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Front cover: Red-mantled Dragonlet (*Erythrodiplax fervida*) photographed 18 December 2012 at the National Butterfly Center in Mission, Texas, representing a new species for Texas and the U.S. Photo by R. Nirschl.

2013 DSA Northeast Regional Meeting Announcement, 20–23 June

Ginger Brown <vbrown@fullchannel.net> and Mike Thomas <mikethomas206@comcast.net>

The 2013 Northeast regional meeting will be held in Griswold, Connecticut, from Friday 21 June to Sunday 23 June. The close proximity to Rhode Island will provide participants the opportunity to visit a wide variety of habitats in both states, including large rivers, forested streams, marshes, coastal plain ponds, and wooded clearings. This is a peak time in the region for many odonate species, and we anticipate a number of new records will be added to the state's database.

Meeting headquarters will be at the AmericInn (860-376-3200) in Griswold, Connecticut, where we have reserved a block of 30 rooms which will be held until 20 May. Conveniently located off Interstate I-395 at exit 85, AmericInn has given us a discounted rate of \$79.90 + tax (two Queen beds non-smoking). When you reserve your room, mention that you are attending the Northeast Regional Meeting of the DSA to get this rate. The hotel offers wifi and a continental breakfast. There are a limited number of rooms with a microwave and refrigerator that are available on a first-come basis. Please make your reservations as early as possible. Other hotels in the area include Quality Inn (860-564-4021) and Holiday Inn Express (860-564-1010) in Plainfield, Connecticut (I-395 at exit 87). Camping is available at nearby Hopeville State Park (860-376-0313), and Countryside (860-376-0029), Ross Hill (860-376-9606) and Deer Haven (860-376-1081) campgrounds. There are several restaurants in the area, and a Home Depot and Walmart for anyone needing acetone or other supplies.

For those flying into the region, Griswold is approximately 38 mi. southwest from the T. F. Green Airport (PVD–Warwick, Rhode Island) and 58 mi. southeast from Bradley International Airport (BDL–Windsor Locks, Connecticut). Rental cars are available at both airports.


Attendees should plan to arrive on Thursday evening 20 June to take advantage of trips starting from the parking lot of the AmericInn on Friday 21 June at 8:30 AM. Field excursions on Friday and Saturday will occur in both Rhode Island and Connecticut. In Rhode Island, Arcadia Management Area and the Great Swamp Management Area provide excellent access to forested streams, swamps, ponds, bogs, and fens with good potential to produce Pine Barrens Bluet (*Enallagma recurvatum*), Attenuated Bluet (*E. daeckii*), two species of *Ophiogomphus* (*O. aspersus*, Brook Snaketail; *O. mainensis*, Maine Snaketail), Taper-tailed Darner (*Gomphaeschna antilope*), Coppery Emerald (*Somatochlora georgiana*) and three species of spiketails, (*Cordulegaster diastatops*, Delta-spotted Snaketail; *C. maculata*, Twin-spotted Snaketail; and *C. obliqua*, Arrowhead Spiketail). A fourth spiketail, *C. erronea* (Tiger Spiketail), has not been found in Rhode Island to date, but is present in nearby Connecticut and thus a target for survey in Rhode Island.

We will also explore several undersurveyed sites in eastern Connecticut, including the Quinebaug, Shetucket, and Pachaug Rivers (bring canoes/kayaks), and various wetland habitats in Pachaug State Forest (Voluntown). Target species include *Gomphus abbreviatus* (Spine-crowned Clubtail), *G. adelphus* (Mustached Clubtail), and three species of *Ophiogomphus* (*O. aspersus*, *O. mainensis*, and *O. rupinsulensis* [Rusty Snaketail]). Approximately 30 miles to the west is the Connecticut River, which should provide opportunities for finding two elusive clubtails—*Gomphus fraternus* (Midland Clubtail) and *G. vastus* (Cobra Clubtail). An early evening hunt for two species of shadowdragons, *Neurocordulia obsoleta* (Umber Shadowdragon) and *N. yamaskanensis* (Stygian Shadowdragon), will provide good sport for those willing to test their netting skills. Maps, site directions, county lists, and collecting permits will be provided at the meeting.

continued next page...

Calendar of Events

For additional information, see <<http://www.odonatacentral.org/index.php/PageAction.get/name/DSAOtherMeetings>>.

Event	Date	Location	Contact
DSA SE Regional Meeting	26–28 April 2013	Richmond, Virginia	Paul Bedell <ppedell@richmond.edu>
MOSP Gathering	14–16 June 2013	Red Lake WMA, Minnesota	Mitch Haag <hami0108@yahoo.com>
DSA NE Regional Meeting	20–23 June 2013	Griswold, Connecticut	Ginger Brown <vbrown@fullchannel.net>
DSA Annual Meeting	12–15 July 2013	Prince Albert, Saskatchewan	Dave Halstead <halstead@siast.sk.ca> 

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Other target species in both Connecticut and Rhode Island include *Enallagma laterale* (New England Bluet), *E. minusculum* (Little Bluet), *E. pictum* (Scarlet Bluet), *Nasiaeschna pentacantha* (Cyrano Darner), *Rhionaeschna mutata* (Spatterdock Darner), *Celithemis fasciata* (Banded Pennant) and *C. martha* (Martha's Pennant), among others.

If you have any questions, please contact Ginger Brown or Mike Thomas at the e-mail addresses listed above. Also, please let us know if you are planning to attend and when you have made your lodging reservations.

We look forward to seeing you this coming June.



Don't Forget to Renew Your DSA Membership!

This is the first ARGIA of 2013, so if you haven't renewed your membership yet, now is the time to do it!!! To renew your DSA membership and/or subscribe to Bulletin of American Odonatology, visit OdonataCentral and click on the "Societies" link in the top banner, or go directly to the URL <http://www.odonatacentral.org/index.php/PageAction.get/name/DSA_Membership>.

Orthemis discolor (Carmine Skimmer), New for Cuba and the Caribbean

Jerrell J. Daigle <jdaigle@nettally.com>

I have examined and confirmed *Orthemis discolor* Burmeister (Carmine Skimmer) from eastern Cuba. The specific data is as follows: Guantánamo Province, Camino a La Naza, Municipio Baracoa, 4 February 2008, 1 pair, Adrian Trapero; Santiago de Cuba Province, Rio Cauto, Muni-

cipio Palma Soriano, 23 February 2007, 1 male, Adrian Trapero and A. Cabrera. This is the first positive record of this species from Cuba and the Caribbean. It normally ranges from Texas to Bolivia.



Vous le Pensez Pleuvior Aujourd'hui?

Nick Donnelly <tdonnelly@binghamton.edu>

Are you kidding? Of course it's going to rain today. Just like yesterday, and just like tomorrow...

French Guiana was a new place for us (Ailsa, Nick, and son Malcolm), joined by Fred and Peg Sibley. We had been in Guyana in the early 70s and in southern Venezuela several times in the 60s, 70s, and 80s, but now we were pushing our tropical adventures right to the Atlantic Ocean border with Brazil.

Once again we mistimed our tropical trip, arriving too soon after the start of the wet season. The rains had just started, and our three fellow lepidopterists found the butterfly and moth collecting very poor. Most insects were just coming out. It could be global warming, but my personal history of judging the best timing for a tropical visit has been so poor for decades that I can only say that I have no knack for choosing seasons.

Our trip began inauspiciously. We arrived at the Binghamton airport on a warmish winter day to find that our flight (to Miami via Washington) was cancelled by fog, of all things. We drove to Syracuse to try for an

alternate flight via Newark and discovered that Newark was having the same problem. Now we were really stuck, because we would miss the only one day to Cayenne flight from Miami, and would have to overnight in Guadeloupe. (Tip: when scheduling a trip to a small French possession, better start in Paris; it is very difficult to reach it from any other point in the world.) When we finally arrived in Cayenne on the fourth day of our trip, we were very happy to see the remainder of the party—John Heppner, John Bedford, and Ichiro Nakamura, with whom we had traveled in the past.

Language was a problem. Arriving a few days before any of us, our leader e-mailed us, "Bring your French book. Am a little rusty with French, and the hotel had no one who could speak either English, German or Spanish, and only knew French." He was right—even the children all spoke French.

French Guiana is a backwater, known mainly as having been the place where Alfred Dreyfus and Papillon languished for years on Devil's Island. Now they downplay this "famous" site, and you have to search to find a boat

trip to the old island prison. What French Guiana now has is the European Space Agency's equivalent of Cape Kennedy, and you see in the airport many travelers with "aerospace engineer" written all over their faces. They launch a communications or scientific satellite only about once a month, so the place is still a little sleepy. It is very expensive because the food (and everything else) is flown in from France at vast expense. It is no exaggeration to say that in your jungle lodge you eat the same breakfast that you would in Paris: all the eggs, milk, butter, bacon, ham, bread, etc., are flown in.

Tourists looking for a jungle lodge experience have several possibilities, though less than ten percent of the country is accessible to travelers, and even this portion has few roads. The government is not anxious that the aboriginal population in the interior be exposed to outside influences, and ecotourists must find their adventure fairly close to the coast. We divided our time mainly between Patawa and Amazone Lodge, near Roura. Happily, the coastal mountains still have some fine habitat, though large portions of the forests are scrubby tropical second-growth forest. We were not overwhelmed by the number of odes that we found, and many evenings I processed fewer than a dozen specimens. During the entire two weeks, the four eager dragonfly enthusiasts never caught a clubtail (Fred did see one). So, how did it go?

Surprisingly well, as it turned out. We took more than seventy species—the exact number depending on our eventual abilities to identify several *Micrathyria* species. Libellulids comprised more than half the species total, consisting of eastern South America "old friends" such as *Rhodopygia* and *Zenithoptera*, and some exciting slight acquaintances such as *Misagria*, *Dasythemis*, and *Elga*. The most common forest dragonfly was *Misagria parana*, a *Pachydiplax*-sized libellulid that lurked along forest paths. Its larger relative, *Misagria calverti*, was scarcer. We took single specimens only of *Dasythemis essequiba* and *Elga* sp., both tiny, distinctly marked dragonflies essentially identical to each other in all ways except for the terminal appendages, which were very different. Belle's fairly recently described *Macrothemis brevidens* turned up, looking as casual as possible as it patrolled just like its Mexican–Central American close cousin, *M. inequiunguis*. *Micrathyria spinifera* was scattered in the forest and encountered singly along the paths. It and *M. hippolyte* were the most common, and *M. mengeri*, *M. dido*, and *M. pseudeximia* were also found. Males of two pond species and a female are still unnamed. Odonatists consider *Zenithoptera* "butterfly-like", because it sits with its black wings closed over its back. I asked John Bedford (a butterfly guru) if he thought it looked butterfly-like. "No" was his answer.

Orthemis were common and very challenging. *Orthemis discolor* was the common species, and Fred took *O. concolor*, *O. cultriformis*, and *O. ambirufa*. Several brightly marked *O. biolleyi* were found in open places in the forest. The tropical collector needs to net every large red-bodied libellulid male he sees, if only for a hand-lens examination. *Erythemis haematogastra* look exactly like some *Orthemis* species, and *Rhodopygia geijskesi* looks just like *Orthemis ambirufa*.

