observations will be presented. In addition, brief comments will be made on the taxonomic status and distribution of *Orthemis macrostigma* and *Orthemis schmidtii*.

Dragonflies of the Connecticut and Merrimack Rivers in New Hampshire. Pam Hunt, New Hampshire Audubon, <phunt@nhaudubon.org>

Although New Hampshire has a rich history of odonatological exploration dating back to the 19th century, most early work was focused on the apparently more intriguing "boreal" habitats of the White Mountains. Meanwhile, the equally intriguing dragonflies of two of New England's major rivers—the Connecticut and Merrimack—were largely unsurveyed. In the last few years this situation has changed considerably, with significant finds being documented on both rivers. In this paper I present a summary of current knowledge of "big river" dragonflies in New Hampshire, compare this with what we know from downstream stretches, and touch on the conservation issues facing these habitats in the region.

Tracking Migratory *Anax junius* and other Large Dragonflies with Radiotelemetry. Mike May <may@aesop.rutgers.edu>, Rutgers University

Since 2005, along with Dr. Martin Wikelski of Princeton University, other Princeton colleagues, and my doctoral student, Dave Moskowitz, I've been exploring the use of radiotelemetry to track movements of large Anisoptera. We attached miniaturized radio-transmitters (~300 milligrams) to the thoraxes of 14 individual *Anax junius* and followed them during their fall migration for up to 12 days, using receiver-equipped Cessna airplanes and ground teams. They exhibited distinct stopover and migration days and, on average, migrated approximately every three days in a generally southward direction. Logistic limitations prevented following the dragonflies more than 150–200 km beyond their release point, but the technology offers the promise of tracking them to the completion of their migration. In the summer of 2006, Dave also began using miniature transmitters to follow the activities of *Cordulegaster erronea*. He was able to follow about half a dozen males, in some cases for more than a week. Apparently these dragonflies visit streams to search for females relatively rarely and briefly and spend most of their time feeding and resting in the forest canopy. All stayed within an area of a few hectares, near the stream where they were first caught. More studies are ongoing in 2007.

Exploration of the Phylogeny of *Epithecina* (*Tetragoneuria*) (Odonata) Based on DNA Analysis. Mary McLaughlin, Jessica Ware and Mike May, <may@aesop.rutgers.edu>, Rutgers University


The genus *Epithecina* (Odonata: Corduliidae) is composed of about 13 species and several named subspecies of uncertain validity. The North American members of *Epithecina* are placed in the subgenus *Tetragoneuria* and the monotypic subgenus *Epicordulia*. The status and relationships among and within subgenera of *Epithecina* are currently unresolved, with some believing the subgenera should be elevated to genus level. Additionally, morphological variation within the species *E. (T.) cynosura*, *E. (T.) costalis*, *E. (T.) petechialis*, and *E. (T.) semiaquaea* across geographic regions make the species dif-

ficult to determine. This analysis of sequences retrieved from the COI region of mitochondrial DNA and the D2 region of 28S large subunit nuclear ribosomal RNA provides some clarification of the status of *Tetragoneuria* but at present leaves species-level ambiguities within the genus unresolved.

Damselfly Foraging Behavior: More Interesting Than You Might Think. Dennis Paulson, <dennispaulson@comcast.net>

Damselflies exhibit two quite different modes of foraging: (1) flycatching from a perch and (2) gleaning from flight. I will explore differences in behavior and anatomy that correlate with these two feeding modes and speculate on why the dichotomy.

Dragonfly Flight Behavior: An Explanation of Wing Vein Convergence in Perchers and Fliers. Jessica Ware, Rutgers University, <jware42@rci.rutgers.edu>

Dragonflies (Anisoptera) are remarkably agile fliers whose soaring, hawking, flapping, gliding and even fluttering styles of flight are as varied as dragonflies themselves. Flight plays a role in feeding, reproduction, predator avoidance, and dispersal. Among Anisopterans, flight speed, maneuverability and time spent hovering differs greatly. Some dragonfly genera engage in short distance flights or territorial patrols from perching locations (i.e., “perchers”, spending a majority of their time perching between periods of flight). Others fly for longer distances, even migrating in several cases (i.e., “fliers”, spending the majority of their time on the wing). Fliers and perchers differ in their flight mechanisms, body size and shape. Perchers and fliers may have evolved different wing venation patterns to meet their flight requirements. I collected 92 wing vein measurements for 86 species from nine families to explore differences in wing vein lengths, wing loading, wing area and body mass between the two flight behaviors. Perchers possess vein patterns that would increase rigidity in regions affecting flight stability and allow for elasticity and flexibility in regions that are important for maneuverability. I have reconstructed ancestral vein lengths to determine whether the ancestors to extant taxa were likely to be perchers or fliers. 

Ohio Dragonfly Conference

Dragonflies and damselflies (Odonata, collectively) are among the most interesting group of insects out there; some might say among the most fascinating of any group of animals. The level of interest in the Odonata has skyrocketed, as can be seen by the number of great new books and publications on the subject, and the many people who

are out in the field looking for them.

It's no mystery why the “dragon” fan base is growing. Not only are these insects brilliantly colored in often outrageous hues of blue, red, gold, green, and nearly every other color of a rainbow, their habits are amazing. Like winged helicop-

ters, dragonflies can engage in aerial maneuvers that would shame even a hummingbird. They put these powers of flight to good use in flying down and devouring their prey, which can range from mosquitoes to butterflies.


Learning to identify Ohio's 160+ species of dragonflies and damselflies, and delving into their fascinating life histories, is every bit as satisfying as studying birds or butterflies. With that in mind, please join us for the inaugural Ohio Dragonfly Conference, to be held Saturday, 21 July with special field trips on Sunday, 22 July. The Ohio Division of Wildlife, Ohio Odonata Society, Greater Mohican Audubon Society, and Ohio Historical Society have joined together to put on this event, which brings together some of the most knowledgeable experts in this field.

Featured speakers include Bob Glotzhofer and David McShaffrey (coauthors of *The Dragonflies and Damselflies of Ohio*) and Larry Rosche (author of *Dragonflies and Damselflies of Northeast Ohio*). Our keynote speaker is Dr. Dennis Paulson, one of America's foremost experts on these insects. Many birders know of Dr. Paulson because of his outstanding book *Shorebirds of North America*, but he knows the Odonata equally well

and his new comprehensive guide to dragons and damsels will soon be available.

A special treat for attendees will be the release of a new publication entitled *Common Dragonflies and Damselflies of Ohio*, a photo-rich and user-friendly guide to many of the species that are routinely found in the state. Authored by Glotzhofer and McShaffrey and published by the Ohio Division of Wildlife, this booklet makes its debut at this conference and participants will be the first to have one.

The conference will be held at the Ohio Agricultural Research and Development Center campus in Wooster. The facilities are top notch, and best of all, the center is located just minutes from some of the best wetlands in Ohio—the massive Killbuck Marsh and Funk Bottoms wildlife areas. Field trips will be led by some of the most knowledgeable people in the state, and participants should see a great diversity of species.

For more information and registration material, please visit Greater Mohican Audubon Society's web site at <<http://gmasohio.org/>> or call or e-mail Jim McCormac at 614-265-6440 or <jim.mccormac@dnr.state.oh.us>. 

DSA/CalOdes Blitz III: 11–12 August 2007 in the Owens Valley

Kathy Biggs, Sebastopol, CA 95472 <bigsnest@sonic.net>

The third DSA/CalOdes Blitz will be held from 11–12 August in the Owens Valley. Most of us will camp near Bishop; but nice and also inexpensive motels are available there too. Some folks will want to be there from the 10th to the 12th or beyond. We'll be working on the eastern edge of California; accessing both desert and high mountain climates that are within a half hour of each other in this part of the state.

Highlights will include the desert form of the Pacific Spiketail (*Cordulegaster dorsalis deserticola*), Bleached Skimmers (*Libellula composita*), Desert Whitetail (*Plathemis subornata*) and we hope to add some new mountain species for the counties of Mono and/or Inyo. We also hope

to refind the Blue-ringed Dancer (*Argia sedula*) that John Abbott found during the DSA annual meeting's post trip there in 2003. This will be a wonderful opportunity for folks newly into odes to get to know the species side by side with the experts. The Owens River's water is running. For about 50 years, it was diverted for use in Los Angeles. It will be interesting to see what species have found this resource.

Nearby are the White Mts. with their famous ancient Bristlecone Pines and a little further off, Yosemite.

For more information, contact Kathy Biggs, <bigsnest@sonic.net> or Doug Aguillard, <doug@basiclink.com>. 

Springtime in Tallahassee, Florida 2007

Jerrell J. Daigle, Tallahassee, Florida, <Jdaigle@nettally.com>


A small but enthusiastic group of frozen snowbirds joined me for several 2007 Springtime Tallahassee soirees from March through April. They were Cary Kerst and Steve Gordon from Oregon, Ed Lam from New York (twice),

and Alex Ardila from Guelph, Ontario, Canada. Our base of operations was the Econo Lodge in west Tallahassee with its cheaper rates.

We went to places like Silver Lake State Park, Trout Pond, and the Lost Lakes, letting the warm sunshine work out the kinks in our frozen limbs. We saw lots of *Gomphus cavillaris brimleyi* (Sandhill Clubtail), *G. australis* (Clearlake Clubtail), *G. minutus* (Cypress Clubtail), *G. dilatatus* (Blackwater Clubtail), *G. geminatus* (Twin-striped Clubtail), *Arigomphus pallidus* (Gray-green Clubtail), *Ladona deplanata* (Blue Corporal), *Epithea sepia* (Sepia Baskettail), *E. costalis* (Slender Baskettail), *Didymops floridensis* (Florida Cruiser), *Libellula semifasciata* (Painted Skimmer), *Enallagma concisum* (Cherry Bluet), and other springtime goodies. The highlights of the trips were the nighttime dunkings of Alex and I in the Apalachicola River trying to catch *Neurocordulia molesta* (Smoky Shadowdragon). We got one female *N. virginienensis* (Cinnamon Shadowdragon) adult and no *N. molesta* adults, but we did find several exuviae of the mysterious *N. molesta*. Later, Ed went to nearby Sweetwater Creek and got one male *N. alabamensis* (Alabama Shadowdragon) at dusk. A really good catch!

One day, we met up with Fred and Peggy Sibley from New York at Torreya State Park to look for the rare *Cordulegaster*

sayi (Say's Spiketail). The season was almost over (26 April), and they were just not there. Fortunately, Steve and I found one solitary perched male. We observed it for several minutes, but when Steve moved closer, it took off. It was the only one we saw that day. However, we did see several *Tachopteryx thoreyi* (Gray Petaltail), much to the delight of the westerners! Later, we had a nice lunch at the campground and Peggy served us some snacks and drinks. Thanks, Peggy!

All in all, we had a lot of fun! We had plenty of sunshine with no clouds and we saw several rare southern springtime species plus several kites for you birders. Because of the drought, most lakes were low, streams were almost dry, and the big rivers were low. However, we did not see much of an impact on the dragonfly populations. Hopefully, in the future, we will find more populations of *Cordulegaster sayi* and even find some *Ophiogomphus* (snaketails). New event: bring your swimming gear for a nice nighttime swim in the Apalachicola River! See you next time! 

Miscellaneous Musings on My Backyard Pond and its Dragonflies

Kathy Biggs, Sebastopol, CA, <bigsnest@sonic.net>

If you love dragonflies, having a pond is a wonderful way to have them around all season. There have been several things I've observed this year that I thought were interesting.

I live in Sonoma County, California and our Sebastopol home and pond are about 12 miles inland, as the *Anax* flies from the Pacific Ocean and Bodega Bay. Or maybe I should say as the rare San Francisco Forktail (*Ischnura gemina*) flies! I'm a participant in the survey Jason Bried is conducting (see ARGIA 18[4], p. 34). Therefore, on Fridays I really pay close attention to what is on the pond. I was quite amazed to find a lone male San Francisco Forktail on my pond on 8 June. We do live on Azalea Creek, which is a tributary of the Laguna De Santa Rosa, which is a tributary of the Russian River, which flows into the Pacific Ocean. Never-the-less, we've never found any San Francisco Forktails along that route, the nearest being along the Estero American south of Bodega Bay and due west of us. Our thought is that we had strong winds blowing in from the coast the day before, and perhaps he was blown in. I netted him for an in hand identification, scanned him and released him—in hopes of starting a “colony” here. But alas, he was never seen again.


On 15 May, also while doing the weekly survey, I was watching a pair of ovipositing Pacific Forktails (*Ischnura*

cervula) when I was surprised to see the female descend under the water surface. The male released her—and then through binoculars I saw why—she had been grabbed by a darner nymph and was being eaten! It hadn't occurred to me that a dragonfly nymph could eat an adult odonate! But, of course they can, and do!

