AGRION

NEWSLETTER OF THE WORLDWIDE DRAGONFLY ASSOCIATION

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AGRION

NEWSLETTER OF THE WORLDWIDE DRAGONFLY ASSOCIATION

AGRION is the Worldwide Dragonfly Association's (WDA's) newsletter, which is normally published twice a year in January and July. Occasionally a special issue may be produced. The WDA aims to advance public education and awareness by the promotion of the study and conservation of dragonflies (Odonata) and their natural habitats in all parts of the world. *AGRION* covers all aspects of WDA's activities; it communicates facts and knowledge related to the study and conservation of dragonflies and is a forum for news and information exchange for members. *AGRION* is freely available for downloading from the WDA website at [https://worlddragonfly.org/about/agrion/]. WDA is a Registered Charity (Not-for-Profit Organization), Charity No. 1066039/0. A 'pdf' of the WDA's Constitution and byelaws can be found at its website link at [https://worlddragonfly.org/about/].

Editor's notes

Keith Wilson [kdpwilson@gmail.com]

WDA Membership

Membership signing up and renewal process is achieved directly through the WDA website [https://worlddragonfly.org/]. There are three kinds of WDA membership available, either **Regular** or single (£50/year), which is the standard category, **Family** (£75/year) or **Reduced** (£25/year). The latter is a reduced membership category for students (grade school, undergraduate, graduate, etc.) and anyone (student or not) residing in a developing nation (see UN list). For further information consult the WDA website at: [https://worlddragonfly.org/new-changes-in-2021/]. You can sign up for membership using the WDA's website [https://worlddragonfly.org/membership-account/membership-levels/] or by contacting the WDA secretary directly [wda.secretary@gmail.com]. Sponsored memberships are also available for those who cannot afford the cost due to currency restrictions or other reasons. Prior to 2021, membership options were with or without the WDA's journal (*The International Journal of Odonatology*)—in electronic form or hard copy, but as from January 2021 the *IJO* has only been available in electronic form and is now freely accessible through Open Access [https://worlddragonfly.org/ijo/]. For member benefits see WDA web page under Member Resources [https://worlddragonfly.org/resources/member-resources/].

WDA Membership Renewal

Automatic renewal is in place for existing members so they do not have to worry about their membership renewal. A reminder email, notifying members of their upcoming membership payment, will be sent seven days prior to the debit.

Conference news

The International Congress of Odonatology ICO2023

The next ICO was held in Paphos, Cyprus at the Neapolis University. The Congress was originally scheduled to be held in 2021 but, due to Covid-19 uncertainties, was rescheduled for 25-30 June 2023. For further information consult the WDA website [Link]. There is an ICO 2023 report by David and Ros Sparrow on page 44.

Members news

Sadly, I have to report the passing of four WDA members and prominent odonatists over the past six months, Kiyoshi Inoue, Jill Silsby, Richard Rowe and Mike May.

Cover. *Urothemis abbotti* female 1 February 2023, Trang, Thailand. Photo credit: Markku O. Tunturi. Photos of the male *Urothemis abbotti* were published for the first time in the July 2022 issue of *Agrion*. Here, good photos of the female are provided (see article "Photographs of the female Urothemis abbotti" on page 62.

Kiyoshi Inoue 1932 - 2023

Kiyoshi Inoue peacefully passed away on 21st May 2023 in Osaka, Japan at the age of 91. He was the long-serving President of the *International Odonatological Foundation*, *Societas Internationalis Odonatologica* and former President of the *Dragonfly Society of Japan*.

Kiyoshi-san was one of the leading odonatologists in Japan and Asia. He published many papers focused on the study of odonate taxonomy, behaviour and ecology and was the co-author of the hefty two-volume tome titled *Japanese Dragonfly Encyclopedia,* first published by Kodansha in 1985 (authors: Yasushi Hamada and Kiyoshi Inoue). This book was reprinted in color in 2005 with the English title: *The Dragonflies of Japan in color* (ISBN: 9784069972027). He was also the lead author of the popular Japanese book titled: *All about Dragonflies* (authors: Kiyoshi Inoue & Kôzô Tani), first published in 1993 by Tombo-Shuppan Publishing, Osaka; the book is now in its 5th revised edition.

The fantastically successful *12th International Symposium of Odonatology* held in Osaka, 1993 was largely organised by Kiyoshi-san. During the post-conference field trip overseas participants were amazed at the dexterity and dragonfly catching abilities of Japanese odonatists using telescopic fibreglass net poles several metres long. Participants were also entertained by a male voice choir of which Kiyoshi-san was a member and were astonished to experience Japanese-style auctions for rare dragonfly specimens presided over by Kiyoshi. After the 1999 *International Congress of Odonatology* held in Colgate, New York Kiyoshi-san also treated members at the end of the post symposium tour to the Adirondacks to a beautiful rendering of 'Going Home' as a way of thanks.

Kiyoshi-san authored the *Critical species of Odonata in Japan* assessment contribution to the "Guardians of the watershed. Global status of dragonflies: critical species, threat and conservation" published in 2004 [Link]. In 2010 he co-authored a book titled: *All about Red Dragonflies* (authors: Kiyoshi Inoue & Kôzô Tani) that is devoted to the study of the 21 *Sympetrum* species found in Japan [Red Dragonfly (Japanese: 赤とんぼ - Aka-tombo) is the name of a culturally important and popular children's song in Japan (Link)].

Kiyoshi-san graduated in engineering from Osaka University. He worked for much of his career as a chemical engineer for the Energy & Chemicals Company of the large Japanese Itochi Corporation and retired as General Manager of the Kansai Research Institute. He was renowned for his warm-hearted and genial personality and will be sadly missed by his odonatist colleagues, friends and family.

Tributes to Kiyoshi-san are provided by his friends Misa Piper (page 68) and Hide Natsuma (page 69).

Photo (right): Kiyoshi Inoue (far right) at the Wetland Centre mid-symposium field trip, *Societas Internationalis Odonatologica* (SIO) Conference in Hong Kong Aug 2006.

In memoriam of Jillian Dorothy Silsby 1925 - 2023

Jillian Dorothy Silsby (née Lewis), known to everyone as Jill Silsby, was born in a military hospital in Delhi in 1925, where her father was a British General in the Indian Army. Her family was stationed in India during World War II, and in her formative years Jill was able to enjoy the elegant social life of the final years of the British Raj. Of all the places she subsequently lived, including Saudi Arabia, Kenya, South Africa and the UK, she loved living in India the most, which she described as 'a wonderful, beautiful place'. Jill passed away at the grand age of 98 earlier in 2023.

Jill gained a Diploma of Social Science from the University of Southampton, UK in 1949 and maried Ronnie Silsby in the same year. After raising three chidren Jill & Ronnie moved to Riyadh, Saudi Arabia where they lived from from October 1977 to May 1980. Prior to their stay in Saudi Arabia the Silsbys travelled extensively in the UAE and Oman. Jill's wildlife interest in the Middle East was predominantly birdwatching and bird photography (Fig. 1A). Jill authored the book titled: *Inland Birds of Saudi Arabia,* a photogrpahic guide, published in 1981 by Immel Publishing Ltd., London (Fig. 4A).

Jill first became very active in the then relatively small world of Odontology in the early 1980s after relocating from Saudi Arabia to Purley, south of London. She attended her first *Societas Internationalis Odonatologica* (SIO) conference held in Paris in 1985 at the age of 60. Jill served as the Secretary of the *British Dragonfly Society* (BDS) from 1987-94 and as a Trustee of the BDS from 1995-97. Her husband, Ronnie, was the BDS Treasurer from 1989-96. In their retirement both Jill and Ronnie were regular attendees at biennial SIO & WDA conferences and their successor the biennial *International Congress of Odonatology* (Fig. 2). She was a founding member of the *Worldwide Dragonfly Association* (WDA) formed in 1997 and served as its first Secretary and Treasurer from 1997 to 2001. Her WDA membership number was Number 1 and she earned the informal title *Mother of the Association*. Although the inaugural meeting was held at the SIO Symposium held in Maribor, Slovenia on 17th July 1997 (proposing the establishment of the WDA), the Association was formally confirmed at the first WDA council meetings held at Jill & Ronnie's home in Purley, Surrey, UK on 6th and 7th September 1997.

Jill was the first editor of *AGRION,* the WDA's newsletter, a post she held for ten years from 1997 to 2007. She was also the editor of *Selysia* (a biannual newsletter of Odonatology) together with Martin Schorr (Zerf, Germany) from 1996 until 1997. In 2001 she authored and edited the popular and highly aclaimed book: *Dragonflies of the World*, which was published by CSIRO Publishing, Australia (Fig. 4B).

From the 1980s the Silsbys travelled extensively in all parts of the world and over a fifteen-year period regularly visited Africa, often for six weeks or more, during the northern hemisphere winter period between November and March. In the January 1999 issue of *Agrion* Jill described some of the highlights of her African dragonfly adventures in an article titled: 'In search of *Anax tristis*'. After a possible sighting of this huge, enigmatic and elusive dragonfly in South Africa in 1981, Jill remarked that *A. tristis* took its position at the top of her 'want to examine closely' list. She delighted in recalling the details of four sightings of *A.*

Figure 1. (A) Jill in Saudi Arabia ca. 1977-1980. (B) Jill at Down House (Charles Darwin's family home), 2005. (C) Jill's memorable photo of a male *Anax tristis* - a live specimen rescued by Peter Allen from drowning in a marsh during a *British Dragonfly Society* field trip to the Gambia in October 1996.

Figure 2. Post-symposium field trip group photo taken in Österbybruk, Sweden following the WDA *International Symposium of Odonatology* held at Gällivare, July 2001. Jill and Ronnie Silsby are bottom row third and second from the right respectively. Photo credit: Valerie Pritchard.

Figure 3. Jill with her memory box at her Banstead nursing home apartment, 2005. It contains a brass plaque, that Jill remarked: "We had this plaque on our house in Saudi Arabia, where we lived. That's 'Silsby' in Arabic" The dragonfly photo bottom right is an African *Phyllomacromia* sp. female.

tristis at different locations in Africa and then finally managed to see, photograph and examine a male specimen in October 1996 after Peter Allen had netted a male struggling on the water's surface at a swamp at Sanyang Banko, Gambia (Fig. 2).

In December 2002 Jill and Ronnie moved from their large detached house in Hayden Avenue, Purley to an apartment at Astoria Court, High Street, Purley. When Jill struggled with her mobility some six years after Ronnie's death (10th June 2002) she moved to a nursing home in Banstead, south London in 2008 (Fig. 3).

I met Jill on several occasions at various dragonfly conferences and at her Banstead apartment. I was particularly pleased when she visited me in Hong Kong in the mid-1990s and although it was mid-winter, with practically no dragonflies on the wing, I was nevertheless able to net many different odonate larvae from local streams. She was notably impressed with the very large and powerful *Megalogomphus sommeri* larva and the huge elongated terminal abdominal segments of *Labrogomphus torvus*, photographs of which she included in her *Dragonflies of the World* book.

Jill was an indomitable woman with a charming personality, always good company and willing to chat at length about her interests, especially birds and dragonflies.

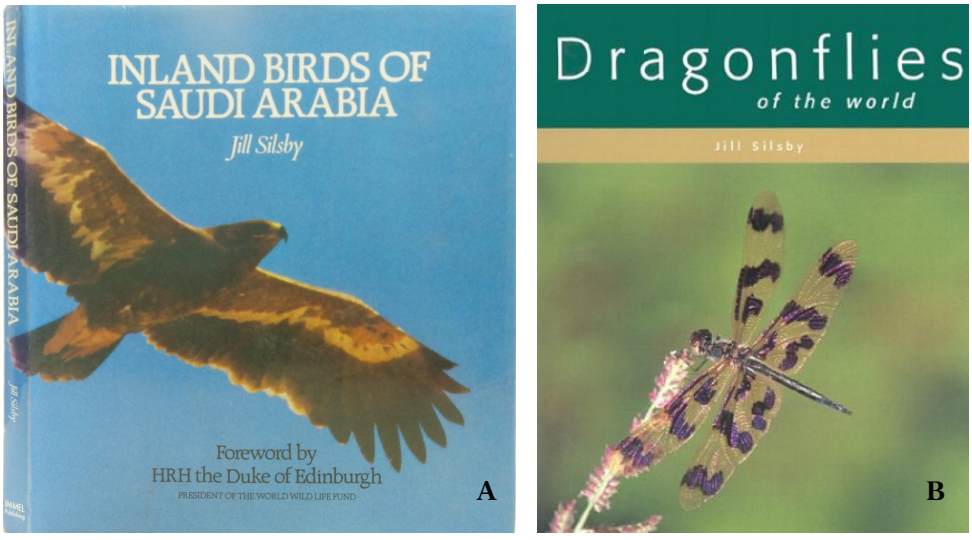


Figure 4. Books by Jill Silsby. (A) *Inland Birds of Saudi Arabia* published in 1981 by by Immel Publishing Ltd., London. (B) *Dragonflies of the World* published in 2001 by CSIRO publishing, Australia.

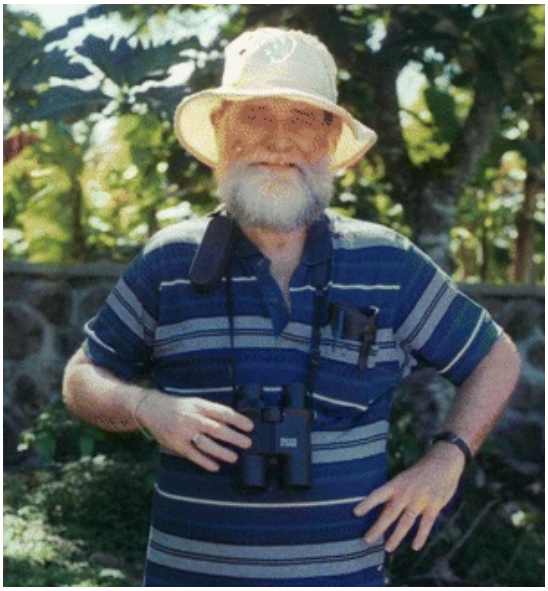
Richard James Rowe 1948 - 2023

Richard Rowe passed away 4 April 2023 at his home in Peeramon, Queensland, Australia, aged 74. I was very saddened and surprised to hear of Richard's passing as I had spoken to him only recently at an odonate get-together held at the Naturalis Biodiversity Center, Leiden in September 2022. A tribute to Richard has been prepared by Michael Winterborn, Professor Emeritus at University of Canterbury, New Zealand and Milen Marinov see "Richard James Rowe 1948- 2023" on page 65. Michael Winterbourn was a friend of Richard's since the 1980s when he supervised his PhD research.

Figure 3. Richard (front left) attending meal with odonatist colleages at an Odonate get-together meeting held at the *Naturalis Biodiversity Center,* Leiden, September 2022.

Michael L May

Michael L. May, Professor Emeritus, Rutgers, The State University of New Jersey, USA, passed away 16 June 2023. At Rutgers he was a Professor of Insect Behavior, Structure and Function. Mike's broad entomological expertise included systematics and taxonomy of Odonata, character evolution in Odonata, insect migration, insect energetics and behavioral ecology. Mike was one of the founding members of the WDA, and served as its President from 2003-2005. He was also one of the main editors of the *International Journal of Odonatology*. Jessica Ware, one of Mike's former Ph.D students, and John LaPolla wrote a tribute to Mike May in 2012, which was published in the journal *Organisms Diversity & Evolution* [Link].



WDA and social media

WDA has an active social media team coordinated by Social Media Coordinator, Rhema Dike [https://worlddragonfly.org/about/social-media-team/]. Rhema is a student and research assistant at the University of Lagos in Nigeria. Rhema studies the diversity, distribution, and taxonomy of Odonata in Southwestern Nigeria. He also studies odonates as indicators of water quality. The Social Media Team regularly posts information on Facebook, Twitter, Instagram and the WDA website about Odonata related news and research. WDA's Facebook group can be found at [https://www.facebook.com/WorldwideDragonflyAssociation], its Twitter presence at [https://twitter.com/worlddragonfly?lang=en] and Instagram at [https://www.instagram.com/worlddragonfly/].

Next issue of *AGRION*

For the next issue of *AGRION,* to be published at the beginning of January 2024, please send your contributions to Keith Wilson [kdpwilson@gmail.com]. All articles, information and news items related to dragonflies or of interest to WDA members are most welcome and will be considered for publication. Please send all text and figure captions in a Word file by email. Please do not include artwork with the text but provide a separate file or files, ideally in a compressed format (e.g. 'tiff', 'jpeg' or 'gif'). Do not make up plates of multiple photos but send the original photo images as separate files.

If you have an odonate photo illustrating any rarely observed aspect of dragonfly biology, or an unusual species, or simply a stunning dragonfly shot, please submit it for consideration for publication on the front cover of *AGRION*.

AGRION CONTENTS

WDA Biennial Report 2021-2023

Report from the President

As Jessica mentioned in her presidential report in 2021, 2019-2021 was a turbulent time for her and board members. After contract-out with Taylor and Francis, much efforts have been devoted to reforming our community system, for example, resuming handling of membership, searching for a new publisher, upgrading our website, and having more social media presence, etc.

My term as your president started after the virtual ICO meeting conducted avoiding the risk of COVID-19 on July 15 2021. Board meetings had been held every three months and discussed many issues including WDA business, IJO and *Agrion* publications, ICO meeting, website, accounting, etc.

During my term, we made some change of our policy. We started a new publishing model with Wachholtz which includes free open access for members. However, we soon switched to do self-publication of IJO by judging it will be better and quicker than keeping contract with them. We have now a good abundance of articles for IJO in these two years! More detail will be reported by the Managing Editor in this issue.

Membership had dropped to below 100 immediately after we started resuming handling of membership, but we are now up to 153 members including new and old people. Thank you to everyone for supporting WDA, and to the WDA board members working to increase membership value.

We will have a real ICO meeting this summer. ICO2023 will be held in Paphos, Cyprus. The congress venue will be Neapolis University. David and Ros Sparrow have worked hard to organize and reorganize the ICO meeting, and it will be a truly wonderful meeting.

I am thankful to Jessica Ware and Frank Suhling for their guidance over the last two years, and I wish Kendra Abbott a wonderful presidency.

With my best regards
Yoshitaka Tsubaki, Kyoto, Japan

Report from the President Elect

I am excited and honored to be president-elect for WDA. I really enjoy interacting with all the WDA members and helping with the mission of the organization. I may be biased, but think we have one of the most welcoming and wonderful societies. With your help, I am very excited to move the organization forward in the next two years as President.