Uracis is a common genus that every odonatist quickly finds in tropical forest. The "usual suspects" that are widespread and seem to occur together are *U. imbuta* (smaller) and *U. fastigiata* (larger). We also found a third, *U. infumata*. The great mystery of this genus is that the females possess an ovipositor very similar to that of *Cordulegaster*. But only rarely are they seen laying eggs, and the larva has never been found. One afternoon I was treated to a good view of females of *U. imbuta* laying eggs in the soils of a forest path. Almost all previous viewings of egg laying have been in mud, sometimes covered with a thin film of water. Here, mating *U. imbuta* aggregated along a path that was still quite dry (the rains had only just started when we arrived), and the path was covered by dead leaves, all which were rolled up, like discarded cigars. Just-mated females of *U. imbuta* flew gently above these leaves, slowly descending like miniature helicopters, so that their vertical abdomens (with their pointy ovipositors) gently touched the soil between these leaves. They looked like tiny *Cordulegaster*s ovipositing in molasses. The soil was barely damp and rather firm. What really surprised me was that the females did not choose the lowest points (the places where rain water would soon collect in small puddles), but, in one case, a point about 20 cm higher than nearby low point in the path. When the soil moistened with rain, the tiny, newly emerged larva would have either to crawl about half a meter through dead-leaf debris to find a puddle, or, more intriguing, find a suitable moist habitat among this leaf debris. Is the larva of *Uracis* terrestrial? Why have we never solved this marvelous problem?

On previous trips we have enjoyed the company of one of our sons, Malcolm, whom we discovered long ago to be possessed of a sharp eye and a great swing. On this trip he distinguished himself yet again by finding a small, obscure damselfly which he told us sat with its wings spread. Indeed! It seemed way too small to be a megapodagrionid, and its flight seemed too gentle—one might say, ethereal—to be even close to anything we had ever seen in this family. When I finally found one, it looked for all the world like a large mosquito (or small crane fly) perched on a leaf by a forest stream. We could really make out nothing with a hand lens, and when we returned home I was amazed to see that it was a 2/3 size scale model of a damsel-

fly familiar from several past trips called *Dimeragrion per-cubitale*. But *Dimeragrion* is a conspicuous, large damselfly characteristic of the sandy streams of the Roraima Plateau of southern Venezuela and Guyana. Its sandy habitat is very different from the tiny, clay-bottomed, stony trickles in French Guiana. It is difficult to imagine that such a small damselfly, with different habits and a very different habitat, should be so similar. Will wonders never cease?

Malcolm was also responsible for the best find of this trip (or, indeed, of many trips)—a specimen of the dragonfly *Lauromacromia dubitalis*. This rarely-found dragonfly is presently placed uncomfortably (in my view) with the cordulids, or cordulines, if you prefer. When I saw Malcolm's specimen, I thought it looked just like a species of the African genus *Phyllomacromia*, and that it might imply an African origin for what would then be the only Neotropical genus of Macromiidae. Maybe we should reconsider the diagnosis for Macromiidae vs. Corduliidae.

Of the “real” corduliids, *Aeschnosoma forcipula* was encountered several times. It flies somewhat slowly along forest paths, and commonly lands on vegetation easily within reach of the net. Not surprisingly, it also came to the lights and light traps that our group managed.

Speaking of light traps reminds me that we found our share of aeshnids in the evening. *Coryphaeschna viriditas* and *C. amazonica* came to lighted sheets, and also flew commonly along the roads in the sun. Fred was given a huge female of *Neuraeschna producta* taken at a light by a French lepidopterist prior to our arrival. *Gynacantha* itself was mainly represented mainly by the dark species *G. membranalis*, which commonly flew (and always eluded me!) along the forest paths in the late afternoon. Malcolm and Fred were very successful in netting them; I was always flummoxed by them, and gave them the common name “Black-Ops Darner” as they burst from vegetation right in front me and promptly disappeared down the path.

On a tropical trip, the dedicated ode searcher always wants to find gomphids, the most desired group of dragonflies. In retrospect, it is commonly the damselflies that yield the most ultimate satisfaction. Here we found true “giants” of the odonate world, the famous “helicopters”. *Mecistogaster lucretia* has the longest abdomen of any odonate, and the sight of them flying slowly through the tropical forest is not readily forgotten. Ailsa, Fred, and Malcolm all caught gorgeous males, whose clear and smallish wings, (in contrast with the longer-winged but shorter-abdomened *Megaloprepus* of the cordilleran forests of Mexico to Bolivia) give them an other-worldly appearance as they cruise slowly, looking for spiders to snatch from their webs.


While we are on “BIG”, we have to mention the world's largest beetle (perhaps not the heaviest). This is a long-horn named *Titanus giganteus*, which looks like it could consume small children. John Bedford was tending his lighted sheet one night when he heard a loud “thump” on the ground several feet away. Looking for the source of the noise, he found this huge beetle walking determinedly towards the light. This was really the prize insect specimen of the trip!

Along some forest streams we found *Polythore picta*, with vividly marked wings. It is closely related to larger montane damselflies of the Andes, but is somewhat smaller. *Hetaerina* is always a delight and we were pleased to find both males and a female of the recently described *H. gallardi*, males of which have all wing tips marked with bright red, as well as the wing bases. Malcolm was delighted to find the only *Mnesarete* of the trip, a fine *M. cuprea*. He also found *Palaemnema brevignoni*, the easternmost occurrence of this genus. Fred found a lone female of *Chalcopteryx* sp. at Fourgassie Falls.

The only protoneurid damselfly we found was *Neoneura*. We could identify two of the three species (*N. myrthea* and *N. joana*, both originally described from Guyana), but a third, red species is still unnamed. These were all flying slowly over shaded streams, and were scarce.

As usual, the common damselfly genus *Argia* was both numerous and difficult. *Argia oculata* was almost everywhere, which is to be expected from its wide Neotropical distribution. The smaller “*paula*”, one of several species Dolly Gloyd once named but never formally described, was also fairly common, but difficult to find in the forest vegetation. There were a few of the dark-winged *A. fumigata* in the forest, and one occurrence of the widely distributed *A. indicatrix*.

In addition to odonates, we were treated to many other tropical birds and animals. One day we walked to a lek of the Guianan cock-of-the-rock, which is brilliant orange instead of the red of the Andean species. Several times we saw a monkey new to us, the yellow-footed tamarin. Malcolm managed to score an armadillo, and I stepped (lightly, happily) on a young fer-de-lance. Morpho butterflies were fairly common and, of course, spectacularly beautiful.

In spite of the rainy weather and too-early stage of the wet season, we had a wonderful time. No matter how disappointing a trip to a French place might be, I always remember a lesson learned early in my life—no Frenchman ever punishes his stomach! But if you go, take lots of euros... 

Vagrant Emperor, *Hemianax ephippiger* (Burmeister, 1839), in the New World: Synthesis and Comments on Recent Discoveries

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Vagrant Emperor (*Hemianax ephippiger*) is a well-known Palearctic migrant species originating from Africa that can reach the northernmost island of Iceland in summer. There is no consensus among odonatists concerning the correct assignment of *ephippiger* to the genus *Anax* or *Hemianax*. Recent studies both on adults and larval characters between the two genera have reinstated the discussion. Rowe (1991) showed that larval characters of *Hemianax ephippiger* are not shared with any other *Anax* species to date. Gentilini *et al.* (1993), attempting to map a small number of fossil wings onto extant taxa, place *ephippiger* and *papuensis* in the genus *Anax*. But the suppression of *Hemianax* is asserted as fact in the abstract, without any discussion in the text. In her phylogenetic study of the extant Aeshnidae, von Ellenrieder (2002) maintains the genus *Hemianax*.

This long debate seems to continue and we choose to keep a conservative point of view in using *Hemianax ephippiger*.

Hemianax ephippiger in the New World

The first known and documented observation of this Afrotropical aeshnid in the New World dates back to 2002 in French Guiana and constitutes the first record for the New World (Machet & Duquef, 2004). Later in 2006, a single female caught in Guadeloupe in the Lesser Antilles constituted the first record for the West Indies (Meurgey 2006). The following year, additional specimens were seen in the Virgin Islands in the Greater Antilles (Sibley, 2007) and two others (male and female) in Dominica (Meurgey and Weber, 2007) just south of Guadeloupe in the Lesser Antilles. As far as we know, no other record from the West Indies or the New World has been recorded since then (Meurgey & Picard, 2011).

Recently, Lionel Dubief and Vincent Lemoine kindly informed us that they found two specimens in Guadeloupe at the same locality as in 2006 and 2007 (northwest of Grande-Terre). The first specimen was caught on 15 October and a second was only observed on 23 October 2012.

A few months later, Maurice Duquef (2012) reported the capture of a teneral female in French Guiana on 21 March 2012, at almost the same locality as in 2002, indicating that the species probably breeds near Sinnamary. Follow-

ing this, Dennis Paulson (pers. comm.) informed us that the species now breeds with certainty on Curaçao where exuviae were found, and is reported from Aruba where 3 individuals were found on 1 January 2013 by Gert Veurink.

The arrival of several individuals in the West Indies in 2012 followed the tropical storm Rafael that originated on the west coast of Africa on 5 October and reached the Caribbean on 13 October. De Marmels (2007) stated that the arrival of African species such as *H. ephippiger* to the West Indies was correlated with the occurrence of tropical storms originating from the coasts of West Africa and was generally associated with large flows of Desert Locusts (*Schistocerca gregaria*).

Given that the species has been recorded as breeding in the Caribbean region, we believe the species will extend its distribution in ensuing years throughout the West Indies and establish populations. Future tropical storms originating in Africa subsequently reaching the West Indies may augment populations of this species in the West Indies. The arrival of Afrotropical species to the West Indies (*Hemianax ephippiger* and *Tramea basilaris*) and documented observations provides a unique opportunity to study the colonization of the Caribbean islands by species and to measure their negative or positive impact on native species.


We urge visiting and resident odonatists to send us their observations, which will allow us to study and monitor the evolution of the colonization by *H. ephippiger* throughout the West Indies

Acknowledgements

We warmly thank Lionel Dubief, Vincent Lemoine and Dennis Paulson for kindly sharing their observations.

References

- De Marmels, J. 2007. How and when did the Vagrant Emperor, *Hemianax ephippiger* (Burmeister, 1839) arrive in the Caribbean? *ARGIA* 19(2): 16.
- Duquef, M. 2012. Reproduction probable d'*Hemianax ephippiger* (Burmeister, 1839) en Guyane (Odonata: Anisoptera: Aeshnidae). *Martinia* 28 (2): 126.
- Gentilini, G. and G. Peters. 1993. The upper Miocene

- aeshnids of Monte Castellaro, central Italy, and their relationships to extant species. *Odonatologica* 22(2): 147–178.
- Machet, P. & M. Duquef. 2004. Un visiteur inattendu, et de taille!...*Hemianax ephippiger* (Burmeister, 1839) capturé à la Guyane française. *Martinia* 20 (3): 121–124.
- Meurgey, F. 2006. *Anax ephippiger*, new species for Guadeloupe (French West Indies). *ARGIA* 18 (1): 21–22.
- Meurgey, F. and L. Picard. 2011. Les libellules des Antilles françaises. Biotope éditions, Collection Parthénope, Mèze, France, 440 pp.
- Meurgey, F. and G. Weber. 2007. The Odonata of Dominica, British West Indies—2006 Collecting Trip. *ARGIA* 18 (4): 14–16.
- Rowe, R.J. 1991. Larval development and emergence in *Hemianax papuensis* (Burmeister) (Odonata: Aeshnidae). *Journal of the Australian Entomological Society* 30: 209–215.
- Sibley, F.C. 2007. Second record of *Anax ephippiger* (Vagrant Emperor) from the West Indies. *ARGIA* 18 (4): 17.
- von Ellenrieder, N. 2002. A phylogenetic analysis of the extant Aeshnidae (Odonata: Anisoptera). *Systematic Entomology (London)* 27: 1–31. 