Then on 2 June, I found a Shadow Darner (*Aeshna umbrosa*) that had emerged, fallen into the water and then somehow gotten back up on an Arrow-head plant stem. His wings were “glued” together and his body bent and his eyes dimpled. I was able to use a skewer to pry his wings apart, and then I used my fingers to iron out the wrinkles. I also used my fingers to straighten his body (this may have caused him pain as he really wiggled right as I did it). I wasn't able to do anything about his eyes, but he later flew off. While Dave and I were taking images of this darner, something weird happened on the pond. It was about 10:30 AM and a Blue-eyed Darner (*Rhionaeschna multicolor*) male flew into the pond, doing first that splash-the-thorax thing that I've always thought was for cooling . . . but it wasn't really very hot out. It did that three times, and was flying really erratically. Then he drug his whole abdomen in the water, rose, flew erratically again and went back to dragging his abdomen in the water, where he subsequently got trapped on the surface. So Dave took the pond net to raise him out of

the water and he flew off immediately with a fairly regular flight. I wonder what might have caused this behavior and it occurred to me that perhaps he was trying to wash something bothersome off his body as he was acting like he was irritated—an ant maybe? Any ideas?

One other thing I've been musing about: One fall we had a female Pacific Spiketail (*Cordulegaster dorsalis*) making figure 8s while feeding over our front lawn. She came day

after day and I was certain it was the same individual as she always flew with one leg dangling below her. The next spring, the first Spiketail reported in the state was a female Pacific Spiketail flying in figure 8s over my front lawn with one leg dangling below her. Could she have overwintered somewhere? 

Saving (My) Private Clubtail

Don Roberson, 282 Grove Acre Ave., Pacific Grove, CA 93950, <creagrus@montereybay.com>

Monterey County is a large coastal county in central California. It has not been surveyed much for odonates, although this is changing. In preparing a county checklist in 2006, I located but a single record of *Gomphus* (*Gomphus*) *kurilis* (Pacific Clubtail): one collected along the Arroyo Seco River on 27 May 1974 and now in the Bohart Museum at U.C. Davis (perhaps collected by R.M. Bohart himself). Tim Manolis graciously provided the specimen details.

On 29 April 2007, I was looking for odonates along the upper stretches of the North Fork of the San Antonio River, within the Los Padres National Forest in Monterey County. There is a spot where the river forms a pond due to some blockage, and I spotted a gomphid sitting on a small rock on the other side of that pond. I lifted my binoculars and saw it was a Pacific Clubtail . . . and noticed almost as quickly that there was a big bullfrog sharing the opposite side of the same rock! I felt panic. I wanted to

document the clubtail with a photo, knowing that it was the first for the county in over 30 years, but I feared the bullfrog would eat it before I could get a decent shot. So I plunged right into the pond up to my knees and shuffled forward through the muck, snapping shots as I went. So far so good—now the trick was to scare the frog without spooking the clubtail, and finally get a full-frame photo of the ode. I was much less adept at this and managed to spook them both at the same time, leaving me with a bare rock. The clubtail went and sat in the bullrushes and never returned to the rock in the next 20 minutes as my boots soaked through thoroughly. I did come away with an interesting photo though, which was some consolation.

[See a photo of this standoff on the cover. Ed.] 

Northeastern Regional DSA Meeting, Sussex County, New Jersey, 22–24 June 2007

Jim Bangma <jbangma@ptd.net>, **Allen Barlow**, and **Sheryl Chacon**

The Donnelly Effect seemed to be gearing up as a group of early arrivals were chased out of White's Pond by lightning and rain. Fortunately, the group had already seen the local population of Lilypad Forktail (*Ischnura kellicotti*) as well as both New Jersey species of Pond Clubtail (*Arigomphus furcifer* and *A. villosipes*). The evening was spent eating, visiting and watching wave after wave of thunderstorms blast through. Jim's rain gauge measured nearly ¾-inch of rain during the evening.

The place: Sussex County, New Jersey, possibly the premier place in the country for a large variety of odonates—at

least it has the longest county list! The time: late June, arguably the peak weekend for a great list of species. The event: the DSA Northeastern Regional Meeting. The goals: to survey some new sites and blitz some old ones, to find a lot of odes, and to have fun.

Something happened overnight, possibly due to Allen and Jim's frantic incantations. The next morning, when the group met at the Andover Diner to eat and visit with the famous attack waitress, the temperature was in the mid-60s and there wasn't a cloud in the sky. And the weather was to remain like that for the balance of the weekend



with highs in the mid to lower 70s and overnight lows around 50.

On Friday morning we split into two groups, one to survey mainly in the Delaware Water Gap National Recreation Area and the other to concentrate on Stokes State Forest. Both groups somehow managed to caravan through the town of Newton, arriving more or less together.

The Water Gap group began at a recently located hill-topping site along the river. This unnamed field may be the mother of all Halloween Pennant (*Celithemis eponina*) spots, but held good numbers of clubtails and other critters as well, along with a turkey family which was seen repeatedly throughout the weekend. Rapids (*Gomphus quadricolor*), Spine-crowned (*G. abbreviatus*) and Mustached (*G. adelphus*) Clubtails were found among the many Rusty Snaketails (*Ophiogomphus rupinsulensis*). But then, what was probably the odonate highlight of the trip came when a Green-faced Clubtail (*G. viridifrons*) was located, seen by all and photographed well. This is a dragonfly that we have struggled to find in the area for years, finding them just north of New Jersey, but generally locating only exuviae in the state. Unfortunately, another main target, the *delawarensis* race of Septima's Clubtail (*G. septima*), recently located at this spot, was nowhere to be found. This group moved on to Quick Pond, a relatively new state wildlife management area, where a good mix of pond and lake species were found including all three species of Corporal (*Ladona* spp.).

Meanwhile, the other half started at Arctic Meadows, a Nature Conservancy site near Quick Pond, locating the expected Brook Snaketail (*O. aspersus*) and Crimson-ringed

Whiteface (*Leucorhina glacialis*) as well as adding site records such as Frosted Whiteface (*L. frigida*) and Elfin Skimmer (*Nanothemis bella*). Moving on, the group spent a large part of the day along the Big Flatbrook at Steam Mill, searching both the beaver meadow and the stream. Riffle Snaketail (*O. carolus*) landing on the parking lot gravel before everyone was out of the cars, was netted and examined and then flew away while being photographed—the only one seen on the trip.

A picnic that evening at Swartzwood State





Park was interrupted by one of the local Bald Eagles flying overhead. Several fortunate observers were able to watch Hal White prove that you can't carry water in a paper bag, at least not for very long. After the picnic, Cliff Bernzweig led a successful quest along the Paulinskill for UMBER Shadowdragon (*Neurocordulia obsoleta*). The day ended with a species count of 63, not too bad for a day's work..

Saturday was pretty much a rerun of Friday, although most attendees chose to switch routes. The need for repeated surveying was highlighted by the species totals—the second day added 28 more, mainly revisiting the same sites. The Water Gap group was pleasantly surprised to find Septima's Clubtail as well as another Green-faced. Over in Stokes, there were no Riffle Snaketails present but Maine Snaketail (*O. mainensis*) was found in good numbers at the same spot.

We want to thank Bill Olsen for helping out in the Water Gap. Bill is coordinating biological inventories of the park and was responsible for permits for netting. He added his botanical knowledge and enthusiasm as well as his considerable hamburger flipping skills. We think we got him hooked when he caught a Comet Darner (*Anax longipes*) at Quick Pond.

Saturday night, instead of a meeting, we headed for the Delaware again, this time seeking Stygian Shadowdragon (*N. yamaskanensis*). It was pretty cool by the time we got there and only a few were flying. Most of us amused ourselves watching Fred Sibley and Cliff stand waist deep

in the river slapping a mist net into the water. Hey, give them credit, they caught the only one of the night. By the time we left, it was cold enough that only four hardy souls went for ice cream.

The highlight of the trip? Niko. It didn't take long for everyone to realize that he wasn't the seven year old kid that Andy brought along, but was simply a bit shorter than the rest of the group. He more than held his own swinging a net, identifying odes and discussing fine ID points. If he is the future of odonatology, it's looking pretty good.

The weekend ended with a total of 91 species, 19 Clubtails. We added at least two site records for both Quick Pond and Arctic Meadows. A number of species found at Steam Mill, which is historically one of the best covered spots in the state, have not been recently recorded. The Green-faced Clubtail almost approached Holy Grail status in New Jersey. We could not have asked for better weather; well, maybe five degrees warmer would have been nice. Where are we going next year?



E.B. Williamson Moves to the Bentley

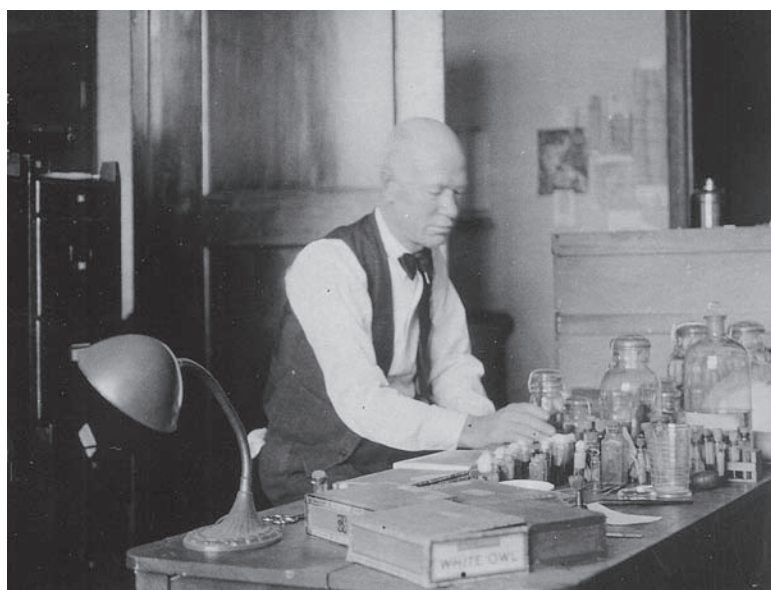
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Well, he's not actually moving anywhere, but all of E.B. Williamson's correspondence files and associated (non-specimen) materials have moved to the University of Michigan's Bentley Historical Library. We did this for several reasons—his files will be catalogued and available for researchers, they will be searchable, and the Bentley's far better suited for curating this material than the UMMZ. I also worry that when I finally leave the UMMZ, nobody here will really know much about E.B. Williamson, and the significance of the material will be forgotten. EBW's correspondence files date from 1899–1932, and take about eight shelf feet of space. Letters from all the prominent odonatologists of his time are in there: P. Calvert (including Williamson's letters to Calvert), Needham, Kennedy, Ris, Howe, Forster, Schmidt, DeSelys, and many, many others. Some people were prominent in EBW's life such as Fred Gaige and Alexander Ruthven, who persuaded Williamson to come to the University of Michigan Museum of Zoology.

Unfortunately, Williamson suffered a stroke and subsequent pneumonia infection, and died too early at 55. He had been at the UMMZ for only a few years, and although he had published far more on new species of Odonata than most anyone in North America, his life's work on the genus *Argia* (dancers) was never completed. His assistant, Leonora D. (Dolly) Gloyd, was a young woman at the time of his death. Her husband, Howard Gloyd, was a herpetologist. Fast forward to 1981. Dolly Gloyd was an

adjunct curator when I arrived at the UMMZ, and had been working on a revision of the genus *Argia* for many years, vowing to continue the work that Williamson never had the chance to finish. Unfortunately, she never finished the *Argia* project, either. However, she was a personal link to the past history of the Odonata collections here, and I wish I had been able to get her to write down more of her experiences with Williamson.

Williamson's move of his collection and library to Michigan did not result in any significant work being done on Michigan Odonata. EBW's focus was on Neotropical species, as well as southeastern US gomphids (clubtails) and *Macromias* (river cruisers). The only Michigan collecting that I am aware of was the times that Williamson vacationed in Oden, Emmet County (1906–1909); Berrien Co. (1914); Branch Co. (1925); on a trip with Gaige and Jesse Williamson in Jackson Co., and with Jesse Williamson to Luce, Mackinac, and Schoolcraft Counties, in 1927. In all, we have 165 Michigan specimens from E.B. Williamson. I can't even begin to estimate how many of his specimens we have in all, but I'll bet more than 50,000. Aside from his Odonata work, he was an accomplished iris breeder, and at one point, A.G. Ruthven asked if EBW might not mind making some money from his "hobby" and sell a bunch of irises to him for his garden. It's my understanding that the iris farm kept food on the table after the 1928 banking collapse.



E.B. Williamson in his UMMZ office, about 1930.

While reading through some of EBW's correspondence with Fred Gaige (curator of Insects at UMMZ), I found that the widow of Friedrich Forster wanted to sell all of her husband's collection for at least \$3,000 (in 1920s). Apparently, Williamson and the museum really only wanted the Odonata part of the collection, which contained a lot of type material. Gaige thought that from what he had seen of the rest of the collection, it should be thrown out because of the dermestid damage, poor labeling, etc. Eventually, a fellow named Manis from Detroit, talked to Forster's widow, and the UMMZ ended up purchasing the collection for \$750, with the rest of the stuff thrown in. From what I have seen of the Forster material, Gaige had it right. Excerpted here is a bit of Gaige's letter to Williamson (24 Jan 1927):

I think progress has been made on the Forster Odonata. I finally got Mr. Manis out here last Sat. p.m. He is a nice old chap, and as he years ago collected material in Asia Minor for Staudinger he knew a lot about insects, also what constitutes fine specimens, good ones, and what is worthless, and why, what happens to collections if neglected and as he seems to have collected butterflies is pretty critical of condition of specimens. He is Orientalist in the Detroit Library, and a cultured gentleman . . . I wish very much Mrs. Forster had had him handle the matter instead of Harscher. He could have come out here when you and the others were working the Odonata, and I believe we could have settled the affair immediately.

