



EDITORIAL

I am delighted with the response to my appeals for material for this Asian number of AGRION. There are articles from Brunei, China (Hong Kong and Southern), India, Indo China, Indonesia, Japan, Java, Papua New Guinea, Philippines, Sarawak, Sri Lanka, Thailand and Turkey: I thank all those who responded so magnificently. And I hope you will all agree that the inclusion of ECHO at the end of the newsletter is a very appropriate addition.

A LETTER from NORMAN MOORE

Dear members of the WDA

Thank you all, and especially the editors and contributors to the Guardians of the Watershed [International Journal of the WDA 7(2)], for your great kindness in dedicating this splendid work on dragonfly conservation to me. You could not have given me a kinder present.

As Philip Corbet says in his most generous introduction, the volume is a milestone in our endeavour to promote the conservation of dragonflies throughout the world. The progress made under Jan van Tol's chairmanship of the Odonata Specialist Group, now being continued under that of Viola Clausnitzer, is exciting and most encouraging. When we published our Action Plan in 1997 so little was known about the status of dragonflies in all but a few countries in the Temperate Zones that any Red List of threatened species was extremely tentative, requiring a great deal of correcting and expansion. It was clear that most species that were threatened could not even be listed, and would be in the "Data Deficient" category if they were. Our recommendation in the Action Plan that the Red List of Threatened Species should be improved was a *sine qua non* for future conservation work. How splendidly you, the authors of the Guardians of the Watershed and all who helped you, have risen to that challenge. Thanks to your efforts we have now got a vastly more authoritative Red List. Also, your detailed analyses of threats in all the regions of the world is much more thorough than was possible ten years ago. As a result, much more information can now be given to conservation organisations and governments concerning the conservation of particular areas that are vital to dragonflies. Of course, an enormous amount needs to be done but you have laid a solid foundation for the future.

With warmest congratulations and thanks

Norman Moore

26 – 8 – 04

NOTICE of the 4TH WDA BIENNIAL MEETING

The 4th Biennial General Meeting of the Worldwide Dragonfly Association will be held at the Pontevedra Campus of the University of Vigo, NW Spain on Friday 29th July 2005 (at a time to be confirmed).

4th WDA SYMPOSIUM

The 4th WDA Symposium of Odonatology will be held from 26th to 30th July 2005 at the Pontevedra Campus of the University of Vigo in north west Spain.

A registration form will be available from the website.

Abstracts of each presentation (oral, poster or informal) need to reach the Sym. Organiser no later than 30 April '05.

In Spain insect collecting is controlled by permit. If you wish to collect voucher specimens please contact the Sym. Organiser urgently.

Some accommodation is available by contacting the Symposium Organiser. The end of July is the high season for local tourism and advanced booking will be highly advisable.

Nighttime temperatures can be as low as 12C and the daytime maximum may reach 34C. Come prepared for showers or even rain.

If you require a letter of invitation please contact the Symposium Coordinator:

Richard Rowe, School of Tropical Biology, James Cook University,
Townsville, Q4811, Australia,

e-mail: Richard.Rowe@jcu.edu.au

Full details of the planned programme are available on the Symposium website
(<http://webs.uvigo.es/c04/webc04/WDA/index.htm>)

or through the WDA website (<http://powell.colgate.edu/wda/dragonfly.htm>).

If you are unable to access the website and would like details sent to you please contact the Secretary, Linda Averill.

Adolfo Cordero Rivera
(Symposium Organiser)
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INTERNATIONAL SYMPOSIA – *Richard Rowe*

The biennial International Symposia are a core activity of the Worldwide Dragonfly Association. So far we have held three, each different and each exciting.

The first at Colgate University, July 11-16, 1999, was billed as the 'International Congress of Odonatology'. Organised by Vicky McMillan, with Rob Arnold, this conference demonstrated that WDA was born strong and healthy. Around 100 participants and partners attended the conference, and it generated a firm foundation on which the Association could build.

The 2nd WDA International Symposium of Odonatology was held north of the Arctic Circle in Gällivare, Sweden, from 22-27 July 2001. Göran Sählen organised this Symposium, held not far from the northernmost limit of dragonfly occupation. Over 70 attended and enjoyed the long summer days.

The 3rd WDA International Symposium of Odonatology was held in the historic town of Beechworth, Australia, from 8 to 13 January 2003. Organised by John Hawking this conference showed that the WDA had grown to maturity in a remarkably short time. Around 70 people made it to the southern hemisphere, most of them avoiding winter. This Symposium also provided an opportunity for Australia's far-flung dragonfly biologists to meet face-to-face.

The 4th WDA Symposium of Odonatology is being held from 26 to 30 July 2005, in NW Spain at the Pontevedra campus of the University of Vigo. It is being organised by Adolfo Cordero and promises to have a very exciting programme (in the nicest possible way). We would encourage European dragonfly workers and odonatologists, and anyone just interested, to make the trip and to join us. We also remind the North Americans that for them this is 'just across the ditch' and that with a little effort good fares can be found across the Atlantic.

The 5th Symposium is scheduled for Windhoek in Namibia in mid 2007, and we anticipate that the 2009 Symposium will be held in North America some time in the summer (even us larval specialists don't relish field activity in the winter).

CHANGE IN CODE OF PRACTICE

The Board of Trustees has voted to make the following addition to Section 2.1 of the WDA Code of Practice for Collecting Specimens. The original Code appeared in *AGRION* 6(2): 22-23; July 2002. The added text is shown in boldface.

2.1 Before any dragonfly is collected, or collected material exported from its country of origin, all existing, relevant regulations should have been complied with. Such regulations may include: permission to enter land, to collect certain species, to collect biological material of any kind, and to export or retain it. **It is recognised that an unexpected encounter may sometimes require an odonatologist to secure, and perhaps retain, a dragonfly without having obtained the requisite permission beforehand. In such an event, it is assumed that, if the specimen is collected in a place where restrictions are known to apply (e.g., a nature reserve), the appropriate authorities will be informed soon afterwards.**

NEWS FROM MEMBERS

Matti Hämäläinen was in Thailand again for four weeks in November.

Moira Hope (158 N. View Rd, London N8 7NB). "I always enjoy AGRION and am sorry I am now so housebound as to be unable to help much". Moira acknowledges the need for wind-farms but is concerned about their proliferation and their increasing acreage. She continues: "I know RSPB are worried about migratory birds being sucked into the vortices. The Bat Conservation Trust tells me they have reports of considerable bat wind-farm deaths in Canada. I have also had a report of dragonfly wind-farm deaths in Spain. I have written to BP and Shell to ask what plans they have to deal with this, because I feel it could be solved if money and expertise were spent on it NOW. So far no reply. So rapidly are plans going ahead that even shipping companies are complaining that they will interfere with their 'migratory' routes! I feel the bird/bat/ dragonfly/ butterfly groups all need to get together over this and make ourselves felt, because the corporations will be only too happy to forget us. Prince Charles was on about wind-farms, so I am writing to him today too. Personally I feel that what they look and sound like is the least of our worries. PS. When I get their address I will write to Butterfly Conservation too."

Milen Marinov (mg_marinov@yahoo.com) held a Dragonfly Week in his native Bulgaria during the summer, which was a great success. His handbook "Dragonfly Year in Bulgaria" 2005) is only in Cyrillic at present but is described by **Tim Beynon** as "one of the best in design, layout and 'handleability' in the field I've seen."

Mike May was a Guest Speaker at BDS's Members Day in November. He spoke on the Migration of *Anax junius* in North America, which was very well received.

Gordon & Valerie Pritchard: "We have just returned from a wonderful trip to the South Pacific. We had a great cruise in French Polynesia that got Valerie into Bora Bora on her 65th birthday, followed by a week in Sydney with friends, who then joined us for a week's camping in Central Australia. I am feeling pretty good. I have four days of chemotherapy at the beginning of each month and that slows me down a bit, but otherwise I feel fine both physically and spiritually."

Georg Rüppell & Dagmar Hilfert also attended the BDS Members Day in November and gave one of their ever-popular video presentations: "Flashes in flight – communication between odonate males".

Jill Silsby. I made no less than five excursions into Africa during 2004. Dragonflies were not the principal object but were nevertheless greeted with enthusiasm when seen. A trip to Gabon and the Equatorial Rainforest was probably the most thrilling but Tunisia (where I spent a night in a Bedouin tent in the middle of the Western Sahara) was a close second. The reason for all these African experiences is that I'm working on a mammoth project: "Africa from Top to Toe" which will encompass everything from deserts and rainforests, through flora and fauna (chapter on odonates will be my favourite!), to the Pyramids and rock paintings. Am I REALLY going to be 80 in February???

CONCENTRATING on ASIA

DRAGONFLIES of YALA and TISSAMAHARAMA (SRI LANKA) – *Karen Conniff*

The rain brings out the best in Yala (in **Sri Lanka**). On a recent visit in May, and after a few rain showers, I discovered that the rain kept the dust down, leaves were a brighter green and overnight it seemed that blossoms appeared on the branches of trees and shrubs. The fruits that had formed from a previous rain had brought in a multitude of birds and butterflies. Not quite as obvious as the numbers of birds and butterflies were the appearance of many dragonflies that moved from one rain-recharged pond to the next.

I was on a tour of Yala with **Gehan de Silva Wijeyeratne** * and several journalists. We all hoped to see a leopard, but while searching for leopards our binoculars were also turned toward other mammals, birds, and crocodiles. I also used mine to view the variety of dragonflies that were dipping and darting over the surface of the ponds. The dragonfly that was easiest to find was a noticeable yellow and brown one that kept zooming across the front window screen of the vehicle. This was the Globe Skimmer (*Pantala flavescens*). When we stopped by a pond to look at birds or crocodiles I quickly scanned the pond for stumps and broken sticks hoping to see perching dragonflies and on them I found Orange-winged Groundlings (*Brachythemis contaminata*); immediately recognisable because of their bright orange wings. Others included Little Blue Darters (*Diplacodes trivialis*), Sombre Skimmers (*Orthetrum sabina*), the bright red Eastern Scarlet Darters (*Crocothemis servilia*), and faded blue Brown banded Skimmers (*Orthetrum glaucum*). I saw more but there was not enough time to determine each species. The challenge of spotting and identifying dragonflies is as satisfying to me as adding to my list of birds.

It was difficult to view dragonflies from the vehicle but luckily we stopped briefly for a quick bite to eat in the park near a river and a small pond. I took a stroll along the edge of the pond and found a few of the smaller and more delicate damselflies (zygopterans), moving almost imperceptibly amongst the grass. Along the edge of the pond were Ubiquitous Bluetails (*Ischnura senegalensis*) and Orange-headed Sprites (*Pseudagrion rubiceps ceylonicum*). On the river in partial shade along the banks we saw the beautiful purplish pink Dawn Dropwing (*Trithemis aurora*) and its close relative, the Indigo Dropwing (*Trithemis festiva*). There are more to discover but it takes more time than just a quick stop. Once the snack was finished our group was ready to continue our drive because everyone was still hoping to spot a leopard.

The guides at Yala Safari Game Lodge were eager to learn more about dragonflies so I was happy to go with them on a special dragonfly mission. We were limited for time, so early one morning we made a quick trip to Tissamaharama just outside Yala where there is a lovely tank called Devera Wewa. Here the birds were as fascinating as the dragonflies and damselflies but, since we purposely went to spot the latter, we ignored the birds and were able to see a dozen species of Odonata in less than an hour. That morning the weather was not ideal for dragonfly watching being cloudy and with a light drizzle, but still there

were many to see. The first to be spotted were the bright yellow slow moving Yellow Damselflies (*Ceragrion coromandelianum*); both males and females were present and many were seen in tandem and copulating which made recognising the females easy.

