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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. Articles for publication in ARGIA are best transmitted as attachments to e-mails, but can be submitted on floppy disks. The editor prefers MS DOS based files, preferably written in Word, Word for Windows, WordPerfect, or WordStar. **All files should be submitted unformatted and without paragraph indents**. Line drawings are acceptable as illustrations.

T. Donnelly (address above) and Jim Johnson are the editors of ARGIA.

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

Membership In The Dragonfly Society Of The Americas

Membership in the DSA is open to any person in any country. 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.

Dues should be mailed to Jerrell Daigle, 2067 Little River Lane, Tallahassee, FL 32311

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.

Front cover: A hybrid *Libellula luctuosa* × *forensis* to accompany the article by Manolis and Bruun. Photo by George Sappington

In This Issue

We start this issue by remembering how nice this year's DSA meetings were. The New Hampshire meeting just followed a flood event in New England and was followed almost immediately by a major flood event in eastern New York. This was a glorious trip. Pam Hunt ran a great meeting. The bugs that stood out for me were the several ***Somatochlora franklini***, (Delicate Emerald) which is one of the least common emeralds in the Northeast, but which kept turning up.

The GLOM event revisited the DSA national meeting site of 1991 in the St. Croix River of northwestern Wisconsin. It sounds like they had as much fun as we had fifteen years previously.

The big news of the season, as always, consists of the reports of new finds. The first is not quite in the US, but a short distance south of the border. ***Enallagma eiseni*** and ***Telebasis incolumis*** are now within striking distance of the US border. Having edited the latter article and sent the copy to be printed, I received only a day ago the next article, which tells of Wulf and Eva Kappes recording ***Enallagma eiseni*** from Arizona 14 years ago! Wow!

Tim Manolis has had a very full year. Besides reporting on the ***Enallagma eiseni*** and ***Telebasis incolumis*** (above), he has also reported two new hybrids! It is not often that a hybrid is evident as such in a photo, but this issue's cover shows a splendid hybrid ***Libellula luctuosa*** × ***forensis*** (Widow and Eight-spotted Skimmers). His second hybrid, ***Ophiogomphus bison*** × ***morrisoni*** (Bison and Great Basin Snaketails) was not photographed. These reports show the value of collected specimens. Neither of these interesting observations would have been of any value with sight records, and the photo by itself of the ***Libellula*** would have only tantalized. There are probably a lot more hybrids out there. But we have to look for them.

Jan Trybula's report of ***Arigomphus cornutus*** (Horned Clubtail) in New York is especially satisfying to me. I have been urging New York workers to look for this one, as there is an old Ontario record from immediately across the St. Lawrence River. Now Jan has found it! Needham reported it in 1928, but his "***cornutus***" was only ***furcifer***! Now at last we have the real thing.

The new records continue apace. Tim Cashatt reports on ***Libellula auripennis*** (Golden-winged Skimmer) in Illinois. This species is typical of spring-fed ponds close to the eastern and Gulf coasts. The scattered records of this species far inland would pose a great research topic. At least one inland locality seems to be at least semi-permanent: in Huntingdon County, Pennsylvania, where it has been taken for several years.

Cordulegaster dorsalis (Pacific Spiketail) now has several records in New Mexico (Tim Manolis again — my, has he been busy!). Interestingly, these all seem to be the typical ***dorsalis*** and not the eastern California desert race ***deserticola***. I have a typical ***dorsalis*** from the dead center of Nevada, making me wonder what the range of ***deserticola*** really is.

June Tveekrem has followed up her previous photo record of the Quebec Emerald (***Somatochlora brevicincta***) with a report of a collected specimen. The huge range and small number of actual sites for this species raises the very interesting question as to how common this insect is. Is it very, very cryptic? Or what?

Rich Bailowitz reports the Thornbush Dasher (***Micrathyria hagenii***) from Pima County, Arizona. The number of species reported from this state is continually increasing. One of these days it will rival New York and even Texas.

Tom Langschied makes another record for the tropical Amazon Darner (***Anax amazili***) from Kingsville. More

Calendar of Events for 2007

Event	Date	Location	Contact
Dragonfly Days	17–20 May	Weslaco, Texas	<http://www.valleynaturecenter.org/>
NE Regional	22–24 June	Sussex Co., New Jersey	<http://www.njodes.com/>
SE Regional	5–8 July	southwest Georgia	Giff Beaton <giffbeaton@mindspring.com>
DSA Annual	27–31 July	Springerville, Arizona	Jerrell Daigle <jdaigle@nettally.com>

remarkable is the way in which the record was established — hand caught by a school girl!

Fred Sibley went back to Nebraska again this year. His past two years have raised the status of this state as one of the more thoroughly surveyed of the Great Plains states (Not yet up to Iowa).

Bryan Pfeiffer reports on the oviposition of ***Stylurus scudderi*** (Zebra Clubtail), and I follow it with an observation of my own. Bryan and I seem to be in a small, select group of people who have ever seen this extraordinarily fat female. Where do you suppose they hide?

Giff Beaton and Dirk Stevenson have finally found the breeding habitat for the Fine-lined Emerald, ***Somatochlora filosa***. It will be a further challenge to find the breeding sites of all those other southern Emeralds.

Speaking of Emeralds, we have another report of a southern species, ***Somatochlora tenebrosa*** (Clamp-tipped Emerald) by Jim Godwin and Steve Krotzer. This species is reported from a cave entrance, perched in the gloom on a rock surface. There are tropical darners that do this, but what do we really know about dragonflies seeking out really dim places to rest?

Jane Walker sends in a fascinating report of ***Pachydiplax longipennis*** (Blue Dasher) larvae in her birdbaths. Sounds like this species indulges in long-range stealth oviposition? How many other species do this?

We have two book reviews in this issue. I review Garrison, von Ellenrieder, and Louton's magnificent Dragonfly Genera of the New World, and Natalia von Ellenrieder reviews Dijkstra and Lewington's new Field Guide to the Dragonflies of Britain and Europe. Both are significant additions to our literature.

We finish with notices of common names changes and notes on the activities of IORI. Note the change of address for this important institute.

I call your attention especially to the rear cover photo of ***Aeshna mixta*** perched in huge numbers in the tall grass of the Danube delta in the Ukraine. Did you ever imagine that you would se so many dragonflies in a single photo?

This is my last issue as Editor of ARGIA. In July 1992, I wrote that "I am temporarily taking over ARGIA" because of Carl Cook's illness. He had established a first-rate newsletter, and it was my privilege to manage it since then as "Interim Editor". The job was a busy but satisfying one because of the willingness of the membership to supply news items of all sorts. The new Editor is John Abbott <jcabbott@mail.utexas.edu>, and I am confident that all of you will support him as you have supported me. And don't forget that Jim Johnson is already assembling, printing, and distributing both ARGIA and the BAO.

Northeast Regional DSA gathering 2006 — New Hampshire

Mike Blust

Participants at the northeast regional DSA gathering in New Hampshire were surprised to find dragonflies in evidence even before they settled into their hotel rooms. Red ones. Purple ones. Blue ones. Yellow ones. And they weren't hard to get either! The hosts at the Twin-Mountain Hotel had gone out of their way to make their atypical guests welcome: dragonfly birdbaths, dragonfly suncatchers, and little plastic dragonflies left on counters, sinks and windowsills.

Forty-seven participants representing every New England state, as well as others from as far away at Maryland, Washington, and Ontario, enjoyed the wonderful hospitality in a striking part of the Northeast. Our setting was the boreal-like region of New Hampshire's White Mountains from 22–25 June. Our survey sites ranged from big rivers to remote bogs, from woodland roads to high-elevation ponds. Seventy-seven species (at varying levels of certainty) of living odonates participated in the festivities.

The oddities of weather orchestrated by the White Mountains made it difficult to plan field time. Luckily, the cloudy, rainy mornings seemed to give way to sunny conditions just in time for the expeditions. Everyone was awed by Pam's influence over that aspect of the logistics! Participants learned that weather reports for south of the Whites were no predictor of conditions north of the Whites.

Though at times it seemed the odes were not as abundant in field as they were in the hotel, a number of northern species made participants happy. Among the damsels, ***Calopteryx amata*** (Superb Jewelwing) turned up at five sites and ***Nehalennia gracilis*** (Sphagnum Sprite) was found at Church Pond. Dragonflies included seven species

of ***Somatochlora*** including ***S. franklini*** (Delicate Emerald) from three sites and ***S. kennedyi*** (Kennedy's Emerald) from Milan. Other ***Somatochlora*** species included ***S. elongata*** (Ski-tailed Emerald), ***S. forcipata*** (Forcipate Emerald), ***S. minor*** (Ocellated Emerald) and ***S. walshii*** (Brush-tipped Emerald), with a possible exuviae of ***S. cingulata*** (Lake Emerald) from Kinsman.

All five local ***Leucorrhinia*** species were around. And the genus ***Gomphus*** was well-represented by ***G. adelphus*** (Mustached Clubtail), ***G. borealis*** (Beaverpond Clubtail), ***G. descriptus*** (Harpoon Clubtail), ***G. exilis*** (Lancet Clubtail) and ***G. spicatus*** (Dusky Clubtail). ***Nannothemis bella*** (Elfin Skimmer) was reported from a pond on the east side of Kancamagus. A couple of interesting reports still needing documentation include three reports of ***Dorocordulia lepida*** (Petite Emerald), which previously had not been reported north of the White Mountains. A report of ***Libellula semifasciata*** (Painted Skimmer), which was reported from Trudeau Road, had previously not been found north of Concord. Pondicherry National Wildlife Refuge won the prize for diversity with 39 species reported, including four of the ***Somatochlora*** species. Trudeau Road's 29 species was the next most diverse spot.

While field excursions were the primary rationale for this regional meeting, an evening of informative presentations featured a theme of odonate conservation. Also noteworthy was a review of Hal White's field notes from his ramblings in the area 30-plus years earlier. And the picnic behind the hotel was a great time for getting better acquainted with kindred spirits.

Congratulations are due to Pam Hunt, whose thorough and tireless work made this an exemplary regional gathering. Pam is compiling a final species list from the meeting.

GLOM 2006 Informs Beginners and Showcases Rare Clubtails

Bob DuBois, **Bill Smith**, **Ken Tennessen**, **Matt Berg** and **Alysa Remsburg**

The 6th Annual Great Lakes Odonata Meeting was held during 22–25 June 2006, at the Crex Meadows Education Center in Grantsburg, Wisconsin. Near the famed St. Croix River, this was the same site, and just about exactly the same dates, as the 1991 DSA "Grantsburg Dragonfest" (Cook 1991—check out all those great photos). Some of us couldn't help noticing that a couple of the participants of both events (Bill Smith and Ken Tennessen) looked just a bit grayer this time around, but it was motivating to see that their passion for odonates has not diminished in the least. Previous GLOMs were held at Elliot Lake, Ontario in 2001; Roscommon, Michigan in 2002; Finland, Minnesota in 2003; Northeast Ohio in 2004; and the Rainy River District, Ontario in 2005.

