

# AGRION

NEWSLETTER OF THE WORLDWIDE DRAGONFLY ASSOCIATION

PATRON: Professor Edward O. Wilson FRS, FRSE

Volume 24, Number 1

January 2020

Secretary and Treasurer: W. Peter Brown, Hill House, Flag Hill, Great Bentley, Colchester CO7 8RE. Email: [wda.secretary@gmail.com](mailto:wda.secretary@gmail.com).

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

Graham T. Reels. 31 St Anne's Close, Badger Farm, Winchester, SO22 4LQ, Hants, UK. Email: [gtreels@gmail.com](mailto:gtreels@gmail.com).

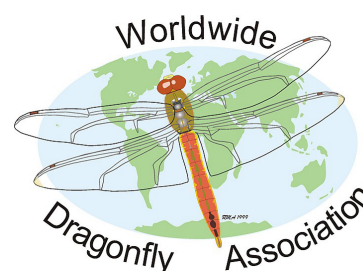
ISSN 1476-2552



# AGRION

NEWSLETTER OF THE WORLDWIDE DRAGONFLY ASSOCIATION

AGRION is the Worldwide Dragonfly Association's (WDA's) newsletter, published twice a year, in January and July. The WDA aims to advance public education and awareness by the promotion of the study and conservation of dragonflies (Odonata) and their natural habitats in all parts of the world. AGRION covers all aspects of WDA's activities; it communicates facts and knowledge related to the study and conservation of dragonflies and is a forum for news and information exchange for members. AGRION is freely available for downloading from the WDA website at [<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 - Important Notice

Control of the membership signing up and renewal process is now being handled by WDA directly from the WDA website. For membership renewal also see the letter sent to all members 16<sup>th</sup> December 2019, a copy of which is provided on page 6. There are several kinds of WDA membership available, either single or family, with or without the WDA's journal (*The International Journal of Odonatology*) in electronic form or hard copy. There are also reduced membership categories for students (grade school, undergraduate, graduate, etc.) and anyone (student or not) residing in a developing nation. You can sign up for a 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.

### Conference & Meeting News

#### The International Congress of Odonatology 2019 and ICO2021

ICO 2019 was successfully held in Austin, Texas (see write up on page 8). The next ICO will be held in Paphos,

---

**Cover: Vagrant Emperor, *Anax ephippiger* (Burmeister, 1809), male, Palm Jebel Ali, Dubai, UAE, 7 December 2010. Photo right: *Anax ephippiger* female, Dyke Road Park, Brighton & Hove, UK, 30 October 2019. Photo credits: Keith D.P. Wilson.**

*Anax ephippiger* is an African and southwest Asian tropical obligate migrant that, in some years, migrates from sub-Saharan Africa into northern Europe as far north as Iceland. In the past British records have been very rare with some years recording zero sightings. Prior to 1980 there were only five records and between 1980 to 1998 there were 11 sightings. The total number of records in Britain and Ireland before 2013 was just over 50. In recent years sightings have increased significantly with 16 in 2013 and an unprecedented number of 30 locations in 2018 with one site recording up to 20 individuals at Croft Pascoe Pool, Cornwall [Parr, A.J., 2019: Migrant and dispersive dragonflies in Britain during 2018. *J. Br. Dragonfly Soc.* 35(2): 48-60]. Much to my delight I managed to photograph a female in my local park, while walking my dog in Brighton, on the south coast of UK in late October 2019 (see photo right). Most sightings tend to occur in late summer and autumn in the UK but they can occur at any time, even in winter. It has never been recorded successfully breeding in UK, although oviposition has been seen. See also Adrian Parr's year 2000 article in *Agrion* [4(2):25] titled: *Hemianax ephippiger* in Britain and Europe.

Keith Wilson



Cyprus at the Neapolis University in from 21<sup>st</sup> to 25<sup>th</sup> June 2021 and will be organised by The Cyprus Dragonfly Society and Terra Cypria. For further information consult WDA website [Link] or contact David Sparrow, Chair of the Organising Committee [davidospfo@hotmail.com].

### Sixth DragonflySouthAsia Meeting

The 6<sup>th</sup> DragonflySouthAsia Meeting in association with DragonflySouthAsia, SouthAsian Council of Odonatology, DiversityIndia, and Sindhudurg Wetland Committee was conducted in Dhamapur village of Sindhudurg district of Maharashtra during 10<sup>th</sup> – 13<sup>th</sup> October 2019 (see write-up on page 10).

### European Congress on Odonatology (ECOO) 2020

The 6<sup>th</sup> European Congress on damselflies and dragonflies, ECOO 2020, will be held in Slovenia from 29 June to 2 July, with a post congress field trip. Visit the ECOO 2020 website for more information [Link]. Registration will be available after late December 2019 when a registration form for the ECOO 2020 will be available. For those who plan to actively participate 5<sup>th</sup> April 2020 will be the deadline for submission of abstracts and also the deadline for early registration.

### Dragonfly Society of the Americas: 2020 Annual Gathering

To be held at Lawton, Oklahoma from June 19-21. Pre-meeting field trips June 16-18 and post-meeting field trips June 22-24 (field trip sites will be in and around the Wichita Mountains Wildlife Refuge, not far from Lawton, OK). For further information [https://www.dragonflyamericas.org/2020-meeting].

### WDA's International Journal of Odonatology

In the six months to the end of June 2019, there had been 3,248 article downloads, which is 9% higher than the same period in 2018. The most downloaded article was 'Ovipositor morphology and egg laying behaviour in the dragonfly *Lestes macrostigma* (Zygoptera: Lestidae)' by Natalia A. Matushkina and Philippe H. Lambret, with 439 downloads. The first issue of IJO in 2020 will be an Odonate Flight special issue.

### Wolfgang Schneider 1953-2019

Sadly, Wolfgang Schneider passed away 17<sup>th</sup> September 2019. After suffering a bout of cardiac arrhythmia Wolfgang was admitted to hospital where he fell into a three-week long coma from which he did not recover.

Wolfgang was a founder member of the WDA and instrumental in preparing the WDA's Constitution and Byelaws. He became one of the first members of the WDA Board of Trustees with responsibilities for conservation projects and their funding. He was also the Regional Representative for Germany. After two years as President Elect from 2007-09 Wolfgang served as President of the WDA from 2009 to 2011.

Boudjéma Samraoui has written a tribute in memory of Wolfgang on page 34.

A list of 95 Wolfgang Schneider publications prepared by Wolfgang himself up to 1998, and thereafter Frank Suhling and Keith Wilson, is provided in: "Bibliography of Dr. Wolfgang Schneider (1953-2019)" on page 36.

Henri Dumont has also published an: 'In memoriam Wolfgang Schneider' in *Odonatologica* 48(3/4): 167-174 published in December 2019.



Wolfgang Schneider (left) with Gordon Pritchard (WDA President 2007-09) at Calgary, May 2009 preparing for the 6<sup>th</sup> WDA Biennial General Meeting. Photo credit: Valerie Pritchard.

### Congratulations to Jessica Ware

The WDA's newly elected President for 2019-21 was awarded a US Presidential Early Career Award for Scientists and Engineers (PECASE) in July 2019. The PECASE is the highest honor awarded by the United States Government to outstanding scientists and engineers who are beginning their independent research careers and who show exceptional promise for leadership in science and technology [Link].

### Next issue of AGRION

For the next issue of AGRION, to be published at the beginning of July 2020, please send your contributions to Keith Wilson [kdpwilson@gmail.com] or Graham Reels [gtreels@gmail.com]. All articles, information and

news items related to dragonflies or of interest to WDA members are most welcome and will be considered for publication. Please send 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 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*.

## WDA Board 2019–2021

The new WDA board for the period 2019-2021 appointed  
at the Biennial General Meeting held at ICO 2019, Texas

### President

Jessica Ware  
Department of Biological Sciences  
Rutgers University, Newark, NJ, USA  
Email: jware42 at andromeda.rutgers.edu

### President-elect

Yoshitaka Tsubaki  
Kyoto University  
Japan

### Immediate Past President

Frank Suhling  
Institute of Geoecology Landscape Ecology and  
Environmental Systems Analysis  
Technische Universität Braunschweig  
Braunschweig, Germany

### Secretary and Treasurer

Peter Brown  
Hill House, Flag Hill, Great Bentley,  
Colchester, CO7 8RE, UK  
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

Javier Muzón  
Laboratorio de Biodiversidad y Genética Ambiental  
(BioGeA) – UNDAV  
Buenos Aires, Argentina

### Trustees

#### Editor, *Agrion* Newsletter

Keith Wilson  
Brighton, United Kingdom  
Email: kdpwilson at gmail.com

Christopher Beatty  
Cornell University  
Ithaca, New York, USA

Göran Sahlén  
Ecology and Environmental Sciences  
Halmstad University, P.O.Box 823  
30118 Halmstad, Sweden  
Email: goran.sahlen at hh.se

Mamoru Watanabe  
Lab. of Conservation Ecol., Institute of Biological  
Sciences, University of Tsukuba, Ibaraki 305-8572,  
Japan

#### Grant Coordinator

Göran Sahlén  
Email: goran.sahlen at hh.se

#### Social Media Coordinator

Manpreet K. Kohli  
Department of Biological Sciences, 431 Boyden Hall  
Rutgers University, 195 University Ave., Newark, NJ  
07102 USA  
Email: mkk24 at njit.edu  
[website](#)

#### Webmaster

Will Kuhn  
Discover Life in America (dlia.org)  
Gatlinburg, Tennessee, USA  
Email: willkuhn at crossveins.com  
[website](#)

## AGRION CONTENTS

Editor's notes	2
WDA Board 2019–2021	4
Letter sent to members from the WDA Board	6
Message from the President	7
International Congress of Odonatology 2019 in Austin, Texas	8
6 <sup>th</sup> DragonflySouthAsia Meeting	10
Field observation on water mite parasitism on two damselfly species in Protected Forest Management Unit Seluma, Bengkulu, Indonesia	14
Rapid Odonata Survey at Protected Forest Management Unit Seluma, Bengkulu Province, Sumatra	16
New additions to the checklist of dragonflies and damselflies of Nepal	21
An echo of Marguerite - Edmond de Selys Longchamps' heartfelt remembrances of his young daughter Marguerite (1848-1852) and its influence on the nomenclature of Odonata	24
In memoriam: Wolfgang Schneider Bidding farewell to Desert Wolf...	34
Bibliography of Dr. Wolfgang Schneider (1953-2019)	36
<i>Procordulia</i> sp. at the peak of Mount Talamau, West Sumatra, Indonesia	40
A new record and microhabitat of <i>Austrocordulia leonardi</i> (Anisoptera, Libelluloidea incertae sedis)	45
New Books & Reviews	48
Dragonflies and Damselflies of New Zealand	48
Die Eiszeitlibellen der Alten Welt: Pleistozäne Biogeographie Paläarktischer Libellen [Ice-Age Odonata of the Old World. The Pleistocene Biogeography of Palaearctic Dragonflies]	49
Dragonflies and Damselflies of Victoria & Tasmania - Book Review by Richard Rowe	50
Book review - The scientific names of North American dragonflies	52
The Damselflies and Dragonflies of Iran	55

Letter sent to members from the WDA Board

# WORLDWIDE DRAGONFLY ASSOCIATION



16 December 2019

Dear WDA Member,

Warm greetings from the WDA Board! We hope that you have had a good year! This summer was eventful for many, with odonatological meetings held in several locations, including the successful ICO held in Austin and organized by John and Kendra Abbott.

Over the past several years since contracting with Taylor and Francis, the publisher of our *International Journal of Odonatology*, membership admin has been difficult and some members have become frustrated with the renewal process. The issues were numerous and troublesome, and we lost many members through these difficulties.

This letter is to announce that we have taken back our membership! You can now join the WDA and renew your membership through our newly revamped website ([worlddragonfly.org](http://worlddragonfly.org)). For your convenience, you can set your membership to automatically renew every year. The updated site also features members-only content, like a membership directory where you can (optionally) add a profile and see what other WDA members are working on.

The first issue of the upcoming IJO volume 23 is devoted to odonate flight stemming from a special symposium held during ICO 2017 in Cambridge. Put together by Richard Rowe, this issue includes seven articles by 14 of the leading authors in the field and a tribute to Charlie Ellington. You won't want to miss this exciting issue!

IJO is just one of the many benefits of WDA membership, which include:

- access to *Agrion*,
- access to the *International Journal of Odonatology*,
- access to the past library of *Odonatological Abstracts*,
- access to the WDA Membership Directory,
- opportunity to apply for grants through WDA,
- starting in 2023, reduced member registration rates for ICO,
- and more to come!

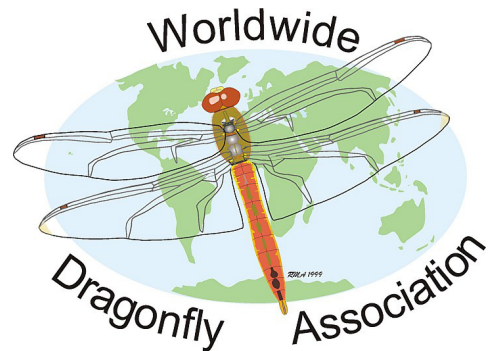
We sincerely hope that you will consider joining or renewing your membership ([worlddragonfly.org](http://worlddragonfly.org)), and we look forward to seeing you at the next International Congress of Odonatology, to be held in 2021 in Paphos, Cyprus ([worlddragonfly.org/meetings](http://worlddragonfly.org/meetings)). Please contact us should you have any questions or suggestions ([wda.secretary@gmail.com](mailto:wda.secretary@gmail.com)).

Sincerely,  
Your WDA Governing Board

The image shows eight handwritten signatures in blue ink, arranged in two rows. The first row contains four signatures, and the second row contains four signatures. Below the signatures in the second row are the names of the signatories: Will Kuhn, Manpreet, John C. Abbott, and Christopher Beatty.

Jessica Ware, Frank Suhling, Yoshitaka Tsubaki, John Abbott, Christopher Beatty, Peter Brown, Manpreet Kohli, Will Kuhn, Javier Muzon, Göran Sahlén, Mamoru Watanabe, Keith Wilson.

**Message from the President**  
Jessica Ware [jware42@andromeda.rutgers.edu]



Dear WDA members,

This year marks the start of the roaring twenties, a new decade of dragonfly & damselfly research and interest! With the start of a new year, and a new decade, we also have a new website and membership renewal portal! We hope that members will find this to be less cumbersome to navigate than previous membership renewal processes, and that WDA will continue to grow! Please join me in thanking Will Kuhn for his efforts to facilitate this transition, and the rest of the board for their work to make things as seamless as possible for members.

When I think of the roaring twenties, I can't help but think of Tillyard's book on Permian insects, which came out in 1925 (Tillyard, R.J., *Kansas Permian Insects. Part 5. The orders Protodonata and Odonata*. Am. J. Sci. 1925. 9:40-73). This volume was a treasure to read when I was a student, and I loved imagining him working away on his research while listening to Bessie Smith, Sophie Tucker or Tommy Dorsey on the Victrola! Sitting here in the early days of January 2020, I wonder whether Cynthia Longfield, a great odonatologist who was one of the first female members of the *Entomological Society of London* in 1925, was as excited about the start of a new decade as we are? As they wrote descriptions, drew meticulous diagrams of morphological features, and hypothesized about the evolution of Odonata surely Tillyard and Longfield might never have imagined all that WDA has done over the last twenty years and what we will do together over the next twenty!

A few housekeeping updates to report are as follows. First, please join me in welcoming Yoshi Tsubaki, who will be serving as president-elect. We also welcome to the board Chris Beatty, who will be serving as a trustee. In a different role but remaining on the board are Manpreet Kohli, who will be now serving as social media coordinator, and Peter Brown who will now be serving as treasurer and secretary. Second, we are looking for volunteers to help communicate our passion for odonates on social media. If you are interested in writing short posts about dragonflies or damselflies, or posting photos, trip logs, etc, for social media please contact Manpreet Kohli (MKK@njit.edu). Thirdly, thanks again for the amazing meeting this summer, planned by John and Kendra Abbott. Please start planning to join us for the excellent WDA meeting to be held in Paphos, Cyprus, in 2021, and organized by David and Ros Sparrow! Lastly, but most certainly not least, may I please take this moment to thank Frank Suhling for his service over the last two years as president of WDA. Thank you, Frank!

On behalf of the current WDA board, may I wish you a very happy and wonderful year!

Jessica Ware  
President, WDA  
Curator of Invertebrate Zoology, American Museum of Natural History, NY, NY

## International Congress of Odonatology 2019 in Austin, Texas

John Abbott [jabbott1@ua.edu]  
Alabama Museum of Natural History,  
The University of Alabama, Tuscaloosa, AL 35487

For the first time since 1999, the International Congress of Odonatology (ICO) was held in the United States. The 2019 ICO was based in Austin, Texas from July 14<sup>th</sup> through the 19<sup>th</sup>. Austin is the capital city of Texas, known for its welcoming feel and live music, it provided a great backdrop for the meeting. The main meeting location was the Palmer Events Center on Lady Bird Lake. The meeting was attended by over 70 students and researchers from all over the world. Participants originated from Australia, Brazil, Cameroon, Canada, China, Colombia, Cyprus, Czech Republic, France, Germany, Great Britain, Italy, Japan, Mexico, Netherlands, New Zealand, Nigeria, Puerto Rico, Spain and Taiwan with numerous participants from the United States.



Figure 1. Evening dinner cruise on Lady Bird Lake.

The meeting organizers put special emphasis on students for this Congress, working hard to get as many students as possible to attend and involving them throughout the meeting in new and creative ways. There were five plenary talks and 49 oral presentations organized into nine sessions. Focused sessions included the Future of Odonatology, Natural History of Odonata, Morphology & Biomechanics of Odonatology, Odonata without Borders and Odonata Outreach. There were also 11 poster presentations and three workshops (Direction of WDA and IJO; Dragonfly Nymphs: Basic Anatomy and Identification; What is an Acceptable Record? Species Richness and Standardization of jurisdiction Lists).

The mid congress dinner was a dinner river cruise on Lady Bird Lake to see the famous Mexican Free-tailed Bats that live under the Congress Street Bridge. The dinner was fun for all as they imbibed on Tex-mex food and local spirits.

The meeting ended with an optional field excursion to a local dragonfly hotspot, Southeast Metropolitan Park. Participants observed at least 30 species, including numerous clubtails. The list included: Blue-fronted Dancer (*Argia apicalis*), Powdered Dancer (*Argia moesta*), Blue-ringed Dancer (*Argia sedula*), Double-striped



Figure 2. ICO 2019 Group photo against Austin skyline.





Bluet (*Enallagma basidens*), Rambur's Forktail (*Ischnura ramburii*), Common Green Darner (*Anax junius*), Comet Darner (*Anax longipes*), Broad-striped Forcetail (*Aphylla angustifolia*), Jade Clubtail (*Arigomphus submedianus*), Flag-tailed Spinyleg (*Dromogomphus spinosus*), Eastern Ringtail (*Erpetogomphus designatus*), Four-striped Leaf-tail (*Phyllogomphoides stigmatus*), Russet-tipped Clubtail (*Stylurus plagiatus*), Swift River Cruiser (*Macromia illinoensis*), Prince Baskettail (*Epitheca princeps*), Halloween Pennant (*Celithemis eponina*), Banded Pennant (*Celithemis fasciata*), Checkered Setwing (*Dythemis fugax*), Black Setwing (*Dythemis nigrescens*), Eastern Pondhawk (*Erythemis simplicicollis*), Great Pondhawk (*Erythemis vesiculosa*), Widow Skimmer (*Libellula luctuosa*), Needham's Skimmer (*Libellula needhami*), Thornbush Dasher (*Micrathyria hagenii*), Roseate Skimmer (*Orthemis ferruginea*), Blue Dasher (*Pachydiplax longipennis*), Wandering Glider (*Pantala flavescens*), Spot-winged Glider (*Pantala hynenaea*), Eastern Amberwing (*Perithemis tenera*), Common Whitetail (*Plathemis lydia*), Black Saddlebags (*Tramea lacerata*), and Red Saddlebags (*Tramea onusta*).