There were many cut lotus stems on the tank; ideal perches and best for spotting dragonflies. A short distance from the edge of the tank a Dancing Dropwing (*Trithemis pallidinervis*) was perched on a lotus stem and beside it on another stem was a bright red Eastern Scarlet Darter (*Crocothemis servilia*); both male and female Eastern Scarlet Darters were present in large numbers. Another numerous species was the Asian Pintail (*Acisoma panorpoides*); both the blue males and yellow females were spotted along the edge of the tank. As we quickly walked the tank edge we saw a Sombre Skimmer (*Orthetrum sabina*), Brown-banded Skimmer (*Orthetrum glaucum*), Black Velvet-wings (*Neurothemis tulia*) males, a juvenile male and females, Variable Gliders (*Rhyothemis variegata*) males and females, Spine-legged Reedling (*Rhodothemis rufa*), Orange-winged Groundling (*Brachythemis contaminata*), Ubiquitous Bluetails (*Ischnura senegalensis*) and Little Blue Darters (*Diplacodes trivialis*) males and females. That is quite a list for just one hour of observation and it is definitely not complete since the weather was overcast and there are surely many more that can be identified on a sunny morning. The advantages of the tank over the park are that we could get close to the edges, walk at leisure and take time to identify both dragonflies and damselflies. To many naturalists in Sri Lanka, Odonata is an almost unknown Order but I say to all of them "Take the time to zoom in on dragonflies; and discover a new world."

* **Gehan de Silva Wijeyeratne** manages a wildlife and adventure travel company. He is the lead author of *A Birdwatcher's Guide to Sri Lanka* (OBC) and *A Photographic Guide to the Birds of Sri Lanka* (New Holland). To subscribe to his free, wildlife e-newsletter, e-mail: gehan@jetwing.lk with "subscribe wildlife news" in the message header. Gehan is not a WDA member but he is very involved in promoting awareness of Odonata in Sri Lanka. (Editor)

A DRAGONFLY EXPEDITION to NORTHERN PART of WESTERN GHATS in KERALA STATE

F.K. Kakkassery, Kerala, India.

Kerala, my state, proclaimed by our tourism Department as "God's own country", is one of the smallest states of **India**, lying in its extreme south west coast, with the eastern side guarded by Western Ghats and the western side by the Arabian Sea. In fact, Kerala is a tiny strip of land with an area of 38,863 sq/km with maximum length of 580 km and width varies from 35km to 125km. Because of the south west monsoon and north east monsoon, we are getting an average rain fall of about 3000mm, so that our State is blessed with 44 rivers, a good number of lakes, ponds, back waters, 4.5 million drinking water wells etc, and is an ideal environment conducive to luxurious life of Dragonflies and Damselflies. Western Ghats is an array of mountains with tropical rainforests, starting from the south west tip of peninsular India and lying parallel to Arabian sea extending over Mumbai (Bombay). Fraser, who studied Indian dragonfly fauna extensively, including the Western Ghats, compiled *The Fauna of British India* in three volumes but, after his voluminous work, no serious attempts have been made to study this region. Now, seven decades after his research study, a lot of environmental changes have occurred due to rapid increase in the human population, reaching up to 35 million people living in this small state, which has in turn affected the numbers of odonates in the region.

Last year, in the fourth week of November, my M.Sc research student, Mr. Joshil (another dragonfly enthusiast) and I set out on a three-day expedition to Wyanad, searching for rare and endemic species described by Fraser. This is one of the fourteen districts of Kerala, situated in an elevated picturesque mountainous plateau in the Western Ghats. It lies between 11° 26' 28"N & 11° 48' 22"N & 75° 46' 38"E, and 76° 26' 11"E. In fact, Wyanad is one of the mountain districts of Kerala, situated at a height of 700 to 2100m above sea level, and an ideal home to many species of animal and plant life. Temperatures range from 12°C to 25°C. This district also has the added advantage of linking Kerala with the golden triangle of South India: Bangalore, Mysore and Ootacamund.

We went by motorbike to Wyanad from Calicut, a seaside Kerala city some 90 km from our destination, equipped with insect net, camera etc. We started very early in the morning enjoying the zigzag ride through the hair pin mountain bends and reached there just as the sun rays were filtering through the lush green forests, and the mountains covered with the morning mist. I was ecstatic to be there with the fresh cool breeze wafting from the mountain-side, the emerald forests beckoning us to merge with that green paradise. We visited many small places: Sulthan's Battery, Pookte lake, Manthavady and Muthanga wild life sanctuary and I felt greatly excited at relocating such rare endemic damselfly species as, *Euphaea (Indophaea) fraseri*, *E. dispar*, *Vestalis apicalis apicalis* etc near the banks of the streamlets of the these virgin rainforests, which had been described by Fraser for the first time from India; the damselfly, *Neurobasis chinensis chinensis* is common in this mountain range. I was able to take good photographs of these endemic species as a precious reminder of my expedition.

We made another interesting observation: that from a single pond with an area of one hectare (in a place called Thaloor), we could find a total of 24 odonate species - dragonflies (18 species) and damselflies (6 species). The dragonflies were *Acisoma panorpoides panorpoides*, *Anax guttatus*, *Brachydiplax sobrina*, *Brachythemis contaminata*, *Crocothemis servilia servilia*, *Diplacodes trivialis*, *Hydrobasileus croceus*, *Ictinogomphus rapax*, *Neurothemis tullia tullia*, *Orthetrum sabina sabina*, *Pantala flavescens*, *Rhyothemis triangularis*, *Trithemis aurora*, *T. festiva*, *Tetrathemis platyptera*, *Tramea limbata*, *T. basilaris*, and *Urothemis signata signata*; the damsels were *Agriocnemis pygmaea*, *Ceragrion cerinorubellum*, *C. coromandelianum*, *Copera marginipes*, *Ischnura senegalensis* and *Lestes elatus*. In fact, it was one of the best experiences of my life that I could

find 24 odonates from one locality in one day! We spent one whole day observing and taking photographs of these wonderful magnificent living creatures.

However, I was unhappy that a large area of the land of Wyanad was transformed for agricultural purposes with plantations and estates of tea, coffee, rubber, pepper and cardamom etc. As a result of the high human population density of Kerala, (819 persons/sq km) people have been migrating up the mountain side and encroaching into the green valleys for housing and agricultural activities.

As I bade farewell to Wyanad, I was sad at the thought that, even as a dragonfly lover, I would not be able to preserve this region just as it is now for future generations, and I wondered whether these lovely insects would still be there when I returned on a future expedition.

DRAGONS and TEMPLES in NORTH INDIA *Allan Brandon, Conwy, Wales, UK*

This is about a memorable trip that my wife Gloria and I made to northern **India** with Indian odonatologist Francy Kakkassery and his family in September 2003. We had known them personally since an earlier trip around Kerala and the adjoining states in south-west India in Nov-Dec 2001. A whole month was then spent wallowing in odonate, wildlife and cultural paradises with Francy as our remarkable host, companion and guide. We photographed 60 species of odonates on that trip.

The northern Indian adventure began with our arrival at Delhi Airport at 0445 on the morning of 7th September. We were met by Francy's brother-in-law Thomas Mathew (a true gentleman if there ever was one) who delivered us to hotel at Gurgaon on the south-western outskirts of Delhi to recover. Thomas Mathew, though a native Keralite, had worked as a mechanical engineer in Bharatpur for many years and was to be our interpreter. We enjoyed a late breakfast on the hot hotel terrace under a cloudy sky full of *Pantala flavescens*, for the monsoon period was not yet over. Francy, his wife Tris and their two endearing young children Joseph and Anna were on a two-day train journey from Kerala and were to meet up with us that afternoon.

We hired Toyota Qualis with driver, spent the first three days exploring the many cultural delights of the Delhi area and the few dragon sightings at temple ponds etc. were fortuitous. They were all libellulids: *Brachythemis contaminata*, *Bradinopyga geminata*, *Orthetrum s. sabina* and *Pantala flavescens* (including exuviae). At the Mahatma Gandhi Memorial, Rajghat, we just missed George Bush, but easily made up for it with photographs of *Brachythemis contaminata*, *Crocothemis s. servilia*, *Diplacodes nebulosa*, *Ischnura aurora* feeding up in the herbaceous verge of the car park.

On the 10th we set off on a day-long trip northwards, crossing the states of Uttar Pradesh and Uttaranchal, heading for Dehra Dun, in the Himalayan foothills. It was good to leave the noisy, over-populated Delhi region behind even though much of the journey took us through intense agriculture. Stops were made at likely roadside ponds and ditches. Typical of the many roadside ponds in this agricultural lowland were the zygopterans *Ceriagrion coromandelianum* & *Ischnura aurora* and the libellulids *Brachythemis contaminata*, *Crocothemis s. servilia*, *Neurothemis t. tullia*, *Orthetrum pruinosum neglectum*, *Orthetrum s. sabina*, *Potomarcha congener* and the ubiquitous *Pantala*. We had our first view of the River Ganges at Haridwar. All the species encountered on the trip so far had also been common on the coastal plains of Kerala but a pair of crepuscular *Zyxomma petiolatum* seen at a roadside ditch near Rishikesh, higher up the Ganges valley, represented our first new odonate species. Sightings of new species were, fortunately, to become commonplace as we entered the Himalayan foothills.

A two-night stop over in the small town of Dehra Dun, Uttaranchal, gave us the chance to meet up with Dr Arun Kumar of the Zoological Survey of India, an Odonatology colleague of Francy's. He suggested suitable sites to visit in this hilly region including the clear, cool, rock-strewn river at Sulphur Spring, and photographing Sahstra Dhara nearby Dehra Dun. Francy and I spent all morning wading in the waters, with *Pantala* flying above us, observing. We listed the zygopterans *Bayadera indica*, *Neurobasis chinensis*, *Rhinocypha (Aristocypha) quadrimaculata* and the anisopterans *Nepogomphus modestus*, *Orthetrum glaucum*, *O. brunneum*, *O. t. triangulare* & *Trithemis festiva*. To Francy's chagrin, a large male gomphid patrolling for a mate evaded capture and identification.

We enjoyed a memorable lunch at the Kumars and headed higher up the mountains to Mussoorie, a former British hill station retreat where one can still escape from the heat of the plains. From our hotel room we could look down on the River Ganges far below but we soon learnt that mist and cloud prevailed at these altitudes and dragons were not easily come by. Luckily we had an hour of sunshine at Kempty Fall, a favourite spot for the northern Indians, where clear rivers tumbling down forested mountain slopes cascaded through gorges and over gorgeous waterfalls. The zygopterans *Anisopleura lestoides* & *Megalestes major*, gomphids *Anisogomphus cf. orites* & *Onychogomphus bistrigatus* and powder-blue pruinosed skimmers *Orthetrum t. triangulare* & *O. glaucum* had all seemingly materialised from nowhere.

We returned to the Delhi region on the 13th and on route encountered the same assemblage of lowland species at roadside ponds that we had seen previously on the northbound journey. By the following morning, Sunday, our numbers had grown: Thomas Mathew's daughter, Smily and her toddler son Alan were to accompany us on our journey southwards. The somewhat over-crowded vehicle made its way first to Badkal Lake, about 25 km north-east of Delhi and part of a recreation complex much loved by the local Delhi people. It also proved to be a superb site for odonates and provided us with a good list of species although the number breeding there is probably much larger than what we gleaned from this cursory visit. The zygopterans present were *Agriocnemis pygmaea*, *Ceriagrion corimandelianum*, *Pseudagrion microcephalum* & *Ischnura senegalensis*. Apart from an *Anax* sp. and *Ictinogomphus cf. atrox*, the anisopterans observed were all typical lowland libellulids: *Acisoma p. panorpoides*, *Bradinopyga geminata*, *Brachythemis contaminata*, *Crocothemis s. servilia*, *Diplacodes trivialis*, *Orthetrum s. sabina*, *Pantala flavescens*, *Tramea* sp., *Trithemis pallidinervis* & *Urothemis s. signata*. Francy and I collected many libellulid exuviae which were later identified by Dr Richard Seidenbusch as *B. contaminata*, *C. servilia*, *Rhodothermis rufa* and *Tholymis*

tillarga. I was so engrossed by all this activity that by the end of our visit I was dragged away drenched in sweat through parties of cool and dignified Delhi visitors and more or less disowned by Francy and the others!

After lunch, we made our way southwards towards Bharatpur, Rajasthan, and had one stop at small temple ponds beyond Mathura. Zygopterans were prevalent: *Agriocnemis pygmaea*, *Ceriagrion coromandelianum*, *Ischnura senegalensis* & *Rhodischnura nursei*. (Photo on website). This last species is a gem, a mere 18 mm long, and a real joy to behold.