Capture of the *Rhionaeschna mutata* (Odonata: Aeshnidae) in Quebec, a New Provincial Record

Alain Mochon, Yamaska National Park, Conservation and Research Officer <mochon.alain@sepaq.com>

In 2012, an inventory of the Odonata fauna of the bog of Lac des Atocas situated in the national park of Mont-Saint-Bruno (Quebec, Canada) was undertaken. The capture of one *Rhionaeschna mutata* (Spatterdock Darner) specimen (Figure 1) represents a new provincial record. According to Mr. M. Savard (pers. comm.), with this addition the Quebec Odonata fauna is now composed of 144 species. A description of the collecting site is given along with the conditions prevailing during the collecting activities.

Area of collection

Lac des Atocas (45.5440°N, 73.3121°W) is situated at about 25 km east of Montreal. It is part of a hydrographic system composed of five lakes interconnected by small streams (Figure 2). Lac des Atocas is small, with a surface of 0.68 ha (6800 m²). It is situated on Mont-Saint-Bruno at an elevation of 112 m in a moderately narrow depression where the microclimatic conditions are wet and cool. The shores are boggy with an abundance of sphagnum plants and acidophilic plants typical of a bog (Gratton, 1980). As a head lake it receives resurgent water and surface water from surrounding hillsides. The accumulation of organic matter gives this environment the characteristics of a minerotrophic bog. The water of this small lake is evacuated through a slow brooklet, which becomes intermittent in summer. This lake shelters an important population of amphibians, especially *Notophthalmus viridescens* (Eastern Newt), but no fish. As the summer progresses the water body is invaded by *Nuphar variegata* (Yellow Cow-lily). The bordering circumferences of the lake are occupied by a

red maple forest with *Betula alleghaniensis* (Yellow Birch) and *Alnus incana ssp. rugosa* (Speckled Alder) (Figure 3).

Capture of *Rhionaeschna mutata* in Quebec

It was a sunny and warm day on 30 June 2012 and many insect species were active. Many Odonata species were collected. At the end of the afternoon (16:45), the last specimen captured was an Aeshnidae about 6 cm long. However, its blue face and blue eyes were not usual characteristics of Aeshnidae, so pictures were taken and the specimen was brought back for formal identification. The morphologic features of the specimen—the blue face (Figure 4) and male appendages—distinguished it from any other known Quebec Aeshnidae. The captured specimen was *Rhionaeschna mutata* (Spatterdock Darner).



Figure 1. Mature male *Rhionaeschna mutata* (Spatterdock Darner) collected on 30 June 2012. Photo by Alain Mochon.

Contrary to the other darners which typically fly from mid- to late summer, the flight season of *R. mutata* is short and extends from the end of May to the beginning of July (NYNHP, 2011). The light blue face and deep blue eyes distinguish species of the *Rhionaeschna* genus in North America. The specific epithet *mutata* means “changed” and hints at the species looking like a “mutant” of *R. multicolor* (Paulson and Dunkle, 2012)

At least 46 species of Odonata are found in Lac des Atocas and its forested circumferences: 17 Zygoptera and 29 Anisoptera (Mochon, in prep.). However, the lake shelters some rare species such as *Erythemis simplicicollis*, (Eastern Pondhawk, rank S2), *Arigomphus furcifer* (Lilypad Clubtail, rank S3), *Cordulegaster obliqua* (Arrowhead Spiketail, rank S3), *Enallagma aspersum* (Azure Bluet, rank S3), *Libellula incesta* (Slaty Skimmer, rank S3), *L. luctuosa* (Widow Skimmer, rank S3) and *Stylurus notatus* (Elusive Clubtail, rank S3).

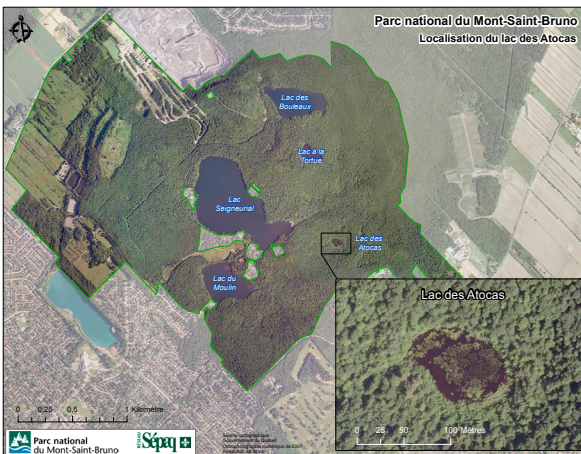


Figure 2. The Mont-Saint-Bruno National Park has an exceptional hydrographic system with five lakes connected by a network of brooks. Lac des Atocas is the smallest component.

Distribution of *Rhionaeschna mutata* in Northeastern America

Rhionaeschna mutata is an endemic species with a relatively limited distribution (von Ellenrieder, 2003). This darner is one of the rarest species in Canada (Oldham, 2006) and is known to usually live and reproduce in stagnant ponds free of fish and invaded by plants like waterlily (Paulson and Dunkle, 2012). In the U.S., the species is considered as “apparently secure” (rank N4). Nevertheless, it is considered “critically imperiled” (rank S1) in the states of New Hampshire and Vermont, “imperiled” (rank S2) in the state of New York and “vulnerable” (rank S3) in the state of Massachusetts (NatureServe 2012). In the state of Maine the status of this darner is still undecided because



Figure 3. Habitat at Lac des Atocas. Photo by Alain Mochon.

only two specimens were observed in 1998 (Brunelle and de Maynadier, 2005).

In Canada, NatureServe Explorer (2012) classifies the species as “critically imperiled” (rank N1). It was collected in localities in southwest Ontario (Curry, 2012; Oldham, 2006). In 2005 a specimen was captured in Nova Scotia without it being possible to confirm the presence of an established population (Cook and Bridgehouse, 2005; White *et al.*, 2010).

Conclusions

According to Catling *et al.* (1998) the diversity of the Odonata fauna is a means at our disposal for estimating the relative integrity of ecosystems. The presence of *R. mutata* is an addition to a long list of rare plant and animal species found in this national park’s environment. The question is now to know whether it is a permanent species or an accidental one, since it is known to fly long distances. In the event that its population is established in this environment, it can be expected to be low due to the



Figure 4. Light blue face and deep blue eyes distinguish *Rhionaeschna* in North America. Photo by Alain Mochon.

historic destruction of bogs and small lakes for human development. The introduction of fish and the northern limit of distribution of the darner are also factors to take in consideration.

Acknowledgments

I must thank Michel Savard, head of the Quebec Odonata Atlas Initiative, for providing comments on a draft of the manuscript, and Jean-Guy Pilon, Quebec specialist in odonatology, for the translation of the text. Special thanks are due to Nathalie Rivard, Donald Rodrigue and the wardens at the Mont-Saint-Bruno National Park for their precious support and for accommodating my visits so graciously.

References

- Brunelle, P.-M. and P.G. de Maynadier. 2005. The Maine damselfly and dragonfly survey. A final report prepared for Maine Department of Inland Fisheries and Wildlife (MDIFW), 31 pp. <<http://mdds.umf.maine.edu/MDDS%20Final%20Report.pdf>>
- Catling, P.M., R. Hutchinson and B. Ménard. 1998. Dragonflies and Damselflies. In: Assessment of Species Diversity in the Mixed Plains Ecozone. <<http://www.naturewatch.ca/MixedWood/odonata/odonata04.html>>
- Cook, C. and D. Bridgehouse. 2005. *Aeshna mutata* Hagen (Spatterdock Darner) in Nova Scotia, a new provincial record, and significant range extension. *ARGIA* 16 : 5.
- COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2012. Candidate Wildlife Species. Part 2: Candidate List Arthropods. Group 2: Mid priority candidates. Last update : October 2012. <http://www.cosewic.gc.ca/eng/sct3/index_e.cfm#8>
- Curry, B. 2012. Provincially rare dragonflies and damselflies in Hamilton, 2011. The Wood Duck (Journal of the Hamilton Naturalists' Club) 65(6): 133–134. <http://www.hamiltonnature.org/publications/Wood_Duck_February_2012.pdf>
- Gratton, L. 1980. Études floristique et phytosociologique du mont Saint-Bruno. Université du Québec à Montréal. Montréal, QC, 218 pp.
- Mochon, A. (in preparation). Liste provisoire des odonates à la tourbière du lac des Atocas, parc national du Mont-Saint-Bruno, Montérégie, et découverte de l'aeschna des nénuphars (*Rhionaeschna mutata*) au Québec. La Naturaliste canadien.
- NatureServe. 2012. NatureServe Explorer: An online encyclopedia of life. Version 7.1. NatureServe, Arlington, Virginia. <www.natureserve.org>. Last updated July 2012.
- NYNHP (New York Natural Heritage Program). 2011. Online conservation guide: Spatterdock Darner (*Rhionaeschna mutata*). Albany, New York, 7 pp. <<http://www.acris.nynhp.org/report.php?id=8214>>
- Oldham, M.J. 2007. Spatterdock Darner (*Rhionaeschna mutata*) in Ontario. *Ontario Odonata* 7: 10–15.
- Paulson, D. 2011. Dragonflies and Damselflies of the East. Princeton Field Guides. Princeton, New Jersey, 538 pp.
- Paulson, D. and S.W. Dunkle. 2012. A checklist of North American Odonata, including English name, etymology, type locality, and distribution. Occasional Paper No.56, Slater Museum of Natural History, University of Puget Sound, June 1999; updated February 2012. 86 pp.
- von Ellenrieder, N. 2003. A synopsis of the Neotropical species of 'Aeshna' Fabricius : the genus *Rhionaeschna* Förster (Odonata: Aeshnidae). *Tijdschrift voor Entomologie* 146: 67-207. <<http://nev.nl/tve/pdf/te0146067.pdf>>
- White, E.L, J.D. Corser and M.D. Schlesinger. 2010. The New York dragonfly and damselfly Survey 2005–2009: distribution and status of the odonates of New York. New York Natural Heritage Program, Albany, New York. 324 pp. <http://www.dec.ny.gov/docs/fish_marine_pdf/nyddsfinalreportpt1.pdf>. 

ARGIA is now only digital!

We know this isn't a welcome change for some, but this is a reminder that ARGIA will no longer be printed and hard copies mailed to members. With the advent of 2013, ARGIA is only available as a PDF online through OdonataCentral <www.OdonataCentral.org>. Benefits to going digital include a reduced DSA membership rate and unlimited color. All images and figures will still be of printable resolution, however, so you can print a high-quality copy for yourself as desired.

Erythrodiplax fervida (Red-mantled Dragonlet), a New Species for the United States

Rick Nirschl <ricknir@hotmail.com>

On 18 December 2012, I was photographing butterflies at the National Butterfly Center in Mission, Texas in Hidalgo County with Loren and Babs Paddleford, who were trailing me by about 100 feet. Both butterflies and dragonflies were in abundance this December with the unusually warm weather we had been having, so I wasn't surprised to see a dragonfly perched in the garden. But I was stunned to be looking at a brilliant red dragonfly that I had never seen before, at least in the United States, as I later learned. I carefully approached it and was fortunate to get two photographs before it disappeared (see front cover of this issue). We were unable to relocate it after about an hour of searching.

Later that afternoon, I went to Bentsen Rio Grande Valley State Park and sat with Assistant Superintendent Javier DeLeon, trying to identify this dragonfly without success. Using *Dragonflies and Damselflies of Texas* (Abbott, 2005), the closest we could come was Amanda's Pennant (*Celithemis amanda*), but the pattern on the abdomen was different and it had a red basal spot on the forewing, which would be absent in the pennant. That evening I sent the photos to John Abbott and Dennis Paulson, asking if this might be a Mexican species. Paulson immediately responded identifying it as *Erythrodiplax fervida* (Red-mantled Dragonlet). Abbott replied that it looked good for *E. fervida* but that he would like to check his specimens in the morning to rule out any other possibilities. An e-mail the next morning confirmed the species. Mike Rickard kindly posted the discovery on Texas Odes.