Travel awards were provided to six young odonatologists to support their attendance at ICO 2019: Leocris Batucan, Jr (Taiwan), Cornelio Andrés Bota-Sierra (Colombia), Ashley C Mariani-Ríos (USA-Puerto Rico), Juliana Sandoval Hernandez (Colombia), Mónica Torres-Pachón (Mexico), and Yesenia M Vega-Sánchez (Mexico).

This meeting would not have happened without the help of a number of people. Specifically, the Congress Organization Committee: John Abbott (co-convener), Kendra Abbott (co-convener), Ola Fincke, Manpreet Kohli, Will Kuhn, Nancy McIntyre, and Jessica Ware. The Scientific Committee was made up of Nancy McIntyre (chair), Seth Bybee, and Ola Fincke. The Travel Awards Committee was made up of Kendra Abbott (chair), John Abbott, Manpreet Kohli, and Will Kuhn. As webmaster, Will Kuhn, also spent a great deal of time making everything happen smoothly online.

Finally, we are very appreciative of the financial support for student member attendance that was generously provided by the Dragonfly Society of the Americas (DSA), Gesellschaft deutschsprachiger Odonatologen (GdO), and Worldwide Dragonfly Association (WDA). In addition, the Texas Parks and Wildlife Department provided \$1,000 in financial assistance to help with the Congress.

We look forward to seeing everyone again in Cyprus at the 2021 Congress!



**Figure 3-6.** (3) Friday field trip participants lined up by sex and height (roughly) in an exercise conceived by Ola Fincke to show fitness. (4) Swift River Cruiser (*Macromia illinoensis*). (5) Four-striped Leaf-tail (*Phyllogomphoides stigmatus*). (6) Black Setwing (*Dythemis nigrescens*).

## 6<sup>th</sup> DragonflySouthAsia Meeting

Pankaj Koparde<sup>1\*</sup>, Neha Mujumdar<sup>2</sup>, Parag Rangnekar<sup>3</sup>, Amila Sumanapala<sup>4</sup>

<sup>1</sup>School of Ecology, Faculty of Social Innovation, Partnership, & Co-creation, MIT World Peace University, Kothrud, Pune, Maharashtra, India

<sup>2</sup>Bombay Natural History Society, Hornbill House, Shaheed Bhagat Singh Road, Mumbai, Maharashtra, India

<sup>3</sup>Foundation for Environment Research & Conservation, No. 407, III-A, Susheela Seawinds, Alto-Vaddem, Vasco-da-Gama-403 802, Goa, India

<sup>4</sup>Colombo University, Colombo, Sri Lanka

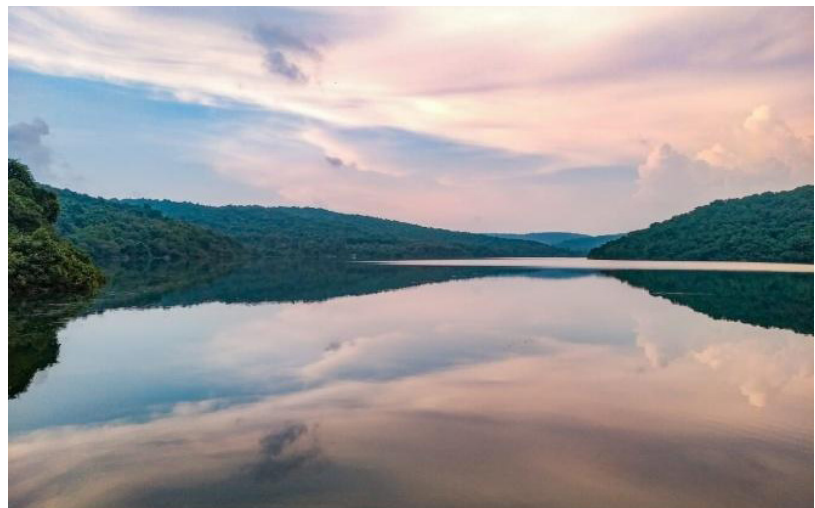
\*correspondence to [pankajkoparde@gmail.com]

The 6<sup>th</sup> DragonflySouthAsia Meet in association with DragonflySouthAsia, South Asian Council of Odonatology, DiversityIndia, and Sindhudurg Wetland Committee was conducted in Dhamapur village of Sindhudurg district of Maharashtra during 10<sup>th</sup> - 13<sup>th</sup> October 2019. Situated in the heart of the town, Dhamapur Lake (16.0414 N, 73.5923 E, 16 m asl) is an ancient human-made lake that is over 400 years old. The lake was built primarily for irrigation purposes, and the forest surrounding the lake was grown specifically to provide timber for building ships for the navy in the era of King Shivaji. Today, the Lake has become vulnerable to the pollution and ill effects of beautification. Hence there is an urgent need to work towards conservation of this habitat. Realizing the conservation needs of the region, DragonflySouthAsia meeting was held in Dhamapur to document local biodiversity as well as educate the masses about dragonflies. In total, 24 participants from India and Sri Lanka attended the meeting.

### Habitats Surveyed

Dhamapur village and surroundings host a diversity of habitats such as tropical moist deciduous and semi-evergreen forest, low elevation lateritic plateaus, seasonal and perennial forest streams, paddy fields, and grasslands. During the four-day-long meeting and workshop, we covered static water bodies such as lakes, marshlands and lotic systems such as streams feeding to the local rivers. On day one, participants surveyed different areas of the lake such as moist deciduous, marshes, and streams along one bank and paddy fields and open grassland areas on the other side (Figures 3, 4). In the following days, we covered streams fed by the lake, Thakurwadi Lake, and streams feeding into Kasartaka River (Figure 5). Night trails were also conducted for herpetofauna and nocturnal birds.

The success of the meet was on various scales this year. In all, we documented 62 species of odonates, 90 avian species, 49 butterflies, 16 species of herpetofauna, and six mammals. We could make at least 110 people aware of the local biodiversity, especially the odonates. In the meet, we came across a few unidentified species



Figures 1-2. (1) Satellite map of Dhamapur Lake, Sindhudurg, Maharashtra. Credit: Google Earth. (2) Dhamapur Lake and surrounding forest.



Figures 3-6. (3) Participants of DragonflySouthAsia Meeting 2019. (4-6) School interaction by Pankaj Koparde and Neha Mujumdar with Shivaji Vidya Mandir, Kalase school kids, Dhamapur village kids, and school children from Eureka Science Club, Kankavli.

such as one *Gynacantha* sp. that most resembled *G. khasiaca* known from the Khasi Hills of Meghalaya and a *Platylestes* cf. *platystylus*. *Gynacantha* c.f. *khasiaca* (Khasi Darner) and *Platylestes* cf. *platystylus* are probable new records for the state. All these species were found in streams and marshy areas in and around the lake.

### Indoor Sessions

Experts studying different aspects of odonates (dragonflies & damselflies) conducted indoor sessions for the participants, as many of them were beginners. Our schedule included presentations on the introduction to odonates and field identification on the first day so that participants were prepared for the field observations. On day one, Pankaj Koparde covered the introduction, evolution of the odonates and hands-on taxonomy session, and Parag Rangnekar took photography of odonates as it is an essential tool for identification of species. On the second day, Parag Rangnekar taught core taxonomy (Figure 6), followed by a talk by Amila Sumanapala on Sri Lankan odonates. We had also arranged participants' presentations in which Vivek Chandran (Kerala), Dattaprasad Sawant (Maharashtra), and Dheerendra Singh (Rajasthan) presented their work. On day three, behavioural aspects were covered by Neha Mujumdar, followed by sessions on research methods and ethics by Pankaj Koparde (Figure 6). On the last day, we had detailed discussions on Odonata conservation and the role of citizen science in conservation, how to practice citizen science and use of mobile apps in the same (Figure 7). This year we made the conference highly sustainable, avoiding usage of flex, printed material, teacups, and plastic wrappings, bottled water, etc. We provided e-certificates to participants, which they can print, if required.

### Outreach Programs

This year's meet was unique as we conducted not just the field and class sessions but also outreach programs for local people, especially school children. On the second day, two experts, Pankaj Koparde and Neha Mujumdar, conducted an outreach program for school children of Kalse village. Nearly 70 kids from 7<sup>th</sup> to 9<sup>th</sup> standard attended the talk in which we discussed Odonata biology. The kids enthusiastically showed us the odonates in the field after the discussion and were keen on learning more about them. The following day Pankaj Koparde led another outreach session arranged by Mr. R. B. Sawant in which students from nearby villages, as well as local people of varied age groups (20 - 80 years), took part (Figure 8). Kids from Eureka Science Club, Kanakvali, came from the neighbouring town to participate in the outreach program.

The conservation of Dhamapur Lake is essential as many locals depend on it being a significant source of water. Documentation of biodiversity around this lake and other parts of Dhamapur will undoubtedly help to increase knowledge on the local biodiversity and to understand how we should channelize our efforts for its conservation. This was a first attempt to survey and document the biodiversity of this region, focusing mainly on odonates. Local newspapers covered the story on the same.



Figures 7-9. (7). Fieldwork interaction by Pankaj Koparde and Neha Mujumdar with Shivaji Vidya Mandir, Kalase school kids. (8-9) Indoor sessions in the workshop. Pankaj Koparde explained research methods in Odonatology (left), and Parag Rangnekar taught hands-on taxonomy to participants (right).

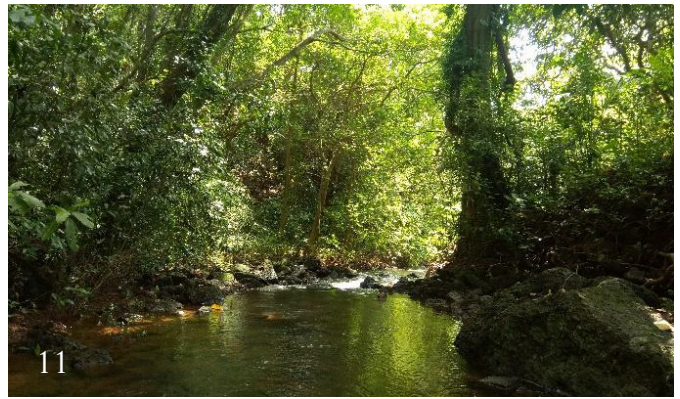


Figure 10-17. (10-11) Stream with dense canopy cover, flowing long Dhamapur Lake. (12-13) Participants looking for odonates in marshy habitat around Dhamapur Lake. (14-15) Stream at Kasartaka (left) and Lake at Thakurwadi (right). (16) *Pseudagrion malabaricum* male. Credit: Pankaj Koparde. (17) Sindhudurg Marsh Dart (*Ceriagrion chromothorax*) male. Credit: Dattaprasad Sawant.

## Field observation on water mite parasitism on two damselfly species in Protected Forest Management Unit Seluma, Bengkulu, Indonesia

Muhammad N. Janra<sup>1\*</sup>, David Gusman<sup>2</sup>, Agus Susanto<sup>2</sup>, Haryanto Yatap<sup>2</sup>,  
Aning Fahrudin<sup>2</sup>, Faizal Andriyansyah<sup>2</sup>, Atet Prameswara<sup>2</sup> & Henny Herwina<sup>1</sup>

<sup>1\*</sup>The Biology Department, Andalas University, Jalan Kampus Unand Limau Manis Pauh,  
Padang, West Sumatra 25163, Indonesia [mnjanra@sci.unand.ac.id]

<sup>2</sup>The Office of Environment and Forestry, Bengkulu Province,  
Jl. Pembangunan Simpang Padang Harapan, Bengkulu City

During our Odonata survey at Puguk site in Protected Forest Management Unit (PFMU) Seluma, Bengkulu from 7-9 September 2019, we observed parasitism cases on at least three individuals of damselflies. Two individuals of *Euphaea variegata* and one *Heliocypha angusta angusta*, all males, were seen invested with water mites (Hydracarina). Mite infestations were centred on the ventral thorax of the damselflies. Simple counting on the lateral view, multiplied by two, on photographs of infested *Euphaea variegata* and *Heliocypha angusta angusta* resulted in approximately 44 and 10 mites on each respective damselfly (see Figure 1). No mite infestations were detected on any odonate at Lubuk Resam.



Figure 1-2. Damselflies with water mites on its ventral thorax (1A,B) *Euphaea variegata*, (2A,B) *Heliocypha angusta angusta*.

As aquatic organisms, water mites spend their larval stage as parasites on many insects that associate with water bodies; they infest odonates at the nymph stage or sometimes stay until the imaginal stage (Zawal 2006, Baker et al. 2007). More than 55 water mites from the genus *Arrenurus* have been described and detected to exclusively associate with Odonata as their ectoparasites (Corbet 1999, Andrew et al. 2015). This genus is widely distributed, using their host odonates as food and dispersal apparatus (Andrew et al. 2012). Hence, we are inclined to think that the mites we saw on some damselflies in Puguk site belong to this genus.

Water mites usually grow through a cycle consisting of egg, inactive prelarvae, larvae, protonymph, deutonymph, tritonymph and adult; only in larval stage, water mites behave as parasites on other insects (Smith 1988). The choice of host, such as *Euphaea variegata* and *Heliocypha angusta angusta*, may ease their return to the water body whenever their parasitic life is ended. These two damselflies were observed to have close affinity with stream and river, as they perch mostly on rocks, bushes or other places near the water. Some works regarding water mite parasitism on odonates found that there is no significant difference between males and females to be infested (such as Abro 1990, Forbes et al. 2004, Ilvonen et al. 2015), although our observation only involved males. A common thought on this mite parasitism, which may contradict the finding of most researches, is that they tend to choose female odonates for bigger size than males and provide a larger food resource and more movement that helps mite dispersal.

It is quite difficult to reveal the actual condition of parasitism in PFMU Seluma from our chance observation, especially as we did not collect any infested individual. However, it shows that Odonata parasitism is also ongoing in a tropical region such as Indonesia. However, parasitism on Odonata probably receives a lack of attention among the emergence of interests on Indonesian odonates from local researchers and practitioners; we could not find any reference from within this geographical boundary during the preparation of this manuscript. Therefore, we would like to encourage more surveys, researches and studies on various aspects of Indonesian odonates in the immediate future.

### Acknowledgement

We would like to acknowledge the administrative assistance during the implementation of survey in PFMU Seluma; Head of Office of Environmental and Forestry in Bengkulu Province, the Head of PFMU Seluma, Headman of Puguk and Village Head of Lubuk Resam. To all field personnel in this survey: Agustian Armidi, Agustini, Ardi Kurniawan, Sekwandi, Antoni Wijaya, Supriyanto, Okto Arif Bu Azis, Rengga A. Putra, Hairi and Ovet Putra from Office of Environmental and Forestry in Bengkulu Province; Immer Nainggolan, Shandi Fernando Iswanto, Edo Rizki Putra, Yusuf Bahyar from PFMU Seluma; Farhan Abdurrazaq, Riko Adrian Saputra and Fitri Syofura from Bengkulu University. This survey was financed through the scheme “Kegiatan Inventarisasi Keanekaragaman Hayati (KEHATI) KPHL Seluma No DPPA 2.05.2.05.01.05.39 Year 2019.”

### Reference

- Abro, A., 1990. The impact of parasites in adult population of Zygoptera. *Odonatologica* 19: 223-233.
- Andrew, R.J., N.R. Thaokar & P.R. Verma, 2012. Ectoparasitism of Anisopteran dragonflies (Insecta: Odonata) by water mite larvae of *Arrenurus* spp. (Arachnida: Hydrachnida: Arrenuridae) in Central India. *Acarina* 20(2): 194-198.
- Andrew, R.J., P.R. Verma & N.R. Thaokar, 2015. A parasitic association of Odonata (Insecta) with *Arrenurus* Dugés, 1834 (Arachnida: Hydrachnida: Arrenuridae) water mites. *Journal of Threatened Taxa* 7(1): 6821-6825.
- Baker, R.A., P.J. Mill & A. Zawal, 2007. Mites on Zygoptera, with particular reference to *Arrenurus* species selection sites and host preferences. *Odonatologica* 36(4): 339-347.
- Corbet, P.S., 1999. *Dragonflies: Behavior and Ecology of Odonata*. Harley Books, Great Horkesley, England.
- Forbes, M.R., K.E. Muma & B.P. Smith, 2004. Recapture of male and female dragonflies in relation to parasitism by mites, time of season, wing length and wing cell symmetry. *Experimental and Applied Acarology* 34(1-2): 79-93.
- Ilvonen, J.J., K.M. Kaunisto & J. Suhonen, 2015. Are sexes equally parasitized in damselflies and dragonflies? *Oikos* 125: 315-325.
- Smith, B.P., 1988. Host-parasite interaction and impact of larval water mites on insects. *Annual Review of Entomology* 33(1): 387-507.
- Zawal, A., 2006. Parasitizing of dragonflies by water mite larvae of the genus *Arrenurus* in the neighborhood of the Barlinek (NW Poland). *Zoologica Poloniae* 49: 37-45.

## Rapid Odonata Survey at Protected Forest Management Unit Seluma, Bengkulu Province, Sumatra

Muhammad N. Janra<sup>1\*</sup>, David Gusman<sup>2</sup>, Agus Susanto<sup>2</sup>, Haryanto Yatap<sup>2</sup>, Ading Fahrudin<sup>2</sup>, Faizal Andriyansyah<sup>2</sup>, Atet Prameswara<sup>2</sup> & Henny Herwina<sup>1</sup>

<sup>1</sup>The Biology Department, Andalas University, Jalan Kampus Unand Limau Manis Pauh, Padang, West Sumatra 25163, Indonesia [mnjanra@sci.unand.ac.id]

<sup>2</sup>The Office of Environment and Forestry, Bengkulu Province, Jl. Pembangunan Simpang Padang Harapan, Bengkulu City

### Abstract

A survey on the diversity of Odonata at Protected Forest Management Unit Seluma in Bengkulu Province, Sumatra was undertaken over five days between 7-14 September 2019 by conducting observations at suitable habitats for dragonflies. The survey recorded 34 dragonfly and damselfly species, with some notable records that emphasize the value of this site as a conservation area. The results will be useful as a baseline for future work on Odonata at this site as well as in Bengkulu province.

### Introduction

It is predicted that the Oriental, Australasian and Neotropical regions hold some undescribed dragonfly species (Kalkman et al. 2008). It is an indirect inference that these regions are indeed rich with Odonata diversity and areas within them remain unexplored. On the other hand, Indonesia is thought to have around 800 species of dragonflies from a total of approximately 7000 world Odonata species (Silsby 2001, Alfariysi 2017). This country constantly suffers from habitat destruction such as deforestation which directly impacts its biodiversity (Margono et al. 2014), demanding continuous effort in investigating the actual richness of its nature including the odonates.