Brachythemis contaminata, *Crocothemis s. servilia* and *Orthetrum s. sabina* were the only anisopterans about. We stayed the next three nights at the hotel in the Keoladeo Ghana National Park while Francy's family made use of Thomas Mathew's home in nearby Bharatpur. The national park is crammed with birders in the winter season but we had it almost to ourselves. We had expected the odonate populations in Rajasthan to have been devastated by the drought of the preceding two years and were told that the local lakes had dried up. Moreover, the rain and cloud was not conducive to good dragonflying but we got a fair assemblage of lowland species: *Agriocnemis pygmaea*, *Ceriagrion coromandelianum*, *Rhodischnura nursei*, *Acisoma p.panorpoides*, *Anax sp.*, *Brachythemis contaminata*, *Crocothemis s. servilia*, *Orthetrum s. sabina*, *Pantala flavescens*, *Potomarcha congener*, *Rhyothemis v.variegata* & *Tholymis tillagra*. Using the national park as a base we explored the cultural sites of the Agra region and found that even the Taj Mahal wasn't without odonate interest by way of *Bradinyopyga geminata*, *Ortherum s. sabina* & *Pantala flavescens*.

On the 17th we journeyed westwards and into the drier region of Rajasthan to view the fantastic temples of Jaipur. Here the preceding drought had certainly taken its toll on the odonate populations. A roadside pond at Dosa village, 60 km east of Jaipur held the blue-tails *Ischnura aurora* & *I. senegalensis* and the libellulids *Acisoma p. panorpoides*, *Brachythemis contaminata*, *Crocothemis s. servilia*, *Orthetrum s. sabina* & *Tramea cf. limbata*.

Two days later we were back at Delhi Airport bidding a sad and fond farewell to our Indian friends although we know now that we will be seeing them in Kerala in January 2005. We were off to Kathmandu for a further week before returning to the UK, but that's another story!

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HOW DO THE JAPANESE SEE DRAGONFLIES? - Tetsuyuki Ueda

Sometimes I think I would like to be a poet as well as an ecologist, especially when looking at a red dragonfly when its wings are aglow with the setting sun.

When I was very young I was captivated by an idea that the red dragonfly, *Sympetrum frequens*, was not only an insect but also a "fukei": this Japanese word is an equivocal one and, within a strict definition, the concept of the word is poor. It may be a word just for poets. I use it as the word to express a personal representation between humanity and nature. For the convenience of most readers 'Scenery' used to be synonymous with 'fukei', but I think my interpretation may better emphasise the mental action of the subject.

That aside, why had I had this idea? Imagine a person looking at a red dragonfly perched on the top of bamboo stick. What does he see? A red dragonfly! Yes, of course. But, I came to realise, he should also be seeing his own personal experience through the red dragonfly.

And then, in 1995, a very strong earthquake occurred in the Hanshin District of Japan. An old man and his wife were buried alive under rubble. Until they were rescued (after 24 hours), the wife continuously sang a children's song so as to encourage her husband, and also perhaps herself. The title of the song was "Aka-tombo (red dragonfly)", which is a favourite song for most Japanese. When I read of this in the newspaper, my heart was captured once again by the idea---the red dragonfly is not only an insect, it is also a "fukei". How did the song give this old couple the will to remain alive?

And so in 1999 I began a project, together with various experts such as an ecologist, a literary person, a linguist, a sociologist and an artist: our project was named 'How do the Japanese see dragonflies? A study on the Japanese view of nature'.

By analysing peoples' eyes on insects, especially dragonflies, we try to clarify the characteristic of the Japanese view of nature. People are likely to be more familiar with insects in Eastern Asia than in other parts of the world. Dragonflies are familiar insects in the Far East, but only the Japanese regard them as holy insects. Dragonflies symbolize good harvests, victory, happiness - and even the Japanese people themselves. The ancient Japanese called their country "Akitsu", which is an old name for dragonflies. This way of seeing dragonflies by the Japanese may be strongly associated with rice farming, which was a key industry in Japan, but not in other countries in Eastern Asia, at least not for the ruling races in China and Korea. Rice farming has provided various types of favourable dragonfly habitats around the villages of Japanese people: paddy fields, irrigation ponds, irrigation streams and so on. Thus many dragonflies, especially the red dragonfly *Sympetrum frequens*, colonized these and dramatically increased in number. Consequently they became familiar insects and the fact that most Japanese people have traditionally believed in a kind of simple animism, in which gods and spirits live with them taking the form of various animals, plants, rocks and so on, may have been an important factor in dragonflies becoming regarded as holy insects.

Such an animistic outlook seems to be remaining in the modern Japanese people but they have also been strongly influenced by the scientific view of nature since the Meiji Era. These two different views of nature exist together, but are not always harmonised, in the modern Japanese. Therefore they may sometimes act against nature in conflicting ways.

Recently, as the results of our project, we published a book: "How Do the Japanese See Dragonflies?" As the book was written in Japanese, I would like to show its contents in English:

Introduction: A red dragonfly *Sympetrum frequens* is not only a mere insect but also a scene in the Japanese mind. By Tetsuyuki Ueda:

1. Why does *Sympetrum frequens* ascend mountains? 2. *Sympetrum frequens* is a scene in the Japanese mind. 3. Commonality of the scenery. 4. The future of the scenery. 5. The scenery in our mind is manipulated.

Part I. Eyes for Dragonflies

Chapter 1: Symbolism of dragonflies in Japan from the viewpoint of the historical changes of their name: *Akizu*, *kagerou*, *tombau*. By Yokoo, Ayako:

1. The age of *akizu*.
2. The age of *kagerou*.
3. The age of *tombau*.

Chapter 2: Folklore of dragonflies in China. By Chu, Yau-I

1. Chinese viewpoints on dragonflies.
2. Dragonflies in ancient documents.
3. Dragonflies and the living of the masses.
4. Image of dragonflies in Taiwan.
5. The world where people detest dragonflies.
6. The Japanese love dragonflies.
7. The children play with dragonflies.
8. The difference between *tombo* and *kagerou*.
9. Image of spiders.

Chapter 3: Symbolism of dragonflies in Korea. By Chung, Kwang

1. Introduction. 2. Korean names of dragonflies. 3. The proverbs and folklore on dragonflies. 4. Symbolism of dragonflies in the Korean literature.

Chapter 4: The insects in the Annals of the Choson Dynasty and their symbolism, with particular reference to dragonflies, cicadas and ants. By Chung, Kwang

1. Introduction.
2. The Annals of the Choson Dynasty.
3. Insects in the Annals.
4. Symbolism of cicadas & ants.

Chapter 5: Eyes for the beauty in dragonflies. By Koga, Etsuko

1. Introduction.
2. Dragonfly shapes and their symbolism.
3. Insects of the Japonism.
4. Various eyes for the beauty in dragonflies.

Chapter 6: Dragonflies in Japanese modern literature. By Yokoo, Ayako

1. Introduction. 2. Dragonflies in children's song. 3. Dragonflies in the *tanka* composed by the peoples of the Emperor's family. 4. Dragonflies written in Japanese modern literature.

Chapter 7: The world of dragonfly in dialect words. By Saito, Shinichiro

1. Introduction. 2. The general names of dragonflies in dialect. 3. A discussion on the general names of dragonflies in dialect. 4. The dialectal names of damselflies. 5. The dialectal names of *Calopteryx atrata*. 6. A discussion on the dialect names of damselflies and *Calopteryx atrata*. 7. A problems of the dialectal names of *akatombo* and *Ranzan Ono*. 8. A problem of the dialectal names of *akatombo* and *Gosan Koshigaya*.

Chapter 8: Another *akatombo*: *Pantala flavescens* or *Sympetrum depressiusculum*. By Higashi, Kazunori, Sawabe, Kyoko and Ueda, Tetsuyuki

1. *Akatombo* in western Japan and in eastern Japan. 2. *Sympetrum frequens* in Japan and *Sympetrum depressiusculum* in Korea. 3. *Akatombo* in the western Japan, *Pantala flavescens*.

Chapter 9: How do the Japanese see dragonflies? By Ueda, Tetsuyuki

1. Introduction. 2. The spirit of a rice plant: the symbol of good harvests. 3. From "*akitsu*" to "*kagerofu*": impact of the Continental culture. 4. "*Akitsu*" and "*kagirohi*": animistic sense. 5. *Kachi-mushi*: the symbol of victory and happiness. 6. *Akitsu* in the Meiji era: dragonflies symbolize Japanese themselves. 7. The beginning of autumn decided by the red dragonfly: the symbol of season. 8. Dragonfly as a vehicle of the departed soul: a spiritual insect. 9. Catching dragonflies: children's friends. 10. Red dragonflies in a red sunset: the Japanese core scenery.

Part II. The Japanese view of nature illustrated by eyes on some insects and spiders

Chapter 10: A view of nature featuring the vindictive spirits: a tower erected for the repose of insects' spirits. By Yokoo, Ayako

1. Introduction. 2. The towers erected for the repose of animals' spirits in Saga. 3. Custom of Saga. 4. Some modern city dwellers' impressions of the memorial ceremony for insects. 5. "Animal protection" in Western countries and "*musiokuri*" and "*hojyoue*" in Japan.

Chapter 11: A boy who catches dragonflies cannot learn: taboos referring to dragonfly catching. By Ueda, Tetsuyuki

1. Introduction. 2. Classification of taboos on dragonfly catching. 3. Dialectal names of dragonflies connected with taboos. 4. Correspondence of taboos to the ecology of concerned dragonflies.

Chapter 12: Inventing '*Gaichu*' (insect pests): view of pests in modern Japan. By Setoguchi, Akihisa

1. Introduction. 2. View of pests in the Edo period. 3. View of pests in modern Japan: Agricultural pests. 4. View of pests in modern Japan: medical pests.

Chapter 13: The Japanese view of nature as shown by the Latrodectus spiders scare. By Yoshida, Makoto

1. A progress report on the Latrodectus spiders scare. 2. Some comments on the Latrodectus spiders scare. 3. Proving the Japanese view of nature with Latrodectus spiders scare. 4. A new turn of the Latrodectus spiders scare. 5. Favourable and unfavourable cultures for spiders.

Chapter 14: An essay on the folklore of spiderfighting. By Saito, Shinichiro.

1. Introduction. 2. Spiderfighting as one of the year's pageants. 3. Some old docs. on the folklore of spiderfighting. 4. Spiderfighting in various parts of Japan. 5. Public experiments of the fighting in *Argiope bruennichii*. 6. Dialectal names of *Argiope* spider in the south part of Korea. 7. Spiderfighting in foreign countries. 8. Comparison of biology between *Argiope amoena* and *A. bruennichii*. 9. What was spiderfighting?

Chapter 15: Ecology of spiderfighting---Why *Argiope amoena* has been selected for spiderfighting? By Yoshida, Makoto

1. Types and distribution of spiderfighting. 2. Diversity of spiderfighting related to the distribution and density of fighting spiders. 3. The unknown of spiderfighting at inland area related to the population density of *Argiope amoena*. 4. Why *Argiope amoena* was chosen as the fighting spider?

Chapter 16: Changes of the Japanese view of nature as shown by *haiku* composing with insect. By Yuma, Masahide

1. Introduction.
2. View onto insects in *haiku*.

Chapter 17: Representation & discourses on insects in the Edo period from the aesthetics of autumn flowers to the parodies on insects. By Endo, Akira

1. Introduction. 2. Autumn flower as Japanese aesthetical tradition. 3. Parody-minded discourses on insects in the Edo period. 4. Disappeared insects in the culture of the Meiji era. 5. Renaissance of insect-phylia in the Taisho era.

Chapter 18: Japanese translations of Jean Henri Fabre's "*Souvenirs entomologiques*" and the readers: modern and post-modern in Renaissance of "insect-phylia". By Endo, Akira

1. Introduction. 2. On the translators of "*Souvenirs entomologiques*". 3. Various readers in three booms. 4. Immortality of Fabre. 5. Postscript: For the future of insects.