The first item on my agenda is one that Yoshitaka Tsubaki has been working on and that is to fill several positions on the board. We have board members that have served for many years and would like to step down. I would love any recommendations or volunteers for these positions.

I am also hoping to implement some of the great ideas that came out of the workshop held during the 2019 ICO on making WDA more relevant.

I have a special place in my heart for conservation and I hope to find additional ways the society can contribute to odonate conservation priorities.

Kendra Abbott, Alabama, USA

Report from the Secretary

During the last two years we have ended contracts with Wachholtz and formally ended the relationship with Taylor & Francis (Informa) for the publishing of the *International Journal of Odonatology* (IJO).

We have signed new contracts with Birgit Rödder (Medien Design) and Thomas Ulber (HerPrint) to assist in the self-publishing of the IJO as outlined by the Managing Editor below.

We have also signed contracts with EBSCO Information Services to allow the open access IJO to be part of their e-journal service for research databases and public libraries worldwide.

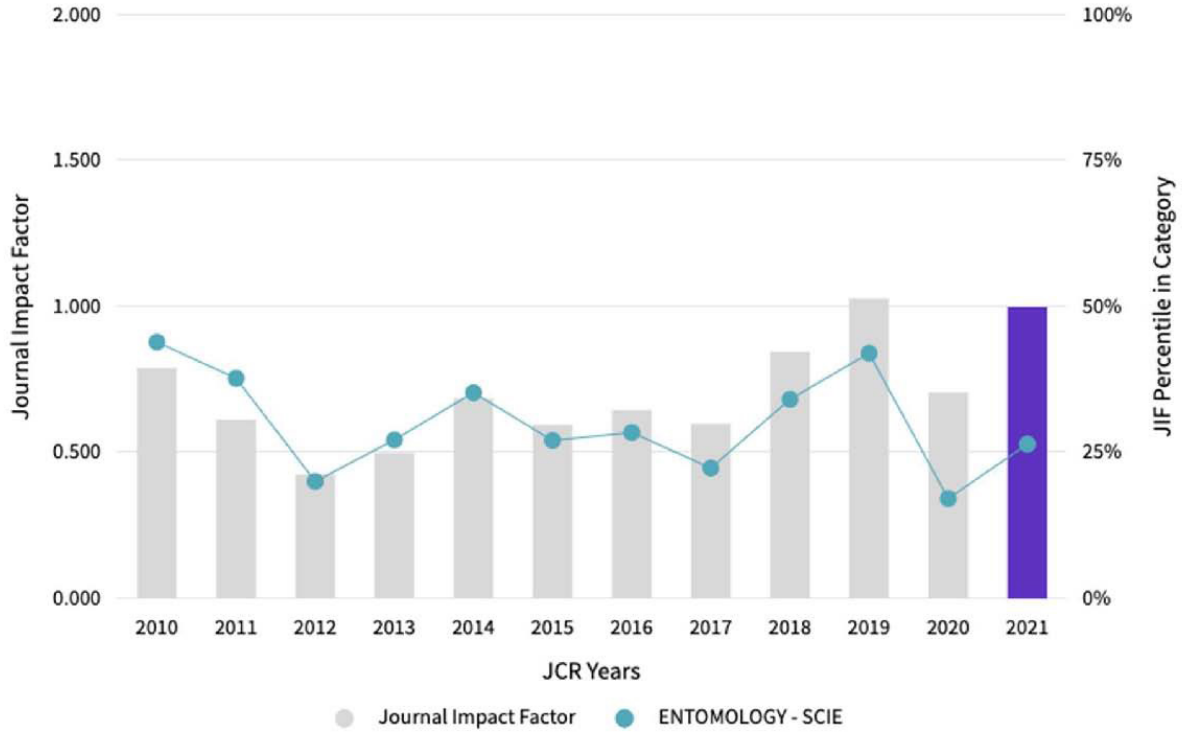
The Secretary & Treasurers roles have been performed by the same person as there is quite an overlap in some areas, however the important role of Secretary must be split out again going forward and the board will ensure that this takes place.

We still need an active increase in both new members and membership renewals and of course thank you for your continued support.

Peter Brown, United Kingdom

Report of the Managing Editor

Since the last report, in 2021, part of Vol. 24 (pp. 37-196), Vol. 25 (120 pp.) and part of Vol. 26 (73 pages) of the *International Journal of Odonatology* were published. Our impact factor, as reported by Journal Citation Reports (https://jcr.clarivate.com/jcr/home), was increasing until 2020, when we had a slight dip from 1.0 to 0.7. I am pleased to report that the impact factor increased again in 2021 from 0.7 to 1.0 and I am hopeful that the upward trend will resume once the 2022 numbers are announced. The 10-year trend for impact factor has remained reasonably consistent with a general upward trend in the last few years. The journal has remained steady within the entomology category, ranking 68 out of 105 in 2021.



As reported in the 2021 Biennial Report, the journal went to an online only, open access format and chose Wachholtz to publish the journal. Wachholtz published volume 24 (2021), but with tremendous delays to each article. The overall layout was also generally viewed as not pleasing. As a result, starting with volume 25 in 2022, we went back to a self-publishing model and hired Birgit Rödder (MedienDesign) to do the layout. I'm happy to report things have turned around tremendously. Birgit is a delight to work with and is very communicative and timely. I have received several positive notes on the new appearance of the articles. All articles are now freely available on the *Worldwide Dragonfly Association* website, [https://worlddragonfly.org/ijo/]. Thanks to webmaster Will Kuhn for his continued work and time in making the website and IJO pages so user friendly and aesthetically pleasing for readers of IJO.

There have also been a number of changes to the Editorial Board since the last report. We had two retirements, Ola Fincke and Dennis Paulson. Both Ola and Dennis have been long time contributors to making IJO a successful journal and their work is much appreciated. And of course, Richard Rowe passed away earlier this year. He was always helpful and encouraging to me and IJO; he will be missed. Cornelio Bota-Sierra has joined the editorial board. A list of the full Editorial Board is available on the website [https://worlddragonfly.org/ijo/editorial-board/]. I very much appreciate the help of this incredibly capable team. Their efforts make the journal the success that it is!

John Abbott, Alabama, USA.

Report from the Newsletter AGRION **editorial team**

The *Agrion* newsletter serves to promote the WDA's aim to advance public education and awareness of the study and conservation of Odonata and their natural habitats in all parts of the world. During the two-year 2021-23 period *Agrion* received many articles covering many parts of the world, most from Asia and Australasia and the occasional contribution from the Americas and Europe but none during this period from Africa.

In addition to communicating facts and knowledge related to the study and conservation of dragonflies it serves as a forum for news and information exchange between members. It also serves as a valuable resource of archive information by reporting on WDA's main activities.

Keith Wilson and Graham Reels served as *Agrion's* newsletter editors for the period 2021-23 and have now been *Agrion's* editors for a long period of 16 years. Both Graham and I have expressed a willingness to make way for a new editor or editorial team from 2023.

During 2023 Graham was appointed to take on editorial duties for *Notulae Odonatologicae* and following his new appointment has given notice that he intends to retire from the WDA *Agrion* Newsletter editorial team following the publication of the July 2023 *Agrion* issue.

Graham is a meticulous editor and has always completed his review and edits to *Agrion* articles promptly and to a very high standard. His invaluable contributions over many years have been much appreciated by myself and my many thanks to Graham are echoed here by the 2021-23 WDA Board.
If anyone is interested in taking on the editorial and compilation duties of producing the *Agrion* Newsletter please feel free to contact the WDA Secretary or myself directly [kdpwilson@gmail.com].

Keith Wilson, United Kingdom

Report from the International Symposia Committee

ICO2023: We are looking forward to meeting soon, from 25th to 30th June 2023 during the ICO2023 in Paphos, Cyprus. Originally Paphos was supposed to be the venue of the ICO2021. Unfortunately, the conference had to be postponed due to the Corona Pandemic, first to later in 2021 and with ongoing problems in Europe it was decided to postpone it to 2023. We thank David and Rosalyn Sparrow and the whole Cyprus Dragonfly Study Group for their flexibility and their willingness to postpone and reorganise several times.

ICO2021: In 2021 a virtual WDA event & Biennial General Meeting was held on 15th July to bridge the long gap between the ECO2019 in Austin, Texas and ECO2023 in Paphos. The program of the virtual ICO2021 included six plenary talks about work being done around the world. The plenary speakers represented North America, Africa, Australasia, Asia and also two speakers gave globally focused presentations; one from the IUCN Dragonfly Specialist Group Co-chairs and one from the GEODE Project. Following the plenary presentations there was a screening of Georg Rüppell and Dagmar Hilfert-Rüppells' film: My Dragon River. During the event there were two breakout sessions where members could link up and socialize on various odonatological topics of interest to them and talk directly to other members in the chat session.

In my perception the virtual meeting was clearly a success being attended by a surprisingly high number of persons. And still being a fan of personal meeting during conferences I could imagine that the format of a virtual ICO may be something we could possibly organise as well as another opportunity to meet in between the live ICOs

The future: Some more future venues for ICO have been proposed and a schedule has been further developed. The ICO2025 will be held in Boyacá, Colombia. Organiser will be Melissa Sanchez Herrera. Details of the ICO2025 will be announced during the meeting in Paphos. Proposed venues for the further future are Brazil in 2027, by Rhainer Guillermo Ferreira, and in 2029 in New Zealand, by Milen Marinov.

Frank Suhling, Germany, Congress Coordinator

Report from the Webmasters and Social Committee

Despite the social media team being shorthanded during this period due to conflicting work schedules, we have seen gradual but steady increases in our followership on the different social media platforms. On Facebook, we are currently at ~2200 followers (up 587 since our last evaluation in 2021), on Twitter ~700 followers (up 213 since our last evaluation in 2021), and on Instagram which is our newest platform -over 300 followers since its inception in March 2021. One of our main goals is working on converting these numbers into WDA memberships.

Overall, we're in desperate need of more hands and if anyone would like to join the team, please contact the WDA secretary or Rhema Uche-Dike [rhemadike@gmail.com] directly.

Rhema Uche-Dike, American Museum of Natural History, USA

Report from Acting Webmaster

Membership on the website has increased since we took over from Taylor & Francis, which had dropped to below 100. We are now up to153 members.

William Kuhn has stepped down from webmaster and Kendra Abbott has been helping to maintain the website until a new webmaster is in place. Cyprus ICO and the IJO are hosted on the website, which has been successful.

Kendra Abbott, Alabama, USA

Report from the Treasurer

In November 2010 the European symposium deposited a fund of €7,980 with the WDA for safe keeping. They were originally in a WDA Euro account but when this was closed due to administration costs, the funds were transferred to the main WDA Lloyds bank account. Since moving to the QuickBooks accounting system, they have been accounted for by the provision of a Restricted EUR Funds account so that they are not included in the main WDA Accounts. In September 2016 €2,300 was drawn down to assist the Swedish ECOO leaving a remainder of €5,680. This balance was transferred to Sonia Fernandes in March 2022 so that the European symposium can administer their own funds independently

As interest rates have improved for deposits, two new WDA Lloyds Bank accounts have been set-up to earn interest to try and offset the increase in bank charges due to currency payments required to the IJO self-publishing service suppliers. One is instant access and the other requires notice (but is also instant access with the loss of any interest).

We still experience some attempts at testing stolen credit card information criminal have gleaned from elsewhere on the internet. Since the end of 2020 when this first happened, no further attempts have been successful, but our Credit Card processing system is extremely vigilant and may refuse Credit Card payments for our legitimate users. If you do experience card processing issues, please contact the Treasurer.

The WDA QuickBooks accounting system contains all historical financial transactions dating back to January 2015 and current transactions have been entered and reconciled against the relevant bank accounts until the 1st June 2023. There are still checks and balances to perform to ensure that all receipts and expenditure are accounted for in the correct category and class.

As the WDA provides the initial funding and administers some of the ICO financial transactions, income usually exceeds the Charity Commission auditing threshold during ICO years. The delegate fee income is healthy, but of course this is offset by the considerable expenses.

We currently have an cash balance of £54,478 which excluding contingent liabilities, leaves an available balance of £46,858. We made a loss at the end 2022 of £4,418 but this includes the initial funding for ICO2023 of £1323 (€1500) and the difference between membership subscription income and the cost of self-publishing the IJO, of approximately £2,500.

This situation was anticipated but the good news is that membership numbers are rising and so the losses will reduce. Our available funds allow us to continue offering grants and self-publishing the IJO, for the immediate future, but we do need to attract new members and of course retain existing members.

The accounts during the first half of an ICO year do not show the true picture until the ICO has completed and the books balanced, so we expect this to take place very soon.

Peter Brown, United Kingdom

Report from the chair of Conservation and Funding
During the first year when the world was still in the pandemic, nothing was happening considering grants. However, during 2022 and 2023 there have been applications for the Philip Corbet Grant and grants for attending ICO in Cyprus that are being taken care of [at the time of compiling this report in mid-June 2023].

The Richard Rowe Grant for assistance to attend ICO2023 in Cyprus
This year grants were pooled from WDA, DSA and GdO. This resulted in the ability to collectively assist four participants to attend the congress, namely:

Daniela Ayala Sánchez, Instituto de Ecología A.C de México, Mexico (originally from Colombia). "Taxonomy and phylogeny of the genus Euthore Selys 1869"

Daniel Schönberger, Lund University, Lund, Sweden (originally from Germany). "Metabolic allometry in Odonata"

Ojonugwa Ekpah, University of Lagos, Nigeria. "Status and distribution of Nigerian Odonata from confirmed county-level data for two decades"

Diagal Wisnu Pumungkas, Indonesia Dragonfly Society, Indonesia. "Distribution records of Javan endemic Odonata with notes on habitat characteristics for Heliogomphus drescheri & Rhinocypha heterostigma"

Philip Corbet Grant
The successful applicants will be notified soon regarding their applications for grants to attend ICO 2023 in Cyprus.

Göran Sahlén, Sweden

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The 2023-2025 WDA Board of Trustees

President: Kendra Abbott, University of Alabama, Department of Biology & Communication and Information Science.

President-elect: Melissa Sanchez, University of Alabama, Museum Research and Collections.

Immediate Past President: Yoshitaka Tsubaki, Kyoto University, Japan.

Secretary/Treasurer: Peter Brown, email: [wda.secretary at gmail.com].

Managing Editor, *International Journal of Odonatology*: John Abbott, Museum Research and Collections, University of Alabama, Tuscaloosa, Alabama, USA, email: [jabbott1 at ua.edu].

Congress Coordinator: David Sparrow, email: [davidrospfo at hotmail.com].

Editor, Agrion Newsletter: Keith D.P. Wilson, Brighton, UK, email: [kdpwilson at gmail.com].

Trustee: Christopher Beatty, Cornell University, Ithaca, New York, USA.

Trustee: Kehinde Kemabonta, Department of Zoology, University of Lagos, Lagos, Nigeria.

Grant Coordinator: Vacant.

Social Media Coordinator: Rhema Uche-Dike, American Museum of Natural History.

Social Media Team: Kendra Abbott – interim webmaster & Ethan Tolman, American Museum of Natural History, twitter: @EthanTolman.

Unusual oviposition site selection observed for *Tetrathemis platyptera* Selys, 1878

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On 30th April 2023 ca.1310 hrs I observed a yellow and black dragonfly flying around the ceiling of a living room guesthouse at Kuala Tahan at the edge of the Tembeling River (Malay: Sungei Tembeling), Pahang, Peninsular Malaysia (Fig. 1A). The dragonfly could have flown in from an entrance door facing the garden and road, which was open at that time. Subsequently, it commenced ovipositing behaviour, with the abdomen tip repeatedly touching the vertical drive shaft of the white ceiling fan. Upon closer observation with a zoom camera, it was indeed ovipositing and yellowish-orange eggs were seen attached to the fan's drive pole (Figs 1B-E). The action was videoed and the oviposition images provided here are video screen captures. After one or two minutes, the dragonfly disappeared from the room. The dragonfly was identified as *Tetrathemis platyptera* Selys, 1878.

Tetrathemis species are usually found in small pools and slow streams in shaded swampy forest. Females are known to oviposit by adhering eggs to tips of small branches and roots overhanging water (McCrae & Corbet, 1982; Kiran & Kakkassery 2007; Wilson 2008; Walker & Theischinger 2021). The observed female could have flown in from a secondary forest between the river and guesthouse. Moreover, the location of Kuala Tahan is across the river bordering the Taman Negara National Park from where the dragonfly could possibly have dispersed in search of suitable oviposition sites.

Overall, this is an interesting observation of an unintentional ecological trap in a village near to Taman Negara National Park. The shiny tiled floor surface, in the guesthouse living room, was probably mistaken by the female *Tetrathemis* for a shaded forest pool—its normal choice of oviposition site.

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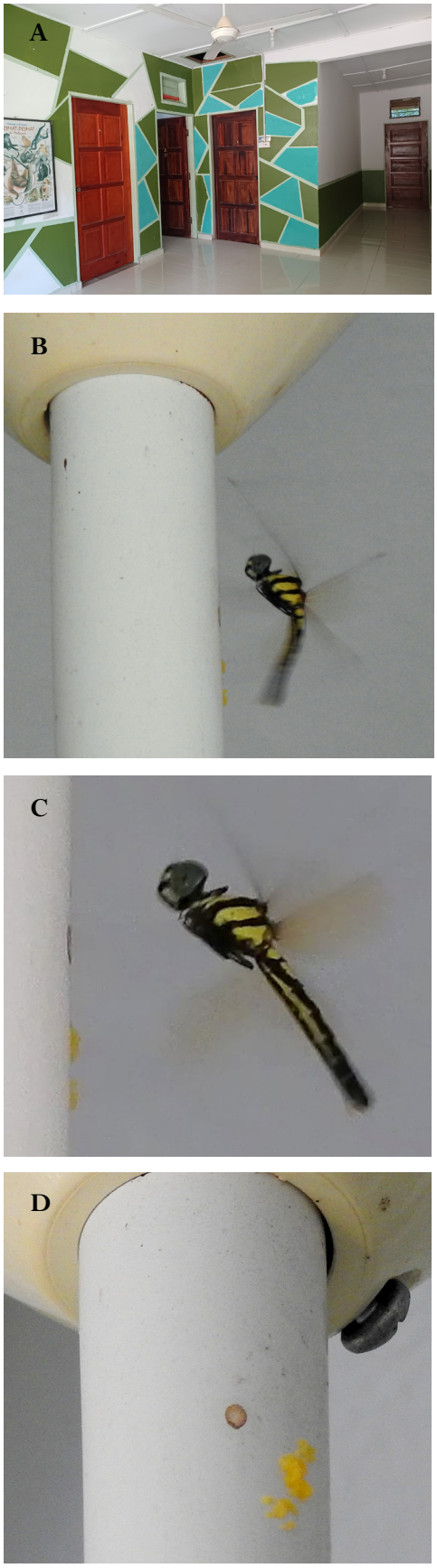

Figure 1. (A) Living room of a Kuala Tahan guesthouse at the edge of the Tembeling River (Malay: Sungai Tembeling), Pahang, Peninsular Malaysia with a ceiling fan located in the middle of the room. Photo credit Miss Liew Yoke Kheng. (B-C) *Tetrathemis platyptera* female ovipositing on drive shaft pole of ceiling fan. (D) Egg mass deposited on ceiling fan drive pole. Image credits (B-D): Liew Yoke Kheng.