In this paper we present the results of rapid surveys on dragonflies undertaken at two sites in Protected Forest Management Unit (PFMU) Seluma in Bengkulu Province, Indonesia. This part of Sumatra island receives less attention for its Odonata diversity, as most studies on Sumatran dragonflies seem to be focused at the northern,

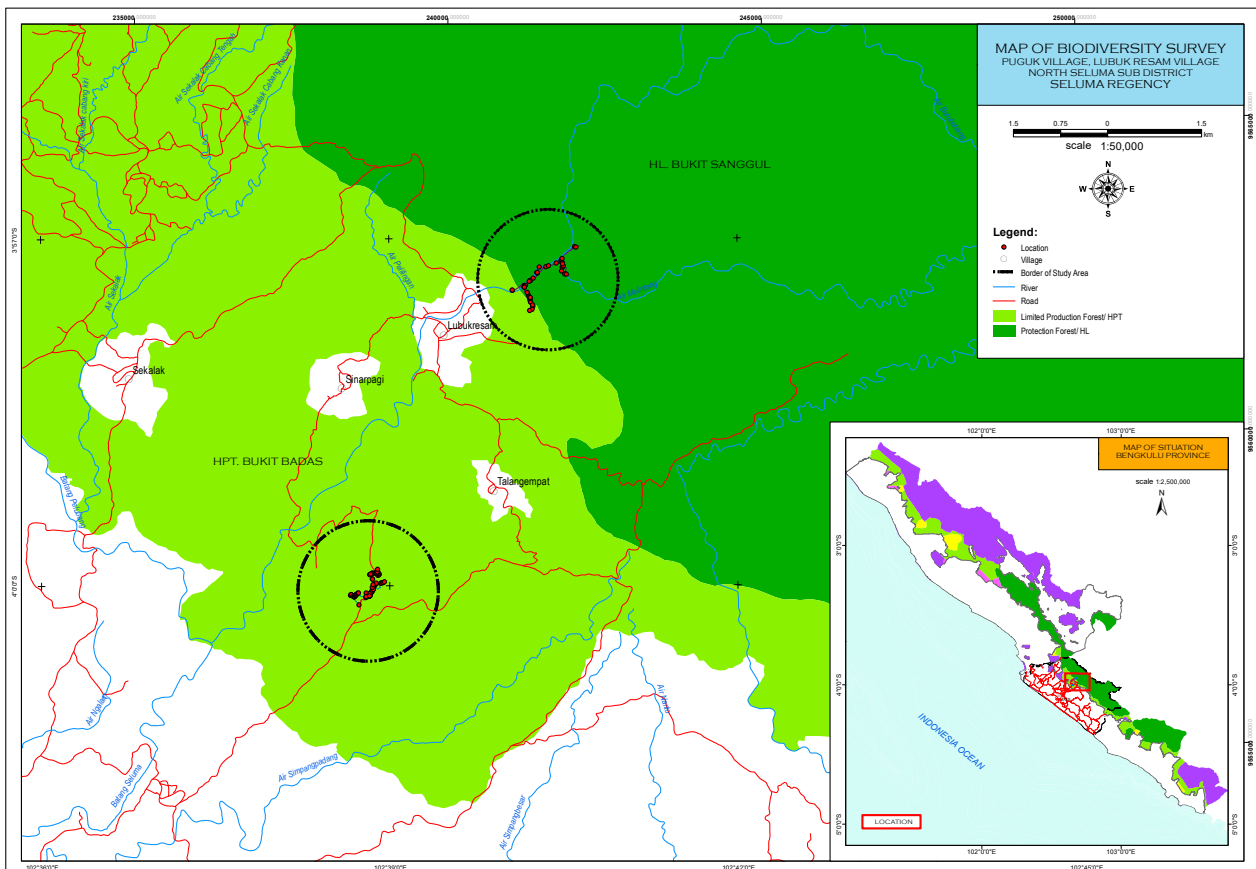


Figure 1. Map of survey sites in PFMU Seluma, Bengkulu Province.





Figure 2-7. (2) Lubuk Resam River in the second survey site. (3) Habitat of sighted *Drepanosticta* sp. (4) Collection method for Odonata using insect net. (5) Female *Anax* cf *panybeus*. (6) *Drepanosticta* sp. (7) Male *Heliocypha angusta angusta*.

southern and eastern regions of Sumatra, including at its offshore islands (Janra et al. *in prep*). The similarity of geographical features of the mainland portion of this province with its neighbouring provinces may make it less appealing as a wildlife research site. For instance, the Kerinci Seblat National Park is more accessed for various research purposes from Sungai Penuh in Jambi Province, albeit parts of the administrative area of Bengkulu are also included in this national park. This, however, should not lessen the meaning of this province for its scientific significance.

The PFMU Seluma is located in Seluma Regency, Bengkulu Province at the geographical coordinates 3°48'03"- 4°12'48" S and 102°33'20"-102°59'58" E. It covers 82,242 ha forested land that functions mainly as protected forest as well as for limited productive forest (The Office of Environment and Forestry of Bengkulu Province 2016). The PFMU Seluma is projected to be a pilot project where the conservation and sustainable utilization of forest are expected to go in harmony. Hence, thorough knowledge on the biodiversity in this area becomes essential.

Dragonflies play important environmental roles, such as being predators that balance the overall composition of insects in nature as well as functioning as an excellent indicator for clean aquatic habitats (Strong et al. 1984, Silsby 2001, Setiyono et al. 2017). Therefore, including Odonata as part of biodiversity survey matter will perfectly synchronize with the management plan of PFMU Seluma.

The Odonata survey at PFMU Seluma was conducted during six field days between 7-14 September 2019 in two sites within the area; Puguk (4° 0' 4.23" S, 102° 38' 50.27" E, 445 m asl) and Lubuk Resam (3° 57' 21.906" S, 102° 40' 17.1408" E, 343 m asl). Odonates were spotted and recorded following available pathways along the rivers, tributaries and under forest canopy. Forest in both sites has been interspersed with openings created from selective logging and perennial cultivation. The survey involved specimen collection and a photographic approach to inventory dragonfly species (see Janra 2010). The second technique was more preferable to minimize impact on the local dragonfly community; however, specimen collection was sometimes inevitable for species that are unidentifiable remotely. Samples were caught using insect net and sometimes by bare hand, then stored in triangle-folded papers, soaked with acetone while in the field before later being processed in the entomology laboratory of Andalas University in Padang, West Sumatra.

## Result and discussion

The survey recorded thirty-five Odonata species belonging to seven families of Zygoptera and three families of Anisoptera within five effective days of survey (see Appendix 1). This number may look small compared to the total species of Sumatran Odonata; however, it still gives a meaningful contribution to the biodiversity database of Bengkulu. It does, in fact, provide a baseline for future reference on the dragonflies in this province.

An interesting sighting was on an individual of *Drepanosticta* sp recorded at Puguk, from a small stream bordering traditional coffee plantation with secondary growth. A male individual was perching under the shaded bushes near the bank of a rocky stream. The habitat where this individual was sighted was in accordance with that described for this genus by Silsby (2001): woodland stream with mossy banks, sometimes in the swampy area feeding into the stream in tropical forests. The species in this genus generally wander closely to their breeding area. It was the only observation on this genus made during the survey.

The highlight species in this survey was probably goes to *Devadatta argyroides*. A female of this stout damselfly was observed perching on a hanging vine right on a small pathway within the wood, not very far from a big river in Lubuk Resam. Since this species requires good forest as its habitat, we may expect to find more species from this genus from PFMU Seluma or other area in Sumatra. *Devadatta* was previously included as a



Figure 8-9. (8) *Devadatta argyroides*. (9) *Cratilla metallica*.

member of Amphipterygidae, but later separated into a stand-alone family, Devadattidae with a single genus distributed from southern China to Southeast Asia including Sumatra (Silsby 2001, Dijkstra et al. 2014). Some new species from this genus were recently described from Borneo using molecular technique, as morphological features are somewhat unreliable to determine its species (Dow et al. 2015).

The survey also observed abundant *Helioocypha angusta angusta* along the streams, rivers and tributaries within the survey sites. This species is easily recognized from the patterns of vitreous fenestrae in its partial opaque hindwings (wing and other body parts detailed in Hämäläinen 2016). Altogether with *Libellago hyalina*, which frequents the same habitat, they represented two of fifteen known species and subspecies of Sumatran chlorocyphid. Other significant sightings were *Cratilla metallica* and *Anax panybeus*, each observed once during the survey at high canopy and under canopy respectively. The first species was observed in abundance in Jambi (Janra pers. obs.), however, many observations from other parts of Sumatra denoted it as a rare sighting (such as Dow et al. 2018). This species was recently sighted in Padang, West Sumatra (Janra pers. obs.). The only individual *Anax panybeus* observed in this survey was a female, sighted during the afternoon when it was spotted flying from across the river in Lubuk Resam before it perched vertically under a tree branch, 100 meters from our camp site. This later species was recently found in other parts of Southeast Asia, and South Asia but proposed to be Critically Endangered, at least in Singapore (Soh et al. 2018).

## Conclusion

At present, the checklist of Odonata from PFMU Seluma is just started to be compiled and is far from complete. Furthermore, it only represents a small part of the overall dragonfly diversity in Bengkulu province. More contributions to complete the inventory of dragonfly for this province and Sumatra in general are called for. Some species recorded in this survey are considered significant to assist in quantifying the value of PFMU Seluma as a conservation area. Despite its incompleteness, this result provides a robust baseline for future Odonata works in Bengkulu Province and Sumatra in general.

## Acknowledgement

Our gratitude to Rory A. Dow and some anonymous persons from Indonesia Dragonfly Society for their insightful help on species identification. We acknowledge the following persons for their assistance on administrative affairs regarding the implementation of survey in PFMU Seluma: Head of Office of Environmental and Forestry in Bengkulu Province, the Head of PFMU Seluma, Headman of Puguku and Village Head of Lubuk Resam. We also thank the field personnel in this survey: Agustian Armidi, Agustini, Ardi Kurniawan, Sekwandi, Antoni Wijaya, Supriyanto, Okto Arif Bu Azis, Rengga A. Putra, Hairi and Ovet Putra from Office of Environmental and Forestry in Bengkulu Province; Immer Nainggolan, Shandi Fernando Iswanto, Edo Rizki Putra, Yusuf Bahyar from PFMU Seluma; Farhan Abdurrazaq, Riko Adrian Saputra and Fitri Syofura from Bengkulu University. The field survey was financed through the scheme of Kegiatan Inventarisasi Keanekaragaman Hayati (KEHATI) KPHL Seluma No DPPA 2.05.2.05.01.05.39Year 2019.

## References

- Anon., 2016. *Long-term Management Plant for Protected Forest Management Unit IV Seluma*. The Office of Environment and Forestry of Bengkulu Province, Bengkulu.
- Dow, R.A., A.D. Advento, E.C. Turner, J-P. Caliman, W.A. Forster, M. Naim, J.L. Snaddon & Ps. Sudharto, 2018. *Odonata from the BEFTA Project area, Riau Province, Sumatra, Indonesia*. Faunistic Studies in Southeast Asian and Pacific Island Series. Odonata Journal of the International Dragonfly Fund Vol. 24, pp 1-22.
- Hämäläinen, M, 2016. Description of *Helioocypha vantoli* spec. nov. from Siberut in the Mentawai Islands (Odonata: Chlorocyphidae). *Zootaxa* 4079(4): 495-500.
- Janra, M.N., 2018. Inventory of dragonflies and damselflies (Odonata) in Andalas University's Limau Manis Complex, Padang: Using photographic approach. *Jurnal Natural* 18(2): 89-96
- Kalkman, V.J., V. Clausnitzer, K.B. Dijkstra, A.G. Orr, D.R. Paulson and J. van Tol, 2008. Global diversity of dragonflies (Odonata) in freshwater. *Hydrobiologia* 595: 351-363.
- Margono, B.A., P.V. Potapov, S. Turubanova., F. Stolle & M.C. Hansen, 2014. Primary forest cover loss in Indonesia over 2000-2012. *Nature Climate Change* 4: 730-735
- Setiyono, J., S. Diniarsih, ENR. Oscilata & N.S. Budi, 2017. *Dragonflies of Yogyakarta. Jenis Capung Daerah Istimewa Yogyakarta*. Indonesia Dragonfly Society, Yogyakarta.
- Silsby, J., 2001. *Dragonflies of the World*. Smithsonian Institution Press, Washington D.C.
- Soh, J., G. Leng, SKb. Muhammad Fawzi, N. Thomas & RWJ. Ngiam, 2018. New record of the dragonfly, *Anax panybeus*, in Singapore. *Singapore Biodiversity Records* 2018: 19-21.
- Strong D.R., J.H. Lawton & R. Southwood, 1984. *Insects on Plants*. Harvard University Press, Boston.

**Appendix 1. List of odonata recorded during survey at PFMU Seluma, Bengkulu.**

No	Family	Species	Habitat
1	Platystictidae	<i>Drepanosticta</i> sp	River, tributary
2	Calopterygidae	<i>Vestalis chinensis</i>	River, tributary
3		<i>Vestalis luctuosa</i>	River, tributary
4	Chlorocyphidae	<i>Heliocypha angusta angusta</i>	River, tributary
5		<i>Libellago lineata</i>	River, tributary
6	Devadattidae	<i>Devadatta argyroides</i>	Under canopy
7	Euphaeidae	<i>Dysphaea dimidiata</i>	Tributary
8		<i>Euphaea variegata</i>	River, tributary
9	Platycnemididae	<i>Coelliccia membranipes</i>	Bush, tributary
10		<i>Copera marginipes</i>	Bush, tributary
11		<i>Nosoticta insignis</i>	Tributary
12		<i>Prodasineura verticalis</i>	River, tributary
13	Coenagrionidae	<i>Argiocnemis rubescens</i>	Bush, tributary
14		<i>Ischnura senegalensis</i>	Bush, tributary
15		<i>Pseudagrion pruinosum</i>	Tributary
16	Aeshnidae	<i>Anax panybeus</i>	Under canopy
17	Gomphidae	<i>Ictinogomphus decoratus</i>	Pond, river
18	Libellulidae	<i>Brachydiplax chalybea</i>	Pond
19		<i>Cratilla metalica</i>	Under canopy
20		<i>Crocothemis servilia</i>	Agricultural area
21		<i>Diplacodes trivialis</i>	River, tributary, agricultural area
22		<i>Lathrecia asiatica</i>	Agricultural area
23		<i>Neurothemis ramburii</i>	River, tributary, agricultural area
24		<i>Neurothemis terminata</i>	River, tributary, agricultural area
25		<i>Onychothemis culminicola</i>	River, tributary, agricultural area
26		<i>Orthetrum crysis</i>	River, tributary, wood
27		<i>Orthetrum glaucum</i>	River, agricultural area
28		<i>Orthetrum pruinosum</i>	River, agricultural area
29		<i>Orthetrum sabina</i>	Settlement, agricultural area
30		<i>Orthetrum testaceum</i>	River, pond, bush
31		<i>Pantala flavescens</i>	River, bush, wood
32		<i>Potamarcha congener</i>	Agricultural area
33		<i>Tholymis tillarga</i>	Settlement, agricultural area
34		<i>Tramea transmarina</i>	River, bush
35		<i>Trithemis festiva</i>	River

## New additions to the checklist of dragonflies and damselflies of Nepal

Karen L. Conniff<sup>1</sup>, Milan Aryal<sup>2</sup>, Sajan KC<sup>3</sup>, & Antoine van der Heijden<sup>4</sup>

<sup>1</sup>ICIMOD GPO Box 3226 Kathmandu, Nepal;

[karoconniff@gmail.com]

<sup>2</sup>Butwal-11, Devinagar, Rupandehi

[aryalmilan100@gmail.com]

<sup>3</sup>Pokhara Nepal

[sajankc143@gmail.com]

<sup>4</sup>Oosterbierum, Netherlands

[odonatophilic@gmail.com]

<sup>1</sup>Corresponding author: [karoconniff@gmail.com]

### Abstract

Thirty years ago a comprehensive checklist of Nepal Odonata was published by Graham Vick (1989). Since that time several new species have been found and described from Nepal bringing the list to 176 species. Here we publish details on another eight species new to the list of dragonflies and damselflies of Nepal (*Aciagrion approximans*, *Agriocnemis femina*, *Sarasaeschna spec1*, *Sarasaeschna spec2*, *Burmagomphus spec*, *Aethriamanta brevipennis*, *Onychothemis testacea*, *Rhodothemis rufa*).

Further key words. Anisoptera, Dragonfly, Zygoptera, Damselfly

### Introduction

It has been thirty years since Vick (1989) published the first Odonata checklist of Nepal. At that time, he recorded 172 species. His checklist was based on his own field data, local collections and previous published records and included a list of 113 references containing information on the dragonflies and damselflies of Nepal. Changes in taxonomy and nomenclature of species occurring in Nepal have been made and published over time, but only a few publications included records of species previously unrecorded for Nepal. These include: Kemp & Butler (2007: description of *Gomphidia t-nigrum* from Pokhara), Conniff & Limbu (2018: *Microgomphus phewataali* described from Nepal), Sharma et al (2018: *Bradinopyga geminata* new to Nepal), Aryal (2019: *Ischnura nursei* new to Nepal). In this paper we list additional records based on photographs for *Bradinopyga geminata* and five species as new to the fauna of Nepal. In addition, we provide information on two species of *Sarasaeschna* and a species *Burmagomphus* which do not fit any of the species currently known from Nepal and which might very well constitute species new to science. As these records are only based on photographs, we refrain from formally describing these.

### Methods

The records of species new to Nepal are from the Terai region of Nepal, the central mid-hills, and one from above 2000 m at Daman. Dates of records are given along with the location and elevation. All records are from photographs taken by the authors with credit noted.

### New records

1. *Aciagrion approximans approximans* (Selys 1876) – 4♂ Dipang Taal Pokhara. Located on the south side of the lake near a small fishery (28°10'42"N, 84°04'07"E, 700m a.s.l.), date 09-iv-2019. KC & SKC.
2. *Agriocnemis femina* (Brauer 1868) – 2♂ Parsa Wildlife Preserve Terai (27°28'58"N, 84°49'12"E, 397m a.s.l.), date 5-iii-2017; Haldi Bari, Jhapa district 26°33'22"N, 88°01'05"E 99m a.s.l.), date 04-ix-2019. KC.
3. *Aethriamanta brevipennis brevipennis* (Rambur 1842) – 2♂ Bis Hajar Taal Chitwan (27°37'04"N, 84°26'15"E 202m a.s.l.), date 24-vii-2012; 5♂ 2♀ Pokhara (28°13'16"N, 83°56'59"E, 800m a.s.l.), date 20-viii-2019. KC.
4. *Sarasaeschna spec 1*. - 1♀ Godavari Knowledge Park 2013 (27°35'39"N, 85°23'19"E, 1571 m a.s.l.), date 05-v-2012. KC.
5. *Sarasaeschna spec 2*. – 1♂ Sim Bhanjang Sim Khola (27°35'36"N, 85°04'54"E, 2450m a.s.l.), date 04-vii-2015. KC.
6. *Burmagomphus spec* - 2♂ 1♀ Karuniala branch of Karnali River in Bardiya District south of Chisapani Bridge (28°37'51"N, 81°16'44"E, 200m a.s.l.), date 10-x-2019. KC



Figure 1-8. (1) *Aciagrion approximans approximans*, ♂ Dipang Taal Pokhara. (2) *Agriocnemis femina*, ♂ Haldi Bari Bitamod Jhapa. (3) *Aethriamanta b. brevipennis*, ♂ Wetlands west Pokhara. (4) *Onychothemis testacea*, ♀ Chitwan National Park. (5) *Rhodothemis rufa*, ♀ Bis Hajar Taal Chitwan. (6) *Sarasaeschna* sp. 1., ♀ Godavari. (7) *Burmagomphus* sp., ♂ Bardiya National Park. (8) *Burmagomphus* sp., ♀ Bardiya National Park.