As it is, before he came out I went over to the bank and on the strength of my bald head and general manly beauty and unquestioned integrity borrowed \$750 for six months, gave it to him in form of a New York draft payable to Mrs. Elise Forster, got a receipt from him saying it was in full payment for that section of the collection consisting of all the Odonata and no more, gave him a similar one for Mrs. Forster's signature combined with a contract that utterly dissociated the Odonata from the rest and gives us a chance to bid on that if we will, otherwise to assist Mrs. Forster to dispose of it in this country, failing in this to return it to Germany"

Mr. Manis had visited the Forsters, a good deal, apparently and knew the confusion in which the old man worked. Told me of the room, crowded with insects, plants, and stones, etc. and said that often he could find nothing that he looked for so went on to something else. He died of cancer of the stomach, probably aggravated by bad food and too little of that. Two sons are living in New


York. Manis knew all about you, that you were god-father to one of his children, etc. etc.

To me, the most interesting aspect of this letter is that the UMMZ had all of Forster's material here before the Museum purchased it. Apparently, no other museum wanted the non-Odonata, as we ended up with boxes and boxes of dermestid-eaten specimens that were largely untouched when I came to the museum in 1981.

Another letter from Gaige to EBW, dated 12 Sep 1927, mentions collecting in the U.P. by Hubbs (UM Fish Division):

It was tough that Jess [Jesse Williamson] and I lost out on the U.P. trip, but it was unavoidable this season. Better luck next time. We did enjoy your trip up here, and next summer shall plan a much longer one. There are several *Somatochlora* in a few bugs that Hubbs took up in the Huron Mts. That was early July. I'll bet a fellow could make a killing, as he caught his things without a net and just took what was sitting under his nose when he was not fishing. When you get *Somat. [ochlora]* in that kind of collection, they must have been thickernhell [sic]."

I can attest to taking *Somatochlores* (striped emeralds) by hand in the Huron Mountains, as it was 71 years later that I was engaged in the survey of Odonata in the Huron Mountain Club.

Williamson's correspondence files will likely prove to be a valuable resource for future biographers and anyone researching the history of Odonatology. It's fitting that they will reside in the Bentley Historical Library and University Archives, where they'll be easier to access than if they were sitting on a shelf in the UMMZ. 

British Virgin Islands (BVI) Revisited: Colonization of an Island

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In October of 1997 I collected my first odonate in the BVI, and wrote about the spectacular odonate invasion of the island (ARGIA 11[1]: 16–19). Since then Peggy and I have returned each October, with the exception of 2005. Most of the time has been spent on Guana Island with sporadic visits to the larger islands—Anegada, Tortola and Virgin Gorda. When I asked Nick Donnelly in 1997 if he knew of anyone who had collected in the region, he replied, "Why

would anyone go there for odonates?" My list for the islands was ten species with only *Tramea calverti* [English names in appendix] and *Pantala hymenaea* being slightly unexpected. Thus, his comments seemed appropriate, but in hindsight we both failed to appreciate (1) the value of repeat visits to the same area and (2) the opportunity to study colonization on an island with essentially no resident odonates.

In October 2006 we returned to Guana for another “Science Month” and found an island greener than we had ever seen it. The previous year had been as wet as 1997 with flooding of the Flat and, unlike normal years, there had been rain in every month. Although the small study pond of previous visits had been filled in, the higher water table created several tiny ponds in natural depressions. The salt pond, where discharge water from the desalinization plant is stored, had been restructured to drain more effectively to the ocean. That plus the increased rain fall resulted in greatly reduced salinity and a fresh water lens at the far end of the pond. The mangroves edging the pond were now flourishing and expanding after years of barely surviving. But most exciting, this pond, ignored when it more saline, was being exploited by a great number of species and individuals.

Guana Island (named for a rock formation that resembles an iguana head) is a small (ca 800 acres) dry island with minimal (sometimes zero) freshwater sites for odonates. In good years, the suitable sites (1–3) are tiny with late larvae being cannibalized by earlier larvae. Production of adults is close to zero and even the most optimistic projection would only involve four taxa (*Ischnura ramburii*, *Erythrodiplax umbrata*, *Orthemis*, and *Tramea abdominalis*). Periods of very intense rain (10–15 inches) produce large temporary pools on the island, but these usually dry up before even fast developing larvae like *Pantala* can emerge. Thus, all odonates on Guana can be considered immigrants from off island. One removal study (ARGIA 14[1]: 5–7) initially indicated a rather steady rate of immigration, but when a heavy rain storm produced a many fold increase in pond size, the number of immigrants increased dramatically as well. This seemed to indicate the potential for colonization was huge and supported the idea of large numbers of individuals constantly looking for new habitat to invade. Many of the ten species present in 1997 were thought to be from quite distant locations but the subsequent finding of breeding populations on Tortola and Beef Islands (only a few miles away) reduced that subset to *Pantala hymenaea* and *Tramea calverti*. From 1997 through 2004 five species new to BVI list were found on the main island of Tortola, (ARGIA 12[1]: 18–19), but these were probably previously present and not new arrivals. Only one individual of one of these species made it to Guana.

Since 1997 the area has started to receive more rain and 2005 and 2006 were exceptionally wet, not only in amount of rainfall but in 2006, the distribution through the year. The author did not visit the islands in 2005 but other scientist reported large numbers of dragonflies following a storm similar to the 1997 storm. On arrival in 2006, the island was obviously greener than on any previous visit and a quick survey found small freshwater ponds where none had been before. In addition a change in the outflow

from the desalinization plant had made the pond attractive to many BVI species to lay eggs.

Of the ten species recorded in 1997 only seven were found in the following years with October species lists ranging from four to six species. One new species was added to the Guana Island list, *Brachymesia herbida*, but *Pantala hymenaea*, *Perithemis domitia*, and *Tramea calverti* were not seen after 1997. *Perithemis* is resident on Tortola but *P. hymenaea* and *T. calverti* were still vagrants to the BVI with one individual each recorded on other islands during that period.

Now 2006: The seven “regular” Guana species listed above were not just present they were all more abundant than on any previous visit and all were paired or egg laying. *Perithemis domitia*, not seen since 1997, was defending territory on two tiny shaded pools. *Tramea onusta*, new to the BVI, was common and egg laying in the salt pond. *T. calverti*, not seen since 1997, was only slightly less common than *T. abdominalis*. *Erythrodiplax berenice*, new to Guana, was holding territories at the salty end of the salt pond and common. *Hemianax ephippiger*, new for the BVI, was an interesting accidental from either Africa or, more likely, from a newly established population in the Caribbean. By the end of 2006, we had two new species for the BVI, three for Guana Island, and more species recorded (14 vs. 11) on Guana Island in one day than in the previous ten visits.

It would not be inconsistent with the findings of our previous removal studies or general knowledge of odonates to find nearby species arriving as soon as new habitat opens up, but the arrival of *Pantala hymenaea*, *Tramea calverti*, and *T. onusta* were unexpected. There has been habitat available on the larger islands but never any previous indication of breeding populations of these three species. In 2006 there were no exceptional storms to push migrating individuals off course and into the BVI, but these species arrived and arrived in numbers. Perhaps the wetter aspect of all the islands in the area caused them to explore further than they might have in drier years.

After the BVI visit a week was spent on Montserrat in the Lesser Antilles with minimal time on odonates, but *Lestes forficula*, *Ischnura capreolus*, *Anax junius*, *Brachymesia herbida*, *Miathyria marcella*, and *Tramea abdominalis* were added to that island list (see Donnelly, ARGIA 18[4]: 13–14). This brought up the question of why the difference in species lists between BVI and Lesser Antilles.

The difference between the American Virgin Islands and BVI lists (see Donnelly, ARGIA 14[1]: 7–9) is somewhat easier to explain. Three species are stream species and we have not found permanent streams in the BVI. Two species, *Anax junius* and *Erythrodiplax justiniana*, are not recorded

from the BVI but there are sight records of an *Anax* and an unknown *Erythrodiplax*/*Erythemis*. *Enallagma civile* is then the only missing species that would find suitable habitat in the BVI. Maybe we haven't looked hard enough.

On Montserrat and other Lesser Antillean islands there is suitable habitat for *Pantala hymenaea*, *Tramea calverti* and *T. onusta*, but no records. Are the water gap and/or the uninviting dry islands between BVI and the Lesser Antilles sufficient to stop or seriously impede immigration? This is not a great distance, 100 miles, and it is surprising to find that strong fliers like those mentioned above have not been recorded in the Lesser Antilles. Is this just lack of collecting combined with the sporadic eruption of these three species or a real barrier?

Orthemis, strong fliers and common, are represented by different species in the BVI and Lesser Antilles. There is some barrier preventing the *Orthemis macrostigma* of the Lesser Antilles from establishing in the BVI and the *Orthemis* "Antillean Red" and "Antillean Purple" from establishing in the Lesser Antilles. One can assume the species cross the gap in both directions, but in numbers too small to overcome competition from existing populations. Is a 100 mile water gap the limiting factor in the dispersal of this genus?

Appendix

The appendix lists all BVI species recorded to date and updates information from the earlier notes.

Lestes forficula (Rainpool Spreadwing): Regular although uncommon—community college pond on Tortola and airport ponds on Beef Island. Now absent from the initial discovery site on Tortola due to invasion of water hyacinth. There is a historical record from Anegada but not recorded in any recent visits.

Ischnura ramburii (Rambur's Forktail): Always widespread in BVI but sporadic on Guana. Abundant on Guana in 2006, with many pairs.

Hemianax ephippiger (Vagrant Emperor): (ARGIA, 18[4]: 17) third record for New World—one female. The subsequent report of several individuals on Dominica by François Meurgey and Gaeille Weber (ARGIA 18[4]: 14–16) strengthens the idea the species has recently established in the New World. By that reasoning this would be a colonizer from the Lesser Antilles and not from Africa.

Brachymesia furcata (Red-tailed Pennant): Common on several ponds on Tortola—particularly the Josiah Bay Pond, a new and very large freshwater site produced by damming the ocean end of bay.

Brachymesia herbida (Tawny Pennant): Only once recorded for Guana. Common on Tortola (see *B. furcata*). Recorded from Anegada island starting in 2002.

Erythemis vesiculosa (Great Pondhawk): An uncommon but widespread species on Tortola and sporadically recorded on Guana and Anegada. Several pairs and numerous individuals on freshwater end of Guanasalt pond in 2006.

Erythrodiplax berenice (Seaside Dragonlet): Probably the most abundant species in the BVI and found in all mangrove areas, but not previously present on Guana. In 2005, the salt pond on Guana became less saline and mangroves, formerly barely surviving, have flourished. In 2006 numerous *E. berenice* inhabited the saltier portion of the pond, but were absent from the freshwater end. It seems surprising that all the species coming to Guana detect small amounts of salinity and avoid, or invade, such waters, but are unable to respond appropriately to lethal dump ponds with oily surfaces.

Erythrodiplax umbrata (Band-winged Dragonlet): Always a regular species in BVI and on Guana but present in much greater numbers in 2006 at the freshwater end of the Guana salt pond.

Microthyria dissocians ("Antillean Dasher"): Not recorded since 2002 when its one pond site on Tortola filled in with water hyacinth.

Orthemis "Antillean Red": There are red and purple form *Orthemis* in the BVI and they are now thought to be separate species. The red form is found on all the islands and is the only form found on Anegada. It is the dominant (95%) form on Beef Island and mildly brackish areas of Virgin Gorda but absent from high elevation ponds (over 500 feet) on Tortola and Virgin Gorda. Somewhat surprising to find both forms on Guana (ratio of 6 purple to 9 reds) where habitats are all sea level. On Guana there is a decided preference by reds for the freshwater end of salt pond and purples for road puddles.

Orthemis "Antillean Purple": See above.

Pantala flavescens (Wandering Glider): Fairly common and seen most years on Guana with the expected increases everywhere after heavy rain. More common than the following species in 2006.

Pantala hymenaea (Spot-winged Glider): A few recorded in 2004 on Beef Island for the first BVI record since 1997—perhaps established by then at Josiah Bay Pond. On Guana, in 2006, they were mixed in with feeding groups of *P. flavescens* and *Tramea*.


Perithemis domitia (Slough Amberwing): Fairly common at a number of spots on Tortola. The two individuals recorded on Guana in 1997 were floating half dead in an oily pool and obviously storm waifs. This year the species was found again on Guana, but represented by territorial males at two small, heavily shaded “depression” ponds. Found in ponds that in drier years would not have been present.

Tramea abdominalis (Vermilion Saddlebags): Present on Guana in most years and common on the larger islands. Only slightly more common than *T. calverti* in 2006 and less common than *T. onusta*.

Tramea calverti (Striped Saddlebags): One very worn individual was found on Virgin Gorda in 2004 but otherwise not seen in BVI since 1997. Slightly less common in 2006 than the other species of *Tramea* but all three using the salt pond and feeding in swarms over the grassy field.