In late January 2013, the Dragonfly Society of the Americas accepted this record as *Erythrodiplax fervida*, added it to the checklist of North American Odonata, and assigned it the common name of Red-mantled Dragonlet.

Erythrodiplax fervida is a common tropical dragonlet and its appearance in the United States was not entirely unexpected (Abbott). Its range extends from South America through Central America and in Mexico north into the state of Tamaulipas. A review of my photographs from an August 2011 Central American trip showed that I had photographed this species in Panama.

Acknowledgements

Thanks to John Abbott and Dennis Paulson for their help in identifying this dragonfly.


References

- Abbott, J. C. Dragonflies and Damselflies that may ultimately occur in Texas. <<http://www.odonatacentral.org/index.php/PageAction.get/name/TXProbDragons>>. Updated December 2010.
- Abbott, J.C. 2005. Dragonflies and Damselflies of Texas and the South-Central United States: Texas, Louisiana, Arkansas, Oklahoma, and New Mexico. Princeton University Press, 360 pp.
- Texas Odes <<http://birding.aba.org/maillist/txod>>. 

Photos Needed for ARGIA

Do you have high-quality photos of odonates that you'd like to showcase? We are always looking for great photos to use on the front and back covers of ARGIA. Contact Celeste Mazzacano at <celeste@xerces.org> if you'd like to make a contribution. Please note that even though ARGIA is no longer being mailed as a hard copy, we are still striving for high-quality images that will have good resolution when printed. Images in TIFF format are best, but JPEGs work too as long as they are high quality and compression artifacts are limited. Resolution must be 300 ppi at about the sizes you see printed in this issue (no more than 6.5 inches in width).

DSA is on Facebook

 For those of you who stay connected using social networking sites, The Dragonfly Society of the Americas now has a Facebook group page. Upcoming events, publications, information, announcements, and links relating to the Society are posted here, as well as photos and discussions contributed by those who "like" the page. Find us at <<http://www.facebook.com/DragonflySocietyAmericas>>, or just search for "dragonfly society" within Facebook and the page will appear in the results list.

Argia johannella, New for Panama

Dennis Paulson, Seattle, Washington <dennispaulson@comcast.net>

The Odonata fauna of Panama is moderately well known in and around the Canal Area (Donnelly, 1992), but much remains to be learned about other parts of the country, many parts of which have still not been explored.

Argia johannella was described by Calvert (1907) from Juan Viñas at 1040 m, Cartago Province, Costa Rica, and there were no further published records of it until Brooks (1989) listed it from Estacion Pitilla, north side of Volcán Orosí at 680 m, Guanacaste Province, Costa Rica.

While living in Costa Rica in 1966–1967, I found the species common on the Caribbean side of the country at 30–700 m elevation, from Los Chiles to Laguna Arenal to Turrialba.

It has remained poorly documented but was also recorded from Honduras (Donnelly, 2000) and Nicaragua (Fred Sibley, in litt. 2003). It appears to be confined to or at least most widespread in the lowlands of the Caribbean side of Central America.

While co-leading a dragonfly nature tour to Panama, I found a small population of *A. johannella* on 2 September 2012 in a small marsh where a stream emptied into a lake at Altos del Maria (8.644°N, 80.073°W), elevation 940 m, Coclé. Photos were taken of both sexes by several members of the group, and identity was confirmed by Rosser Garrison. Co-occurring species were *Argia extranea*, *A. indicatrix* and *Cannaphila vibex*.

I also photographed a female *A. johannella* on 1 September 2012 at a tiny grassy stream and marshy pond at Canopy Lodge, El Valle de Anton (8.603°N, 80.130°W), 590 m, Coclé. Associated species there were *Acanthagrion trilobatum*, *Argia extranea*, *A. indicatrix*, *Remartinia luteipennis*, *Epigomphus* sp., *Dythemis nigra* and *Libellula herculea*.

These locations are on the Pacific side of Panama, so the species might occur elsewhere on that side of Central America wherever there is no real montane barrier between the two sides.



Argia johannella, representing a new species from Panama. Male (upper), female (lower). Photo by D. Paulson.

Literature Cited

- Brooks, S. J. 1989. Odonata collected from Guanacaste National Park, Costa Rica, July 1988. *Notulae Odonatol.* 3: 49–52.
- Calvert, P. P. 1901–1908. *Biologia Centrali-Americana*. Vol. 50: Neuroptera (Odonata), pp. vi–xxx, 17–420. R. H. Porter, Dulau & Co., London.
- Donnelly, T. W. 1992. The Odonata of Central Panama and their position in the Neotropical odonate fauna, with a checklist, and descriptions of new species. Pp. 52–90 in *Insects of Panama and Mesoamerica, Selected Studies*, D. Quintero and A. Aiello, eds. Oxford Univ. Press, Oxford.
- Donnelly, N. 2000. Visit to a little-known area—the Miskito Coast of Honduras. *ARGIA* 12(3): 17–18. 🦋

2013 Nick and Ailsa Donnelly Fellowship Awarded

The Nick and Ailsa Donnelly Fellowship has been awarded to François Meurgey for 2013. This fellowship will subsidize travel expenses so François can attend the 2013 DSA annual meeting in Prince Albert, Saskatchewan.

First Record of *Argia terira* From Panama

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Although it was not previously reported from the country, I found *Argia terira* Calvert common at a small cloud-forest stream above Guadalupe, Chiriquí Province, Panama, on a trail near the Los Quetzales Cabañas at 7700–8000 feet elevation. Males perched on a stone fence, leaves, and the ground in the late-morning sun where the stream crossed the trail. Several were photographed for documentation.

Argia terira was described in the *Biologia Centrali-Americana* (Calvert, 1907) from six male and three female specimens from Camino de la Palma, between Guadalupe and El Alto, San José Province, Costa Rica. Calvert & Calvert (1917) mentioned finding the species at Laguna del Reventado, near Cartago, Cartago Prov., at 9200 ft. Ris (1918) added records from La Trinidad, ? Prov., 5200 ft; Palo Verde, ? Prov., 5200 ft; and Volcán Irazu, San José Prov., 9200 ft. Garrison (1982) added a record from NE of San José, San José Prov., 4900 ft.



Argia terira, representing a new species for Panama. Photo by D. Paulson.

I have examined specimens from the following additional Costa Rican localities: Cerros de Escazú, San José Prov., 6800 ft.; La Chonta, 1.0 mi S El Empalme, Cartago Prov., 7600 ft; 7 km SE Cañon, Cartago Prov., 8400 ft; 23 km NW Villa Mills, Cartago Prov., 8200 ft; La Trinidad, km 71, Cartago Prov., 8500 ft; 5.1 mi San Rafael, Heredia Prov., 6000 ft; 3 mi N San José de la Montaña, Heredia Prov., 6300 ft; 1.0 mi SE Varablanca, Heredia Prov., 6700 ft; Varablanca, Heredia Prov., 6300 ft; Volcán Barba, Heredia Prov., 6200–8900 ft; and Monteverde, Puntarenas Prov., 4900 ft. As most elevations were reported in feet, I have converted meters to approximate elevation in feet for a few localities.


All of these localities are clustered in the mountains around the Meseta Central, from the Cordillera Central

northwest into the Cordillera de Tilarán and a bit southeast into the Cordillera de Talamanca. As the Talamanca range extends into western Panama, tying that region biogeographically to the highlands of Costa Rica, the occurrence of *A. terira* in Panama is not surprising. However, this record approximately doubles the length of its known range along the cordilleras.

The known elevation range of *A. terira* in Costa Rica and Panama is 4900–9200 feet. It lives in a variety of habitats in and out of forest, from small streams to marshy and boggy ponds, and shares with *A. chelata* the highest elevation records for *Argia* in either country. The latter species averages a bit lower elevation and is the only other *Argia* known to occur with *A. terira*. Both species have been seen active when it is cool and even cloudy, perhaps a prerequisite for living in a cool, cloudy climate!

A. terira is a large *Argia* (male total length around 45 mm), characterized by broad black middorsal and humeral stripes on a bright blue thorax and a black abdomen with the following blue: S1, basal half of S2 except for black stripe on each side, basal third to half of S3, and S8–10. Females have a brown thorax striped like that of males except for a narrower humeral stripe. The metepisternum (lower sides of the thorax) is entirely and uniquely yellow, a characteristic gold stripe shared by immature males. The abdomen is black, with pale markings on S8–10. The wings are golden in both sexes, another good identifying characteristic. No other species looks anything like it where it occurs.

Literature Cited

- Calvert, A. S., and P. P. Calvert. 1917. *A Year of Costa Rican Natural History*. MacMillan, New York, 577 pp.
- Calvert, P. P. 1901–1908. *Biologia Centrali-Americana*. Vol. 50: Neuroptera (Odonata), pp. vi–xxx, 17–420. R. H. Porter, Dulau & Co., London.
- Garrison, R. W. 1982. *Archilestes neblina*, a new damselfly from Costa Rica, with comments on the variability of *A. latialatus* Donnelly. *Occasional Papers of the Museum of Zoology, University of Michigan*, No. 702: 1–12.
- Ris, F. 1918. Libellen (Odonata) aus der Region der amerikanischen Kordilleran von Costarica bis Catamarca. *Arch. f. Naturgesch.* 82A: 1–197. 

An Unusual Form of the Hoary Skimmer (*Libellula nodisticta*) from the Northern California Coast Ranges

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Hoary Skimmer, *Libellula nodisticta* (Hagen) (Libellulidae), is a widely distributed but uncommon dragonfly in western North America. According to Manolis (2003) and Paulson (2009), it is usually found in the vicinity of springs. The male is the most lightly marked of the California *Libellula*, with a large black basal spot on each wing, but only a small black nodal spot, and with white suffusion reduced to a small patch near the wing base. The female wings are similar, but typically lack white coloration.

On 3 July 2012, while observing dragonflies at a small private lake near Willits, California, I photographed an unusual *Libellula* perching in tules (*Schoenoplectus*) at the edge of the lake. The very small black nodal spots differentiated it from the abundant *L. forensis* (Hagen) (Eight-spotted Skimmer), and I immediately assumed it to be *L. nodisticta* based on these spots. However, I subsequently looked at illustrations of *L. nodisticta* in *Dragonflies and Damselflies of California* (Manolis, 2003), and they didn't seem to match my dragonfly, which had much more white suffusion on the wings. On 5 July I found and collected two more males of the unusual skimmer, and photographed a third. All were along the lake's shoreline near large stands of tule, in the company of many *L. forensis*. The specimens were patterned essentially like a typical *L. nodisticta*, but had greatly extended white suffusion reaching from the base nearly to the tip of each wing, and somewhat larger black basal spots. *L. forensis* was abundant at the lake, and all individuals of that species showed less white and much larger nodal spots than the specimens in question.

I returned to the lake on 18 August, and in several hours of searching I found and collected a single tattered female of the unusual skimmer at the edge of a dense stand of tules. This female was patterned much like the males, except that the nodal spots were even smaller, and the white suffusion on the wings



Figure 1. Male *L. nodisticta* collected on 5 July 2012. Photo by N. Arthur.

was weaker (but still more extensive than on a typical male of *L. nodisticta*; see Figure 3).

A specimen was sent to Rosser Garrison for a genitalia examination, and he concluded that the dragonfly was indeed *L. nodisticta* but said he had never seen one with so much white. Additionally, the habitat in which they were collected is not typical for *L. nodisticta*, which usually occurs at springs. The habitat is a small man-made lake in oak/Douglas-fir forest in the northern California Coast Ranges. The elevation is approximately 2000 ft. (610 m) above sea level. The lake was not present before the 1960s. It is strictly closed to the public, and obtaining permission to enter the property is not possible.



Figure 2. Female *L. nodisticta* collected on 18 August 2012. Photo by N. Arthur.

