



AGRION

NEWSLETTER OF THE WORLDWIDE DRAGONFLY ASSOCIATION

PATRON: Professor Edward O. Wilson FRS, FRSE

Volume 16, Number 1

January 2012

Secretary: Robert Walter Reimer. Villa 2, Compound 12, 30th Street, Al Ain, Al Mnaizlah, Falaj Hazzaa, United Arab Emirates. Email: wda.secretary@gmail.com.

Editors: Keith D.P. Wilson. 18 Chatsworth Road, Brighton, BN1 5DB, UK. Email: kdpwilson@gmail.com.

Graham T. Reels. H-3-30 Fairview Park, Yuen Long, New Territories, Hong Kong. Email: gtreels@gmail.com.

ISSN 1476-2552



AGRION

NEWSLETTER OF THE WORLDWIDE DRAGONFLY ASSOCIATION

AGRION is the Worldwide Dragonfly Association's (WDA's) newsletter, published twice a year, in January and July. The WDA aims to advance public education and awareness by the promotion of the study and conservation of dragonflies (Odonata) and their natural habitats in all parts of the world. *AGRION* covers all aspects of WDA's activities; it communicates facts and knowledge related to the study and conservation of dragonflies and is a forum for news and information exchange for members. *AGRION* is freely available for downloading from the WDA website at <http://ecoevo.uvigo.es/WDA/dragonfly.htm>. WDA is a Registered Charity (Not-for-Profit Organization), Charity No. 1066039/0.

Editor's notes

Keith Wilson [kdpwilson@gmail.com]

Conference News

The postponed 2011 International Congress of Odonatology, originally scheduled to be held at the Kanagawa Prefectural Museum of Natural History in Odawara City, Kanagawa, Japan in July-Aug 2011, has been rescheduled for 28 July to 2 August 2012 at the same venue. For further information and details of registration see pages 12-13.

Details of the 2013 International Congress of Odonatology scheduled to be held 17-21, June 2013 in Friesing, Bavaria, Germany are available at <http://www.anl.bayern.de/english/events/odonata/index.htm>. Information on the 2012 European Congress on Odonatology to be held 2-6 July, 2012 at Belgrado, Serbia is also available at [http://www.nhmbeo.rs/ecoo2012_-_congress_info/congress_announcement.301.html].

WDA Secretary

Natalia von Ellenrieder served very ably as the WDA Secretary from mid-2009 to mid-2011 and was formally replaced by Bob Reimer 9 July 2011 at a WDA Board Meeting held in Leiden. Unfortunately Bob, for medical reasons, is unlikely to be able to continue with his duties as WDA Secretary through to 2013. He has been undergoing treatment in the US and the UAE but in November 2011 suggested it would be prudent to try and find a replacement Secretary as soon as possible. Bob has already set up a generic WDA Secretary email [wda.secretary@gmail.com] which will serve for communication with Bob and his successor. I wish Bob every success with his new treatment regime. The Board has asked several members for help and Sónia Ferreira has agreed to fill the vacancy. Many thanks to Bob and Sónia.

Epiophlebia sinensis Li, Nel, Zhang, Fleck, Gao, Lin and Zhou, 2011

A new species of the relict *Epiophlebia* was recently described from Heilongjiang Province, China by Jing-ke Li et al., 28 October [2011: A third species of the relict family Epiphlebiidae discovered in China (Odonata: Epiproctophora). *Systematic Entomology* (1365-3113): 1-5]. Congratulations to the authors for making this fascinating discovery in northeast China, bridging the *Epiophlebia* distribution gap between Nepal and Japan where the only other two extant members of this family are known from.

Next issue of *AGRION*

For the next issue of *AGRION*, to be published at the beginning of July 2012, please send your contributions to Keith Wilson [kdpwilson@gmail.com] or Graham Reels [gtreels@gmail.com]. All articles, information and news items related to dragonflies or of interest to WDA members are most welcome and will be considered for publication. Please send a Word file by email (preferably) or on disk by post. Please do not forward any original artwork but send a soft copy, ideally in a compressed format e.g. 'jpeg' or 'gif', or as a file on disk if sent by post.

A striking dragonfly photo, taken by Shikhei Goh, of a *Trithemis pallidinervis* [<http://ngm.nationalgeographic.com/ngm/photo-contest/2011/entries/gallery/nature-winners/?source=fohomefeat1>] in a rain shower in Indonesia's Riau Island has just won the Grand-Prize and Nature category in the National Geographic Photo Contest 2011. A damselfly photo [<http://www.wildlifeextra.com/go/photo/uk-insect-photos-2011#damsel#cr>], taken by Diane Sleddon, also won the bugs section of the Wildlife Extra UK Wildlife Photography Competition 2011. If you have an odonate photo illustrating any rarely observed aspect of dragonfly biology, or an unusual species, or simply a stunning dragonfly shot, please submit it for consideration for publication in *AGRION*.

Cover photo: Emerald dwarf (*Nannophyopsis clara*), 25 May, 2003, Luk Keng, Hong Kong. A tiny libellulid; hind wing length 16 mm, abdomen plus anal appendages 15 mm. Credit: Keith DP Wilson.

AGRION CONTENTS

Editor's notes	2
Message from the President	3
Surprise rediscovery of <i>Acanthaeschna victoria</i>, a key taxon in dragonfly evolution (Odonata, Aeshnoidea, Telephlebiidae)	4
<i>Sympetrum fonscolombii</i> in Lanzarote, an example of coping with arid climates	10
2012 International Congress of Odonatology	12
Female courtship in <i>Mnesarete lencionii</i> ?	14
<i>Pantala flavescens</i> an ancient mariner	15
New provincial records of Odonata from Thailand mostly based on photographs	16
<i>Atractocerus</i> sp. (Coeloptera: Lymexylidae) a damselfly-looking beetle	26
New odonate books	27
Membership Application Form 2012	30

Message from the President

As president of the organisation, I'm writing this to all members as a New Year Greeting, but at the same time I'd like to mention something about what has happened in the organisation last year and what we expect during 2012. First I'd like to express my gratitude to my predecessor at the post, Wolfgang Schneider, whose able work has laid a very smooth floor for me to step onto. A well-working organisation is the perfect dream of its president, but it does give me a fear of introducing a number of pebbles and stones for my successor to navigate... I will do my best not to.

The past year has seen one big change in our organisation: we have successfully transferred the publication of our journal IJO to a professional publisher, Taylor and Francis. This could not have been done without a lot of efforts from many people - perhaps mainly our editor, Mike May, our former secretary Natalia von Ellenreider and, not the least, our former editor Reinhard Jödicke who managed to achieve and maintain a high quality of the journal and thus make it interesting for a professional publisher in the first place. My thanks to you all! We have as of today seen three issues of the "new" IJO, and it looks promising indeed. I am informed that the delay in publication caused by the transition from the WDA to T&F will disappear during 2012.

The coming year will be an interesting one. As we all know, the 2011 International Congress of Odonatology in Japan had to be postponed due to the tragic earthquake and tsunami that hit Japan last spring. But the organisers have worked the past autumn to ensure that this meeting can be held on July 28 - August 2 2012 instead! This is heartening news, and I hope to see many of you in Odawara the next July!

With this, I wish you a splendid 2012 with many exiting activities in odonatology!

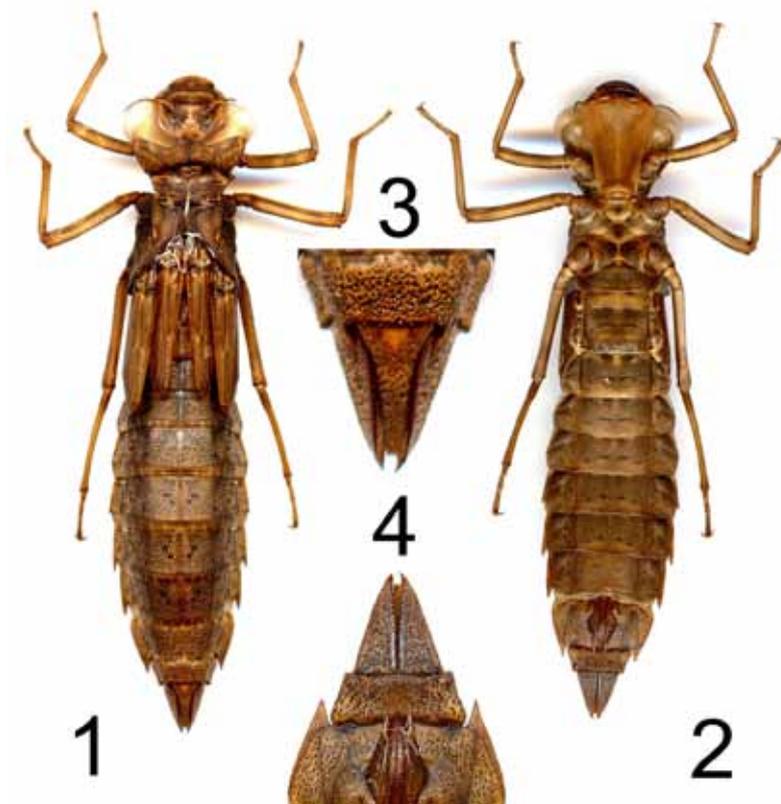
Uppsala, January 1, 2012

Göran Sahlén, WDA President
[Goran.Sahlen@hh.se]

Surprise rediscovery of *Acanthaeschna victoria*, a key taxon in dragonfly evolution (Odonata, Aeshnoidea, Telephlebiidae)

Gunther Theischinger [Gunther.Theischinger@environment.nsw.gov.au] and Steve Jacobs
Water Science, Office of Environment & Heritage, Department of Premier & Cabinet, PO Box
29, Lidcombe NSW 1825, Australia

The Office of Environment and Heritage in the New South Wales Department of Premier and Cabinet is committed to monitoring as part of the Monitoring Evaluation and Reporting (MER) programme. In this programme, randomly selected New South Wales coastal sites have been sampled using sweep- or kick-samples for macroinvertebrates, utilising 10 metres of edge, and if available, riffle habitat. The collected material is live-picked and generally identified to the family level to provide a measure of river health. Numerous specimens of common taxa are usually found, and a few, mostly single individuals of rarer animals are collected as well. Now and then, however we are luckier than that.



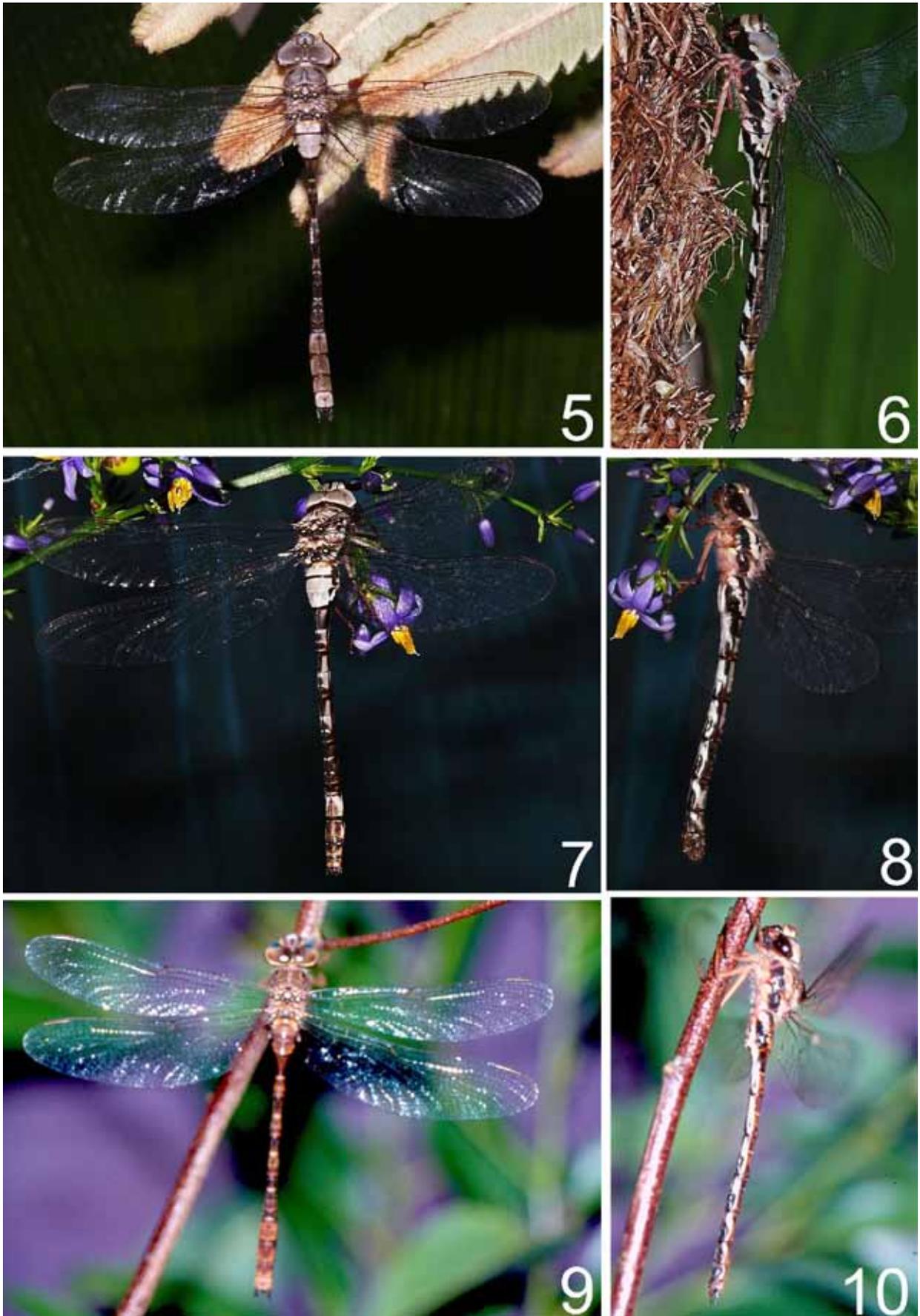
Figs 1-4. *Acanthaeschna victoria*, final instar female exuvia: 1) dorsal; 2) ventral; 3) anal pyramid, dorsal; 4) segment 9+ anal pyramid, ventral. Photos Gunther Theischinger.