Tramea onusta (Red Saddlebags): A new species for the BVI. Nick Donnelly (ARGIA 14[1]: 7–9) recounts the only other record for the Virgin Islands. A 1960s machete kill—don’t get Nick mad. The random collecting of *Tramea* on this trip produced six males and a female of this species compared to eight males and a female combined for the other two species. The specimens collected represented a tiny fraction of the *Tramea* present.

Acknowledgements

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Pygmy Snaketail (*Ophiogomphus howei*) not Shy about Mating

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On 6 June 2007, Bob DuBois, one of Wisconsin’s odonate authorities, took me to the Chippewa River at US 8, just E of Bruce, Rusk County, to look for dragonflies. One of the species known to be there is *Ophiogomphus howei* (Pygmy Snaketail). This gorgeous little gomphid, perfectly shaped but only 35 mm long, has an almost legendary status among odonatophiles. It can be very common, as indicated by the number of exuviae found at favored emergence sites (Bob easily showed me fresh exuviae at this site), and if you encounter it while emerging, you can get photos and specimens of immature individuals.

But the common wisdom has it that to see a mature adult is a lot harder, as the males stay well out over clean, gravelly rivers and fly up into the trees when they’re not at the water. They are said to be in nearby fields as well, but the lack of published photos indicates not many people have had the good luck to find them there. I performed a Google Image Search on the species and found only a single photo from nature, by Nick Donnelly on the University of Michigan Museum of Zoology Arthropod Images Archive. (Parenthetically, Google doesn’t find all images, and people with online photos should try to make their images findable by search engines). There are also good photos in a number of field guides, but some or all are of posed individuals.

So, needless to say, I didn’t have high expectations of seeing any *howei*. But at about 10:30, just minutes after we parked the car by a gauging station on the west side of

the river and south of the highway, I found a copulating pair of the species at waist height on the leaves of a low shrub in a warm, sunny clearing not far above the river. I photographed them at length, then caught the pair with great excitement. I asked Bob if he had ever seen a mating pair, and he said “yes, once.”

We saw no others, nor did I see any at several other known *howei* rivers. On 11 June, I returned to the same river on another beautiful sunny morning with temperature around 69° F. I parked the car in the same spot at 08:50, got out and started walking down the primitive road toward the river. Almost immediately, I spotted a pair of *howei* in the sun on the broad leaf of a mulberry tree just above head height. “Unbelievable,” I thought, another stroke of good luck. But it immediately became more unbelievable when I saw another pair of *howei* about a meter from the first pair in the same tree!

I photographed both pairs, then caught them all with one swing. The few specimens of *howei* already in my collection are from Virginia, and getting specimens from the opposite end of the range of a species in a genus known for geographic variation seemed a good idea. Then I went down to the broad, slow-flowing river, which was swarming with gomphids. I scanned across the surface many times with binoculars and thought I saw at least a few tiny ones among the many clubtails (mostly *Gomphus*) of several species, but none of the small ones came close enough to see them very well.


Heading back toward the car a bit later (about 09:30), I had to suspend disbelief again when I found a third pair at the same height on the same tree! I can't even imagine the probability of that, but the tree did have broad leaves, it was in the sun, and it would have been visible from the river, so it may have presented optimal stimuli to a copulating pair flying into the dense woodland from the river.

So I found four mating pairs of Pygmy Snaketails between 08:50 and 10:30, in the sun from waist to just above head height and within about 30 meters of their home river. Perhaps this information will prove useful to future *howei*-hunters.

Here are the species found in almost five hours spent on two days in early June at the Chippewa River. Some of them were seen only in sunny clearings and were doubtless visitors from other wetlands.

Calopteryx aquabilis (River Jewelwing)
C. maculata (Ebony Jewelwing)
Hetaerina americana (American Rubyspot)
Argia moesta (Powdered Dancer)
Enallagma ebrium (Marsh Bluet)
E. exulans (Stream Bluet)
Ischnura verticalis (Eastern Forktail)
Anax junius (Common Green Darner)
Basiaeschna janata (Springtime Darner)
Dromogomphus spinosus (Black-shouldered Spinyleg)
Gomphus lineatifrons (Splendid Clubtail)
G. lividus (Ashy Clubtail)
G. quadricolor (Rapids Clubtail)
G. ventricosus (Skillet Clubtail)
G. viridifrons (Green-faced Clubtail)
Hagenius brevistylus (Dragonhunter)

Ophiogomphus howei (Pygmy Snaketail)
O. rupinsulensis (Rusty Snaketail)
Stylogomphus albistylus (Eastern Least Clubtail)
Didymops transversa (Stream Cruiser)
Macromia illinoiensis (Swift River Cruiser)
Dorocordulia libera (Racket-tailed Emerald)
Leucorrhinia intacta (Dot-tailed Whiteface)
L. proxima (Belted Whiteface)
Libellula pulchella (Twelve-spotted Skimmer)
L. quadrimaculata (Four-spotted Skimmer)
Plathemis lydia (Common Whitetail)

What interested me most about the more common species was the abundance of *Macromia illinoiensis* (Swift River Cruiser). In all my years of visiting eastern rivers, mostly in the south, I had never seen any *Macromia* (river cruisers) so common. Although they are common at many Wisconsin Rivers, on our first visit to the Chippewa they literally swarmed in one sunny clearing, and I estimated at least 20 of them perched in 100 square meters of clearing. They roosted on vertical dead stems of herbaceous and shrubby plants, mostly below head height, and they were so tame at that time we were able to pick some of them off the stems by hand. Both sexes were present, both immature (brown-eyed) and mature (green-eyed). We saw at least four copulating pairs roosting in the same places, and I photographed two next to one another. I walked around looking for concentrations and was able to photograph four roosting above one another on the same stem, then a fifth came in a bit farther away and contributed a new personal-best record for me. Between the cruisers and the snaketails, I fell in love with the Chippewa River, and I highly recommend the rivers of northern Wisconsin to the wandering dragonhunter. 

Zebra Mussels and Lake Odonates

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Several years ago Nick Donnelly printed a picture of a *Epitheca princeps* (Prince Baskettail) exuviae with several zebra mussels attached (ARGIA 17[3]: 33). At the time we wondered if this would impact the *Epitheca* population and talked about a follow-up.

On 28 June 2007, I did spot checks along about a mile of shoreline on the east side of Keuka Lake approximately 6 miles south of Penn Yan, Yates County, New York. Keuka Lake, one of the finger lakes, is a deep lake with gravelly shore line. The whole lake is ringed with cottages and the most difficult part of collecting exuviae is finding some-


one home so one can collect without trespassing. Thus the sampling was dependant on where I could gain access.

Exuviae were not evenly distributed and I don't know if that reflects my inability to find exuviae or selectivity by larvae on where they emerge. None seem to come out on lawns; a few are found on trees and most are on retaining walls or sides of boat houses. Larvae were found up to 15 feet from shore and two inches to 15 feet above the water.

Exuviae of four species were collected: *Epitheca princeps* (Prince Baskettail), 112; *Epitheca cynosura*? (Common

Baskettail), 19; *Dromogomphus spinosus* (Black-shouldered Spinyllegs), 4; and *Basiaeschna janata* (Springtime Darner), 2. Only the *E. princeps*, 35 exuviae or 30%, and *E. cynosura*, 1 exuviae or 5%, had zebra mussels attached. Most individuals had only 1 mussel but 12 had more with 5 and 7 being the maximum counts. Only two individuals had mussels on the ventral surface but 6 had mussels on the thorax. About the same number of mussels were found on segments 5–9 with only 1 on segment 10 and a total of 6 on segments 3 and 4. The one *E. cynosura* with an attached mussel had it on the prothorax.

The 60 attached mussels, roughly measured to nearest mm, ranged in size from 1–16 mm with an average and mean of 6.

There were no indications the size or number of mussels caused the larvae to travel a shorter distance from the water. There were no individuals that had failed to emerge because of attached mussels. Preliminary evidence would indicate no serious problems to the odonate population from zebra mussels. 

How and When did the Vagrant Emperor, *Hemianax ephippiger* (Burmeister, 1839) Arrive in the Caribbean?


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In mid-October 1988, a gigantic swarm of the African Desert Locust, *Schistocerca gregaria* (Forsk.) crossed the Atlantic, probably helped by strong winds following the hurricane “Joan”. Thousands of locusts were recorded in Surinam, Trinidad, Grenada, Barbados, St. Lucia, Dominica, St. Kitts, Antigua, St. Vincent and Puerto Rico, where they did some damage to diverse crops. A second, smaller wave of locusts arrived in the first week of November. On 9 November, a group of locusts was observed in crops near Rio Caribe, Sucre State, on the northeastern Caribbean coast of Venezuela. More locusts were found in Miranda, Aragua, Carabobo, Falcon and Monagas States, as well as in the Distrito Federal.

I took the information given above from a paper in Spanish by Cerdá (1989), but plenty of reports in English should be available as well. I think the event described could explain how and when *Hemianax ephippiger* (Vagrant Emperor) arrived in the Caribbean. In passing, I might emphasize that care should be taken when dropping the genus-group

name *Hemianax* Selys, 1883. As Von Ellenrieder (2002) correctly pointed out, the taxonomic reasons of Gentilni & Peters (1993) for synonymizing *Hemianax* with *Anax* Leach, 1815 have never been forwarded in detail.

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Anisoptera Larvae in the Headwater Streams of Lake County, Ohio

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There are approximately 90+ species of Anisoptera recognized in northeast Ohio, with new records being observed on a regular basis. Many net swingers have spent hours walking the Grand River collecting brilliantly colored clubtails and darners. The day ends and you are sunburned and wet with a full sample bag. Sound like a good time? I say it's overrated! At least that is what I kept telling myself

this winter while I was hunched over a microscope with cold coffee and often conflicting dichotomous keys. It is much more intriguing to be counting setae and comparing lateral spines of larval Anisoptera. Sunburned and wet, not me! I am the one with the pale complexion and tired eyes. These are the stories of a net “dragger!”

In an effort to better understand and manage the natural resources of Lake County, the Lake County Soil and Water Conservation District (SWCD) started a county-wide inventory of information on headwater streams in the summer of 2000. Using the Ohio EPA protocol for evaluating primary headwater streams (HHEI), over 1000 headwater streams were assessed. Data collected on the streams include: detailed morphological measurements, in-situ chemistry, the presence and abundance of obligate salamanders and the presence and abundance of benthic macroinvertebrates. The information collected is then used to classify each stream based on the quality of habitat found and the diversity of species using that habitat. Class III streams are high quality, perennial habitats with cold groundwater-fed baseflow. Typically, these streams are inhabited by cold-water adapted fauna and should account for approximately 10% of the flow network. Class II streams have moderate habitat quality and are likely to become intermittent during dry periods. The salamander and macroinvertebrate populations are limited in both diversity and abundance. Class I streams lack most habitat features and most often only have water during periods of rain and snow melt. The presence of macroinvertebrates is not likely and if present, is most often represented by chironomidae and oligochaeta.

The headwater streams evaluated as part of this study are located in Lake County, Ohio. Lake County is located in northeast Ohio and is bordered by Cuyahoga County to the west, Ashtabula County to the east, Geauga County to the south and Lake Erie to the north. The study area is divided by the east-west trending Portage Escarpment, with the Huron-Erie Lake Plains physiographic region to the north and the Glaciated Allegheny Plateau to the south. The lake plain and the escarpment vary in width from 1 to 3 miles. The till plateau, which overlies Pennsylvanian and Mississippian sedimentary bedrock extends south from the plateau across the county boundary. The high gradients, numerous substrate types and large amounts of groundwater influx in the till plateau have created a cluster of Class III headwater streams in this area. The streams on the lake plain

range from ephemeral to perennial, but typically lack high quality habitats. Class II and Class I streams dominate this region. Morphological development of stream habitat is limited due to the low gradients. Additionally, the fine grained sediments typical of the lake plain soils do not provide adequate micro-habitats.

During the evaluation of these streams, I became quite interested in identifying the adult dragonflies that were patrolling our study sites. It was this interest in dragonflies that prodded me to evaluate the approximately 400 macroinvertebrate voucher samples for the presence of Anisoptera larvae. Approximately 75% of the voucher samples were collected with a dip net by agitating substrate and detritus in all available micro-habitats (riffles, pools, undercut banks, etc) and then sweeping the net through the area and along the bottom of the channel. The remaining 25% of the voucher samples were collected with a Surber sampler in the riffle areas only. Macroinvertebrate voucher samples from 64 separate headwater locations contained Anisoptera larvae. These locations represent habitats from both the lake plain and the till plateau regions and 22 separate subwatersheds of the Chagrin River, East Branch of the Chagrin River, Grand River and Arcola Creek Watersheds. A total of 123 larvae were found in the voucher samples and account for 17 distinct species. There were 8 larvae that were very early instars and positive identification was not possible.