Last chapter: The structure of the modern Japanese view of nature: Insects, gods, humans and nature. By Ueda, Tetsuyuki

1. Introduction. 2. The origin of the "insect-phylia culture" in the Edo period. 3. Changes of eye on insects. 4. Science in Japan. 5. Uneasiness at the "unknown". 6. Animistic sense. 7. Universality of the song "*Aka-tombo* (red dragonfly)". 8. Don't sing the wings of red dragonflies. 9. Gods, humans and nature.

DRAGONS on the WAY to KOMODO (Indonesia) – Jan Taylor

The trip to see the Komodo Dragons started with a few nights in **Bali**. We stayed at the Udayana Eco Lodge, run by Alan and Meryl Wilson. (Meryl is in the process of painting portraits of all the butterflies found in the grounds.) The Lodge occupies about 40 ha of land on the University campus, which is built on high ground south of the airport. A course was being run there on experimental techniques for people involved in agribusiness by two academics from Canberra.

While the participants were learning the finer details of statistical analysis I was exploring the grounds, and soon found a perfect, duckweed-covered pond surrounded by ginger plants and water plantains. All day this was occupied by two or three powder-blue dragonflies, which settled on vantage points about 20cm to a metre above the water. They had the shiny metallic green frons characteristic of *Brachydiplax*. Round about there were some butterfly-like *Neurothemis*, which preferred upright stems away from the water, but occasionally settled by the pond. One day I saw a narrow red-bodied species with yellow marking on its thorax. It was *Lathrecista asiatica*. It was settled about 2 m up on the tip of a ginger leaf. I later saw it again on a branch about 4 m over the water. There were some damselfly, but I do not know what they were, one was black and settled on the duckweed, another with blue tips and could have been *Pseudagrion microcephalum*, which is familiar to me from northern Australia. In the late afternoon, about 4.30 or so, another dragon arrived with dark tips to its wings. Several of them were engaged in frenetic flying over the water until dusk. This behaviour was familiar, having seen *Zyxomma elgneri* doing this at Millstream in the Pilbara Region of NW Australia. However, this species was pale whitish-blue instead of brown, and proved to be *Z. obscurum*. Other species included the ubiquitous *Diplacodes trivialis*, and the somewhat similar looking *Potamarcha obscura*, both of which usually settled near or on the ground in open areas. Also there was a *Trapezostigma transmarina euryale*, which patrolled in an open space near the Kingfisher Lookout. It could be seen every day flying about 2-3 m above the ground against the backdrop of a view across the bay to Mt Agung.

The flight to Flores was put off for a day (our seats had probably been commandeered for campaigning politicians for the presidential election). Coming in to Flores I wondered if we had taken a wrong turn and were flying over spinifex-covered hills to land in the Pilbara. The rainfall here is the lowest in Indonesia – Kathryn Monk in her book (Ecology of Nusa Tenggara and Maluku) records that Labuanbajo has less than 10cm a year! The hills are covered in dry straw-coloured grass (but not spinifex). This was not a good sign for dragonfly-hunting, in fact only three species were seen – *Diplacodes trivialis* was fairly common, especially on a walk to a cemetery, where there was also another single, rather ragged-winged, *Lathrecista* perched on a branch about 1.5m high in a shady place. Each morning I saw a medium-sized red dragonfly around the cottages at Batu Gosok. It tended to fly under the cover of the roofs, stopping to dance around and settle in shafts of sun in sheltered places, often choosing palm leaves etc., which would not bear its weight. *

We went by boat to the island of **Komodo** to see the dragons, which were rather sluggish and repulsive animals compared to our pretty, sleek goannas. It was all very dry, but had areas of trees in the gullies where there were palms, cycads, jungle fowl, mound-building Orange-footed Scrub Fowl, deer and pigs and the occasional *Diplacodes trivialis*.

Having seen the dragons and snorkelled over the coral we had a welcome return to the humid tropics at Ubud in Bali. We stayed on the steep forested side of the gully cut by the Campuhan River, where we could watch squirrels in the palms and the flashing colours of passing Javan Kingfishers. Walks in the paddy fields brought plenty of sightings – there were many *Pantala flavescens* and the red-bodied *Crocothemis servilia*. One tree had almost every spiky branch tipped by a dragonfly. There were also a number of the greenish *Orthetrum sabina* blending with the grasses at the side of the track.

One day I ventured down a precipitous path on the way to the river. Part of the bank had given way and water dripped down the exposed soil. First I saw a dark damselfly that reminded me of *Nososticta* in the Pilbara – probably a species of *Drepanosticta*. Then there was a beautiful blue species reminiscent of *Calopteryx virgo*. It would have been *Vestalis luctuosa* and I saw a green female nearby as well. Then I noticed a chubby little dragonfly with dark wings perched on a leaf. It stayed put, so I was able to take a photo with my digital camera. When I looked at the image I was amazed to see what was revealed in its wings – they were beautifully iridescent, even more so than *Rhyothemis graphiptera*. I later found that it was *R. fenestrata*.

When I got to the river I saw several *Vestalis*, but it was the *Rhinocypha*, which fascinated me. I saw a female laying eggs on a partially submerged twig, with a male patrolling nearby with a beautiful display which involved hovering only 2-3cm over the water. It did this by flipping out all four wings into a cross formation viewed from above, where they flashed their iridescent colours in the sun. At the same time it conspicuously stretched its legs out to reveal their white surfaces. The bright pink thorax would have been very visible to the female (and other males).

Returning up to the Campuhan temple there was a male resting on a pink joss stick, which matched his thorax. Later, when going on the bird walk, which followed an irrigation channel, we came to a place where the fast flowing channel came out of a tunnel. This seemed to be a perfect place for *Rhinocypha*; there were at least a dozen settled and flying there. I saw frequent repeats of the colourful display I had witnessed earlier. The scene was completed by the presence of a few shiny blue *Vestalis*. Maybe Meryl will move on to the Odonata after she has finished the Butterflies.

DISTRIBUTION MAPS OF TURKISH ODONATES UPDATED

Recently new distribution maps and histograms of the flight period of **Turkish** odonates were made and published on the internet (<http://www.libellen.org/epallage>); they are based on a large number of new records published in a special issue of the German journal 'Libellula' which was devoted to the dragonfly fauna of Turkey. Also included on these maps are the results of further fieldwork in 2003 and 2004 and the records published by Hacet & Aktaç (2004; Odonatologica 33(3) 237-354). The

latter make the European part of the country the best-investigated part of Turkey. The following map gives all localities where *Orthetrum brunneum*, one of the more common species, was recorded. Most observations were made during the holidays of European Odonatologists, which explains why the south is so well investigated. Strangely the western part of Turkey, where many of the famous archaeological sites are found, is less often visited. We intend to publish a distributional atlas of Turkish odonates in the coming years and we therefore would like to receive new records. Records of Turkish odonates can be sent to Vincent Kalkman (Kalkman@naturalis.nnm.nl).



Vincent Kalkman, Arjan Kop, Marcel

Wasscher

DETECTIVE WORK on MYSTERIOUS EASTERN DEMOISELLES - Matti Hämäläinen

Southern China & Indo-China is home to some of the most magnificent and enigmatic species of Calopterygidae in the world. These include, among others, *Archineura incarnata*, *A. hetaerinoidea*, "*Echo*" *maxima*, *Calopteryx oberthueri*, *C. melli*, *C. coomani*, *C. laosica*, *C. grandaeva*, *C. atrocyana* and *Matrona kricheldorffi*. Most of these damselflies are surprisingly little known and poorly represented in collections. They offer many conundrums for taxonomists, and very little or nothing is known of their biology. So far I myself have made only one short trip to the haunts of these beauties, to Laos in late April 2002. There I was lucky enough to see some *Archineura hetaerinoidea* on two streams near the Vietnamese border. What a fantastic sight these insects were with their wings spanning 10-11 cm and body measuring 8-9 cm! But this is not a report of a field trip, but a story attempting to show how rewarding it can be to dig out old, dusty publications in libraries and how useful are the type specimens in museums.

What is *Calopteryx grandaeva* Selys, 1853? - This taxon has been puzzling since its description. I wrote briefly on this question in a paper on the Caloptera of Fujian in the latest issue of *Odonatologica* and a more detailed taxonomic paper is *in prep.* However, a brief informal treatment may be of interest here.

In Selys' *Synopsis de Calopterygines* (1853) two new *Calopteryx* species from China, *C. atrata* and *C. grandaeva*, were described in the same page. Both were credited to Selys, but *grandaeva* by mistake, since its description was provided by Hagen, and Selys himself had not even seen the type (a single female) from "Chine. (Musée de Berlin)". Hagen was listed as the author in Walker's (1853) catalogue and in *Monographie des Calopterygines* (1854), but the rules in CODE are inexorable in this case, and Selys remains the official author.

In February 2002 I received the holotype of *grandaeva* on loan from Berlin museum. It seems that no odonate taxonomist had studied this type after Hagen! It is a rather teneral pinned specimen, which lacks the tip of abdomen (already noted in the original description); otherwise it is in good condition. It bears only a single handwritten label "China / Melly". This very meagre data did not suggest much hope of finding its type locality in that vast country! But I was wrong. The name "Melly" seemed to be the only clue. The first thing was to check *Index Litteraturae Entomologicae* by Horn & Schenkling (1928-1929) for any references to Melly. This invaluable publication listed a few coleopterological papers by André Melly (1802-1851) - a good match. Jan van Tol, whom I had contacted for help, kindly send a photocopy of a detailed obituary of Melly written in German by H. Schaum, published in *Entomologische Zeitung* 13(3): 67-71, 1852. From that I spotted a sentence, which seemed to disclose the exact type locality of *C. grandaeva*. It listed the localities from where Melly had received most of the material for

his very extensive insect collections. The only Chinese locality was "Tschusan". This is an island off the Zhejiang coast (west of Hangzhou), later called "Chu Shan" and "Zhoushan". I became quite confident that this island (or an adjacent place in mainland Zhejiang) is the type locality of *C. grandaeva*. Now it was easier to evaluate the status of *grandaeva* and compare it with specimens of *atrata*, the type locality of which is "environs of Shanghai", also in Zhejiang and less than 100 km from Zhoushan. Besides the broader wings, there were no differences to separate *grandaeva* and a female syntype of *atrata*, received for loan from the BMNH (London). I had also available a long series of *atrata* from the northern part of Fujian province and also some specimens from elsewhere in China. There is considerable variability in both sexes as regards the proportional wing breadth of *atrata*, especially in the Fujian populations (ca 400 km south of Shanghai). Some of the females had proportionally still broader wings than in the *grandaeva* holotype. Therefore, *grandaeva* seems to fall well within the variability of the Chinese populations of *atrata* and must be treated as synonym.

***Calopteryx atrocyana* (Fraser, 1935), another enigmatic species.** - This broad winged insect was rather briefly described without illustrations by Fraser (1935) as *Agrion atrocyana* on the basis of two male and one female specimens from "Tonkin" (Northern Vietnam). Very little has been written on *atrocyana* since, but it was considered as a probable synonym of *grandaeva* by van Tol & Rozendaal (1995). In September 2002 I studied the type series of *atrocyana* (BMNH, London). It turned out that *atrocyana* is a distinct species with much broader wings than in the broadest *atrata* (= *grandaeva*) individuals. There are also clear differences in the shape and venation of the wings and colour pattern in these two species. In addition of the type series (two males and one female), at least two other specimens of *atrocyana* are available in collections, both from "Tonkin": a male specimen (NRS, Stockholm) which Ris (1912) described as the first male of *C. grandaeva* and a male specimen from "Than Moi, Tonkin" identified by Lieftinck as *grandaeva* (RMNH, Leiden). All these five *atrocyana* specimens seem to belong to Hans Fruhstorfer's material. Undoubtedly it is a very rare insect. A still greater rarity found by Fruhstorfer (1866-1922), the famous lepidopterologist, in Than Moi in June-July 1900 was the large-sized "*Echo*" *maxima* Martin, 1904, so far known only from a single female specimen. But that is another story!