ICO 2023
25 – 30 June, 2023
Neapolis University, Paphos, Cyprus

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Originally planned as ICO 2021 but postponed due to COVID travel restrictions, ICO 2023 finally got underway on 25th June 2023, with a welcome cocktail reception. The event was based at Neapolis University which is in the heart of the tourist district of Kato Paphos. Accommodation was available on-site for most delegates but some were housed in the nearby Paphos Gardens Hotel. A total of 85 delegates from 23 countries attended the event, which featured presentations on five main themes: Dragonflies on islands (6 papers), Biogeography (8 papers), Conservation (13 papers), Phylogenetics, Systematics and Taxonomy (9 papers) and Climate change (8 papers). There was then a broader theme of Ecology and Ethology with 5 papers.

A highlight of the group photoshoot on the Tuesday lunchtime was a fly-past by two *Pantala flavescens* (Wandering Glider) individuals, the dragonfly that features on the WDA logo. Although common throughout the tropics and North America, this species is very scarce in the Palearctic (but quite common on Cyprus) and was a new sighting for many of the European delegates.

For the mid-congress field trip, we used four coaches which visited the Ezousa valley and then travelled up the Diarizos valley, arriving a little way from the source of the river at the Kelefos bridge. A late lunch was then taken in the cool at the Psilo Dendro ("Tall Tree") Trout Farm Restaurant at 1300 m asl, where the endemic Cyprus Jay obligingly put in an appearance. We were surprised by how popular the post-congress field trip turned out to be, with 34 delegates signing up to attend on at least one or two of the days and 24 attending the full three days. These numbers exclude the eight "guides" from the organising committee. This resulted in a need for two minibuses.

There are 37 species on the island's checklist, although three are thought to be no longer present and a further three are extremely rare. Two further species are not normally seen on the wing at this time of year, so 29 species is the maximum number which could potentially be seen on the field trips. In fact, the dragonflies and damselflies were extremely cooperative on the congress field trips and not at all shy, with a total of 27 species being recorded. The missing two (as far as we are aware) were *Erythromma viridulum* (Small Red-eye) and *Anax imperator* (Blue Emperor). Despite having only a small number of species, Cyprus nonetheless has some highly charismatic ones. In addition to *E. fatime*, *Caliaeschna microstigma* (Eastern Spectre) was observed in the Diarizos Valley, where it calmly perched whilst being photographed. *Anax immaculifrons*, the justly named Magnificent Emperor and Europe's largest dragonfly, is on everyone's wish list and finding it is a daunting task for the organisers. However, the park at Lemba has been known to be a reliable site for this species, and we were not disappointed with a male observed making frequent patrols, perching a number of times and going into copula and females observed ovipositing exophytically alone and unguarded and on another occasion alone with a male giving non-contact guarding. The island's specialty, *Ischnura intermedia* (Persian Bluetail) was found at a several locations, although normally in low numbers.

Perhaps one of the most important aspects of these congresses is the networking that takes place and Neapolis University was the ideal location for this. Nearby tavernas attracted lively groups in the evenings, and at the University, the outdoor dining area around the pool was a perfect setting for informal chats. The congress dinner, a highly relaxed affair, was held here with tables rearranged to promote interactions, and the modest cost of wine and beer on Cyprus allowed for a free flow without the prospect of breaking the ICO 2023 budget!

Forthcoming events are ECOO 2024, which will held in Seville, Spain in early July. ICO 2025 will be held in Colombia in the charming colonial town of Villa de Leyva, located a three-hour drive from the capital city of Bogota. We hope to see you all at those events.

A domineering dragonfly? – Notes on *Anax imperator* Leach, 1815 from 19th century England and considerations on the etymology of its name

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Abstract

Evidence is presented to support the hypothesis that William Elford Leach's (1815) genus and species names (both referring to a sovereign or a commander) for the dragonfly species *Anax imperator*, discovered in England, were based on the impressive size of this large and robust species. The alternative view, suggesting that the dominant, aggressive territorial behaviour of *Anax imperator* male inspired the names, is ruled out by the fact that Leach almost certainly never saw this species in the field. William Kirby's early observations on the aggressive and voracious behaviour of this species are reproduced. Details of the early taxonomy and nomenclature of *A. imperator* are presented, and the growth of the knowledge of this species in Britain and continental Europe is briefly discussed.

Introdution

Anax imperator Leach, 1815 – the Emperor Dragonfly or Blue Emperor – is one of the few odonate species originally named from specimens collected in Britain. The life history and behaviour of this conspicuous species are well studied. In the 1950s, working in England, Philip S. Corbet contributed much to the knowledge of the biology of this species. Interestingly, the first note on the behaviour of this species was published in the same year (1815) that the species was named, but by a different author. Since the early observations on the behaviour of *A. imperator* are little known, they are reproduced here. This also provides an opportunity to analyse why William Elford Leach chose the binomial *Anax imperator* for this species, both names referring to a sovereign, emperor or commander. The fact that the species name *imperator* came into common use only in the beginning of the 20th century is discussed.

William Kirby's observations on a tireless, aggressive and voracious dragonfly

The first volume of the seminal *An introduction to entomology*, by William Kirby and William Spence, includes a brief account on dragonflies, written by Kirby. The relevant text in the 'letter' titled 'Indirect benefits derived from insects' (Kirby & Spence 1815, pp. 268-269) reads:

"When they [= species of *Libellulidae*, meaning all Odonata] assume the imago state, their habits do not, like those of the white ants, become more mild and gentle, but on the contrary are more sanguinary and rapacious than ever; so that the name given to them in England, 'Dragon-flies,' seems much more applicable than 'Demoiselles,' by which the French distinguish them. Their motions it is true are light and airy; their dress is silky, brilliant and variegated, and trimmed with the finest lace:—so far the resemblance holds but their purpose, except at the time of love, is always destruction, in which surely they have no resemblance to the ladies. I have been much amused by observing the proceedings of a species not uncommon here, which however is nondescript. It keeps wheeling round and round, and backwards and forwards, over a considerable portion of the pool it frequents. If one of the same species comes in its way, a battle ensues; if other species of *Libellulidae* presume to approach, it drives them away, and it is continually engaged in catching Phryganeae[1] and other insects (for the species of this tribe all catch their prey when on the wing, and their large eyes seem given them to enable them the more readily to do this,) that fly over the water, pulling off their wings with great adroitness and devouring in an instant the contents of the body. From the number of insects of this tribe which are every where to be observed, we may conjecture how useful they must be in preventing too great a multiplication of the other species of the class to which they belong."

Further information on the behaviour of this 'nondescript dragonfly species' was given in 'Motions of insects', published in the second volume of the book (Kirby & Spence 1818, p. 355-356). Kirby wrote: "Indeed, such is the power of the long wings by which the dragon-flies are distinguished, particularly in *Aeshna* and *Libellula*, and such the force of the muscles that move them, that they seem never to be wearied with flying. I have observed one of the former genus sailing for hours over a piece of water—sometimes to and fro, and sometimes wheeling from side to side; and all the while chasing, capturing, and devouring the various insects that came athwart its course, or driving away its competitors—without ever seeming tired, or inclined to alight."

In the fourth (revised) edition of Volume 1 (Kirby & Spence 1822, p. 273) and in the third (revised) edition of Volume 2 (Kirby & Spence 1823, p. 355), Kirby was able to inform that the undescribed species

1 Caddisflies of the family Phryganeidae.

he had observed had been named as *Anax imperator*. The relevant changes in the texts read: "I have been much amused by observing the proceedings of a species not uncommon here, *Anax Imperator* of Dr. Leach" and "I have observed one of the former genus (*Anax Imperator*, Leach) sailing…"

The Reverend William Kirby (1759-1850), Rector of Barham (Fig. 1), had most likely made his observations in the surroundings of his home village Barham in Suffolk, where he lived all his life. His entomological interests started in the early 1790s. Thus, his observations on *Anax* have taken place after that date.

Figure 1. William Kirby (1759-1850) as a young man.

Why did William Elford Leach call a dragonfly an emperor?

William Elford Leach (1791-1836) presented a classification of the British insects in the 'Entomology' chapter published in the 9th volume of The Edinburgh Encyclopaedia (Leach 1815). The 'Tribe Libellulides' (representing the present order Odonata) was divided into three families: Libellulida, Aeshnides and Agrionida. In the family Aeshnides, four genera were recognized: *Cordulegaster*, *Gomphus*, *Aeshna* and *Anax*. *Aeshna* was J.C. Fabricius' name from the year 1775, but the others were new names devised by Leach. The definitions of the genera were very brief. Only one difference was given to separate the genus *Anax* from *Aeshna* (Fig. 2). In *Anax*, the hind wing of male was stated not to be angulated at its anal edge (resembling that in the female), whereas in *Aeshna* male the hind wing was stated to be angulated. One species – *Imperator* – was listed in the genus *Anax*, but no description was given. The species was stated to "inhabit England", but no details were given.

The genus name is based on the masculine Greek word ἄναξ [anax], which means 'lord of the manor' or 'supreme commander'. The Latin species epithet *imperator*, also a masculine noun in apposition, means 'ruler', 'sovereign' or 'military commander'. In ancient Rome it was the title of the emperors. So, the Latin *imperator* has practically the same meaning as the Greek *Anax* making the name a tautology, presumably to stress properties of power and/or grandeur perceived by the author.

In books and other publications on dragonflies, various authors have debated the reason for Leach choosing these two names reflecting majesty and power. Two different reasons have been suggested as his inspiration: either the large size and robust habitus of *Anax imperator*, or its dominant and aggressive territorial behaviour.

A behavioural basis for the name would be plausible only if Leach had personally observed these dragonflies in nature, or if he had heard of the species' aggressive behaviour from an acquaintance or colleague. Unfortunately, there is no evidence which would prove that he had seen *Anax imperator* in the field. On the other hand, Leach's simple statement – "Inhabits England" – suggests that he had not collected specimens of this species. Had he collected specimens and

483. ÆSHNA. GENUS CCCCLXXXIII. ÆSHNA. Fabricius.
LIBELLULA. Linn. Donovan.
Hinder wings of the male angulated at their anal edge.
Abdomen cylindric in both sexes, not clavate.
Grandis. *Sp.* 1. *Grandis.*
Libellula grandis. Linn. Donovan.
Æshna grandis. Fabricius.
Inhabits Europe.
Obs. There are several European species, which have been confounded with *Æshna grandis.*
484. ANAX. GENUS CCCCLXXXIV. ANAX. Leach's MSS.
Hinder wings of the male not angulated at their anal edge, but resembling those of the female. Abdomen cylindric in both sexes; not clavate.
Imperator. *Sp.* 1. *Imperator.*
Inhabits England.

Figure 2. Definitions of the genera *Aeshna* and *Anax* from Leach (1815, p. 137).

observed their territorial behaviour, we might expect that he would have given a more precise locality (ies), just as he did for *Libellula cancellata* [= *Orthetrum cancellatum*], *Cordulegaster annulatus* [= *C. boltonii*] and *Gomphus vulgatissimus* (see Leach 1815, p. 136-137).

In his book, *The entomologist's useful compendium*, George Samouelle (1819, p. 259) gave more specific information on the occurrence of the species: "*Anax Imperator.* Inhabits England in the New Forest of Hampshire".

Unfortunately, the type specimens (at least one specimen of both sexes) of *Anax imperator*, studied by Leach, have long been lost. Therefore, it is not possible to find out whether the attached labels gave any information on the origin and collector of the material. However, there is good reason to believe that the type specimens came from the New Forest in Hampshire. It is also possible that George Samouelle (c. 1790-1846) had collected these specimens. He was an assiduous collector, known to have been active in the New Forest, as evidenced by several notes in his books (Samouelle 1819; 1833-1834).

There is no indication that Leach ever visited the New Forest. Samouelle's (1819) book was dedicated to Leach, his close friend, as an expression of gratitude for the great help and contributions which Leach had provided to the author. The book followed Leach's classification of the British insects, and part of the information was based on Leach's manuscripts. Samouelle (1819; 1833-1834) refers to the observations made by several other entomologists in the New Forest, but Leach was not among them. Neither do Leach's own entomological publications include any records from the New Forest, nor is this location mentioned in the detailed biography of Leach by Harrison & Smith (2008).

It therefore seems unlikely that Leach himself had ever seen *Anax* in the field and so could not have observed its behaviour. It can also, quite reliably, be ruled out that Leach learned of this species' behaviour from George Samouelle or William Kirby. Had Samouelle observed something special in the behaviour of *Anax imperator* in the New Forest, he would surely have mentioned it in his book; for example (1819, p. 257-258) he wrote on the feeding behaviour of *Aeshna grandis* ("Inhabits the fields near London; Hackney and Plaistow Marshes: but is difficult to catch unless in windy weather, when it may be found on the water plants growing in ditches. It may also be taken at the dusk of fine evenings in the months of June and July, flying in pursuit of various insects which appear only at these times.") and *Libellula depressa* ("Inhabits gardens and woods, flying over them in pursuit of insects.") Instead, in the *Anax imperator* account (p. 259), Samouelle presents advice on how to preserve the bright colours of this species and other anisopteran dragonflies: "It is necessary to inform the young entomologist, that the insects of the first and second stirpes[2] of this family require, whilst in the recent state, that the contents of the abdomen should be extracted, and filled with either a piece of paper or cotton, rolled up as near as possible to the natural size of the body, as without this precaution the insects will lose their colour and turn entirely black. For further directions see Instructions for Killing and Preserving."

It is also unlikely that Leach learned of the behaviour of *Anax imperator* from William Kirby; although Leach and Kirby were in correspondence and discussed naming and distinguishing insects at the time when Leach prepared his 'Entomology' chapter (Freeman 1852, p. 256). As noted above, Kirby was unaware of the name *Anax imperator* in the second volume of his 'Introduction to entomology', published in 1817. In fact, Kirby may have learned of the name *Anax imperator* only from Samouelle's (1819) book, since Kirby & Spence (1826: 573-589) did not include the Edinburgh Encyclopaedia and its Entomology chapter among the publications cited.

Presumably, Leach used the binomial name *Anax imperator* to convey the impressive size of this large robust species, and perhaps its spectacular coloration (depending on the state of preservation of its colours), both of which make it stand out among the other British dragonfly species. Recently, Hämäläinen & Fliedner (2023) argued convincingly that Leach's genus name *Lestes* [Greek, meaning pirate or robber] referred to the well-developed cercal armature rather than the predatory behaviour of these damselflies. Similarly, a morphological character is also the basis of the other five genus names given by Leach: *Calopteryx* [originally *Calepteryx*], *Cordulegaster*, *Cordulia*, *Gomphus* and *Petalura*.

Anax formosus (Vander Linden, 1820) versus *Anax imperator* Leach, 1815

Leach's (1815) publication, as well as Samouelle's (1819) book, which followed Leach's classification and nomenclature, remained unknown to the few entomologists working on the odonates in continental Europe at that time. Leach's new genus names were finally recognised outside Britain in the 1840's, when Edmond de Selys Longchamps used them in his book *Monographie des Libellulidées d'Europe* (Selys Longchamps 1840). Hermann A. Hagen also used these names in his synonymic catalogue of the European odonates (Hagen 1840).

Meanwhile, in the 1820s, two authors independently described what we now accept as *A. imperator*, as two separate new species, *formosa* and *azurea*. Pièrre Léonard Vander Linden's description (of both

2 Referring to all anisopteran genera.

sexes) of *Aeshna formosa* from Italy (Vander Linden 1820) included an illustration of the male (Fig. 3A). In 1825, Toussaint de Charpentier described *Aeschna azurea* based on a male specimen from Hungary. His description included an illustration of the male anal appendages (Charpentier 1825, p. 31; plate 1, fig. 1). Obviously, neither Vander Linden, nor Charpentier were aware of Leach's definition of the genus *Anax*. Even if they had been, they would not have been able to judge whether or not their species was the same as *imperator,* since that species was not described or illustrated (Fig. 2).

Subsequently, a coloured illustration (Fig. 3B) of *Aeshna formosa* male from France was published by Fonscolombe (1838), and Charpentier (1840, pls 17 and 45) published fine illustrations of both sexes of *Aeschna azurea* (Figs 3C and 3D). Charpentier (1840, p. 99) listed the earlier *Aeschna formosa* as a synonym of his own junior name (!). At that time rules regulating nomenclature had not yet been established, and many authors egotistically preferred to use their own taxon names.

Both of the species epithets *formosa* and *azurea* refer to the colourful appearance of the species. The Latin adjective *formosus* means 'beautiful' and the Latin adjective *azureus* means 'sky-blue'.

The Englishman James Francis Stephens (1792-1852) was the first author to recognize *Aeshna formosa* as an *Anax* species. Stephens (1833, p. 114) listed *Anax imperator* and *Aeschna azurea* as synonyms of *Anax formosa*. Obviously, Stephens considered the oldest name *imperator* as a *nomen nudum*. Later, in his voluminous book series, *Illustrations of British entomology,* Stephens (1835-1837 [1836], p. 81-82) provided an English description of both sexes of *Anax formosa* and gave the following information on its occurrence in Britain: "Not uncommon, in June and July, in several parts of the country, especially in the New Forest; also taken on Wandsworth and Wimbledon commons, near Hertford and Epping; likewise occasionally at Arno's Grove, near Southgate." The use of the name *Anax formosa* [correctly emended to *Anax formosus* by Rambur (1842)], with *Anax imperator* and *Aeschna azurea* as its synonyms became firmly established in the major works on the European odonates by Selys Longchamps (1840, p. 117), Hagen (1840, p. 59-60) and Selys Longchamps & Hagen (1850: 110). After that the name *Anax formosus* (Vander Linden) was used for this species, obviously without any exception, in all publications both in Britain and continental Europe until 1890.