The organizers of GLOM 2006 had two primary goals: 1) to draw some inexperienced folks/families and target the presentations to the beginner level, and 2) to showcase Wisconsin's two newly described snaketail species (***Ophiogomphus susbehcha*** and ***O. smithi***) as enticements for experienced odonatists as well. The strategy worked well as the 35 participants attending the event spanned the full range Odonata-related experience. Beginners eagerly soaked up knowledge as the seasoned veterans patiently answered questions, explained identification pointers, and freely shared their ecological insights. Days were filled with field visits that hit a wide variety of habitats including large river, stream, lake, bog pond, and bog. Evening presentations covered topics such as Dragonflying Basics, St. Croix Specialties, Ode ID Tips, the results of a multi-year peatlands survey project, and an introduction to the Wisconsin Odonata Survey. The weather cooperated quite nicely throughout the event, and participants continued to pursue odonates even during two short periods of rain (at those moments we suspect that Nick may have been wondering how GLOM was going). The event received ample media coverage in several regional newspapers including excellent pre- and post-event articles by Gregg Westigard in the Inter-County Leader (serving Northwest Wisconsin).

On the 23rd, most of the participants enjoyed a gorgeous day of canoeing on the St. Croix River from Nelson Landing to Hwy 70. This reach of the St. Croix is a wild and scenic river managed by the National Park Service; it has no dams and an undeveloped shoreline. Those who were hoping for lots of clubtails were not disappointed as ***Hagenius brevistylus***, ***Dromogomphus spinosus***, ***Gomphus vastus***, ***G. ventricosus***, ***G. viridifrons***, and ***Ophiogomphus rupinsulensis*** were flying in abundance. Additionally, ***Gomphus fraternus***, ***G. lineatifrons***, and ***Ophiogomphus howei*** were still to be seen in low numbers. The St. Croix snaketail (***O. susbehcha***) was represented as only a few well-weathered exuviae, as this early season species emerged especially early this year due to a warm spring in northwestern Wisconsin. A variety of common skimmers and emeralds were seen in backwaters and shoreline areas of reduced flow. Damselflies seen along the river included ***Calopteryx maculata***, ***C. aequabilis***, ***Hetaerina americana***, ***Argia moesta***, ***Enallagma exsulans***, and one lonely ***E.***

antennatum. A group of folks who did not join the canoe expedition visited numerous road access points along the river and saw most of the same species.

On the 24th, we visited a section of McKenzie Creek, a small, sandy trout stream in Polk County, known to have a robust population of Sioux snaketail (***O. smithi***). Participants were not disappointed as a number of adults and larvae were netted, photographed, and shown to all. Kick netting of three dozen ***Ophiogomphus*** larvae showed ***O. smithi*** to be more abundant than ***O. rupinsulensis*** by about a 6 to 1 margin. Other frequent species at McKenzie Creek were ***Gomphus lividus***, ***Cordulegaster maculata***, ***Calopteryx maculata***, and ***C. aequabilis***. A nearby bog-bordered lake known as Marsh Lake also received much attention from the group. The excellent number and diversity of species there included ***Arigomphus furcifer***, ***Nannothemis bella***, ***Lestes eurinus***, and ***L. unguiculatus***. Late in the afternoon, some in the group made quick stops, dodging rain clouds, at Big Sand Lake and Clam Lake, which provided large-lake habitats where ***Lestes inaequalis***, ***L. vigilax***, and ***Enallagma signatum*** were added to the growing species list.

On the morning of the last day we visited what is locally known as the cabin site on the St. Croix River, which is a beautiful stretch known to have an especially strong population of ***O. susbehcha***. Although only exuviae could be found, participants got to see a magnificent example of the deep, heavy flow that this species requires. Matt Berg and his intrepid band of high school student helpers have conducted numerous exuvial searches along the St. Croix River near Grantsburg in recent years. Knowledge thus gained allowed Matt to lead the group to this noteworthy ***O. susbehcha*** site. Many other clubtail species were present at the cabin site, and lots of photographs were taken.

To see a complete list of the 53 species of Odonata seen during GLOM 2006, a list of participants, and some pictures taken during the event, visit: <http://web.gk12.net/homes/mberg/GLOM2006.htm>. In addition, the authors gratefully acknowledge the substantial and varied contributions of Julie Pleski, Kurt Mead, Andy Paulios, Liz Owen, Becky Berg, and Bryan Huberty in helping to ensure the success of GLOM 2006.

Plans are currently underway to hold GLOM 2007 during the second week of June at the Volo Bog State Natural Area in Lake County, Illinois. Volo Bog, which is located about 45 miles northwest of Chicago, is the only remaining quaking bog in Illinois and is host to a wide array of interesting plant and animal species. Contact Yvette Liautaud for more information about GLOM 2007 (e-mail: whymlode@sbcglobal.net>; phone: 630-372-6821).

Reference

Cook, C. 1991. Dragonfly Society of America's "Grantsburg Dragonfest". ARGIA 3(3): 1–7.

First Records of *Enallagma eiseni* and *Telebasis incolumis* from Northern Baja California

Tim Manolis, **Marshall J. Iliff**, and **Richard A. Erickson,** (TM) 808 El Encino Way, Sacramento, CA 95864; (MI) 282 Perham St., West Roxbury, MA 02132; (RE) LSA Associates, 20 Executive Park, Suite 200, Irvine, CA 92614

Since 2003 two of us (Iliff and Erickson) have collected odonates during a number of visits to the Baja California Peninsula. We have focused particular attention on the northern half of the peninsula, especially the Colorado Desert. These areas have received scant attention over the years as most collectors concentrated on the Cape District of Baja California Sur (e.g. Garrison, 1986).

Our most recent foray in this effort found the three of us crossing the border in the pre-dawn hours of 24 July 2006 for a whirlwind two-day exploration of sites along the northern Pacific slope to the heights of the Sierra San Pedro Mártir. One of the first places we sampled that morning was also the southernmost of the trip, the Arroyo Santo Domingo above the old mission site (~30° 45′ N, 115° 54′ W). The willow-bordered creek there has a sandy/rocky substrate and intermittent surface flow with pools about 0.5 m (1–2 ft) in depth. Some areas of the creek were choked with submerged and floating vegetation.

Among the first damselflies encountered were striking bluets (***Enallagma***) unlike anything present north of the border in California. Iliff had seen and photographed similar individuals in Baja California Sur and suspected that they were ***Enallagma eiseni***, a species endemic to the Baja California Peninsula. Manolis agreed that these must indeed be ***E. eiseni*** but, given the seeming unlikelihood of that species being found so far north, wanted to defer final judgment until appropriate references could be consulted. At this site Manolis also noticed what appeared to be two

different size classes of firetails (***Telebasis***), one noticeably larger than in his previous experiences with ***Telebasis salva***. Suspicious that we might have another interesting discovery on our hands — ***T. incolumis***, another peninsular endemic, was previously unknown from the state of Baja California — we collected some of both sizes.

Continuing our trip that afternoon, we drove the road up from Highway 1 to the Sierra San Pedro Mártir, stopping to sample odonates at the bridge crossing of Arroyo San Telmo, below the town of San Telmo (~30° 59′ N, 116° 06′ W), and at Rancho Meling (~30° 58′ N, 115° 44′ W). The habitat along Arroyo San Telmo was similar to that at Arroyo Santo Domingo, but with a muddier substrate, narrower channel, and more emergent vegetation (cattails, tules, etc.). The creek at Rancho Meling was much shadier than at the other two sites, with tall cottonwoods and willows crowding the stream bed. We were perplexed to find what we were calling ***E. eiseni*** to be the common bluet at these sites as well. Our estimates of numbers seen at each of these sites were 50 at Arroyo Santo Domingo, 20 at Arroyo San Telmo, and 20 at Rancho Meling.

After spending the night camped out in the Sierra San Pedro Mártir, where we found little suitable aquatic habitat for odonates and saw no bluets or firetails, we headed north for home on the afternoon of 25 July. We were not quite done collecting, however. In Valle San Jacinto at km post 70 along Highway 1 (~31° 28′ N, 116° 18′ W), about 19 km (11.5 mi.) southeast of Santo Tomás, we stopped to check a small, roadside stock pond with an even smaller patch of cattails. Here again were good numbers of ***E. eiseni*** (100, the most common odonate present). We also collected another large ***Telebasis***.

Continuing north, we made a brief stop at a small farm pond at Ejido Ajusco, just north of Santo Tomás (~31° 35′ N, 116° 25′ W), where we saw at least one ***E. eiseni***. We then drove west through the valley of the Río Santo Tomás to the campground in Cañon Santo Tomás (~31° 34′ N, 116° 31′ W), where we did our last collecting of the trip, only about 112 km (~70 miles) south of the US border. Habitat along the arroyo there was similar to that at the sites we had sampled on 24 July. As had now become quite predictable, ***E. eiseni*** was fairly common (8 individuals noted late in the day) and again we collected another large firetail.

Our last stop of the evening was at the entomology collection at Centro de Investigación Científica y de Educación Superior de Ensenada (CICESE), where with the gracious help of Daniela Ramirez we examined and identified most of our specimens, leaving the bulk of them with the collection. For further examination, Manolis took a sample of the ***Enallagma*** from all sites at which they were collected, as well as all of the firetails collected.

On 27 July Manolis visited with Rosser W. Garrison at the latter's office at the California Department of Food and Agriculture in Sacramento. They confirmed that all the presumed specimens of ***E. eiseni*** collected were indeed that species, and determined that the three large firetails collected were ***T. incolumis***. All the smaller ***Telebasis*** collected were ***T. salva***. Our bluet specimens were deposited with CICESE, Garrison, and Manolis; the three specimens of ***T. incolumis*** were divided between CICESE, Garrison, and Dennis R. Paulson.

To put our observations in context requires some basic knowledge of the biogeography of the Baja California Peninsula. The peninsula spans a little over 1200 km (about 760 miles) from north to south. High mountains and the California Current combine to create a Mediterranean climate along the Pacific slope of roughly the northern third of the peninsula. The flora and fauna of this region are thus similar to those of adjacent coastal southern California. The southeastern third of the peninsula, known as the Cape District, has a tropical climate and associated biota. Much of the rest of peninsula is desert separating these northern and southern regions. The vast central Vizcaíno Desert has been moderately effective at isolating tropical and subtropical species to the southern half of the peninsula, and much of the endemism on the peninsula is restricted to the Cape District.

Neither ***E. eiseni*** nor ***T. incolumis*** was known in the published literature from the northern half of the peninsula (the state of Baja California) before our trip (González Soriano & Novela Gutiérrez, 1996; Westfall & May, 1996; Paulson & González Soriano, 2005). We are aware of no specimens of ***T. incolumis*** from north of the vicinity of La Purisima (~26º 11′ N, 112º 04′ W) in central Baja California Sur (collected by C.F. Harbison on 18 September 1955; in the Paulson collection). However, correspondence with Paulson after the trip revealed in his collection specimens of ***E. eiseni*** that were collected in the vicinity of El Progreso (~29º 58′ N, 115º 13′ W) on 18 February 1992 by Gordon Hutchings, and at the nearby mission site at San Fernando by Harbison on 21 October 1956. These sites are about 70 miles southeast of the Arroyo Santo Domingo. As far as we can tell, Harbison's specimens constitute the first collection of ***E. eiseni*** in the state of Baja California. We suspect that the range of ***E. eiseni*** is continuous from the southern tip of the peninsula, and a record from Rancho San José del Castro, on the Vizcaíno Peninsula, Baja California Sur, 6 October 2005 (R.A. Erickson, specimen in CICESE) fills a significant gap between the records from central Baja California Sur and the Baja California records reported here.