Acknowledgements

Thanks to Rosser Garrison (Senior Insect Bi-systematist, Plant Pest Diagnostics Branch, California Dept. of Food & Agriculture) for identifying the unusual dragonfly as *Libellula nodisticta*.



Figure 3. Typical male *L. nodisticta*, Sonoma Co., California. Photo by David Hoffmann.

References

- Manolis, T. 2003. *Dragonflies and Damselflies of California*. University of California Press. 295 pp.
- Paulson, D. 2009. *Dragonflies and Damselflies of the West*. Princeton University Press. 536 pp.

Seeing Red: Late Summer and Early Fall in the Muleshoe Ranch Region of Southeast Arizona

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Most of the greater Nature Conservancy's Muleshoe Ranch region of Southeast Arizona lies between 1000 and 1500 m elevation. It consists for the most part of a convoluted tableland that is criss-crossed by a cluster of drainages, seven of which have permanent sections of water large enough to support native fish populations. Most of these drainages run from east to west, out of the Galiuro and Winchester Mountains, and eventually empty into the San Pedro River (when water levels are at their highest). In the mid 1990s, Muleshoe Ranch attained some notoriety when Desert Shadowdamsel (*Palaemnema domina*), a new family, genus, and species of odonate for the United States, was discovered breeding. Additional trips over the next decade also revealed breeding populations of Tarascan Dancer (*Argia tarascana*) and Pima Dancer (*A. pima*) in the canyons just north of the ranch headquarters. However, after a decade or more of drought throughout the southwest, both the *A. pima* and *P. domina* populations apparently suffered and repeated trips to Bass and Hot Springs Canyons on the Ranch failed to turn up either species. Of these "big three", only *A. tarascana* seemed to remain unscathed. Three visits to the region in late summer and early fall 2012 confirmed the continued presence of these species and led to other exciting discoveries.

30 August 2012: Swamp Springs Canyon

Arizona's field destinations are normally easy to access but a few require some difficulty to explore. These dif-



Male Sierra Madre Dancer (*Argia lacrimans*) at Hot Springs Canyon. Photo by P. Deviche.



Pima Dancer (*Argia pima*) pair in tandem. Swamp Springs Canyon. Photo by D. Danforth.

ficult places can be rewarding, but many times they are a real disappointment. Certainly, most superlative is when a new field site is extremely difficult to reach but produces outlandishly good results. Such was the case with Swamp Springs Canyon, which is just north of the Muleshoe Ranch. After conferring with the manager of the Muleshoe Ranch about our difficulty in accessing a major drainage (Redfield Canyon) due to our being denied access to a privately owned stretch, he explained that there was yet another possibility. One of the tributaries of Redfield Canyon could be reached but it involved a difficult trek. First we (Bailowitz and Danforth) would need to traverse nine miles of slow-going rough road requiring a good high-clearance vehicle. Then we would need to bushwhack two miles on foot down the appropriate drainage to reach a stretch of canyon (Swamp Springs Canyon) with permanent water.

We spent the bulk of the day getting in and getting out. But the few hours along the springs yielded everything we had hoped for and then some (see complete list below). We ended the day with 24 species, four of which were new to Graham County. We succeeded in getting the big three: *P. domina* and *A. pima* in some numbers, and a singleton *A. tarascana*. But the most amazing find was an extensive, apparently breeding population of Mayan Setwing (*Dythemis maya*). Close to 30 males and at least four females and were observed. This represents the first documentation of a female in the state, and every female we saw was observed ovipositing.

The permanent reaches of water in the canyon are a series of spring-fed terraced pools beneath a canopy of cottonwood, ash, willow, and sycamore trees. In the dim light of the heavily forested canyon was an array of bright red species. First and foremost were the *D. maya* males with their dazzling red, a series of beacons in the shade. Four other reddish species also competing for attention included Neon Skimmer (*Libellula croceipennis*), which was as common as the setwing; Flame Skimmer (*L. saturata*), almost as common; Canyon Rubyspot (*Hetaerina vulnerata*), eight seen; and Desert Firetail (*Telebasis salva*), with about 20 seen. Also brilliant red and surrounding the majority of the pools were Cardinal Flowers (*Lobelia cardinalis*). The oddly behaving bright blue Desert Shadowdamsel (*P. domina*) hanging out in the shady recesses of the canyon and in flood debris added to the exoticness of the place. And, for extra spice, Black-and-White Damsel (*Apanisagrion lais*) was as common as you will ever see it. The russet canyon walls, thick green canopy, sparkling turquoise water, and incandescent fire-colored flowers and insects combined to make a feast for the eyes.

October 2012: Double R, Bass, and Hot Springs Canyons

The Muleshoe Ranch region includes several sites of interest that are easier to access than Swamp Springs Canyon. These include the ranch headquarters, where a permanent hot spring forms a small shaded pond, and Double R, Bass, and Hot Springs Canyons. These canyons can be accessed from the headquarters by foot or a short drive and they present many of the characteristics of Swamp Springs Canyon, including shaded water pools and stretches of shallow, spring-fed streams.

During a visit on 6–7 October, Jim Burns surveyed the ranch headquarters and Double R Canyon. This survey yielded 21 species, comprising 15 species observed in August in Swamp Springs Canyon plus six other species (see complete list below). Most remarkable were two male Carmine Skimmers (*Orthemis discolor*) at the ranch headquarters. Oddly, for a species so common in our neighboring state of Sonora, this represents only the fourth record for Arizona.

Finally, on 13 and 14 October, Pierre Deviche surveyed Bass Canyon as well as Double R and Hot Springs Canyons <<http://azdragonfly.net/location/muleshoe-ranch>>. At these sites he found a total of 33 species, including 11 that had not been seen in August or early October (see complete list below). Hot Springs Canyon contained by far the highest

species diversity. The most interesting finding at this site was a male White-tailed Sylph (*Macrothemis pseudimitans*; <<http://azdragonfly.net/news/335>>) that provided the second US record of the species. Other species in Hot Springs Canyon included approximately 15 *D. maya* (<<http://azdragonfly.net/news/336>>), including one pair in wheel and then seen ovipositing, suggesting local breeding; one male Spot-winged Meadowhawk (*Sympetrum signiferum*, close to the northern limit of the species); about 30 *Argia tarascana*; three Sierra Madre Dancers (*A. lacrimans*); and one male *A. pima* (another male was present in Double R Canyon). A male Slough Amberwing (*Perithemis domitia*) provided a new late flying date for this species in Arizona. Despite seemingly appropriate habitat, no *P. domina* was found. However, mid-October may be too late for this species and a systematic search earlier in the year in Hot Springs Canyon, where the species was discovered in the 1990s, may reveal its continued presence.

Taken together, these surveys, conducted over a 6 week long period, revealed the presence of 42 species, an excellent number for any region of this size in the Southwest.



Male (upper) and female (lower) Mayan Setwing (*Dythemis maya*) at Swamp Springs Canyon. Photo by D. Danforth.

List of species seen in the Muleshoe Range region 30 August (*), 6-7 October (^), and 13-14 October (#) 2012

Blue-eyed Darner (*Rhionaeschna multicolor*)*^
 Malachite Darner (*Remartinia luteipennis*)*^#
 Persephone's Darner (*Aeshna persephone*)^
 Serpent Ringtail (*Erpetogomphus lampropeltis*)*#
 Pale-faced Clubskimmer (*Brechmorhoga mendax*)#
 Blue Dasher (*Pachydiplax longipennis*)^
 Mayan Setwing (*Dytthemis maya*)*#
 Red Saddlebags (*Tramea onusta*)#
 Neon Skimmer (*Libellula croceipennis*)*^#
 Flame Skimmer (*L. saturata*)*^#
 Roseate Skimmer (*Orthemis ferruginea*)#
 Carmine Skimmer (*O. discolor*)^
 Red Rock Skimmer (*Paltobemis lineatipes*)*#
 Slough Amberwing (*Perithemis domitia*)*#
 Mexican Amberwing (*P. intensa*)^#
 Filigree Skimmer (*Pseudoleon superbus*)*
 White-tailed Sylph (*Macrothemis pseudimitans*)#
 Variegated Meadowhawk (*Sympetrum corruptum*)*^#
 Spot-winged Meadowhawk (*S. signiferum*)#
 Common Whitetail (*Plathemis lydia*)^
 Wandering Glider (*Pantala flavescens*)^

American Rubyspot (*Hetaerina americana*)#
 Canyon Rubyspot (*H. vulnerata*)*^#
 Great Spreadwing (*Archilestes grandis*)*^#
 Shadowdamsel (*Palaemnema domina*)*
 Painted Damsel (*Hesperagrion heterodoxum*)^#
 Black and White Damsel (*Apanisagrion lais*)*^#
 Lavender Dancer (*Argia hinei*)*^#
 Aztec Dancer (*A. nabuana*)#
 Fiery-eyed Dancer (*A. oenea*)#
 Sooty Dancer (*A. lugens*)*#
 Amethyst Dancer (*A. pallens*)*^#
 Pima Dancer (*A. pima*)*#
 Springwater Dancer (*A. plana*)*^#
 Spine-tipped Dancer (*A. extranea*)#
 Tarascan Dancer (*A. tarascana*)*^#
 Sierra Madre Dancer (*A. lacrimans*)#
 Mexican Forktail (*Ischnura demorsa*)#
 Familiar Bluet (*Enallagma civile*)*^#
 Arroyo Bluet (*E. praeviarum*)*#
 Desert Firetail (*Telebasis salva*)*^#



Male White-tailed Sylph (*Macrothemis pseudimitans*) at Hot Springs Canyon. Photo by P. Deviche.



Male (upper) and female (lower) Desert Shadowdamsel (*Palaemnema domina*) at Swamp Springs Canyon. Photo by D. Danforth.



Male Spot-winged Meadowhawk (*Sympetrum signiferum*) at Hot Springs Canyon. Photo by P. Deviche.

Monitoring *Celithemis elisa* (Calico Pennant) Emergence: Year 8 and Counting

Sue and John Gregoire, Kestrel Haven Avian Migration Observatory, Burdett, New York 14818 <khmo@empacc.net>

For odonates in central New York, the 2012 season was dismal. During the winter, temperatures were way above normal, resulting in no ice cover on lakes, ponds and streams. Lack of snowmelt and rainfall left all water levels frighteningly low, then a very warm (hot) March and April wreaked havoc on normal phenology. As the season progressed, high temperatures and continuing drought dried up many wetlands by late May.


All this culminated just as our study of the emergence season for *Celithemis elisa* (Calico Pennant) was beginning. We have monitored their activity here for seven years and we were eager to see how these adverse conditions affected the population here. As we suspected, emergence began a little earlier than in previous years, but not by much. The trend has been for earlier emergence almost every year, so this was not unexpected. Each year, a peak period of emergence commences immediately, lasts a few days, and then reduces to a slower pace. After the initial burst, emergence continues in lower but steady numbers punctuated with occasional small surges lasting a few days. The pattern continued in 2012, although in low numbers overall. This too, was not unusual. As indicated in the accompanying table, their numbers have fluctuated greatly over the seven-year study period.

Normally, emergence extends into late July, sometimes into August. In 2012, only a few emerged in late June and the population produced its last teneral in early July. It seemed very early to us but, accounting for the early beginning, was not beyond the range of total emergence periods we had previously witnessed.

In summary, by their standards, the emergence season for *C. elisa* was successful and normal. Their pond is deep and

Table 1. Summary of *Celithemis elisa* activity. Numbers derived from a single daily circumnavigation of the study pond.