The reinstatement of the name *Anax imperator*

In his synonymic catalogue of the world dragonflies, William Forsell Kirby (1844-1912), reinstated the rejected name *Anax imperator* Leach, 1815 and ranked *A. formosus* as its junior synonym (Kirby 1890, p. 84-85).

However, even in the English entomological literature the resurrected name *imperator* did not take hold immediately. For instance, Lucas (1897) and McLachlan (1898) still used the name *A. formosus*. The name *Anax imperator* first reappeared in some notes, such as Walker (1897), published in 'The Entomologist' (a journal which Kirby 'assisted') in 1897-1898. In his ground-breaking book, *British dragonflies (Odonata)*, William John Lucas (1900, p. 163-170, pl. XII; see Fig. 3E) used the name *Anax imperator*. Lucas also reproduced Leach's and Samouelle's texts on *Anax*, and wrote on the status of the specific epithet *imperator* as follows: "Although we have here no actual description of the species, yet the diagnosis of the genus, of which there is but the one British species, seems to quite justify Kirby in adopting in his catalogue the specific name *imperator*, as prior to Vander Linden's name *formosus,* assigned to it in 1823 [sic]." In his catalogue, Kirby (1890) had not provided any explanation for his action, nor did he argue for any of the numerous other changes he made in the odonate classification and nomenclature in the same publication.

In Kirby's time, zoologists applied the 'law of priority' principle defined in the revised version of the 'Strickland Rules', proposed by the British Association for the Advancement of Science in 1865 [Link]. Kirby's action agrees also with the Article 12.2.6 of the present International Code of Zoological Nomenclature [Link], which rules that a combined description of a new genus and a single new nominal species, published before 1931, makes both names available.

Lucas's (1900) book firmly established the use of the binomial name *Anax imperator* in Britain. In continental Europe, the species name *imperator* was a little slower to gain acceptance. In a major book on the Central European dragonflies, Tümpel (1901, p. 47) continued to use the name *Anax formosus*, as did also Martin (1909, p. 9) in his monograph of the aeshnid species of the World. However, Dziedzielewick (1902) and Ris (1909), for instance, used the name *Anax imperato*r. Obviously, Ris' example increased the use of the new name in Germany and elsewhere in continental Europe, and during the 1910s the name *imperator* became established as the standard name.

Coincidentally, in the same year 1890, when Kirby synonymized Vander Linden's species name, another Englishman honoured Vander Linden with a new taxon name linked to the same aeshnid species. In his book, *An illustrated handbook of British dragonflies*, William Harcourt-Bath (1890, p. 57), named a new variety *Anax formosus* var. *Lindeni*. The new variety was characterized as follows: "*Lindeni* (mihi), is an occasional variety of the female which possesses yellowish wings, the costal nervure being reddish."

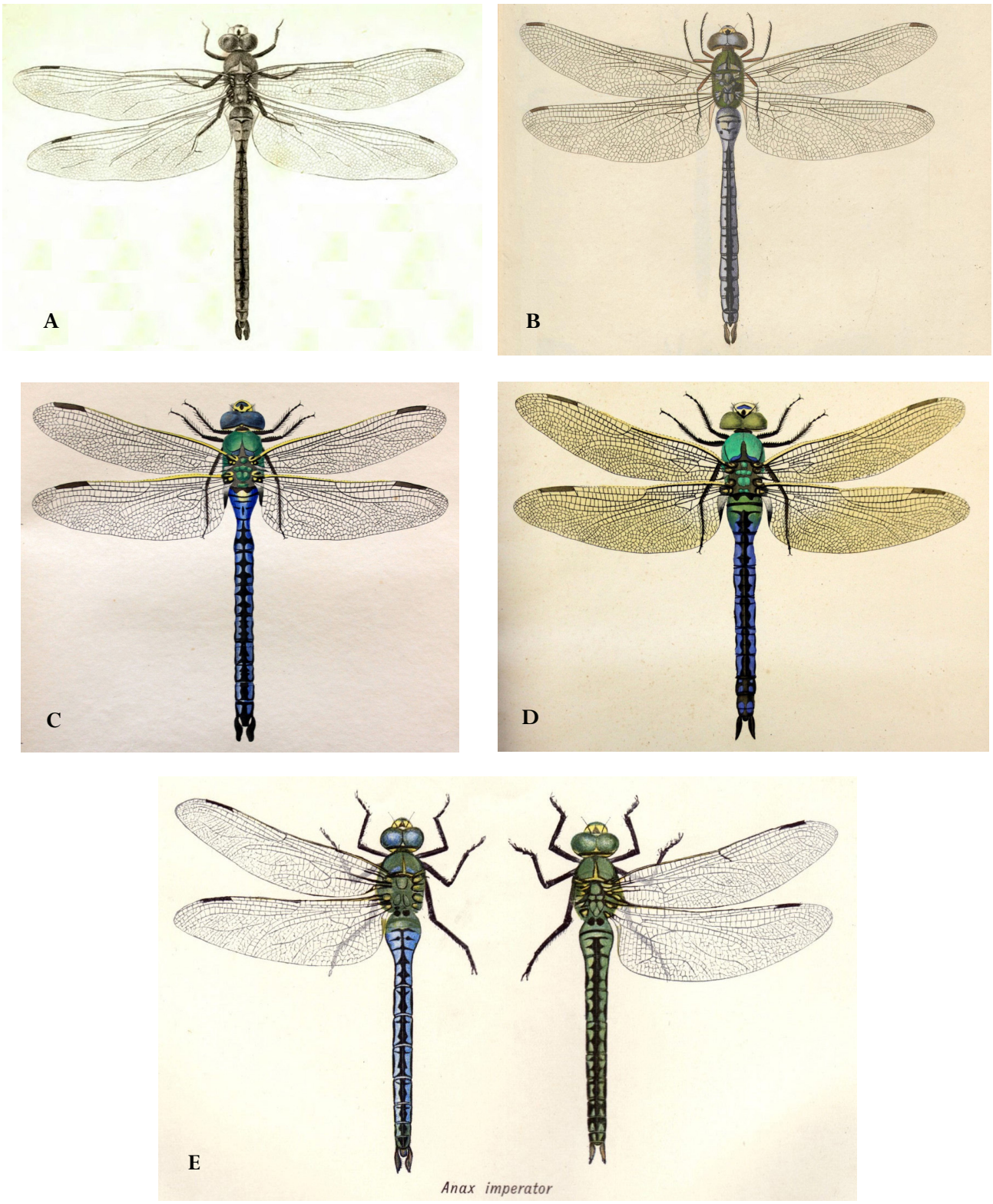

Figure 3. Old illustrations of *Anax imperator*. (A) '*Aeshna formosa*' male from Vander Linden (1820, plate 1, fig. 1). (B) '*Aeshna formosa*' male from Fonscolombe (1838, plate 3, fig. 1). (C) '*Aeschna azurea*' male from Charpentier (1840, plate 17). (D) '*Aeschna azurea*' female from Charpentier (1840, plate 45, fig. 1). (E) *Anax imperator* male and female from Lucas (1900, plate 12). [Illustrations are not in scale].

However, the value of this intended tribute was greatly diminished by the fact that in the same publication the author introduced no less than 21 new, totally meaningless infrasubspecific variety names, 14 of them named after various entomologists!

Lucas (1894) dubbed *Anax formosus* (= *imperator*) 'The imperial dragonfly'. It may have been the

first English common name proposed for this species. In her book, *The dragonflies of the British Isles*, Cynthia Longfield (1937) coined the name 'The Emperor Dragon-fly', which has remained in common use.

The expanding range of the Emperor Dragonfly

Anax imperator, a species which 200 years ago was only known to "inhabit England in the New Forest of Hampshire", has proven to be a widespread and common species distributed throughout most of Europe and southwestern parts of Asia, as well as throughout Africa.

In Britain, after its discovery, *A. imperator* was for a long time confined to the southern and southwestern parts of England, where it was a rather local species, although it could be "not uncommon" in its known sites, as William Kirby stated in 1815. In his dragonfly handbook, Harcourt-Bath (1890, p. 57) wrote: "It is exceedingly local in this country, only occurring in a few localities in the South, the following of which have been recorded, namely – the New Forest, Epping Forest, near Hertford, also Southgate, Wandsworth, and Wimbledon Commons, in the Metropolitan District." Lucas (1900, p. 170) listed records from just 15 localities from Surrey, Sussex, Hampshire, Middlesex, Essex, Kent, Cambridgeshire and Guernsey. Longfield (1937, p. 102) stated: "In the British Isles it is a southern England species, and not common there except in a few counties." A total of 18 counties with records were listed, the number of which was increased to 25 in Longfield (1949, p. 123).

The range of *A. imperator* in Britain, covering the lowland areas of southern England and the southern part of Wales, remained largely the same until the early 1990s. Since then the species has rapidly spread westwards and northwards. It has also become much more common in its former haunts. It was first recorded in Ireland in 2000 but now inhabits most of the island. It is now also firmly established in the northernmost counties of England. The first records in Scotland were made in 2003. Since 2018, it appears to have established there in several locations. According to a recent report of the British Dragonfly Society (Taylor & al., 2021), among the resident British dragonflies, *A. imperator* has had by far the highest increase in area occupancy during the last 50 years.

A. imperator has also invaded northwards into the Baltic states and Scandinavia. In Estonia it has now reached the Gulf of Finland in the north. It was first found in Denmark in 1994, and now occurs throughout the country. In Sweden it was first recorded as recently as 2003, but now it is a common species in the southernmost part of the country, and its range has already passed the latitude of 60° N. Given our warming climate, one wonders how many decades it will take for the powerful "Imperial Dragonfly" to conquer the Arctic Circle.

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Wing resting behaviour in Lestidae

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Introduction

The family Lestidae consists of approximately 150 damselfly species found worldwide. Unlike most other damselflies, most species of Lestidae hold their wings outspread at rest (Fig. 1A), lending them the nickname "spreadwings." However, not all genera adhere to the "spreadwings" moniker. Three notable exceptions to this trend are the genera *Sympecma*, *Indolestes* and *Austrolestes* which, unlike other Lestidae, hold their wings closed when at rest. Moreover, in contrast to most damselflies that hold their wings perpendicular to their body when at rest, these odonates exhibit a distinctive posture whereby their wings are held off their body to either the left or right side (Figs B-E). This intriguing deviation from the standard resting position of damselflies led to a small study in which we address the following questions: (1) are these indeed the only genera of Lestidae that hold their wings closed on one side of the body; (2) have they a preference for placing their wings either on the left or on the right side and (3) do the genera showing this behaviour form a monophyletic group?

Methods

As the main source of information on resting behaviour of Lestidae we used Observation.org. Observation.org is a website where people can upload and share their observations of plants and animals from around the world. We went through every image on Observation.org for Lestidae. If an image appeared to be a duplicate, i.e. there were multiple images of the exact same damselfly just from different angles, we counted that as one individual. No images of *Sinhalestes* were available on Observation.org for which reason we included data from the pictures of *Sinhalestes* provided in (Sumanapala & Bedjanic 2003).

Results

We were able to find data for 61 of the 152 species of Lestidae (Table 1). The genera *Archilestes*, *Lestes*, *Orolestes, Chacolestes, Sinhalestes,* and *Platylestes* always or nearly always have their wings open at rest (based on 6417 specimens from 45 species). There were some photos of *Archilestes*, *Chalcolestes* and *Lestes* with their wings closed at rest, but this made up only about 1.5 % of all individuals and might pertain mostly to individuals not completely at rest. The percentage of specimens having their wings closed is 100% in

Species	Wings open	Wings closed	Closed, left	Closed, right	Closed, unable to tell
Archilestes (8; 2)	31	2	0	0	2
Austrolestes (11; 9)	0	53	15	13	25
Chalcolestes (2; 2)	2571	12	0	0	12
Indolestes (34; 4)	0	36	5	6	25
Lestes (83; 37)	3630	158	19	43	96
Orolestes (5; 2)	10	0	0	0	0
Platylestes (4; 1)	1	0	0	0	0
Sinhalestes(1; 1)	2	0	0	0	0
Sympecma (4; 3)	23	1638	631	588	419

Table 1. Resting wing behaviour of Lestidae genera. Column 1 shows the genus name with in parentheses respectively the number of species currently recognised and the number of species for which we have data.

Figure 1. Typical "spreadwing" resting behaviour. (A) *Lestes nodalis*, Lang Son, Vietnam. Photo credit: Tom Kompier. (B) *Austrolestes cingulatus*, New South Wales, Australia. Photo credit: Hemme Batjes. (C) *Austrolestes colensonis*, Marlborough, New Zealand. Photo credit: James Bailey. (D) *Indolestes gracilis,* Nuwara Eliya, Sri Lanka. Photo credit: Ria Vogels. (E) *Sympecma fusca,* Haskovo, Bulgaria. Photo credit: Jan van Duinen.

Austrolestes (53 records of nine species), 100% in *Indolestes* (36 records of four species), and 98.8 % for *Sympecma* (1661 records of three species).

Of the 1727 individuals of *Austrolestes*, *Indolestes,* and *Sympecma* that appeared to be resting with wings closed, only 1258 could be identified holding their wings off to one particular side. Of these, 48.3% (607) were closing their wings to the left, while 51.7% (651) were closing their wings to the right. Each side appears to be at a probability of about 50/50 and is therefore random.

Phylogenies and Relationships of Lestidae

For the next part of our investigation, we wanted to see how closely related *Austrolestes*, *Indolestes*, and *Sympecma* are. Are they closely related, and therefore all share the same trait? Or are they more distant, and could have evolved this habit convergently?

Currently there is no phylogeny of Lestidae which includes all of the genera but three papers give some insight in how the different genera are related (Bybee et al 2021, Dijkstra et al 2013, and Simonsen et al 2022). These three phylogenies all indicate that *Sympecma*, *Indolestes*, and *Austrolestes* are not monophyletic, with *Sympecma* more distantly related. Rather surprisingly this suggests that the behaviour of folding the wings on one side of the abdomen evolved twice within Lestidae. A phylogeny with a wider taxon selection is needed to confirm if this indeed is true.

Conclusion

Our observations on the Lestidae family and their wing behaviour have answered our three main questions: (1) that the three genera *Sympecma*, *Indolestes*, and *Austrolestes* are indeed the only genera that hold their wings closed on one side of the body; (2) that they do not appear to have a preference for where they place their rested wings, placing them on either side of their body, and (3) that the currently available molecular phylogenies indicate that the genera with closed wings at rest do not form a monophyletic group. The next step for understanding this behaviour would be to test if individuals have a preference for keeping their wings left or right or that this is simply depending on environmental factors such as the position of the sun or the direction of the wind.

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List of Odonata recorded from Tempat Berkesinambungan Wildlife Santuary, Tanjung Kelayang Reserves, Belitung Island, Indonesia and distribution of two endemic species

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According to Paulson et al. (2023) there are 6405 extant Odonata species throughout the world. Indonesia is home to about 900 described species of Odonata representing some 14% of the world's odonate biodiversity (Lupiyaningdyah, 2020). Indonesia is the largest archipelago in the world and contains a multitude of small islands that have varied environments and high levels of biodiversity. One of the archipelago provinces that has unique biodiversity is Belitung Island, formerly known as Billiton Island.

Belitung is located at the northern extremity of the Java Sea, between Sumatra and Borneo. Much of the terrain of the island is relatively flat, but there are a number of hills, the highest of which is Gunung Tajam with an altitude of ca 460m a.s.l. There is a long history of tin mining on the island, which has had a significant impact on habitats for Odonata. The tin mining activities were first started by the Netherlands Government in 1823. A Belgian national captain named J.P. de la Motte, who served as a Resident Assistant and Chairman of the Royal Dutch Army, found tin on the island. After the Treaty of London in 1850, mining activities were taken over by Billiton Maatschapij, a tin mining company belonging to the Dutch Government. At that time Belitung was divided into six regions, namely: Tanjungpandan, Gantung/Lenggang, Badau, Sijuk, Buding and Belantu. Nowadays, tin mining is controlled by PT Timah Tbk, formerly known as PT. Timah Persero, and some ex-mining areas of the company are being re-mined for tin by locals. So, tin mining still exists today and these activities have deleterious impacts to local rivers and lakes. Pollution from mining causes a change in chemical composition of the water by adding harmful chemicals and materials that threaten the lives of water organisms and their habitats.

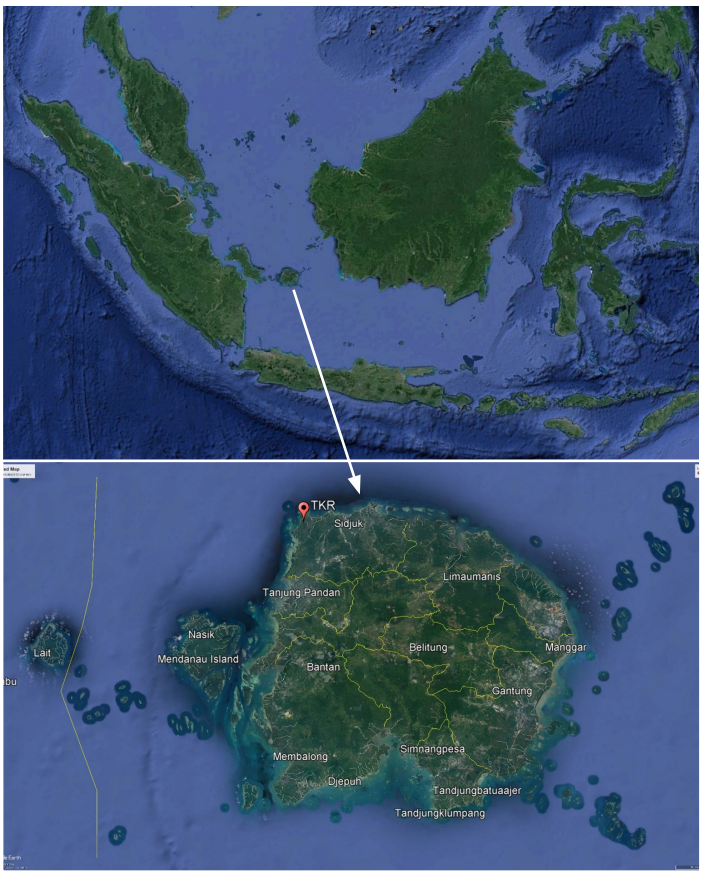

Figure 1. Belitung Island, Indonesia and the location of Tanjung Kelayang Reserves (TKR), in the northwest coastal region of Belitung. Credit: Google Earth.