Not only do our recent observations and the prior specimen records cited above represent significant northern extensions of the ranges of ***E. eiseni*** and ***T. incolumis***, but they are equally surprising in that both species seemed to be fairly widely established and, at least in the case of the bluet, fairly common on the Pacific slope of northwestern Baja California. ***E. eiseni*** outnumbered other bluet species (***E. annexum***, ***E. civile***), and often any other zygopteran species, at all sites at which it was encountered. Unfortunately, we did not take detailed notes on the relative proportions of large versus small firetails at each site, but we did see more large firetails than the three collected. Our general impression was that, at most sites, small firetails (presumably ***T. salva***) outnumbered large ones (presumably ***T. incolumis***). However, we suspect that, with more careful scrutiny of the region, ***T. incolumis*** will be found in reasonably good numbers at these and other sites.

For those who may go in search of these two species, we would note that the bluet is much more distinctive than is the firetail. The abdominal patterning of ***E. eiseni*** is striking, with black spear-shaped marks on the dorsal surfaces of the blue bands of the middle (3–6) segments [see rear cover]. The cerci are long and black, more-or-less straight in lateral view but incurved at the tips in dorsal view, and extend well beyond the paraprocts. Blue areas of the body are typically aqua or turquoise, but some individuals approach a "truer" blue. ***T. eiseni*** appears to be a bit smaller and more delicate than other sympatric ***Enallagma*** (e.g. ***E. annexum*** and ***E. civile***), in this regard and in the aqua coloration resembling somewhat ***E. carunculatum***. The species' behavior seems similar to that of other bluets.

We could find no significant pattern or color differences between ***T. incolumis*** and ***T. salva***. The most noticeable difference is in size, but this might be hard to judge where only one species is present. Besides noticing the size difference, Garrison (1986) also noticed a difference in microhabitat preference, with ***T. incolumis*** preferring shady sites and ***T. salva*** preferring sunny ones. The structural differences between the two (the cerci of male ***T. incolumis*** have two ventral teeth at the tip, those of ***T. salva*** have one; females, which we did not collect, differ in prothoracic structure) are not visible in the field. Although ***E. eiseni*** is reported to fly throughout the year, Westfall and May (1996) report a limited known flight season for ***T. incolumis***, from 31 August to 10 October. However, our July observations and November specimens in Paulson's collection suggest that the firetail's flight season is considerably broader than previously thought.

The discovery of these two damselflies within 112 km (~70 miles) of the US border raises some very interesting possibilities. For one thing, there appear to be no significant barriers to dispersal of either species between the Río Santo Tomás and the border, suggesting that they should be looked for in southwestern California. In addition, if these two species are so well-established so close to the United States, it does not seem too unreasonable to suggest that other species known only from the southern half of the Baja California Peninsula—including a third endemic odonate, ***Rhionaeschna manni***, might also be found to occur in the northern half. Tropical taxa such as ***Macrothemis*** and ***Micrathyria*** may not range farther north than the southern tip, but the northern limits of other species such as ***Argia tezpi***, ***Orthemis discolor***, and ***Erythemis plebeja*** remain to be determined on the peninsula. ***Erythrodiplax basifusca*** reaches at least the northern Vizcaíno Desert (M.J. Iliff specimen in CICESE) and ***Pseudoleon superbus*** ranges north at least to Arroyo Santo Domingo (male photographed by Iliff 24 July 2006). The former is unknown from California and the latter is known from a single record in San Diego County (Douglas Aguillard pers. comm.). The possibilities for future study on the Baja California Peninsula are many, and even comparatively well-known southern California may yet hold surprises for the astute observer.

We would like to thank Rosser W. Garrison for help in identification of specimens, help in our literature review, and for providing helpful comments and information. Dennis R. Paulson provided locality data for specimens in his collection and other helpful comments, and Gordon Hutchings kindly provided additional information about previously unpublished records of ***E. eiseni*** from Baja California. Michael A. Wall provided information on the San Diego Natural History Museum collection. We thank CICESE employees and associates Horacio de la Cueva, William H. Clark, and Daniela Ramirez for putting materials and equipment at our disposal.

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First Record of *Enallagma eiseni* from the USA

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It was 14 years ago, and still it seems as if it were yesterday.

Between 21 June and 16 July 1992 we traveled through Arizona, Utah, Colorado and New Mexico, areas interesting from a nature point of view.

During the first week we started from Phoenix, driving south to the Organ Pipe Cactus National Monument (Pima Co.), where we visited on 28 June Quitobaquito Springs, an oasis hardly 50 meters away from the Mexican border. Notice boards warned of attacks and robberies, and that cars must not be left unattended. From the path of approximately 100 m from the parking lot to the pond, the car was well in view; however, bushes and high water vegetation obscured the view of the car during a walk round the pond (with a diameter of approximately 100 meters). Thus Eva stayed near the car during my exploratory walk.

Even before I reached the open water, I noted a small ***Enallagma*** that sat on a narrow leaf and in perfect light for a picture. The black abdomen markings on a blue ground took me completely by surprise. They were aligned in the exact opposite direction than those of all ***Enallagma***,***Argia*** and ***Coenagrion*** varieties that were known to me. The black markings pointed towards the end of the abdomen! First of all, I took some pictures and then I caught the male. With the damselfly in my net I walked round the pond. On another part of the shore, I was able to also take some more pictures of this small damselfly . When I returned to Eva after only 20 minutes, I was rather excited.

Eva looked first of all at the ***Enallagma*** and then went to the pond. I got into our black car, closed the windows and took some pictures, while the temperature outside the car was 42.7°C in the shade. Unfortunately, the ***Enallagma*** did not survive the increasing heat by more than three minutes, whereas fortunately I did. Now we had one sample specimen. Then I tried to classify this variety.

That was 14 years ago!! As dragonfly experts for Europe, we found this rather difficult: For years we had consulted the "Needham/Westfall Dragonflies of North America" of 1955. Furthermore, since our first visit in 1985 to British Columbia, we had added the BC book from R. Cannings/ K. Stuart and had collected many individual descriptions and keys for species. These notes were compiled into our own classification guide. However, I could not come to a conclusion; moreover, the heat was unbearable.

I waited for Eva outside and near the car. She informed me of her observations. In total, we had seen more than 20 individuals of this species around the pond. Together we then explored the spring with its nice little inlet into the pond .

Sixty minutes at Quitobaquito Springs and only seven dragonfly species — there must certainly be more. But our excitement about this particular species remained unbroken. We were not able to classify it!

After our return to Hamburg, we tried together with friends to classify the species by means of the pictures we had taken as well as the male specimen collected. However, we did not come to a conclusion, thus this ***Enallagma*** remained unidentified.

In September 1996 Westfall/May published "Damselflies of North America", which we purchased straight away. Of course, we checked this guide book the same evening.

And then an outcry: This is it, it is ***Enallagma*** "Quitobaquito," it must be that one! Immediately we looked up the photographs. Of course, the strangely different markings of this species were unmistakable. The specimen is typical of the species but is quite small, with hindwing of 13 mm. Hindwing measurements from 7 males from Baja California average 16.4 mm, range 15.5–17.5 mm (D. Paulson, pers. comm.)

We read the text in Westfall/May "Damselflies of NA" (page 399): "This little known species, apparently endemic to the deserts of Baja California, is unusual both in morphology and color pattern, and its affinities within the genus are unclear. It is found near streams or pools of desert oases (Garrison, 1896b). Distribution and dates: MEXICO: Baja California, April to October 21."

Fourteen years after our first sighting, an e-mail exchange with Dennis Paulson informs him about this newly identified specimen, and he receives the specimen for his collection. "This is the first record of ***Enallagma eiseni*** from the USA, 28.6.1992 Quitobaquito Springs, Organ Pipe Cactus National Monument, Pima Co., Arizona."

A Hybrid *Libellula* (*forensis* × *luctuosa*) from Northern California

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The spring of 2006 had been wet and cold, and Bruun and his friend, George Sappington of Redding, were both impatiently awaiting the arrival of early season odonates. On 29 April they agreed to meet at the Battle Creek Wildlife Area headquarters along Coleman Fish Hatchery Road. This location is in south-central Shasta County, California, just north of Battle Creek, which divides Shasta and Tehama Counties. A couple of years ago, the California Department of Fish and Game built a couple of shallow ponds by the headquarters parking lot. Bruun and Sappington met at the ponds around 7:30 AM. A half hour to an hour later, Sappington was crouched down photographing what appeared to be a young male Widow Skimmer (***Libellula luctuosa***). The only other libellulids seen up to that point were a couple of teneral Variegated Meadowhawks (***Sympetrum corruptum***). The skimmer flew off before Bruun could photograph it, but was relocated a short time later, allowing Bruun to capture a number of images, one of which he subsequently posted on his web site.

Manolis viewed the image at the web site and responded to Bruun, noting that the "Widow Skimmer" seemed to have characteristics of both the Widow Skimmer and the Eight-spotted Skimmer (***Libellula forensis***). Bruun then went out the following Monday, 1 May, and collected the individual, which had by that time matured somewhat in coloration. There were many teneral Eight-spotted Skimmers present at the site by that time, and Bruun thought he saw a Widow Skimmer or two under the trees among the blackberry bushes south of the ponds. On 12 May, the last time Bruun went to the ponds, he found several teneral Widow Skimmers and many adult Eight-spotted Skimmers.

Bruun sent the specimen to Manolis and Rosser Garrison, of the California Department of Food and Agriculture in Sacramento, who examined it in detail and came to the conclusion that it seemed to be a hybrid. The wing pattern [see cover photo] is the most striking aspect of intermediacy between ***L. forensis*** and ***L. luctuosa***. The forewing pattern vaguely resembles that of ***L. forensis*** but the black patches are more extensive and poorly defined, with "bleeding" margins. The hind wing pattern somewhat resembles that of ***L. luctuosa***, but the dark basal patch is more extensive, extending distally well beyond the nodus, and the distal margin of this patch has the sinuous edge typical of ***L. forensis***.

Most convincing of hybrid origin for this individual is the structure of the penis, a feature that was shown to have some taxonomic significance in ***Libellula*** by Kennedy (1922), who figured the penes of ***L. forensis***, ***L. luctuosa***, and other members of the genus. Kennedy's figures for these two species are copied here, in comparison to the penis of the hybrid (Figure 1). The most noticeable aspects of intermediacy in this view are the shape and length of the cornua, as well as the size and shape of the medial lobe. The cornua of ***L. luctuosa*** are long and sinuous, extending beyond the tip of the strongly-hooked medial lobe, whereas the cornua of ***L. forensis*** are short and fairly straight, about half the length of the thick, blunt medial lobe. As shown in Figure 1, these structures on the hybrid individual are approximately in the middle of these extremes.