7. *Bradinopyga geminata* (Rambur, 1842) - 2♂ Patan Durbar Lalitpur (27°40'19"N, 84°19'34"E, 1319m a.s.l.), date 13-x-2011; 2♀ Parsa Wildlife Preserve, forestry office (27°30'07"N, 84°50'06"E, 318m a.s.l.), date 04-iii-2017; 2♀ Rani Mahal Kali Gandaki River Tansen (29°55'36"N, 83°31'40"E, 452m a.s.l.), date 21-viii-2019. KC.

8. *Onychothemis testacea* Laidlaw 1902 - 1♀ Chitwan National Park (27°33'52"N, 84°28'09"E, 191m a.s.l.), date 10-v-2018. Recorded by Antoine van der Heijden.

9. *Rhodothemis rufa* (Rambur 1842) 2♀, 4♂ Bis Hajar Taal Chitwan (27°37'04"N, 84°26'15"E 202m a.s.l.), date 42-vii-2012 KC. 2♂ Haldi Bari Jhapa district Eastern Terai (26°33'22"N, 88°01'05"E 99m a.s.l.), date 09-ix-2019. KC.



Figure 9. *Sarasaeschna* sp. 2., ♂ Sim Bhanjang Sim Khola.

## Discussion

*Bradinopyga geminata* was not included in the checklist of the Odonata of Nepal published by Vick (1989). The species was first listed for Nepal by Sharma et al 2018 and has since 2011 been recorded at several localities in the Kathmandu Valley. The two species of *Sarasaeschna* and the species *Burmagomphus* are only recorded by photographs and no voucher is available. None of them match with species known from Nepal and it is not unlikely that the *Burmagomphus* and one or maybe even two of the *Sarasaeschna* are new to science. However, without vouchers it is impossible to determine this with certainty. These records show that additional field work is needed to fully describe the diversity of damselflies and dragonflies found in Nepal. The other five species found new to Nepal (*Aciagrion approximans*, *Agriocnemis femina*, *Aethriamanta brevipennis*, *Onychothemis testacea*, *Rhodothemis rufa*) are all common and widespread Oriental species whose occurrence in Nepal is no surprise. Several of the records presented are from National Parks or Ramsar Sites and indicate a need to further study the Odonate fauna in the parks where habitats are less likely to be affected by human interventions. All over Nepal destruction of rivers for sand mining and hydropower has affected invertebrate populations. The first author has noted the destruction of many wetlands and riverine habitats visited over the past eight years, so the National Parks are particularly valuable for the preservation of species and diversity.

## References

- Aryal, M., 2019. A note on *Ischnura nursei* (Morton, 1907): The first record from Nepal (Zygoptera: Coenagrionidae). *Bionotes* Vol. 20(2): 37-40.
- Conniff, K. & M. Singh Limbu, 2018. Description of *Microgomphus phewataali* sp. nov. from Nepal (Odonata: Gomphidae). *Odonatologica* 47(3/4): 277-288.
- Kemp, R. & S.G. Butler, 2001. Some dragonfly records from Phewa Tal, Pokhara, Nepal, with notes on *Phyloganga montana* (Selys) (Zygoptera: Amphipterygidae). *Notulae Odonatologica* 5 (7): 88-91
- Sharma, M, B.R. Oli, S. Awasti, N. Subedi & P.R. Pokhrel, 2018. Dragonflies and Damselflies (Insecta: Odonata) of western Nepal: A checklist. *International Journal of Fauna and Biological Studies* 5(6): 140-146
- Vick, G., 1989. List of the dragonflies recorded from Nepal, with a summary of their altitudinal distribution (Odonata). *Opuscula zoologica fluminensia* 43: 1-21

**An echo of Marguerite -  
Edmond de Selys Longchamps' heartfelt  
remembrances of his young daughter Marguerite (1848-1852)  
and its influence on the nomenclature of Odonata**

**Matti Hämäläinen [matti.hamalainen@helsinki.fi],  
Karin Verspui [karin.verspui@gmail.com] &  
Albert G. Orr [agorr@bigpond.com]**

**Abstract**

In the calopterygid damselfly *Echo margarita* Selys, 1853, both the generic name *Echo* and the specific name *margarita*, are demonstrated to be eponyms given *in memorium* to Selys' lost daughter Marguerite (1848-1852), who died in early childhood. The binomial name signifies 'memory' of Marguerite. Previously the name *Echo* was thought to refer to a mythological character from antiquity, as in the many other classically based Selysian calopterygid genera. Selys' other allusions and private dedications to the memory of Marguerite, such as his diary notes and other private documents concerning her life and death, are also discussed. Information is provided on the imposing Selys family mausoleum, constructed soon after Marguerite's death and her final resting place.

**Introduction**

The voluminous published diaries of Edmond de Selys Longchamps – *Une vie au fil des jours: Journal d'un notable politicien et naturaliste Michel Edmond de Selys Longchamps (1823-1900)* - by Caulier-Mathy & Haesenne-Peremans (2008) give us a uniquely intimate window into the rich public and private life of the man, who, besides being a distinguished politician (a senator and the President of the Belgian senate), was also the foremost odonatologist of his time, and is often considered to be the 'Father of odonatology'. Behind this highly public figure was a warm and passionate family man, a loving father to his four children and many grandchildren (Figure 1).

Baron Michel Edmond de Selys Longchamps (25 May 1813 - 11 December 1900) and his wife Sophie Caroline d'Omalius d'Halloy (18 September 1818 - 22 December 1869) had four children: Caroline (25 February 1839 - 18 December 1906; from 14 April 1864 wife of Count Jules Lallemand de Levignen), Michel Ferdinand Raphaël (20 November 1841 - 11 January 1911), Charles Michel Edgard Walthère (21 December 1846 - 31 July 1912) and Valentine Emilie Marguerite (6 February 1848 - 14 May 1852).

The death of his youngest child Marguerite from meningitis at the age of four weighed heavily on Selys' heart for the rest of his life. He felt a great void which he tried to alleviate in many ways, including private dedications in the form of odonate names, some hidden in plain sight. Although the first author has already touched on this topic in his article 'In joy and sorrow - the personal significance of some Selysian dragonfly names' (Hämäläinen, 2013a), we wish to present here a more detailed treatment of the various ways Selys cherished the memory of his beloved daughter, and to bring new insights to the eponymous names by which Selys immortalised her memory.



**Figure 1. Edmond de Selys Longchamps (1813–1900) as a young man. Copied from Caulier-Mathy & Haesenne-Peremans (2008).**

**Etymology of the generic and species names in the binomen *Echo margarita* Selys, 1853 – a calopterygid damselfly**

In May 1852, at the time of Marguerite's death, Selys was working on the monograph of the subfamily Calopteryginae (sous-famille Caloptérygines), the first of the two subfamilies of the family Agrionidae, in which he classified all Zygopteran taxa. The monograph *Monographie des Caloptérygines* (Selys Longchamps & Hagen, 1854) was preceded by *Synopsis des Caloptérygines* (Selys Longchamps, 1853), which was an abbreviated prelude to the monograph. In the synopsis the subfamily was divided into seven 'Legions', including 'Légion Calopteryx' and 'Légion Hetaerina'. However, in the monograph these two legions were combined as 'Légion Calopteryx',



which represents the present family Calopterygidae. In this group, a total of 11 new genus-group names were introduced. Most of these new names established by Selys, or his collaborator Hermann August Hagen (1817-1893), refer to actual people or mythological characters from classical Greek or Roman antiquity. The etymologies of the three genera of African demoiselles named by Selys, *Sapho*, *Phaon* and *Cleis* [a preoccupied name replaced by *Umma* Kirby, 1890] are linked together. *Sapho* refers to Sappho, the renowned lyric poetess (c. 630- c. 570 BC) from the island Lesbos, who, according to legend, is said to have fallen tragically in love with the boatman Phaon from Mitylene in Lesbos. *Cleis* has often been referred to as Sappho's daughter, but *Cleis* was also a common name among Greek courtesans. Also, Selys' genus name *Mnais* refers to an ancient Greek courtesan, as well as Hagen's names *Hetaerina* and *Lais* [a preoccupied name replaced with *Mnesarete* Cowley, 1934]. In addition, two other names given by Selys for new calopterygid genera are taken from antiquity: *Matrona* is a Latin word for a respectable married woman and *Vestalis* refers to the Vestal Virgins of ancient Rome. Until now it was believed that Selys' genus name *Echo* had a similar straightforward classical origin. Fliedner (2006) included *Echo* among the 'Götternamen', names based on divine and semidivine beings. Hämäläinen in Karjalainen & Hämäläinen (2013) stated that the name *Echo* was based on a nymph in Greek mythology. [Echo was an oread (mountain nymph) who resided on Mount Cithaeron. She was punished by Zeus' wife Hera for diverting her from spying on her husband's amours.] However, we conclude here that when choosing the generic name *Echo*, Selys was not referring to ancient myth, but rather, sought to revive the memory of Marguerite.

As already pointed out by Hämäläinen (2013a) the species epithet *margarita* in Selys' calopterygid binomial *Echo margarita* was a dedication to the author's lost daughter Marguerite. Selys did not provide any etymology for the name, but the French name 'Écho Marguerite' given in the 1854 *Monographie* (p. 67) clearly indicates that this is the case.

The species *Echo margarita* was named and described on the basis of a single female specimen (Figure 2). Selys had obtained it from Captain William Wilson Saunders (1809–1879), a British amateur entomologist and botanist, during a visit to London and the British Museum in August 1851. In the description the provenance of the specimen was given as 'Chine (?)', but on the pinned specimen there is no locality label. Subsequently it was presumed to have come from Cherrapunji, in north-eastern India.

Selys' diary entry for the 31<sup>st</sup> of March 1853 reads: "J'ai terminé en ce mois les diagnoses et la description revue des vingt-sept Calopteryx [Légion Calopteryx]. Il reste à revoir les vingt-six Hetaerina." [This month I finished the diagnoses and the revised descriptions of the twenty-seven *Calopteryx* (Légion Calopteryx). It remains to review the twenty-six *Hetaerina*.] So, the binomial name *Echo margarita* (in the Légion Calopteryx) was coined within 10 months of Marguerite's death.

When we consider Selys' original (*Synopsis*, 1853) classification of his Légion Calopteryx (Figure 3), it is somewhat curious that he selected the name *Echo* (given to a species with only a single female specimen of uncertain provenance) for the name of one of his five full genera rather than using the name *Mnais* or *Sapho*, which were classified as subgenera of the genus *Echo*. In both of these subgenera there were two species available with known males. Moreover, for *Sapho ciliata* and *Mnais pruinosa* long series of specimens of both sexes were available. Therefore, it would have been more logical to select one of these two names for the full genus name. (In the 1854 *Monographie* some changes in the classification of Légion Calopteryx were made; the number of full genera was reduced to four, since *Neurobasis* was downgraded to a subgenus of the genus *Phaon*, and subgenus *Cleis* was transferred to the genus *Echo*.)



Figure 2. Holotype of *Echo margarita*; a female specimen together with the only associated label. Photo by Matti Hämäläinen.

LÉGIONS.	GENRES.	SOUS-GENRES.
I. CALOPTERYX.	CALOPTERYX . . . . .	{ 1. SYLPHIS, Hagen. 2. CALOPTERYX, De Selys. 3. MATRONA, De Selys.
	NEUROBASIS . . . . .	{ 4. NEUROBASIS, De Selys.
	ECHO . . . . .	{ 5. ECHO, De Selys. 6. MNAÏS, De Selys. 7. SAPHO, De Selys.
	PHAON . . . . .	{ 8. CLEIS, De Selys. 9. PHAON, De Selys.
	VESTALIS. . . . .	{ 10. VESTALIS, De Selys.
II. HETAERINA. . . . .	HETAERINA. . . . .	{ 11. LAIS, Hagen. 12. HETAERINA, Hagen.

Figure 3. The generic classification of the Légion Calopteryx and Légion Hetaerina, Copied from Selys' *Synopsis des Caloptérygines* (1853).

The retention of *Echo* as the full genus suggests that the binomial name *Echo margarita* was of special personal significance to Selys. At the same time, he was compiling a private document preserving the memory of Marguerite (dated 14<sup>th</sup> May 1853), as described below. He had also begun planning an imposing mausoleum for his little daughter (and eventually for his other family members), also detailed below. This led the first author (MH) to reconsider the etymology of the genus name *Echo*; his conclusion, fully supported by KV and AGO, is that it does not refer to a character from Greek mythology (although we may have been allowed to believe this). Rather, Selys intended that the binomial *Echo margarita* should signify ‘a memory of Marguerite’. This is in accordance with a figurative meaning of the French word ‘écho’ - something which, by association, suggests a memory of something else.

This interpretation received almost certain confirmation when some sketches were discovered in Selys’ original diary. At the entry for the 23<sup>rd</sup> of January 1865, the day when his granddaughter (Caroline’s daughter) Marie Marguerite was born, is an arrangement of pen and ink drawings showing a daisy (*Leucanthemum vulgare*; ‘marguerite’ in French) and an *Echo margarita* (Figure 4). The sketches bear the captions, ‘Felix dies’ (Happy day), ‘Margarita rediviva’ (Marguerite reborn) and ‘Echo margarita’. In his diary on the following day Selys wrote (translated): “I had difficulty not weeping upon hearing this sweetest name, Marguerite! What a token of remembrance!” This rush of emotion must have prompted Selys to add the whimsical little illustrations to his diary. The association of these two drawings and their captions give us a clear indication that both the genus and species names in the binomen ‘*Echo margarita*’ were in memory of his daughter. A touching dedication, associating her memory forever with a beautiful oriental demoiselle damselfly species, currently known to occur in north-eastern India, northern Burma and south-western Yunnan.

Later, on 8<sup>th</sup> of July 1876, Selys received a few specimens of both sexes of *Echo margarita* collected by Edwin Felix Thomas Atkinson (1840–1890)<sup>1</sup> in the Khasi Hills and one male specimen from Cherrapunji in north-eastern India. Selys identified the Cherrapunji male as *E. margarita*, but described the Khasi Hills specimens as a new subspecies *E. margarita tripartita* (Selys Longchamps, 1879). However, *tripartita* is now considered a synonym; it represents individuals from within the accepted range of variation in the size of the dark spot at the wing apex. For further details, see Hämäläinen (2013b). Selys’ magnificent portfolio of watercolours of the Odonata species in his collection [for details, see Wasscher & Dumont, 2013; Verspui & Wasscher, 2016; 2017] includes a plate of *Echo margarita* (Figure 5), illustrated by Guillaume Séverin (1862–1938) between 1894 and 1899. Although charming and informative, these illustrations done from dead cabinet specimens fail to capture the full splendour of the living damselflies (Figure 6).

As though *Echo margarita* were not enough, ten years after losing Marguerite,



**Figures 4.** An illustration taken from Selys’ original diary, added to the entry for the 23<sup>rd</sup> of January 1865, the day when Selys’ granddaughter Marie Marguerite was born. By courtesy of the Library of the University of Liège.



**Figure 5.** A cropped and rearranged version of a plate by Guillaume Séverin in the portfolio of watercolours from Selys’ Odonata collections showing a male of *Echo margarita* from Cherrapunji (whole insect on left) and the holotype female of *E. margarita* (whole insect on right), above them wing of male and female of *E. margarita tripartita* from Khasia Hills, respectively. By courtesy of the Royal Belgian Institute of Natural Sciences, Brussels.

<sup>1</sup> Both Hämäläinen (2016) and Beolens (2018) misrepresent William Stephen Atkinson (1820–1876) as eponymously inspiring the three odonate species named by Selys as ‘*atkinsoni*’. These names were dedicated to Edwin Felix Thomas Atkinson.



**Figure 6. Living *Echo margarita* in nature, Yingjiang County, Dehong, southwestern Yunnan, China, 3<sup>rd</sup> November 2014. (Cropped mirror images of the originals). Photo credits: Hao-miao Zhang. (A) Male. (B) Female.**

Selys returned to his elegiac theme in nomenclature. On the 7<sup>th</sup> of June 1862, he (Selys Longchamps, 1862) selected, as a second eponymous dedication to his long dead child, the Amazonian ‘megapod’ damselfly species *Philogenia margarita*. Once again, this species was known from only a single female specimen, and it was chosen ahead of several alternatives available. (Previously this species had been given the manuscript name *Euclea terminalis* Selys). By selecting a species known only from the female, Selys was surely making a deliberate and symbolic gesture, marking the 10<sup>th</sup> anniversary of Marguerite’s death. Later in 1886, Selys described the male of *Philogenia margarita* from Amazonas (cf. Figure 7). On the previous page Selys named a new species *Philogenia raphaella* from Bogota. Selys thought that *P. raphaella* might be a local race of *P. margarita*, but no later worker has doubted its status as a good species. *Raphaella* is the feminine form of the Archangel Raphael, the healing angel. Giving this name to the sister species of *margarita* undoubtedly had symbolic significance. Perhaps with this name Selys provided the most fitting angel to accompany his angelic daughter whose last illness had so tormented him (see para. ‘Selys ends his memorial document ...’ on page 30). However, we cannot discount the possibility that this name may have also referred to her elder brother, or perhaps it is a double entendre referencing both brother and archangel. These interpretations are strongly supported by a private remark Selys made to Friedrich Ris, (who visited him in November 1891 and again in June 1898), indicating that the generic name *Philogenia* Selys, 1862 “love of descendants” signified his love for his children and grandchildren, whereas the generic name *Palaemnema* Selys, 1860 “ancient memory” was an allusion to his reverence for his forebears (see Calvert, 1931: 2 and Fliedner & Endersby, 2019: 197).



**Figure 7. A male of *Philogenia margarita* from Peru (Ucayali Región, Aguaytia, 9 September 1946, leg. Felix Woytkowski); presently in collection of Rosser W. Garrison. Photo credit: Rosser W. Garrison.**

### **Selys’ private documents for the memory of the life and death of Marguerite**

Selys’ private diaries (published by Caulier-Mathy & Haesenne-Peremans in 2008) include numerous notes on Marguerite during her life time, and many later diary entries revive and cherish her memory, the last one on the 14<sup>th</sup> of May 1895, 43 years after her death. In addition, Selys wrote two special documents on the life and death of Marguerite.

**Document: In memory of Marguerite.** In the archives of Château d’Halloy (the former mansion of Sophie’s family), presently kept at University of Liège, exists a 39-page handwritten text titled ‘*D.O.M. et Valentinae Aemiliae*

*Margaritae de Selys Longchamps nata die Vita feb. M.DCCCXXXVIII, evanuit die XIVta maii M.DCCCCLII Leodii*<sup>2</sup> (Figure 8), where Selys writes on the life and death of his daughter. This document, dated the 14<sup>th</sup> of May 1853, was written for the first anniversary of her death. It is a compilation of Selys' diary entries referring to Marguerite. Many are copied almost *verbatim*, but a few are more detailed, and also included are notes not in the diary. Most of the entries deal with Marguerite's illnesses, and only a few happy events from her life are mentioned. Given the circumstances, his preoccupation with his children's health is understandable. Selys was a devoted father with good grounds for apprehension in an age when childhood mortality was high.

Paternal devotion notwithstanding, the document also includes several seemingly misplaced diary extracts relating to the events of the French 1848 revolution, and similar political upheavals in other European countries. As an ardent liberal Selys evinced genuine delight in the coincidence of his daughter's birth and the French revolution having both occurred in February 1848 - *Februarius mihi rosarum mensis*<sup>3</sup> - as he put it. (Later he also wrote a short document '*L'age de raison*' where he compares the similarity of the fate of his daughter and that of the French revolution; see below). The document also includes some notes on other family members, mainly reports on the health of his other children, especially his oldest daughter Caroline, who suffered a long illness in 1851.