Species	# of larvae	# of sample sites
<i>Aeshna tuberculifera</i> (Black-tipped Darner)	1	1
<i>Aeshna umbrosa</i> (Shadow Darner)	8	7
<i>Anax junius</i> (Common Green Darner)	1	1
<i>Boyeria grafiiana</i> (Ocellated Darner)	18	12
<i>Boyeria vinosa</i> (Fawn Darner)	11	9
<i>Boyeria</i> *	1	1
<i>Cordulegaster diastatops</i> (Delta-spotted Spiketail)	1	1
<i>Cordulegaster erronea</i> (Tiger Spiketail)	2	2
<i>Cordulegaster maculata</i> (Twin-spotted Spiketail)	3	3
<i>Cordulegaster obliqua</i> (Arrowhead Spiketail)	4	4
Cordulegastridae*	2	2
Cordullidae*	1	1
<i>Epithea princeps</i> (Prince Baskettail)	2	1
Gomphidae*	1	1
<i>Lanthus parvulus/vernalis</i> (N./S. Pygmy Clubtail)	4	4
<i>Leucorrhinia intacta</i> (Dot-tailed Whiteface)	1	1
<i>Perithemis tenera</i> (Eastern Amberwing)	1	1
<i>Somatochlora linearis</i> (Mocha Emerald)	2	2
<i>Somatochlora tenebrosa</i> (Clamp-tipped Emerald)	1	1
<i>Stylogomphus albistylus</i> (Least Clubtail)	57	24
Unknown larvae*	1	1

*Early instar larvae, no positive identification

Pending confirmation, three new county records have been identified in the collection. These are *Cordulegaster erronea* (Tiger Spiketail), *C. diastatops* (Delta-spotted Spiketail) and *Lanthus parvulus/vernalis* (Northern/Southern Pygmy Clubtail). The following is a list of species identified from the voucher collection. Identifications were made by the author, Bob Glotzhofer (Ohio Historical Society), Larry Rosche (Cleveland Museum of Natural History), and Judy Semroc (Cleveland Museum of Natural History).

Further collections of voucher samples are planned in addition to a complete survey of the Zygoptera larva in

the voucher samples. It should be noted that of the 64 sample sites that contained dragonfly larva, 57 were Class III streams. The Ohio EPA has estimated that only 10% of the drainage network in Ohio will be Class III streams. If correlation between larval rearing habitat and Class III streams could be made, the conservation of these stream habitats today is critical.

Truth be told . . . sunburns and soggy shoes aren't all that bad! I have plans to expand this study and would appreciate comments from the DSA membership. 

Return—Briefly—to Guatemala

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Tom Wolfe entitled a book, “You Can’t go Home Again.” Wow, I see what he meant. I had organized a geological mapping project in Guatemala in 1962 and supervised it until 1979—quitting only when the Guatemalan army took over my sponsoring institution, the Instituto Geográfico Nacional, and shut me down.

During those seventeen years I came to know the Motagua River valley as well as my back yard—including myriads of odes. During the subsequent years I took one family trip to Guatemala (not to this particular area) and one brief geological trip in 1993. Returning this year, I found that the countryside had changed almost beyond recognition. Whereas in the 60s I could run up and down an almost empty dirt road in the Sierra de las Minas, chasing the large, elusive darner *Remartinia luteipennis* (Malachite Darner) with no concern to my personal safety, this year I couldn’t even cross this busy now-paved highway without evading the constant traffic, largely consisting of trucks laden with the trunks of what had been a vast and pristine cloud forest. Where the forest had been was now cut-over, barren hills, with the highway itself lined by shabby cinder-block buildings and garish, signs proclaiming “Pinchazos” (flat tires repaired) or “Refrescos” (snacks). The Atlantic Highway in the Motagua Valley itself was once a pleasant place to enjoy lovely, semi-arid country and see motmots, magpie-jays, parakeets, and other birds. Now it is a linear junk yard, and who knows where the birds have gone.

Happily, there is some brightness among the gloom. Several areas in Guatemala are now protected—either by being designated as protected by governmental decree or by being privately protected as eco-lodges. Ailsa and I joined a small group organized by the FSCA’s John Hepner to visit two such places. We started in dry karst forest near Flores, in the Petén (an eco-lodge named Ixpam-

pajul), and then moved on to the cloud forest in the Sierra de las Minas (a private lodge next to the vast “Biotopo Quetzal”. The first half was dry (the rains were late this year) and very hot in flat country; the second was cool and damp in rugged and muddy mountain forest.

We were the only dragonfly people—the remainder pursued birds, photographed butterflies, or black-lighted for moths. Why do they call it “black lighting”, anyway? John and the other moth person used 1000 watt lights that turned the forest into something like Times Square on New Years eve. A few odes came to the black lights (*Mecistogaster modesta*, *Brachymesia herbida* [Red-tailed Pennant], *Tholymis citrina* [Evening Skimmer], *Coryphaeschna vitriditas* and *apeora*), but the most interesting visitors were local animals. At the dry forest location, the sheets were regularly visited by the local Gray Foxes, who brought their youngsters to pick juicy beetles off the sheets, even munching them while the moth collectors were picking off specimens on the other side of the sheet. The local Coatimundi (called “pesote” in Guatemala) also came to see what snacks they could find. (They preferred the fat moths.) Birds came the following day to pick remaining specimens off the sheet. A Violaceous Trogon found a huge yellow moth that precisely matched its own brilliant yellow coloration, and presented a most bizarre appearance on its low limb while it appeared to consume itself.

There was little water at this site. An artificial stream (a few years old) by the main lodge had about 20 species of odes. I almost got into deep trouble when a group of visiting high school students gathered around to watch a geezer with a net doing something odd. Seeing one of the *Perithemis* (Amberwing) species, I conspicuously netted it to show the students what I was doing. As I was removing it from the net I realized at the last second that what I

had caught on this swing was a large, angry, amber-winged wasp. What a story this would have made: “The day the silly gringo got stung . . .”

Ailsa and I went out one day with a local taxi driver to explore the very dry countryside. We found a large lake with the sort of barren shoreline one associates with Nevada. There few dragonflies, of which the most conspicuous were the bright red *Planiplax sanguiniventris*, which looks so much like *Erythemis peruviana* (Flame-tailed Pennant) that one can distinguish them only in the hand, and with a close look. One can't avoid the conclusion of mimicry, but which is the mimic, and why? On another lake's shores we found the remains of a small pyramid, apparently a ruined Mayan structure. Finding an unmapped structure was about the only thrill this lake provided. But on a small stream (the only one for miles) we did find some interesting odonates, including the first *Neoneura paya* (a very thin, brilliant yellow damselfly) taken in the interior of the country.

At the lodge itself, the only “natural” body of water was an unattractive, small muddy pond, which had receded to the point of near disappearance. There were few odonates now, but when the rains finally arrive, I think it will be a hive of activity. I was happy to find my old friend *Ischnura acicularis*, which is so small (one of three “World's Smallest Odonate”) that looking for it in the fringe of grass is something like looking for very tiny, thin wasps, and not an ode experience at all. Also present was the large gomphid *Aphylla angustifolia* (Broad-striped Forceptail), which apparently lives in a variety of unattractive places. The pond was a magnet especially for *Orthemis* (Tropical King Skimmer) species, having many *cultriformis* and a smaller number of *discolor* (Carmine Skimmer) and *ferruginea* (Roseate Skimmer). This gave me a chance to note a behavioral difference between the two latter species that I had not previously noticed. When both *ferruginea* and *discolor* are present, *ferruginea* perches (on small tree limbs that I dragged into the water for this purpose) closer to the water and *discolor* closer to the bank. They may be inches apart, but they maintain their relative positions for as long as I watched them. Various darners appeared briefly, doing fast turns around the pond. I never netted *Anax concolor* (Blue-spotted Comet Darner) (I cannot be certain of the identification), but I did take a few *Coryphaeschna viriditas*. Its sister species *apeora* flew higher, rarely coming low enough to even swing at. As I waited (and waited) for these species to reappear, one day a large Cayman, who spent its days at the bottom of the pond, surfaced for its daily breath. It is just as well that I did not wade into the opaque water!

My main personal thrill at this locality was getting to know Collared Peccaries about as well as one would want. Two herds appeared each day consisting of over a dozen animals

each. One herd seemed to stay close to my pond (water was the magnet, I am certain). One day as I approached this herd on my way to the pond, about eight animals broke off and ambled into the scrub. A group of six remained, and a young boar appointed himself boss and challenged me, blocking the path. He stood about twenty feet from me, occasionally raising the long bristles on his back and making his intentions clear by snapping his jaws. I got his message, but wanted to get past him. When we both decided it was cool, he backed off and let me walk past slowly.

The cloud forest also presented few species, but not because of lack of moisture. At 1700 meters, there simply isn't much odonate variety in this difficult habitat. Ailsa and I found several typical tropical waterfalls—small shaded streams running over wet rocks. Our favorite place featured a large damselfly, *Paraphlebia duodecima*, maintaining its perch each day on the same broad-leafed plant growing in the face of the fall. We never saw it do anything and never saw a female. It would be there when we arrived at 9 AM and would be still there when we left at 3:30. The large yellow damselfly *Heteragrion tricellulare* would arrive at 11:00 and was still active when we left. They would spend their day maintaining their individual perches, but flying out to challenge their chums in frequent confrontations. Seeing these lovely large damselflies flying at each other in territorial encounters is a gorgeous sight! The large, somber damselfly *Amphipteryx agrioides* perched almost in the falls itself, preferring to sit on a bit of vine only inches from the spray. These are so dark colored that only with binoculars can one find the small blue tip of their abdomens in the gloom. The most interesting damselfly was the very large *Hetaerina rudis*. This insect perches about 10–20 feet above the stream, only coming down to the water during the thirty minutes or so during the day, when sunlight actually hits the small stream. No wonder this species is so rare in collections! While we waited at the falls, a few *Argia* (*chelata* and *medullaris*) and *Brechmorhoga* (*pertinax* and *rapax*) would appear, but never in numbers. *Epigomphus subotus* seemed to live here but appeared rarely. At our first evening at this lodge, eating an al fresco dinner on the terrace, I felt an annoying bug land on the back of my head. Instead of simply brushing it off, I carefully caught it in my fingers. It was a female *subotus*—the first capture of an odonate on my own head.


Mecistogaster modesta was very common around the lodge, where the forest had been cleared somewhat. We all got used to these lovely “helicopters”, and one of our group even saw one pick a small spider from its web. Their slow flight is very different other damselflies, and indeed from all other insects. They are like ghosts in the forest.

The lodge was noted as a viewing place for Resplendent Quetzals. We had missed these birds in repeated trips to

Central America, and we felt we were finally due to see one. These magnificent birds (the mature males have very long, shimmering green feathers on their backs) would arrive each morning to eat the fruit of several *Cecropia* trees which grew around the lodge. Their method of eating was unusual: they would fly at the fruit and grab and pull off morsels on the wing, somewhat like a huge flycatcher (fruit catcher actually). It is difficult of getting bored of birds like this, but their chums, the Highland Guans, nearly upstaged them. This bird has one of the most unusual calls I have ever heard — almost like a motorcycle racing downhill.

Our neatest encounter with wildlife was with a small green venomous tree viper that lived outside our room.

It would sun itself during the day, and one day tried to slither under our door (the space was too small). It did get into our neighbor's room and was swiftly removed. We all decided that this snake was becoming too chummy for comfort and one of our group caught it. We all spent about an hour photographing it perched in a small tree (one enthusiast got several good snaps of it striking at the camera). We put it back in the forest, but we had no idea how many of its brothers and sisters remained.

It is sad to see how badly a countryside can be damaged by development, but we should all give thanks that there are some public and private attempts to preserve the glories of this magnificent country. 

Red Wasp (*Polistes carolina*) Predation on Pale-faced Clubskimmer (*Brechmorhoga mendax*)

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The Big Springs Ranch, located north of Leakey in Real County, Texas (USA), has been the subject of regular faunal and floral surveys since April 2006. Interest has been focused on the odonate fauna of the site because of personal interest and because of the location's importance as the major headwaters of the Frio River. The odofauna of the location includes two local, United States rarities, *Macrothemis imitans leucozona* (Ivory-striped Sylph) and

Macrothemis inequiunguis (Jade-striped Sylph). Here I detail an anecdotal observation of wasp predation on *Brechmorhoga mendax* (Pale-faced Clubskimmer).

On 23 June 2007 I was engaged in studying *M. inequiunguis* and other large odonates feeding above travertine pools at the base of the largest spring, and caught a male *Brechmorhoga mendax*. I needed good photographs of this species, and using a technique learned from other field photographers, anesthetized the insect with trifluoroethane, used in canned compressed air cleaning camera lenses. After taking a series of high-resolution photos, the battery ran down and I hiked to my vehicle to change it out, leaving the dragonfly in place, hanging from an Arizona Walnut (*Juglans major*) leaflet.




I returned a few minutes later and thinking the bug might still be present, checked the location, but did not see it. About to venture on, I noted a movement on the ground below and saw a Red Wasp (*Polistes carolina*) dragging something there. Upon looking more closely I found it to be dragging the thorax and wings of the *B. mendax*. I began photographing

it, and realized it was actually eating the thorax, audibly so. I watched while it devoured the remainder of the thorax. I presume that it also consumed the head and abdomen, as a thorough search of the area produced no other remains. In the end only the wings were left that I could determine.