Hybrid dragonflies are rarely reported in the literature, and Corbet (1999) cites only one previous hybrid combination involving ***Libellula*** species. A couple of factors that may influence the likelihood of hybrid pairings are: (1) expansion of the range of one species into that of a similar or closely related, but previously allopatric, species; and (2) strongly disproportionate local population densities (a condition which may often arise as a consequence of the first factor listed). Both of these factors might be involved in instances of hybridization between these two species in this region. Careful examination of the present known ranges of ***L. luctuosa*** and ***L. forensis*** (Donnelly, 2004) reveals that these two species' ranges overlap, to a great extent, only along the Pacific slope from Washington to Central California. There is good evidence that this situation has developed fairly recently, within the past hundred years (Paulson and Garrison, 1977). During his wide-ranging field work in northern and central California in the second decade of the 20th Century, Kennedy (1917) failed to record ***L. luctuosa***, but it is now common in this region, including at many of his collecting sites. ***Libellula luctuosa***

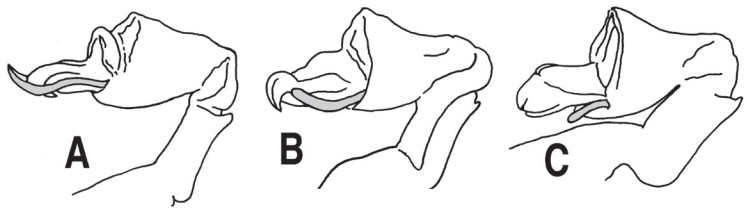

Figure 1. Lateral view of the penes of (A) *Libellula luctuosa*, (B) hybrid *L. luctuosa* × *forensis*, and (C) *L. forensis*. The cornua of each are shaded in light gray. Penes of *L. luctuosa* and *L. forensis* copied from Kennedy (1922). Sketch by Tim Manolis.

was only first discovered in Oregon in 1991 (Johnson & Valley, 2005) and in Washington in 1996 (Paulson, 1997). Hence, until a few decades ago, it appears that these two species of ***Libellula*** had largely allopatric distributions, ***L. luctuosa*** occurring east of the Rocky Mountains and in the Southwest (southeastern California to southern New Mexico), and ***L. forensis*** occurring from the western edge of the Great Plains west to the Pacific Coast. An indication of this former state of affairs appears in an older common name often applied to ***L. forensis***, the "Western Widow Skimmer."

Besides hybridizing, these two species may be interacting in other, more subtle, ways as ***L. luctuosa*** expands within the range of ***L. forensis***. For example, at some locations (e.g., along the American River at Sacramento, Sacramento County) where Kennedy (1917) found ***L. forensis*** but not ***L. luctuosa***, the former species is now scarce but the latter species is abundant (Manolis, pers. obs.) Perhaps human-caused changes in aquatic habitats in the Pacific States that have allowed ***L. luctuosa*** to expand its range into the region have also favored it in competition with other species such as ***L. forensis***, or some other factor(s) may be at work (climate change?). In any case, the interplay of these two species in the Pacific Northwest bears careful scrutiny in the future.

We greatly appreciate the assistance of Rosser W. Garrison in the evaluation of this specimen and for useful comments on this paper. This hybrid specimen, including one leg preserved in alcohol and available for DNA analysis, has been deposited in his personal collection at the California Department of Food and Agriculture in Sacramento, California.

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A Hybrid Gomphid (*Ophiogomphus bison* × *morrisoni*) from California

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Reports of hybrid dragonflies are rather rare in the published literature and are particularly scarce in the case of the Gomphidae (e.g., see summaries in Tennessen, 1982 and Corbet, 1999). Only two instances of hybridization (involving the same presumed cross, ***Ophiogomphus rupinsulensis*** × ***carolus***) have been reported within the genus ***Ophiogomphus*** (Donnelly, 2000). I here report an apparent hybrid of ***O. bison*** and ***O. morrisoni*** from northeastern California.

I collected the specimen, a male, along the bank of the Susan River in Susanville, Lassen County, on 31 May 2002. It was netted from the tip of a bare twig emergent in the river adjacent to a bank of jumbled rocks and chunks of concrete partly covered with weeds and brush. I initially took it to be ***O. bison***, but upon further, detailed examination I noticed a number of odd characters of structure and pattern that were either intermediate in nature between that species and ***O. morrisoni*** or different from either species or any of the other ***Ophiogomphus*** species known from western North America. I then considered the possibility that the specimen represented either a hybrid, an aberrant individual of a known species, or an undescribed species of ***Ophiogomphus***.

Ophiogomphus bison is found on relatively small rivers and streams on the Pacific Slope, generally to the west of the Sierran–Cascade crest in southwestern Oregon and northern California, while ***O. morrisoni*** occurs on small streams, rivers and some lakes, primarily east of the Sierran–Cascade crest, in south-central Oregon, eastern California, and Nevada (Kennedy, 1917; Manolis, 2003; Donnelly, 2004; Johnson & Valley, 2005). Their ranges are thus broadly allopatric with limited, narrow geographic overlap. Only ***O. morrisoni*** was known to occur on the

Susan River and ***O. bison*** had never even been collected in Lassen County prior to 2002, offering little support for the hybrid hypothesis initially, but I subsequently found ***O. bison*** in good numbers, in sympatry with ***O. morrisoni***, along the river within two miles of the collection site (see discussion below). In the interim, Rosser Garrison (pers. comm.) examined the specimen and concurred that it was most likely a hybrid between these two species.

Description

The key similarities and differences between this individual and a small sample of the presumed parental forms (four males of each species collected in sympatry along the Susan River in Susanville) are described below and/or illustrated in Figure 1. The most striking features that distinguish this specimen are:

(1) A penis vesicle shaped unlike either that of ***O. morrisoni*** or ***O. bison*** although intermediate between these two species in color pattern (see Figure 1). The most obvious difference between the penis vesicle of the hybrid and those of ***O. morrisoni*** and ***O. bison*** (and all other ***Ophiogomphus*** species found in the western US for that matter) is its complete lack of a forked distal process;

(2) Cerci intermediate in shape between those of ***O. bison*** and ***O. morrisoni***. The cerci of ***O. bison*** are relatively slender, evenly tapered distally, and typically extend slightly beyond the distal tip of the epiproct. Each cercus has a linear row of denticles on the distal half of the ventral margin. The cerci of ***O. morrisoni*** are stout with a sagging, inflated bulge distally and a more-or-less small, nipple-like distal tip. The cerci are usually shorter than (or about equal in length to) the epiproct. The inflated bulge has a roughly oval ventral patch of denticles. The cerci of the hybrid are intermediate in length, about equal in length to the epiproct, slightly tapered to a blunt, but not inflated tip, and have an oval patch of denticles ventrally near the tip;

(3) Thoracic coloration that is something of a mosaic of the patterns of ***O. morrisoni*** and ***O. bison*** (front of thorax more like ***bison***, sides more like ***morrisoni***).

Much of the rest of the hybrid's coloration and structure is intermediate between these two species. The vertex of ***O. bison*** is solid black, whereas ***O. morrisoni*** has a pale yellow oval posterior to the postocellar ridge; the hybrid has a small yellow square spot in this region. The tibiae of ***O. bison*** are solid black; those of ***O. morrisoni*** have a pale yellow stripe on the external face. This stripe on the hybrid is black distally, fading to a dull olive color proximally. The pterostigma of ***O. bison*** are black; those of ***O. morrisoni***, brown above and olive yellow below, those of the hybrid olive-brown above and below. In general, the complex pattern of dark and light areas on the abdomen follows the same trend: dark areas are most extensive on ***O. bison***, least extensive on ***O. morrisoni***, and of intermediate extent on the hybrid.

In July 2002, still unsure of what this odd specimen represented, I returned to Susanville to search for more ***Ophiogomphus***. On 8 July I searched the stretch of the river in town where I had caught the odd specimen. There were a handful of male snaketails along the river, but all were ***O. morrisoni***. The next morning I visited another stretch of the river at the Bureau of Land Management Hobo Camp Day Use Area, about two miles upstream from the first site. There were quite a few male snaketails on territories along the shoreline and out over the river. Most of them appeared to be ***O. morrisoni***, but some looked like ***O. bison***. At a gravel bar below a pool I flushed 3–4 snaketails as I approached, and so stood back a bit and waited for them to return. After a minute or so I looked up, and directly overhead were three dragonflies hooked together in a kind of "tandem ball." They became disentangled when netted. They proved to be two male ***O. morrisoni*** and one male ***O. bison***! They were all "typical" individuals of their species (as have been all other specimens I have collected along the Susan River subsequently), with none of the odd characters noted on the hybrid. My overall impression was that ***O. morrisoni*** outnumbered ***O. bison*** along the Susan River at this site.

On 2 July 2003, I again found territorial males of both species at Hobo Camp. Indeed, Hobo Camp is the only spot along the Susan River, or anywhere in Lassen County for that matter, at which I have found ***O. bison***. ***Ophiogomphus morrisoni***, on the other hand, is widespread on rivers and creeks throughout Lassen County, including a number of sites along the Susan River both upstream and downstream from Susanville (pers. obs.). The discovery of populations of both species at the same location on the Susan River in Susanville, apparently the

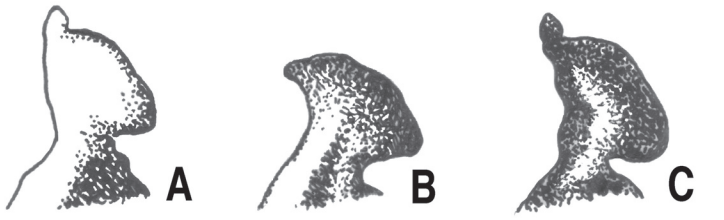

Figure 1. Penis vesicles of (A) *Ophiogomphus morrisoni*, (B) presumed hybrid *O. morrisoni* × *bison*, and (C) *Ophiogomphus bison*. All sketched from males collected in May or July 2002 along the Susan River at Susanville, Lassen County, California.

first and as yet only known instance of their sympatric breeding, offers further support for hybrid origin of the specimen described here.

Acknowledgements

I thank Rosser Garrison for examining the hybrid specimen and for his opinion as to its identity. The specimen now resides in his personal collection.

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Arigomphus cornutus, a State Record for New York

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New York recently began the New York Dragonfly and Damselfly Survey (Novak, 2005, 2006) and has already produced another state record (***Celithemis verna***, Brown, 2005). Because of its known range, it was probable that ***Arigomphus cornutus*** was in northern New York (T.W. Donnelly, pers.com.).

Arigomphus cornutus (Tough, 1900; Horned Clubtail) is found in the upper Midwest through the northern Great Lakes (Dunkle, 2000). Although known as far to the east as Quebec, Canada, the furthest east it has been documented in the United States of America is Michigan (Donnelly, 2004; Abbott, 2006) and one record from Indiana in 1932 (Curry, 2001). The species inhabits sluggish streams, ponds, and other permanent waters with marshy or boggy margins (Dunkle, 2000; Needham, Westfall, & May, 2000; Mead, 2003), and can be seen flying from mid-May to late July. Males are recognizable by their terminal appendages (Needham, Westfall, & May, 2000) and females by their distinctively tall occiput (Curry, 2001; Mead, 2003).

On 6 June 2006, I was collecting odonates with Adam Simmons, an undergraduate Biology student at SUNY Potsdam who is a contract worker for the NYDDS. We caught a teneral female and a mature male ***A. cornutus*** on the Red Sandstone Trail along the Racquette River, just south of Potsdam, New York (44° 38.38′ N, 74° 58.51′ W) in Saint Lawrence County, the town of Potsdam. In this location, the river is rather slow and has many marshy areas on the banks and islands. The female was in the understory along the trail. The male was flying over a marshy area. Associated species along this stretch of trail between the river and the marshes included ***Cordulia shurtleffii***, ***Ladona julia***, ***Leucorrhinia intacta***, and ***Gomphus exilis***.

On 21 June 2006, I collected a mature male with assistance of Pat Burdick at a pond at Indian Creek Nature Center on Upper and Lower Lakes Wildlife Management Area, in the Town of Canton, also in Saint Lawrence County (44° 35.32′ N, 75° 17.51′ W). Associated species at the pond included ***Enallagma ebrium***, ***Dorocordulia libera***, ***Leucorrhinia intacta***, ***Libellula luctuosa***, and ***Libellula pulchella***.