ODONATA, BURGLARY AND BALLISTIC CICADAS IN SOUTH-EAST ASIA -

Rory Dow

In May 2004 I embarked on another dragonfly quest in Asia. The itinerary was a month in **Sarawak, Borneo**, joined by Graham Reels for the first three weeks, then two weeks in Chiang Mai, **Thailand**. In an account of this length I cannot cover every location visited, let alone every species encountered on such a long trip. What follows is just a sample.

I had been trying to get a permit for the collection of specimens in Sarawak for several months prior to my departure, but my timing was bad, the permit situation in Sarawak was in a state of flux and it was impossible to get one at this time. Despite not being able to collect in Sarawak the trip was very successful, many Odonata were found and a number of extremely valuable local contacts were established.

We began our Borneo adventure in **west Sarawak**, in the vicinity of Kuching. Whilst in this region we based ourselves at the Matang Wildlife Centre (MWC), a part of Kubah National Park, to the north-west of Kuching. One of the MWC's functions is Orang-utan rehabilitation. I had visited Kubah in 2003 and found it to be very promising for Odonata. Early in our stay in the west we met with Indraneil (Neil) Das, a herpetologist based at University Malaysia Sarawak (UNIMAS) and a friend of Bert Orr's. At Neil's request I gave a talk on the Odonata of Sarawak at UNIMAS.

Although we were staying at the MWC we devoted quite a lot of our time to other areas and I will cover some of these first. On a visit to a peat swamp forest on the UNIMAS campus we found at least three species of *Amphicnemis*, one of which appears likely to be unnamed, and a strong colony of the little known *Podolestes harrissoni*. A trip to the Semengoh Orang-utan rehabilitation centre and its surrounds yielded species such as the very striking *Macrogomphus quadratus*. Interestingly we found *Acisoma panorpoides* on a pool here, this is a widespread and generally common species that appears to have been seriously under recorded in Sarawak, I am aware of only one (unpublished) record, but I encountered it several times this year.

The habitat at Kubah is mostly mixed dipterocarp forest, with some small open streams around the buildings at the MWC. One of these streams ran just behind our accommodation where it emerged from the forest, so with only a few steps we could find species such as *Heliocypha biseriata*, *Rhinagrion borneense*, *Prodasineura hyperythra*, *Pseudagrion perfuscatum*, *Trithemis aurora* and *Neurothemis* spp. Venturing further into the forest many more species were encountered, including *Rhinocypha cucullata*, *Vestalis amabilis*, *V. amoena* and *Tyriobapta kuekenthalii*. The MWC has a selection of Bornean wildlife in enclosures in the forest, we found a male *Indaeschna grubaueri* perched in an enclosure containing False Gharials and a female was observed ovipositing in an adjacent enclosure containing Estuarine Crocodiles.

Aside from the Odonata we had one very memorable encounter at the MWC. Whilst looking at some hornbills in a large aviary we realised that there was an Orang-utan staring down at us from on top of the cage: an incredible sight. It turned out that this was an individual that had been released back into the wild but that still returned to the MWC from time to time.

Our stay at the MWC was marred by one unfortunate incident. Our accommodation was broken into one night while we were asleep and my binoculars, along with a few items of lesser value, were stolen. Sarawak has very little crime, but it turned out there had been a string of such incidents at the MWC, some of the locals resent the loss of hunting rights within the park and the fact that they are not employed at the centre.

From **west Sarawak** we moved on to Gunung Mulu National Park, close to Brunei in **east Sarawak**, and another area that I had visited in 2003. This park is an altogether wilder place than any we visited in the west, with large rivers and imposing mountains draped in forest, prompting Graham to describe it as more 'Borneo-like' than the areas around Kuching.

Mulu is a fabulous place for Odonata, this year we found over 60 species within the park. With species encountered in 2003, the total passes 70; these were all found within a fairly short distance of the headquarters. Much of the park remains entirely virgin territory from an odonatological perspective, including areas of very different habitat from that around the headquarters, so the final total for the park should be substantially higher.

On a pond in the headquarters clearing, in addition to common species of open and disturbed habitats, we found *Tetra-themis irregularis* in a shady corner and on several occasions spotted a pair of *Pseudothemis jorina*, a species that I believe on Borneo has only been recorded in Brunei before. A sample of species encountered in the forest is *Libellago stictica*, *Rhino-cypha cucullata*, *Dysphaea dimidata*, *Neurobasis longipes*, *Podolestes orientalis*, *Elatoneura analis*, *Archibasis viola*, *Coeliccia nigrohamata*, *Gomphidia maclachlani*, *Tetracanthagyna plagiata*, *Brachygonia oculata*, *Orthetrum pruinosum schneideri* and *Onychothemis coccinea*. Fleeting glimpses of elusive gomphids and aeshnids were common, sometimes crepuscular aeshnids come to the lights of the park buildings: one evening at dusk we found a female *Gynacantha* in the park shop and I plucked a female *Heliaeschna* from a light outside our room later the same evening.

During our stay we developed a useful relationship with the park manager Brian Clark. Courtesy of Brian we were able to make a boat trip to a lovely boulder strewn stream running over sandstone in a remote corner of the park. On this stream and its tributaries we encountered species we had not seen elsewhere at Mulu, such as *Devadatta podolestoides*, *Rhino-cypha aurofulgens* and *Prodasineura dorsalis*.

Just outside the park is the Sipan Lounge, a bar/restaurant where we would go for a beer in the evenings. Throughout the time Graham was in Borneo he derived considerable amusement from my misfortunes; I had been repeatedly bitten, stung, burnt by caterpillars, trapped in tangles of rattans while sinking into thick mud and so on, while Graham had passed through relatively unscathed. In the Sipan Lounge I finally had a few laughs at Graham's expense. On evening we were enjoying a beer when a large cicada that had been flying around the bar suddenly launched itself at Graham's head like a small rocket, striking him hard and painfully.

We left Mulu somewhat reluctantly, Graham was returning home to Hong Kong and I was going to Lambir Hills National Park near Miri. Lambir has very different habitats to Mulu or Kubah; the park consists of a cluster of low-forested hills, with some small sections of swamp forest near the headquarters. There are three ponds, two of them large, around the HQ area, which add considerably to the number of species that can be found at the park.

In addition to many common and widespread species the ponds at Lambir boast a number of more localised species including *Lestes praemorsus*, *Pseudagrion lalakense* (as far as I am aware the only site yet known for this species outside Brunei), *Rhyothemis obsolescens* and *Aethriamanta gracilis*. The Sungai Liam that runs down from the hills and near the park HQ, is host to numerous species including *Libellago aurantiaca*, *Prodasineura collaris*, *Stenagrion dubium*, *Orchithemis pulcherrima* and *Tyriobapta kuekenthali*. I photographed both sexes of *Macromidia fulva* on a trail in the forest. *Euphaea ameeke*, a species only previously recorded from Brunei, is quite common on the larger hill streams. The small hillside streams are home to *Devadatta podolestoides*, *Drepanosticta rufostigma* and another, difficult to place, platystictid as well as *Coeliccia macrostigma*. The canteen lights at Lambir attracted a number of aeshnids, with *Heliaeschna crassa*, *Gynacantha ?dohrni* and a female *Tetracanthagyna brunnea* all making appearances.

In **Thailand** I based myself at the Lanna Resort to the north-west of Chiang Mai City and on the border of Doi Suthep: Pui National Park. Lanna Resort is a great place to stay for anyone interested in Odonata, boasting a couple of pools and a rich stream. Matti Hämäläinen had very kindly given me some good locations for Odonata on Doi Suthep and Doi Inthanon and arranged for Brother Pinratana, who visited Doi Inthanon shortly after I arrived in Chiang Mai, to bring me up some acetone (not so easy to find in Chiang Mai) from Bangkok, for which I am extremely grateful. John Moore had provided me with some interesting non-national park locations.

I had visited Chiang Mai in January 2003, during the cool dry season, and had only encountered two species of gomphid then. Now, in the rainy season, there were gomphids galore. On the Lanna Resort stream a *Burmagomphus* species, *Paragomphus capricornis* and *Gomphidia abbotti* were all common and I found a teneral *Gomphidictinus perakensis* here on one occasion (a species I also encountered low on Doi Suthep). Of course not only gomphids were present on the stream, other species encountered here include *Libellago lineata*, *Heliocypha biforata*, *H. perforata*, *Dysphaea gloriosa*, *Neurobasis chinensis*, *Onychothemis culminicola* (just one male), *O. testacea* (common) and *Pseudothemis jorina*. The pools here yielded many species, most notably *Ceriagrion chaoi*, *Ischnura aurora* (a single male) and *Rhyothemis plutonia*.

I explored Doi Suthep on several days, encountering numerous species not seen on my previous visit. *Euphaea ochracea* was abundant on the lower streams, where *Prodasineura auricolor* and *P. sp. nec. verticalis* both put in an appearance, as did others including *Protosticta curiosa*, *Idionyx* sp. and *Orthetrum triangulare*. Higher up I encountered species such as *Burmargiolestes melanothorax*, *Coeliccia loogali*, *C. doisuthepensis* and *Drepanosticta anascephala*.

I also devoted several days to Doi Inthanon where, despite the clouds and rain that inevitably seemed to descend on the mountain as soon as I arrived, I found many interesting species. I was delighted to find the beautiful *Aristocypha iridea* in good numbers on a rocky stream near the park headquarters; *Anisopleura furcata* and *Tetracanthagyna waterhousei* were also present here. A pond in this area yielded *Anax nigrofasciatus* and the unnamed *Hemicordulia* sp. that has been reported from this mountain. *Mnais andersoni*, *Ceriagrion fallax pendlebury* and *Coeliccia chromothorax* were common at several locations. I had a single encounter with *Amphigomphus somnuki* on a tiny stream higher up the mountain.

I spent several days exploring sites to the east of Chiang Mai city, all areas recommended by John Moore. At ponds and marshy areas at the Huai Hong Khrai Rural Development Centre I found species such as *Ceriagrion praetermissum*,

Tetrathemis platyptera, *Orthetrum luzonicum* and *Aethriamanta aethra*. On a stream a few miles away I caught *Macromia cupricincta* and *Merogomphus parvus*, on several occasions I spotted large and extremely shy gomphids on this stream but they never permitted approach to within net or camera range.

A pond at a resort near the village of Pong Din produced *Aethriamanta brevipennis*. A small, boulder-strewn and mostly open stream at the same location was teeming with *Heliocypha perforata* and I took *Onychogomphus (Lamelligomphus) sp. near castor* here. On a section of the stream closed over by small trees I found two *Tetracanthagyna waterhousei* females ovipositing into the same branch sticking out about three feet above the stream. These huge aeshnids seemed untroubled by my presence and I was able to approach them to within a foot. One remained steadfastly on the branch while the other decided that I might make a better substrate for its eggs and flew around me for a while, even making a few ovipositing movements on my camera pouch before returning to the branch. This fascinating and memorable encounter seems an appropriate incident with which to end this account.

ASIAN ODONATES: HOW DO THEY STACK UP? - Dennis Paulson

I have spent much time in the American tropics and some time in the Asian Tropics, and it's interesting to consider the differences between them. One way to do that is to compare faunas of two countries on opposite sides of the world that have had their odonates reasonably well sampled: perhaps a comparison between Costa Rica and **Thailand** might be interesting.

I compiled species lists from the latest publications on the two countries, including known undescribed species. Thailand is almost 10 times as large as Costa Rica, but it has not that many more odonate species (308 vs. 277). That the odonate diversity is not very different, considering the difference in size, makes it seem that the Neotropical region is considerably richer in species than the Oriental region. Ecuador, slightly larger than Thailand, has only 303 species known from it, but the discrepancy in the species-area relationship between Costa Rica and Ecuador is very likely because the latter is much more poorly known than the former, and surely less known than Thailand as well.

In both Costa Rica and Thailand, Zygoptera make up a bit less than half of the odonate fauna (44% in Costa Rica, 43% in Thailand). These are higher figures than one would find at higher latitudes, as zygopteran diversity decreases more with latitude than does anisopteran diversity. Damselflies make up 29% of the North American fauna and 35% of the European fauna. The differences in these latter numbers is surprising to me, as North America has much more tropical influence than Europe, and I would have predicted it had a relatively larger zygopteran fauna.