September 2011 at a tributary to Sandy Beach Creek on Sapphire Coast Drive (36.83594°S/149.90993°E). Apart from the presence of some swordgrass the site was similar to others where we had sampled without finding *A. victoria*. Surprisingly, however, the sample contained about 20 final instar and F-1 larvae of this species. These large numbers of an extremely rare dragonfly in a small area made me (GT) feel somewhat uneasy about my quick identification of the larvae. All collected larvae survived a few more days of hotel accommodation and were later inspected under the microscope in Sydney.

Details on nomenclatorial history, history of discovery, decline, rediscovery, conservation, distribution, biology, ecology, phenology and larval morphology of *Acanthaeschna victoria* have been treated comprehensively (Theischinger 2000, 2008, 2011; Hawking & Theischinger 2004; Peters & Theischinger 2007; Theischinger & Endersby 2009). However, some additional information emerged from the most recent collecting. It is listed and discussed below, where necessary with reference to previously available information.

During a nine-day monitoring operation along the New South Wales south coast, we had to visit a small tributary of Maxwell Swamp (37.37293°S/149.76848°E) on 16 September 2011. The site consisted of multiple tiny, and a few larger, pools with deep very dark water surrounded and partly covered by very tall swordgrass which made sampling very difficult. It came as a surprise when the sample was found to include an F-2 larva of *Acanthaeschna victoria*, a large endemic Australian dragonfly species believed to be extinct or almost so for more than a century (1883-1999). Previously, only three preserved *A. victoria* larvae had been identified, all of them from north-eastern New South Wales, and those only by supposition. We decided to keep the larva alive for rearing and to go to a similar nearby site to get additional material. At this site, also a tributary to Maxwell Swamp (37.38079°S/149.78100°E) two more larvae were obtained. They were also kept alive in order to increase the chances of rearing success.

While the three precious *Acanthaeschna victoria* larvae were kept in a cool room at the hotel we had to sample other sites including one on 19



Figs 5-10. *Acanthaeschna victoria*, live imagines: 5-8) subadult male and female (c. 2 days old), dorsal and lateral; 9, 10) adult male, dorsal and lateral. Photos Leonard Müller.

Identification of larvae, final instar female larva and subadult imagines

Successful rearing in Sydney confirmed the identity of all hitherto available *Acanthaeschna victoria* larvae. For the first time female larvae and exuviae (final instar) were available for completion of the previously only male based description of the larva (Theischinger 2000, 2002). The emerging dragonflies made it possible to show for the first time the interesting change in coloration from subadult to mature imagines in this species.

The final instar female larva (Figs 1-4) is similar to the male larva (Theischinger 2000, 2002). The gonapophyses reach slightly beyond the end of segment 9, the epiproct lacks a basal projection, is distinctly shorter than the paraprocts and apically slightly bifid to truncate, and the cerci are about 1/5 the length of the paraprocts.

Whereas mature adults of *A. victoria* are coloured in different shades of brown from pale to very dark (Figs 9, 10), the range in subadults (Figs 5-8, 11) is markedly wider, from almost white to nearly black, making for a significantly stronger contrasting pattern. In particular, the dorsal surface of abdominal segments 1-3 in both sexes and the terminal abdominal segments of the male are much paler in subadults than in mature imagines.

Biology, ecology, food, competition

Conditions of a few of the known larval habitats of *Acanthaeschna victoria* were measured when collecting. They are given in the table below.

Site	Water temp. (°C)	Conductivity mS/cm	Turbidity NTU	Dissolved O2 mg/L	Alkalinity mg/L	pH
Cockwhy Creek 29.11.2007	18	0.280	107	4.6	12.5	5.5
trib 1 Maxwell Swamp 16.11.2011	9	0.227	4.5	7.7	<10	5.5
trib 2 Maxwell Swamp 16.10.2011	11.5	n.a.	4.9	1.6	<10	5.3
trib Sandy Beach Creek 19.10.2011	16	0.712	1.5	5.2	15	5.8

It appears that all habitats where larvae of *A. victoria* were found are low in dissolved oxygen and pH. Many of the sites are subject to periodic desiccation. For example, the site at Cockwhy Creek was found completely dry a year after a pharate larva of *A. victoria* was found (end of November). The habitat at Cabbage Tree Ck near Wiliamstown was found nearly dried up in August a month after a pharate larva of *A. victoria* was found. The sites at Nadgee included only small and isolated pools where in a wet season larvae of *A. victoria* were found. Only the site near Merimbula appeared to have sufficient water with numerous larvae of *A. victoria*, but this was in a wet period.

Initially, for rearing the most recently collected larvae, water and some substrate were used from tributaries of Maxwell Swamp at Nadgee and from the tributary to Sandy Beach Creek on Sapphire Coast Drive near Merimbula. Then water from garden tubs was used apparently without negative effect. The food provided included Oligochaeta, Hemiptera, larvae of Culicidae and very small tadpoles. Culicid larvae seemed to be the preferred food, and to judge from the way some of the larger larvae went through them, they may well have been an effective mosquito control in the 19th century when *A. victoria* was possibly quite common (if its early description from several specimens is any measure). Only the largest dragonfly larvae had a successful go at tadpoles. Cannibalism of the larvae was not observed. All emergence to adult happened during the night, starting in one observed case at about 2300 hrs. Some larvae of *Adversaeschna brevistyla* and of *Anax papuensis* were also present in the samples from Nadgee and from near Merimbula.

It appears that *A. victoria*, being adapted to low oxygen and low pH streams with periodic drying, can avoid competition with much of the higher Aeshnoidea and, by being apparently restricted to small low altitude wallum (*Banksia aemula*) and blackwater streams, competition with most telephlebiids (with the exception of *Austrophlebia* and *Telephlebia*).

Distribution

Previously the distribution of *Acanthaeschna victoria* was generally accepted to include only south-eastern Queensland and north-eastern New South Wales (Watson et al. 1991; Theischinger & Hawking 2006). There was no reason for Martin (1909), other than perhaps the species' name, to include Victoria. Peters & Theischinger (2007) then specified the north-south range of the species as 25°-32°S, c. 770 km, but only a year later a record from near Ulladulla (Theischinger 2008) extended the range south by more than 300 km. The most recent records, however, from tributaries of Maxwell Swamp (37.37293°S/149.76848°E and 37.38079°S/149.78100°E) at Nadgee, make the north-south range of *A. victoria* 1360 km long and extending to just 5 km from the New South Wales/Victoria border. This suggests that the north-south range of the species is even greater and probably



Figs 11, 12. *Acanthaeschna victoria*, live subadult male: 11) c. 2 days old, head and thorax, dorsal; photo Leonard Müller; 12) c. 7 days old, dorsal; photo F. Peels.

includes Victoria.

It remains to be seen if the recently observed occurrence of *A. victoria* along parts of the south coast of New South Wales is just a consequence of a couple of rather wet seasons or if it can be confirmed in future. *A. victoria* may in fact be more of a south coast species than a north coast species in New South Wales. At this stage its recent discovery on the south coast cannot, however, be seen as an effect of climate change. On the other hand it appears possible that by sensible future collecting and observation *A. victoria* may become usable as an indicator species for certain environmental/climatic situations and changes in areas where it was not even expected. But for this to occur much more data are required.

Phenology

On the basis of the records of larvae and adults of *Acanthaeschna victoria* available until 2007 (all only from south-eastern Queensland and north-eastern New South Wales) it was considered as a spring species, and this may well hold for populations from north of Sydney.

The more recent records from further south (see table below), however, indicate that *A. victoria* is probably much more of a summer species south from about Sydney and that there is possibly a phenological north-south cline for the appearance season of the adults. This may additionally be influenced by local water level and temperature.

Some phenologically relevant data

Date	Locality	Instar	Approx. latitude
14.10.1958	Brisbane	mature adult female	27.5°S
3.10.1966	<u>Herston</u>	mature adult male	27.5°S
15-24.10.1999	Broadwater	mature males and copula	29°S
6.10.1999	<u>Wooli Wooli River</u>	<u>pharate male larva</u>	30°S
August 2010	near Williamstown	<u>pharate male larva</u>	33°S
	Sydney		34°S
29.11.2009	<u>Cockwhy Creek</u>	<u>pharate male larva</u>	35.5°S
4.11.2011	<u>Merimbula</u>	First of possible 17 adults emerges	37 °S
15-26.11.2011	<u>Merimbula</u>	7 more of possible 17 adults emerge	37°S
4.12.2011	<u>Merimbula</u>	5 larvae still in final instar	37°S
1-3.12.2011	<u>Nadgee</u>	3 larvae finally in final instar	37.5°S

Elusiveness, Recovery, Conservation, Climate Change

The apparent rarity and elusiveness of *Acanthaeschna victoria* over the last (20th) century led to its inclusion in the category VU B1+2 in the IUCN Red List of Threatened Species (Hawking & Theischinger 2004) and to its common name “Thylacine Darner” (Hawking & Theischinger 2002). The surprising recent collection in numbers of larvae in a tributary of Sandy Beach Creek near Merimbula and their successful rearing, however, provided enough subadult individuals for release back into their natural habitat.

On top of that, the recent collection in several places of a species that was not observed or collected by several “generations” of odonatologists for well over 100 years makes it appear possible but unlikely at this stage (too little is known) that this “rare” lowland species will become useful for climate change projects in the future. Such projects will require the collection of many more specimens than those currently available.

Systematic position and phylogenetic affinities

Acanthaeschna victoria was long regarded as a member of the aeshnid subfamily Brachytroninae (e.g. Fraser 1960, Watson et al. 1991; Davies & Tobin 1986). Bechly (1996) listed it under Telephlebiidae: Austroaeschinae. According to Von Ellenrieder (2002) *Acanthaeschna* and *Austroaeschna*, *Austrophlebia*, *Antipodophlebia*, *Telephlebia* and *Planaeschna* constitute particularly problematic taxa because they occupy different positions as basal taxa in any of the three main groups of Aeshnoidea within her most parsimonious trees. Peters & Theischinger (2007) regarded *Acanthaeschna* as telephlebiid and sister to *Austrophlebia* + (*Austroaeschna* + *Dromaeschna*). G. Fleck (pers. comm.) suggested that it is more probable that *Acanthaeschna* represents a basal stem within Aeshninae. After all this it has to be considered fortunate that the latest finding in numbers of *A. victoria* provided the material and thus the start up basis for molecular analysis of the Australian Aeshnoidea.

Acknowledgements

We wish to thank Christine Theischinger (Grays Point) and Elke and Leonard Müller (Berowra) for looking after the larvae and emerging adults of *Acanthaeschna victoria* while we were in the field/on holidays and to L. Müller and F. Peels for taking photos. We are also very grateful to J. Miller, M. Krogh and D. Bickel for critically reading the MS and for helpful suggestions.

Summary

During monitoring by the Office of Environment and Heritage in south-eastern New South Wales a rather large number of larvae of the rare and elusive dragonfly species *Acanthaeschna victoria*, a key taxon in dragonfly evolution, were found at three new localities. The southernmost of these at Nadgee extends the range of the species south by more than 200 km to 5 km from the NSW/Victoria border and suggests that the species will eventually be found in Victoria. Rearing of the larvae in Sydney confirmed the hitherto only supposed identity of the larvae, and provided for the first time information on the morphology of the female larva and on the coloration of the subadult imagines. The rearing also provided new information on food of the larvae, life history and phenology. Some of the reared subadults were released in their natural habitat, and specimens were preserved for future DNA analysis for phylogenetic studies. A thought is given to the possible future usage – when more data are available – of *A. victoria* as an indicator species for ecological condition and climate change.

References

- Bechly, G., 1996. Morphologische Untersuchungen am Flügelgeäder der rezenten Libellen und deren Stammgruppenvertreter (Insecta; Pterygota; Odonata) unter besonderer Berücksichtigung der Phylogenetischen Systematik und des Grundplanes der Odonata. *Petalura, Special Vol. 2*: 1-402.
- Davies, D.A.L. & P. Tobin, 1985. *The dragonflies of the world: A systematic list of the extant species of Odonata. Vol. 2. Anisoptera*. Societas Internationalis Odonatologica, Utrecht.
- Fraser, F. C., 1960. *A Handbook of the dragonflies of Australasia*. Royal Zoological Society of New South Wales, Sydney.
- Hawking, J.H. & G. Theischinger, 2002. Vernacular names for the Australian dragonflies (Odonata). *Austrolestes*, Supplement to No 4, autumn 2002: 1-6.
- Hawking, J.H. & G. Theischinger, 2004. Critical species of Odonata in Australia. *International Journal of Odonatology* 7(2): 113-132.
- IUCN, 2003. Red list of threatened species. <www.redlist.org>
- Martin R., 1909: *Aeshnines*. – In “Collections Zoologiques du Baron Edm. de Selys Longchamps”. Pp. 18-20, 1-223. (Institut Royal des Sciences Naturelles de Belgique: Brussels).
- Peters, G. & G. Theischinger, 2007. Die gondwanischen Aeshniden Australiens (Odonata: Telephlebiidae und Brachytronidae). *Denisia* 20: 517-574.
- Theischinger, G., 2000. The *Acanthaeschna* Story. *Linzer biologische Beiträge* 32/1: 235-240.
- Theischinger, G., 2002. *Preliminary keys for the identification of larvae of the Australian Petaluridae, Archipetaliidae, Austropetaliidae, Telephlebiidae and Aeshnidae (Odonata)*. Cooperative Research Centre for Freshwater Ecology, Thurgoona (NSW). Pp. i-iv; 1-101.
- Theischinger, G., 2008. Notable range extensions of dragonflies in new South Wales. More species in Victoria? *Victorian Entomologist* 38(4); 59-64.
- Theischinger, G., 2012. *Acanthaeschna victoria*. In Queensland's Threatened Animals. (Eds LK Curtis, AJ Dennis, KR McDonald, PM Kyne and SJS Debus) p. 22. CSIRO Publishing, Melbourne. (In press.)
- Theischinger, G. & I. Endersby, 2009. *Identification Guide to the Australian Odonata*. 283 pp. Department of Environment, Climate Change & Water NSW. Sydney.
- Theischinger, G. & J. H. Hawking, 2006. *The Complete Field Guide to Dragonflies of Australia*. 366 pp. CSIRO Publishing.
- Von Ellenrieder, N., 2002. A phylogenetic analysis of the extant Aeshnidae (Odonata, Anisoptera). *Systematic Entomology* (London) 27: 1-31.
- Watson, T., G. Theischinger & H. Abbey, 1991. *The Australian Dragonflies. A Guide to the Identification, Distribution and Habitats of Australian Odonata*. 278 pp. CSIRO, Canberra and Melbourne.