Year	Season Total	Peak Period	Peak % of Total	Total Emergence Period
2005	2,455	7-11 June	83% (2,028)	>62 days
2006	10,944	5-9 June	47% (5,169)	63 days
2007	6,497	1-6 June	75% (4,892)	61 days
2008	8,237	8-12 June	76% (6,244)	64 days
2009	1,505	6-10 June	15% (229)	68 days
2010	642	31 May-4 June	43% (277)	82 days
2011	1,933	1-7 June	58% (1,152)	52 days
2012	982	27-31 May	57% (556)	54 days

withstood the heat and drought, although it lost almost four feet in depth overall. Numbers were low, but not the lowest we've seen. With continuing study, we hope to set parameters around what *C. elisa* considers "normal". Each year presents a different set of standards for us to ponder. As a result of the bad weather in 2012, we do not expect an abundant 2013, but it will no doubt give us something more to think about. 

Advice Column

You cannot outwait a friendly dog. No matter how long you stay hunched over below window level in your car, whenever you pop up he will be waiting beside the driver's door, gazing up adoringly, tail thumping in expectation. You will either have to give up on odeing this site today, or give in and let him come along.

M. Dobbs

If you have any short notes of advice relating to lessons you've learned in your experiences with odonates that you'd like to pass on to fellow odonate enthusiasts, send them to the editor <celeste@xerces.org> and we will share your wisdom with the world.

Five Observations of *Boyeria* (Anisoptera: Aeshnidae) Roosting During the Night Mostly on Outdoor Parts of Buildings, Near Streams

Raymond Hutchinson, <raymond.hutchinson@sympatico.ca>

How surprised could one be to discover adult aeshnids, namely *Boyeria*, roosting or spending the night on outdoor parts of buildings situated in the country, near streams? The following are five instances of such observations over the years from summer nature study camps where I have tried to spread the love of insects, especially dragonflies. On 8 August 2000, at a summer camp near Rawdon, north of Montreal, a female *Boyeria vinosa* (Fawn Darner) was completely immobile, suspended on the ceiling clinging by the front legs, just inside a very long wooden building, in the hall leading to the outside door. It was around 10:30 PM. Upon delicate manipulation, it was evident that the dragonfly was not dead, but in a kind of comatose state (Hutchinson, 2001). A couple of years later at Chertsey, also in the Laurentians, north of Montreal, another female *B. vinosa* was observed under similar conditions, but this time dangling from the ceiling of an outdoor washroom; some modest movement showed us that the dragonfly was alive and well, but just roosting around 11 PM (Hutchinson, 2001).


As a science camp animator for many years at Port-au-Saumon in the Saguenay River area, I witnessed three more cases of roosting *Boyeria*, this time all *B. grafiana* (Ocellated Darner). On the last day of July 2009, a male *B. grafiana* was suspended on the wooden arm of a balcony, just under two light bulbs that were left shining till midnight, so that the young entomologists of the nature camp, Ère de l'estuaire, could start building a collection from insects coming to light, starting around 9 PM. Another *B. grafiana*, this time a female, was found under exactly the same conditions under the light bulbs, on 1 August 2009. Finally, on 13 July 2012, a female *B. grafiana* was observed suspended on the ceiling of a building where campers take their showers before retiring for their night sleep. A light bulb remained shining all night at this spot. These observations are carefully recorded in the field notebooks that I have accumulated since 1972 (108 notebooks).

Two reasons may explain why these observations were made. First, netting insects that come to light is a conve-

nient way to start a collection. The campers marvel at the sight of numerous spectacular insects that appear out of the surrounding obscurity, especially spectacular moths. Furthermore, collecting spiders around these shining lights is another activity of the camp for interested young naturalists. Over the years, I have learned to appreciate and identify many spiders to species. These roosting *Boyeria* observations are an adjunct to the two other activities that take place just after bedtime or early morning. When a roosting *Boyeria* is found, I ask the campers to leave the dragonfly untouched until I arrive to register and note different aspects of the roosting dragonfly's behavior.

I have surveyed the literature summarizing night-roosting Odonata in the past (Hutchinson 1976a, 1976b) and recorded my modest discoveries in the field (Hutchinson, 1976c). Corbet (1999) records a number of roosting Odonata observations made by different odonatists. Given the Port-au-saumon camp will still exist perhaps for a few years, it is feasible that similar observations might be made again in the future and can be reported.

References

- Corbet, P.S. 1999. Dragonflies, Behavior and Ecology of Odonata. Comstock Publishing Associates, Ithaca, New York. 829 pp.
- Hutchinson, R. 1976a. Quelques données préliminaires sur les dortoirs de libellules (première partie). *Cordulia* 2: 72–76.
- Hutchinson, R. 1976b. Quelques données préliminaires sur les dortoirs de libellules (seconde partie). *Cordulia* 2: 81–86.
- Hutchinson, R. 1976c. La récolte d'odonates dans leur dortoir. *Cordulia* 2: 87.
- Hutchinson, R. 2001. Découverte d'une *Boyeria vinosa* Say femelle (Odonata: Aeshnidae) suspendue au plafond d'un bâtiment en fin de soirée. *Nouv'Ailes* 11(1): 3. 

ARGIA has a New Editor-in-Chief

After many years of hard work, John Abbott is handing over the net handle of editorship to Celeste Mazzacano. Please be patient in the coming year as she makes the transition, and note new editor contact <celeste@xerces.org>.

Spiders Collected in Odonata Exuviae in the Province of Quebec

Raymond Hutchinson <raymond.hutchinson@sympatico.ca> and Benoît Ménard <menardben@videotron.ca>

For over thirty years, both authors have been collecting a few odonate larvae and exuviae at each outing. About 6,000 larval and exuvial specimens have been donated to the Canadian National Collection (CNC) of insects, arachnids and nematodes of Agriculture Canada, in Ottawa. About 80 species or more are in the CNC. However, a few need to be identified to species, namely zygopterans, *Aeshna* (mosaic darners) specimens and some *Somatochlora* (emeralds). Both authors have fairly large holdings of larvae and exuviae in their homes.

The first author has furthermore learned to identify many common Quebec spiders to species with the help of Charles Dondale and Jim Redner, CNC arachnologists (now retired), who built the AgricultureCanada Spider Collection (about 500,000 specimens).

Recently, we discovered that live spiders could be found in dragonfly exuviae. Although this behavioral trait of spiders does not appear to be very frequent, we are able to report a few cases where we have found spiders in odonate exuviae.

On 1 October 2005, under a bridge with much traffic in Gatineau, we discovered exuviae containing live spiders, including a female *Steatoda bipunctata* (Theridiidae; False Widow) spider residing in a larval skin of *Epithecina princeps* (Prince Baskettail). The remains of two flies and some spider silk (probably part of a molt) were observed in the dragonfly exuvia (Figures 1 and 2). Another *E. princeps* exuvia contained a *Tetragnatha* sp. (Tetragnathidae; Orbweaver) spider, and an exuvia of *Neurocordulia yamaskanensis* (Stygian Shadowdragon) was found to harbour a *Steatoda*



Figure 1. *Epithecina princeps* (Prince Baskettail) exuvia with spider silk. Photo by Raymond Hutchinson.

bipunctata female and the remains of a spider molt. We also collected exuviae of the dragonflies *Libellula luctuosa* (Widow Skimmer) and *Epithecina cynosura* (Common Baskettail) with spiders but lost the

spiders because they fell from the exuviae on the grassy soil at our feet. We were unable to recoup the lost spiders (Hutchinson and Ménard, 2010). When the presence of a spider is suspected in a skin, it is advisable to keep an insect net underneath so that the specimen will fall into the net, instead of on the ground.

On 16 June 2012 at Luskville, on the shore of the wide Ottawa River, one of many larval skins collected of *Stylurus notatus* (Elusive Clubtail) contained a rarely found spider for the province of Quebec, *Clubiona maritima* (Leafcurling Sac Spider), only the second record for the province (Bélanger and Hutchinson, 1992). Details of this capture are given in Hutchinson (2012).

Manolis (2008) has also reported a male *Sassacus vitis* (Jumping Spider) in a larval skin of *Macromia pacifica* (Gilded River Cruiser).


When searching for spiders in odonate exuviae, one must isolate each species in an individual vial while observing the possible presence of silk, remains of molt or prey, etc. It remains to be discovered how frequently spiders may adopt odonate larval skins as a refuge or residence to pursue their activities. In Gatineau, the underside of the bridge where our specimens were found is protected from wind and water and many spiders can be observed walking or hiding near the Odonata skins. The same cannot be said of the extensive stone walls on the shore of the Ottawa River in Luskville. Larval skins on the underside of the Gatineau Bridge can remain there for months protected from wind and water and snow, so that spiders can in all likelihood find long-term lodgings. The skins in Luskville are often blown away by wind or washed away by trickling water.

In the future, we will be watching for new sightings of spiders in Odonata exuviae.



Figure 2. *E. princeps* (Prince Baskettail) exuvia with spider silk. Photo by Raymond Hutchinson.

References

- Bélanger, G. and R. Hutchinson. 1992. Liste annotée des Araignées (Araneae) du Québec. *Pirata* 1(2): 2–119.
- Hutchinson, R. 2012. Une nouvelle mention de l'araignée rarement récoltée au Québec, *Clubiona maritima* (Araneae : Clubionidae) dans une exuvie de *Stylurus notatus* (Odonata : Gomphidae). *Nouv'Ailes* 22(2): 16.
- Hutchinson, R. and B. Ménard. 2010. Des araignées (Araneae) dans des exuvies de libellules (Odonates, Anisoptères). *Nouv'Ailes* 20(1): 19.
- Manolis, T. 2008. Spiders residing in Odonata exuvia—an update and request for information. *ARGIA* 20(3): 19. 

Request for Help on Nebraska Dot Map Records

Fred Sibley, 2325 County Rd. 6, Alpine, New York 14805 <fcsibley@empacc.net>

As many in the odonate community are aware, records for the North American Dot Map project were combined to reflect county-level records and thus no information on collector, dates, or specific locality were available for incorporation in the OdonataCentral database.


Matching of these Dot Map records for Nebraska to actual specimens or photos in preparation for a report on odonate distribution has been a difficult process. Over 150 records still lack data and the majority of these are from the 1998 DSA meeting in Valentine, Nebraska.

If you submitted records to Nick Donnelly or Roy Beckemeyer after the meeting for inclusion in the Dot Map project I would love to hear from you, either via e-mail <fcsibley@empacc.net> or earth mail (Fred Sibley, 2325 Co. Rd. 6, Alpine, New York 14805).

Most collecting was done in Cherry County, but only four species now lack data: *Lestes australis* (Southern Spreadwing), *Coenagrion resolutum* (Taiga Bluet), *Aeshna palmata* (Paddle-tailed Darner) and *Epitheca princeps* (Prince Baskettail).

However, there are numerous records with missing data from Antelope, Brown, Holt, and Keya Paha Counties at the northern border of the state, and from Dawes, Sheridan, and Sioux Counties in the northwest corner of state. These were probably collected by DSA members before or after the meeting.

Species of special interest would be *Argia plana* (Springwater Dancer) from Keya Paha County, *Boyeria vinosa* (Fawn Darner) from Brown and Keya Paha Counties, *Epitheca costalis* (Slender Baskettail) from anywhere in state but particularly the Dot Map records from Holt and Lincoln Counties (note the Lincoln County record might also be listed as Dot-winged Baskettail), and *Somatochlora ensigera* (Plains Emerald) from Sioux County.

There is a record of *Ischnura cervula* (Pacific Forktail) from Kimball County. This is the only record for Nebraska and there is no indication in the Dot Map records of who supplied the it. Any additional information about this record would be appreciated. 