I do not know whether the wasp took the dragonfly from its perch, or whether the dragon had fallen to the ground before being consumed. A Red Wasp, perhaps this same individual, had been hovering about the walnut while I was taking pictures.

Others have described predation on dragonflies by vespid wasps (Dijkstra et al., 2001), as well as by other Hymenoptera (Kiauta, 1971) and Hymenoptera mimics (Platt & Harrison, 1995), and of course dragons are commonly taken by other flying predators (Papazian, 1994), though I found no specific references to predators of *B. mendax* (Abbott, 2005, 2007).

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Notes on Avian Predators of Odonata

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Intrigued several years ago by photos of a Purple Martin (*Progne subis*) bringing an *Anax amazili* (Amazon Darner) to a nest box in Marlin, Texas, and its importance as an out-of-range county record (in Abbott, 2005, p. 165) we began paying closer attention to predation on odonates by birds and other predators (Gallucci, 2007). This coincided with the attempts of several of us, including Greg Lasley, Brush Freeman, Martin Reid and myself to document new county records of odonates in Texas, which was also encouraged by the later formation of the Odonata Survey of Texas by John Abbott (2006, 2007). This increased field effort brought us into hundreds of situations in which odonates and birds had potential contact.

In particular, Freeman has monitored remains below martin colonies in coastal Texas. He identified seven species brought to the colonies, noting from one site: "... in addition there were 63 unidentified to species brought in to chicks ... [to] a martin colony with 38 gourds and about 35 pairs of martins."

Freeman also observed one of the more unusual phenomena reported to the Texas Odonate Listserv TexOdes as recounted here by Greg Lasley (2004): "... Freeman sent me a note about an amazing spectacle of migrant (apparently) Band-winged Dragonlets (*Erythrodiplax umbrata*) he and others observed on the morning of 19 July ... "This morning we had two biology boats out at 6:30. We headed out first to Sand Point which basically separates Matagorda and Lavaca Bays on the east ... As we approached the point we saw what looked like thin smoke over a small brackish marsh inland on the peninsula, extending and getting very dense as it collected up to the extreme tip of the point. We soon saw that they were dragonflies, millions of dragonflies and I mean millions! They stretched for over 1/2 mile between about 7:00-7:45 AM in a dense cloud the width of the peninsula and were perched on every available grass blade and stem ... I have never seen such a swarm of insects in my life over such a large area, though I have seen probably several thousand dragonflies over fields and sod farms before, but nothing ever matching the numbers we saw this

morning. By about 8:15 the swarm dispersed out and across the bays leaving very, very few behind . . . a few gulls were seen “flycatching” and a number of Green Darners were seen catching these smaller dragonflies.”

We are further intrigued by the recent boon in availability of record material, made possible by the inexpensive availability of Internet space for hosting photographs, and advances in digital photography (Lasley, 2007). Recently we have seen a number of photographs taken by Mark Bartosik (2007) which show birds that have captured adult and larval dragonflies. In many cases these individual dragonflies are identifiable to species, and this gives us an opportunity to pair predator species with prey species. This is something that has not been accomplished much in the past, likely due to both the fleeting glimpses one can manage in the field and because only recently has field identification of odonates come into its own enabling skillful field observers to identify both predator and prey. John Abbott and Mark Bartosik are preparing a paper further detailing the records documented in Bartosik’s stunning photographs.

With those things in mind, we considered it of potential anecdotal interest to begin compiling instances of bird predation on odonates. Some history is always in order. In easily the single most comprehensive work on the subject Kennedy (1950) reports on 178 bird taxa shown by stomach content analysis to contain larval or adult odonate remains. The paper itself contains a wealth of information and analysis, but, with rare exception, does not identify the odonate species involved, only the predators. Nevertheless, it is a rich compendium of the extent of predation of one group of flying predators on another.

Beckemeyer in an online compilation (2002), reports on predation of adult Odonata by 24 species of birds, including Ring-billed Gull (*Larus delawarensis*), Baird’s Sandpiper (*Calidris bairdii*) and six species of ducks. He also identifies 24 species of birds as predators of larval odonates, many perhaps as they emerge from the water. These listings include the species with the highest percentage of odonates contained in their stomachs and it is likely that other bird species were identified, but fall below the minimum threshold for his purposes. Again however, none of this material associates the bird predator with the specific odonate prey.

Most other works documenting avian predation on odonates is in the form of anecdotal literature or online listserv records, some of which identify the birds involved, and some which identify both the birds and the odonates (Brunelle, 1999; Convey, 1992; Erbaugh & Larsen, 2002; Goodwin, 1999; Moore, 1900; Rose, 1999). Some of these notes are tangential to the stated purpose of research (Clarke et al., 1996), and some involve flying vertebrates

other than birds (Dunkle & Belwood, 1982).

Thanks to John Abbott for reviewing this note, and checking the materials cited herein, and his, and Mark Bartosik’s graciousness regarding Mark’s photographs.

Below, compiled by odonate species, in alphabetical order, is a preliminary list of the avian predators that we found documented online (Brunelle, 1999; Erbaugh & Larsen, 2002; Rose, 1999), in photos examined by the authors, through literature research, or by field observation.

adult Anisoptera

- Swallow-tailed Kite, *Elanoides forficatus* (Gallucci, pers. obs.)
- Laughing Gull, *Larus atridilla* (Freeman, pers. obs.)
- Eastern Kingbird, *Tyrannus tyrannus* (Freeman, pers. obs.)
- Scissor-tailed Flycatcher, *Tyrannus forficatus* (Freeman, pers. obs.)
- Purple Martin, *Progne subis* (Freeman, pers. obs.)

Anax amazili (Amazon Darner)

- Purple Martin, *Progne subis* (Abbott, 2005, p. 165)

Anax junius (Common Green Darner)

- Mississippi Kite, *Ictinia mississippiensis* (Gallucci, pers. obs.)
- Tern sp. (Brunelle 1999)
- Scissor-tailed Flycatcher, *Tyrannus forficatus* (Gallucci, pers. obs.)
- Purple Martin, *Progne subis* (Freeman, pers. obs.)

Anax longipes (Comet Darner)

- Purple Martin, *Progne subis* (Freeman, pers. obs.)

Arigomphus submedianus (Jade Clubtail)

- Purple Martin, *Progne subis* (Freeman, pers. obs.)

Brechmorhoga mendax (Pale-faced Clubskimmer)

- Green Kingfisher, *Chloroceryle americana* (Gallucci, pers. obs.)

Enallagma basidens (Double-striped Bluet)

- Purple Martin, *Progne subis* (Freeman, pers. obs.)

Epithecina (*Epicordulia*) sp. (poss. *princeps*) (Baskettail sp., possible Prince Baskettail)

- Purple Martin, *Progne subis* (Freeman, pers. obs.)

Erythrodiplax berenice (Seaside Dragonlet)

- Purple Martin, *Progne subis* (Freeman, pers. obs.)

Idiataphe cubensis (Metallic Pennant)

- Swallow-tailed Kite, *Elanoides forficatus* (Rose, 1999)
- Phyllogomphoides stigmatus* (Four-striped Leaf-tail)
Great Crested Flycatcher, *Myiarchus crinitus* (Gallucci, pers. obs.)
- Sympetrum corruptum* (Variegated Meadowhawk)
Lesser Prairie-Chicken, *Tympanuchus pallidicinctus* (Erbaugh & Larsen, 2002)
Scissor-tailed Flycatcher, *Tyrannus forficatus* (Erbaugh & Larsen, 2002)
- Tramea lacerata* (Black Saddlebags)
Purple Martin, *Progne subis* (Freeman, pers. obs.)
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First Record of Baja Bluet (*Enallagma eiseni*) in California

Richard Bledsoe, <rlbledsoe@yahoo.com>

On 17 June 2007, I went to the bird and butterfly gardens at the Tia Juana Valley Regional Park near San Diego, California to photograph butterflies. While there, I saw a Blue-eyed Darner (*Rhionaeschna multicolor*) feeding. That made me

think about looking at dragonflies, so I decided to check the pond on Saturn Blvd. on my way home. But I had problems: I had forgotten to bring my binoculars or dragonfly field guide. In fact, I only had my camera equipment with me.

At the pond on Saturn Blvd I found and photographed a bluet (*Enallagma*) that I thought looked odd. Later that evening when I reviewed the photos, I realized that I didn't know what species this was. So next day (18 June) I returned properly equipped (camera, net, binoculars, dragonfly guide, 10× hand lens, ruler, and lunch).

It was lucky for me that the odd bluet was in the same vicinity posing nicely. I took some images of him in the habitat and then netted and examined him. From my notes: a small bluet only one and one-eighth inches long, in side view the lower appendages were hard to see with the 10× while the uppers looked huge in comparison, and these appendages looked very different to me than those of California's other bluets. He was a handsome bluet and had a very different and striking pattern atop his abdomen of backwards pointing dark arrows.

The pond where the bluet was found is on the west side of Saturn Blvd. just north of Sunset. It is a very small pond and access is limited by the thick growth of cattails. There were a couple of small patches of floating vegetation mats and the bluet perched on them. Prior to his capture he was watching his territory and changing perches occasionally.

The bluet I captured in hand and in images was a single individual and I did not see any females. When I released him he flew into the bushes and disappeared and had not returned an hour later when I returned to check.


That evening I wanted to identify the bluet by using my detailed photos, a process I have found fairly easy to do with well-marked species. I had a lot of practice identifying species of odes as I searched for and photographed them while traveling full time in my recreation vehicle in the eastern, midwestern, and southern USA during 2004 and 2005.

I had suspected the bluet might be from Mexico as the pond is only 1.5 miles north of the international border with Mexico and attempted to find web sites covering the Baja California species. I did not have any luck although I searched far and wide. So, I resized some of the images I'd taken, and e-mailed them to California regional coordinators for the records at OdonataCentral, Kathy Biggs and Tim Manolis.

Soon, Kathy e-mailed back the identification as a Baja Bluet (*Enallagma eiseni*) and referred me to her Damselflies (Zygoptera) of the Southwest web site where there were some comparison photos: <<http://southwestdragonflies.net/damselflies/swzygoptera.html>>. This was at 10:30 PM and I was very happy to have an identification to say the least and I quit for the day.

On 23 June, I met David Blue and his wife Linda at the "Baja Bluet pond" but we were unable to find the species again. Doug Aguiard had also tried to locate one the day before without success. So, it is hard to say if there will be more opportunities to see this species in this area. However, I will be checking.

This is my fifth season of searching for and photographing Odonata and I never expected to have a first record in California and am quite thrilled by the experience.

[Note from Kathy Biggs: This is actually only the second location within the US borders for the Baja Bluet. Personal communication from Dennis Paulson. Also, see ARGIA Volume 18, 26 October 2006, Number 3 for information about the other locality for this species in the US, Quitobaquito Springs in Organ Pipe National Monument (Pima County, Arizona) which is currently closed to the public due to safety issues.] 

***Argia harknessi* Calvert (Harkness' Dancer) New to the United States**

Rich Bailowitz, <raberg2@earthlink.net> and **Doug Danforth**, <danforthdg@aol.com>

Several researchers residing in southern Arizona have been studying the odonates of Arizona and Sonora (in adjacent mainland Mexico) for the past seven years. This article documents the first occurrence of the species *Argia harknessi* (Harkness' Dancer) in the state of Arizona and within the United States borders, a documentation resulting from that continuing field work.

Due to the extensive and prolonged drought conditions within most of the state of Arizona, much of the recent field work by local odonatists has been along the eastern

border of the state where drought conditions have been less severe. The San Francisco River is a tributary of the Gila River and straddles the Arizona/New Mexico border. Its headwaters are in the eastern White Mountains west of the town of Alpine. From there, it flows into New Mexico, then southward through Glenwood, New Mexico, and then back to the southwest to join the Gila River southwest of the mining community of Clifton, Arizona.


Severe rainy-season flooding during the summer of 2006 had scoured out extensive groves of cottonwood/willow

forest along the lower stretches of the San Francisco River. Due to this scouring, large reaches of un-canopied river are presently exposed, having periodic riffles, sandbars, and small clumps of tree limbs.

We visited the river on 5 June 2007, working those sections upstream from the bridge in the town of Clifton, all within Greenlee County. Approximately two miles east of Clifton, two males of a large blue *Argia* were encountered on beaver cut willow branches stuck at a riffle. The first male was collected and the second photographed. Both were individuals of *Argia harknessi*.

This is a familiar species in Sonora, mostly inhabiting large rivers, with or without strong currents, cutting through thorn-scrub and Sinaloan thorn-forest. It has been found along most of the major drainages as far north as the Rio Yaqui and its tributary, the Rio Bavispe. *Argia harknessi* has been documented in Sonora along the Rio Bavispe as

close as 120 km of the US border. The Rio Bavispe comes within 60 km of the US border at a point nearly due south of the Arizona/New Mexico border. This find near Clifton, about 190 km north of the Mexican border, extends the range more than 300 km to the north.

The following week, on 12 June 2007, we revisited the site and found two additional males downstream several hundred meters from the original site. We also worked the main channel of the Gila River at Duncan, just over 40 km SSE of the Clifton site, but did not find *A. harknessi* there. One issue, among many, concerns the origin of these specimens. Does this represent recent colonization from the south somehow related to global warming and/or drought or is it a relictual colony of a formerly more widespread species that has been overlooked or in some other way missed? 