These two sites are approximately 24 km apart. Considering the prevalence of the preferred habitat of ***Arigomphus cornutus***, it is likely to occur in other parts of northern New York.

Acknowledgements

I would like to thank the New York Natural Heritage Program and The Nature Conservancy for their support of Adam Simmons and his work for the NYDDS.

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A New Anisoptera Record for Illinois: *Libellula auripennis* Burmeister

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A male Golden-winged Skimmer (***Libellula auripennis*** Burmeister) was collected by Richard Day near a vernal pond in Effingham County at Ballard Nature Center (N 39.0673°, W 88.7027°), 7 June 2006, ca. 1500h CDT. This specimen was deposited in the entomology collection of the Illinois State Museum Research and Collection Center. ***L. auripennis*** is common along the east coast from Massachusetts and Florida, eastern Texas and along the Gulf Coast of Texas. Specimens of ***L. auripennis*** that have been taken from remote states such as southern Missouri (Carter County) and the southwestern corner of Kentucky (Fulton County), Ohio (Hamilton and Ottawa Counties) and Nebraska (Cherry County) have been considered vagrants/accidentals.

The Ballard Nature Center, 3.6 km E of Altamont, is attempting to restore vernal ponds within a savannah restoration. The ponds were constructed following the recommendations of Thomas R. Biebighauser (2002) and are managed to provide breeding habitats for reptiles, amphibians, Odonata, and other species that require fishless breeding ponds. Numerous other ponds are being established on the property and are drained every three years, to provide a fishless habitat and vernal pond habitats in one, two, and three-year stages.

The pond at the collection site was constructed in June 2004, was approximately 14 m × 24 m, and averaged about 38 cm deep. The dominant plants within the pond were Common Cattail (*Typha latifolia*), Water Plaintain (*Alisma subcordatum*), Spike Rush (*Eleocharis obtusa*), floating-leaf pondweed (*Potamogeton* sp., probably *P. diversifolius*) and a rush, *Juncus nodatus*. Approximately 40% of the vernal pond was open water.

In the following seasons we hope to determine whether this species is breeding at the Ballard Nature Center, or if this individual was a vagrant.

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Cordulegaster dorsalis in Southwestern New Mexico: A Long-buried First State Record

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As recently as the publication of the revised edition of "Dragonflies of North America" (Needham, Westfall, & May, 2000), ***Cordulegaster dorsalis*** Hagen was not listed from New Mexico. Subsequent unpublished records, dating from 1995 and later, establish this species in a north-central tier of counties (Rio Arriba, Taos, Sandoval, and San Miguel; Robert Larson pers. comm.), a distribution reflected in the dot-map project of Donnelly (2004). Here I report on some even more-deeply buried specimens that establish the presence of ***C. dorsalis*** as far back as the early 1970s in a somewhat unexpected quarter of the state.

The Essig Museum at the University of California, Berkeley, has a modest collection of unidentified odonates that have gone unexamined for decades and Doug Vaughan and I have recently been curating this material. I found a specimen of ***C. dorsalis*** still in its original field envelope, stapled together with a number of specimens of ***Ophiogomphus arizonicus*** Kennedy, all with a hand-written tag: "New Mexico: Catron Co. W. Fork Gila River, 8-13 mi. NE Gila Cliff dwellings Nat. Mon. IX-14/15-73 S. L. Szerlip [the collector] 6300′."

A few days latter, while I was discussing the specimen with Rosser Garrison in his office at the California Department of Food and Agriculture, Sacramento, he picked through his personal collection and produced another specimen of ***C. dorsalis*** from the same area! The card with this specimen read, in part: "USA New Mexico Catron Co. Indian Creek, Gila Wilderness 29 July 1978." The collector was Ronald Wielgus, and the specimen had formerly been in the collection of Arizona State University, Tempe, Arizona. Garrison had identified the specimen in 1993 and, unaware of the unidentified specimen gathering dust in Berkeley, had written on the card, "new state record."

These two Catron County locations, while inexactly defined, are not far apart. Indian Creek is a tributary of the Middle Fork of the Gila River, about 10 miles north of the West Fork in what is probably the general area in which the Essig Museum specimen was collected (the indication that the West Fork of the Gila is "NE" of the Gila Cliff Dwellings National Monument appears to be an error; it is actually northwest of that site). Both localities are within the Mogollon Mountains in the Gila Wilderness Area. Given the montane riparian habitat at these locations, it is not surprising that both specimens appear to be typical of the nominate subspecies, ***C. d. dorsalis*** (as are, apparently, the northern New Mexico specimens [Robert Larson pers comm.]), rather than the Great Basin race, ***C. d. deserticola*** Cruden. A closely-related species, ***C. diadema*** Selys, also occurs in the Gila River drainage of southwestern New Mexico in Catron and Grant counties, but has been found at lower elevations (below 3000′; fide Robert Larson). The two species might eventually be found together in the area, or they may be found to be broadly parapatric along the Mogollon Rim, which appears to be, from the distribution plotted by Donnelly (2004), the northeastern boundary of the range of ***C. diadema*** (my thanks to Rosser Garrison for pointing this out).

Cordulegaster dorsalis has a mostly continuous distribution along the Pacific Slope of western North America from British Columbia to northern Baja California, but its distribution within the intermountain West and southern Rocky Mountains is patchy and rather poorly documented. The specimens reported here suggest there is a lot about the distribution of the genus in this region that remains to be discovered. Seemingly disjunct populations of ***C. d. dorsalis*** in the southern Rocky Mountains closely resemble Pacific Coast populations, with populations of ***C. d. deserticola*** and ***C. diadema*** occupying the vast spaces in between. The situation appears to be one that would benefit greatly from the sort of combined morphological and DNA sequencing analysis that has recently been applied to species of ***Cordulegaster*** in eastern North America (Pilgrim et al., 2002).

Thanks to Cheryl Barr for access to the Essig Museum and loan of specimens, Robert L. Larson for providing information on the distribution of ***Cordulegaster*** found in New Mexico, and Rosser W. Garrison for sharing access to his collection and his knowledge of the distribution of odonates in western North America.

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Quebec Emerald (*Somatochlora brevicincta*) Found in Minnesota

June Tveekrem, Columbia, Maryland

The Quebec Emerald, ***Somatochlora brevicincta***, has been found in northeastern Minnesota. From what I've been able to ascertain, this is the first record from the north central US or central Canada.

This species is known from eastern Canada (Quebec, New Brunswick, Nova Scotia, Newfoundland), northern Maine, and a western population in British Columbia.

In July 2005, a male ***brevicincta*** was sighted by Kurt Mead and June Tveekrem. Kurt netted it and June took detailed photos, but due to an identification error the specimen was not kept.

In March 2006, several experts were able to identify it from the photos. In July 2006 a voucher specimen was collected by Wayne Steffans, a member of a search party led by Kurt Mead. The specimen was found in the same location as the year before.

Details and all the photographs are posted at <http://www.toadmail.com/~minnodon/brevicincta/>.

Finding the species two years in a row suggests to Kurt and me that the first individual was not a wandering vagrant. However, we do not know whether there is a breeding population or whether they are migrants.

Thornbush Dasher (*Micrathyria hagenii*) New for Arizona

Rich Bailowitz

A wet winter in 2004–2005 in much of Arizona and Sonora, Mexico was conducive to range extensions of some normally subtropical species. The benefits of this extension of range were realized mostly during the late summer and autumn of 2005. Several species of odonata not previously reported from the state turned up in Arizona, two of them in small numbers.

The Thornbush Dasher (***Micrathyria hagenii***) is a subtropical species occurring regularly on the east coast of Mexico northward into Texas and on the west coast of Mexico north to Guaymas, Sonora. On 19 September 2005, the author visited Carpenter Tank on the Buenos Aires National Wildlife Refuge (BANWR) to scout for dragonflies. A total of 18 species was recorded, highlighted by what appeared to be a thriving colony of Thornbush Dasher. A specimen was collected as a voucher.

The following week, on 26 September 2005, Bailowitz returned with photographer Doug Danforth of Bisbee, Arizona, for a photographic voucher. Again, several specimens were seen and photographed at Carpenter Tank and a single specimen was seen at Carrizo Tank, also on the refuge, but some 6 air miles to the west of Carpenter Tank. Of note was the presence of 6+ adults on the 19th. While no pairs were seen in tandem or in wheel and no females were seen ovipositing, with these types of numbers of adults, breeding is certainly suggested.

It is unknown whether, at some stage in their development, Thornbush Dasher can withstand freezes. Subfreezing temperatures occur yearly in the vicinity of Sasabe near the refuge and it is possible that permanent colonies in this section of Pima County are unfeasible. Nevertheless, the various tanks at BANWR will be investigated in future seasons to try to confirm the status of this species in Arizona. With global warming looming, cases such as this may signal the vanguard of subtropical pushes into southern Arizona.

Nebraska Revisited

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The trip to Nebraska last July (ARGIA, 17[4]: 8–10) was so interesting that Peggy and I returned this year for another July of collecting (We went to Montana in the middle of the trip to break the routine). As on the previous trip this was a quick survey — 45 counties in 24 days, with 450 county records.

A visit to the University of Nebraska State Museum col-

lection in Lincoln and an earlier identification of borrowed material turned up about 70 new county records. Thanks to Mary Liz Jamison and the museum staff for their help.

We spent a day in the field with two couples (Don and Janis Paseka, Barbara and Lorin Padelford) who are the resident odonatologists of Nebraska. They started watching odonates around the same time I did (i.e the Valentine meeting). Janis maintains a web site (http://www.geocities.com/ne_odes/) where you can find all the county records mentioned here plus 200 county records not covered by dot maps and the 2005, 2006 collecting. Most interesting are the records of ***Enallagma vesperum*** (a new state species) from Antelope, Cass and Kearney Counties.

No days this year were comparable to the first day of 2005 when we had two species of ***Stylurus*** (Hanging Clubtails) and many ***Gomphus vastus*** (Cobra Clubtail). There were a number of species new for me and lots of really nice habitat. If you enjoyed the Niobrara River during the Valentine meeting, I would highly recommend the Dismal River in southern part of Sandhills.

Enallagma traviatum (Slender Bluet), the only new state species added this year, was picked up by accident in an early morning sweep of vegetation to record ***Ischnura verticalis*** for Dodge County. The Pasekas and Padlefords previously had sight records from Dodge and Cass Counties.

The last day of the trip, while on an outing with the Pasekas and Padlefords, we found our only ***Stylurus*** of the trip, an ***intricatus*** (Brimstone Clubtail) emerging on the banks of the Platte River in Sarpy County. A great finish to an interesting month. Still lots of interesting stuff to find in the state. Next time not so rushed and not spread so thin.

In the last two Julys we visited all but 9 of the 93 counties and every county now has at least 12 records with 63 counties in the 12–20 range.

We have found 80 of the 104 species on the state list and the misses are almost entirely 1–2 record rarities (15 species) or species that emerge before or after July. Most missed species also have a limited range in the state. The number of county records for 50 of the 80 species has more than doubled in the two years of collecting.

Hetaerina americana (American Rubyspot) with 83 county records (CR after this). It is missing from a few Sandhill counties because of the absence of stream habitat and from others because of our failure to find the proper stream habitat.

Calopteryx maculata (Ebony Jewelwing), 49 CR, is scarce in the panhandle, southwest and south-central.