Sympetrum fonscolombii in Lanzarote, an example of coping with arid climates

Mike Averill [mike.averill@blueyonder.co.uk]
49 James Road, Kidderminster, Worcs, UK, DY10 2TR

Sympetrum fonscolombii is widespread in the Mediterranean and can be seen ubiquitously throughout the year in the region. Seeing the species on a dry island like Lanzarote might raise the question as to whether the individuals were home bred or had migrated in from other islands or Africa, but an observation on the 9th March 2010 confirms that where an opportunity exists the species will complete its breeding cycle successfully in dry places. The ability of *S. fonscolombii* to deal with arid conditions has been explored by authors such as Suhling et al. (2009), where they looked at the various habitats in Namibia, grouping dragonflies into six categories relating to the origins and ability of the species to cope with various conditions. *S. fonscolombii* is noted as being one of seven widely distributed species out of a national count of 75 which enter the desert seasonally and successfully breed there. This type of species will enter from other regions with a more temperate climate and take the chance of breeding when the opportunity arises.

The Canary Islands have a subtropical climate but although Lanzarote is the fourth largest, it is the driest Island in terms of rainfall and the vegetation is effectively semi desert. Besides being close to arid parts of mainland Africa, the reason for its lack of rain is that Lanzarote does not have mountains that gather moisture from the Atlantic winds like the other Canary Islands. Annual rainfall is around 100mm, and 85% of that falls between November and March, leaving the land parched in the summer months. There are few natural water features (water supply is mainly desalinated), and so dragonflies need to make optimum use of available water. *S. fonscolombii* is particularly good at this.

Unlike other *Sympetrum* species, *S. fonscolombii* eggs develop quickly after being laid and don't require a winter rest period. Soon after emergence dispersal will occur and it is at this time that the species makes its long flights to other areas. The species is therefore ideally suited to these conditions and can make use of temporary water bodies which may occur on the island.

The observation on the 9th March 2010, in Lanzarote, arose after having struggled to find any standing water and was at a place where rain water had collected. Wet weather in February had led to water building up in an area dissected by a gully beside the road at W 13° 29.272', N 29° 04.291', half a kilometre west of Guatiza.



Sympetrum fonscolombii. Photo credit Mike Averill.



Lanzarote temporary pool. Photo credit Mike Averill.

The silty ponded water had very little emergent vegetation, and other than the bare banks the only supports were dead woody stems. The only species in fact found at the site was *S. fonscolombii* and these were freshly emerged adults. Approximately 200 exuviae were hanging in the bushes. Judging by the silt marks on the vegetation, levels had been much higher and as the summer months approached the water would eventually dry out.

There have been 14 species of dragonfly recorded for the Canary Isles (Weihrach 2011) but Lanzarote would have less than this due to the dry conditions and lack of permanent water bodies, which pose a problem for breeding species.

S. fonscolombii extends from Europe though the Mediterranean to Africa and is exceptional for the genus *Sympetrum* extending as it does so far into the tropics. Indeed, Dijkstra & Pilgrim (2007) suggested that this species might be moved into another taxonomic genus following further systematic work.

References

- Dijkstra, K.-D.B. & Pilgrim, E.M. (2007): *Trithetrum*, a new genus of African dragonflies formerly placed in *Sympetrum* (Odonata, Libellulidae). *Journal of Afrotropical Zoology* 3: 77-81.
- Suhling, F., Martens, A. & Marais, E. (2009). How to enter a desert – patterns of Odonata colonisation of arid Namibia. *International Journal of Odonatology* 12(2): 287-308
- Weihrach, F. (2011). A review of the distribution of Odonata in the Macaronesian Islands, with particular reference to the *Ichnura* puzzle. *Journal of the British Dragonfly Society* 27(1): 28-48.



Sympetrum fonscolombii. exuviae. Photo credit Mike Averill.



2012 International Congress of Odonatology

Yoshitaka Tsubaki [ytsubaki{at}ecology.kyoto-u.ac.jp]

The postponed International Congress of Odonatology (2011 ICO) will be held at the Kanagawa Prefectural Museum of Natural History in Odawara City, Kanagawa, Japan, in July 2012. The core theme will be "Dragonflies in the Changing World" with wide perspectives including various scales of temporal and spatial changes. Following is a brief introduction of the congress. The 2012 ICO Home Page (<http://www.odonata.jp/ico2012/index.html>) is now updated to announce details of the congress (there will be a call for papers, letters of invitation, registration, etc.).

(1) Joint Congress

The 2012 International Congress of Odonatology (2012 ICO) that was initiated by the Japanese Group of WDA will be held cooperatively with the Japanese Branch of FSIO. Reflecting this decision, we try to make the congress unbranded as much as possible: in addition to the change of congress title, registration fee will be equalized between WDA members and non-members, and congress announcements will be circulated in FSIO as well as in WDA. All of the organizing committee expect to have a single gathering of the world's odonatologists.

(2) Congress Schedule:

July 28: registration/ reception/ public lectures
July 29: opening/ plenary session/ oral session
July 30: plenary session/oral session
July 31: mid congress trip
August 1: plenary session/ poster session/ dinner
August 2: plenary session/ oral session/ closing
August 3-6: congress tour

(3) Web-registration

We introduce a web registration system including payments of registration fees via major credit cards. It means that you do not need to pay a commission for bank transfer or postal money order at your registration. The web registration system will start on February 1, 2012. As for early-bird advantage and the deadline of registration, please visit the site <http://www.odonata.jp/ico2012/index.html>.

(4) Preliminary registration

Please perform a preliminary registration earlier than the launch of formal registration to indicate your interest of attending the congress by e-mail to reg.intodon2012@gmail.com. Those who make interim registration will be informed by e-mail about all news concerning the congress (e.g. launch and deadline of registration, fees, etc.), and added the list of people planning to attend on the website. The list will be updated from time to time, which may help you to know whom you can contact in the congress before your arrival at Odawara in Japan.

(5) Mid-congress trip

We will arrange a beautiful mid-congress trip for you. Buses will take you to various dragonfly habitats, such as lakes, ponds, swamps, rivers, springs and man-made biotopes, in the area of Fuji-Hakone-Izu National Park. We will bet you enjoy great views of Mt. Fuji and Lake Ashinoko. Weather permitting, you will have chances to watch, photograph and even collect dragonflies including those endemic to eastern Asia, such as *Nihonogomphus viridis*, *Stylogomphus suzukii* and *Ephthalmia elegans*, during this trip. The trip will be concluded by an evening BBQ with drinks on the garden-restaurant adjacent to a biotope.

(6) Congress tour

An optional (post-) congress bus tour will start in the morning of August 3 and visit various habitats, such as large lakes, ponds, swamps, rivers, streams and paddy fields in Yamanashi, Nagano and Shizuoka prefectures, central Japan. The participants may have chances to encounter Far East dragonfly genera/species: i.e., *Calopteryx cornelia*, *Sieboldius albardae*, *Stylurus oculatus*, *Sinogomphus flavolimbatus*, *Anotogaster sieboldii*, *Aeschnophlebia longistigma*, *Anaciaeschna martini*, *Deielia phaon*, *Pseudothemis zonata*, *Rhyothemis fuliginosa*, etc. The participants will also enjoy sight-seeing of Japanese traditional culture (Shrines, temples, barrier stations). We recommend you to perform pre-registration. The cost of this three-days tour will be around 57,000 JP Yen, including transportation (bus), hotels and meals. But it is still in the negotiating process as the cost will vary with the number of participants and other conditions. The fee will be fixed before the launch of formal registration.

(7) 2012 ICO Travel Grants

The 2012 ICO will support a few participants from developing countries without their own funding possibilities. A sponsored participant must give an oral presentation or present a poster. Send your applications to the treasurer Ryo Futahashi [ryo-futahashi\[at\]aist.go.jp](mailto:ryo-futahashi[at]aist.go.jp) before 31st March, 2012. Subject title of the mail should be "Application for 2012 ICO Travel Grants". For more detail, visit our web-site <http://www.odonata.jp/ico2012/index.html>.

(8) Symposium session

We invite submissions for symposium proposals. For details, please visit the web-site <http://www.odonata.jp/ico2012/index.html>. We look forward to receiving your contributions.



Kanagawa Prefectural Museum of Natural History

499 Iryuda, Odawara, Kanagawa 250-0031, Japan
(0465)21-1515 (Phone)
(0465)23-8846 (Facsimile)



Female courtship in *Mnesarete lencionii*?

Rhainer Guillermo-Ferreira [rhainerguillermo@yahoo.com.br]
Diogo Silva Vilela [deeogoo@gmail.com]

During our field research at the Ecological Reserve of the “Clube de Caça e Pesca Itororó de Uberlândia”, Uberlândia, State of Minas Gerais, Brazil (15°57’S, 48°12’W; altitude 863 m; 640 ha), we collected and observed specimens of the rare *Mnesarete lencionii* Garrison, 2006. The males we observed had the blue-grey-black colouration pattern and hyaline wings described by Garrison (2006). However, although females presented the body colour described, their wings were not hyaline but had a reddish-brown spot at the base and ivory pterostigma.

At first glance, we thought *M. lencionii* females were *Hetaerina* males. Only after capturing them we noticed they were females, identified later as *M. lencionii*. Thus, in our curiosity, we made some behavioural observations. The observations presented here are from three males and seven females.

Males always remained perched, paying no attention to females around. Females displayed a curious behaviour. They approached the male and perched in front of him and started to make short hovering flights and then returned to the male’s perch. Such behaviour may be considered a visual signal for inter-sexual communication (Corbet 1999) or even a display used to invite males to mate (Abbott 2005). Considering that red spots are used in sexual attraction and courtship by male calopterygids (reviewed by Cordoba-Aguilar & Cordero-Rivera 2005), we wonder if a red spot on a female wing, combined with hovering flights, can eventually have a role in female courtship and male mate choice.

We also observed females fighting each other near the male. Apparently, this population had a female biased sex ratio. This fact should indeed promote female-female competition for males.

Since this species is rare and we have seen only ten individuals in three years, we provide this note as a suggestion for further studies if someone finds a better population to investigate.

References

- Abbot, J., 2005. *Dragonflies and damselflies of Texas and the South-Central United States. Texas, Louisiana, Arkansas, Oklahoma and New Mexico*. Princeton University Press. Princeton, NJ.
- Corbet, P.S., 1999. *Dragonflies: Behavior and Ecology of Odonata*. Comstock, Ithaca, NY.
- Córdoba-Aguilar A., 2005. Evolution and ecology of Calopterygidae (Zygoptera: Odonata): status of knowledge and research perspectives. *Neotrop. Entomol.* 34: 861-879.
- Garrison, R.W., 2006. A Synopsis of the genera *Mnesarete* Cowley, *Bryoplathanon* gen. nov., and *Ormenoplebia* gen. nov. (Odonata: Calopterygidae). *Natural History Museum of Los Angeles County, Contributions in Science* 506: 1-84.



Mnesarete lencionii male and female. Photo credits: Rhainer Guillermo-Ferreira

Pantala flavescens an ancient mariner

Simon Davidson [simoncathlyn@hotmail.com]

In our winter when I can not see odonates I carry out research into the use of marine chronometers on sailing ships in the early 19th century. I was recently reading the Ship's Log of an East India Company ship called the Bombay sailing from Malacca to Canton in 1810 (India Office Records, 1810). I was surprised to read that Captain Archibald Hamilton recorded in his log on the 5th October 1810, mid-ocean between Cambodia, Malaya and Borneo, seeing 'Dragonflies'. They were I would suggest almost certainly *Pantala flavescens*.

"Friday 5 October 1810 8 am near to Latitude 5 17' N Longitude 106 8' E
Observed a great number of dragonflies on board which had not been on board before".

"Wednesday 10 October

Have continued to see a number of dragonflies about the ship ever since the 5th instant more or less sometimes only flying about the Vanes at the Mast Head".

Reference

India Office Records, 1810. Captain's Log HEIC Bombay L/MAR/B/48B. *British Library*.



Pantala flavescens. Credit K.D.P. Wilson.