In Sijuk in the northwest region of Belitung Island, there is the last primary forest frontier sanctuary for threatened species survival zone called Tanjung Kelayang Reserves (TKR). The TKR is a leading developer and regulator at Tanjung Kelayang Special Economic Zone and is working with nature to preserve it and help prevent deleterious climate-change related impacts to the area. TKR has dedicated almost half of its development area, nearly 200 ha, as a wildlife sanctuary and nature reserve, also called the Tempat Berkesinambungan zone. This sanctuary zone is important to maintain the survival of populations of all the highly threatened species of Belitung Island through a conservation, education, and ecotourism programme. Tempat Berkesinambungan also serves as a natural reservoir and catchment area for rainfall water through the peat swamp forest area. TKR is located in the Tanjung Pandan Granite Triassic area with UNESCO Global Geopark status which is dominated by the presence of granite in the coastal area and quartz sand inland. Weather conditions at TKR are generally of a maritime climate nature because it is located in the coastal area of the Tanjung Kelayang region; sharp changes in ecological properties in a

short time, and frequent temperature changes. TKR coastal area has the influence of seawater intrusion into groundwater especially during the long dry season, but impacts are limited by peat ecosystems. Seawater intrusion only occurs if the conditions of the coastal forest ecosystem are especially dry. As the last forest frontier of northwest region, the TKR role of preserving forest ecosystems and peat areas is very important to maintain groundwater stability, maintain the biophysical stability of the environment, and remain a home for important flora and fauna in the area.

Odonates are good indicators of aquatic and terrestrial healthiness (Heckman, 2006). Belitung Island has 92 species of Odonata recorded, based on the checklists and surveys by Asahina (1977), Dow (2010, 2011), Dow et al. (2007), Lieftinck (1935, 1937, 1939a, 1939b, 1940a, 1940b, 1942, 1948, 1950, 1954, 1960, 1965), Hämäläinen, Dow, & Stokvis (2015), Kosterin (2015), van Tol (1990) and Watson (1967). Since the 2017 exploration this total has risen to 103 (Alfarisyi 2017). Since then, Odonata exploration and monitoring is still active due to habitat loss by mining

Figure 2. Endemic zygopterans from Belitung Island. (A) *Mortonagrion appendiculatum* male. (B) *Mortonagrion appendiculatum* female. (C) *Amphicnemis kuiperi* male. (D) *Amphicnemis kuiperi* female (mature form). (E) *Amphicnemis kuiperi* female (immature form).

activities and deforestation. The important environments that support diverse odonate communities are mostly peatlands, primary forests, streams and rivers. Due to the tin ore interest on this island, most of the mining will be conducted on the peatlands, destroying the habitat. Moreover, with the tin ore price so high, more people are mining in the peatlands, marshes, lowland streams and rivers, blackwater valley and primary forest in search of the tin ore. More and more important habitat will be destroyed by mining activities, and more Odonata species will face habitat loss.

Several species of Odonata appear to be endemic to Belitung: *Amphicnemis billitonis* Lieftinck, 1940, *Amphicnemis kuiperi* Lieftinck, 1937 and *Mortonagrion appendiculatum* Lieftinck, 1937. Until recently our knowledge of the Odonata of Belitung was based almost entirely on collections made by F.J. Kuiper in the 1930s. M. A. Lieftinck identified most of Kuiper's specimens, the majority of which are now in the collections of the Naturalis Biodiversity Center (RMNH) in the Netherlands. In Tanjung Kelayang Reserves we found two of the endemic species, *Mortonagrion appenculatum* and *Amphicnemis kuiperi*, in three peat swamp forest locations. In total, we have counted about 18 individuals of *M. appendiculatum* and 32 individuals of *A. kuiperi* since September 2022 from the three locations in the peat swamp forest habitat. These two species are good bioindicators of microclimate change and freshwater pollution by heavy metals and non-organic alkaline compounds. These coenagrionid damselfly species are found in peat swamp forest areas with tall tree canopies and full shade areas. They are found in microhabitats such as small ponds or low forest streams in the blackwater habitat of peat swamp forests. In total the list of Odonata from Tanjung Kelayang Reserves is 48 species divided into 19 species of Zygoptera and 29 species of Anisoptera. In *M. appendiculatum*, the male has dark brown eye colour with a yellow face, the upper side of the eye has a curved blue spot, the primary body colour is black (brown when young) with blue-turquoise spots which are scattered on the thorax and at the segmentation of the abdomen, with segments 8-9 extensively blue. These blue abdominal markings are a main characteristic of the species. The female individual is black with blue spots (similar to the male individual) but without the extensive blue on segments 8-9. This damselfly depends on the forest humidity and likes shady habitats. It does not like habitats that are warm or exposed to direct sunlight. For this reason, this species is highly threatened by the clearing of forest land which is converted into mining, plantations, settlements and agriculture.

In *A. kuiperi*, the male has a dark-green eye, with black slender body, green metallic synthorax with bright yellow underneath, and clear wings. The female has two different colour forms depending on her age. The immature female has a dark red eye with green underside, bright red synthorax with clear wings and a black slender abdomen. When the female matures, the colour changes to dark blue eyes with bluish-green underside, dark green with bright blue underside of synthorax with clear wings and a black slender abdomen. Both of these individuals prefer to perch hanging on a branch or the tip of a leaf.

So far, *A. kuiperi's* known natural habitat is spread across the primary forest, hills, and peatlands with high humidity (Alfarisyi, 2019). We found the population is abundant on Belitung Island with a large foraging area. It seems to be tolerant to the land changes and may survive for years to come, seeking refuge in other high humidity, shady and peat-related habitats. For *M. appendiculatum*, by comparison, the natural habitat location is only in the villages of Air Seruk (Dow, Alfarisyi, & Bilitoni, 2017), Cerucuk (Dow, Alfarisyi, & Bilitoni, 2017), Batu Penyu, Mempiu (Alfarisyi, 2018), Selat Nasik (Alfarisyi, 2019), Petaling (Alfarisyi, 2019), and Kembiri. The habitat of Air Seruk and Cerucuk village is now destroyed by tin mining, and Mempiu village is threatened by land clearing for palm oil plantation. Encountering these endemic damselfly species in Tanjung Kelayang Reserves in Tanjung Binga village is so important for new distribution and chance for the species survival area.

In total area of occurrence, *A. kuiperi* is much more abundant and widespread in the peatland-related primary forest area, compared to *M. appendiculatum* which is stenotopic with a smaller flight area. These two endemic damselflies depend on the forest humidity and like shady habitats and do not like habitats that are warm or exposed to direct sunlight. For this reason, they are highly threatened by the clearing of forest land which is converted into mining, plantations, settlements and agriculture. For *M. appendiculatum* the IUCN Red List status has risen from Data Deficient to Endangered (Dow, 2019a) due to the high threat to its natural habitat, compared to *A. kuiperi* rising to the IUCN Red List status of Vulnerable (Dow, 2019b).

From its beginning, TKR embarked on a study to find innovative and sustainable adaptations to the water system in the TKR area so that it can better cope with both intense rainfall and extreme drought. We considered an aquifer that was found to have formed naturally in the area over time as rainwater accumulated within the reclaimed sand layers. Without making massive changes to the forest surface, TKR has built a retention reservoir above the aquifer to hold and release rainwater naturally to prevent flooding without massive upgrades to TKR drainage infrastructure. It is so important to maintain the peat swamp forest habitat, this is a nature-based solution zone that can avoid the environmental costs related to intensive construction. The forest has become a sanctuary that can perform other critical environmental functions – such as minimizing the evaporation of groundwater and promoting biodiversity. Additionally,

it can become a last frontier of aquatic habitats such as those for Odonata emergence. Table 1 lists all the odonate species found in Tanjung Kelayang Reserves.

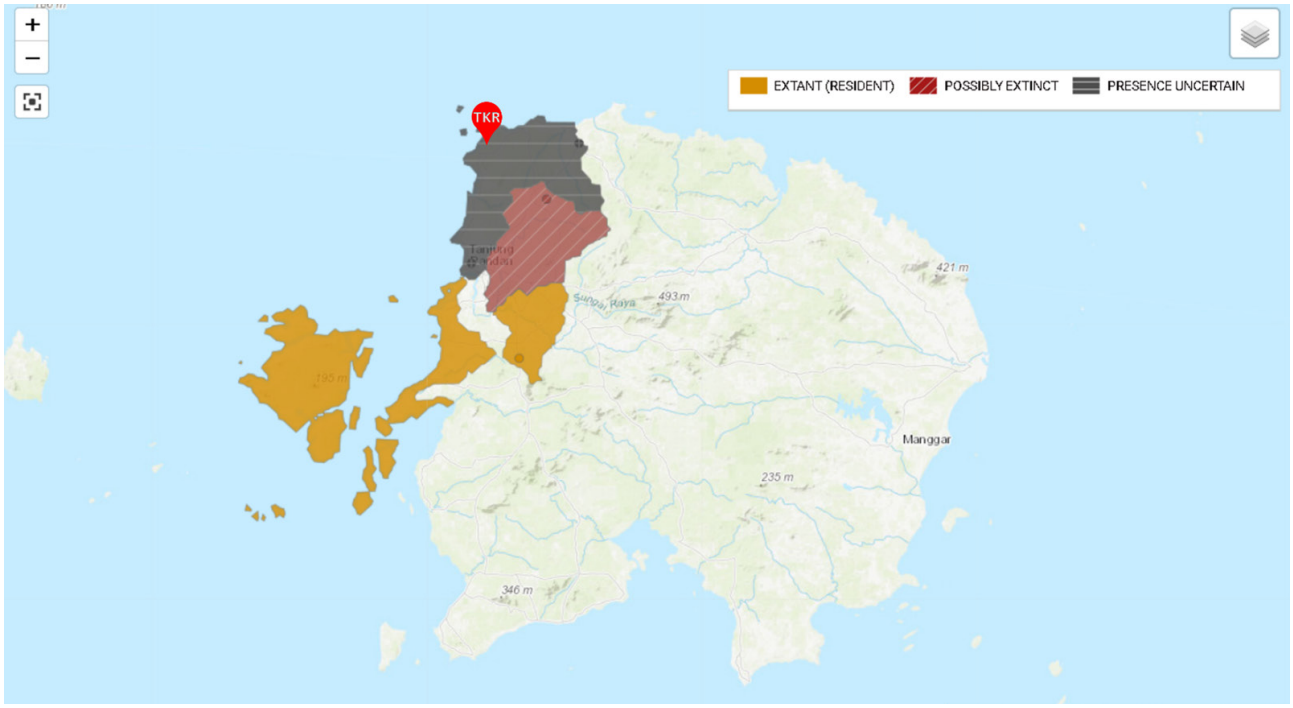

Figure 3. Geographical range of *Mortonagrion appendiculatum* endemic to Belitung. Adapted from R.A. Dow (2019: The IUCN Red List of Threatened Species. Version 2022-2) with new distribution from Tanjung Kelayang Reserves (TKR) added.

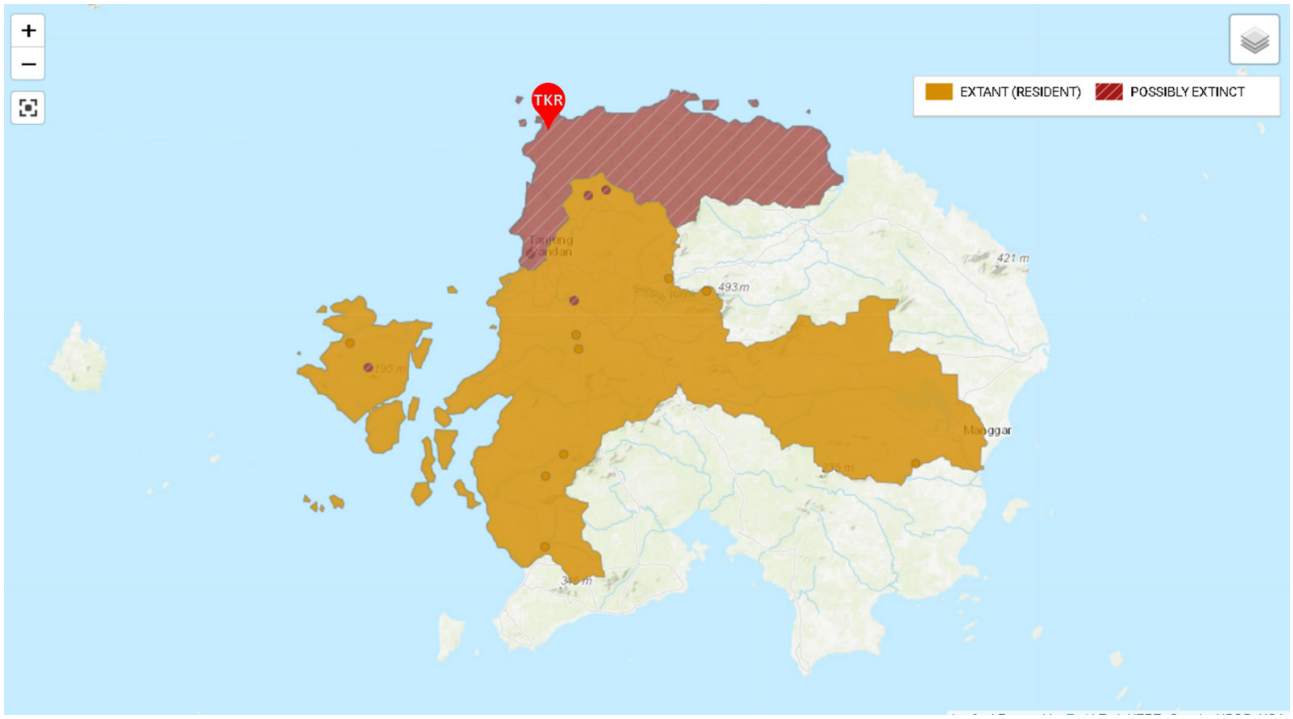

Figure 4. Geographical range of *Amphicnemis kuiperi* endemic to Belitung. Adapted from R. A. Dow (2019: The IUCN Red List of Threatened Species. Version 2022-2) with new distribution from Tanjung Kelayang Reserves (TKR) added.

Table 1. Checklist of the Tanjung Kelayang Reserves Odonata Species

No.	Suborder	Family	Species (* = Endemic species)
1	Zygoptera	Lestidae	*Lestes praemorsus decipiens* Kirby, 1894
2			*Orolestes wallacei* (Kirby, 1889)
3		Chlorocyphidae	*Libellago hyalina* (Selys, 1859)
4		Platycnemididae	*Copera vittata vittata* (Selys, 1863)
5			*"Elattoneura" aurantiaca* (Selys, 1886)
6			*Prodasineura collaris* (Selys, 1860)
7			*Prodasineura interrupta* (Selys, 1860)
8			*Pseudocopera ciliata* (Selys, 1863)
9		Coenagrionidae	*Aciagrion hisopa* (Selys, 1876)
10			*Agriocnemis minima* Selys, 1877
11			*Amphicnemis kuiperi* Lieftinck, 1937 *
12			*Archibasis melanocyana* (Selys, 1887)
13			*Archibasis viola* Lieftinck, 1949
14			*Ceriagrion cerinorubellum* (Brauer, 1865)
15			*Mortonagrion aborense* (Laidlaw, 1914)
16			*Mortonagrion appendiculatum* Lieftinck, 1937 *
17			*Mortonagrion falcatum* Lieftinck, 1934
18			*Pseudagrion coomansi* Lieftinck, 1937
19			*Pseudagrion microchepalum* Lieftinck, 1937
20	Anisoptera	Aeshnidae	*Anax guttatus* (Burmeister, 1839)
21			*Gynacantha bayadera* Selys, 1891
22		Gomphidae	*Ictinogomphus decoratus melaenops* (Selys, 1854)
23		Macromiidae	*Epophthalmia vittigera* (Rambur, 1842)
24		Libellulidae	*Agrionoptera insignis* (Rambur, 1842)
25			*Brachydiplax chalybea* Brauer, 1868
26			*Brachygonia oculata* (Brauer, 1878)
27			*Chalybeothemis fluviatilis* Lieftinck, 1933
28			*Diplacodes nebulosa* (Fabricius, 1793)
29			*Diplacodes trivialis* (Rambur, 1842)
30			*Nannophya pygmaea* Rambur, 1842
31			*Nesoxenia lineata* (Selys, 1868)
32			*Neurothemis fluctuans* (Fabricius, 1793)
33			*Orchithemis pruinans* (Selys, 1878)
34			*Orchithemis pulcherrima* Brauer, 1878
35			*Orthetrum chrysis* (Selys, 1891)
36			*Orthetrum sabina* (Drury, 1773)
37			*Pantala flavescens* (Fabricius, 1798)
38			*Pornothemis starrei* Krüger, 1902
39			*Rhodothemis rufa* (Rambur, 1842)
40			*Rhyothemis obsolescens* Kirby, 1889
41			*Rhyothemis phyllis* (Sulzer, 1776)
42			*Risiophlebia dohrni* (Krüger, 1902)
43			*Tholymis tillarga* (Fabricius, 1798)
44			*Tetrathemis flavescens* Kirby 1889
45			*Tramea transmarina euryale* (Selys, 1878)
46			*Tyriobapta laidlawi* Ris, 1919
47			*Urothemis signata insignata* (Rambur, 1842)
48			*Zyxomma petiolatum* Rambur, 1842

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Photographs of the female *Urothemis abbotti* and further notes on this rare Oriental libellulid

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Introduction

In the July 2022 issue of this newsletter, I published notes and photographs of the libellulid species *Urothemis abbotti* Laidlaw, 1927 (Rare Basker), which I had observed in southern Thailand in the surroundings of the Thai Break Resort, Na Yong District, Trang Province during January 2022 (Tunturi 2022). Previously, only five records of this rare species were known. The first specimens were collected in Trang province in Thailand by William Louis Abbott at the end of the 19th century. The later four records came from Singapore and Peninsular Malaysia (Terengganu and Pahang[1]); for details see Tunturi (2022).

Last winter, I was again able to stay in southern Thailand for ten weeks from 10th of December 2022 to 18th of February 2023. Most of the time (except for the periods of 3–4 and 17–27 January) were again spent in the Thai Break Resort in Trang (WGS84 co-ordinates: 7.483026° N, 99.724994° E). My major odonatological target there was to observe and obtain photographs of the female of *U. abbotti*.