Argia apicalis (Blue-fronted Dancer), 75 CR, is scarce in panhandle (found in counties along the Platte) and evidently missing from the western Niobrara where the river becomes a small stream through marshy pasture.

Argia tibialis (Blue-tipped Dancer), 9 CR, was found in same specialized habitat as last year, so evidently this is a real association. My six records have all been at small log jams. The species is usually perching on one of the logs, but, if not, then in close proximity to the obstructions.

Enallagma anna (River Bluet), 25 CR, was found in numerous additional eastern counties this year. It is always in small streams in association with ***E. civile*** and it is always the less common of the two.

Enallagma antennatum (Rainbow Bluet), 39 CR, is primarily an eastern species in Nebraska although it is found to the western border on streams running into the Platte.

Enallagma carunculatum (Tule Bluet), 37 CR (see ***E. civile***). Has been missed in the eastern counties although it is recorded from almost every county in Iowa. Since this species and the next have to be caught to be sure of identification it's surprising that they haven't been picked up, even if present in only small numbers.

Enallagma civile (Familiar Bluet), 89 CR, is replaced, as the dominant bluet, by ***E. carunculatum*** in the western Sandhills and Panhandle counties. Then one had to visit small cattle ponds and trickles from watering troughs to be assured of ***civile***. It is greatly outnumbered at all the western lakes by ***carunculatum*** although it is probably present at all in tiny numbers.

Ischnura damula (Plains Forktail), 13 CR, was not common but found in a solid block of western counties from north to south. It is usually greatly outnumbered by ***I. verticalis***. When ***I. verticalis*** is rare, ***damula*** is also rare.

Ischnura verticalis (Eastern Forktail), 92 CR, was recorded in all but Perkins County. That county list has 16 species, counting the sight records, but no ***Ischnura*** were found despite searching both of the county's ponds extensively. Maybe I shouldn't have been surprised, as ***Ischnura verticalis*** was hard to find in some of the surrounding counties even in good habitat.

Aeshna species were as difficult to find and in as small numbers as last year. ***Aeshna multicolor*** (Blue-eyed Darner), 23 CR, is common in the western half of state but decidedly rare in the eastern half. Other species are harder to

find although ***Aeshna palmata*** (Paddle-tailed Darner) was reasonably common in the far northwest corner of state at eastern edge of range. One record for ***palmata*** from Chase County is considerably east of the normal edge of range in Colorado.

One ***Nasiaeschna pentacantha*** (Cyrano Darner), 3rd record for state, was seen in Cuming County for a northern range extension. It was patrolling a heavily shaded area at one end of a borrow pit lake rather than in a stream.

Gomphids are always hard to find and I am not sure if this is due to July being too late, habitat being too compromised in most of state or just my inability to find them. A total of one ***Arigomphus submedianus*** (Jade Clubtail), two ***Gomphus externus*** (Plains Clubtail), one ***Gomphus militaris*** (Sulphur-tipped Clubtail), two ***Ophiogomphus severus*** (Pale Snaketail), five ***Progomphus obscurus*** (Common Sanddragon) and two ***Stylurus intricatus*** (Brimstone Clubtail) for the month.

Celithemis elisa (Calico Pennant) previously recorded in the state only from Cherry County (Valentine meeting) was common in Sioux and Dawes Counties in the northwestern corner of the state. A single individual was seen at a new pond in Perkins County, southwest portion of the state.

Celithemis eponina (Halloween Pennant) recorded from only six counties up to 2004 has now been collected in 33 counties and seen in numerous others. Evidently it is uncommon over the whole state.

Erythemis simplicicollis (Eastern Pondhawk), 80 CR, ***Pachydiplax longipennis*** (Blue Dasher), 72 CR, and ***Perithemis tenera*** (Eastern Amberwing), 53 CR, are widespread across state although restricted by habitat.

Libellula luctuosa (Widow Skimmer), 86 CR, ***Plathemis lydia*** (Common Whitetail), 87 CR, and ***Libellula pulchella*** (Twelve-spotted Skimmer), 88 CR, are present in every county but ***lydia*** becomes rare and/or local in the western counties.

Sympetrum (Meadowhawks) continue to plague me. After Valentine, where every perch was occupied, it doesn't seem right to have to work for each county record. Maybe July is too early, but the Valentine meeting was early July. ***Sympetrum corruptum*** (Variegated Meadowhawk), 55 CR, is unpredictable, often being abundant over a lake in one county and absent in the next. ***Sympetrum obtrusum*** (White-faced Meadowhawk), 51 CR, is the most widespread and findable species—usually in tall grass back from river or pond. ***Sympetrum internum*** (Cherry-faced Meadowhawk), 18 CR, (none last year and only two females this year) was amazingly scarce. ***Sympetrum semicinctum*** (Band-winged Meadowhawk; includes ***occidentale*** the Western Meadowhawk), 45 CR, ranges great distance from the water and is often more easily found in shelters several miles away, or in the grill of your car. I only came across one ***Sympetrum rubicundulum*** (Ruby Meadowhawk), 27 CR, this year and Nick thinks it's a hybrid, so no record there.

I corrected some of my problems with collecting ***Tramea*** (Saddlebags) by using a large net dropped from above and ended up with 13 new county records of ***Tramea lacerata*** (Black Saddlebags) and six for ***Tramea onusta*** (Red Saddlebags). The latter usually represented by single individuals at widely scattered location and probably present across the whole state.

Appendix

	2004	2005	2006
Total state list	100	103	104
Total county records	843	1465	1977
Counties with 0-10 records	65	30	0
Counties with 11-20 records	14	38	63
Counties with 21-67 records	14	25	30
Average county total	9	16	21

Added since 2004: ***Argia nahuana***, ***Nasiaeschna pentacantha***, ***Stylurus plagiatus***, ***Enallagma traviatum***

New county records were found for all but 5 species already with more than 3 records: ***Lestes disjunctus*** (Common Spreadwing), ***Enallagma clausum*** (Alkali Bluet), ***Leucorrhinia intacta*** (Dot-tailed Whiteface), ***Libellula quadrimaculata*** (Four-spotted Skimmer), and ***Sympetrum pallipes*** (Striped Meadowhawk).

For 53 of the 80 species collected in 2005 and 2006 the number of county records has at least doubled.

There were records collected in 84 of 93 counties. Museum records were recorded from 5 additional counties. Only 4 counties have no new records added since 2004

Counties not visited and species totals: Sandhills: Cherry (67), Brown (46), Holt (24); Southeast: Douglas (25), Otoe (19), Lancaster (41); Southwest: Lincoln (51), Logan (23), Dundy (19)

Amazon Darner (*Anax amazili*) Comes to Kleberg County, Texas

e-mail from **Tom Langschied**, Kingsville, TX

In a remarkable twist of fate, on Thursday morning a girl in my daughters 5th grade class showed me a dragonfly she had "hand" caught outside of her home in Kingsville. I quickly recognized this as not being a dragonfly I had expected from the area and after a mad dash home for some books and a revisit to the 5th grade classroom, I was able to confirm the identity of this ode as an Amazon Darner (***Anax amazili***). Quite a surprise! This visit to the classroom also quickly became an hour-long discussion about dragonflies in general and the uniqueness of this particular species in Texas.

Friday, I revisited the class to help them in the final stage of preserving the specimen for science. This overall event seems to have captivated most of the class about dragonflies and how important an observation and collection even by a 5th grader can help in the advancement of science (odonate distribution).

Ovipositing Behavior of *Stylurus scudderi* Selys

Bryan Pfeiffer and **Greg Hanisek**, (BP) <bryan@wingsenvironmental.com>; (GH) <ghanisek@rep-am.com>

During separate field investigations in August of 2006 we coincidentally observed ***Stylurus scudderi*** (Zebra Clubtail) exhibiting similar ovipositing behaviors on rivers and streams in Vermont and Connecticut. Unlike males, which were obvious and territorial, females would make brief, stealthy egg-laying excursions and then retreat to perches on nearby vegetation or presumably at some distance. These observations may help fill a gap in knowledge of this Gomphidae species. Moreover, the Vermont field observations include males patrolling flooded gravel roads at three sites.

Stylurus scudderi is widely but sparsely distributed across eastern North America, from Nova Scotia west to Minnesota and south to Georgia (NatureServe, 2006). With a global rank of G4 (apparently secure), the species' spotty distribution accounts for its status as imperiled in certain states. ***S. scudderi*** generally prefers streams and rivers of moderate or low gradient and with gravel or sandy benthos (consistent with the observations described here). Among the more dashing clubtails in the eastern half of the continent, the male ***S. scudderi*** is readily recognized by its yellow-green-ringed abdominal segments and relatively large club. Females are more stout in appearance without a pronounced club. There are few accounts of female ovipositing behavior (T. Donnelly pers. comm.)

During field excursions in Vermont from 5 August to 9 August, adult ***S. scudderi*** were readily encountered on six rivers and streams. Indeed, as a result of investigations during the 2006 field season, ***S. scudderi***, heretofore scarcely known in Vermont, is now recorded from nine of the state's 14 counties (Michael Blust pers. comm.) By comparison, ***S. spiniceps*** (Arrow Clubtail) is known from six Vermont counties and ***Hagenius brevistylus*** (Dragonhunter) is known from three. In Vermont, ***S. scudderi*** breeds on the state's largest river, the Connecticut (which, owing to a historic technicality, actually resides in New Hampshire), and on streams as small as 3.5 meters in width. Riparian zones at these sites included open fields and shrub (alder–willow) wetland and even a spot where a stream was a mere two meters from a gravel road (drive-by ***scudderi***). One site is a slow, tannic flow through an expansive peatland in a basin (with granitic bedrock) in Vermont's northeastern corner. ***Gomphus descriptus*** (Harpoon Clubtail) and ***Somatochlora minor*** (Ocellated Emerald) are among the species recorded at the site. In Vermont, ***S. scudderi*** exuviae have been collected from sand and mud patches, rootlets and an "emergent" rock along streams and rivers.

The Connecticut site is a shallow, 200-yard stretch of the Pomperaug River in Southbury (New Haven County). Deciduous woods grow up to the edge of an eight-to-ten-foot, vertical earthen bank on the west side. A border of deciduous trees separates a similar bank from more open habitat on the east. The predominant streamside trees are Sycamore and Red Maple, many of them festooned with grape vines. The stream corridor is open and sunlit. During the observation period, the river flowed in about one-third of its 30-meter-wide bed where ***S. scudderi*** was most active. Most of this section was from one to two feet deep with water flowing close to the west bank. The stream bed consisted of coarse sand and gravel interspersed with scattered rounded stones up to about softball size. The bed could easily be seen through the clear water, which was broken here and there by modest riffles. The flow was deeper and faster to the north, and deeper and slower to the south. Both of these areas had more silt on the bottom than the favored stretch, and ***S. scudderi*** avoided both areas.

At this site, ***S. scudderi*** was first observed on 21 August 2002 but not found on several visits during 2003, 2004, and 2005. In 2006, however, ***S. scudderi*** was first seen on 5 August, when three to four males displayed aggressive territorial behavior. Territorial activity peaked on 9 August, when six to eight males were present. This visit also produced two sightings of ovipositing females. Visits on the next two days, 10 and 11 August, each produced two more sightings of females. Each of the site visits lasted from 2 to 2.5 hours. The encounters with females during each of those visits lasted not much more than one to two minutes each.