When one looks at the finer points of odonate diversity of these two tropical countries, there are many similarities (see graph) and some interesting differences. Costa Rica supports a relatively higher diversity of species in the two largest families, Coenagrionidae and Libellulidae, many of which are classic pond species. Are there more ponds in the New World? On the other hand, Thailand is distinctly better off for gomphids, which are generally stream species, and seemingly a bit better off for stream-dwelling zygopterans.

Costa Rica is rich in streams, so I see no reason why it shouldn't be well off in stream species, and in fact it has many stream damselflies. Some of the stream damsels are very similar in the two countries, for example platystictids and protoneurids. The former live in waterside vegetation on both continents, and collectors in either country know you may have to get down on your hands and knees and catch *Palaemnema* and *Drepanosticta* by hand in the dense foliage. On the other hand, protoneurids of both continents fly out over the stream and hover, their thorax a disconnected spot of colour.

The New World has no platycnemidids, but perhaps the very diverse stream-dwelling genus *Argia* might represent the ecological equivalent. That genus has at least 30 species in Costa Rica and up to a half-dozen on one stream - and it is interesting, that the largest genus in Thailand, *Coelliccia* with 13 species, is a platycnemidid.

The stream damselflies of Southeast Asia seem perhaps a bit showier than those of Central America. The chlorocyphids, with their sparkling wings, have no parallel in Central America, although *Chalcopteryx* of South America could compete. There are beautiful calopterygids in both regions, but there is no stream species in Costa Rica that would make me gasp as I did on my first sighting of a male *Neurobasis chinensis* in flight. The polythorids of Costa Rica and euphaeids of Thailand seem ecological equivalents on the two continents, while megapodagrionids occur on both but have diversified more in Costa Rica.

My gasping at *Neurobasis* would certainly be equalled or exceeded by the reaction of an old Asian hand at the first sighting of a pseudostigmatid. I can only hope it would be the huge *Megaloprepus caerulatus*, the first species of that family that I saw. It left me both shaken and stirred. But why are there no comparable damselflies in Thailand? There are no bromeliads, but there are certainly tree holes, where most pseudostigmatids breed, and a long-bodied damselfly should have found appropriate breeding sites in the wet forests of Asia. A molecular phylogeny showing the origin of the Pseudostigmatidae might contribute to the resolution of this question.

Aeshnids are of comparable diversity in both countries, yet I have consistently seen more individual aeshnids in the New World than the Old World tropics. The reason for this is anyone's guess. The Neotropics are surprisingly lacking in corduliids (I saw one individual in 14 months in Costa Rica), while there is a substantial diversity in Southeast Asia, most of them macromiines, which have not colonized the tropics in the New World.

Are there genera in common between these two countries, so far apart? Actually, there are a surprising number, listed here with the number of species in each country (Thailand first): *Lestes* 7, 6; *Ischnura* 3, 3; *Anax* 3, 2; *Gynacantha* 7, 8; *Pantala* 1, 2; *Sympetrum* 1, 2; and *Tramea* 3, 5. These genera obviously make up a similar fraction of each fauna, not much more diverse in one hemisphere than the other, which I think is rather astonishing. Equally interesting is the fact that they are in four different families. Each of the genera has a very wide distribution, although *Gynacantha* is restricted to the tropics and *Sympetrum* must be of temperate origin.

This is a rather cool appraisal of two very exciting faunas. The only strong impression I have of a broad difference between the two regions is that odonates in Southeast Asia seem more likely to fly during cloudy and even rainy weather than those in Central America. Is it generally cloudier in Asia, thus forcing odonates to be active during that type of weather?

SOME NOTES ON DRAGONFLIES OBSERVED AT THE KBFSC, BRUNEI —

Vincent Kalkman

Last year I had the opportunity of spending two weeks in the Kuala Belalong Field Study Centre (KBFSC) in order to help Rodzay Wahab with collecting of larva for a course he was following at the Leiden University. The KBFSC lies in the eastern part of **Brunei** in the Batu Apoi Forest reserve and has a well studied dragonfly fauna with 49 species already known from the surroundings of the field centre (see Orr 2001). The centre is ideal for the study of dragonflies as there are several different undisturbed habitats within a few hundred meters of the complex and approximately 60 to 70 species can be found in the area. Most of my time in KBFSC was spend collecting larva. This was sometimes slow and rather boring compared with the easy success and direct rewards you get when catching adults. But every evening, when going through the material, I was surprised to see the number and the diversity of the collected larva. Comparing the collected larva with the collected adults would give the impression that they were collected at totally different sites. Some species, such *Libellago semiopaca* and *Prodasineura verticalis*, were common above the water but were rather difficult to find as larva, while gomphids were seldom seen as adults but were by far the most common group beneath the water. The list of species encountered as larvae but not as adults is rather long and included several species of Gomphids, one or two Cordulids and *Tetracanthagyna* sp. The larvae collected will hopefully be described someday. Here I describe some of the interesting observation made during my two weeks stay.

Rhinagrion-larva: Several larvae of the megapodagrionid-genus *Rhinagrion*, most likely *R. borneense*, were caught at a small river (Sitam) running out in the Belalong River. So far 8 species of *Rhinagrion* have been described, two from which descriptions of the larva have been published: *Rhinagrion philippinum* by Needham & Gyger (1939) and *R. mima* by Lieftinck (1956). In addition to this description, two drawings of the *Rhinagrion* larva have been published, one depicting *Rhinagrion borneense* (Orr, 2003) and one of *Rhinagrion* sp. (van Tol, 1992). (**Drawings will be found in website version**, Ed). Several different configurations of the anal appendages are found in the larvae of Megapodagrionidae, often unique for the family. The anal appendages of *Rhinagrion* are not only different from other families but also different from those of other species of Megapodagrionidae. Lieftinck (1956) noted that the paraprocts are larger than the epiproct and that they have a thicker cuticle and are undulated. Both Maus Lieftinck and Bert Orr probably never had the chance to study living larva of *Rhinagrion*, otherwise they would have noted that the larva holds the paraprocts not spread as in other larvae but together. Both the paraprocts are undulated and pressed together they form a tube holding the epiproct. Figure 1 (**shown on Web version**) gives an impression of this based on a sketch in my notebook. A living larva studied with a stereomicroscope revealed that the epiproct was swung from side to side with a high frequency. Probably this was done in order to increase the oxygen intake. It is possible that in normal situations, in water with a higher oxygen content, the frequency may be lower or the epiproct might even be motionless. The configuration of the appendages gives the impression that the paraprocts mainly serve to protect the epiproct. This might be an adaptation to an environment in which torrential flows regularly occur. An additional function might be that it hides the movement of the epiproct from the eyes of predators. Another species with aberrant appendages of which the living larva was observed under a stereomicroscope was a *Devadatta* sp. This species belongs to the Amphipterygidae, a small family in which the appendages are squat and in which the main respiratory-organ is formed by two filamentous tufts present between the appendages just below the anus. This species is also illustrated in Orr (2003). In living larva the epiproct was raised making the filamentous tufts visible from above. These tufts were retracted and exposed again once every few seconds.

Rhinocypha cognata: The behaviour of *Rhinocypha cognata* (as *R. stygia*) is very briefly described in Bert Orr's paper on territorial and courtship display in Bornean Chlorocyphidae (Orr 1996). Based on five observed contests between males he writes that 'contest observed were brief (less than 1 min.) and involved a rapid ascent with the pair facing one another with the hindwing held forward and canted vertically, displaying the small terminal spot. The abdomen was apparently not displayed'. I was able to observe territorial behaviour of two males for about 15 minutes. Both were sitting on branches of a fallen tree about 1.80m above the water and about 40cm from each other. When one male would start flying the other reacted immediately and display started. This involved both males flying in a shaking way (horizontal) passing each other head to head at about 5 to 15 cm distance. After they passed both made a curve in order to confront again. No signalling with the wings, legs or abdomen was observed, the latter was slightly curved downwards. This behaviour stopped after a minute or so with one of the males sitting down, starting all over again with one of the males taking off. One time a third male arrived which was followed by a rapid ascending chase in circles of 30-40 cm, too fast to observe anything. Strangely the behaviour observed by me is rather different than that observed by Bert Orr.

Coeliccia nigrohamata: This species was rather common at a seepage area near the field-station. Most times they were seen sitting on the tips of leaves a meter or so above the ground. Only once territorial behaviour was observed: two males faced towards each other and were harassing with their legs. While doing so they remained more or less still in the air.

Faunistic notes: The following common Bornean species, not mentioned for the station by Orr (2001), were found within one kilometre of the field station: *Copera vittata*, *Neurothemis terminata*, *Tyriobapta torrida* and *Trithemis aurora*. Also new for the field station is *Tetracanthagyna* sp. which was only found as a larva. I was not able to study the material afterwards and therefore do not know which species is involved. The larvae were found between clumps of small root at the banks of the

Belalong river. Although larvae probably belonging to *Leptogomphus* were common, only two adults were found, interestingly belonging to two, both rare, species. One fresh male of *Leptogomphus pasia* Van Tol, 1990 was found at Mata Ikan, a small brook near the field station. Thus far this species was only known from a male and a female caught at 2 localities in Sabah. Another fresh male found at a seepage area belonged to *L. pendleburyi* Laidlaw 1934, known only from the type specimen, a male caught at Mount Kinabalu. The number of different Gomphid larva caught surpasses the number of species known from KBFSC making clear that several other species are to be expected. For example larva likely to belong to *Gomphidia*, a genus not yet recorded from Brunei, were found several kilometres south of the field station. Several species of the family Platystictidae were found at the seepages area near the field station. Numbers were very low, but repeated visits to this site were each time productive. Besides *D. rufostigma* and *D. versicolor* several undescribed but known (Orr, 2001) species of *Drepanosticta* and *Protosticta* were collected. One of these was a male with a very long abdomen (*Protosticta* sp. B as mentioned in Orr, 2001) caught sitting one meter above the ground. Only a small number of seepage areas in the Batu Apoi Forest reserve have been sampled making it likely that several other new species of Platystictidae are to be found.

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NOTES from a NON-ODONATOLOGIST in HONG KONG *Graham Reels*

I would hesitate to call myself an "odonatologist", since to me this implies a publication list as long as your arm, or at least an acknowledged expertise in the order, but I hope that the following account will be of passing interest, and I thank Jill Silsby for inviting me to submit it.

I have been living in **Hong Kong** since 1988, and first became interested in dragonflies after a chance encounter with Keith Wilson in 1992 at Sha Lo Tung (Hong Kong's top dragonfly site). Subsequently I was able to confirm a rare scoop over the redoubtable Wilson by showing him specimens of *Mortonagrion hirosei* that I had caught in malaise traps within a Hong Kong reedbed in 1990 and 1991, and then sent to Syoziro Asahina for identification. At the time, Keith was busily expanding the Hong Kong species list by leaps and bounds, but was unaware of the presence of *M. hirosei* in Hong Kong (it was previously known only from Japan, where it had been considered an endangered endemic).

I started getting to grips with the Hong Kong species in 1994 to 1995, whilst working on a survey of freshwater wetlands for Hong Kong University, using Wilson's as yet unpublished keys to adults for guidance. In 1995, Keith published *Hong Kong Dragonflies*. This was the first book on the subject, and suddenly it became much easier to put a name to species in the field.

In 1995 to 1997 I worked on the insect component of Hong Kong University's territory-wide Biodiversity Survey of Hong Kong. It was during this period that I achieved my second scoop over Keith, collecting *Macrodiplax cora* at a remote coastal marsh. This was a new addition to the Hong Kong list, in spite of it being such a widespread species in the Old World.

Things really took off in 1998 to 2000, when I worked for a Hong Kong-based conservation charity (Kadoorie Farm & Botanic Garden) that was undertaking rapid biodiversity assessments in forest nature reserves in tropical **southern China**. Over the course of some 16 survey trips into the provinces of Hainan, Guangxi and Guangdong, covering more than 50 nature reserves, I saw and collected many species of dragonfly which were undescribed or poorly known. This material was passed on to Keith Wilson (also an occasional participant in the field trips) who has been working through it over the past few years. Among the most memorable species I have been privileged to see in China are *Pseudolestes mirabilis*, a Hainan endemic which has iridescent scales on the hindwing, and the magnificent *Chlorogomphus papilio*, an enormous beast which can be mistaken for a Birdwing butterfly (*Troides* spp.) on first sight, due to extensive yellow coloration on the very broad hind wings.