Observations

Urothemis abbotti was observed at the same four small ponds (Fig. 1) and lake in the surroundings of the Thai Break Resort as reported in the previous year (Tunturi 2022). Moreover, two new sites for this species were found nearby: (1) a four meter wide and 40 meter long ditch in a rubber plantation about 150 meters east of the resort, bordering a sunny opening (the other half a dozen nearby ditches in this plantation were in shade and with smaller open surface; no *U. abbotti* specimens were present in them); (2) a similar ditch area between rows of passion fruit vines in a plantation less than 200 meters west of the resort. (This area was open for sun, but only the first four meters wide ditch had open water surface suitable for *U. abbotti*).

During every (almost daily) visit to these sites, a total of from one to half a dozen males was seen. The highest daily count at the waterbodies near the resort was 15 males on 29 January 2023. At the lake (500 m away), five additional males were seen on 1 February 2023. The total size of the population in these sites must have been at least a few dozens. The number of *U. abbotti* individuals was much larger than in the previous year, when highest number recorded at the same time (at the lake) was four individuals, including a copulating pair. Interestingly, in these waterbodies, *U. abbotti* was now more abundant than its congener *U. signata insignata* Selys, 1872.

Although males were observed during almost every visit to each site, only a total of four females was observed during my whole stay. The first three observations were made at the lake, which is situated ca 500 m south-west of the resort (see Fig. 4B in Tunturi 2022).

A copulating pair (Fig. 2E) was observed and photographed on 28 December 2022. Another

1 According to Robin Ngiam (pers. comm.) the specimens reported to have been collected from Tasek Bera (Pahang) in 1971/1972 have not been found, and this record remains to be confirmed.

Figure 1. Small pond, Thai Break Resort, Trang, Thailand, 26 December 2022.

Figure 2. *Urothemis* spp. photographed at ponds, Trang Province, Thailand. (A-C & E-F) *Urothemis abbotti*, Thai Break Resort, Na Yong District during the period 16 December 2022 to 11 February 2023. (A) Male, 16 December 2022. (B) Female, 1 February 2023. (C) Female, 11 February 2023. (D) *Urothemis signata insignata* female, Khao Chong Hi Cave, Na Young District, 10 January 2022 (no *U. signata* were observed during the winter of 2022-23). (E-F) Coupled *U. abbotti* pairs, 28 December 2022 & 4 February 2023. (G) Coupled *U. abbotti* pair ovipositing, 4 February 2023. Photo credits: Markku O. Tunturi.

copulating pair was observed on 1 February 2023. The couple was flying fast in a zigzag way at the height of five meters, offering no chance for photography. Suddenly, the wheel broke and the male perched 25 meters away from me, but the female perched only five meters away and posed conveniently (Fig 2B). On 4 February 2023, one pair was again seen, flying in tandem (Fig. 2F) in search of an oviposition site, where the female, guided by the male, laid eggs (Fig. 2G). On 11 February 2023, a female individual (Fig. 2C) was seen at the ditch in the rubber tree plantation.

I also tried to find *U. abbotti* in half a dozen ponds situated about 3–6 kilometers northwards of the Thai Break Resort. However, no *U. abbotti* individuals were seen. Instead, a few *U. signata insignata* were present at all these waterbodies.

Figure 3. Teneral *Urothemis abbotti*, Na Yong District, Trang Province Trang, Thailand 23 December 2022. Photo credit: Markku O. Tunturi.

Identification of the female

Laidlaw (1927) described the female as follows: "Very similar in appearance to the male. The dark colour patches on the hind wing decidedly less extensive than in the male. The hinder patch is circular rather than oval in outline, and has a diameter of about 3–4 cells. Other differences are as follows: On the head the vesicle of the frons is without any red tinge. The general colour of the synthorax and abdomen is duller. Segments 3–7 have an apical dorsal mark of black, the black band on the dorsum of 8–9 is broader than in the male, and 10 has a very narrow basal ring of black. As in the male the black markings on the abdominal segment have a slightly metallic gloss."

In the field, the most readily observable colour difference between male and female *abbotti,* apart from the bright red abdomen and thoracic dorsum in mature males, is the presence of black markings on segments 3–9 in the female. In females, the coloured patches on the hind wing are paler (yellowish), whereas in male they are reddish. Moreover, in the female the frontal surface of the face lacks reddish tinge.

The colour of the legs offers the easiest character to separate females of *Urothemis abbotti* and *U. signata insignata* in the field. In *abbotti* (Fig. 2C) female the legs are largely yellow with short, distinct, black stripes at 'knees' (identical with that in male). In *signata* (Fig. 2D) female the legs are predominantly blackish with variable, rather diffuse, yellowish stripes on femora.

Urothemis signata insignata has long vulvar scale as the generic prefix indicates (Ngiam & Ng 2022, pp. 319–320). It seems that *Urothemis abbotti* female has similar vulvar scale (Fig 2B).

Colour pattern of the immature male

Teneral individuals of *U. abbotti* have not yet been described. A photograph, taken at the lake on 23 December 2022, shows an immature male (Fig. 3). The colour of the abdomen is closer to female's brownish yellow than male's orange red, and there are some traces of the black markings on the dorsum of abdomen at least on segments 5–7. The colour of frons in this teneral male is light brownish yellow (resembling that of female; Fig. 2C), whereas in mature male frons is vivid red (Fig. 2A).

Acknowledgements

Robin Ngiam provided me with the information of the uncertainty of the *U. abbotti* record from Tasek Bera in Pahang. Matti Hämäläinen edited my text and made it suitable for publishing. Once again, Philipp Karch made our life nice and easy during our stay in Thai Break Resort and my wife Anne was my patient and safe driver for ten weeks.

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Tribute to
Richard James Rowe 1948- 2023

Michael Winterbourn[1] [winterbourn@xtra.co.nz]
& Milen Marinov[2] [mg_marinov@yahoo.com
[1]Emeritus Professor, University of Canterbury, New Zealand
[2]Ministry for Primary Industries, New Zealand

Richard passed away on 4 April 2023 at his home in Peeramon, Queensland, Australia, aged 74. His health had not been particularly good for some years, but his untimely death was unexpected. Richard was well-known to many entomologists, especially odonatologists, throughout the world, and made significant contributions to our knowledge of the dragonflies and damselflies of New Zealand and Australia.

Richard was born in Fielding, in the lower North Island of New Zealand and attended schools in the Manawatu and Auckland. While he was a schoolboy his interest in dragonflies developed through many hours spent in the countryside watching and collecting them. Even in those early days he had developed the habit of making field notes, and he was rarely without a pencil and a collection of index cards in his pocket. After spending his senior secondary school years at Auckland Grammar School, Richard enrolled at Auckland University where he obtained BSc and MSc degrees in Physics. His life-long fascination with politics also developed while he was a student. He was elected to the Auckland University Students' Association executive, a body that was a stepping-stone for entry into national politics by more than a few New Zealand members of parliament. On leaving university Richard had a brief stint as a secondary school teacher, before the opportunity arose for him to become a student again.

The arrival of Philip Corbet at Canterbury in the early 1970s provided a fortuitous opportunity for Richard to study Odonata with like-minded scientists. Corbet had been appointed director of the newly established Joint Centre for Environmental Science, an initiative of Canterbury University and nearby Lincoln Agricultural College (now Lincoln University), and was able to establish a small dragonfly research group at the university. Richard therefore moved to Christchurch and in 1978 embarked on a taxonomic study of the coenagrionid, *Xanthocnemis* and the larval behaviour of the most common species, *X. zealandica*. For this work he was awarded a PhD in 1986. At the same time that he was pursuing his doctoral research Richard wrote his invaluable book 'The Dragonflies of New Zealand', a comprehensive account that included many of his own observations of the New Zealand odonate fauna as then known (Rowe, 1987, Fig. 1B). No previous volume had been devoted solely to New Zealand Odonata. While at Canterbury University he edited the natural history journal Mauri Ora (subsequently New Zealand Natural Sciences) and collaborated with another New Zealand dragonfly worker, Bill Winstanley, on studies of the petalurid, *Uropetala*. He also expanded his interest in predatory and agonistic behaviour by linking up with the spider behaviour group led by the Zoology Department's Dr Robert Jackson. This proved to be a fruitful association that continued following his graduation and led to co-authorship of four spider predation papers.

In 1990, Richard was appointed to a lectureship in

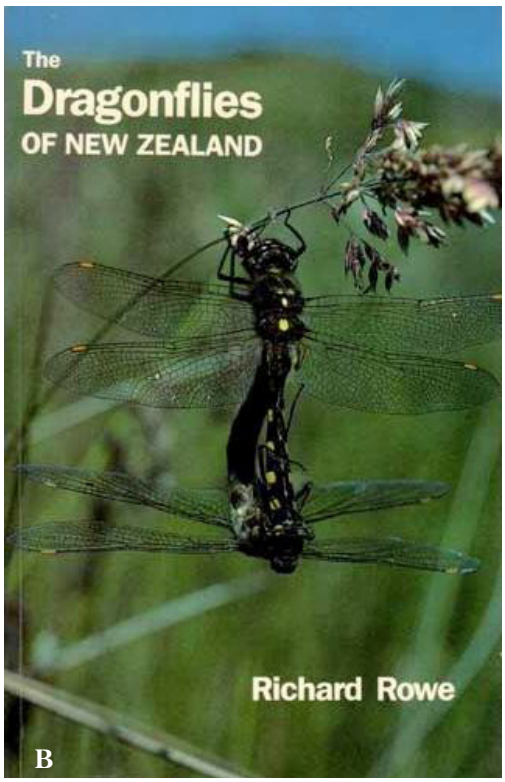


Figure 1. (A) Richard Rowe portrait. (B) The Dragonflies of New Zealand by Richard Rowe, published in 1987 by Auckland University Press - its book cover depicting a pair of *Procordulia grayi* mating at St Bathans, New Zealand.

the Zoology Department of James Cook University, Townsville, where he initially taught biometrics and entomology. He continued to carry out research on the agonistic behaviour of various Australian dragonfly species and supervised graduate students working on the behaviour of several kinds of animals, not just Odonata. Although Richard spent more than 30 years in Australia, he never abandoned his interest in the New Zealand fauna. He continued to encourage studies of Odonata in his two countries of residence and provided invaluable support (updated distribution records, new field notes, important ideas for future studies, etc.) to anyone interested in the region. Richard developed the New Zealand Odonata database initiated by Ken Deacon when the latter came to New Zealand as a doctoral student with Phil Corbet in the 1970s. The database was initially an Excel spreadsheet with over 3000 entries documenting specimens in almost all New Zealand's scientific collections, which had been meticulously reviewed by Ken. Some of the information was verified and updated by Richard, and it has now grown to be a Pacific Odonata database with more than 14,000 data entries.

Richard was a helpful and well-liked supervisor who really cared about his students. He was a member of the Australian and New Zealand Entomological Societies and made an important contribution to the management of the former society as its director of operations. In total, Richard authored or co-authored about 40 scientific papers in entomological and zoological journals, the largest proportion being on agonistic and anti-predator behaviour of odonate larvae. He also described two new species of *Xanthocnemis* and most recently, *Hemicordulia armstrongi*, named after Dr John Armstrong, one of his early heroes and mentors. Their communications had a profound effect on Richard, and years later he could still remember discussions on Samoan material collected by Dr Armstrong and classified by Frederic Charles Fraser under *Ischnura*.

Following his retirement from James Cook University, Richard moved to the small town of Peeramon on the Atherton Tablelands of Queensland, a locality with a more equable climate than tropical Townsville. There he began to revise his New Zealand dragonfly book, a task that was close to completion at the time of his untimely death. He was also involved (as co-ordinator) with a number of collaborators in the writing of a new book on dragonflies, which he saw as being

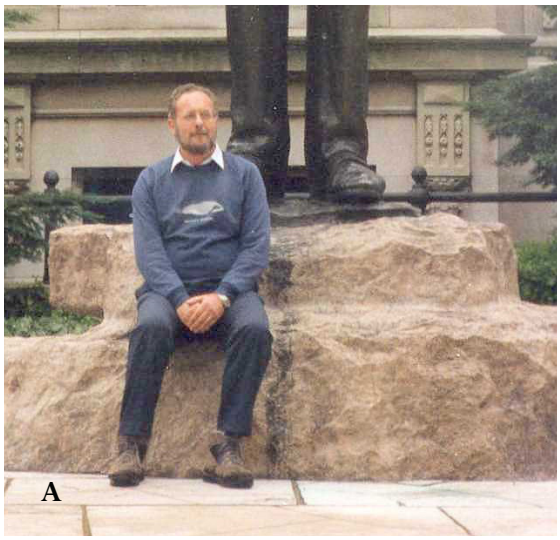
Figure 2. Cass, Canterbury region, South Island, New Zealand. (A) Richard Rowe watching a visiting Swiss biologist Andreas Frutiger at Grasmere Stream, Cass 1986. Photo credit: Michael Winterbourn. (B) Richard with Michael Winterbourn, 1987. Photo credit: Kevin Collier. (C) Post *International Limnological Society* conference tour at Lake Sarah, Cass, 1987, depicting Richard showing a *Uropetala chiltoni* larva to Vince Resh a Californian aquatic entomologist. Photo credit: Michael Winterbourn.

a comprehensive review in the tradition of his mentor, Philip Corbet. During this period Richard was also a very active member of the Dragonfly Specialists Group, and the International Union for Conservation of Nature (IUCN), participating in various projects including Red List assessments of New Zealand and other Pacific Odonata. He also contributed to Amazing Freshwater Species, The Search for Lost Dragonflies, and The Tree of Life. In July 2005 Richard announced that he and John Trueman intended to provide web-based databasing of core information on the world odonate fauna, a project that would form an important component of the Odonatological database (ODAT) and of inestimable value to future odonatologists.

Richard was the international symposium coordinator and congress chair for the *Worldwide Dragonfly Association* (WDA) 2005-2017, and was involved in organizing six conferences. In 2018 he wrote an informative article for *Agrion* titled: 'Studying dragonflies wherever they are, whatever they do'—a summary account of the *International Congress of Odonatology* (*ICO*) held at Clare College, Cambridge, which Richard helped to organise [*Agrion* 22(1): 10-17], and in July 2021 he discussed the present state of Australasian odonate research at the virtual WDA Odonata Conference. Richard served as a behavioural ecology content editor for the WDA's *International Journal of Odonatology*, and was guest-editor of an issue devoted to odonate flight in Volume 23. The issue stemmed from the special symposium held during *ICO* 2017 in Cambridge, and included nine articles by 15 of the leading authors in the field and a tribute to Charlie Ellington. The WDA now awards Richard Rowe grants for attending *ICOs*, a fitting recognition of his sterling service to the Association.

We have fond memories of Richard, Michael both as supervisor of his doctoral research and as a fellow aquatic entomologist who became a life-long friend, and Milen as a follower in the studies of the New Zealand Odonata. Richard had the habit of returning to New Zealand for a few weeks almost every summer and each time he would search for dragonflies, visit relatives and look up as many of his old friends and colleagues as he could. With one of us (MW) he would often visit Cass where he did a large-scale field experiment as part of his doctoral research, and would look for *Uropetala* burrows and *Procordulia* on the wing. Richard was a good cook and in the 1980s, daringly brought lasagne onto the menu of field courses at the Cass Mountain Biological Station. He was also partial to a helping of cheese from the bar at the university staff club, and with beer in hand, would delight in talking politics and the issues of the day with all and sundry.

Richard never married and is survived by two younger brothers and a sister.



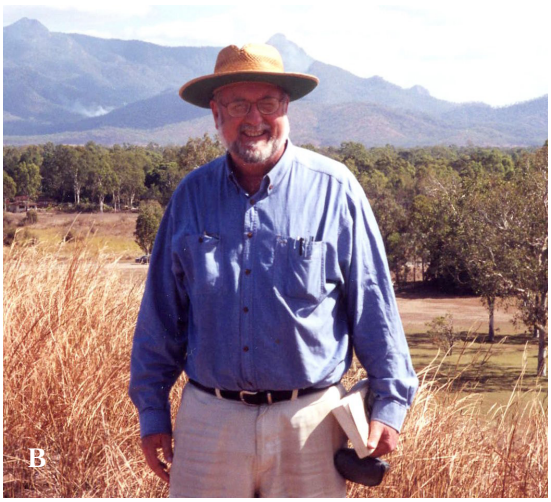


Figure 3. (A) Richard Rowe in front of the Abraham Lincoln Statue, Louisville, Kentucky, 1992. (B) Richard near Townsville, Queensland, Australia, 2001. (C) Richard on a field trip to Cass looking for *Uropetala chiltoni* burrows, 27 February 2019. Photo credits: Michael Winterbourn.

In memory of Kiyoshi 1932-2023

Misa Piper
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Kiyoshi Inoue presenting at the 17th *Societas Internationalis Odonatologica* (SIO) Conference in Hong Kong Jul-Aug 2006.

The first time I met Kiyoshi Inoue was in 1993, after the ***Societas Internationalis Odonatologica*** (SIO) symposium in Osaka, when he led participants on the post-symposium tour to Dragonfly Kingdom, the world's first Dragonfly Sanctuary in Nakamura (now Shimanto City). I was a member of the board of *The Society of Dragonflies and Nature,* so I worked as an interpreter for the foreign visitors at that time.

The 1995 SIO international symposium, the first that I attended, was held in Essen, Germany. Kiyoshi told everyone, "I would like as many Japanese people as possible to participate in international conferences. And I am very happy that Misa is participating this time." At the 1997 Slovenian international symposium, we became very close. Kiyoshi and Werner agreed to pay each other's expenses and become members of the *Society of German-speaking Odonatologists* and the *Japanese Society of Odonatology*. Kiyoshi and I started exchanging emails. Werner and I visited Okinawa with him for a dragonfly survey. Every evening after the long hot day, he enjoyed his favourite beer for dinner, and when he drank it all, he laughed and said to Werner, "Ah, the beer has evaporated again! Let's have another…". The empty beer glass reminds us of Kiyoshi.

After that, every time I returned to Japan, he picked me up at the airport, and we talked about dragonflies while having lunch. He became like an uncle to us.

He encouraged Japanese members to participate in overseas symposiums and organized his original symposium tours for Japanese participants. He also personally invited foreign researchers to Japan to show them around Japan's dragonfly habitats. I believe that he brought the *Japanese Society of Odonatology* more internationalization and international exchanges, and that is his great contribution to his society.

I heard from his family that he left with his beloved dragonfly specimens. We imagine he is catching dragonflies with his favourite catching net in heaven.

Rest in Peace, our beloved Kiyoshi…

Misa and Werner Piper

Tribute to Inoue-san, the greatest dragonfly lover
29 March 1932 - 21 May 2023

Hidetaka Natsume [romluna@y4.dion.ne.jp]

Mr. Kiyoshi Inoue passed away at his home in Osaka on the afternoon of May 21, 2023. He was 91 years old. Losing the great Odonatologist who loved dragonflies and was loved by dragonflies—I am at a loss for words upon hearing the news of his passing.