**New provincial records of Odonata
from Thailand mostly based on photographs**

**Leslie Day [samuibutterflies@gmail.com],
P.O. Box 67, Nathon, Koh Samui, Surat Thani, 84140, Thailand**

Dennis Farrell [ifidontreplyimdead@hotmail.co.uk]

Eric Gibert [ericgibert@yahoo.fr], 2, Daisy Road No. 04-40, 359425, Singapore

**André Günther [andre.guenther@ioez.tu-freiberg.de],
TU Bergakademie Freiberg, Institut für Biowissenschaften,
Leipziger Str. 29, 09599, Freiberg, Germany**

**Matti Hämäläinen [matti.hamalainen@helsinki.fi],
Netherlands Centre for Biodiversity Naturalis, Leiden, The Netherlands**

**Ernst Klimsa [eklimsa@t-online.de],
Zeisigstr. 2, D-92421, Schwandorf, Germany**

**Alexey Korshunov [avkorshunov@mail.ru],
Kemerovo State University, Kemerovo, Russia**

**Oleg Kosterin¹ [kosterin@bionet.nsc.ru],
Institute of Cytology & Genetics SB RAS,
Novosibirsk, Russia; Novosibirsk State University, Novosibirsk, Russia**

**Noppadon Makbun [due_n@hotmail.com],
211/5 M.4 Takhli, Nakhon Sawan, 60140, Thailand**

**Arlo Pelegrin [memutic@yahoo.com],
PO Box 5029, Buffalo Creek, Colorado, 80425, USA**

**Ulrich Röder [roeder.ausacker@t-online.de],
Hüholzer Weg 2, D-24975 Ausackerholz, Germany**

**Reinthong Ruangrong [reinthong99@hotmail.com],
9 Moo 10, Tambon-Laksam, Banphaeo, Samut Sakhon, 74120, Thailand**

**Nikita Vikhrev [nikita6510@yandex.ru],
Zollogical Museum of Moscow State University, Moscow, Russia**

¹ Corresponding author

For those who love and study dragonflies the identification of specimens based on photos is a perpetual headache. We are often unable to provide confident determinations without voucher specimens but are frequently requested to do so. It is true that a good many species may be confidently identified from general appearance but most of these are common and widespread. The more interesting or difficult a group is (that is almost the same) the less suitable it is for such photo-id, and species not yet described obviously, by definition, cannot be identified. Therefore, the potentially most interesting records could also be the least reliable when based only on photographs. Besides, even if a species is easily identified, photographs are often taken at the wrong angle, or use the wrong plane of focus to show key characters such as particular veins or other details. Dragonfly photography has the potential to produce quite a lot of erroneous records if we are incautious in our application of photo-identifications.

At the same time we can no longer disregard this type of information. The ease of digital photography and increasing public interest in Nature on the one hand, and the contraction of natural habitats, with the residue often being confined to national parks, together with the strengthening of Nature protection legislation worldwide on the other hand, result in an increasing number of persons eager to explore Nature but unable to collect

voucher specimens because of either personal ethical concerns or for legal reasons. They are producing a rapidly increasing collection of photographic records of Odonata, affording some data useful to science. This approach is adopted from the birdwatching code of practise, where it works quite well since photographic identification of bird species is in general reasonably reliable. For those adopting this data generated from <dragonfly watching> as a basis for faunistic records, the great challenge is to filter out the noise of unreliable photo-id's. Unfortunately, reliable records still appear to be biased towards widespread, common and photogenic species. Yet they are still data and therefore must be utilised.

Thailand is one of the countries best explored for Odonata in the tropics. The atlas by Hämäläinen & Pinratana (1999), which shows Odonata distribution by provinces, provided a substantial summary of accumulated knowledge and a sound base for further study. A number of publications reported additional species to many provinces. These include a series of papers published since 1999 in issues 16-22 of Malangpo (the Newsletter of the Thai National Office of Societas International Odonatologica): Yeh (1999); Pinratana (2000, 2003); Hämäläinen & Pinratana (2000); Hämäläinen & Yeh (2000); Donnelly (2000); Hämäläinen (2001, 2002a); Dijkstra & Kalkman (2001); Thipaksorn et al. (2001); Chanpaisaeng & Khunwiset (2002 [with some identification errors]); Khunwiset & Chanpaisaeng (2002 [with some identification errors]); Orr (2003); Kosterin & Vikhrev (2008). Another series of papers with faunistic records from Thailand have been published in Aeschna, a journal published by the Odonatological Society of Osaka: Kitagawa & Ichii (1999); Kitagawa & Katatani (2002, 2003, 2005); Katatani et al. (2004); Muraki (2007). In addition there were two papers published in Notulae Odonatologicae (Thipaksorn et al., 2003; Makhun et al., 2011), a large paper by Ferro et al. (2009) and a couple of papers published in Agrion (Kosterin & Vikhrev, 2009); Kosterin et al., 2011). Some new taxonomical solutions and new species of Thai Odonata appeared as well (e.g. Hämäläinen 1999, 2002b, 2003; Yeh, 1999; 2000; Hoess, 2007; Wilson, 2008).

Along with these semi-formal or formal scientific publications, we have the records accumulated on the internet, particularly in the Asia Dragonfly Home Page launched and maintained by E. Gibert (<http://www.asia-dragonfly.net>), a site dedicated to collect photos of Asian Odonata species. Presently this resource includes 8,509 photographs; 2,633 of them taken in Thailand (as at the end of 2011). It is noteworthy that species identifications on the site are the responsibility of the photographers themselves, but these for Thailand have generally been reviewed by N.M., O.K and others,

Here we attempt a summary of those photographic Thai provincial records, which we consider to be reliable, mostly made by prolific contributors to 'Asia dragonfly home page' operating in Thailand, including D.F. (also known as Faz), who in addition has his own dragonfly blog [<http://thaiodonata.blogspot.com>] containing more photos than on [www.asia-dragonfly.net], and L.D., who also exhibits more of his photos on his own site [www.samuibutterflies.com/insect/dragonflies/] (where the detailed information for photos is not shown but is provided here as provincial records). Their photos may be viewed and checked in the sites mentioned. E.K. is not associated with www.asia-dragonfly.net, and few of A.G.'s photos are included on that site (many of his records were based on specimens, not photographs). All the photo authors who agreed to contribute to the project are co-authors of this communication, arranged above in alphabetical order. Unfortunately, Mr. Kriangkrai Suwannaphak [suwannaphak@hotmail.com] has not answered our invitations and hence regrettably we were unable to list him among coauthors. But since he has published their photos and detailed captions in an open internet source and in view of the great importance of his data we feel we can and should mention them here as well (abbreviating his authorship as K.S.), his contribution and role being the same as those of the listed authors. In the data presented below the photo authors are abbreviated by their initials, occasional records by other photographers are acknowledged. In some cases voucher specimens, as well as reliable visual observations by experienced odonatologists are also noted. Absence of comments for any species record in the list below implies that it is based on photography.

Photos of uncertain identification as well as those showing species already known for relevant provinces were disregarded, but some interesting records are included with a question mark. Reliable new provincial records are enumerated below, but one should take into account the severe limitations of the method of photo-id and retain some caution (especially in case of gomphids). In this connection we should also remember that a published distributional record based on a collected specimen can also be erroneous due to misidentification. The distribution maps in the Atlas by Hämäläinen & Pinratana (1999), to which we are making our additions, contain records compiled from all earlier published papers together with the authors' own (largely unpublished) records. Doubtless there are also identification errors present in the published maps.

The provinces below have numbers as in the scheme on pages 16-17 of (Hämäläinen & Pinratana, 1999).

1. Mae Hong Son Province

Pai, Mae Nam Pai River, 27-29.01.2008 (A.P.): *Neurobasis chinensis* (♂, ♀); *Libellago lineata* (♂).

3. Chiang Rai Province

Chiang Rai suburbs (D.F.): *Ischnura aurora* (♂♂, 21.04.2010)

5. Nan Province

A swamp north of Nan, 15.05.2008 (A.P.): *Ceriagrion indochinense* (♂); *Acisoma panorpoides* (♂); *Lathrecista asiatica* (♂); *Potamarcha congener* (♂, 15.05.2008); *Rhyothemis variegata* (♀); *Tetrathemis platyptera* (♂).

A pond within the city of Nan, 20.04.2008 (A.P.): *Ischnura senegalensis* (♂, ♀), *Crocothemis servilia* (♂).

Tha Wang Pha, under a highway bridge, 10.05.2008 (A.P.): *Diplacodes trivialis* (Rambur, 1842) (♂).

A forest near Wiang Sa, 29.05.2008 (A.P.): *Trithemis aurora* (Burmeister, 1839) (♂).

11. Sukhotai Province

A pond next to Wat Tra Phang Ngoen, 05.03.2010 (U.R.): *Ischnura aurora* (♂); *Ictinogomphus decoratus* (♂); *Brachydiplax chalybea* (♂); *Brachythemis contaminata* (♂); *Crocothemis servilia* (♂, ♀).

Ramkhamhaeng National Park, 28.12.2010 (E.K.): *Acisoma panorpoides*; *Trithemis aurora*.

Si Satchanalai National Park, 29.12.2010 (E.K.): *Neurobasis chinensis*; *Aristocypha fenestrella*; *Euphaea masoni*; *Euphaea ochracea*; *Heliocypha perforata*; *Libellago lineata*; *Pseudagrion pruinosum*; *Orthetrum chrysis*; *Orthetrum glaucum*; *Orthetrum pruinosum*; *Trithemis aurora*.

In addition to imaginal photos, the following exuvia were collected by E.K. at Sukhotai Historical Park on 27.12.2010 and identified by Richard Seidenbusch: *Brachythemis contaminata* (♂); *Crocothemis servilia* (♂); *Tholymis tillarga* (2 ♂♂); *Trithemis pallidinervis* (♂).

12. Phitsanulok Province

Phu Hin Viet Resort, 23.12.2008 (E.K.): *Orthetrum sabina*.

Thueng Salaeng National Park, 29.12.2008 (E.K.): *Vestalis gracilis*; *Heliocypha perforata*; *Pseudagrion rubriceps*; *Copera marginipes*; *Indocnemis orang*; *Neurothemis intermedia*; *Orthetrum pruinosum*; *Potamarcha congener*; *Trithemis festiva*.

Nakhon Tai, 214 m a.s.l., 17°06'13"N, 100°50'28"E, 11.11.2011 (A.K.): *Aciagrion borneense* (♀ collected), *Libellago lineata* (♂ collected), *Copera marginipes* (2 ♂♂ collected), *Crocothemis servilia* (♂ collected), *Neurothemis tullia* (♂, ♀ collected), *Onychothemis testacea* (♂ collected).

15. Nakhon Sawan Province

Country Lake + Bung Boraphet, 24-27.12.2010 (E.K.): *Copera vittata*.

16. Petchabun Province

Nam Nao National Park, 24.12.2008 (E.K.): *Aciagrion pallidum*; *Diplacodes trivialis*; *Neurothemis intermedia*.

The same place, 25-26.07.2010 (K.S.): *Copera vittata* (♂, ♀); *Coeliccia didyma* (♂, appendages bluish white).

The same place (D.F.): *Aristocypha fenestrella* (♂♂, ♀♀, 15.11.2009); *Aciagrion borneense* (♂♂, ♀♀); *Argiocnemis rubescens* ♀, 15.11.2009); *Ceriagrion cerinorubellum* (♂, 02.07.2011); *Pseudagrion australasiae* (♂♂, ♀♀, 17.10.2010), *Copera vittata* (♂♂, ♀♀, 15.11.2009); *Merogomphus pavici* (♂, 10.2010); *Indothemis limbata* (♂♂, ♀♀); *Rhyothemis plutonia* (♂♂); *Tetrathemis platyptera* (♂♂, 10.2010).

The same place, 20.03.2008 (A.P.): *Diplacodes trivialis* (♂).

The same place (N.M.): *Indolestes anomalus* (2 ♂♂, 1 ♀ collected 09-10.07.2011).

Nam Nao National Park, headquarters, 22.04.2009 (N.M.): *Prodasineura doisuthepensis* (2 ♂♂, 1 ♀ collected), a species described by Hoess (2007) from Chiang Mai Province after publication of the Atlas (Hämäläinen & Pinratana, 1999).

Nam Nao National Park, a river near the headquarters, (D.F.): *Aciagrion pallidum* (♂, 16.10.2010); *Coeliccia chromothorax* (♂♂, ♀♀, 16.10.2010, 15.11.2009); *Coeliccia didyma* (♂♂, appendages blueish white, ♀♀, 16.10.2010, 15.11.2009); *Coeliccia poungyi* (♂♂, ♀♀, 16.10.2008, 15.11.2009); *Prodasineura auricolor* (♂♂, 17.11.2010).

Nam Nao National Park, Helicopter Pad Lake and env. (D.F.): *Argiocnemis nana* (♂♂, 17.10.2010); *Amphiallagma parvum* [formerly *Enallagma parvum*] (♂♂, 17.10.2010); *Ischnura aurora* (♂, ♀); *Anaciaeschna jaspidea* (♀, 11.10.2010); *Palpopleura sexmaculata* (♂♂, ♀♀); *Pseudothemis jorina* (♀♀); *Rhyothemis triangularis* (♂, ♀, 02.07.2011).

A river below Nam Nao National Park (D.F.): *Dysphaea gloriosa* (♂).

Thung Salang Luang National Park, 10.10.2009 (K.S.): *Orthetrum luzonicum* (♂).

4 km N of Nam Nao town, a small natural pond, 30.07.2011 (D.F.): *Idionyx* sp. (?selysi) (♂, ♀) *Onychogomphus* sp. (?duaricus) (♂, ♀); *Phyllothemis eltoni* (♂, ♀).

2 km S of Nam Nao town, a small pond, 30.07.2011 (D.F.): *Onychargia atrocyana* (♂ with a highly pruinose thorax).

8 km S of Nam Nao town, a small farmer pond, 23.07.2011 (D.F.): *Anax indicus* (♂); *Indothemis carnatica* (♂♂, ♀♀).

17. Loei Province.

Phu Kradung National Park (D.F.): *Mortonagrion aborensis* (♂).

Phu Kradung top (D.F.): *Potamarcha congener* (♂).

Phu Rua National Park, a forest stream at ca 900-1000 m a.s.l., 04.09.2011 (D.F.): *Noguchiphaea youshikoei* (♂♂, ♀♀).

Phu Rua, Song Hon Waterfall, deep forest near an upland river, 03.09.2011 (D.F.): *Gynacantha phaeomeria* (♂).