Working in China was a very rewarding, but at times depressing, experience. Only small remnants of primary forest persist in the southern provinces, most major waterways are grossly polluted, and many upland rivers are subject to capture for hydroelectric power generation. Deforestation and illegal hunting are still major problems in much of the region. For many nature reserves, finding the "core area" of good habitat became something of a holy grail. Upon being assured that the core area was "2 days walk" away, one would walk for two days through unfailingly despoiled areas, ask how far away the core area was, and be told "2 days walk" by the poker-faced reserve staff. Two days later, increasingly exasperated, one would repeat the question to get the same answer - but by that time you were back where you started. It was like being in a novel by Franz Kafka.

Sometimes, the "core area" really did exist, but turned out to be unworthy of the effort. I have vivid memories of struggling all morning up the slopes of a precipitous limestone pinnacle in Guangxi, through what seemed like miles of maize fields on impossibly steep terraces, in stifling heat, to eventually reach a bone dry half-acre forest at the summit, which had *not one single odonate*. Fortunately, not all the reserves were like that, and many beautiful forests and rivers remain.

The other major problem with working in southern China is the drinking. There is some very fine beer in China but it is relatively expensive, and the drink of choice among the locals is *mao tai*, a strong, cheap liquor made from rice. No doubt there are many candidates for the most disgusting drink ever devised by man, but (with the utmost respect to my Chinese colleagues) *mao tai* gets my vote. It is a conventional politeness in China to drink the health, repeatedly, of your hosts, by mutually downing small cupfuls of this rocket fuel up to, and often beyond, the point of incapacitation. "Foreign guests" are

particularly valued for this amusing dinner-time entertainment. Thus, the non-Chinese contingent of our survey team often had to take into consideration the “hangover factor” when planning the morning field-work schedule.

Since 2000 I have been working as an ecological consultant in Hong Kong. This has given me the opportunity to monitor the colonization by odonates of numerous created wetlands. I achieved my third scoop over Keith Wilson when several individuals of *Trithemis pallidinervis* – another widespread libellulid not previously known from Hong Kong – suddenly appeared in one of my study wetlands in 2003. Keith’s departure in late 2003 has left a big vacuum – during our many dragonfly hunts across Hong Kong and southern China together I learnt most of what I know about dragonflies.

I have now turned my attention to monitoring exuviae (in addition to adults), deploying emergence screens and traps in several ponds as part of a long-term study. I have also been conducting regular total exuviae counts in one small pond, and plan to expand this study to several more ponds next year. These emergence studies are, I believe, the first such studies conducted in Hong Kong, and I will attempt to publish the results in the future.

Earlier this year, I joined my pal Rory Dow on his trip to Sarawak (discussed by Rory elsewhere in this newsletter). This has opened my eyes to a whole new fauna. I will be joining Rory again for further Borneo trips next year. We hope to be able to produce a photographic field guide to the Odonata of northern Borneo some time in the not too distant future. And of course, I can’t say this without acknowledging that it has been rendered infinitely less difficult by the publication last year of Bert Orr’s superb *Guide to the Dragonflies of Borneo*.

INCREASING AWARENESS of DRAGONFLIES in PAPUA NEW GUINEA

Experiences from working with native people - Steffen Oppel

The vast pristine rainforests of **Papua New Guinea** are home to an enormous variety of plants and wildlife, including several hundred species of dragonflies and damselflies. As in many other tropical countries, the continuous growth of the human population has a major impact on the remaining forest ecosystems. Primary forests are cut or burnt and replaced by gardens, plantations, or oilrigs. Furthermore, running waters are often regarded as agents of waste disposal and gradually polluted without second thought. Altogether this development can be assumed to have a very detrimental impact on the more specialized dragonflies endemic to the rainforests of New Guinea.

In rural parts of PNG, the majority of the population lives as subsistence gardeners and hunter-gatherers. Despite their excellent knowledge of the local wildlife, threats to non-game animals (including dragonflies) are generally unknown, ignored or neglected. In order to increase the awareness for the local dragonfly fauna, and the threats it might face, I launched a small project in May 2004, supported by a grant from the International Dragonfly Fund (IDF), the Wildlife Conservation Society and WDA. Besides collecting data and specimens from an odonatological no-mans-land, I was also determined to train local assistants to work with me. The study was carried out in the Crater Mountain Wildlife Management Area, approximately 70 km southeast of Goroka on the southern scarp of the central mountain range of PNG. The rainforests abound with damselflies of Megapodagrionidae (10-13 species), Coenagrionidae (13 species) and Platycnemidae (9 species), and the larger rivers are home to several Corduliidae (e.g. *Macromia* sp.) and Libellulidae (e.g. *Risiphlebia risi*). Beside several species of *Argiolestes*, the smaller creeks feature *Rhinocypha tincta* and *Neurobasis* sp.

For a white man, sampling dragonflies in these creeks and rivers is a nightmare. After breaking two fingers in the first few months I figured that no footwear whatsoever could provide any useful traction on the round and slimy boulders. My local assistants, whose feet must be equipped with invisible gecko-like suction pads, never had any problems and working with them reduced me to data recorder, for writing was the only thing most of them couldn’t do. Despite none of them ever having caught a dragonfly before, let alone flung some weird nylon net at it, it took them less than a day to handle this expertly. Since I generally needed both my hands to scramble up the slimy green rocks in a creek, I gave up and gave my net to my assistants. They were bouncing up and down the creek and presented me with a variety of specimens that I would have never found myself. I never understood how their eyes managed to pick out tiny brown stick-like insects sitting motionless on a tiny brown stick-like perch 3 m up against a background of thousands of tiny brown sticks. After first discovery they locked on their target and never failed to bring it in. In seemingly hopeless cases, where a dragonfly would escape up a 10m moss-covered rock face, one of them would suddenly show up on the top of the cliff after having swiftly climbed around the backside and collected what I had already written off as a lost specimen.

The main goal of this study was to compare the dragonfly faunas between a pristine rainforest and a garden landscape with secondary or at least depleted forest. Since I was not sure about seasonal patterns in the occurrence of most species, I decided that sampling should be carried out simultaneously. After sufficient training I sent my most educated assistants back into the village, in order to collect specimens and record the habitat where a species was found. For six weeks sampling took place with approximately similar effort in both study areas, and much to my amazement the degraded area around the village ended up with a longer species list (35 vs. 33). However, due to the poor weather conditions in the pristine forest, and the general scarcity of many forest-dwelling damselflies (e.g. *Podopteryx selysi*) I believe that a much longer sampling period is needed to adequately compare the two sites. In the village, the species accumulation curve seemed to level off after 35 days, indicating that fewer species would be added with a longer sampling period. In the pristine forest it took about 90 days for the species accumulation curve to level off. In 8 months that I had previously spent at that site I found about 65 species in two square km of the pristine forest, many of which were only seen once or twice during this time. The identification of all specimens and analysis of the data is not completed yet.

Altogether the project was fairly successful, and I sparked some enthusiasm for dragonflies in the local community. Returning from my time in the pristine forest back into the village, many people reported to me where they had seen what kinds

of dragonflies. Consciously noticing the presence of these animals can be regarded as a first step, because people would subsequently also notice their absence. I am determined to go back to that village and show pictures to the community and explain some things about dragonflies and the environment. These people are great observers, but the general lack of education makes it very hard for them to draw inferences. While it is generally easy to understand that a forest-dwelling animal will disappear when the forest disappears, it is much harder to grasp that a stream-dwelling damselfly will disappear when too much soap is added to the water. Providing this education is a prerequisite for environmentally conscious and sustainable behaviour.

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Handbook to the Odonata of New Guinea and the Neighboring Islands

John Michalski

Since around 1992 I have been at work on a comprehensive guide to all the known taxa of dragonflies and damselflies of **New Guinea**, Maluku, and the Solomon Islands. The monograph is nearing completion, and is being edited by Guido Keijl in the Netherlands, to become an instalment in the new "Fauna Malesiana" series. At present, the manual encompasses 585 taxa in 94 genera, including 4 new species descriptions and re-descriptions. Dichotomous keys to adults are provided for all species, and a basic key is provided to separate naiads at the family level. 1,458 figures, mostly line drawings taken from Lieftinck, Martin, Schmidt, and other workers but hundreds of which were produced by the author, enhance the roughly 350 pages of text. Colour plates are also being prepared to show many species alive in natural settings, as well as distinguishing characteristics for colourful genera such as *Neurobasis*, and full-body scanned images to provide a general idea of the diversity of body form found in this order. It is hoped that the monograph will reach publication some time in mid-2005.

Although the manual includes all published information on the fauna of Maluku (formerly the **Moluccas**), the Bismarck and Solomon Islands, and the smaller satellite islands surrounding New Guinea, the main island of New Guinea is the primary focus of the work. The fauna covered by the manual may be broken down as follows:

Suborder	Family	Genera	Species/Subspecies
ZYGOPTERA	Calopterygidae	1	7
	Chlorocyphidae	1	12
	Amphipterygidae	1	1
	Lestidae	2	13
	Platystictidae	1	14
	Protoneuridae	1	46
	Isostictidae	4	25
	Megapodagrionidae	2	34
	Platycnemididae	11	45
	Coenagrionidae	19	136
	ANISOPTERA	Gomphidae	1
Aeshnidae		7	38
Synthemistidae		2	11
Corduliidae		5	27
Libellulidae		35	175
TOTAL		94	585

Items of special taxonomic interest include New Guinea's wide array of Argiinae, with 30 highly unusual taxa from four genera, and the high development of endemic Platycnemididae, with 45 taxa from 11 genera. Also noteworthy is the frequent occurrence of high spp. diversity within a rather narrow range of generic diversity. Examples include *Huonia* (15 taxa), *Diplacina* (20 taxa), *Nannophlebia* (20 taxa), *Palaiargia* (25 taxa), *Papuagrion* (22 taxa), *Teinobasis* (36 taxa), *Argiolestes* (3 taxa) and *Nososticta* with 46 and counting.

Many spp. Range widely over large geographic areas, while many others are so far known from a single isolated valley. Several spp. Show a broad range of colour patterns, and it is likely that a number of currently recognized taxa will ultimately be synonymized or reduced to the status of colour-varieties.

A large proportion of New Guinea's odonate fauna is entogenic, showing no close relatives outside the region. One striking example is the libellulid genus *Huonia*, made up of stocky, robot-like, green-and-black dragonflies that perch flatly on streamside boulders, making brief sorties over the water before returning to the treetops. I believe they fill the ecological niche of the Gomphidae, which are otherwise represented by only one species throughout the entire region: *Ictinogomphus australis lieftincki*.

Little is known about the developmental stages of Melanesian Odonata and this is reflected in the admittedly sketchy treatment they are afforded in this monograph. A brief key has been developed to allow for the separation of naiads at the family level, but this is sure to become obsolete as more material makes its way into publication. However, every known illustration of regional immatures has been compiled and reproduced as a starting reference.

In July-August of 1994 I made my first trip solo across PNG, visiting villages, buying tribal artwork, and collecting odonates. In 2004 I finally made a return visit and, in addition to meeting many old friends from 1994, I was successful in getting nice live photos of around 50 species in the field. They should make a nice addition to the monograph.

It's a large project and the editorial staff involved keeps getting side-tracked onto smaller, more easily completed assignments. However, with a little luck, *The Odonata of New Guinea and the Neighboring Islands* should see the light of day before the start of 2006.

DRAGONFLIES of the KEBUN RAYA, BOGOR, JAVA - Bert Orr

Fifty years ago M.A. Lieftinck, the former director of the Museum Zoologicum Bogoriense (MZB), listed 159 species of Odonata from Java, 29 of which were endemic. At the time Lieftinck remarked, "Fortunately enough, most parts of Java had been explored rather thoroughly in search of dragonflies before the radical destruction of its hill-side vegetation was started".