There is no need to reiterate the great achievements that Inoue-san (Kiyoshi-san for many overseas colleagues) left in the dragonfly world over the course of 60 years. He wrote and edited many books in his life, and authored numerous academic papers on dragonflies and damselflies in both Japanese and English. He also participated in various international conferences, has dragonfly colleagues in most parts of the world, and exchanged more than 1,000 species of dragonfly specimens with overseas researchers. For our Japanese colleagues, beyond the world of dragonfly research, as a human being and as a senior in life, we will never forget the kindness of a gentle person who calmly judged things in any situation and treated us kindly in various ways.

Figure 1. Kioyoshi Inoue giving a welcome speech at the ICO2012 Congress Dinner at Yumoto Fujiya Hotel, Hakone, Japan, 1 August 2012.

Inoue-san was born on 29 March 1932 in Osaka, Japan where many people have historically loved dragonflies as friendly creatures around their lives for many hundreds of years. It is said that he was a dragonfly boy who had been chasing dragonflies since childhood, but after graduating from high school, he went on to the engineering department of Osaka University, and after graduation he worked for a private company as a chemical engineer. He retired in 1981 at the age of 57, and dragonflies were just one of his hobbies. Unlike other countries, biology in Japan, especially insects, is dominated by amateur enthusiasts. It can be said that Mr Inoue himself is a representative symbol of the reality in Japan that research by amateur enthusiast accounts for a large part of academic research results.

In addition, Inoue-san's experience at a private company was demonstrated as a coordinator at conferences, research presentations, symposia, and other conferences where many presenters gathered. Inoue-san's popularity was highly valued by various institutions, and in overcoming the differences in each position and environment, many people were convinced by his persuasive power. As a result, Inoue-san brought organizations together. There were so many things he gave us. I believe that his gentlemanly manner of speaking calmly from an unbiased, neutral standpoint has encouraged many people, even when discussions have become evenly matched and conflicts have surfaced between groups.

Inoue-san was one of the founding members of the *Japanese Society for Odonatology*, the world's oldest organization specializing in Odonata. It was founded in 1957. Fortunately, I was born in that year. Ever since I was a child, I have always been chasing dragonflies, and when I was in elementary and junior high school, I presented dragonfly specimens several times during my summer vacation free research. I majored in law at university and worked for a private trading company after graduating. Still, on my first solo trip to Hokkaido in 1977, I collected dragonflies in the Tokachi region, and in 1987, when I was transferred to Dubai in the United Arab Emirates, insect nets were the first items I sent to UAE. After that, I moved to Hong Kong, and after returning to Japan, I received a very polite letter from Inoue-san in response to my small inquiry about dragonfly fauna. When I moved to Sapporo for the third transfer, I encountered new fauna and was most excited to exchange emails with him. We also exchanged much information on dragonflies of the world as well as different topics about dragonfly research. Then, on November 1,

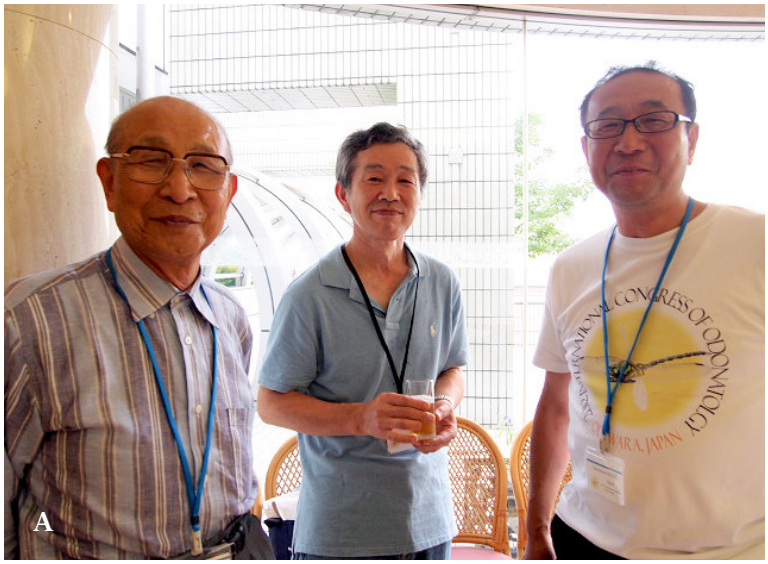
1998, I participated in the annual meeting of the *Japanese Society for Odonatology* held at Musashino College in Ikebukuro, and I was able to talk about overseas dragonflies with Inoue-san and Asahina-san directly. This was the last time the legendary Dr Shojiro Asahina attended a conference of this Society.

Since then, I have been very fortunate to be able to participate in the Annual Meeting of the *Japanese Society for Odonatology* every year. It was a great encouragement for my activities to meet and talk with Inoue-san not only in his hometown of Osaka, but also in Saga, Toyama, Yamagata, and other places I visited for the first time. One day, Inoue-san told me with a calm smile that my birthday, July 1st, was called "Dragonfly NewYear" in traditional Japanese customs. I felt that I was born into this world under the fate of chasing dragonflies.

Back in 1993 was the great success of the 12th International Symposium of Odonatology held in Osaka. It was a wonderful conference recognized not only by many Japanese dragonfly enthusiasts, but also by odonatologists around the world. On that occasion, presided over by Inoue-san, more than 120 participants from 20 countries gathered in Osaka. Many of the participants came into contact with Japanese culture through tours to the surrounding areas, and were able to expand their world of dragonflies and bring about great cultural exchanges and experiences.

In 1997, however, Inoue-san became chairman of the *International Odonatological Foundation*, and it was not until the WDA symposium held in Australia in 2003 that he joined WDA, which was a new organization. As soon as he joined WDA, he wrote "Critical species of Odonata in Japan" in IJO 2004. This paper clearly proves that Inoue-san was the right person who understood the whole actual situation of dragonflies in Japan better than anybody else.

Unfortunately, around this time, Inoue-san developed chronic renal failure, and from 2007 he had to undergo dialysis treatment. As a result, he had to make arrangements for medical appointments even when traveling within Japan. After 2010, he gradually retired from the various positions he held in the dragonfly societies of Japan. He also decided that his vast specimen collection



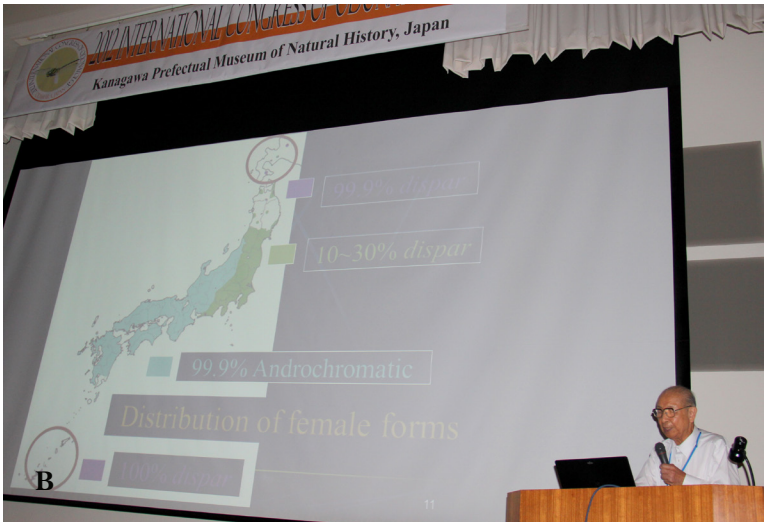


Figure 2. *International Congress of Odonatology* (ICO), Kanagawa, Japan, 2012. (A) Kiyoshi-san (left) at the ICO reception on 28 July 2012 with Morioka and Ikeda. (B) Kioyoshi-san giving his oral presentation on *Deielia phaon* female dimorphism at Kanagawa Prefectural Museum, 2 August 2012. (C) Kiyoshi-san presenting a video session: 'Behaviour of dragonflies' filmed and produced by G. Ruppell & D. Hilfert-Ruppell', 29 July, 2012.

should be donated to the Osaka Natural History Museum. However, Inoue-san still had a big task left to do. At the 2012 *International Congress of Odonatology* (ICO2012) held from 28 July 2012 to 2 August 2012 (it was originally scheduled for 2011, but was postponed to the following year due to the large earthquake, tsunami, and accident at the Fukushima nuclear power plant), he played an active role as co-chair. He invited his wife Sumiko-san to the venue so I could greet her at the welcome reception on the very first day (July 28). Inoue-san presented several interesting programs during the itinerary as well as friendly greetings and hot discussions. ICO2012 was co-hosted by the Japanese Group of WDA, Japan Branch of *International Odonatological Foundation* (SIO), and the Kanagawa Prefectural Museum of Natural History, with the support of the *Japanese Society for Odonatology*. All the photos I am showing here are from that event.

After that, in autumn 2012, at the Yamagata annual meeting of the *Japanese Society for Odonatology* Inoue-san presented "Thoracic pattern analysis of dragonflies in relation to molecular phylogeny" which he first presented in ICO2012 with Futahashi-san, and continued to be active as ever. At the 2014 Sanda (Hyogo) meeting we jointly announced that I would succeed Mr Inoue in his long-standing position. Inoue-san, who had retired from many positions by then, did not participate in the Niigata meeting in 2015, perhaps because the weight on his shoulders had been lifted. No one has ever experienced annual meeting of the Japanese Society without Inoue-san's presence, and that became a hot topic, but he participated in the Odawara meeting again in 2016 and we had a good time chatting at the social gathering. In 2017, a meeting was held at the Lake Biwa Museum near Osaka, so Inoue-san also participated and enjoyed talking about dragonflies. This was the last opportunity for the annual meeting that Inoue-san participated in.

I didn't have a chance to meet him at our annual dragonfly conferences after that, but I often exchanged information by e-mail. Also, I heard that the burden on the body had increased since the dialysis treatment had changed from twice a week to three times a week. I was worried about his health and talked over the phone occasionally. Despite his physical condition, he still sometimes showed up at meetings of dragonfly friends in his hometown of Osaka. Yet the overall situation in the world changed drastically due to the infectious disease that spread from China.

Due to the spread of Covid19 infection, the Annual Meeting of the *Japanese Society for Odonatology* after 2020 was held by Zoom meeting, and participants did not gather at one venue. The *Kansai Research Group of Odonatology*, of which Inoue-san was a founding member, was also held online. Although I am a member of this group, I have never attended the meetings as it has been held only in Osaka every time. Since it became an online format, I was able to participate in the Osaka meeting from my home in Tokyo.

The 169th discourse was held on 27 March 2022 by Zoom meeting. In the Zoom video image, Inoue-san could be seen relaxing at his home in Osaka with his wife, and when he saw me on his computer screen, he spoke, "Look, it's Natsume-san" and I waved my hand and answered. Although it was via Zoom, it was the last time I saw Inoue-san's smiling expression. It is physically impossible to meet with Inoue-san anymore, but if I ever had the opportunity to feel his spirit again, I will walk the rest of my life looking forward to welcome such kind of moment.

There are countless successors who have been encouraged by Inoue-san to continue Odonata research. We, who are left behind, want to raise as many dragonfly lovers as possible for the future. Dreaming of the future of the earth where dragonflies will continue to fly forever, I would like to continue activities such as nature conservation, environmental problems, and enlightenment of dragonfly research. I believe that he would be most pleased with that.

New book

Libélulas
Hijas de agua, hadas del aire.
(Translation: Dragonflies - Daughters of the water, fairies of the air)

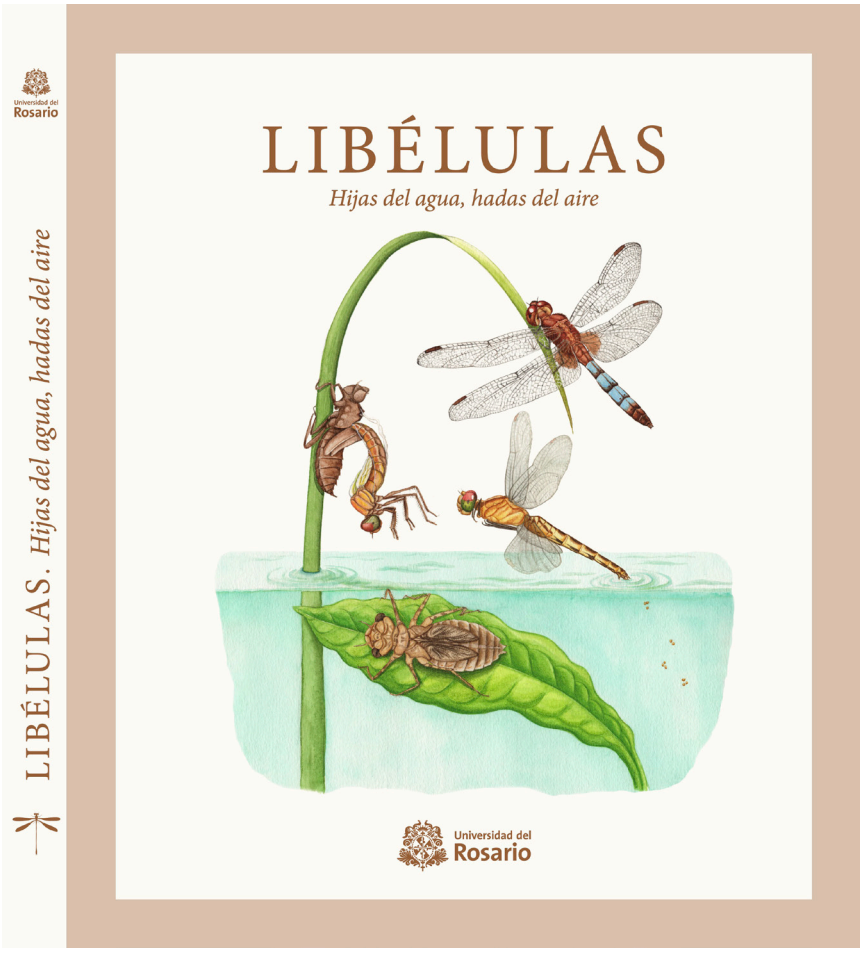
Patricia Londoño Vega & Melissa Sánchez Herrera (eds)
Karim León Vega (graphics)

Melissa Sánchez Herrera [Melissa Sanchez [melsanc@gmail.com]
Department of Museum Research & Collections.
University of Alabama Museums, Tuscaloosa, AL 35487, USA
Division of Invertebrate Zoology. American Museum of Natural History, New York, NY 10024, USA
Faculty of Natural Sciences. Universidad del Rosario. Bogotá, Colombia

Citation: Libélulas. Hijas del agua, hadas del aire. Patricia Londoño Vega, dirección editorial; Melissa Sánchez Herrera, dirección científica; Karim León Vega, investigación gráfica. Bogotá, Colombia. Editorial Universidad del Rosario. 2022. Pgs 188. ISBN: 978-958-500-044-5

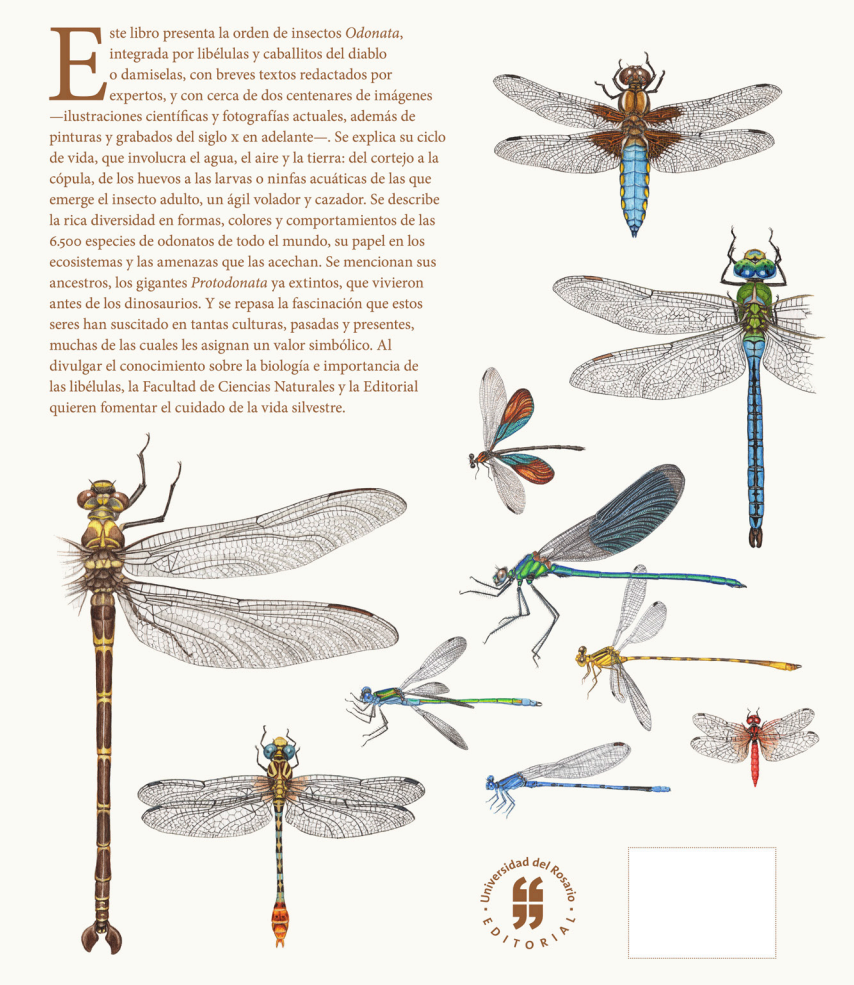
This present book is a beautifully illustrated luxury edition aimed at the Spanish-speaking audience who are interested in, or can be enticed into, the world of odonates. It features concise texts contributed by experts, along with approximately two hundred images, including scientific illustrations, contemporary photographs, as well as paintings and engravings dating back to the tenth century.

As the scientific director, I was part of the editorial board responsible for proposing chapters, recruiting contributors, reviewing scientific illustrations, and ensuring the accuracy of the scientific content provided by our contributors. Working alongside me was Dr Patricia Londoño Vega, a retired full professor from the History Department at La Universidad de Antioquia in Medellín, serving as our managing director. "Patri " led the efforts in finding the appropriate language for this science communication piece, carefully considering an inclusive age range vocabulary, while also coordinating with the scientific illustrations and graphic investigation. She did an incredible job of pushing all of us, including the contributing authors, to present information with the right level of depth that would excite the general public about these fascinating insects, while avoiding jargon. Additionally, Karim León Vargas, a History professor at La Universidad de Antioquia and a PhD candidate in humanities sciences at La Universidad EAFIT, led the graphic investigation and compiled the contributions of numerous talented photographers who provided their odonate portfolios for the realization of this book. Karim extensively explored graphic archives to enhance the visual aspects.