Although ***S. scudderi*** is frequently described as most active from late afternoon into evening, the observations described here occurred between 1000 hrs and 1730 hrs, with most occurring during the earlier hours of this period.

Despite their status as "hanging clubtails," males at most of these sites occupied horizontal perches—often boulders or exposed patches of sand and gravel. They regularly darted out to challenge other male ***S. scudderi***, resulting in high-speed, low-altitude chases that at times covered dozens of yards. The chases usually ended with males returning to the same or a nearby perch. In one instance, at the Connecticut site, a male landed briefly on the red plastic handle of an observer's net. Males ignored most other odonates but, in Connecticut, made regular runs at ***Macromia illinoiensis*** (Illinois River Cruisers). Most flights appeared to involve territorial sorties, with minimal back-and-forth patrols noted. No feeding activity was observed.

The species' sexual dimorphism was apparent even to the naked eye with individuals in flight. The males were fast and slender. They often displayed jerky movements in flight. The contrasting abdominal pattern was evident as they dashed through the sunlight. The females moved more slowly, displaying blunt, tubular abdomens. They appeared paler and less contrasting overall, because of the more extensive yellow abdominal markings.

Compared to the fast, aggressive males, the females were both deliberate and stealthy. In all cases they appeared low over the water near the west bank, where shade met sunlight and leafy branches overhung the water. The first female seen on 9 August oviposited once, then alighted on the leaves of an overhanging red maple branch about six feet above the water. It hung vertically from the leaf, then flew higher into the trees and out of sight. About 30 minutes later, a second female was encountered about 50 meters downstream, but in the same approximate position relative to the west bank. It made three patrols over a distance of about 10 meters. It patrolled more slowly than the males, ovipositing three times. It then repeated the same landing and departure as the first female, with one difference. It moved from a hanging position about two meters above the water to a horizontal perch about seven meters up. There it vibrated its wings for less than a minute before moving higher and out of sight. A pale, buffy egg mass could be seen on the ventral side of its abdomen near the tip.

On 10 and 11 August females were observed a total of four times. All were in the same spot where the first female was seen the day before, and all at some point hung from vegetation. One oviposited five times and one oviposited once. One was seen briefly in flight, and one was netted for closer examination from its hanging position with no ovipositing observed.

No tandem pairs were observed. All of the females oviposited in sunlight but at times flew and perched in shadows. All of the ovipositing occurred in a small riffle less than a foot deep, with one exception. The lone ovipositing event at the downstream site was on a smoother surface where water was about two feet deep.

In Vermont, during at least nine hours of observations at the six ***S. scudderi*** sites, two females were observed ovipositing for less than five seconds each. Each exhibited somewhat similar behavior. (It is likely that each began ovipositing before the observer detected their presence.) The first instance occurred at a 2.5 meter wide section of a small stream with a sandy/gravel bottom (the roadside stream). After being observed delivering a single tap to the stream surface, a female perched on a football-sized rock for approximately two seconds and then rocketed skyward and vanished toward the riparian treeline. It is possible that the observer, standing in the stream approximately three meters from the female (and rotating slowly for a photograph), caused this behavior. Two or three males were in attendance at this site, mostly upstream approximately 10 meters from the ovipositing location.

The second Vermont encounter, at the flowage adjacent to the large peatland, was somewhat similar (and somewhat odd). The female was observed tapping the water surface once, then flopping briefly into the stream before rocketing skyward and away toward a forested area. Three males, most of the time perched on rocks at the site, and frequently involved in territorial chases, did not react to the female.

One final observation from Vermont: At three sites male ***S. scudderi*** were observed patrolling flooded gravel roads. At one site, a sandy road roughly 30 meters from a stream

flowing through a shrub wetland, two males patrolled two puddles, each approximately 10 meters in length and separated by two meters. At another site at least one male patrolled a 30-meter stretch of gravel road adjacent to a stream that overflowed its bank. The final site similarly involved water moving along a gravel road as well as a few isolated puddles. These may have been feeding sites. Or perhaps these flooded roads looked enough like sandy streams to these males. In any event, our colleague Michael Blust calls these particular venturesome individuals "Stylurus puddlei."

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Another Note on *Stylurus scudderi* Oviposition

Nick Donnelly

Walker (1958) notes that "very few females of *Stylurus scudderi* appear to have been taken by anyone". Bryan Pfeiffer's account of their oviposition reminds me of an event I witnessed in Quebec in 1992. Ailsa and I were driving home from Mistassini and stopped briefly in the late afternoon in Reserve La Verendrye, which is well north of Ottawa. We found a lovely cool, sandy-bottomed stream to search for dragonflies. At 5 o'clock precisely ***Ophiogomphus colubrinus*** suddenly appeared in a virtual swarm. When I clapped a net over one which had perched on a boulder, a second one immediately landed on the net!

Stylurus scudderi males were patrolling the stream in their characteristic deliberate manner. I suddenly saw a female (my first!) patrolling near the edge. It was the fattest-bodied gomphid that I think I have ever seen. Think of a flying cigarette, black with bright yellow markings. I followed the female as she flew into a culvert about 50 feet away. I ran up to the road and crossed it to watch the female appear on the other side. Except she did not appear. Baffled, I went back to see if she made a U-turn and headed out the entrance. I still didn't see her. Then I saw her. She was ovipositing near the mid-point of the culvert and continued to do so for a minute or so. The culvert was about 5 feet in diameter (I should have measured it) and the water was about 6 inches deep.

I wonder how many dragonflies oviposit in culverts?

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Breeding Habitat for *Somatochlora filosa* (Fine-lined Emerald)

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On 13 Aug 2006 the authors were searching for ***Cordulegaster obliqua*** (Arrowhead Spiketail) along a small stream where DS had found them breeding. On this cloudy, cool day, there were no ***obliqua*** in sight but we did find a female ***Somatochlora*** emerald. The emerald was obviously ovipositing, so we watched her for about 10 minutes and then captured her. To our surprise, this was a female ***S. filosa***, a species whose breeding habitat has remained undescribed until now.

This stream is in Long County, and is within the grounds of Ft. Stewart, a large US Army base about 50 km west of Savannah, Georgia. Not named, the stream is a small, slow, second- or third-order seep-fed tributary of Taylor's Creek. The stream is sandy-bottomed, with some accumulations of silty muck, and nearby muck beds. The banks have some areas of sphagnum and liverwort. The forest has a mature canopy, and is dominated by Tulip Tree (*Liriodendron tulipifera*), Red Maple (*Acer rubrum*), Black Gum/Black Tupelo (*Nyssa sylvatica* ssp.), Redbay (*Persea borbonia*), and Sweetbay (*Magnolia virginiana*).

Like many striped emerald species, the female was ovipositing on the exposed sandy bank, which in most

places was overlain with a thin layer of silt. The primary method of oviposition seemed to be hovering in one position, ovipositing with up and down thrusts of the abdomen. After several thrusts in one location, she would fly a meter or so away, and repeat the process. No males were seen during the two hours we were at this location.

Somatochlora filosa (Fine-lined Emerald) is considered uncommon to rare in Georgia, but more common below the Fall Line (Mauffray & Beaton, 2005). This is a new early date for the state by almost a month but is within previously reported dates for nearby states. Dunkle (2000) stated that the breeding habitat was unknown but was "probably either boggy forest trickles or sheet-flow swamp thickets." Our observation suggests it is the former, and it is hoped that other researchers can seek areas of similar habitat to further document this species' breeding preference.

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"Cave Dragonfly" Found in Alabama

Jim Godwin and **Steve Krotzer,** (JG) <jim.godwin@huntingdon.edu>; (SK) <rskrotze@southernco.com>

On 19 August 2006, while exiting the Keel Sinks entrance to the Tony Sinks cave system located within the Sharp-Bingham Mountain Preserve in Jackson County in extreme northeastern Alabama, one of us (JG) encountered a dragonfly perched on a wall of the entrance pit to the cave system. The phenomenon of odonates utilizing caves as roosts, ostensibly as thermal refugia, has been reported in the literature (for example see Corbet, 1999), but it is apparently a fairly rarely documented event.

The elevation of the entrance pit, which is located at the lowest point of Keel Sinks, is ca. 275 meters. An ephemeral surface stream bed leads into the pit and only carries water after a rainfall event. The pit has a diameter of ca. 5–7 m and is ca. 12–14 m deep. A mature hardwood mesic forest, dominated by oak and hickory, surrounds the pit/cave system. At this time of the year, and especially in light of recent drought conditions, very little or no standing water was present anywhere in the area. The ambient air temperature in the forest was in the low 90s F, the air temperature in the cave system approximately 60 F, and there was a noticeable thermocline about 1–2 m below the lip of the pit.

The dragonfly was discovered at about 1600 h, perched on the wall of the pit ca. 5 m below the lip, on the cooler portion of the pit wall, well below the thermocline. Light conditions at the time were subdued but far from approaching darkness. Lethargic and easily captured by hand, the specimen was sent to SK, who identified it as a female ***Somatochlora tenebrosa*** (Clamp-tipped Emerald). This largely crepuscular species would seem to be a likely candidate to seek out a thermal refuge during the long, hot days of an Alabama summer!

Literature Cited

Corbet, P.S. 1999. Dragonflies: behavior and ecology of Odonata. Cornell University Press; Ithaca, NY; xxxii + 829 pp.

The Birdbath, a Faunal Microcosm

Jane Walker

As I become more involved with odonates, I look for new avenues of interest. Many of you may know that I have been involved in ***Somatochlora hineana*** surveys in Missouri for the past five years. As explained in an earlier Argia issue, we have some unique problems in Missouri concerning ***S. hineana***. One is the utilization of the same habitat by ***S. tenebrosa***, a sister species. Last summer Joe Smentowski and I collected a female ***S. tenebrosa*** ovipositing in a fen we were surveying. I collected the eggs and have been rearing some of the larvae from these eggs since. The larvae I have been rearing showed similar characteristics to ***S. hineana***; this will make it difficult to distinguish the two. This is a story for a later issue.

Finding food for larvae reared from eggs can be difficult. Luckily, I have managed well, with a constant supply of Cladocerans when the larvae were small, and mosquito larvae and bloodworms now that they are larger. My

source for mosquito larvae has been one of three birdbaths I provide for the birds. Everyday I remove as many as I can and discard the pupal stage (the larvae don't eat these). Just recently, my supply dried up overnight. While bending over the birdbaths and combing through the organic green stuff, I saw movement, and sucked with my eyedropper. To what should my wondering eyes appear but ***Pachydiplax longipennis*** larvae, dozens of them. In all three birdbaths! Yesterday, I even found a caddisfly larva about three millimeters long in my former mosquito birdbath. Unfortunately, the ***S. tenebrosa*** larvae have only been mildly interested in the ***Pachydiplax larvae***, and I stopped using them when I found that ***Pachydiplax*** liked to ride piggy-back on the ***S. tenebrosa***.

Book Review: Dragonfly Genera of the New World, by Rosser W. Garrison, Natalia von Ellenrieder, and Jerry A. Louton. Johns Hopkins University Press, 2006, 368 p., 1626 figs. $99.00, ISBN 0-8018-8446-2

T.W. Donnelly

This is the most important Odonate book published in several years. It is an illustrated key to the genera of all New World Anisoptera, with extended descriptions and comments on each genus.