DSA Voting is Now Online

Please be sure to vote for the President Elect and a new Regular Member. Voting can be done now online. Go to <<http://www.migratorydragonflypartnership.org/vote>> and cast your vote. The voting page is actually hosted on the Migratory Dragonfly Partnership (MDP) website, a sister site to OdonataCentral. This is temporary as we move OdonataCentral over to a new database schema. If you are a registered OdonataCentral user, your username and password will allow you to log in to the Migratory Dragonfly Partnership site. The easiest thing to do is follow the link above, or type it in your browser, and log in to the MDP website using your OdonataCentral username and password. You will then automatically be taken to the voting page where you can cast your vote. If your browser doesn't take you directly to the voting page, click on the "Vote in the DSA Election" link on the MDP home page.

Skydiving Dragonflies

James S. Walker, Anacortes, Washington <jswphys@aol.com>

Dragonflies are masters of flight. It's no surprise, then, that they carry out many of their daily activities while on the wing, including eating, drinking, mating, and egg laying. Some dragonflies even clean themselves as they fly. One way they do this is to perform a series of splash-dunks, followed by a vigorous spin-dry at about 1,000 rpm (Walker 2011a, 2011b, 2012). In this article, we consider another method—referred to as “skydiving”—that dragonflies may use for cleaning while in flight.

To get a mental picture of this technique, imagine a human skydiver plunging toward the ground before opening the parachute. The diver's arms are raised, and the legs are bent at the knee with the feet pointing upward. Darners are observed to adopt a similar position while in flight, and then to drop briefly in “free fall” for about 0.125–0.250 s. During free fall the wings are held almost straight upward, like the arms of a skydiver, and the abdomen is arched upward as far as it will go. Figures 1 and 2 show a Paddle-tailed Darner (*Aeshna palmata*) going into this position and beginning to fall. A slow-motion video of the maneuver can be seen at the Dragonfly Whisperer channel on



Figure 1. Male Paddle-tailed Darner (*Aeshna palmata*) making the transition from normal flight to skydive. Abdomen is partially raised and flapping has almost stopped.



Figure 2. Darner in full skydive; wings raised and stationary, abdomen flexed upwards as far as it will go. Darner drops in freefall $\sim 1/4$ s before continuing usual flight pattern. Skydive maneuver is often done 2–3 times in succession.

The Cleaning Hypothesis

The natural question at this point is: Why do dragonflies skydive? A number of alternatives come to mind. Perhaps it's just an enjoyable maneuver, giving the body a nice stretch. A more serious possibility is that by skydiving a darner is able to lose altitude rapidly, like a whiffing goose, though they could probably do that more quickly with powered flight.

Perhaps the most reasonable hypothesis is that darners are cleaning themselves when they skydive, by rubbing the wings and abdomen against one another. We see this type of cleaning behavior in perching odonates, such as spreadwings. For example, Figure 3 shows a perched Spotted Spreadwing (*Lestes congener*) stretching its abdomen upward to contact the wings. This type of behavior is usually attributed to cleaning, which seems to match observations. Perching odonates land to start cleaning like this, but darners are more likely to keep flying and do their cleaning on the wing.

As I researched the possibility of a cleaning hypothesis for skydiving, I consulted Corbet (1999). He reviews a number of different cleaning mechanisms, but what caught my eye was Figure 8.34 (E) on page 333. This drawing shows a dragonfly (*Aeshna cyanea*) in flight in the “skydive position” as it cleans its abdomen and/or wings. The drawing matches the behavior and posture seen in the slow-motion videos surprisingly well. According to Corbet, abdomen flexing like this, which he calls “abdomen bobbing”, can be a wing-cleaning movement “for both perched and flying dragonflies”.

Which Dragonflies Skydive?

So far, we've seen skydiving only in darners, specifically Paddle-tailed Darners (*A. palmata*) and California Darners (*Rhionaeschna californica*). It's quite likely that similar darners in our area also skydive, though no specific observations have been made at this point. This seems even more likely, given that European hawkers, like Corbet's *A. cyanea*, also exhibit skydive behavior.

Perching dragonflies like skimmers have not been observed to skydive so far. This may be because they do their cleaning when perched. In addition, their shorter, stubbier abdomens may be harder to flex upward into a skydiving position.

Will skydiving be observed in other families of odonates as well? Time will tell, but it would seem reasonable that other flying dragonflies with long, thin abdomens may exhibit similar behavior.

Acknowledgements

I would like to thank Betsy Walker for her constant support and help with these investigations.


Literature Cited

- Corbet, P. 1999. Dragonflies: Behavior and Ecology of Odonata. Ithaca, New York: Cornell University Press, page 333.
- Walker, J. S. 2011a. Spin-Dry Dragonflies. *ARGIA* 23(3): 29–31.
- Walker, J. S. 2011b. Splash-dunk analysis. *ARGIA* 23(4): 29–30.
- Walker, J. S. 2012. Splash-dunking gone bad: the sticking frequency. *ARGIA* 24(1): 19–22.



Figure 3. A male Spotted Spreadwing (*Lestes congener*) flexes its abdomen upward so that it touches the wings. This is presumably a mechanism for cleaning the abdomen and/or the wings.

Online Material

A number of slow-motion videos showing various dragonfly behaviors can be found on the Dragonfly Whisperer channel on YouTube. The skydiving video mentioned above is called “Skydiving Dragonfly, by The Dragonfly Whisperer”, at https://www.youtube.com/watch?v=GC_gm9tjaDY. 

Dorsal Stripe on S2: A Useful Field Mark for Mosaic Darners

James S. Walker, Anacortes, Washington <jswphys@aol.com>

Field marks are an important part of dragonflying, just as they are for birding. This is especially true if, like me, you dragonfly with binoculars and a camera. Having a suite of field marks for a particular species is useful because any single field mark may vary from individual to individual, or may not be visible from a particular vantage point.

In addition, a photo you’ve taken may show only part of a dragonfly’s body. When you get home and view the photo on the computer, a field mark you would like to use for identification may not be visible. This is what motivated me to look for a field mark on the anterior end of mosaic darners to distinguish among the various ones that are common in our area.

Dorsal Stripe On S2

After a few false starts, I settled on the blue dorsal stripe on S2 as a particularly visible and distinctive field mark. It is now one of my favorite tools in the field when using binoculars to distinguish species like Paddle-tailed Darner (*Aeshna palmata*) and Shadow Darner (*A. umbrosa*). I’ve also had good luck with this field mark in identifying Variable Darner (*A. interrupta*) and Walker’s Darner (*A. walkeri*). Here’s a brief verbal description of the blue dor-

sal stripe in these four species:

- Paddle-tailed Darner (*A. palmata*): Thin and straight with sharp edges. It may break at about the midpoint of the stripe, or continue with uniform width.
- Shadow Darner (*A. umbrosa*): Broad in the middle, with a “spindle” or “urn” shape overall. The edges of the stripe are generally a bit fuzzy or diffuse.
- Variable Darner (*A. interrupta*): An incomplete stripe, extending from the posterior end of S2 forward to roughly the middle of the segment. It is relatively thin.
- Walker’s Darner (*A. walkeri*): Fairly straight, with a noticeable taper from a wider base at the posterior end to a narrower top at the anterior end.

When seen in the field, the broad blue dorsal stripe on the Shadow Darner (*A. umbrosa*) gives S2 a much “bluer” overall appearance than is the case with the Paddle-tailed Darner (*A. palmata*), making for relatively easy identification. It’s possible to see the “blue S2” of Shadow Darner (*A. umbrosa*) from quite a distance, and even on the wing.

It will be interesting to study this field mark in the seasons to come. With luck, it may be helpful in distinguishing some of the other mosaic darners that can be quite similar to one another. I know I've found it useful in separating the darners in my area.

As an example of the usefulness of this field mark, consider the two dragonflies on my hand in Figure 1. These represent two different darter species, Paddle-tailed Darter (*A. palmata*, left) and Shadow Darter (*A. umbrosa*, right). Many useful field marks are visible in this photo to distinguish these species, including the presence/lack of blue spots on S10 and the shape of the anterior thorax stripes. The dorsal stripe on S2 adds one more key distinguishing feature.



Figure 1. Two in the hand! A comparison between a Paddle-tailed Darter (*A. palmata*, left) and a Shadow Darter (*A. umbrosa*, right).


As a side note, the dragonflies in Figure 1 are “free-range” dragonflies. What I mean by this is that they have not been caught or manipulated, simply lifted from their perching spots in the bushes onto my fingers. After lifting one, it went along for the ride as I lifted the second. They are free to fly off whenever they like, which makes the time they share with me all the more enjoyable.

Acknowledgements

I would like to thank Jim Johnson for kindly pointing out to me his excellent dragonfly blog, Northwest Dragonflyer. He presents a detailed discussion of many different field marks for the Paddle-tailed Darter (*A. palmata*) and Shadow Darter (*A. umbrosa*), including the dorsal stripe on S2. Specific links are given below.

Online Material

Many excellent dragonfly posts can be found on Jim Johnson's Northwest Dragonflyer blog <<http://nwdragonflyer.blogspot.com>>. His discussion of the field marks for Paddle-tailed Darters (*A. palmata*) and Shadow Darters (*A. umbrosa*) can be found at <<http://nwdragonflyer.blogspot.com/2011/10/sorting-paddle-tailed-and-shadow.html>> (Part 1) and <http://nwdragonflyer.blogspot.com/2011/10/sorting-paddle-tailed-and-shadow_30.html> (Part 2).

Additional photos of the dorsal stripe on S2, along with various comparisons between species, can be found at my blog <<http://thedragonflywhisperer.blogspot.com/>>, at <<http://thedragonflywhisperer.blogspot.com/2012/10/a-useful-field-mark-for-darters-dorsal.html>>. 

Request for pond species lists

If you live in North America, have a created backyard pond, and keep track of the odonates that visit and/or breed there, would you share your list with me? I'm trying to ascertain how many and which species breed in backyard ponds. Thanks!

Kathy Biggs <bigsnest@sonic.net>

Ode Biodiversity Hot Spot in California Acquires Signage through BLM & the Biggs: Interpretative Panel Features Giant Darner (*Anax walsinghami*)

Kathy and Dave Biggs, 308 Bloomfield Rd., Sebastopol, California 95472 <bigsnest@sonic.net>

Bear Creek is considered one of California's Odonata "Hot Spots" and in 2003, when the DSA meeting was held in California, participants who visited this site as one of the field trip destinations remarked that they had never seen so many Giant Darners (*Anax walsinghami*) in one spot!

In 2010, we became acquainted with several members of the California Bureau of Land Management (BLM) office while persuading them to protect some local valuable habitat for the rare Black Petaltail (*Tanypteryx hageni*). This habitat was being trashed by target shooters and off-road vehicles. Through these encounters, BLM personnel became aware of the Odonata of the state. Eventually James Weigand (California State Ecologist for BLM) contacted us, asking for help in identifying Odonata sites in need of protection, as well as places with great ode diversity. During these meetings, the BLM became aware of the great odonate diversity of Bear Creek (Colusa County), which is already listed as a site of Botanical Interest by the state.

Later, in 2011, employees from BLM contacted us about creating an interpretive sign about Odonata for Cowboy Camp, a developed site along Highway 16 at Bear Creek. This site is just a mile or two south of the Highway 20 bridge over Bear Creek near where DSA 2003 participants were taken. As the signage was developed, it morphed into

a sign about biodiversity, referencing more than just the Odonata but featuring odes prominently.