A scan of this document, as well as English translations of entries referring to Marguerite (combined from this document and from entries in Selys' diaries) are available on the internet (see the appendices at the end of the article). Therefore, only a few brief glimpses of Marguerite's life and death, as portrayed in one or both of these two sources, are repeated here. (It should be noted that the translations, by the second and third author, are in places freely rendered to capture the sense rather than *verbatim* translation of Selys' distressed, disjointed French.)

The document begins with these prefatory words (translated): "God gave her to us, although we did not ask him. He took her away from us five years later, when we would have given everything to keep her." The entry for Sunday, the 6<sup>th</sup> of February 1848 reads as follows (translated): "... at a quarter to seven at the dawn of a beautiful day Sophie brought into the world a little girl whom we have named Valentine Emilie Marguerite. The name of Emilie comes from the Polish heroine Plater [Countess Emilia Plater (1806-1831); patriot and symbol of the November 1830 Uprising in Poland] ... The little one has abundant black hair and dark blue eyes."

We learn that on the 15<sup>th</sup> of August 1848 Marguerite participated for the first time at a party at the Longchamps chateau. She was weaned at the age of 8 – 9 months, soon after she had her first illness (a common cold) at the end of December 1848. In her second year she thrived, was healthy and mostly happy. On the 6<sup>th</sup> of June 1849 Selys wrote (translated): "She is one year and four months old. She has improved greatly, walks very well at one year, has her teeth and she babbles." However, in her third year she was already often prone to illness. In July 1850 she had a minor eye inflammation and in late October 1850 she suffered a severe cold with bronchitis and was ill for 8 days. Later that year she twice again fell ill. In mid-March 1851 she had another severe cold, in May 1851 she suffered a minor cold. Then in June and July 1851, while the family was staying in the Halloy chateau, she was ill for three weeks, suffering from lethargy, gastrointestinal problems and bronchitis. Selys regretted that on way to Halloy, in cool and rainy weather, they had not taken proper care of Marguerite, but was relieved that on returning on the 17<sup>th</sup> of July, "she was already revived while going down in the valley of the Meuse at Huy and at Liège she was joyful and feeling herself". Also, a few other happy moments in 1851 were noted by Selys. On the 1<sup>st</sup> of March Marguerite and her small siblings were happy and admired at a ball of 210 people held in Selys' house in Liège. On the 15<sup>th</sup> of August, at the party of her grandmother in Longchamps, she brought her a bouquet and paid her a compliment. Later, on the 29<sup>th</sup> of September at the St Michel party arranged at Longchamps by Selys' brother-in law, Marguerite enjoyed the fireworks. "What a delight" Selys wrote.

The fatal year 1852 started well. On the 1<sup>st</sup> of January Selys wrote (translated): "The children were all in good health. That was rarely the case during this period." On the evening of the 17<sup>th</sup> of February Marguerite

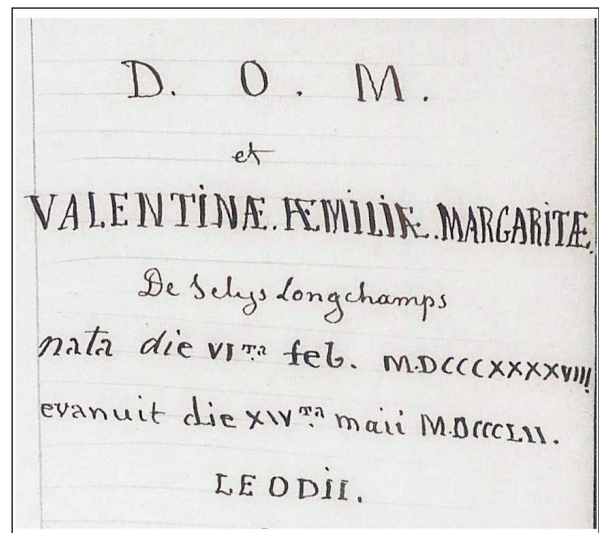


Figure 8. Text from the title page of Selys' handwritten document (14 May 1853) for the memory of his daughter. By courtesy of the Library of the University of Liège.

2 To Almighty God and Valentine Emilie Marguerite de Selys Longchamps, born February 6th, 1848, passed away May 14<sup>th</sup> 1852, Liège.

3 February my month of roses.

was (with Caroline and Walthère) at a children's party with a magic lantern. Selys wrote (translated): "Poor little one was charming. Everybody admired her despite two little boils on her left cheek that were patched up continuously." Then in March her behaviour changed. Selys wrote (translated): "We treat Marguerite's boils in the same manner. She is pale and often bad-tempered. She doesn't like to come alone to my room in the morning and frequently starts to sob upon turning to Miss Cook (governess of the children) whom she doesn't want to leave."

The first sinister forebodings appeared on the 3<sup>rd</sup> of May, and a doctor found her appearance unhealthy, pale and flushed. Over the following 10 days several other medicos inspected her and offered different diagnoses and treatments (including placing leeches on the ears). On the 8<sup>th</sup> of May Selys learned from one medical consultant that she had meningitis, but two days later another consultant (incorrectly) doubted this, suggesting an alternate diagnosis. At this stage the diary entries became longer and longer by the day, explaining in detail the treatments administered in increasingly desperate tones, with occasional slight indications of lingering hope expressed. The father's despair and grief is the most heartrending reading. Finally, on Friday the 14<sup>th</sup> of May the terrible blow fell. Selys wrote (translated): "It is there, in the middle of the room by the chimney, that the poor child delivered her soul to God, at 40 minutes past 3 o'clock in the afternoon. At the moment I felt her pulse faltering, like a watch that is about to stop, I flooded her cheeks with my tears, having already embraced her half a minute before the fatal separation and kissing three times her poor little still warm hand. Half an hour earlier she had raised her beautiful blue eyes to heaven, appearing to see God. Her eyes are now no longer inhabited. You couldn't believe that they had suffered so much." In his handwritten diary entry (Figure 9) of this terrible day, rather wistfully, Selys added a marginal pen and ink sketch of daisies (marguerites), symbols of innocence, and within each he drew a cross of the pattée form, presumably chosen because this shape best fitted into the flower. Later he also retrieved a piece of the wallpaper from the room where Marguerite died; this touching memento is

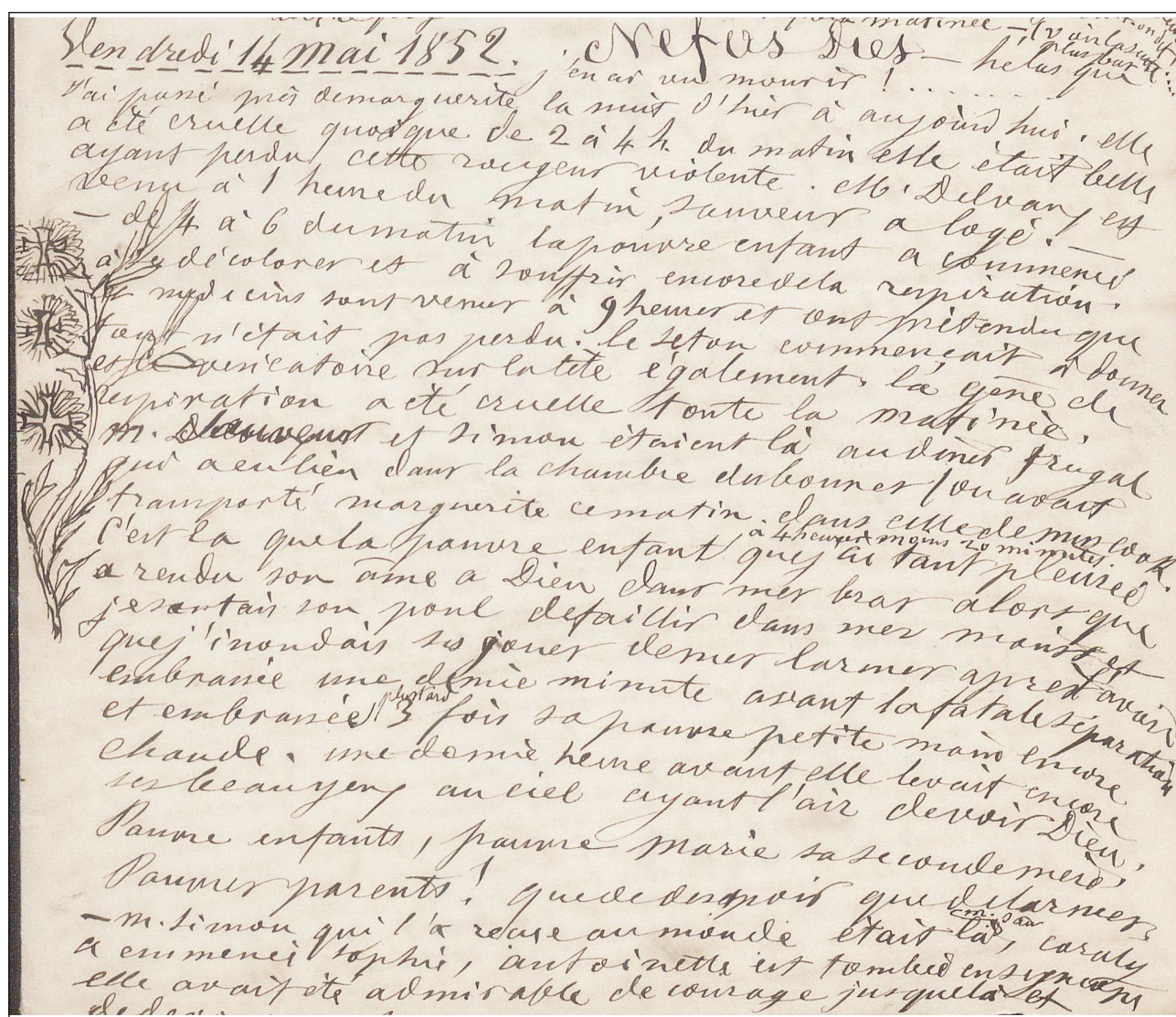


Figure 9. Selys' original diary entry for the 14<sup>th</sup> of May 1852, the day of Marguerite's death. By courtesy of the Library of the University of Liège.

preserved in the special Marguerite file in Selys' archives.

On the 13<sup>th</sup> of May, the day before Marguerite's death and again, on the 15<sup>th</sup>, the day after her death, Selys had commissioned daguerreotypes of her to be made by the photographer Adolphe Kips-de Coppin. In his diary entry of the 14<sup>th</sup> of May 1883 Selys wrote that he had looked at her portrait (obviously made from these daguerrotypes or from those taken in early June 1851 by the same photographer)<sup>4</sup>. On the 15<sup>th</sup> of May Selys went to the town hall to register Marguerite's death and received the burial permit (Figure 10).

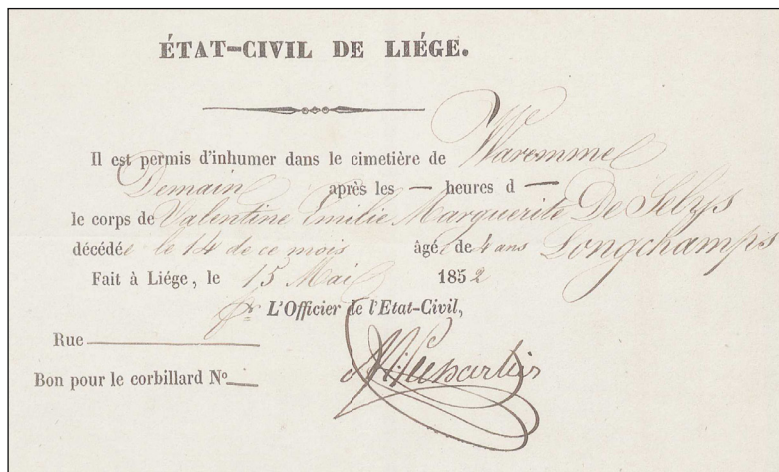
The funeral took place on Sunday the 17<sup>th</sup> of May. Early in the morning, at 5.30 AM a mass of the Angels was celebrated and prayers for the body were offered at Sainte-Croix Church in Liège. Then the little lead coffin was carried to Waremme, where another mass of the Angels was held at the private chapel of the Selys' family (Église Saint-Michel<sup>5</sup>) near Longchamps chateau. The internment took place at 10 AM. Selys wrote (translated): "I wanted to assist at the burial. They had placed her in a deep grave behind the chapel to the right, facing east. After the coffin had been lowered into the ground I watched it. I saw and heard the falling of the first clod of earth, a dreadful noise that tore me apart with tears. I recollected in my mind all the pet names we had given her. I have said: goodbye *ma bichette* – goodbye *la petite mouche* – goodbye *ghighite*, goodbye my poor child that I loved so much, goodbye for ever ...".

According to Selys' diary note of the 6<sup>th</sup> of February 1853, the grave was only marked with a simple cross. Presumably he had already begun planning a family mausoleum in the new cemetery (see below). In his diary a drawing of a symbolic funerary monument (Figure 11) of Marguerite appeared at the end of the May 1852 entries.

Selys ends his memorial document as follows (translated): "The anniversary of the 14<sup>th</sup> of May 1852. I have finished compiling these notes. If they once more cost me tears, at least I have been compensated by a dream where I saw my child again as she was. I held her tight in my arms while shouting to Sophie to come quickly to embrace her, because she is no longer of this world. And as we enfolded that angel in our arms, that joy came to me that ever causes me to break into tears of sweetness and love, the joy that ceased abruptly on my awakening, when the angelic spirit of my daughter vanished."

**Document: The age of reason.** Selys wrote another private document to the memory of Marguerite. The two-paged '*L'age de Raison*' is dated 24<sup>th</sup> February 1855, seven years after the revolution started in Paris. In it he compares the course of the revolution and his daughter's life in an odd, rather maudlin way that seems strange to us. Below are translations of the first and last of the six paragraphs:

"It was 1848, the glorious year



Figures 10. The burial permit for Marguerite. By courtesy of the Library of the University of Liège.



Figure 11. Drawing of a symbolic funerary monument for Marguerite at the end of the May 1852 entries in Selys original diary. By courtesy of the Library of the University of Liège.

<sup>4</sup> Unfortunately, we do not know if this portrait or any of the daguerrotypes still exist. They are not in the Selys' archives, presently held by the University of Liège.

<sup>5</sup> The building was expanded in 1928, and it became a parish church.

for the founders of the Republic, the joyful year for the parents of Marguerite. The same month has seen the birth of the ideal order of progress and the birth of the beloved child. God bless the Republic! God bless Marguerite!”

“Seven years have passed since that early morning awakening in February - Seven years, a century, and yet still I reflect each day on that dream, the happiness of which caused me to weep with elation. Today the new order would have the maturity of wisdom. Today Marguerite would have attained the age of reason, but today unfortunately, the awakening has for me no more than bitter tears. Lord, we no longer have the Republic. Lord, I have lost my child!”

For a scan of this document and its English translations, see the appendices at the end of the article.

### Mausoleum for Marguerite and other members of Selys’ family

In the early 1850s Selys’ mother Baroness Marie-Denise de Selys Longchamps (*née* Gandolphe, later Smits) donated a piece of forested land in Waremme for a new cemetery. Selys participated in a meeting of the municipal council on the 1<sup>st</sup> of April 1852 where the decision for the new cemetery was confirmed. More detailed plans were accepted by the council on the 26<sup>th</sup> of April 1855. The first bodies, all victims of a cholera outbreak, were buried there on the 12<sup>th</sup> of August 1855.

The death of Marguerite prompted Selys to plan a grand family mausoleum in the new cemetery. On the 15<sup>th</sup> of June 1854 he visited the place with the architect Hyacinthe Dejardin (1820–1875) of Liège, who began work on the design for the mausoleum. Construction commenced in the summer of 1855 and evidently the work was completed in the following year.

When Selys’ mother died on the 27<sup>th</sup> of October 1857 (at the age of 80 years), and it was intended she be entombed in the mausoleum, Selys also arranged for the bodies of his daughter Marguerite and his father, Baron Michel-Laurent de Selys Longchamps (died 25<sup>th</sup> April 1837; aged 78 years), to be exhumed from the churchyard of Église Saint-Michel near Longchamps chateau and transferred, in their coffins, to the new crypt. On the 30<sup>th</sup> of October 1857 Selys wrote in his diary (translated): “During the night they exhumed from the cemetery the remains of my angel Marguerite, which were placed in the monument centrally at ground level. My father will be placed there tomorrow lower down, beneath my mother.”

Next day he wrote: “Seen for the last time the three coffins, placed three wreaths, white for my daughter, black and white for my mother, black for my father.” However, Selys was to see the coffins three, perhaps even four more times.

On the 25<sup>th</sup> of April 1873 all coffins, including that of Selys’ wife Sophie (*née* d’Omalius d’Halloy; died on the 22<sup>nd</sup> of December 1869), were temporarily transferred to the nearby mausoleum of the Le Jeune family, since the Selys mausoleum required major renovation due to the architect’s error of calculation in the original structure. Selys wrote



Figure 12A-C. The Selys family mausoleum in the Waremme Communal Cemetery. Photo credits: by Marcel T. Wasscher, taken on the 15<sup>th</sup> of August 2012. Fig. 12A has been published in Wasscher (2012).

(translated): “What a grief! Nevertheless, I could not detach my eyes from these dear coffins that I saw again after so many years.”

The reconstruction of the mausoleum took a year and a half. The interior was completely demolished and then reconstructed. In a document ‘*Le dernier bouquet*’ (see the appendices at the end of the article), dated 2<sup>nd</sup> December 1874, Selys wrote (translated): “Finally I have presided over the sad ceremony of the transferral of my father, of my mother, of Marguerite whom they placed in the basement, my father at the space to the left towards le Geer, my daughter towards Bettincourt, and my mother between the two” and “It is the fourth time I see the carriage of the coffins of my father and my daughter; and the third time for my mother and my wife. I think that I should not again be able to witness that sad event which nevertheless I myself have not hesitated to oversee on each occasion.” He probably saw the coffins once more when his granddaughter (Walthère’s daughter) Irène (Thémis Minerve Irène), aged six or seven years, was placed in the mausoleum on the 10<sup>th</sup> of March 1884. Selys wrote: “They placed it [the coffin] in the central compartment with the wreaths and bouquets, and just against them, the violets that I bought her. It is my last present. We will no longer go together to buy toys, my poor child! She is there, above my poor Marguerite, dead from the same disease, 32 years ago.”

Thus, Selys had to wait a long time before achieving closure in his farewells to his loved ones, and the repeated viewings of the caskets must have caused much anguish and renewed his sense of grief. He went to his own resting place in the mausoleum on the 15<sup>th</sup> of December 1900, four days after his death.

The de Selys family mausoleum (Figure 12) is an impressive structure standing in a prominent central position near the front of the Waremme Communal Cemetery on the Rue de Pont in Waremme. About it is a substantial paved area which sets it apart from the other graves, which are mostly arrayed in echelon, whereas the mausoleum is set at an angle relative to the cemetery grounds, so that it faces more nearly eastward. According to Coen (1982) it is neo-Gothic, rectangular edifice of *petit granit* (a black, flecked limestone mined in Belgium) roofed with fibro-cement. It is accessed through a covered porch with a low pointed arch and it is decorated with trilobal arches and crenulations. The door is ornamented with beautiful hinges of wrought iron. The mausoleum is 4.5 m long and 3.2 m wide. The ridge of the roof is 3.8 m high and there is a spire at the front, topped by an angel, reaching approximately 5.8 m. On either side of the mausoleum walls are four parallel slabs, which are the graves of family members added when there was no longer space inside the mausoleum.