24. Khon Kaen Province.

Khon Kaen (D.F.): *Vestalis gracilis* (♂♂, ♀♀); *Lestes concinnus* (♂♂, ♀♀, 11, 17.09.2007); *Lestes elatus* (♂♂, 11.09.2007); *Lestes thoracicus* (♀, 17.09.2007; ♂♂, ♀♀, 06.10.2009, quite a number of individuals appeared for a short period of time around the latter date); *Aciagrion pallidum* (♂♂, 30.11.2008; ♀♀, 14.10.2008); *Aciagrion borneense* (♂♂, 10, 17.10.2008; ♀♀, 08.11.2007, 10.5.2008; 10.10.2008); *Onychargia atrocyana* (♂♂, ♀♀, 10.10.2008); *Pseudagrion rubriceps* (♂♂, ♀♀, 12.10.2007, 14.10.2008); *Copera ciliata* (♂♂, ♀♀, 18.11.2007); *Prodasineura* sp. (nec. *verticalis*) (♂, ♀, 08.11.2010); *Acisoma panorpoides* (♀, 30.11.2008); *Brachydiplax chalybea* (♂♂, 01.12.2007, 14.10.2008); *Brachydiplax farinosa* (♂, 03.12.2007); *Crocothemis servilia* (♂♂, 16-17.11.2007, ♀♀, 01.01.2007); *Diplacodes trivialis* (♂♂, 16-17.11.2007), *Orthetrum glaucum* (♂); *Potamarcha congener* (♂♂, 12.10.2007, 11.10.2008); *Pseudothemis jorina* (♂♂, 14.10.2008); *Rhyothemis phyllis* (♂♂, 14.09.2007, 12.10.2008); *Rhyothemis variegata* (♂♂, ♀♀, 25.09.2007); *Zyxomma petiolatum* (♂♂, ♀♀).

Khon Kaen, the Chi River, (D.F.): *Libellago lineata* (♂♂, ♀♀, 21.10.2008, 30.11.2008); *Ceriagrion indochinense* (♂♂, ♀♀, 17.09.2007, 16.10.2008); *Ceriagrion praetermissum* (♂♂, ♀♀, 16, 19.10.2008); *Paracercion malayanum* [formerly *Cercion malayanum*] (♂♂, ♀, 19, 22.10.2008); *Pseudagrion microcephalum* (♂♂, ♀♀, 08.11.2007, 11, 14, 20.10.2008); *Pseudagrion rubriceps* (♂♂, ♀♀, 14.10.2008); *Prodasineura autumnalis* (♂♂, ♀♀, 17-18, 20.10.2008); *Prodasineura coerulescens* (♂♂, ♀♀, 17.10.2008, 08.10.2010); *Aethriamanta aethra* (♂♂, ♀♀, 14.10.2008); *Brachydiplax farinosa* (♂, 20.10.2008); *Aethriamanta brevipennis* (♂♂, ♀♀, 01.12.2007, 20.09.2008, 14.10.2008; 10.09.2009); *Crocothemis servilia* (♂♂, ♀♀, 09.10.2008); *Diplacodes trivialis* (♂♂, ♀♀, 8, 14, 22.10.2008); *Neurothemis tullia* (♂♂, ♀♀, 02.12.2007, 09.10.2008); *Potamarcha congener* (♂♂, ♀♀, 10, 14, 22.10.2008); *Rhyothemis variegata* (♀, 10.08.2008); *Rhodothemis rufa* (♂♂, ♀♀, ♂); *Urothemis signata* (♂♂, ♀♀, 08.11.2008).

Khon Kaen, a small marsh at the Chi River (D.F.): *Lestes concinnus* (♀, 15.10.2008); *Lestes elatus* (♂♂, ♀♀, 17.10.2008); *Agrionemina minima* (♂♂, ♀♀, 06.10.2007, 21.02.2009); *Copera chanthaburii* (♂♂, ♀♀, 30.11.2008, 10.10.2009, here locally abundant, kept to deep shade, e.g. under a bridge); *Copera ciliata* (18.11.2007, 10, 15.10.2008, 30.11.2008); *Copera marginipes* (♂♂, ♀♀, 30.11.2008); *Acisoma panorpoides* (♂♂, ♀♀, 21.02.2009).

Khon Kaen, a small drainage puddle, 04.06.2008 (D.F.): *Orthetrum pruinosum* (♂♂).

Khon Kaen environment, 08.10.2009 (D.F.): *Epopthalmia f. frontalis* (♂).

The Chi River 10 km of Khon Kaen, 05.06.2011 (D.F.): *Ceriagrion olivaceum* (♀);

Phu Wiang National Park (D.F.): *Orolestes octomaculatus* (♂♂, ♀♀, 11, 18.06.2011); *Cratilla lineata* (♂); *Potamarcha congener* (♀); *Rhyothemis plutonia* (♂♂, ♀); *Tetrathemis platyptera* (♀, 10.2010); *Trithemis festiva* (♂♂, ♀♀).

Nam Phong National Park (D.F.): *Lestes elatus* (♂♂).

26. Nakhon Ratchasima Province.

Khao Yai National Park, Haew Suwat Falls (U.R.): *Copera vittata* (♂, 20.02.2010); *Prodasineura* sp. (nec. *verticalis*) (♂, ♀, 26.02.2010).

Eco Valley Lodge + Khao Yai National Park, 31.12.2010-05.01.2011 (E.K.): *Aciagrion pallidum*; *Ceriagrion cerinorubellum*; *Onychargia atrocyana*; *Copera ciliata*; *Copera vittata*; *Diplacodes nebulosa*; *Hydrobasileus croceus*.

Khao Yai National Park, a slow flowing river about 900 m a.s.l., 16.07.2011 (D.F.): *Merogomphus parvus* (♂); *Rhyothemis obsolescens* (♂).

Khao Yai National Park, a natural pond and a swampy area in 10 km from Jungle House Resort, 23.04.2011 (D.F.): *Lestes praemorsus* (♂); *Coeliccia kazukoae* (= *C. megumii*) (♂♂, ♀, 22.04.2011); *Agrionoptera insignis* (♀); *Hydrobasileus croceus* (ind.); *Indothemis limbata* (♂♂, ♀, 23.04.2011); *Onychothemis testacea* (♂♂, 23.04.2011); *Rhodothemis rufa* (♂); *Tramea transmarina* (♂).

Khao Yai National Park, open upland pond at about 1000 m a.s.l., 14.08.2011 (D.F.): *Ceriagrion calamineum* (♂).

27. Buri Ram Province

Dong Yai, 01.05.2008 (K.S.): *Copera ciliata* (♂); *Rhyothemis plutonia* (♂, 01.06.2008).

32. Ubon Ratchathani Province

Khong Jeam, 05.09.2007 (K.S.): *Agrionemina nana* (♂); *Copera marginipes* (♀), *Prodasineura autumnalis* (♂);

Brachydiplax farinosa (♂); *Ceriagrion olivaceum* (♀); *Indothemis carnatica* (♂, ♀).

34. Kanchanaburi Province.

Erewan National Park, 01.05.2011 (R.R.): *Macromia flavocolorata* (♂).

35. Ratchaburi Province.

Kang Som Maew rapids, Sounpung District, (R.R.): *Burmagomphus williamsoni* (♂, 13.04.2010); *Gomphidia kruegeri* (♂♂, 13.04.2010, 15.05.2010); *Megalogomphus* sp. cf. *icterops* (♂♂, 26.06.2010; 16.04.2011), preliminary identification by Matti Hämäläinen and Albert Orr. The male coloration is peculiar in having the green patches on mesepisternum contacting each other rather than divided by a black mid-dorsal stripe, so that the front of the prothorax is entirely green.

Borwee waterfall, Sounpung District (R.R.): *Ceriagrion chaoi* (♂, 13.10.2010); *Macrogomphus kerri* (♂, 15.05.2010); *Macromidia genialis* (♀, 15.05.2010).



Figure 1. *Megalogomphus* sp. cf. *icterops* (Martin, 1902), ♂, Nathon, a small sandy based, shady stream at the edge of secondary forest, Koh Samui island, Surat Thani Province, 22.04.2009, Photo credit: Leslie Day.

Kaojon (Kao-chan) waterfall, Sounpung (Suanphung) District (R.R.): *Onychothemis testacea* (♂, 19.04.2010); *Tyriobapta torrida* (♀, 08.04.2011).

Thaiprachan National Park (R.R.): *Gynacantha phaeomeria* (♂, 08.04.2011, 10.07.2011); *Tetracanthagyna waterhousei* (♀, 08.04.2011); *Heliogomphus selysi* (♂, 11.06.2011); *Leptogomphus gestroi* (♂, 25.06.2011); *Macrogomphus kerri* (♂, 05.06.2011); *Orthetrum pruinosum* (♂, 29.10.2009); *Tetrathemis platyptera* (♂, ♀, 10.06.2010).

Khouy-Kokmoo stream, Sounpung District (R.R.): *Gynacantha phaeomeria* (♂, 28.05.2011); *Asiagomphus xanthenatus* (♂, 15.05.2011).

36. Phetchaburi Province.

Kaeng Krachang National Park, 02.10.2011 (U.R.): *Copera vittata* (♂); *Prodasineura laidlawii* (♂); *Heliocypha biforata* (♂); *Orthetrum glaucum* (♂).

The same place, 13.06.2010 (K.S.): *Euphaea masoni* (♂); *Rhinagrion viridatum* (= *R. mima* auct., see Kalkman & Villanueva, 2011) (♀).

The same place, 02.04.2011 (Jeremy Gatten): *Heliocypha biforata* (♂).

The same place, 19.04.2011 (Len Worthington): *Camacinia gigantea* (♂).

The same place (R.R.): *Heliaeshna uninervulata* (♂, 03.04.2010), *Burmagomphus williamsoni* (♀, 05.06.2010); *Gomphidictinus perakensis* (♂♂, 12.05.2010, 03.11.2010); *Merogomphus parvus* (♂♂, 14.04.2010, 12.05.2010).

Kardungla waterfall, Nonyaplong District, 28.02.2010 (R.R.): *Rhinocypha pelops* (♂); *Protosticta curiosa* (♂).

Maeprajan Reserve dam, 19.11.2009 (R.R.): *Tramea transmarina* (♂).

37. Prachuap Khiri Khan Province

Forest stream below Pala-U Waterfall, 07.02.2011 (U.R.): *Ischnura aurora* (♂); *Paracercion malayanum* (♂).

Pala-Uoo (a different spelling of the above name) Waterfall, 08.05.2011 (R.R.): *Onychogomphus castor* (♂).

45. Nakhon Nayok Province

Khao Yai National Park, 24.06.2009 (K.S.): *Merogomphus parvus* (♂).

Khao Yai National Park, a forested stream between the information centre and waterfall, 10.08.2003 (E.G.): *Lestes platystyus* (♂).

Uncertain locality, 03.08.2006 (Porpol): *Agriocnemis minima* (♂).

52. Samut Sakhon Province

Banalksong village, Banphaeo District, 10.02.2011 (R.R.): *Ischnura aurora* (♂, 06.09.2009); *Pseudagrion microcephalum* (♂, 05.11.2009); *Pseudagrion rubriceps* (♂, 06.10.2009); *Copera ciliata* (♀, 25.03.2010); *Gynacantha subinterrupta* (♂, 28.11.2009); *Aethriamanta aethra* (♂, 05.10.2011; ♀, 07.10.2011); *Macrodiplax cora* (♂, 14.03.2011; ♀, 20.04.2010); *Orthetrum sabina* (♂, 14.10.2009); *Potamarcha congener* (♀, 05.02.2011); *Rhyothemis variegata* (gynochromic ♀, 20.04.2010).

The pond in Laksong Songserm Vithaya school. Banlaksong, Banphaeo District, 08.20.2009 (R.R.): *Agriocnemis femina* (♀).

Ban Pak Khlong Khuean Khak, Moo 3, Laksong, Banphaeo District (R.R.): *Brachydiplax chalybea* (♂, 04.10.2009); *Rhyothemis phyllis* (14.10.2009).

D7 canal, Banphaeo District, 23.05.2010 (R.R.): *Paracercion malayanum* (♂, ♀).

Watlaksong school, Banphaeo District, 17.06.2010, also found in 03.2010 and 05.2010 (R.R.): *Podolestes coomansi* (♂♂).

Thairathwithaya 9th School, Banphaeo District, 17.03.2010 (R.R.): *Podolestes coomansi* (♂♂).

53. Prachin Buri Province

Midsized lake in farmland E of Prachin Buri, 20.02.2010 (U.R.): *Pseudagrion williamsoni* (♂♂, ♀); *Acisoma panorpoides* (♂); *Diplacodes nebulosa* (♂); *Neurothemis fluctuans* (♂); *Rhyothemis variegata* (♂, ♀, gynochromic); *Urothemis signata* (♂).

Khao Yai National Park, Khao Ito Fall and Water Reserve, 20.02.2010 (U.R.): *Diplacodes nebulosa* (♂, ♀); *Pseudothemis jorina* (♂).

The same place, 24.02.2010 (U.R.): *Ictinogomphus decoratus* (♂); *Brachythemis contaminata* (♂, ♀); *Neurothemis fluctuans* (♂); *Rhyothemis phyllis* (♂, ♀); *Trithemis pallidinervis* (♂).

Khao Yai National Park (K.S.): *Vestalis gracilis* (♂, 20.08.2009); *Euphaea masoni* (♂, 20.08.2009); *Ictinogomphus decoratus* (♂, 11.09.2010), *Orthetrum chrysis* (♂, 11.09.2010); *Pseudothemis jorina* (♂, 27.07.2010); *Rhyothemis plutonia* (♂, 01.06.2008).

54. Chachoengsao Province

Uncertain locality (K.S.): *Brachythemis contaminata* (♂♂, 25.06.2005), *Cratilla lineata* (♂, 24-25.06.2005).

57. Chanthaburi Province

Khao Soi Dao Wildlife Sanctuary, ponds at the entrance, 12.11.2010 (D.F.): *Paracercion dyeri* [formerly *Cercion dyeri*] (♂♂, ♀, 23.04.2011).