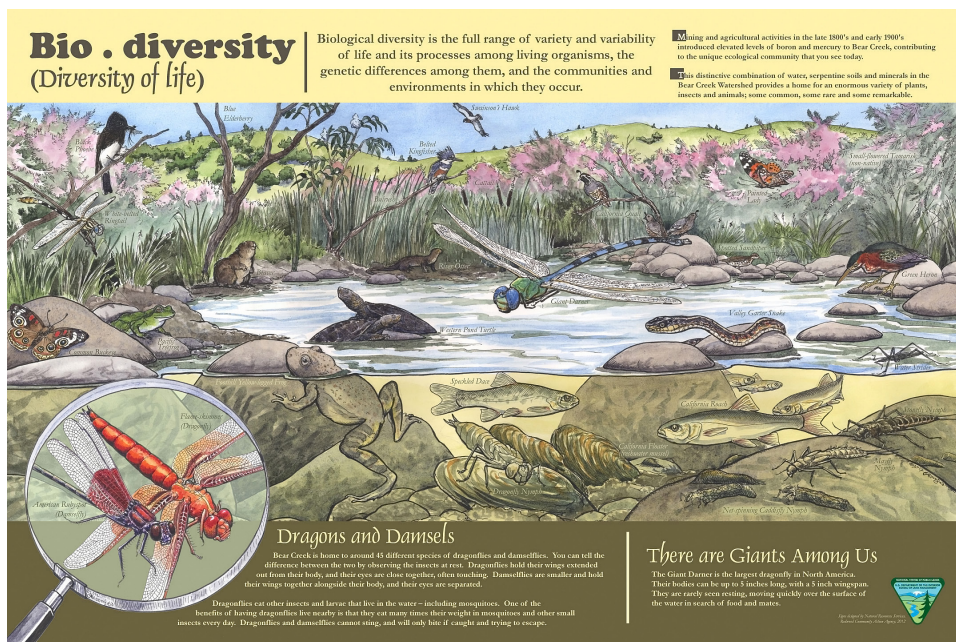
Perhaps other DSA members could work with their local BLM officials to develop interpretive signs for ode Hot Spots in their respective areas. Because of the accolades they have received for the Cowboy Camp signage, BLM in California is already considering making another sign featuring odes at Dos Palmas, a southern California ode Hot Spot in Riverside County just east of the Salton Sea.

Contact information for the creator of sign is Pardee Bardwell, Bureau of Land Management, Ukiah Field Office, Cache Creek Natural Area Manager, 2550 North State Street, Ukiah, California 95482; 707-468-4055 (office); 707-468-4027 (fax); <pbardwel@blm.gov>. The names and contact information of additional BLM staff we worked with are:

James Weigand, Bureau of Land Management, California State Office Ecologist <jweigand@blm.gov>

Richard Burns, Bureau of Land Management, Ukiah Field Office <rburns@blm.gov>

Gary Sharpe, Bureau of Land Management, Ukiah Field Office <gsharpe@blm.gov>



Spiders Residing in Odonate Exuviae: Another Update and Request for More Information


Tim Manolis <Ylightfoot@aol.com>

Back in 2008, I reported on the use of dragonfly exuviae for roosting and nesting by a jumping spider, *Sassacus vitis* (ARGIA 20[3]:19). Since then I have collected over 200 dragonfly exuviae, primarily *Libellula luctuosa* (Widow Skimmer), *Tramea lacerata* (Black Saddlebags) and *Anax junius* (Common Green Darner) at a site along the American River in Sacramento, California, and have continued to find frequent use of the exuviae by this jumping spider. Occasionally I have found other arthropods in exuviae, including one nest each of two other jumping spider species, *Peckhamia* sp. and *Sitticus palustris*, but *Sassacus vitis* is by far the most frequently observed occupant.

I made a request of ARGIA readers who collect exuviae to report their observations of spiders, especially jumping spiders, and have received a modest but gratifying response so far. As I reported in ARGIA in 2008, Steve Krotzer gave me a male *Sassacus vitis* he found in an exuvia of *Macromia magnifica* (Western River Cruiser) in north-eastern Oregon. Since then I have received reports of *S. vitis* in exuviae from four other sites in California and Oregon, suggesting such occupancy is a fairly widespread phenomenon. Gary Suttle found some of these spiders, including a nest sac, in *Plathemis lydia* (Common White-tail) exuviae at a mountain pond in San Diego County, California in 2011; Jim Johnson found single spiders in exuviae from two sites, one in Josephine County and one in Malheur County, Oregon, in 2012; and Kathy Biggs found an *S. vitis* in a *P. lydia* exuvia at a pond in Siskiyou County, California, in 2012. Jim Johnson also sent me a

couple of individuals of *Sitticus palustris* he found in exuviae in Wasco and Klamath counties, Oregon, in 2011 and a couple of individuals of what I have tentatively identified as a species in the jumping spider genus *Pelegrina* from exuviae he collected in Tennessee in 2012.


Another interesting story (at least to me) has emerged from this study. A number of the *Sassacus vitis* egg sacs I have collected in exuviae have produced not only spiderlings but small wasps in the genus *Idris* (Scelionidae) as well. These wasps are brood parasites of spiders. Over 200 species are known from North America, but only about 20 of these have been described, and the breeding biology of most of them is unknown. The species of *Idris* I have been finding in exuvial egg sacs is one of these undescribed, little-known species. This just goes to show that you never know what you might find in odonate exuviae!

If you collect dragonfly exuviae, I would love to hear from you about any spiders, especially jumping spiders, which you might discover. If you put each exuvia in a separate container, e.g., a small vial, any resident spiders should emerge within a day or so. If there is a spider egg sac in the exuvia, the spiderlings (and perhaps wasps, if you are really lucky) should hatch within 20 days or less. *Idris* adults emerge from parasitized eggs, one per egg, instead of spiderlings, and are about the same tiny size (1–2 mm) as the newly emerged spiderlings. I would love to receive any such specimens, alive or dead, and would be glad to reimburse shipping costs. 

Obituary for Gordon Pritchard (from the Calgary Herald, 5–10 January 2013)

Gordon Pritchard, February 9, 1939–December 23, 2012

Gordon Pritchard passed away suddenly at the Foothills Hospital on Sunday 23 December at the age of 73. Gordon was born in Burton upon Trent, England, received his undergraduate training at Imperial College, London and his PhD from the University of Alberta, after which he had a 30 year career in the Department of Biological Sciences at the University of Calgary. He will be forever remembered by his loving wife Valerie; his sister Gillian Chambers; his children Tracy (Darren) Carmelo and Darren (Andrea) Pritchard; his grandchildren Nicola and Abelynne; and his extended family Mark (Sheryl, Ryan, Janine) Preuter and Leonard (Jeri-Lynn) Preuter. A cel-

ebration of Gordon's life will be held at McInnis & Holloway's Chapel of the Bells (2720 Centre Street North) on Friday 11 January 2013 at 3 p.m. Condolences may be forwarded through <www.mcinnisandholloway.com>. If friends desire, memorial tributes may be made directly to the Alberta Cancer Foundation, c/o Tom Baker Cancer Centre, 1331-29 Street NW, Calgary, Alberta T2N 4N2, (1-866-412-4222, <www.albertacancer.ca/memorial>. The family wishes to extend their heartfelt thanks and gratitude to the doctors and nurses of the Tom Baker Cancer Centre who helped Gordon through the years, but especially to Dr. Karen Valentine for the special care and friendship she gave to Gordon. In living memory of Gordon, a tree will be planted at Big Hill Springs Park, Cochrane. 

Book Review: A Manual for the Identification of the Dragonflies and Damselflies of New Guinea, Maluku and the Solomon Islands, by John Michalski

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A Manual for the Identification of the Dragonflies and Damselflies of New Guinea, Maluku and the Solomon Islands, by John Michalski. Kanduanum Books. 2012. ISBN 978-0-615-63726-6. \$75 from author <huonia@aol.com>.

This opus of 561 pages contains eight pages of color photos, and 1,275 line illustrations, including over 100 created new for this manual. This is the first comprehensive guide to all 620 species of New Guinea and its neighboring islands. This region hosts some ten percent of the world's odonate fauna, with over 300 species found nowhere else.

This is an impressive work that John first started in 1990. Over 20 years later, the result is a well-done, comprehensive hardcover volume. The first 41 pages contain introductory material, including a history of odonatology in the region, an introduction to morphological terminology, life history of species in the region, and a detailed discussion of the ecology and habitats for each area in the region.

The bulk of the book contains taxonomic keys to all 561 species currently known from the Papuan region. It is richly illustrated and includes tables of diagnostic characters for many genera. There are three appendices focused on discussions of particular taxonomic difficulty or interest (e.g. Papuan Platycnemididae and Argiinae).

This is definitely not a field guide, but that was not the intention of the author. Rather, this is a critical reference required by anyone doing serious taxonomic work on the odonate fauna of the Papuan region. While \$75 is not pennies, this book is very well priced and I encourage anyone doing work in the Papuan region to purchase it.

Thanks to financial support provided by Mike May, various elements of the book are now hosted on OdonataCentral. They can be viewed by clicking on the link currently on the OC home page, <<http://www.odonatacentral.org>>, or directly at <<http://tinyurl.com/papua-odes>>. 

ARGIA and BAO Submission Guidelines

Digital submissions of all materials (via e-mail or CD) are vastly preferred to hardcopy. If digital submissions are not possible, contact the Editor before sending anything. Material for ARGIA should be sent to Celeste Mazzacano, The Xerces Society for Invertebrate Conservation, 628 NE Broadway, Suite 200, Portland, Oregon, USA 97232, <celeste@xerces.org>. Material for BAO must be sent to Steve Hummel, Lake View, Iowa, USA 54982, <shummel@iowatelecom.net>.

Articles

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

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

Figures

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

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

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

Tables

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

The Dragonfly Society Of The Americas

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ARGIA, the quarterly news journal of the DSA, is devoted to non-technical papers and news items relating to nearly every aspect of the study of Odonata and the people who are interested in them. The editor especially welcomes reports of studies in progress, news of forthcoming meetings, commentaries on species, habitat conservation, noteworthy occurrences, personal news items, accounts of meetings and collecting trips, and reviews of technical and non-technical publications. Membership in DSA includes a digital subscription to ARGIA.

Bulletin Of American Odonatology is devoted to studies of Odonata of the New World. This journal considers a wide range of topics for publication, including faunal synopses, behavioral studies, ecological studies, etc. The BAO publishes taxonomic studies but will not consider the publication of new names at any taxonomic level.

Membership in the Dragonfly Society of the Americas

Membership in the DSA is open to any person in any country and includes a digital subscription to ARGIA. Dues for individuals in the US, Canada, or Latin America are \$15 us for regular memberships (including non-North Americans), institutions, or contributing memberships, payable annually on or before 1 March of membership year. The Bulletin Of American Odonatology is available by a separate subscription at \$20 us for North Americans and \$25 us for non-North Americans and institutions. Membership dues and BAO subscription fees should be mailed to Jerrell Daigle, 2067 Little River Lane, Tallahassee, Florida, USA 32311. More information on joining DSA and subscribing to BAO may be found at <www.dragonflysocietyamericas.org/join>.

Back cover: (upper) Pairs of Common Green Darners (*Anax junius*) photographed on 18 May 2012 by Ron Oriti. While driving on the Death Valley/Eureka Valley Road east of Big Pine, California, Ron noticed a large dragonfly migration heading south to north. He watched hundreds of dragonflies passing overhead. They were mostly Common Green Darners with some gliders mixed in. He went back the next day and saw none, but stopping at Klondike Lake just north of Big Pine, he did find many darners ovipositing. Ron estimates no less than 75 pairs in a small pond next to the Lake. **(lower)** Double-ringed Pennant (*Celithemis verna*) representing a new state record for Pennsylvania. It was found by Tom Raub and Laurie Goodrich on 9 June 2012 near Hamburg, Pennsylvania. Ken Lebo subsequently found it on 13 June 2012 and got this picture. The site is the Kernsville Dam Wildlife Area, a desilting basin for the Schuylkill River that has been maintained by Blue Mountain Wildlife Inc. for the last 10 years. It now serves as good habitat for dragonflies and damselflies, with shallow fishless water surrounded by sedges.