### **Re-echoes of the de Selys Longchamps family**

The de Selys Longchamps family has continued into modern times, some members achieving prominence. The Baron Jean Michael de Selys Longchamps (1912–1943) was the great grandson of Edmond de Selys Longchamps (Raphaël’s descendant) and Marguerite was his great aunt. During WW2 he flew with RAF fighter command, having escaped to the UK during the evacuation of Dunkirk. He is most noted for a daring action in 1943 when, flying a Hawker Typhoon, he shot up Gestapo headquarters in Brussels. For this he was both demoted for disobeying orders, but also awarded the Distinguished Flying Cross, an improbable combination! He was killed months later when his flak-damaged plane crash-landed after a sortie over Belgium. He is buried in England in a military cemetery, but his life and feats are commemorated by a prominent monument in Brussels.

More recently Jonkvrouw Delphine Boël, daughter of Baroness Sybille de Selys Longchamps (Raphaël’s descendant), appeared prominently in the world’s press in connection with her possible relationship with the former King Albert II of Belgium. Delphine Boël is the three times great granddaughter of Selys and three times great niece of that little girl, Marguerite, whose life was cut so tragically short.

### **Acknowledgements**

We are grateful to the personnel of the Library of the University of Liège for allowing us to use the material of the Selys’ archives in their care. Chantal, Francois-Xavier and Clotilde della Faille, and the other members of Selys’ family, are thanked for their kind interest in our project. We thank the Royal Belgian Institute of Natural Sciences for permitting us to publish a watercolour from their collections. Rosser Garrison, Marcel Wasscher and Hao-miao Zhang kindly permitted us to use their photographs. Marcel Wasscher also provided valuable assistance.

### **References**

- Beolens, B., 2018. *Eponym dictionary of Odonata*. Whittles Publishing, Caithness, Scotland, UK.
- Calvert, P. P., 1931. The generic characters and the species of *Palaemnema* (Odonata: Agrionidae). *Transactions of the American Entomological Society* 57: 1-111, 21 pls excl.
- Caulier-Mathy, N. & N. Haesenne-Peremans, (Eds), 2008. *Une vie au fil des jours: Journal d’un notable politicien et naturaliste Michel Edmond de Selys Longchamps (1823-1900)*. Vol. 1 and 2. Commission Royale d’Histoire, Bruxelles.
- Coen, J., 1982. *Michel-Edmond de Selys-Longchamps 1813-1900: gentilhomme et démocrate*. Renier, Waremme.
- Fliedner, H., 2006. Die wissenschaftlichen Namen der Libellen in Burmeisters ‘Handbuch der Entomologie’. *Virgo* 9: 5-23. [English translation available at [http://dominique.mouchene.free.fr/libs/docs/GENE\\_](http://dominique.mouchene.free.fr/libs/docs/GENE_)



[Burmeister\\_Fliedner.pdf](#)

- Fliedner, H. & I. Endersby, 2019. *The scientific names of North American dragonflies*. Busybird Publishing, Montmorency, Victoria, Australia.
- Hämäläinen, M., 2013a. In joy and in sorrow – the personal significance of some Selysian dragonfly names. *Agrion* 17(2): 30-35.
- Hämäläinen, M., 2013b. Synonymic notes on some oriental species of Calopterygidae, Euphaeidae and Chlorocyphidae (Zygoptera). *Notulae odonatologicae* 8(2): 25-29.
- Hämäläinen, M., 2016. Catalogue of individuals commemorated in the scientific names of extant dragonflies, including lists of all available eponymous species-group and genus-group names - Revised edition. *International Dragonfly Fund Report* 92: 1-132.
- Karjalainen, S. & M. Hämäläinen, 2013. *Neidonkorennot – Solisevien vetten jalokivet / Demoiselle damselflies – Winged jewels of silvery streams*. Caloptera Publishing, Helsinki. (Bilingual, Finnish and English).
- Selys Longchamps, E. de, 1853. Synopsis des Caloptérygines. *Bulletins de l'Académie royale des sciences, des lettres et des beaux-arts de Belgique* 20 (Annexe): 1-73.
- Selys Longchamps, E. de, 1862. Synopsis des Agrionines, Troisième légion: Podagrion. *Bulletins de l'Académie royale des sciences, des lettres et des beaux-arts de Belgique* (2)14: 5-44.
- Selys Longchamps E. de, 1879. Quatrièmes additions au Synopsis des Caloptérygines. *Bulletins de l'Académie royale des sciences, des lettres et des beaux-arts de Belgique* (2) 47: 349–409.
- Selys Longchamps E. de, 1886. Revision du Synopsis des Agrionines. Première partie comprenant les légions Pseudostigma, Podagrion, Platycnemis et Protonevra. *Mémoires couronnés et autres mémoires publiés par l'Académie royale des sciences, des lettres et des beaux-arts de Belgique*. 38(4): i–iv + 1-233.
- Selys Longchamps, E. de & H.A. Hagen, 1854. Monographie des Caloptérygines. *Mémoires de la Société royale des sciences de Liège* 9: 1-191, pls 1-14 excl.
- Verspui, K. & M.T. Wasscher, 2016. The damselfly and dragonfly watercolour collection of Edmond de Selys Longchamps: I Agrionines. *International Journal of Odonatology* 19(3): 1-32.
- Verspui, K. & M.T. Wasscher, 2017 The damselfly and dragonfly watercolour collection of Edmond de Selys Longchamps: II Calopterygines, Cordulines, Gomphines and Aeschnines. *International Journal of Odonatology* 20(2): 1-34.
- Wasscher, M.T., 2012. The mansion, diaries and watercolours of Selys. *Notulae odonatologicae* 7(10): 92-95.
- Wasscher, M.T. & H.J. Dumont, 2013. Life and work of Edmond de Selys Longchamps (1813-1900), founder of odonatology. *Odonatologica* 42(4): 369-402.

## Appendices

### Appendix 1.

Scans of unpublished private, handwritten documents by Selys in the archives of Château d'Halloy (the former mansion of Sophie's family), presently kept at University of Liège.

1853 - *D.O.M. et Valentinae Aemiliae Margaritae de Selys Longchamps nata die Vita feb. M.DCCCXXXVIII, evanuit die XIVta maii M.DCCCLII Leodii (14 mai 1853) (39 p.)*.

1855 - *L'âge de raison (24 février 1855) (2 p.)*.

1874 - *Le dernier bouquet (2 décembre 1874) (4 p.)*.

### Appendix 2.

Vignettes of the life, death and memory of Marguerite de Selys Longchamps (1848-1852). This includes English translations (by Karin Verspui and Albert G. Orr) of entries referring to Marguerite, combined from the 1853 document and from entries in Selys' diaries.

English translations (by Karin Verspui and Albert G. Orr) of the 1855 and 1874 documents.

The appendices are available at the second and third authors' ResearchGate accounts at [https://www.researchgate.net/profile/Karin\\_Verspui](https://www.researchgate.net/profile/Karin_Verspui) and [https://www.researchgate.net/profile/Albert\\_Orr](https://www.researchgate.net/profile/Albert_Orr).

**In memoriam: Wolfgang Schneider**  
10<sup>th</sup> August 1953 - 17<sup>th</sup> September 2019

**Bidding farewell to Desert Wolf...**

**Boudjéma Samraoui [bsamraoui@yahoo.fr]**  
Annaba, Algeria

Wolfgang Schneider, age 66, passed away peacefully on 17<sup>th</sup> September 2019 from the late effects of a heart attack he suffered in 2007, after complications from pneumonia he contracted while in hospital. He was born 10<sup>th</sup> August 1953 in Bad Kreuznach, Germany (Photo 1), where he also went to school. As of 1973, he studied biology, chemistry and biochemistry at the Johannes Gutenberg University, Mainz and earned an M.Sc. (1979) and a Ph.D. (1986) in zoology at Mainz University.

Wolfgang had a life-long love affair with dragonflies and the Middle-East. Although he had experience with international organisations and held the position of a Fishery Resources Officer with the FAO, "Dib" ("Wolf" in Arabic as he once called himself) has seen it all, living a full life by criss-crossing the



**Photo 1. Wolfgang and his family in 1957, when he was about four years old.**



**Photo 2. Wolfgang collecting dragonflies on Socotra Island, Yemen in 1996. Photo credit: Friedhelm Krupp.**

region from Lebanon to Socotra Island through several zoological surveys accompanied by his friend, Friedhelm Krupp. Wolfgang was a polyglot but he spoke Arabic with an atrocious accent. His memory of localities was vivid and, when I last met him in Riyadh in 2016, he could recall and describe in great detail all the places he had sampled many years ago (Photo 2). A worthy library has been lost but, fortunately, Wolfgang left behind over 90 scientific publications.

Wolfgang was a warm, friendly, and generous person who readily shared with others his vast, comprehensive knowledge of Odonata and zoology. However, he was not known to hold back his opinion and he had a knack for telling it like it is. Wolfgang was also a great character and gentleman with a good sense of humour. Who hasn't heard his adventures on a boat shoving *Anax tristis* in his mouth and holding the aeshnid tightly with his teeth, surrounded by horrified old sea dogs?

In a period of great turbulences shattering the odonatological community which eventually split into FSIO and WDA, the "silverbacks" pleaded their causes with various "wise men". Wolfgang, among others, kept a cool head and played a key role as a reconciliator. However, this was a stressful episode for him and when I replaced him as President of WDA, he sent me the archives with a simple recommendation: Don't read them! An advice which I heeded (Photo 3).

Wolfgang was a rare combination of someone who had a love of life and an acute awareness of the importance of sharing a simple life with those he loved (Photo 4). He was an inspiring figure to all of us and, personally, I owe him a great debt in fuelling my interest in Odonatology and the dragonflies of the Arabian Peninsula. We are blessed to have known him and he will be sorely missed. May his soul rest in peace surrounded by beautiful damselflies and dragonflies. Our thoughts and sympathy are with his family.



**Photo 3. Wolfgang in discussion with Mike Parr at the 6<sup>th</sup> WDA International Congress of Odonatology in Xalapa, Mexico. Photo credit: Friedhelm Krupp.**



**Photo 4. Wolfgang sitting at the small river below his country house watching *Calopteryx*. Photo credit: Friedhelm Krupp.**

## Bibliography of Dr. Wolfgang Schneider (1953–2019)

Compiled by Wolfgang Schneider to 1998 and  
completed by Frank Suhling [f.suhling@tu-bs.de]  
and Keith DP Wilson [kdpwilson@gmail.com]

- Schneider, W.**, 1981. Zur Kopfmorphologie der Imago des Ölkäfers *Lytta vesicatoria* (Coleoptera: Meloidae). *Entomologia Generalis* 7: 69-87.
- Schneider, W.**, 1981. Eine Massenwanderung von *Selysiothemis nigra* (Vanderlinden, 1825) (Odonata: Macrodiplactidae) und *Lindenia tetrphylla* (Vanderlinden, 1825) (Odonata: Gomphidae) in SüdJordanien. *Entomologische Zeitschrift* 91: 97-102.
- Schneider, W.**, 1981. On a dragonfly collection from Syria. *Odonatologica* 10: 131-145.
- Schneider, W.**, 1981. Neue Funde von *Pseudagrion syriacum* (SELYS, 1887) in der nördlichen Levante (Odonata: Zygoptera: Coenagrionidae). *Entomologische Zeitschrift* 91: 145-150.
- Schneider, W.**, 1982. *Crocothemis sanguinolenta arabica* n. subsp. (Odonata: Anisoptera: Libellulidae), ein afrikanisches Relikt in der südlichen Levante. *Entomologische Zeitschrift* 92: 25-31.
- Schneider, W.**, 1982. Man-induced changes in the dragonfly fauna of the Jordan valley. *Advances in Odonatology* 1: 243-249.
- Schneider, W.** & Achenbach, H., 1982. *Cordulegaster bidentatus* Selys, 1843 - erster Larvennachweis für die Pfalz (Odonata: Anisoptera: Cordulegasteridae). *Entomologische Zeitschrift* 92: 338-340.
- Schneider, W.**, 1983. The larva of *Gomphus davidi* Selys, 1887. *Hydrobiologia* 98: 245-248.
- Schneider, W.**, 1983. Zum Eiablageverhalten von *Erythromma viridulum orientale* Schmidt, 1960 (Odonata: Zygoptera: Coenagrionidae). *Entomologische Zeitschrift* 93: 225-229.
- Schneider, W.**, 1983. Ein seltener Ölkäferfund aus Schusterwört (Rheinhessen) (Coleoptera: Meloidae). *Entomologische Zeitschrift* 93: 254-255.
- Schneider, W.** & R. Kinzelbach, 1983. *Xenos vesparum* Rossius 1793 (Insecta: Strepsiptera) im Rhein-Main-Gebiet. *Hessische faunistische Briefe* 3: 68-72.
- Pfau, H.K. & **Schneider, W.**, 1983. Ein eigenartiges Fächelverhalten bei *Xenos vesparum* Rossius, 1793 (Strepsiptera: Stylopida: Stylopidae). *Entomologische Zeitschrift* 93: 273-277.
- Schneider, W.**, 1983. Designation de lectotypes d'Odonates levantines du M.N.H.N., Paris, et description de la femelle de *Platycnemis kervillei* (Martin, 1909) (Odonata). *Revue Française d'Entomologie* (N.S.) 5(1): 3-6.
- Schneider, W.**, 1984. Beschreibung von *Gomphus kinzelbachi* n. sp. aus dem Iraq (Odonata: Anisoptera: Gomphidae). *Entomologische Zeitschrift* 94: 1-9.
- Schneider, W.**, 1984. Zum Nachweis von *Gomphus pulchellus* Selys, 1840 in Jugoslawien (Odonata: Anisoptera: Gomphidae). *Entomologische Zeitschrift* 94: 109-111.
- Schneider, W.**, 1984. Die Typen von *Sympetrum tibiale* (RIS, 1897) (Odonata: Anisoptera: Libellulidae). *Entomologische Mitteilungen des zoologischen Museums Hamburg* 7: 449-452.
- Schneider, W.**, 1984. Description of *Calopteryx waterstoni* spec. nov. from northeastern Turkey (Zygoptera: Calopterygidae). *Odonatologica* 13: 281-286.
- Schneider, W.**, 1984. Das Weibchen von *Enallagma somalicum* Longfield, 1931 (Odonata: Zygoptera: Coenagrionidae). *Articulata* 2: 106-109.
- Dumont, H.J. & **Schneider, W.**, 1984. On the presence of *Cordulegaster myzmae* Barteneff, 1929 in Turkey, with a description of its geographic distribution and taxonomic position (Anisoptera: Cordulegasteridae). *Odonatologica* 13: 467-476.
- Schneider, W.**, 1985. Dragonfly records from SE-Turkey (Insecta: Odonata). *Senckenbergiana biologica* 66: 67-78.
- Schneider, W.**, 1985. Die Gattung *Crocothemis* Brauer 1868 im Nahen Osten (Insecta: Odonata: Libellulidae). *Senckenbergiana biologica* 66: 79-88.
- Schneider, W.**, 1985. Wiederbeschreibung von *Erythromma viridulum orientale* Schmidt 1960 aus dem östlichen Mittelmeerraum (Insecta: Odonata: Coenagrionidae). *Senckenbergiana biologica* 66: 89-95.
- Schneider, W.**, 1985. *Epallage fatime* (Charp.) (Zygoptera: Euphaeidae) as prey of *Argiope*
- Schneider, W.**, 1985. The types of *Orthetrum anceps* (Schneider, 1845) and the taxonomic status of *Orthetrum ramburii* (Selys, 1848) (Insecta: Odonata: Libellulidae). *Senckenbergiana biologica*, 66: 97-104.
- Schneider, W.** & Moubayed, Z., 1985. Beitrag zur Kenntnis der Odonata des Libanon. *Entomologische Zeitschrift* 95: 183-192.
- Schneider, W.**, 1985. Erstnachweis von *Cordulia aenea* (LINNAEUS 1758) für die Türkei (Odonata: Anisoptera: Corduliidae). *Entomologische Zeitschrift* 96: 92-93.
- Schneider, W.**, 1986. Designation des Lectotypus von *Somatochlora meridionalis* Nielsen, 1935 (Odonata: Anisoptera: Corduliidae). *Entomologische Zeitschrift* 96: 73-78.
- Schneider, W.**, 1986. Die Spanische Fliege (*Lytta vesicatoria*, Coleoptera: Meloidae) in Rheinland-Pfalz.

*Mitteilungen der Pollichia* 72: 305-314.