New and Interesting Odonate Discoveries

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Anax amazili (Amazon Darner) in the Florida Keys

I received an e-mail from Vicki DeLoach of Woodstock, Georgia <vldeloach@aol.com> wanting me to verify some photos she had taken on Captiva Island (Lee County) on 8 June 2007. They turned out to be *Anax amazili*, which represented a new county record and only the third record for Florida though the species does breed in the Florida Keys (pers. comm. Jerrell Daigle).

A few days after the e-mail exchanges above, I received the following e-mail from Lyn Atherton (Tierra Verde, Florida, <bonniedabird@earthlink.net>):

Yesterday, I was forwarded a message by Vicki and Harry DeLoach which told of their finding on 6/8/07, an Amazon Darner, *Anax amazili*, at Captive Island, FL. They stated that they thought theirs was only the third verified report of this species for FL. I wrote them and told them of my discovery of *amazili* at Ft. De Soto Park, Pinellas County, FL, on 8/12/01. As I recall, this was a day or two after a tropical storm had passed by the central Gulf coast where the park is located (and where we live). I did tell my friend, Bob Barber, about my discovery soon after I found and photographed the *amazili*. At the time, he said that he thought this species had been found breeding


in the Keys. Vicki suggested I contact you and let you know about my find at Ft. De Soto Park.

So after a few e-mails over the course of a few days, the number of known counties where *Anax amazili* had been documented in Florida was doubled! The species has been documented in Lee (OC #7753), Liberty, Monroe (OC #7802), and Pinellas (OC #7792) Counties. The numbers in parentheses represent the OdonataCentral record numbers <<http://www.odonatacentral.com>>.

Argia oenea (Fiery-eyed Dancer) New for New Mexico

Received an e-mail from Bob Barber (Alamogordo, New Mexico, <bbarber@odonate.com>) stating the following:

This morning, 22 May 2007 I found a pair of Fiery-eyed Dancers, on a small stream in Fresnal Canyon, near La Luz, New Mexico, (Lat: 32.98°N, Long: 105.94°W) in Otero County.

This Central American species occurs in Arizona and Texas within the US, but this is the first record of its occurrence in New Mexico. Record number OC #7678 in OdonataCentral.com. 

New Records of Odonata from Baja California Sur, Mexico, and a Checklist of the Odonate Fauna of that State

Dennis Paulson, <dennispaulson@comcast.net> and Steven Mlodinow, <SGMlod@aol.com>

A trip by Paulson and Netta Smith to Baja California Sur in January 2004 resulted in the discovery of two species new for that state. Mlodinow visited the Cape area several times during 2005–2006 to search for birds but also expended considerable effort to find and photograph dragonflies. He provided photos to document the occurrence of three additional species.

Rhionaeschna psilus, Turquoise-tipped Darner

Mlodinow photographed a male in woodland at Caduano, 6 January 2006. This is the first record for the peninsula.

Erythemis plebeja, Pin-tailed Pondhawk

Specimens were taken at Todos Santos, 5–6 January 2004, and individuals were seen at San José del Cabo and north of Cabo San Lucas. Mlodinow also photographed several in the Cape region in October 2005. These are the first records for the peninsula.

Libellula croceipennis, Neon Skimmer

Mlodinow photographed males at Todos Santos, 6 October 2005 and 27 September 2006. Although reported in earlier literature from Baja California, we were unable to find a published record that specified a locality or a state.

Macrodiplax balteata, Marl Pennant

Mlodinow photographed a female at Estero San José, San José del Cabo, 1 October 2006. This is the first record for the southern part of the peninsula, although there is one record from Baja California Norte (Paulson & Garrison, 1977).

Orthemis discolor, Carmine Skimmer

Specimens were taken on the road to San Antonio de la Sierra, 9 January 2004. One male of this species and a male of *O. ferruginea* (Roseate Skimmer) spent time at a tiny pool in a dry stream bed, and a female discolor was collected while ovipositing in the pool. Three male discolor were found at a muddy cattle pond 8 meters in diameter in open desert, and one was collected. No *ferruginea* were seen there and this seemed a surprisingly open and arid environment for *discolor*, which is usually associated with wooded habitats. Another male was taken at San Bartolo, and the species was generally distributed at that time in the Cape region but a bit less common than *O. ferruginea*.

Discussion

From our several visits in January, we feel that this is a good

month for Odonata in the Cape region, but perhaps that may have been the case only in that year because there had been good rains during the previous autumn, and there was still a lot of surface water present. This may not be the case in every year. Visits in October were always very productive of dragonflies, and probably the fall is normally the time of relatively high diversity of odonate species at the Cape.

The addition of these species to the Baja California Sur fauna further underscores the tropical nature of the Cape region, although all of them occur farther north in the United States. Other than the endemic *Telebasis incolumis* and *Rhionaeschna manni* and almost-endemic *Enallagma eiseni*, the species of Baja California Sur occur widely in northern Mexico, and most occur as well in the United States. A small number of species, however, reach their northern limit in southern Baja. The lack of certain common species of the western Mexican lowlands, e.g., *Lestes* spp. (pond spreadwings), *Erythemis vesiculosa* (Great Pondhawk) and *Erythrodiplax funerea* (Black-winged Dragonlet), is surprising and may indicate something special about their habitat needs.

The list of 51 species presently known from the southern half of the Baja California Peninsula is impressive considering the general aridity of the region.

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Table 1. The Odonata of Baja California Sur, Mexico

Hetaerina americana (American Rubyspot)
Archilestes californicus (California Spreadwing)
Argia agrioides (California Dancer)
A. oenea (Fiery-eyed Dancer)
A. tezpi (Tezpi Dancer)
A. vivida (Vivid Dancer)
Enallagma civile (Familiar Bluet)
E. eiseni (Baja Bluet)
E. novaehispaniae (Neotropical Bluet)
Ischnura cervula (Pacific Forktail)
I. ramburii (Rambur's Forktail)
*Telebasis incolumis**
T. salva (Desert Firetail)
Anax junius (Common Green Darner)

A. walsinghami (Giant Darner)
Remartinia luteipennis (Malachite Darner)
Rhionaeschna dugesi (Arroyo Darner)
*R. manni**
R. multicolor (Blue-eyed Darner)
R. psilus (Turquoise-tipped Darner)
Erpetogomphus compositus (White-belted Ringtail)
E. lampropeltis natrix (Serpent Ringtail)
Octogomphus specularis (Grappletail)
Progomphus borealis (Gray Sanddragon)
Brachymesia furcata (Red-tailed Pennant)
Brechmorhoga mendax (Pale-faced Clubtail)
Dythemis nigrescens (Black Setwing)
*D. sterilis**
Erythemis collocata (Western Pondhawk)
E. plebeja (Pin-tailed Pondhawk)
Erythrodiplax basifusca (Plateau Dragonlet)
E. berenice (Seaside Dragonlet)
Libellula croceipennis (Neon Skimmer)
L. saturata (Flame Skimmer)

Macrodiplax balteata (Marl Pennant)
Macrothemis inequiunguis (Jade-striped Sylph)
*M. pseudimitans**
Micrathyria aequalis (Spot-tailed Dasher)
M. didyma (Three-striped Dasher)
M. hagenii (Thornbush Dasher)
Orthemis ferruginea (Roseate Skimmer)
O. discolor (Carmine Skimmer)
Pachydiplax longipennis (Blue Dasher)
Paltothemis lineatipes (Red Rock Skimmer)
Pantala flavescens (Wandering Glider)
P. hymenaea (Spot-winged Glider)
Perithemis intensa (Mexican Amberwing)
Pseudoleon superbus (Filigree Skimmer)
Sympetrum corruptum (Variegated Meadowhawk)
Tramea calverti (Striped Saddlebags)
T. onusta (Red Saddlebags)

* Not known to occur in the US.



New and Interesting Records from Martinique (French West Indies)

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Although the Odonata fauna of Guadeloupe is relatively well studied, the Martinique odonate fauna still remains poorly known. Many areas in the northern part of the island have not been surveyed for this group. A recent checklist (Meurgey, 2006) listed 25 extant species from Martinique as reported in ten publications. Martinique is a volcanic island situated 150 kilometers south of Dominica. The northern part is covered with rain forest. The remaining island consists of mostly highly urbanized lowlands devoted to agriculture, or polluted and highly modified by human pressure. This is the main factor that could explain the lack of interest in the odonate fauna of Martinique.

Recently, I examined Odonata specimens collected by Gwenaél David and Bénédicte Thibaut, two French resident naturalists, as part of the research carried out by the Nantes Museum on the French West Indian Odonata. As I had hoped, Gwenaél and Bénédicte had taken *Lestes tenuatus* Rambur (Blue-striped Spreadwing). One mature male was caught in a small pond located in the southern part of the island, at 200 meters elevation. Surrounded by scrub forest, the pond was nearly completely dry the day of the capture, 17 April 2007. Rambur first described *L. tenuatus* from Martinique in 1842. Later publications, (Klots, 1932; Donnelly, 1970) also reported it from Martinique. In reality, we do not have any valid data for this species since 1842.

Lestes tenuatus is rarely seen in the French West Indies. It has been collected from Guadeloupe and from Dominica where the species was first recorded in 2007 plus Martinique. *L. tenuatus* reaches the southern edge of its Antillean distribution in Trinidad (Daigle, pers. comm.).

The family Aeshnidae (darners) is poorly represented in Martinique with only two species known, *Anax junius* Drury (Common Green Darner) and *Anax amazili* Burmeister (Amazon Darner). *A. amazili* was first reported by Klots (1932), but it has not been seen there since. In comparison, eight aeshnid species occur on Guadeloupe (Meurgey, 2006), and three in Dominica (Meurgey, 2007).

During surveys carried out in the southern end of the island in 2007, Gwenaél and Bénédicte found several exuviae in a small pond at "La Pagerie", Trois-Ilets, including three aeshnid exuviae. Direct examination with similar specimens from Guadeloupe, allowed us to identify one of them as *Triacanthagyna caribbea* Williamson. This is the first record for this genus and species from Martinique, also known from Guadeloupe. It is not recorded from Dominica, where the only species known is *T. trifida* (Rambur) (Phantom Darner) (Donnelly, 1970). Two other exuviae, first assigned to the genus *Gynacantha* on the basis of existing literature, were sent to Ken Tennessen for confirmation. As expected, the exuviae were definitely assigned by Ken to the genus *Gynacantha* and it is most

likely *G. nervosa* Rambur (Twilight Darner). This is the first record for this genus and species from the French West Indies and only the second record from the Lesser Antilles. The crepuscular habits of both *Gynacantha* and *Triacanthagyna* make field observations difficult. Collecting exuviae and larvae are thus the best way to ascertain their presence, and can give an excellent account of ecological requirements for these species in Martinique.

Tramea calverti Muttkowski (Striped Saddlebags) is known from the Greater Antilles (Cuba to Puerto Rico) and it is recently reported from Guadeloupe in the Lesser Antilles in April 2004 and March 2006. A mature male, caught in April 2007, at "L'Anse Mitan" along a small track, brings the number of island records from the Lesser Antilles to two.

The three new records bring the total number of species in Martinique to 28. No doubt that further studies on this island will bring additional discoveries of previously unrecorded species.

I express my gratitude to Gwenaël David and Benedicte Thibaud for their fieldwork and contributions to the study of West Indian Odonata. I also thank Ken J. Tennessen for kindly confirming the identification of *Gynacantha nervosa*.

Odes on Bank Notes

Scott Young, Austin, Texas <birding-biker@austin.rr.com>

So I was just doing some armchair odeing by combining it with my passion for banknote collecting. After looking through over 1000 banknotes in my collection, and doing some research online, I can find only one banknote worldwide that depicts a dragonfly. It is the 50 (femti) Kroner note from Norway, pick #46. Now I know that this is quite

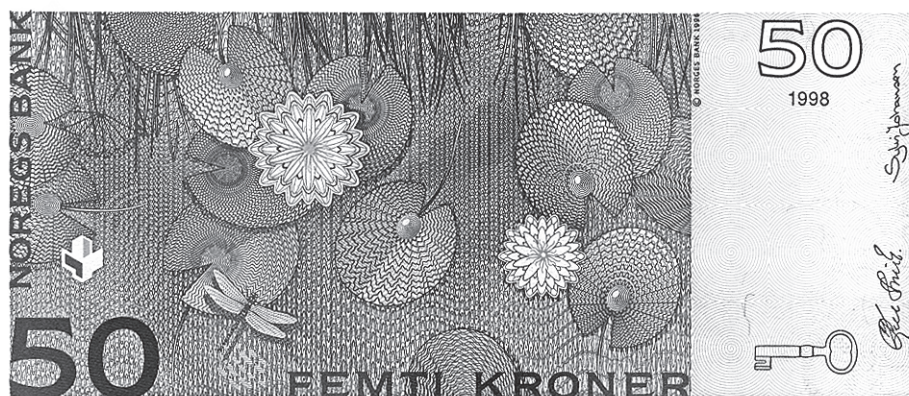
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removed from the science that many of you do, but do you know of any other examples?