Since that time, the destruction of lowland and hillside vegetation has been almost complete. The very few remaining vestiges are mostly preserved within a system of national parks, often centred around the 23 active volcanoes of the island and occupying a total of 2.9% of the land area. This provides barely adequate protection for much of the unique flora and fauna, especially as streams containing volcanic contaminants may be impoverished. Since 1955, there has been limited collecting. Only one new species, *Procordulia papandayanensis* van Tol, 1997, (an endemic), has been added to the fauna and one species thought to be endemic, *Lestes praecellens*, has been found in Peninsular Malaysia, leaving the total of endemic species unchanged. The conservation status of several rare and localised species is probably precarious.

Also notable is the local attenuation or demise of what were formerly common and widespread species. It is this trend that contributes most to the worldwide perception of biodiversity erosion. Everyone knows this is happening, but it is exceptional, especially in the tropics, to be able to quantify the effect. In 1929, Lieftinck compiled a checklist of the odonates of the botanic garden (Kebun Raya) in Bogor, within which the original MZB buildings were housed. In 2000 and 2003 I spent six weeks in Bogor, staying mostly in the Kebun Raya guesthouse, a rather grand building in Dutch colonial style. Most afternoons and on weekends I was able to explore the 1 km² of the Kebun Raya, where diverse dragonfly habitats occur, including a series of ponds, drains and modified natural streams. I compiled a list of all species seen. Also, for about ten years Pudji Aswari had been making a reference collection from the Kebun Raya, housed in the MZB. We combined our data to provide a contemporary checklist, full details of which will appear in Treubia (in fact most of our records overlap).

Lieftinck recorded a total of 49 species, 16 Zygoptera and 33 Anisoptera. We found only 30 species, 9 Zygoptera and 21 Anisoptera. The most conspicuous absences, which would have been impossible to overlook, were stream dwelling species such as *Neurobasis florida*, *Euphaea variegata*, *Libellago lineata*, *Prodasineura autumnalis*, *Onychothemis culminicola*, *Macrogomphus parallelogramma* and *Paragomphus reinwardti*. The formerly common *Vestalis luctuosa* is now extremely rare. Incredibly, however, there is a thriving population of *Heliocypha fenestrata*. Along the shaded parts of the stream males of this pretty little insect flit over the rank, slightly clouded water polluted with raw sewage and detergents. The absence of other species may be explained by a lower tolerance of contaminants, but perhaps more importantly, the rheophytic vegetation of the stream banks has been radically altered by the construction of concrete levees along its length. *Heliocypha* oviposits in dead twigs, which litter the streambed and are unaffected, but the oviposition substrate of many species has been destroyed. Such heavy-handed landscape management is depressingly common throughout the world, and in purely quantitative terms, its effects are perhaps most devastating in formerly rich tropical habitats.

WELCOME TO NEW MEMBERS

Germany

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Reviews.

Damselflies of Alberta. John Acorn. 2004. University of Alberta Press, Ring House 2, Edmonton, Alberta T6G 2E1, Canada (uap@ualberta.ca). \$29.95 Canadian.

This is an intensely personal book, written by someone who observes and appreciates all aspects of nature and loves to educate anyone who will pay attention. Much attention is paid to John in Alberta, where he could truly be called a "nature personality." The book treats the 22 species of zygopterans in Alberta in great detail and is without question a scholarly treatise. But it's worth having a copy just because it's a good read. Throughout John tells stories about damselfly biology, damselfly research, and damselfly researchers, bringing subjects to life with his own particular brand of generosity and humour. How many books have you seen in which some of the species are introduced by limericks? Enough said. Well, not quite enough. I recommend reading the Preface of this book and taking it to heart. John criticises rightfully the present paradigm that forces scientists to write in cold, objective terms in their scientific papers, no matter their passion for their subject. Thank goodness this paradigm doesn't extend to books, and that his publisher gave him the latitude to put as much of himself in this book as he wished.

Dennis Paulson September 04

The WDA has its roots in Slovenia but its branches spread all over the world.
Our membership is now 269 and we have members in 34 countries

ECHO

Rory Dow - During our visit to **Sarawak** last year **Graham Reels** and I decided we would attempt a photographic field guide to the Odonata of Sarawak, Sabah and Brunei. We intend to cover every species recorded in this region, of course we will not be able to provide a photograph of every species but we believe we can provide pretty good photographic coverage, having good photographs of many species from this years trip and my visit last year, plus whatever we get next year. We will be aiming for a genuine field guide, something along the lines of Keith Wilson's recent Hong Kong field guide, and will be trying to keep the cost down so that more people who live in Borneo will be able to afford it (that said we have no publisher at present and may end up publishing privately in Hong Kong, which may put up the price). We hope to be publishing the book by the end of 2005.

Victor Gapud – My interest in **Philippine** Odonata has gradually grown through the years since the 1980's in addition to my work on Philippine water bugs, especially the leptopodids and ochterids. My discovery of *Argiolestes realensis* from the National Botanic Garden in Quezon, part of the Sierra Madre Range on the eastern side of Luzon, really got me excited about damselflies even more. In this same place, one could observe at least 6 species of *Risioconemis* foraging in the same general area. In 2000, I discovered a second species, *Argiolestes baltazarae* in a lowland forest in the heart of the Northern Sierra Madre Natural Park. Since then, I have accumulated a fairly good collection of Philippine damselflies. In 2002, a university funding allowed my students and me to travel around Luzon to see first hand the state of the habitats of endemic damselflies, especially *Risioconemis* & *Drepanosticta* spp. The works of Matti Hämäläinen on *Risioconemis* and those of Needham and Gyger and of Lieftinck on *Drepanosticta* have been very useful. I met Jan van Tol and Vincent Kalkman in Manila early this year before boarding their plane for the Netherlands and we had a brief talk on the status of Philippine Odonata research. I am glad to know that Jan is almost ready to publish a revision of Philippine platystictids and eager to receive his paper. The paper of Dirk Gassmann and Matti Hämäläinen on *Risioconemis (Igneocnemis)* would facilitate my fieldwork on this group. I have now accumulated photo images of many damselflies. In Jan's paper on *Protosticta* of Sulawesi, he raised doubts about the existence of the genus in the Philippines. I am happy to say that I collected a male from the Mantalingahan mountain range in southern Palawan last July. I hope to return to the place to obtain more individuals of this probably undescribed species. Last June, I spent a week in a lowland forest of Palawan, still part of Northern Sierra Madre Park, and discovered a new species of *Amphicnemis* and two new species of *Drepanosticta*. With the help of all those who have been working on our damselflies, I hope to be able to come out with a Handbook on Philippine damselflies in the near future. I welcome their valuable help. Address: Dept of Entomology, Univ. of the Philippines Los Baños College, Laguna 4031, Philippines; e-mail: vicgap@laguna.net

Vincent Kalkman – A few months ago I started working on a study of the Oriental representatives of the family Megapodagrionidae. This family contains well over 200 species that are largely confined to the tropical parts of both the old and new world, the largest diversity being found in South America, **Madagascar** and **New Guinea**. The family is represented in Asia and Australasia with 21 genera, most of them having between 1 and 10 species. An exception is the largely New Guinean genus *Argiolestes* that has 36 species. The work will concentrate first at making a number of revisions of some smaller genera and describing the larva of as many genera as possible (read available). In a later stage it is hoped to reconstruct the evolutionary history of the family partly based on DNA-analyses. I would be grateful if people would inform me of the existence of material (larva or adults) or pictures of Megapodagrionidae. Also I would appreciate any information on field-observations as information on behavior and habitat is scarce.

Steffen Oppel – In November 2003 I arrived in **Papua New Guinea** to work as a research assistant for the Wildlife Conservation Society. While my task was mainly ornithological fieldwork, I was immediately overwhelmed by the richness of the odonate fauna in our study area near Crater Mountain, 70 km SE of Goroka. I spent nine months in the pristine rainforest surrounding the research station and found some 65 species of 13 families, identification still pending for most of them. Identification will proceed in collaboration with **John Dobunaba** from the Forest Research Institute in Lae, PNG, and with **John Michalski**.

Many of the forest-dwelling damselflies were extremely rare, encountered only once or twice in several months (i.e. *Podopteryx selysi*). I have been recording habitat variables for all encounters and hope to build a database that would enable me to build habitat models for a few of the more common species. Some species appeared to occur seasonally, which is surprising since the site is aseasonal forest with continuously high rainfall. In May I started a project supported by the International Dragonfly Fund (IDF) to compare the faunas of a pristine rainforest and a mixed secondary forest/garden site. This aims to identify the species that are mostly affected by deforestation or water degradation following human settlement.

I also carried out a small project on *Neurobasis kimminsi*, marking individuals and following their movements for several weeks. This work is almost completed and should be published in due course.

Back in Germany I will busy myself with data analysis and write-up, and hope to be returning to the study area next year to work on habitat relationships of selected species. For further information or assistance in identification and analysis you are welcome to contact me via **E-mail**: steffen.oppel@gmx.net

Reagan Joseph Villanueva – My odonatological study at present is hampered by academic demands. Field-work is limited to available time, and usually confined to Davao City areas. After meeting with **Jan van Tol** and **Vincent Kalkman** last March, I was able to visit several sites and collected some interesting species. In all, I have collected two undescribed *Amphicnemis* species belonging to *furcata*-group, one *Coeliccia* (*Asthenocnemis*) that needs further samples for verification, two undescribed males of *Risioicnemis moroensis*, and 2-3 undescribed *Drepanosticta* species, one similar to *D. mylitta* and the two to *D. lymetta*, all from Mindanao. I was also able to rear to adult emergence the larvae of *Pseudagrion pilidorsum*, *Paragomphus balneorum*, *Tetracanthagyna bakeri*, *Idionyx philippa*, *Diplacina bolivari* and *D. brauri*. Current efforts on rearing the larva of *Heteronaias heterodoxa* and on searching the whereabouts of *Risioicnemis*, *Teinobasis* and *Drepanosticta* larvae remained unsuccessful. D3C Gahol Apartment, Lope Jaena St., Daváo City, 8000 Philippines.

**Worldwide Dragonfly Association
Nominations to the WDA Board of Trustees 2005-2007**

In accordance with the WDA Constitution and By Laws, all members of the Board of Trustees, except for the President Elect, resign at the Biennial General Meeting following that at which they took up their posts although all (apart from the President) are eligible for re-election.

Gordon Pritchard has agreed to stand for election to the post of **President Elect** having been formally nominated (by Reinhard Joedicke) and seconded (by Philip Corbet). In addition Frank Suhling will be retiring in July 2005 as Chairman of the Conservation and Funding Committee. Göran Sahlen has agreed to stand for election for this role and he will look after funding issues while current Board member Viola Clausnitzer will look after conservation issues. Should you wish to nominate another member of the WDA for the position of President Elect, Chair of the Conservation & Funding Committee (or any other position on the Board of Trustees) please complete the following nomination form and return it to the Secretary so that it reaches her no later than February 19th 2005, after which no nominations can be registered. In the event of a vote being required for any position postal/email ballot slips will be issued in March 2005. Please ensure that any nomination is supported by the signatures of two WDA members and by the person nominated.

Nominated Board Members for the period 2005-2007 are as follows:

- | | |
|--|---|
| President : Hidenori Ubukata | President Elect : Gordon Pritchard |
| Immediate Past President: Mike May | Secretary: Linda Averill |
| Treasurer: David Allan Fitch | Managing Editor: Reinhard Jödicke |
| Webmaster: Rob Arnold | Symposium Co-ordinator: Richard Rowe |
| Chairman C & F (Funding): Göran Sahlen | C & F (Conservation): Viola Clausnitzer |
| Regional Co-ordinator: Dennis Paulson | |

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Nomination Form

I, (Write your name here and give your WDA membership number if known) wish to nominate the following WDA member for the office of

.....:

Name of Nominee:(WDA Membership No.....)

Signature of Proposer:.....

Signature of Seconder:.....

I agree to the above nomination..... (Nominee’s signature)

Please cut out this form & return to the WDA Secretary, 49 James Rd, Kidderminster, DY10 2TR, UK by February 19th 2005 at the latest.