- Schneider, W.**, 1986. *Systematik und Zoogeographie der Odonata der Levante unter besonderer Berücksichtigung der Zygoptera*. Dissertation thesis, Mainz, Univ., Fachbereich Biologie. 3 vols: VIII + 202 pp. (vol. 1), 151 maps (vol. 2), 547 figures (vol. 3).
- Schneider, W.**, 1987. Der Holotypus von *Paragomphus genei* (SELYS 1841) (Odonata: Anisoptera: Gomphidae). *Entomologische Zeitschrift* 97: 129-132.
- Schneider, W.**, 1987. Die Verbreitung von *Onychogomphus macrodon* SELYS, 1887, mit der Beschreibung des bisher unbekanntes Weibchens und einer Wiederbeschreibung des Männchens (Odonata: Gomphidae). *Opusc. zool. flumin* 13: 1-12.
- Schneider, W.**, 1987. The genus *Pseudagrion* SELYS, 1876 in the Middle East - a zoogeographic outline (Insecta: Odonata: Coenagrionidae). Proceedings of the Symposium on the Fauna and Zoogeography of the Middle East, Mainz, 1985. In: Krupp, F., **Schneider, W.** & Kinzelbach, R. (eds.) Beihefte zum TAVO A. 28: 114-123.
- Schneider, W.**, 1987. Levante, Hydrofauna. Teilkarte 3: Insecta. TAVO, Karte A VI 12, Stuttgart.
- Krupp, F. & **Schneider, W.**, 1988. Die Süßwasserfauna des Vorderen Orients. Anpassungsstrategien und Besiedlungsgeschichte einer zoogeographischen Übergangszone. *Natur und Museum* 118: 193-213.
- Schneider, W.**, 1988. Dragonflies (Odonata) of the Wahiba Sands and adjacent areas, eastern Oman. *Journal of Oman Studies, Special Report* 3: 377-388.
- Krupp, F. & **Schneider, W.**, 1989. The fishes of the Jordan river drainage basin and Azraq oasis. *Fauna of Saudi Arabia* 10: 347-416.
- Schneider, W.**, 1990. *Field guide to the commercial marine resources of the Gulf of Guinea*. FAO Species Identification Sheets for Fishery Purposes. Rome, FAO, 268 pp., 16 pls.
- Fischer, W., Sousa, I., Silva, C., De Freitas, A., Poutiers, J.M., **Schneider, W.**, Borges, T.C., Feral, J.P. & Massinga A., 1990. Gufa de campo das especies comerciais marinhas e de aguas salobras de Moçambique. Fichas FAO de identificacao de especies para actividades de pesca. Roma, FAO, 424 pp., 42 pls. (in Portuguese).
- Krupp, F., **Schneider, W.**, Nader, I.A. & Kuushain, O., 1990. Zoological survey in Saudi Arabia, spring 1990. *Fauna of Saudi Arabia* 11: 3-9.
- Krupp, F. & **Schneider, W.**, 1991. Two new species of *Nemacheilus* Bleeker 1863 from the Orontes River drainage basin of Lebanon, Syria and Turkey (Pisces: Osteichthyes: Balitoridae). *Senckenbergiana biologica* 71: 23-34.
- Schneider, W.**, 1991. New records of Meloidae (Insecta: Coleoptera) from Arabia with description of a new species. *Fauna of Saudi Arabia* 12: 273-288.
- Schneider, W.**, F. Krupp & D. Kock, 1991. Middle East terrestrial zoogeography. TAVO map A VI 11. L. Reichert, Wiesbaden (Introduction booklet 9 pp.).
- Krupp, F. & **Schneider, W.**, 1991. Zur Bestandserfassung der rezenten Fauna im Bereich des Nahr al-Habur. In: Kühne, H. (Hrsg.): Die rezente Umwelt von Tall Seh Hamad und Daten zur Umweltrekonstruktion der assyrischen Stadt Dur Katlimmu. *Berliner Beiträge zum Vorderen Orient, Syrische Forschungen* 1: 69-85.
- Krupp, F. & **Schneider, W.**, 1991. *Artdetermination und Bewertung ökologischer und erdgeschichtlicher Faktoren bei der Darstellung zoologischer Verbreitungsmuster*. In: Rölug, W. (ed.): Von der Quelle zur Karte. DFG Abschlußbuch zum Sonderforschungsbereich 19: 65-76.
- Schneider, W.**, 1992. *Anax tristis* Hagen, 1867 (Odonata: Aeshnidae) and *Tholymis tillarga* (Fabricius, 1798) (Odonata: Libellulidae) recorded from off Angola. *Fragmenta entomologica* 23: 243-246.
- Kinzelbach, R., Martens, H., Neubert, E. & **Schneider, W.**, 1992. *The fauna of the littoral fringe and of adjacent terrestrial habitats*. In: Krupp, F. (ed.): Establishment of a marine habitat and wildlife sanctuary for the Gulf region. Final report for phase 1. Jubail & Frankfurt pp. 108-127.
- Schneider, W.**, 1992. Guide de terrain des ressources marines commerciales du golfe de Guinee.- Fiches FAO d'identification des especes pour les besoins de la peche. Rome, FAO, 268 pp., 16 pls.
- Schneider, W.** & Krupp, F., 1993. Dragonfly records from Saudi Arabia, with an annotated checklist of the species from the Arabian Peninsula (Insecta: Odonata). *Fauna of Saudi Arabia* 13: 63-78.
- Schneider, W.** & Kinzelbach, R., 1994. *Effect of the GulfWar Oil Spill on the Supratidal Fringe with Special Reference to the Strandline Habitat*. In: Feldkamp, E. & Krupp, F. (eds): Establishment of a Marine Habitat and Wildlife Sanctuary for the Gulf Region. Final Report Phase II. Jubail & Frankfurt pp. 301-314.
- Schneider, W.** & Kinzelbach, R., 1994. Effects of the 1991 oil spill on the supratidal fringe. *Courier Forschungs-Institut Senckenberg* 166: 34-39.
- Schneider, W.** & Utzeri, C., 1994. *Gomphus pulchellus* Sei. new to the Italian Odonate Fauna (Anisoptera: Gomphidae). *Notulae odonatologicae* 4: 72-73.
- Kock, D., Krupp, F. & **Schneider, W.**, 1994. Einige Säugetiere aus dem Nahr al-Khabur-Gebiet, NE-Syrien. *Säugetierkundliche Mitteilungen* 35: 177-183.
- Schneider, W.**, 1995. Die Verbreitung von *Pseudagrion syriacum* Selys 1887 und Erstnachweis der Art für die Türkei (Odonata: Zygoptera: Coenagrionidae). *Entomologische Zeitschrift* 105: 161-166.
- Schneider, W.**, 1995. Der Darmstädter Zoologe Johann Jakob Kaup (1803-1873) als Autor einiger Libellentaxa

- (Qdonata: Anisoptera: Aeshnidae, Libellulidae). *Entomologische Zeitschrift* 105: 253-256.
- Fischer, W., Krupp F., Schneider W., Sommer C., Carpenter K.E. & Niem V.H. (eds), 1995. *Guia FAQ para la identificacion de especies para los fines de la pesca*. Pacifico centro-oriental. Rome, FAQ, 3 vols, XIII + 1813 pp.
- Compagno, L.J.V., Krupp, F. & **Schneider, W.**, 1995. Tiburones. *Guia FAQ para la identificacion de especies para los fines de la pesca*. Pacifico centro-oriental 2: 647-744.
- Schneider, W.**, 1995. Echeneidae. *Guia FAQ para la identificacion de especies para los fines de la pesca*. Pacifico centro-oriental 2: 1060-1061.
- Schneider, W.** & Krupp, F., 1995. Holocentridae *Guia FAQ para la identificacion de especies para los fines de la pesca*. Pacifico centro-oriental 2: 1182-1185.
- Iwamoto, T. & **Schneider, W.**, 1995. Macrouridae. *Guia FAQ para la identificacion de especies para los fines de la pesca*. Pacifico centro-oriental 3: 1246- 1288.
- Schneider, W.** & Krupp, F., 1995. Malacanthidae. *Guia FAQ para la identificacion de especies para los fines de la pesca*. Pacifico centro-oriental 3: 1266-1271.
- Schneider, W.** & Krupp, F., 1995. Pomacanthidae. *Guia FAQ para la identificacion de especies para los fines de la pesca*. Pacifico centro-oriental 3: 1388-1391 .
- Schneider, W.** & Krupp, F., 1995. Pomacentridae. *Guia FAQ para la identificacion de especies para los fines de la pesca*. Pacifico centro-oriental, 3: 1392-1404.
- Schneider, W.** & Dumont, H.J., 1995. *Arabineura* n. gen., a new protoneurid genus from Arabia, with the description of the hitherto unknown female of *Arabineura khalidi* (Schneider, 1988) comb. nov. (Insecta: Odonata: Protoneuridae). *Biologisch Jaarboek Dodonaea* 62: (for 1994): 114-120.
- Schneider, W.**, 1995. Eine Paarungskette zwischen *Orthetrum sabina* (Drury 1770) und *Crocothemis erythraea* (Brulle 1832) (Odonata: Anisoptera: Libellulidae). *Entomologische Zeitschrift* 105: 462-463.
- Dumont, H.J., **Schneider, W.**, Verschuren, D. & Pavesi, M., 1995. *Coenagrion lindenii zernyi* (Schmidt): An east Mediterranean taxon threatened with extinction by introgression from the west (Zygoptera: Coenagrionidae). *Odonatologica* 24: 451-459.
- Schneider, W.**, 1995. Regionale Zoologie und Zoogeographie der Arabischen Halbinsel. - *Informationen aus dem Hessischen Landesmuseum Darmstadt* 2/95: 25- 28.
- Schneider, W.** & Krupp, F., 1996. A possible natural hybrid between *Ischnura elegans ebneri* Schmidt, 1939 and *Ischnura fountainei* Morton, 1905 (Odonata: Coenagrionidae). *Zoology in the Middle East* 12: 75-81.
- Schneider, W.**, 1996. Sokotra - Insel der Dioskuren. *Informationen aus dem Hessischen Landesmuseum Darmstadt* 1/96: 25-28.
- Sommer, C., **Schneider, W.** & Poutiers, J.-M., 1996. *The living marine resources of Somalia*. FAO Species Identification Field Guide for Fishery Purposes. Rome, FAO, 1996, 376 p., 32 colour plates.
- Pohl, H., Katbeh-Bader, A. & **Schneider, W.**, 1996. Description of a new genus and two new species of Corioxenidae from Jordan (Insecta: Strepsiptera). *Zoology in the Middle East* 13: 107-119.
- Amr, S.A., Al-Melhim, W.N., Katbeh-Bader, A. & **Schneider, W.**, 1997. On the common Insecta of Al Azraq, Jordan. *Entomologist's Gazette* 48: 55-66.
- Schneider, W.** & Katbeh-Bader, A., 1997. Ein atypisches Weibchen von *Pseudagrion syriacum* Selys 1887 aus Jordanien. *Entomologische Zeitschrift* 107: 391-394.
- Schneider, W.** & Dumont, H.J., 1997. The Dragonflies and Damselflies of Oman . An updated and annotated checklist. *Fauna of Saudi Arabia* 16: 89-110.
- Cassola, F. & **Schneider, W.**, 1997. Tiger Beetles (Coleoptera, Cicindelidae) from the Saudi Arabian Gulf Coast. *Fauna of Saudi Arabia* 16: 247-253.
- Schneider, W.**, 1997. Die Libellensammlung Johann Jakob Kaups. *Informationen aus dem Hessischen Landesmuseum Darmstadt* 2/97: 21-23.
- Schneider, W.** & Dumont, H.J., 1998. *Checklist of the dragonflies and damselflies of Soqatra island (Insecta: Odonata)*. In: H.J. Dumont (ed.), Proceedings of the First International Symposium on Soqatra Island: Present and Future 1: 83-105. United Nations Publications, p. 219-232, New York.
- Schneider, W.** & Parr, M.J., 1998. *Orthetrum julia falsum* Longfield 1955 new to the dragonfly fauna of Yemen and the Arabian Peninsula (Anisoptera: Libellulidae). *International Journal of Odonatology* 1: 155-158.
- Pohl, H. & **Schneider, W.**, 1998. Fächerflügler aus dem Baltischen Bernstein. *Informationen aus dem Hessischen Landesmuseum Darmstadt* 2/98: 14-15.
- Schorr, M., **Schneider, W.** & Dumont, H.J., 1998. Ecology and distribution of *Lindenia tetraphylla* (Insecta, Odonata, Gomphidae): A review. *International Journal of Odonatology* 1: 65-88.
- Joger, U., Pohl, H. & **Schneider, W.**, 1999. Kurzbericht über eine Expedition auf das Sokotra-Archipel (Jemen). *Informationen aus dem Hessischen Landesmuseum Darmstadt* 1/99: 30-33.
- Schneider, W.**, 1999. Soqotra - the island of the dragon's blood. *Agrion* 3(2): 27-28.
- Schneider, W.**, 2000. The "Sad Emperor" and the Sailors. *Agrion* 4(2): 23.
- Suhling, F., Jödicke, R. & **Schneider, W.**, 2003. Odonata of African arid regions—are there desert

- species. *Cimbebasia* 18: 207-224.
- Schneider, W.**, 2004. Critical species of Odonata in the Levant. *International Journal of Odonatology* 7: 399-407.
- Jödicke, R., Boudot, J. P., Jacquemin, G., Samraoui, B., & **Schneider, W.**, 2004. Critical species of Odonata in northern Africa and the Arabian Peninsula. *International Journal of Odonatology* 7: 239-253.
- Schneider, W.**, 2004. Friedrich Moritz Brauers and Johann Jakob Kaups types of dragonflies (Insecta: Odonata) in the Hessisches Landesmuseum Darmstadt.- *Kaupia, Darmstädter Beiträge zur Naturgeschichte* 13: 77-87.
- Krupp, F., Apel, M., Hamoud, A., **Schneider, W.**, & Zajonz, U., 2006. Zoological survey in the Red Sea coastal zone of Yemen. *Fauna of Arabia* 21: 11-32.
- Krupp, F. & **Schneider, W.**, 2008. *Die Fischfauna des Nahr al-Khabur, Nordost-Syrien*. In book: Umwelt und Subsistenz der assyrischen Stadt Dūr-Katlimmu am unteren Khabur (ed) Hartmut Kühne 8: 41-51.
- Boudot, J.P., Kalkman, V.J., Amarin, A., Bogdanović, T., Rivera, A.C., Degabriele, G., Dommanget, J.-L., Ferreira, S, Garrigós, B, Jovic, M. & Kotarac, M., Lopau, W., Marinov, M. Mihokovic, N. Riservato, E., Samraoui, B., & **Schneider, W.**, 2009. Atlas of the Odonata of the Mediterranean and North Africa. *Libellula Supplement* 9: 1-256.
- Schneider, W.** & Simons, M.E., 2012. *Ein Brief von Michel-Edmond baron de Selys Longchamps (1813-1900) an Friedrich Förster (1864-1918)*. IDF-Report 51: 1-8.
- Medvedev, A.F., Kosterin, O.E., Malikova, E.I. & **Schneider, W.**, 2013. Description date of *Somatochlora exuberata* Bartenev, *Leucorrhinia intermedia* Bartenev and *Sympetrum vulgatum grandis* Bartenev, the fate of a.n. Bartenev's type specimens and designation of the lectotype of *L. intermedia* (Anisoptera: Corduliidae, Libellulidae). *Odonatologica* 42(3): 211-228
- Schneider, W.**, & Nasher, A.K S., 2013. Dragonflies from Mainland Yemen and the Socotra Archipelago: Additional Records and Novelties. *International Dragonfly Fund – Report* 57: 1-13.
- Schneider, W.**, & Samraoui, B., 2015. The status and distribution of dragonflies and damselflies (Odonata) in the Arabian Peninsula. Chapter 5, pp. 51-70. In García, N., Harrison, I., Cox, N., & Tognelli, M.F. (eds) *The status and distribution of freshwater biodiversity in the Arabian Peninsula*, Gland, Switzerland, Cambridge, UK and Arlington, USA, IUCN.
- Al-Obaid, S., Samraoui, B., Thomas, J., El-Serehy, H.A., Alfarhan, A.H., **Schneider, W.**, O'Connell, M., 2017. An overview of wetlands of Saudi Arabia: Values, threats, and perspectives. *Ambio*, 46(1): 98-108.
- Krupp, F. & **Schneider, W.**, 2016. Zoologische Entdeckungsreise ins Wadi Masila. *Jemen-Report* 47(1/2): 95-103.

## *Procordulia* sp. at the peak of Mount Talamau, West Sumatra, Indonesia

Muhammad N. Janra<sup>1\*</sup>, Muhammad Anshari<sup>1</sup>, Thala Alfajru<sup>2</sup>, Arif Rahman Hakim<sup>2</sup>

<sup>1\*</sup>The Biology Department, Andalas University, Jalan Kampus Unand Limau Manis Pauh, Padang, West Sumatra 25163, Indonesia. \*email [mnjanra@sci.unand.ac.id]

<sup>2</sup>The Chemistry Department, Andalas University, Jalan Kampus Unand Limau Manis Pauh, Padang, West Sumatra 25163, Indonesia.

### Introduction

Dragonflies are exceptionally abundant in tropical countries, where they can be found in various suitable aquatic habitats (Orr 2006). The tropical rainforest provides complex yet typical habitats for dragonflies in lowland, highland and even mountainous habitats; hence some species may be confined to certain specific habitats (Oppel 2005). Mountains in tropical areas harbour various aquatic microhabitats which may contain specific dragonfly species as a result of adaptation to harsh environment factors (Dijkstra & Lempert 2003). In Sumatra, Indonesia, the chain of Bukit Barisan Mountain Range stretches from the north to the southern part of the island and creates a variety of geographical landscapes (Directorate General of Forest Protection and Nature Conservation 2003). The mountain tropical forests in Sumatra are included within 200 critical ecoregions which make them a global conservation priority (Olson & Dinerstein 2002).

Mount Talamau, at 2,912 m altitude, is the second highest peak in West Sumatra Province after Mount Kerinci, and is located near the equator at GPS coordinates 0°4'44.79"N and 99°59'2.91"E (Normasiwi et al. 2015), see Figure 1. It is classified as part of a volcanic landscape, where ancient eruptions left 13 non-active craters, filled with water (Lumbanbatu 2009), see Figure 2. Each lake or pond has been given a name by the surrounding villagers: Talago Biru (or Blue Pond; talago is the term for pond in Minangkabau language), Talago Buluah Parindu, Talago Cindua Mato, Talago Imbang Langik, Talago Lumuik (Mossy Pond), Talago Mandeh Rubiah, Talago Puti Bungsu, Talago Puti Sangka Bulan, Talago Rajo Dewa, Talago Satwa, Talago Siuntuang Sudah, Talago Tapian Puti Mambang Surau and Talago Tapian Sutan Bagindo (Anggara, *pers. comm.*), see Figures 3-6. Most of these names are derived from the royal customary names used by the Minangkabau tribe, the major ethnic group in West Sumatra Province. In this study, we outline an encounter with a corduliid dragonfly around the peak of Mount Talamau, West Sumatra, Indonesia.

### Description

Between 1-5 March 2019, all authors conducted a mountaineering trip to Mount Talamau through the common hiking route in Pinago Village, similar to the route taken by Normasiwi et al. (2015). Several temporary night camps were made during the ascent, as night hiking is not recommended on this mountain. We entered the plateau from the west side embankment at a height around 2,700 meters above sea level in the afternoon on 4 March. We walked eastward to a small patch that contains two ponds, Talago Biru and Talago Puti Mambang Surau, and headed towards the shore on the east side of Talago Puti Sangka Bulan to build a night camp at 0° 4' 30.72" N 99° 58' 58.56" E, ca. 2,740 meters altitude. While passing Talago Biru, MNJ saw a dragonfly hovering above the pond surface for a couple of seconds before it flew away. In this very limited observation, the dragonfly looked to have a stout body and with shiny greenish or blueish color. However, due to the urgent need to set up

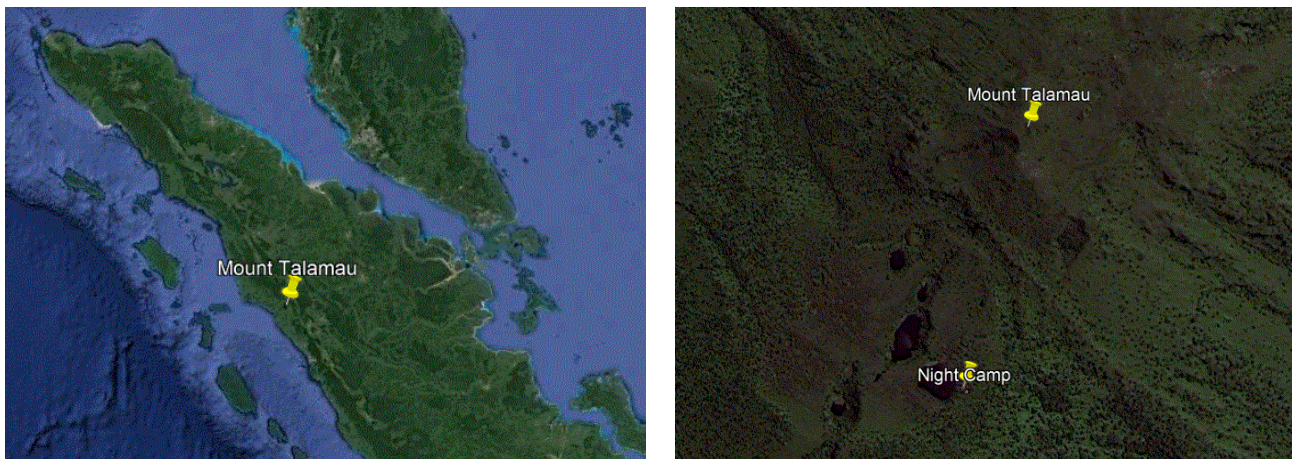


Figure 1-2. (1) Google satellite maps showing position of Mt Talamau. (2) Satellite map showing ponds near peak.



our camp site before daylight ended, no further observation was made that day.

On the next day, the authors spent nearly three hours surveying the two ponds, Talago Puti Sangka Bulan and Talago Biru, which both have accessible walking paths. At the first pond we found some exuviae on grass stalks along the north side (see Figure 7). There were 13 exuviae within approximately 30 meters of the pond edge, assessed to be a between a day and a week old from the time of emergence. In addition to this finding, a dead nymph was found floating at the nearby shore. We also spotted two teneral that were drifting, yet alive, on the pond surface. Upon careful inspection, one individual apparently failed to develop its left wings, while the other one presumably experienced some deformation as its body looked curved backward (see Figures 8-9). Both were lifted from the water and helped to perch on the thickets away from the pond, with a feeble expectation that they could fly away somehow. Ample pictures were taken of both tenerals during this time. The exuviae, on the other hand, were collected and brought to the Animal Taxonomy Lab in the Biology Department of Andalas University in Padang for further examination.