Khao Khrating National Park, a pond (D.F.): *Ischnura aurora* (♂).

Some locality and date (D.F.): *Indothemis orang* (♂); *Paracercion malayanum* (♂).

58. Trat Province

Uncertain locality (K.S.): *Ictinogomphus decoratus* (♂, 01.05.2007); *Diplacodes nebulosa* (♂, 22.10.2008; ♀, 18.12.2007); *Rhodothemis rufa* (♂, 22.10.2008); *Urothemis signata* (♂, 19.12.2007).

“Near the river”, 19.05.2005 (K.S.): *Cratilla lineata* (♂).

Ko Chang island (K.S.): *Coeliccia yamasakii* (♂, 25.03.2009; ♀, 24.03.2009); *Prodasineura* sp. (nec. *verticalis*) (♂♂, ♀♀, 24.03.2009, 17.06.2009); *Orthetrum pruinosum* (♂, 23.03.2009); *Tetrathemis platyptera* (♂, 11.10.2010).

The same place (D.F.): *Rhinagrion viridatum* (♂♂, ♀); *Coeliccia yamasakii* (♂♂, ♀♀); *Prodasineura* sp. (nec. *verticalis*) (♂♂, ♀♀).

Koh Chang Island, 12.103 N, 102.275 E (N.V.): *Aciagrion borneense* (♂ photo 12.12.2011); *Agriocnemis pygmaea* (♂ collected by light 07.12.2011); *Crocothemis servilia* (♂ collected by light 10.12.2011).

Koh Chang Island, 12.076 N, 102.287 E (N.V.): *Aciagrion borneense* (2 ♂♂ collected 08.12.2011; ♂ photo 15.12.2011); *Agriocnemis pygmaea* (2 ♀♀ collected 13.12.2011); *Pseudagrion australasiae* (♂ photo 15.12.2011); *Coeliccia yamasakii* (♀ collected, tandem observed 08.12.2011); *Coperia vittata* (♂, ♀ collected 08.12.2011); *Crocothemis servilia* (♂ photo 15.12.2011); *Diplacodes nebulosa* (♂ collected 08.12.2011); *Neurothemis fulvia* (♂ photo 13.12.2011; ♀ collected 15.12.2011); *Orthetrum sabina* (♀ photo 15.12.2011); *Trithemis aurora* (2 ♂ collected 13.12.2011).

Koh Chang Island, 12.115 N, 102.299 E (N.V.): *Aciagrion borneense* (♂ photo 10.12.2010, ♀ collected 9.12.2010); *Coeliccia yamasakii* (♂, ♀ collected, ♂ photo 11.12.2011).

59. Chumphon Province

Uncertain locality, 27.09.2010 (K.S.): *Devadatta argyoides* (♂).

60. Ranong Province

Khlong Nakha Wildlife Reserve, Khlong Bangmun stream, 9-11.04.2000 (M.H.): *Megalogomphus* sp. cf. *icterops* (♂, photograph only).

Suwan Siri Waterfall, Amphoe La-Un, 20.08.2009 (L.D.): *Merogomphus parvus* (♀).

Ngao Waterfall, Amphoe Ranong, 17.08.2009 (L.D.): *Brachydiplax chalybea* (♂).

Khao Phra Narai Waterfall, Amphoe Kapoe, 16.08.2009 (L.D.): *Brachythemis contaminata* (♂).

Uncertain locality, 26.09.2010 (K.S.): *Onychargia atrocyana* (♀).

61. Surat Thani Province

Khao Sok National Park, Sok River, 08°54'44.10" N, 98°30'45.10" E (A.G.): *Devadatta argyoides* (♂ collected 05.04.2009); *Dysphaea dimidiata* (♂♂, ♀♀ visual observation, as very common, 18-19, 22-23.03.2008, 31.03.2009, 01, 03, 05.04.2009, ♂ collected 22.02.2001; ♂ photographed 18.04.2008); *Libellago aurantica* (♂ collected 21.02.2001, ♂♂, ♀♀ photographed 18.03.2008, 31.03.2009); *Rhinagrion viridatum* (♂♂, ♀♀ visual observation 31.03.2009, 01, 03.04.2009) *Ischnura senegalensis* (♂♂, ♀♀ visual observation at a small riverside pond 31.03.2009, 01, 03, 05.04.2009); *Coeliccia albicauda* (♀ collected 01.04.2009); *Cratilla metallica* (♂♂, ♀♀ visual observation 18-19, 22-23.03.2008, 31.03.2009, 01, 03, 05.04.2009); *Neurothemis fulvia* (♂ visual observation 03, 05.04.2009); *Orthetrum chrysis* (♂♂, ♀♀ visual observation 18-19, 22-23.03.2008, 31.03.2009, 01, 03, 05.04.2009); *Orthetrum luzonicum* (♂, 23.03.2008); *Onychothemis culminicola* (♂♂, ♀♀ visual observation 18-19, 22-23.03.2008, 31.03.2009, 01, 03, 05.04.2009); *Tholymis tillarga* (♂ collected 22.02.2001); *Trithemis festiva* (♂♂, ♀♀ visual observation 18-19, 22-23.03.2008, 31.03.2009, 01, 03, 05.04.2009).

Khao Sok National Park, Sok River tributary, 22.02.2001 (A.G.): *Vestalis anne* (♂, ♀ collected).

Khao Sok National Park, Bang Laen River, 08°55'15" N, 98°31'45" E, 21.02.2001 (A.G.): *Echo modesta* (2 ♂♂, 1 ♀ collected); *Vestalis anne* (♀ collected); *Dysphaea dimidiata* (♂ collected); *Sieboldius japonicus* (♂ collected).

Khao Sok National Park, valley of a small river falling to the reserve, 08°55'15" N, 98°31'45" E, 27.12.2009 (N.V.): *Coeliccia albicauda* (2 ♂♂ photographed and collected, ♀ photographed in a tandem).

Dat Fa Waterfall, Amphoe Ban Na San, 08.03.2010 (L.D.): *Rhinocypha pelops* (♀).

Mueang Thuat Waterfall, 11.02.2011 (L.D.): *Agriocnemis rubescens* (♂, ♀); *Calicnemia imitans* (♂); *Drepanosticta ?sharpi* (♀).

Ban Por, Koh Samui (L.D.): *Aciagrion borneense* (♂, ♀, 04.01.2009); *Aciagrion pallidum* (♂); *Tramea transmarina* (♂, 03.01.2009).

Ban Tai Ponds, Koh Samui (L.D.): *Agriocnemis minima* (♂, ♀, 29.12.2008); *Brachydiplax sobrina* (♂, 7.11.2009).

Santi Thani estate, Ban Tai, Koh Samui (L.D.): *Macromia cupricincta* (♂, 28.10.2009), *Orthetrum glaucum* (♂, 15.10.2008)

Chaweng Lake, Koh Samui, 7.11.2009 (L.D.): *Ceriagrion cerinorubellum* (♂).

A small pond, Soi 5, Maenam, Koh Samui, 12.12.2008 (L.D.): *Ischnura senegalensis* (♂, ♀).

Song Ruea Waterfall, Koh Samui (L.D.): *Rhinagrion viridatum* (♂, 04.01.2009; ♀, 9.02.2009); *Onychargia atrocyana* (♂, ♀, 12.12.2009); *Coeliccia albicauda* (♂, 15.12.2009); *Indaeschna grubaueri* (♂, 17.01.2009); *Merogomphus parvus* (♂, 27.06.2008), *Orthetrum luzonicum* (♂, 16.02.2009); *Orthetrum testaceum* (♂, 24.01.2009); *Rhyothemis*

triangularis (♀, 31.08.2007); *Trithemis festiva* (♂, 15.10.2008).
 Koh Samui Island, Hin Lad Waterfall Path (L.D.): *Coeliccia didyma* (♂, 17.01.2009); *Protosticta ?curiosa* (♀, 03.03.2010); *Anax guttatus* (♂, 20.09.2007); *Gynacantha basiguttata* (♀, 14.03.2011); *Gynacantha subinterrupta* (♂, 01.12.2009); *Indaeschna grubaueri* (♀, 17.01.2009); *Hydrobasileus croceus* (♀, 29.02.2011); *Tetrathemis irregularis hyalina* (♂, 26.07.2009); *Tholymis tillarga* (♀, 08.03.2009).
 Bo Phut Pond, Koh Samui (L.D.): *Copera vittata* (♂, 14.12.2008); *Aethriamanta aethra* (♂, ♀, 07.02.2009).
 A small stream behind Nathon, Koh Samui, 28.06.2009 (L.D.): *Cratilla lineata* (♀).
 Nathon Pond, Koh Samui, 24.12.2008 (L.D.): *Lathrecista asiatica* (♂); *Neurothemis fulvia* (♂); *Orthetrum chrysis* (♂); *Potamarcha congener* (♂, ♀).
 Koh Samui Island, Nathon, a small sandy based, shady stream at the edge of secondary forest (L.D.): *Megalogomphus* sp. cf. *icterops* (♂, 22.04.2009) Fig. 3, the characters as mentioned above; *Paragomphus capricornis* (♂, 15.20.2008); Wanorn Waterfall, Koh Samui, 11.02.2009 (L.D.): *Pseudothemis jorina* (♂).
 Mangrove area next to Koh Samui Airport (L.D.): *Rhyothemis phyllis* (♀, 03.12.2007); *Rhyothemis variegata* (gynochromic ♀, 05.01.2009).
 Koh Samui Island, Bank Rak, 30.01.2009 (L.D.): *Macrodiplax cora* (♂).
 Koh Samui Island, Baan Lipa Noi, Wanorn Waterfall, (L.D.): *Macrogomphus parallelogramma albardae* (♂, 13.06.2009); *Microgomphus chelifera* (♂, ♀, 20.06.2009); *Camacinia gigantea* (♂, ♀, 13.09.2011, at a new lily pond).
 Koh Samui Island, Central hills (500 m), 02.02.2010 (L.D.): *Aciaagrion borneense* (♀).
 Koh Phangan, 12.02.2009 (Dan Barta): *Paragomphus capricornis* (♂).
 The same place, 10.10.2011 (L.D.): *Cratilla metallica*; *Tyriobapta torrida*.

62. Phang Nga Province

Sri Phang Nga National Park, Ton Ton Toei Waterfall, 08°59'52-58" N, 98°27'39-44" (A.G.): *Rhinocypha pelops* (2 ♂♂, 1 ♀ collected, ♂ photographed 16.03.2008); *Vestalis anne* (3 ♂♂, 2 ♀♀ collected 4.11.04.2009).
 Khao Lak, Pakweeb village, PakWip Stream downstream waterfall, 08°44'41.17" N, 98°16'35.06" E, 24.03.2008, 14.03.2008 (A.G.): *Vestalis anne* (♂ collected); *Archibasis viola* (♂ collected), a new record for Thailand.
 Khao Lak, Ban Bang Khaya Nai, a flooded pit, 08°43'57" N, 98°14'30" E (A.G.): *Lestes praemorsus* (♂ collected 9.04.2009); *Pseudagrion microcephalum* (♂, ♀ collected 11.04.2009); *Anax guttatus* (visual observation 24.03.2008, 9-11.04.2009); *Hydobasileus croceus* (♂ collected 14.04.2009, visual observation 24.03.2008, 9-11.04.2009); *Rhyothemis phyllis* (photos 24.03.2008, ♀ collected 14.04.2009).
 Khao Lak, Ban Bang Khaya Nai, Palm Galleria, 08°43'37,62" N, 98°13'38,10" E, 12.03.2008 (A.G.): *Agriocnemis pygmaea* (♂ collected 12.03.2008 as attracted by light); *Anax guttatus* (visual observation at a garden pond, 14-15.03.2008, 9, 11.04.2009); *Tholymis tillarga* (4 ♂♂ collected 17, 21.03.2008, 11.04.2009 as attracted by light); *Zyxomma petiolatum* (visual observation at garden ponds and pools, 13-25.03.2008, 30.3.-15.4.2009).
 Khao Lak, Bang Niang, street to Chong Fa waterfall, a tributary of Ban Niang River, 8°40'17.06" N, 98°15'53.23" (A.G.): *Vestalis amethystina* (♂ collected 14.02.2001); *Vestalis anne* (3 ♂♂, 3 ♀♀ collected 13-14.02.2001).
 Khao Lak, Bang Niang, street to Chong Fa waterfall, a pond, 8°40'17.06" N, 98°15'53.23", 13.02.2001 (A.G.): *Brachygonia oculata* (♂ collected); *Orchithemis pulcherrima* (♂ collected).
 5 km NE Khok Kloi, a primary forest on a hill slope at a tiny stream at Khao Khuan Kha Mt., 08°18'04.48" N, 98°20'08.80" E, 23.02.2009 (O.K.): *Vestalis anne* (♂ photographed and collected, ♀ visual observation).
 Khao Lak env. (Jürgen Ruddek): *Pseudagrion microcephalum* (♂♂, ♀♀ photo and visual observations 23-24, 27.07.2011), *Anax guttatus* (♂♂ visual observations 30.7.2011, 03.08.2011), *Potamarcha congener* (♂♂ photo and visual observations 23-24.07.2011, 03.08.2011), *Rhyothemis phyllis* (♂♂ photo and visual observations 25,27.07.2011, 03.08.2011), *Tholymis tillarga* (♂♂ photo and visual observations 26-29.07.2011), *Urothemis signata* (♂♂ photo and visual observations 30.7.2011, 03.08.2011).
 A large shallow roadside pond 5.8 km S of Khok Kloi, 8°13'31.1" N, 98°17'55.8" E, 23.02.2009 (O.K.): *Urothemis signata* (♂♂, photographed and collected); *Rhyothemis phyllis* (♂♂ visual observation).

63. Phuket Province

Khao Phra Thaeo National Park, secondary rainforest, 03.01.2004 (René Manger): *Cratilla lineata* (♀).