A great site for looking up banknotes is Ron Wise's Geographical Directory of World Paper Money, <<http://aes.iupui.edu/rwise/default.htm>>.

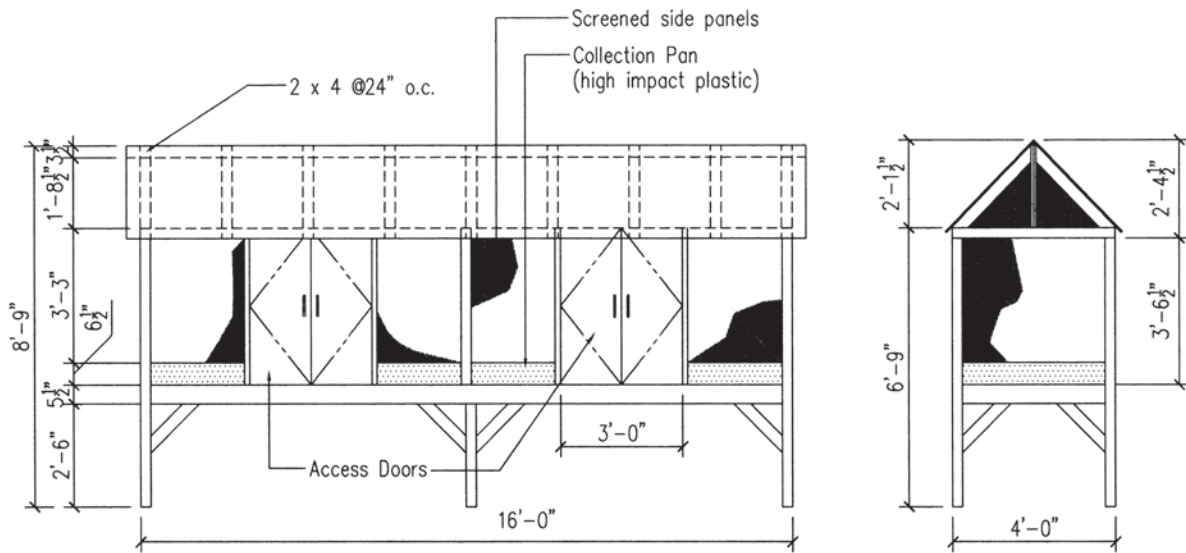


Dragonfly Vivarium Construction Plans

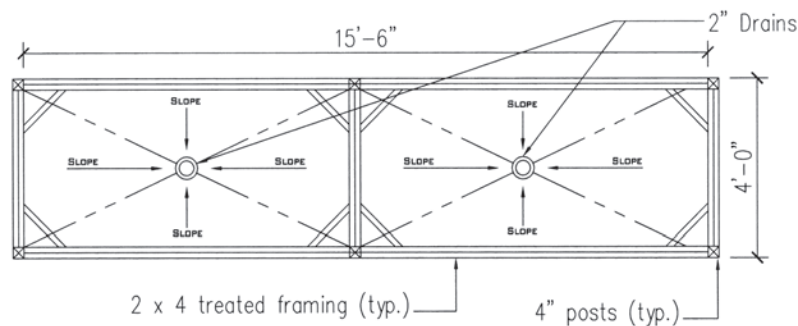
Richard Groover, J. Sargeant Reynolds Community College, <rgroover@reynolds.edu>

I have developed a set of construction plans for an outdoor dragonfly vivarium. My intention is to use this vivarium for part of my doctoral research; as some may remember I announced at the Kentucky DSA meeting, that I will be researching dragonfly colonization and recolonization

of lentic habitats. I am interested if anyone has thoughts, comments, or suggestions on the design. I credit several DSA members for the initial design and inspiration for this vivarium, namely Carl Cook.



Elevations



Plan

THE DRAGONFLY VIVARIUM



Request for Damselfly Specimens

Mark A. McPeck, <mark.mcpeek@dartmouth.edu>

In the past year I have started a new project on the evolution of male and female mating structures in the Odonata. The project involves using a micro CT scanner to generate three-dimensional models of the reproductive claspers of males and the thoraces of females to understand how males and females choose one another for mating.

The CT scanner generates a series of slices of the structures of an individual at a resolution of 2.5 microns (that's one millionth of a meter!!) This is the same type of machine that reconstructed the pre-Cambrian fossils of embryos from China (i.e., Hagadorn et al., 2006, Integrated x-ray insights into cellular and subcellular structures of Neoproterozoic animal embryos, Science 314: 291–294). From these slices I generate three-dimensional computer models of male (i.e., cerci and paraprocts) and female (anterior portions of thorax) parts. The first goal of the project is to reconstruct the evolution of these structures. After we have this completed, we will build “docking” models to estimate what a female feels when a male grabs her for mating. The ultimate goal is to estimate which species might hybridize with one another.

If you'd like to see what these models look like, you can find a couple at <<http://anax.dartmouth.edu/~mcpeek/bodyModels.html>>.

This summer I'd like to complete an analysis of four major zygopteran genera. These are *Enallagma* (bluets) and *Ischnura* (forktails) (of course), *Argia* (dancers), and *Calopteryx* (jewelwings). I have chosen these because good


molecular phylogenies have been published for them. If you could spare some specimens from your personal collections, I would appreciate receiving 1–2 males and 1–2 females of each species in these four genera from as many people as can spare them. Obviously, the rarer species in each genus would be more useful. I am making a general broadcast for specimens because I'd like to get specimens from across the ranges of each species if possible to get some idea of geographic variation for the more common species.

Any kind of dried specimens are fine. The x-ray is absorbed by the exoskeleton, and so it really doesn't matter how specimens were processed. Even ethanol-preserved specimens will work just fine—I'll just dry them.

If you could spare some, please send them to:

Mark A. McPeck
Centerra Biolabs
Dartmouth College
7 Lucent Drive
Lebanon, New Hampshire 03766

Please drop me an e-mail at <mark.mcpeek@dartmouth.edu> if you can send specimens, so I can be looking for them.

As always, I am most grateful for all the wonderful help that everyone has provided me over the years with specimens. The odonate community is just fantastic! 

Rearing And Photographing *Orthemis* (Tropical King Skimmers)


Ken Tennessen, <ktennessen@centurytel.net>

In examining exuviae of *Orthemis ferruginea* (Roseate Skimmer) and *O. discolor* (Carmine Skimmer), I have found several characters that appear to hold promise for their separation. However, it is imperative that we acquire additional specimens that are positively associated with adults.

This brings up the question on how to preserve the adult information so that we can be certain of the identification. Reared adults that have been put in alcohol along with their exuviae are very difficult to identify because the colors tend to disappear. Anyone who finds either of these two species emerging this season is urged to pick them up and keep the adult and exuviae associated. This can

be done by keeping the adult alive (in a paper bag) for a couple of days and then doing either of the following:

- 1) photographing it (after which it can be preserved in alcohol with its exuvia) or,
- 2) drying the adult and putting it in a cellophane envelope with a unique number so that it can always be associated with its exuvia.

This approach will allow future identification of the adults and therefore positive identification of the exuviae also. 

Book Review: **Dragonflies of North America, A Color and Learn Book with Activities**, by Kathy Biggs and Tim Manolis. CD ISBN 10:0-9677934-4-3, Book ISBN 10: 0-9677934-4-0; \$6.95 in US and \$7.95 in Canada.

Reviewed by **Nick Donnelly** <tdonnelly@binghamton.edu>

The perfect gift for your tiny child! This new coloring book comes in two versions: a conventional 11 × 8.5 inch, 48 page book, and a CD-ROM. There is a page with suggested colorings for each species. The book consists of “37 species with life cycle and biology info for your child, your grandchild or your inner child!” The authors are to be congratulated for this fine, innovative concept.

I was personally much impressed by the CD. By printing individual pages from the PDF, your child can attempt multiple versions, or compete with his/her sibling to see who can produce the best/most outlandish/most colorful, etc., version of any particular page. One of my grandsons found it a bit “young” for himself (how fast they grow . . .)

but was equally taken by this feature. So get your crayons and wait for the first rainy day.

For prices and availability, see: Azalea Creek Publishing, <azalea@sonic.net>, fax: 707-823-2911, <<http://www.sonic.net/~bigsnest/azaleacreekpublishing/>>.

You can get additional information at <<http://southwest-dragonflies.net/ColoringBook/>>.



New and Recent Books Briefly Noted

Encyclopedia of South American Aquatic Insects: Odonata — Anisoptera by Charles W. Heckman. 2006. Springer Press, 725 pages. ISBN 1-4020-4801-7.

See <<http://www.springer.com/west/home/generic/search/results?SGWID=4-40109-22-147613718-0>> for a description.

Dragonflies and Damselflies of Namibia by Frank Suhling and Andreas Martens. 2007. Gamsberg Macmillan Publishers, 280 pages. ISBN 9-789991-607641.

This book was literally hot off the presses at the World-wide Dragonfly Association meeting held in Swakopmund, Namibia in April of this year. Attendees, including myself, eagerly grabbed a copy to aid us in our identifications during our post meeting forays. The book describes the 127 species recorded in Namibia providing information on their distribution range, habitat, ecology and behavior. The identification keys not only cover the Namibian species, but also those of neighboring Botswana and southern Angola, so that coverage is of 149 species. The general overview of dragonfly biology and the species descriptions are extensively illustrated with 174 photographs, 27 plates with line drawings and 125 distribution maps.

Gossamer Wings — Mysterious Dragonflies by D. Hilfert-Rüppell and G. Rüppell. 2007. Splendens-Verlag, 168 pp. ISBN 978-3-00-020389-3.

Written in both German and English, this book is full of photography that will impress anyone interested in odonate behavior. The Rüppell's illustrate chapters such as From Water to Air, Flight, Prey Capture, Threatening and Fighting, Courting, Mating Techniques and more with their beautiful photographs. Ola Fincke suggests in the Preface that we should turn off our iPods and delve into this book which endeavors to illustrate so many of the small dramas we encounter in our gardens and along streams. I couldn't agree more.

Dragonflies of California Poster

Includes scans of 18 species of California's dragonflies. Designed by Frank Keller, Images by Greg Kareofelas. Can be purchased from the Bohart Museum of Entomology. \$15 plain/\$18 laminated. Purchasing information is available at <http://www.tenebrionid.net/Document1_files/dragonflyposter.html>.



ARGIA and BAO Submission Guidelines

Digital submissions of all materials (via e-mail or CD) are vastly preferred to hardcopy. If digital submissions are not possible, contact the Editor before sending anything. Material for ARGIA must be sent directly to the John C. Abbott, Section of Integrative Biology, C0930, University of Texas, Austin TX, USA 78712, <jcabbott@mail.utexas.edu>; material for BAO must be sent to Ken Tennessen, P.O. Box 585, Wautoma, WI, USA 54982, <ktennessen@centurytel.net>.

Articles

All articles and notes are preferably submitted in Word or Rich Text Format, without any figures or tables, or their captions, embedded. Only minimal formatting to facilitate review is needed—single column with paragraph returns and bold/italic type where necessary. Include captions for all figures and tables in a separate document.

Begin the article with title, author name(s), and contact information (especially e-mail) with a line between each. The article or note should follow this information. Paragraphs should be separated by a line and the first line should not be indented. Where possible always refer to the scientific name of a species followed by its official common name in parentheses.

Figures

Submit figures individually as separate files, named so that each can be easily identified and matched with its caption. Requirements vary depending on the type of graphic.

Photographs and other complex (continuous tone) raster graphics should be submitted as TIFF (preferred) or JPEG files with a minimum of 300 ppi at the intended print size. If unsure about the final print size, keep in mind that oversized graphics can be scaled down without loss of quality, but they cannot be scaled up without loss of quality. The printable area of a page of ARGIA or BAO is 6.5 × 9.0 inches, so no graphics will exceed these dimensions. Do not add any graphic features such as text, arrows, circles, etc. to photographs. If these are necessary, include a note to the Editor with the figure's caption, describing what is needed. The editorial staff will crop, scale, sample, and enhance photographs as deemed necessary and will add graphics requested by the author.

Charts, graphs, diagrams, and other vector graphics (e.g. computer-drawn maps) are best submitted in Illustrator format or EPS. If this is not possible, then submit as raster graphics (PNG or TIFF) with a minimum of 600 ppi at the intended print size. You may be asked to provide the raw data for charts and graphs if submitted graphics are deemed to be unsatisfactory. When charts and graphs are generated in Excel, please submit the Excel document with each chart or graph on a separate sheet and each sheet named appropriately (e.g. "Fig. 1", "Fig. 2", etc.)

Tables

Tables may be submitted as Word documents or Excel spreadsheets. If Excel is used, place each table on a separate sheet and name each sheet appropriately (e.g. "Table 1", "Table 2", etc.)

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Back cover: (upper) *Enallagma eiseni* (Baja Bluert) taken near San Diego, California. This is a new species for California and only the second location for this species in the US (see story on page 23). Photo by Richard Bledsoe. (lower) Are two heads better than one? This “two-headed” *Epitheca cynosura* (Common Baskettail) was taken on 6 June 2007 by Milt Rutter in the North Kingsville Sand Barrens, located in northeastern Ashtabula County, Ohio.