I wish this book had been published in 1961. This was my first year of serious collecting in the New World tropics. Happily, in Venezuela I went to the field with Janis Racenis, who simply identified for me most of what I found. But how does an unguided collector identify his odonate catch? The answer is, that is very difficult. Borror's wonderful 1945 "Key to the New World Genera of the Libellulidae" serves well for libellulids. But what to do with those pesky gomphids and aeshnids? Calvert's monumental volume in the Biologia Centrali Americana (if you can get a copy!) works well for Central America (at least to identify genera), but for decades Neotropical odonatists had a difficult time placing their Anisoptera specimens in the correct genus.

The New World tropics have always presented a special challenge to naturalists of all sorts. Originally colonized by the Spanish and Portuguese, rather than the French, Germans, Dutch, or British, this region enjoyed far less of a tradition of natural history investigations than did Africa, India, or southeast Asia, including the island archipelagos. Much of the New World fauna remains undescribed, and comprehensive summaries of groups are scarce. This problem extends right through the world of plants and animals. In the world of ferns, for example, a recent monumental book on New World genera of ferns by Tryon and Tryon has made itself an essential volume for New World botanists. The present book on dragonflies is structured remarkably like the fern book. And, like the fern book, it will probably not be necessary to use the present book if one stays north of the Mexican border.

There has not been a Fraser or a Lieftinck or a Pinhey or an Asahina to summarize the New World odonate fauna. Brazilian native Newton Dias dos Santos produced dozens of short papers but no overall summary. The Belgian Jean Belle was the closest to a resident northern European naturalist that the continent enjoyed. Teaching mathematics in Suriname, he spent decades pursuing (mainly in the museums of the world) Neotropical gomphids, and summarized this family in a marvelous fashion. Janis Racenis came to Venezuela from Latvia shortly after World War II and described many new species from northern South America. But the literature on New World odonates consists almost entirely of brief papers describing new species or, rarely, covering an entire genus, and this presents a serious challenge even for the veteran odonatist.

My own identification problems have been difficult enough, but in the last several years I received numerous requests, more or less along the lines of, "I live in Guyana and am just starting to get interested in the Odonata. Can you help me with the literature?" At last I have a helpful answer to such enquiries.

Garrison, von Ellenrieder, and Louton have produced a book which revolutionizes the study of Anisoptera (soon to be joined by the Zygoptera) in the New World tropics. They have essentially extended Borror's 1945 key to Libellulids to the entire Anisoptera. They have adopted and extended Borror's crucial idea of illustrating every character in the key. One of the most difficult aspects of keys is that the user never quite is confident that he understands what the author means by certain words or phrases. ("He calls that parallel?"). Plunging into the keys in this book I had the same feeling, except that in my usage all I had to do was look at the accompanying figures to see just what they meant by "parallel", or whatever.

But they have done more than upgrade Borror's keys. Each genus is described and discussed, often with supplementary figures to give the reader a good feel for the genus — its species, its principle characters, and its range (shown by a map).

The authors do not divide the families into subunits, such as subfamilies or tribes. Nor are some large genera (e.g. ***Gomphus***) further subdivided into subgenera. There are no taxonomic innovations — no startling synonymies nor daring combinations proposed. They do not even suggest any groupings of putatively related genera. What innovative work they have done has already been presented in separate papers, such as their recent regrouping of several taxa within the ***Macrothemis*** – ***Brechmorhoga*** – ***Gynothemis*** group. Where major puzzles still confront us, such as the status of "***Aeshna***" ***williamsoniana***, they explain the problem, but present no solution.

I tried the key several times with various bugs from my collection. I sailed through ***Gynacantha*** with ease, reached ***Macrothemis*** correctly after a few diversions, and struck out on a mysterious female gomphid. (Maybe it is a new genus after all?). Veteran odonate collectors in the New World tropics will simply have to have a copy of this book. They might be able to identify their genera without it, but the summary comments on each genus will be invaluable. And the numerous figures (they present no less than 1626 of these) present many details which have never been illustrated.

There is really very little more that one could ask for in a book of this sort. The execution is excellent. No serious worker on the New World tropical fauna can be without this book. And for the beginners, especially those isolated from major libraries, this book will really get them started. Instead of assembling hundreds of Xerox copies of individual papers, their most critical literature is now available between just two covers.

Book Review: Field Guide to the Dragonflies of Britain and Europe, by Dijkstra, K-D.B. and R. Lewington, 2006, British Wildlife Publishing 320 pp. [ISBN 0 9531399 4 8] price on Amazon.com is $41.17

Natalia von Ellenrieder

Due to their often beautiful colors, large size, fascinating behavioral traits and relative ease in observation, dragonflies (Order Odonata) have become today one of the most popular groups of insects. Europe's dragonfly fauna is probably the best known in the world, and there are many field guides and catalogs available for its study. This new identification guide covers Europe from the Arctic Circle to the Mediterranean basin, including western Turkey, Cyprus, Morocco, Algeria, Tunisia and the Azores, Canaries and Madeira as well, and allows for the identification of the adults of all 120 species of dragonflies and damselflies recorded from Europe plus 40 known from W Turkey and NW Africa.

A team of dragonfly experts from across Europe, coordinated by K-D. Dijkstra, contributed to the text and distributional data, and the guide has been profusely illustrated by Richard Lewington, recognized as one of Europe's foremost illustrator of insects. The book begins with a comprehensive introduction to studying and identifying dragonflies, providing general information on their anatomy, habits and habitats, names and conservation status across Europe. A section with concise identification keys in the form of innovative diagnostic tables allowing for recognition of suborders, families and genera follows. Each taxon is accompanied by a detailed color illustration where main diagnostic characters are pointed out. There is then a guide by country to the main habitats where one can find dragonflies throughout Europe, North Africa and Turkey, followed by individual species accounts which constitute the main body of the volume. Families are arranged phylogenetically, and genera and species within them from most to least common; similar species are placed close together to facilitate comparison. Each account includes a general description, field characters and hand-held characters, variation, behavior, range and status, habitat and flight season, and an updated distribution map. Excellent color artwork of the general habitus and, when necessary to reach an authoritative identification, of particular diagnostic structures are provided as well; some accounts are accompanied by photographs. The appendices at the end of the book provide a summary on taxa with controversial status requiring further taxonomic studies, and a checklist of species treated in the book, using scientific and vernacular names side by side. One of the advantages of this book is the inclusion of vagrant species, which are being linked to recent global climate change. This should make it easier to identify new species and chart any subsequent colonization by them in such a well known area as Europe.

Of all dragonfly field guides covering Europe, this is not only excellent for identification of the adults, but it also offers a complete introduction to the biology of these fascinating insects. If you are interested in data on European species and are looking for identification means for their adults, this beautiful book is the one to get.

New Common Names for Three North American Odonates

Dennis Paulson, Chair, DSA Common Names Committee

The Common Names Committee has recently voted to change the common names of three species. These names, established a decade ago, were deemed misleading and inappropriate, and thus dragonfly enthusiasts would be better served by more meaningful names. The committee decided that it would be better to make such changes early in the history of the names, leading to a more acceptable set of names and thus greater stability in the future.

Epitheca costalis is now **Slender Baskettail**. The former name, Stripe-winged Baskettail, was considered inappropriate, as only a very small percentage of females, in a limited geographic area, are characterized by a dark stripe along the front of the wings. Thus almost all individuals of the species lack the character that originally prompted the name. ***E. costalis*** is a relatively slender species, and its body shape is often used to distinguish it from the Common Baskettail, ***E. cynosura***.

Somatochlora elongata is now **Ski-tipped Emerald**. The original name, Ski-tailed Emerald, is modified slightly here to agree with other odonate common names in which "tipped" refers to the cerci (superior appendages) rather than the entire abdomen. The cerci of males of this species are ski-shaped.

Celithemis ornata is now **Ornate Pennant**. Previously called Faded Pennant because its pattern is subdued in comparison with some of its flashier relatives, that name is now considered inappropriate in this actually rather dark species. Ornate goes along with the scientific name and is a good description of the complexly patterned thorax, abdomen, and wing bases of both sexes.

Ophiogomphus susbehcha Common Name Changed

Dennis Paulson, Chair, Common Names Committee

The Common Names Committee, acting at the request of DSA members in Wisconsin and Minnesota, has voted to change the common name of ***Ophiogomphus susbehcha*** from Wisconsin Snaketail to St. Croix Snaketail. Local people have been calling it St. Croix Snaketail for some time, and it is so listed by government agencies. It was described from the St. Croix River, and it is known from Minnesota as well as Wisconsin, so the original location is as good a geographic locator as a state name. It is quite difficult to assign descriptive names within large genera such as ***Ophiogomphus***, with numerous similar species.

Important Announcements and Updates for the IORI (International Odonata Research Institute)

Bill Mauffray, International Odonata Research Institute, PO Box 147100, Gainesville FL 32614-7100, New addresses (June 1 2006) <iodonata@bellsouth.net>, <www.iodonata.net>; old addresses (phased out July 1 2006) <iori@afn.org>, <www.afn.org/~iori>

Book Updates: all references to publications prices are at <www.iodonata.net>.

Revised Damselflies of North America: expected in mid-October. The color companion guide will be a few months later. If you have ordered already some time ago and your mailing address has changed please let me know now!

Dragonflies of North America: only about 20 copies remain. This will not be revised for another two years

Dragonflies of Central America: only about 40 copies remain. This is not scheduled for republication

Back issues of ODONATOLOGICA are available.

Web site & e-mail address changes: Note the important changes of both addresses given above.

IORI and Odonata Central: IORI has moved all of the Dragonfly Society of America information to the

OdonataCentral site at <www.odonatacentral.com>.

The e-mail directory will gradually be merged into OdonataCentral's site. Please register (no cost) your name and information to the OdonataCentral list <http://odonatacentral.bfl.utexas.edu/utilities/directory/>.

There is a new way to help IORI: You can now refer anyone needing a home mortgage for a home purchase, new construction, or a refinance through me and Countrywide home loans will donate $100 per closed transaction to the IORI. Either you must call me and provide me with the person needing a loan's phone number or they must call me and identify themselves as an IORI referral. My cell phone number is 352-219-3141. This offer applies to all 50 states in the US. This offer is only good if the party contacts me first before starting their loan process.

Kirkland Lake, Ontario Article Corrections

Jerrell J. Daigle <Jdaigle@nettally.com>

In ARGIA 17(3), we inadvertently left out two companions, Barbara Natterer and Sid Dunkle as attendees of the 2005 Kirkland Lake, Ontario, Canada post-meeting field trip. Also, we misspelled Kat's name—it is Kathy Kozacky. We are sorry about that! Please accept our heartfelt apologies!

Argia

Binghamton, New York Vol. 18, No. 3, 26 October 2006

Back cover: (upper) *Aeshna mixta* swarm in the Ukraine. On 19 August 2006 Elena Dyatlova and Vincent Kalkman witnessed a massive migration of *Aeshna mixta* in the Ukrainian Danube delta. It was estimated that at least 40,000 were present along a one kilometer stretch of beach, the vast majority of them being males. The event coincided with strong southern winds blowing the dragonflies to the Black Sea coast. For more information, contact V.J. Kalkman, European Invertebrate Survey –Nederland. naturalis - National Museum of Natural History, PO-box 9517, NL-2300 RA Leiden, The Netherlands, tel. (0)71-5687413, <kalkman@naturalis.nl>; (lower) *Enallagma eiseni* at Arroyo Santo Domingo, Baja California, to accompany article by Manolis, Iliff, and Erickson. Photo by Marshall Iliff.