65. Nakhon Si Thammarat

Ai Khiao Waterfall, Amphoe Phrom Khiri, 06.02.2010 (L.D.): *Gomphidia abbotti* (♂).
 Yong Waterfall, Amphoe Thung Song, 08.02.2010 (L.D.): *Orthetrum luzonicum* (♂).
 Near Khanom, 22.02.2010 (L.D.): *Rhyothemis plutonia* (♀).
 Krung Shing Waterfall, 29.04.2007 (K.S.): *Lyriothemis biappendiculata* (♂).

67. Trang Province.

Unspecified locality (Wongpakorn Kaoian): *Libellago stigmatizans* (♂, ♀, 30.03.2009); *Lyriothemis mortoni* (♂, ♀, 20.07.2009); *Camacinia gigantea* (♂, 30.05.2009).

74. Mukdahan Province

Mukdahan National Park, a stream at the entrance, 21.20.2010 (D.F.): *Agriocnemis nana* (♂♂, ♀♀).

76. Sa Kaeo Province

Pang Sida National Park (K.S.): *Vestalis gracilis* (♂♂, 24.06.2007, 31.08.2010, 12.06.2011); *Rhinagrion viridatum* (♂, 17.04.2008); *Coeliccia kazukoae* (= *C. megumii*) (♂♂, 31.05.2007, 17.04.2008, 31.08.2010, 01.09.2010, 12.06.2011, ♀, 31.08.2010); *Copera vittata* (♂♂, 24.06.2007, 17.04.2008); *Protosticta* sp. (? *khaosoidaoensis*) (♂, 12.06.2011); *Prodasineura* sp. (nec. *verticalis*) (♂, 17.04.2008); *Cratilla lineata* (♀, 31.08.2010); *Neurothemis intermedia* (♂♂, 24.06.2004, 26.08.2006); *Orchithemis pulcherrima* (♂, 17.04.2008).

The same place (D.F.): *Vestalis gracilis* (♂♂, ♀♀); *Aciagrion pallidum* (♀, 12.11.2010); *Coeliccia kazukoae* (= *C. megumii*) (♂).

Discussion

With the provincial records accumulated, updated maps would provide a more complete picture of dragonfly distribution, changing from scattered provincial patches to contiguously filled areas as expected, namely (i) the entire country, (ii) only the North, (iii) only the peninsula, (iv) only the continent, (v) along the Burmese border and (vi) continental south-east. This indicates that despite the natural habitats being in a state of continued rapid deterioration from human activity, it is still possible to map the natural distribution of Odonata species, although nowadays the actual habitats are fragmented, especially those of stream dwelling species. At present they are mostly confined to national parks and 'waterfalls', both fortunately quite numerous in Thailand. Along with our nearing a reconstruction of this 'true' distribution, the idea of provincial recording is losing its scientific justification, being rather a general concept which leaves scope for a more precise recording, databasing and mapping, especially valuable in view of our ravages on Nature.

We record two species new for Thailand. A species photographed in Ranong and Ratchaburi Provinces and Koh Samui (Surat Thani Province) is preliminarily identified as *Megalogomphus* sp. cf. *icterops* (Martin, 1902). In its colour pattern it differs slightly from *M. icterops*, a species known to range in other parts of Sundaland and at least once found in the Peninsular Malaysia (Orr, 2005). In the Thai specimens the green colour on the front of the pterothorax is not similarly divided by black as in *M. icterops*. Since no specimens of the Thai form has yet been collected, it is not possible to judge its correct taxonomic status. The other species new for Thailand is *Archibasis viola* Lieftink, 1949. This record is based on reliably identified voucher specimens. Two more new national records made by D.F. and N.M. will be published separately and are not included here.

Acknowledgements

We are grateful for Albert Orr for helpful comments on the manuscript and to Jürgen Ruddek for some data from the Khao Lak environs. R.R. and K.S. are grateful to Philip Benstead for identification of some species; O.K. expresses his gratitude to Martin Schorr for a great help with literature.

References

- Chanpaisaeng, J. & S. Khunwiset, 2002. A survey of Odonata adults at Ao Luk, Krabi province, Thailand. *Malangpo* 19: 191.
- Dijkstra, K.-D.B. & V. Kalkman, 2001. Orange and gold. *Malangpo* 18: 164-166.
- Donnelly, N., 2000. Farangpo-2000 – Hong Kong, Thailand and Cambodia. *Malangpo* 17: 160-162.
- Dow, R., 2003. A first trip to Thailand. *Malangpo* 20: 200-201.
- Ferro, M.L., R.W. Sites & A. Vitheepradit, A., 2009. Contributions to the faunistics of Odonata in Thailand. *Insecta Mundi* 0104: 1-24.
- Hämäläinen, M., 1999. *Drepanosticta jurzitzai* spec. nov., a new damselfly from southeast Thailand (Zygoptera: Platystictidae). *Odonatologica* 28: 421-423.
- Hämäläinen, M., 2001. Review of two recent Japanese papers on Thai dragonflies, with some additional notes. *Malangpo* 18: 169-170.
- Hämäläinen, M., 2002a. The species list of Thai dragonflies increases steadily – an update. *Malangpo* 19: 176-179.
- Hämäläinen, M., 2002b. *Idionyx iida* spec. nov. from Kanchanaburi, Thailand. *Opuscula zoologica fluminensia* 203: 1-4.
- Hämäläinen, M., 2003. *Cryptophea*, a new euphaeid genus and three new species of Caloptera damselflies from Thailand (Odonata: Euphaeidae, Calopterygidae). *Zool. Med. Leiden* 77: 441-454.
- Hämäläinen, M. & A. Pinratana, 1999. *Atlas of the dragonflies of Thailand – distribution maps by provinces*. Brothers of Saint Gabriel in Thailand, Bangkok.

- Hämäläinen, M. & A. Pinratana, 2000. Additions and corrections to dragonfly lists of five protected areas in Thailand. *Malangpo* 17: 156-157.
- Hämäläinen, M. & W.-C. Yeh, 2000. *Polycanthagyna ornithocephala* – again a new aeshnid to the Thai fauna. *Malangpo* 17: 158-159.
- Hoess, R., 2007. *Prodasineura doisuthepensis* sp. nov. from Thailand (Odonata: Protoneuridae). *International Journal of Odonatology* 10: 64-69.
- Kalkman, V.J., & R.J.T. Villanueva, 2011. A synopsis of the genus *Rhinagrion* with description of two new species from the Philippines (Odonata: Megapodagrionidae). *Int. J. Odonatol.* 14: 11-31.
- Katatani, N., K. Kitagawa, A. Muraki & T. Matuzawa, 2004. Notes on Thai Odonata, Part 3. The Odonata from Chiang Rai. *Aeschna* 41: 59-70.
- Khunwiset, S. & J. Chanpaisaeng, J., 2002. A survey of Odonata adults and larvae in Thong Pha Phum district, Kanchanaburi Province, Thailand. *Malangpo* 19: 192-194.
- Kitagawa, K. & N. Katatani, 2002. Notes on Thai Odonata, Part 1. The Odonata from Chanthaburi in March 1998. *Aeschna* 39: 33-42.
- Kitagawa, K. & N. Katatani, 2003. Notes on Thai Odonata, Part 2. The Odonata from Trang Prefecture in March 1998. *Aeschna* 40: 13-23.
- Kitagawa, K. & N. Katatani, 2005. Notes on Thai Odonata, Part 4. The Odonata from Kanchanaburi. *Aeschna* 42: 23-30.
- Kitagawa, K. & H. Ichii, 1999. Record of the Odonata from Southern Thailand. *Aeschna* 36: 59-68.
- Kosterin, O.E. & N.E. Vikhrev, 2008. Odonatological field notes of two January trips to south-eastern Thailand in 2005 and 2006. *Malangpo* 22: 222-236.
- Kosterin, O.E. & N.E. Vikhrev, 2009. Some new provincial records of Odonata made in Thailand in 2007-2009 and a new record for Vietnam. *Agrion* 13 (2): 75-79.
- Kosterin, O., N. Vikhrev, V. Zinchenko & A. Korshunov, 2011. More dragonfly records from Thailand. *Agrion* 15 (1): 12-16.
- Makbun, N., J. Kulsarin, S. Buranapanichpan & M. Hämäläinen, 2011. Additional records of Odonata from Doi Suthep-Pui National Park, Chiang Mai Province, Thailand. *Notulae odonatologicae* 7: 61-65.
- Muraki, A., 2007. Records of the dragonflies genus *Macromia* from Chiang Dao of Thailand. *Aeschna* 43: 15-19.
- Orr, A., 2003. Rendezvous Kanchanaburi. *Malangpo* 20: 202-205.
- Orr, A., 2005. *Dragonflies of Peninsular Malaysia and Singapore*. Natural History Publications (Borneo), Kota Kinabalu.
- Pinratana, A., 2000. Editorial. *Malangpo* 17: 155.
- Pinratana, A., 2003. Editorial. *Malangpo* 20: 195.
- Thipaksorn, A., P. Kittayapong, J.R. Milne, V. Thirachupt, C. Sindhusake & S. Poonchaisri, 2001. Additions to distributions of rice field odonates in Thailand. *Malangpo* 18: 171-174.
- Thipaksorn, A., P. Kittayapong, J.R. Milne, V. Thirachupt, C. Sindhusake & S. Poonchaisri, 2003. Records of rice field Odonata from Thailand. *Notulae odonatologicae* 6: 20-24.
- Wilson, K.D.P., 2008. Crepuscular activity of *Orientogomphus minor* (Laidlaw) comb. nov. from Thailand and clarification of the taxonomic status of closely related species. *Echo* 5: 15-21
- Yeh, W.C., 1999. Notes on three aeshnid species from Thailand. *Malangpo* 16: 144-145.
- Yeh, W.C., 2000. Description of a new species of the genus *Oligoaeschna* Selys (Anisoptera: Aeshnidae) from Northern Thailand. *Chinese Journal of Entomology* 20: 225-231.

***Atractocerus* sp. (Coleoptera: Lymexylidae) a damselfly-looking beetle**
Keith D.P. Wilson [kdpwilson@gmail.com]



***Atractocerus* sp., 4
November, 2011,
Dibba, Oman.**

On the 4 November 2011 my daughter Kate and I were enjoying a short break, diving at Musandam, where we stayed overnight at Dibba in the northern Omani enclave near the Strait of Hormuz. Kate drew my attention to a strange insect she had found on a wall, which reminded her of a 'wierd' damselfly (GPS: 25°38'47.95"N; 56°15'58.44"E). When I worked in Hong Kong I was often asked if the local southern Chinese owlflies (Ascaphalidae) belonged to or were related to dragonflies (Anisoptera) but the insect before us was nothing like an owlfly and had folded wings superficially resembling a damselfly (Zygoptera). I must confess I had no idea what the insect was. Owlflies belong to the order Neuroptera and are distantly related to odonates but this insect bore no resemblance to any neuroptera.

I sent a photo image off to the 'whatsthatbug' identification web site but they drew a blank. Dr Gerald Legg, Keeper of Natural Sciences at the Royal Pavilion & Museums, Booth Museum of Natural History, Brighton, UK managed to place the insect, which is a ship-timber beetle, *Atractocerus* sp. (Coleoptera: Lymexylidae). After correspondence with Gary Feulner, Chairman of the Dubai Natural History Society, a copy of my photo was sent to Tony van Harten who was also able to place the insect as he, by chance, had previously trapped a single specimen in a light trap at Wadi Bih, Ras Al Khaimah, UAE. Tony van Harten pointed out that



**Split-eye owlfly
(Ascaphalidae) Hong Kong.**

Brigitte Howarth had also trapped a single specimen, attributable to the genus *Atractocerus*, taken at a mercury vapour light trap by BH, on the 19th September 2008 in the Fujairah emirate (Howarth and Gillett, 2009). Tony also added that apart from the three aforementioned records no other Lymexylidae had ever been recorded from the Arabian Peninsula.

Just thirty-seven described species belong to the small family Lymexylidae (ship-timber beetles) which are recorded from throughout the World. The genus *Atractocerus* is distributed throughout the tropical and subtropical regions. The larvae and adults develop in wood of fallen or damaged trees and feed on fungus that grows in tunnels bored by the larvae. It has a soft body with barely noticeable rudimentary elytra (wing cases) and as such is barely recognisable as a beetle. *Atractocerus* fossils are known from amber 100 myo (Grimwold & Engel 2005) earning them the "living fossil" moniker. At one time considered a very basal coleopteran (King, 1955) lymexylids are now thought to be related to the cucujiform groups Cleroidea and Cucujoidea (Wheeler 1986).