The team of author

contributors for this book includes: Adolfo Cordero Rivera, Catalina María Suárez Tovar, Cornelio Bota-Sierra, Emilio Realpe Rebolledo, Jenilee Montes Fontalvo, Jessica L. Ware, Juliana Sandoval Hernández, Karim León Vargas, Manpreet Kaur Kohli, Patricia Londoño Vega, and myself, Melissa Sánchez Herrera. I made a conscious effort to ensure that this team represented a significant number of women and Spanish native speakers. Furthermore, we had the privilege of featuring fantastic photographic contributions from: Adolfo Cordero Rivera, Alejandro Londoño Vega, Bryan Pfeiffer, Catalina Londoño Carder, Cornelio Bota-Sierra, David Cook (Wildlife Photography), Donald Hobern, Emma Londoño Gónzalez, Erland Refling Nielsen, Graham Hall, Jenilee Montes Fontalvo, John Abbott and Kendra Abbott (Abbott Nature Photography), Juliana Sandoval, and William Kuhn. Finally, the stunning illustrations throughout the book were provided by Catalina Londoño Carder, Ivar Da Coll, and Pablo Emilio Realpe Sanabria.



The book delves into the intricate life cycle of these insects, which spans water, air, and land. It explores various aspects, from courtship and copulation to the development of eggs into aquatic nymphs, ultimately giving rise to these vibrant fliers and hunters. We describe the rich diversity of nearly 6,500 species of odonates found worldwide, highlighting their varied shapes, colors, and behaviors, as well as their crucial role in ecosystems and the threats they face. The book also traces the ancestry of this order back to a group of much larger, now extinct, animals called Protodonata, which existed before the dinosaurs. Furthermore, the text explores the profound fascination that dragonflies have held in many cultures, both past and present, with numerous societies assigning them symbolic value. By disseminating knowledge about the biology and significance of dragonflies, all the contributors and the publisher hope to foster a deeper appreciation for wildlife and the environment through a multidisciplinary approach.

Our book was launched at the FILBO 2023 (Feria Internacional del Libro 2023), the International Book Fair in Colombia, this past April. It quickly became a bestseller, instilling hope in us regarding the global appreciation for these beloved insects and, hopefully, encouraging the protection of their habitats in Spanish-speaking countries across Latin America and Europe. If you would like to obtain a copy of this book, you can find it at local bookstores in Colombia, such as La Librería Nacional de Colombia [Link], or for international shipping, you can visit Libreria el Siglo del Hombre [Link].

Melissa Sánchez Herrera

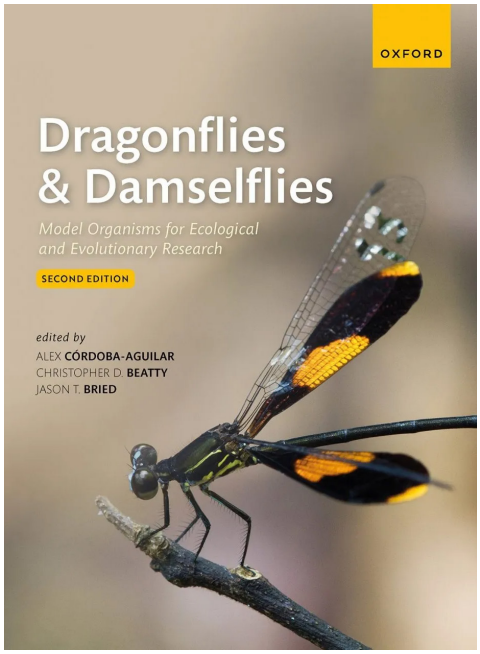
New book

Dragonflies & Damselflies: Model Organisms for Ecological and Evolutionary Research (2nd edn)

Editors: Alex Córdoba-Aguilar, Christopher D Beatty & Jason T Bried

Chapter contributors: John C. Abbott, Daniel Acquah-Lamptey, Fernanda Alves-Martins, Giacomo Assandri, Celina B. Baines, Christopher D. Beatty, Richard J. Bomphrey, Cornelio Andrés Bota-Sierra, David Boukal, Leandro S. Brasil, Jason T. Bried, Sebastian Büsse, Seth Bybee, Lenize Batista Calvão, Ulises Castillo-Pérez, Francesco Cerini, Lenin Chari, Viola Clausnitzer, Adolfo Cordero-Rivera, Alex Córdoba-Aguilar, Paulo De Marco, Charl Deacon, Amanda Dillon, Aleš Dolný, Rachael Y. Dudaniec, Merja Elo, Ryo Futahashi, Christine Goforth, Miguel Gómez-Llano, Gregory F. Grether, Filip Harabiš, Sönke Hardersen, Adam Z. Hasik, Jaakko J. Ilvonen, Frank Johansson, Leandro Juen, Michael June, Kari Kaunisto, Rassim Khelifa, Gabriella J. Kietzka, Manpreet K. Kohli, Lesley T. Lancaster, Sarah H. Luke, Karen E. Mabry, Milen Marinov, John Matthews, Michael L. May, Shannon J. McCauley, Jenilee Montes-Fontalvo, André Morrill, Rosalind L. Murray, André Nel, José Max Oliveira-Junior, Michael A. Patten, Mary Ann C. Perron, Silvana Piersanti, Bertrand Piney, Stefan Pinkert, Ângelo Parise Pinto, Justin Pomeranz, Olga Popova, Manuela Rebora, Maya Rocha-Ortega, Göran Sahlén, Gianandrea Salerno, Michael J. Samways, Rosa Ana Sánchez-Guillén, Melissa Sánchez-Herrera, Xavier Sánchez-Rivero, Emily L. Sandall, Iago Sanmartín-Villar, Arnaud Sentis, Camilla Sharkey, Adam M. Siepielski, Hana Šigutová, John P. Simaika, Sabrina Simon, Brenda D. Smith, Robby Stoks, Anton Suvorov, Ami Thompson, Nedim Tüzün, Khuong Van Dinh, Yesenia M. Vega-Sánchez, Julie Verheyen, Marina Vilenica, Giovanna Villalobos-Jiménez, Simon M. Walker, Jessica L. Ware, Maren Wellenreuther & Erin White

Published: 15 November 2022, hardback [Link]
Online edition 15 December 2022 [Link]
Publisher: Oxford University Press
Print ISBN: 9780192898623. Online ISBN: 9780191924903
459 pages, colour & b/w photos, colour & b/w illustrations, tables



This research-level text documents the latest advances in odonate biology and relates these to a broader ecological and evolutionary research agenda. Despite being one of the smallest insect orders, dragonflies offer a number of advantages for both laboratory and field studies. In fact, they continue to make a crucial contribution to the advancement of our broader understanding of insect ecology and evolution. This new edition provides a critical summary of the major advances in these fields. Contributions from many of the leading researchers in dragonfly biology offer new perspectives and paradigms as well as additional unpublished data. The editors have carefully assembled a mix of theoretical and applied chapters (including those addressing conservation and monitoring) as well as a balance of emerging (e.g. molecular evolution) and established research topics, providing suggestions for future study in each case. This accessible text is not about dragonflies per se, but rather an essential source of knowledge that describes how different sets of evolutionary and ecological principles/ideas have been tested on a particular taxon. This second edition of Dragonflies and Damselflies is suitable for graduate students and researchers in entomology, evolutionary biology, population and behavioral ecology, community ecology, and conservation biology. It will be of particular interest and use to those working on insects and an indispensable reference text for odonate biologists.

New book

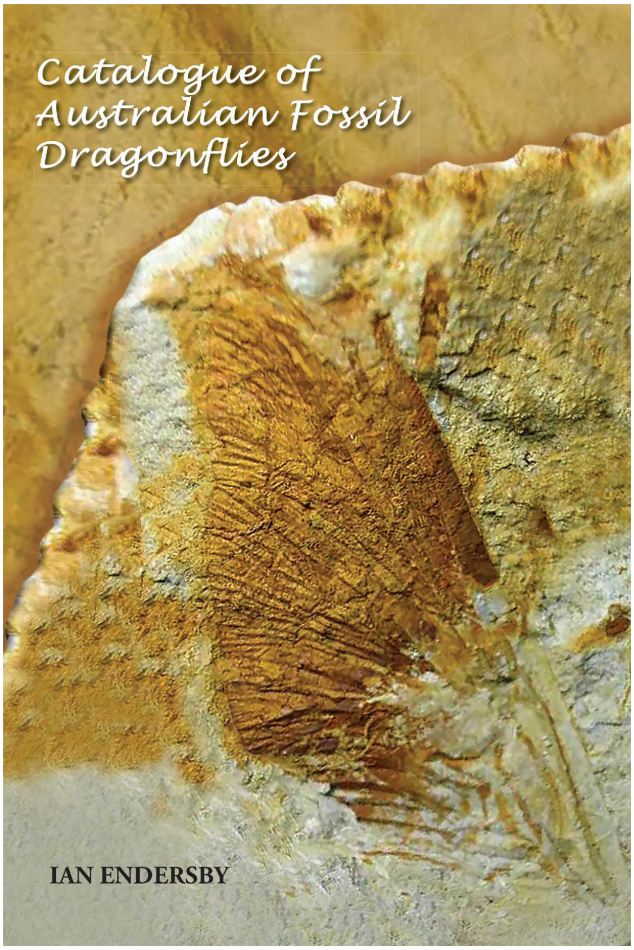
Catalogue of Australian Fossil Dragonflies

Author: Ian Endersby
116 pages
Publisher: Busybird Publishing
ISBN: 978-1-922954-22-0
Published June 2023
Available as 'pdf' file from ResearchGate [Link]

It is a little over 100 years since Robin Tillyard named his first Australian dragonfly fossil (*Mesophlebia antinodalis* in 1916), although Australia's first fossil was *Aeschna flindersiensis* Woodward, 1884, which Tillyard renamed in 1917. Since then there have been major developments in wing vein nomenclature and in our knowledge of the phylogeny of the Odonata and their precursors.

Australian Museums, and the Natural History Museum in London, hold 61 dragonfly fossils from Australia, 32 as wings or wing fragments and 29 as larvae. Some have the part and counterpart preserved. The larvae total includes a specimen previously described as a flea. Also, four specimens initially described as Odonata are now recognised as belonging to different taxa.

For each specimen the original description and other relevant literature is cited and details given for locality and age of deposit, etymology of scientific names, notes on stratigraphy, and museum holdings.



A series of palaeomaps show the disposition of tectonic plates at the time of deposition for each locality and the book is illustrated with photographs of fossils and museum labels. The photographs are not of taxonomic quality.

A free pdf can be downloaded from ResearchGate for those who have access. Otherwise, contact the author direct at ian.endersby@bigpond.com.

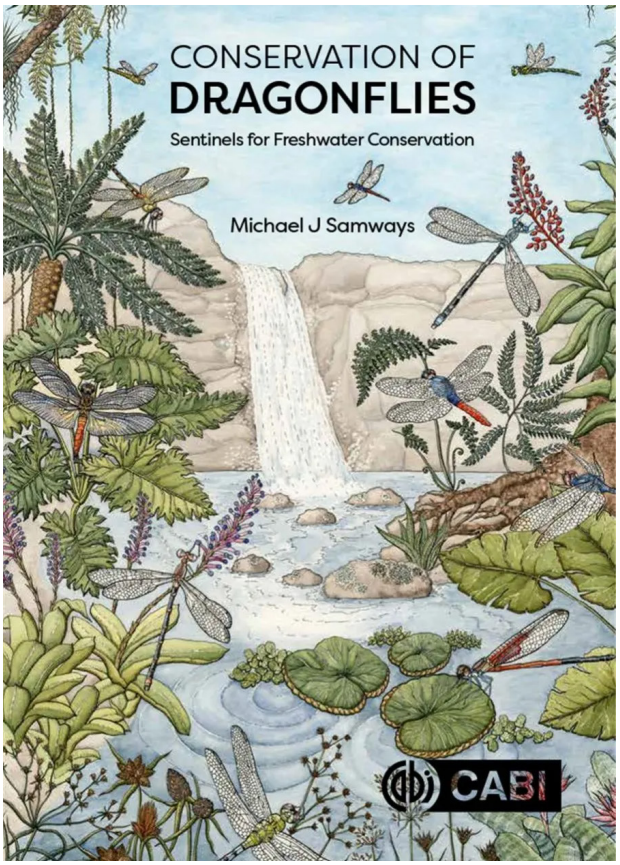
Contents

New book

Conservation of Dragonflies Sentinels for Freshwater Conservation

Author: Michael J Samways
376 pages
To be published: Oct 2023
Publisher: CAB Publishing
ISBN: 9781789248371 hardback
Available for pre-order at NHBS [Link]

This is the frst, comprehensive, single-authored, modern text on the conservation of this iconic group of insects. Dragonflies are sensitive to the health of freshwater systems, and the quality of vegetation along rivers and around ponds. Dragonflies are excellent indicators in these times of great concern over the quality of our freshwater supplies.



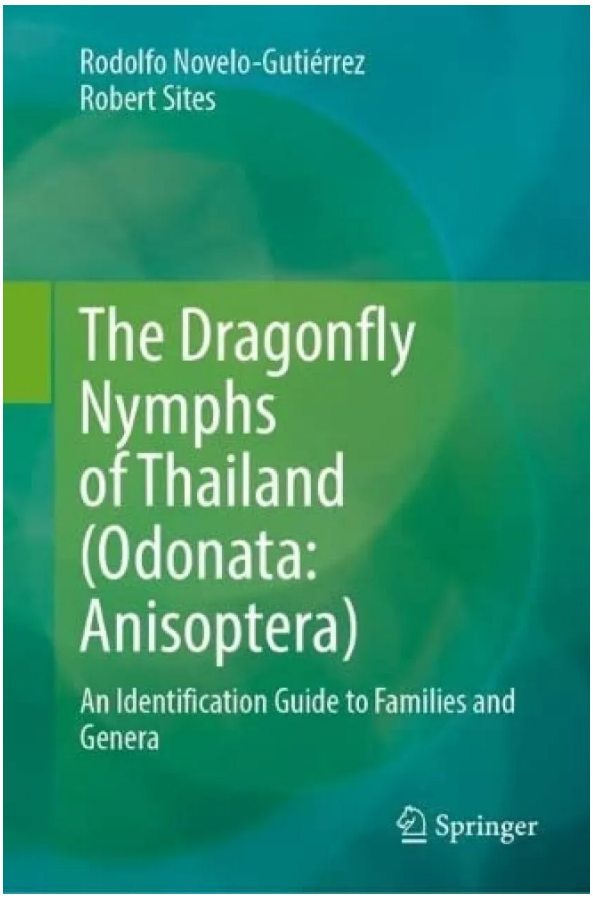
Michael Samways is currently Professor and Chair of the Department of Conservation Ecology & Entomology, Stellenbosch University, South Africa, and is a Fellow of Royal Society of South Africa, and Member of the Academy of Science of South Africa. He has published widely on various aspects of conservation, especially in relation to landscape ecology and the conservation of invertebrates, especially insects. He is also very involved internationally in conservation policy. His recent books include Insect Diversity Conservation (Cambridge University Press, 2005), Dragonflies of South Africa (Pensoft, 2008), Insect Conservation: A Handbook of Approaches and Methods (with Melodie McGeoch and Tim New; Oxford University Press, 2010), Tropical Island Recovery (with Peter Hitchins, Orty Bourquin, and Jock Henwood; Wiley-Blackwell, 2010), and Waterdancers of the National Botanical Gardens (with Christopher Willis; SANBI, 2011). Michael has produced 250 refereed scientific papers.

Dragonflies like the South African White Malachite (*Chlorolestes umbratus*) are excellent candidates for water assessment. Credit: Michael Samways.

New book

The Dragonfly Nymphs of Thailand (Odonata: Anisoptera) An Identification Guide to Families and Genera

Authors: Rodolfo Novelo-Gutiérrez & Robert Sites
700 pages, 480 colour photos and colour distribution maps
Publisher: Springer Nature
ISBN: 9783031337116 hardback
To be published October 2023
Available for pre-order at NHBS [Link]



This unique work is the first reference that provides detailed descriptions of the fully developed larvae of the Odonata suborder Anisoptera, including keys to families and genera, high-resolution photographs, distribution maps, and an updated list of the dragonfly species from Thailand. Also, because the adults are so well known in this country, this book will provide completion to our understanding of the life cycle of an entire fauna. Through the six chapters of this book, the reader will find an introduction with generalities of the order Odonata, a description of the morphology of a dragonfly larva with an emphasis on the structures used in the keys, a brief description of Thailand's geography, relief, hydrology, climate, precipitation, agriculture, history, and faunal studies, and detailed descriptions of each of the 82 genera of Anisoptera of Thailand whose larvae are known. This book will have broad appeal in the large community of odonatists around the world and for the aquatic entomologists, ecologists, and conservationists interested in Southeast Asian fauna in general.

Dr Rodolfo Novelo-Gutiérrez was educated at the National Autonomous University of Mexico. Following graduation from this institution, he taught General Entomology courses for more than a decade. In 1989, he joined the Institute of Ecology, A.C. in Xalapa City. Since then, his studies have focused on the taxonomy of tropical Odonata, although he has also published several papers on aquatic Coleoptera, Hemiptera, and Trichoptera. In 2010, he studied odonate nymphs at the University of Sains Malaysia at the invitation of Dr Che Salmah. From this experience, he published several papers on the odonate fauna of Southeast Asia. In 2012, he began collaborating with Prof. Sites on samples of Odonata nymphs of Thailand that had been collected over the previous 25 years.

Professor Robert Sites has had extensive involvement with Thailand over the past 25 years, including in both education and research. He has taught various entomology courses to Thai students, served as a major advisor for several Thai graduate students, and is known to his Thai colleagues and students as "Ajarn Bob". For nearly 20 years, he taught an annual University of Missouri study abroad course to Thailand for American students. His research on aquatic insects has been conducted in collaboration with Thai colleagues and has included fieldwork in nearly all Thai provinces. The taxonomic focus of his studies has been primarily on Odonata and Heteroptera but also has included studies on Trichoptera and several families of aquatic Coleoptera. In an ecological study, he studied the recovery of the freshwater lentic insect community in waterbodies along the coastline that were inundated by seawater during the tsunami of 2004.