References

- Grimaldi, D. and M. S. Engel. 2005. *Evolution of the Insects*. Cambridge University Press, New York, xv + 755 pp.
- Howarth, B., M. P. T. Gillett, 2009. Increasing knowledge of the entomological fauna of the United Arab Emirates and the role of private collections. *Zookeys* 31: 119-132.
- King, E. W., 1955. The phylogenetic position of *Atractocerus* Palis. *The Coleopterists' Bulletin*. 9(5): 65-74.
- Wheeler, Q. D. 1986. Revision of the genera of Lymexylidae (Coleoptera: Cucujiformia). *Bulletin of the American Museum of Natural History* 183:113-210



***Atractocerus* sp., 4 November, 2011, Dibba, Oman.**

New odonate books

Damselflies of Texas: A Field Guide

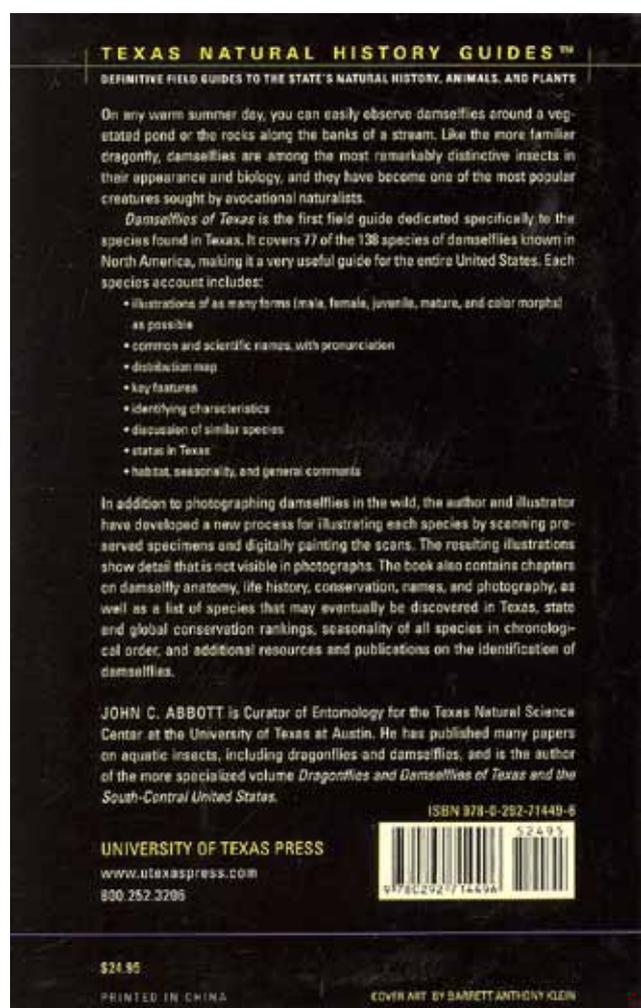
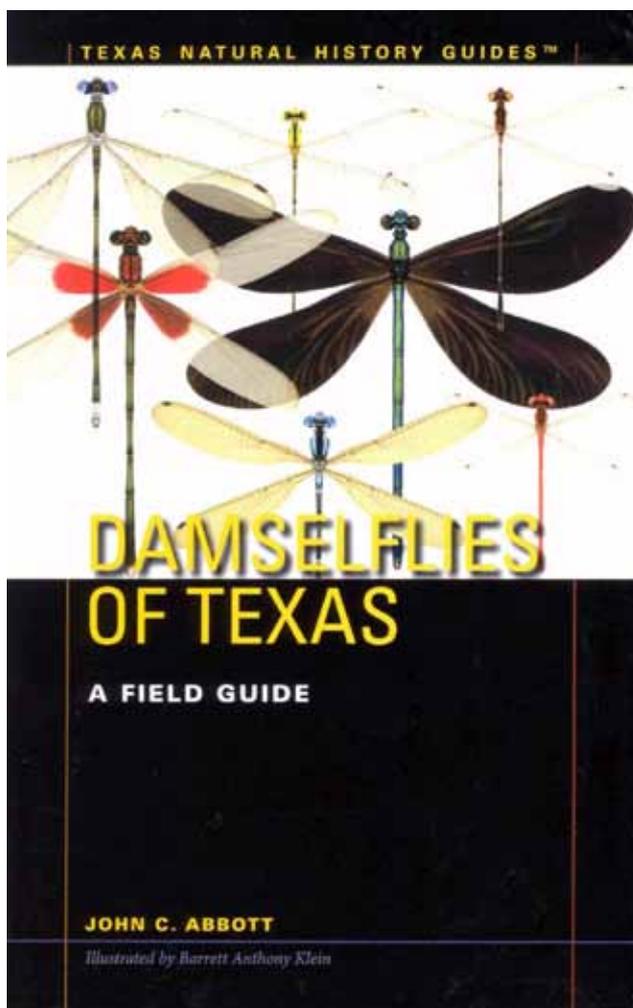
Author: John C Abbott

268 pages, 632 colour photographs, 79 colour illustrations, 80 colour dist maps. University of Texas Press. US\$ 24.95 list price. "Damselflies of Texas" is the first field guide dedicated specifically to the species found in Texas. It covers 77 of the 138 species of damselflies known in North America, making it a very useful guide for the entire United States.

Each species account includes:

- illustrations of as many forms (male, female, juvenile, mature, and colour morphs) as possible
- common and scientific names, with pronunciation
- distribution map
- key features
- identifying characteristics
- discussion of similar species
- status in Texas
- habitat, seasonality, and general comments

In addition to photographing damselflies in the wild, the author and illustrator have developed a new process for illustrating each species by scanning preserved specimens and digitally painting them. The resulting illustrations show detail that is not visible in photographs. The book also contains chapters on damselfly anatomy, life history, conservation, names, and photography, as well as a list of species that may eventually be discovered in Texas, state and global conservation rankings, seasonality of all species in chronological order, and additional resources and publications on the identification of damselflies.



Monitoring Climate Change with Dragonflies

Edited by Jürgen Ott

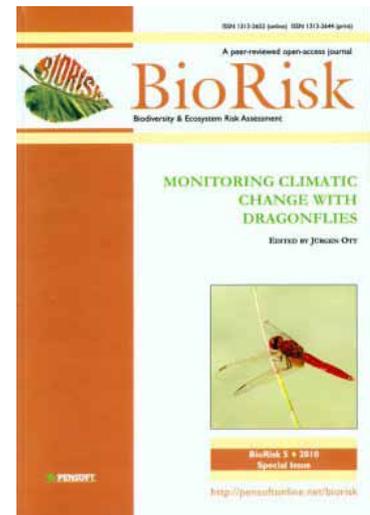
Series: BIORISK 5. 286 pages, full color, richly illustrated with plates, tabs, graphs. Softcover. Published December 2010, ISBN-13: 9789546423238. Price € 85.90 and available as E-book from Pensoft Books.

Monitoring Climate Change with Dragonflies provides an important new tool for dealing with arguably the most important environmental challenge facing modern humanity. It provides a solid foundation on which subsequent research can be built, and can help ensure that responses to climate change are as appropriate as possible

This book combines papers from two symposia of the World Wide Dragonfly Association (WDA) in Pontevedra (2005) and Swakopmund (2007) - which were compiled by the editor, as well as some additional contributions and a general view on biodiversity related climate change impacts from the EC funded ALARM project.

All the contributions show, that there are already and will be even more changes within dragonfly as well as general aquatic communities, leading to threats for many species, in particular the stenoeconomic ones.

We are far from general conclusions and understanding of all factors and effects, as still too many questions are open: e.g. i) whether adaptations of species to new conditions are possible, and if yes, to what extent, ii) what are long term and synergistic effects, and iii) whether there are management options to mitigate climate change impacts.



CONTENTS

Monitoring climate change with Dragonflies: Foreword

Climate change impacts on biodiversity: a short introduction with special emphasis on the ALARM approach for the assessment of multiple risks

Trends in occurrence of thermophilous dragonfly species in North Rhine-Westphalia (NRW)

Do climate changes influence dispersal and population dynamics of dragonflies in the western Peruvian Andes?

Impacts of extreme weather and climate change on South African dragonflies

Climate and elevational range of a South African dragonfly assemblage

Southern dragonflies expanding in Wallonia (south Belgium): a consequence of global warming?

Monitoring of Odonata in Britain and possible insights into climate change

When south goes north: Mediterranean dragonflies (Odonata) conquer Flanders (North-Belgium)

Changes in the range of dragonflies in the Netherlands and the possible role of temperature change

Monitoring the effects of conservation actions in agricultural and urbanized landscapes - also useful for assessing climate change?

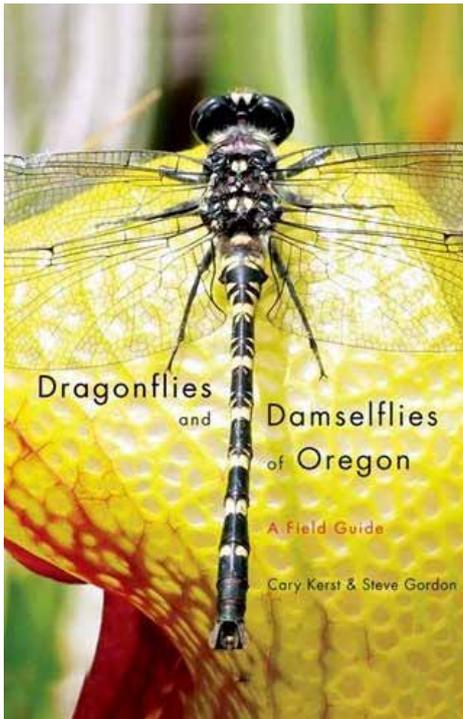
Anthropogenic climate change impacts on ponds: a thermal mass perspective

Expansion of *Crocothemis erythraea* in Ukraine

Dragonfly and Damselfly (Insecta, Odonata) Distributions in Ontario, Canada: Investigating the Influence of Climate Change

The local species richness of Dragonflies in mountain waterbodies: an indicator of climate warming?

Dragonflies and climatic change - recent trends in Germany and Europe



Dragonflies and Damselflies of Oregon: A Field Guide

Authors: Cary Kerst and Steve Gordon

304 pages, illustrations. Oregon State University Press. US\$ 24.95 list price.

Cary Kerst and Steve Gordon include information on identification, as well as biology and behaviour, using common terms useful to the novice and experienced enthusiast alike. The book features stunning colour photographs of male and female of all species currently known in Oregon, along with helpful illustrations and charts with important identification characteristics.

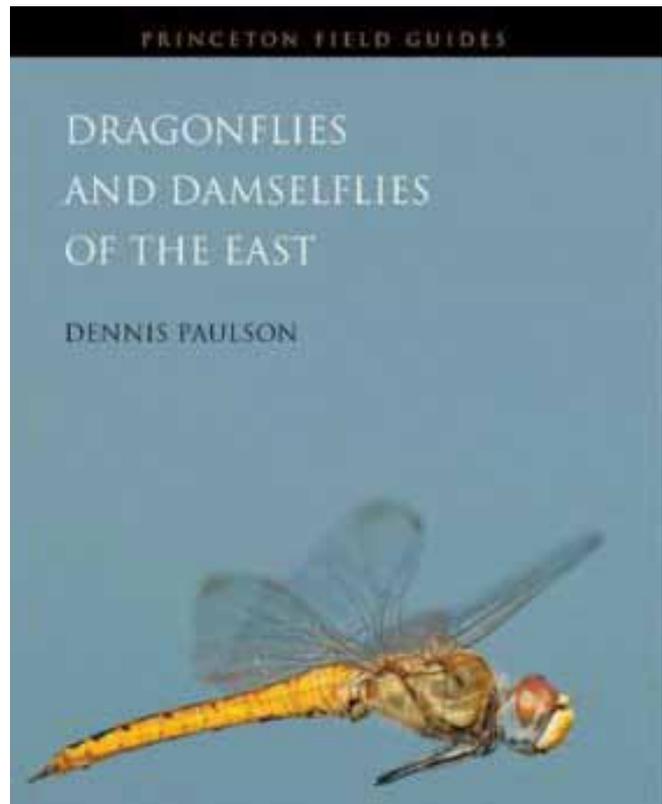
Dragonflies and Damselflies of Oregon presents the life cycle and larval habits of dragonflies and damselflies, along with photographs of the larvae of families. The Oregon range for each species is mapped, and the size range of adults is provided in text and illustration. The book also includes a description of the best sites in Oregon to observe these amazing insects, a useful tool for viewing uncommon species in spectacular settings.

Dragonflies and Damselflies of the East Author: Dennis Paulson

December 2011. 576 pages, 675 colour photos. 350 line illus. 333 maps. ISBN: 9781400839667. Hardback US\$ 85; soft US\$ 29.95, eBook US\$ 29.95. Princeton University Press.

This is the first fully illustrated guide to all 336 dragonfly and damselfly species of eastern North America - from the rivers of Manitoba to the Florida cypress swamps - and the companion volume to Dennis Paulson's acclaimed field guide to the dragonflies and damselflies of the West. "Dragonflies and Damselflies of the East" features hundreds of colour photos that depict all the species found in the region, detailed line drawings to aid in-hand identification, and a colour distribution map for every species - and the book's compact size and user-friendly design make it the only guide you need in the field.

- Illustrates all 336 eastern species
- Features hundreds of full-colour photos
- Includes detailed species accounts, line drawings to aid identification, and a colour distribution map for every species
- Offers helpful tips for the dragonfly enthusiast



Dennis Paulson's books include "Dragonflies and Damselflies of the West" and "Shorebirds of North America" (both Princeton). Now retired, he was director of the Slater Museum of Natural History at the University of Puget Sound.

Worldwide Dragonfly Association Membership Application Form 2012

Since the beginning of 2011 Taylor and Francis has been managing the Association's membership as well as publishing and distributing the WDA's International Journal of Odonatology. Membership benefits include free access to the odontological abstracts service posted twice a year on the WDA website [<http://ecoevo.uvigo.es/WDA>]. Those members who choose a membership option that includes a subscription to the journal will receive both online access and a print subscription.

Existing members were contacted by Victoria Gardner, Managing Editor, Taylor & Francis and Robert Reimer, WDA Secretary in November 2011 with details of renewal procedures. New members please fill in the form below and email it to the WDA Secretary [wda_secretary@gmail.com] and Victoria Gardner, Taylor & Francis [victoria.gardner@tandf.co.uk]. You will receive information on payment procedures.

Membership Category	Currency			
	GB £	US \$	Euro €	JP ¥
Memberships WITH Journal				
Sustaining (includes voluntary donation)	£74	\$115	€87	¥9,400
Single (with journal)	£52	\$82	€62	¥6,800
Family (with journal)	£66	\$103	€77	¥8,400
Student (with journal)	£34	\$53	€40	¥4,300
Affiliated Society (with journal)	£69	\$108	€81	¥8,800
Memberships WITHOUT Journal				
Single (without journal)	£24	\$38	€28	¥3,050
Family (without journal)	£35	\$55	€41	¥4,500
Student (without journal)	£7	\$11	€8	¥1,000

Name: _____

Email: _____

Address: _____

I/We wish to take out membership of the Worldwide Dragonfly Association: (from list above)

Currency: _____

Date: _____