After the rough transporting process, there were eight good exuviae for measurement (see Figures 10-12). Some prominent characters observable are described here. Eyes positioned laterally on the widest part of head, look transparent on the exuvia. Short antennae present, but crumbled on most specimen. The mediobasal longitudinal groove on labia is clearly visible. Wingbase short covering similarly short membranous wing underneath. The pyramid structure at the tip of the final abdominal segment slightly visible from dorsal view. Ventrally, at the apex of the abdomen the cerci are slightly longer than the epiproct; this probably common in cordulid nymphs (Neiss et al. 2018). The ventral side of abdomen with prominent submarginal grooves. A pair of forelegs, which were used to grasp on the grass stalk during emergence, is shorter than the pairs of midleg and hindleg; the last pair is the longest.

The photographs of both tenerals reveal to be females from the same species, due to no external or secondary genitalia apparatus seen at the base of second abdominal segment. After further examination of photos, we tend to think that they are *Procordulia* rather than *Hemicordulia* on account of some morphological characters, mainly for its anal angle on hind wing that is not rounded (Tol 1997); the altitude and habitat are also typical of

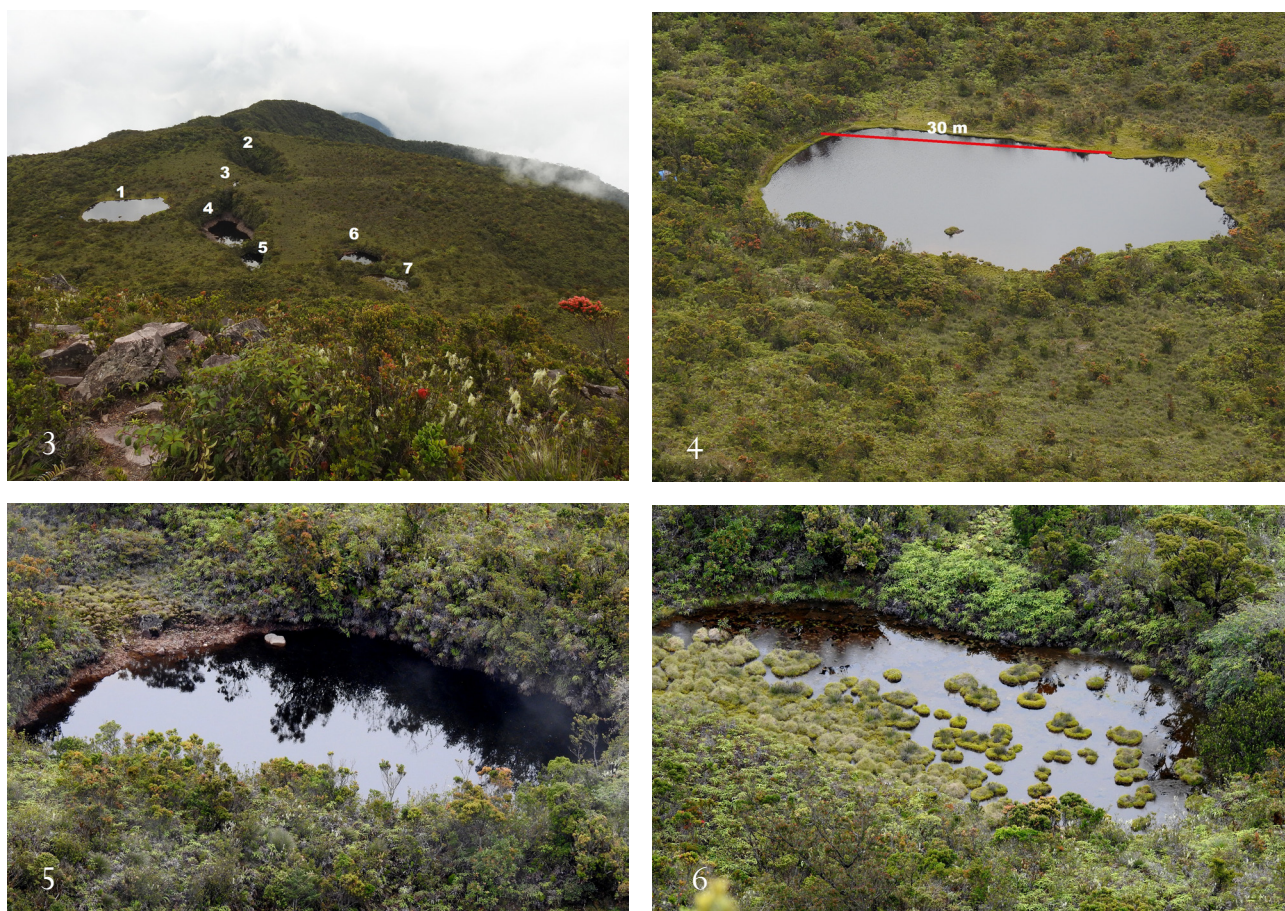


Figure 3-6. (3) Seven montane ponds at 2,740 m altitude, Mount Talamau, viewed from the summit at 2,912 m altitude. (4) Talago Puti Sangka Bulan pond. The red 30 m line shows where 13 exuviae were collected. (5) Talago Puti Bungsu pond. (6) Talago Lumuik pond. Both Talago Puti Bungsu and Talago Lumuik are also two other possible habitats for *Procordulia* dragonfly.



Figures 7-9. *Procordulia* sp. exuviae and teneral females, Mount Talamau, Sumatra, 4 March 2019. (7) A couple of exuviae hanging on grass stalks on the pond side. (8) Teneral with crumpled left wings. (9) Teneral with malformed body.

this taxon. The shape of the abdomen and the size of caudal appendage of the tenerals differentiate them from those described for *Hemicordulia tenera*, the only known representative of *Hemicordulia* in the region (Dijkstra 2007, Kosterin et al. 2015). *Procordulia* is so far represented by *P. artemis* Lieftinck, 1930 and *P. karnyi* Fraser, 1926 in Sumatra; but the identity of our procordulid is undecided as species determinant characters cannot be seen in the photographs. Despite this taxonomic issue, the observation itself is probably the most northward record for *Procordulia* in Sumatra as well as at a much higher altitude than the previous records made for Sumatra and Java (Lieftinck 1933, Tol 1977).

In addition to the discussion above, the biological and ecological aspects related to the survival of this species in this high altitude area need to be further investigated. The exuviae were only found in one pond, Talago Puti Sangka Bulan, with three of them failing to emerge successfully as adults as described above. This reflects the limited number of offspring that may be produced within a reproduction cycle. Of the thirteen ponds known in the peak area of Mount Talamau, only other three ponds were considered potentially suitable habitat for the *Procordulia* dragonfly, namely Talago Biru, Talago Puti Bungsu and Talago Lumuik (see Figures 3-6) aside from the one where we found the exuviae. The assumption is based on the physical condition of these ponds, including their water quality. Talago Biru, where the dragonfly was first sighted during the trip, was checked for exuviae but with no luck finding any. Meanwhile the two other ponds were not surveyed due to inaccessibility and time constraints. The rest of the ponds sighted in, Talago Tapan Sutan Bagindo, Talago Puti Mambang Surau and Talago Siuntuang Sudah, are unlikely to be the dragonfly habitat as they contain acidic sulphurous water (Anggara, pers.



**Figures 10-12.** Some of the exuviae collected from Mount Talamau, Sumatra, 4 March 2019. (10) Series of four exuviae. (11) Mediobasal longitudinal groove on labia (arrow mark). (12) The lines show cerci are slightly longer than epiproct.

*comm.*). The other eight ponds were not visited, as they are located on a different ridge of the mountain, with no clear sighting from the summit point. It would also require more time to explore them which we unfortunately did not possess at that time.

On the third week of April 2019 another trip was made by a group of students from the same faculty as the authors. They did not observe any exuviae in Talago Puti Sangka Bulan or other ponds, although a couple of adult individuals were sighted. There may be seasonality for reproduction, due to limited resources available accumulated with the harsh mountainous condition. Therefore, regular survey is required to reveal more about the biology of this dragonfly as well as its population dynamics in this specific habitat.

#### **Acknowledgement**

We would like to thank Andrianto Anggara for his assistance with a lot of technical things before and after the hiking at Mount Talamau, as well as to the villagers in Pinago, Aur Kuning that helped with their hospitality in

directing the authors at the beginning of the mountain ascent. Our gratitude also goes to Rory A. Dow and Pungki Lupiyaningdyah for their insightful advice on species identification.

## Reference

- Dijkstra, K.D.B., 2007. Gone with the Wind: westward dispersal across the Indian Ocean and island speciation of *Hemicordulia* dragonflies (Odonata: Corduliidae). *Zootaxa* 1438: 27-48.
- Dijkstra, K.D.B. & Lempert, J., 2003. Odonate assemblages of running waters in the Upper Guinean forest. *Archiv für Hydrobiologie* 157: 397-412.
- Directorate General of Forest Protection and Nature Conservation, 2003. *Submission for nomination of tropical rainforest heritage of Sumatra by the Government of the Republic of Indonesia to be included in the World Heritage List*. Indonesian Ministry of Forestry, Jakarta.
- Kosterin, O.E., Karube, H. & Futahashi, R., 2015. Two new subspecies of *Hemicordulia tenera* Lieftinck, 1930 (Corduliidae) from Cambodia and Thailand. *International Dragonfly Fund - Report* 82: 1-19.
- Lieftinck, M.A., 1933. The life-history of *Procordulia artemis* Lieft (Odonata, Corduliidae), with comparative notes on the biology of *P. sumbawana* (Förster). *International Review of Hydrobiology* 28: 399-435.
- Lumbanbatu, U.M. 2009. The morphogenetic of Lubuk Sikaping area in West Sumatra Province. *Jurnal Sumber Daya Geologi* 19(2): 79-93. [in Bahasa].
- Neiss, U.G., Fleck, G., Pessacq, P., Tennessen K. J., 2018. *Odonata: Superfamily Libelluloidea*. In: Hamada N., Thorp J.H. & Rogers D.C. (eds.) *Keys to neotropical hexapoda, Thorp and Covich's freshwater invertebrates*, vol. 3. Academic Press, London, pp: 399-447.
- Normasiwi, S., Mutaqien, Z., Noviady, I., Susanto, E. & Ashari, A.J., 2015. Flora exploration in the protected forest of Mount Talamau, West Sumatra and Mount Sibuatan, North Sumatra to enrich plant collection in Cibodas Botanical Garden. *Prosiding Seminar Nasional Masyarakat Biodiversity Indonesia* 1(3): 501-508. [in Bahasa]
- Olson, D. & Dinerstein, E. 2002. The global 200: Priority ecoregions for global conservation. *Annals of Missouri Botanical Garden* 89: 199.
- Oppel, S., 2005. Habitat associations of an Odonata community in a lower montane rainforest in Papua New Guinea. *International Journal of Odonatology* 8(2): 243-257.
- Orr, A.G., 2006. Odonata in Bornean tropical rain forest formations: diversity, endemicy and implications for conservation management p: 51-78. In: Cordero-Rivera A (ed) *Forest and Dragonflies* (Sofia-Moscow: Pensoft Publisher).
- van Tol, J., 1997. The genus *Procordulia* Martin in western Malesia (Odonata, Corduliidae). *Tijdschrift voor Entomologie* 140: 133-146.

## A new record and microhabitat of *Austrocordulia leonardi* (Anisoptera, Libelluloidea incertae sedis)

Adrian Grieve (AG),  
Marine Pollution Research Pty Ltd, PO Box 279 Church Pt, NSW, 2105;  
[adriangrieve@ozemail.com.au]  
Gunther Theischinger (GT),  
Research Associate, Australian Museum Research Institute,  
Australian Museum, 1 Williams Street, Sydney, NSW 2010, Australia;  
[theischingergunther@gmail.com]

### Abstract

In May 2019 four larvae of *Austrocordulia leonardi* Theischinger, 1973 were found at the original location in the Nepean River at Maldon Bridge, ca. 30 km SSW of Sydney, after rumour was for a while that it had become extinct there. Subsequently another larva was found for the first time at a new Nepean River site just downstream of Menangle Weir, some 23 km downstream from the first site. These findings double the number of locations from which *A. leonardi* larvae have hitherto been recorded. At both sites the larvae were detected within crevices on the underside of submerged wooden logs in approximately 1 m deep water, a microhabitat not previously known or recorded for the species and generally overlooked during routine aquatic macroinvertebrate surveys.

### Introduction.

The discovery of *Austrocordulia leonardi* in 1968 in suburban Sydney (Theischinger 1973) came as a big surprise, since the great odonatologist Robin James Tillyard had been active in the Sydney region for years in the first decade of the 20<sup>th</sup> century, Roderick Dobson had collected there with enthusiasm and success in the 1960s, and there were two prominent resident Australian odonatologists, Tony O'Farrell at the University of Armidale (since 1947) and Tony Watson at CSIRO in Canberra (since 1967) who had collected in the area occasionally. After its discovery the record history of *A. leonardi* progressed rather poorly as it is a rare species with a particular behaviour of the adults (and apparently the larvae), and final instar exuviae hitherto were almost exclusively all that could be detected even at the most promising sites. To date the species is known from fewer than 10 sites, with adult specimens being recorded from three of these and larvae being recorded from two. With extinction periodically rumoured at one or the other of these sites, AG and GT planned an aquatic ecological assessment of Nepean River sites to search for exuviae and larvae of *A. leonardi*.

### Search for *Austrocordulia leonardi*

On 20<sup>th</sup> May 2019 AG undertook an aquatic ecological assessment of the Nepean River at Maldon Bridge (Figure 1A), hereafter site NepMB (34.202024°S/150.633132°E), where adults and exuviae of *A. leonardi* had been recorded several times years earlier. On GT's suggestion, AG first inspected emergent rock faces for the presence of exuviae for a period of 45 minutes. It was necessary to swim (wearing a wetsuit) to the locations due to access restrictions. No exuviae were found, which was not surprising given the length of time since the last emergence period (probably November 2018). Submerged wooden structures and rocks were then targeted by AG. After about 45 minutes of this search four *A. leonardi* larvae were recovered from within crevices on the underside of a single large submerged wooden log (Figure 1B). The log was located in the middle of the river, 5-10 m from either bank, at a depth of around 1m, between two rocky outcrops, which potentially provided optimal protection from the sun. At the time of sampling there was an observable flow through the constricted section. All specimens were identified by GT, then photographed and immediately returned to the exact location of discovery. The larvae represented different instars, the largest (Figure 1C) was in the final instar.

After that, based on identification of potential aquatic and riparian habitat attributes that are consistent with the known habitat requirements of *A. leonardi*, another Nepean River site just downstream of Menangle Weir (Figure 1D), about 23 km downstream of NepMB (34.118817°S/150.742303°E) was visited in order to see if the species could also be detected there:

- This site included bedrock and boulder outcrops along bank edges, which would aid the emergence of dragonfly larvae.
- There were submerged rock and cobble substrates which were (and are) a well-known preferred habitat type.
- It fulfilled the pre-requisite of flowing water within close proximity to a source of broken running water (weir and riffle section).



**Figure 1. (A) Looking downstream in the Nepean River at site NepMB. (B) Showing *Austrocordulia leonardi* habitat in woody crevices on the underside of a log. (C) The largest of the *A. leonardi* larvae recovered from NepMB. (D) looking upstream in NepMW toward weir.**

Following the success at NepMB, searches by AG started with inspection of woody debris on the upstream side of the weir (no rocky substrates were available) which yielded no odonate larvae. Then the fishway wall was checked for exuviae, but only *Cordulephya* exuviae were found. The constructed sandstone rock wall was then checked for exuviae and nearby logs; there were no submerged logs or woody debris, mainly only rocky fragments (cobble to boulder sized) along the submerged edge banks. No exuviae were found, nor were any odonate larvae on the underside of rocks. Filamentous green algae and algal biofilm were present in quantities similar to, or greater than, at NepMB (probably due to exposure to sunlight along the sandstone retaining wall).

After about an hour searching, a subsequent check by AG of submerged woody debris adjacent to the downstream end of the rock wall and on the opposite bank resulted in the detection of one *A. leonardi* larva in a similar microhabitat to that at Maldon Bridge, this time within crevices on the underside of a Casuarina log in a depth of 0.5 to 1m. Flow was noticeably greater in this constricted river section than in adjoining sections up and downstream, which were broad open pools with sluggish flow. The single larva was of a much earlier instar than three of the four specimens from NepMB.

### Discussion

In regard to the habitats searched in the Nepean River the following comments may be relevant for future *A. leonardi* searches there and elsewhere:

- Whilst the main aquatic microhabitat attributes for *A. leonardi* larvae mentioned in the literature are rocky situations, particularly the underside of rocks (Theischinger & Hawking, 2006; NSW DPI, 2007; NSW Fisheries Scientific Committee, 2007), all larvae found on 20 May 2019 were residing in crevices on the underside of large moderately deeply submerged logs. These findings now extend the known habitats utilised by *A. leonardi* to include moderately deeply submerged wooden structures.
- The fact that all larvae were found on the underside of the wooden structures (in crevices), and that previously larvae were found on the underside of rocks indicates that larvae may be definitely cryptic in nature.
- The submerged logs where all the specimens were found were in depths of around 1 m. It is therefore possible, that the criteria of deep pools that is mentioned for *A. leonardi* in the literature (NSW DPI, 2007; NSW Fisheries Scientific Committee, 2007; Theischinger et al., 2009), may in fact relate to the requirement of cooler water temperatures for larvae, and thus not confine the larval habitats just to deep pools.
- Whilst much of the ecological requirements for this species remain to be discovered and confirmed, it can be noted that larvae require cool, oxygenated water such as that provided by riffle zones or artificial structures (e.g. deep dams and weirs), and also occur in crevices on the underside of wooden logs, protected from the sun in moderately deep water.
- Extensive sampling over many years conducted by government agencies, private companies or volunteer organisations have targeted riffles and edge habitats along slow flowing sections of rivers or backwaters using the AusRivAS rapid bio-assessment protocol. While these sampling techniques have generally failed to detect larvae of *A. leonardi*, the first attempts to target cryptic habitats in moderately deep water were successful.
- Targeting larvae which potentially can be found all year round appears most promising, given that adults of *A. leonardi* are only on the wing for about one month per year (often exuviae do not last for much longer) and the life history of the species, most of which is spent in the water, is certainly longer than a year.

It is therefore considered imperative that future searches for the data deficient *Austrocordulia leonardi* include searches among submerged wooden logs in moderately deep water, using a wetsuit if necessary.

## References

- NSW Department of Primary Industries, 2007. Primefact 184. Threatened Species in NSW Sydney Hawk Dragonfly *Austrocordulia leonardi*.
- NSW Fisheries Scientific Committee, 2007. Final Determination *Austrocordulia leonardi* - Sydney Hawk Dragonfly.
- Theischinger, G., 1973. Eine zweite Art der Gattung *Austrocordulia* Tillyard (Odonata, Anisoptera). *Annalen des Naturhistorischen Museums in Wien* 77: 387-397.
- Theischinger, G. & Hawking, J. H., 2006. *The Complete Field Guide to Dragonflies of Australia*. CSIRO Publishing: Collingwood.
- Theischinger, G., Miller, J., Miller, R. & Krogh, M., 2009. Rediscovery of *Austrocordulia leonardi* (Sydney Hawk) in the suburbia of Sydney. *Agrion* 13(2): 50-53.

## New Books & Reviews

### Dragonflies and Damselflies of New Zealand

**Authors:** Milen Marinov and Mike Ashbee

**Format:** Flexibind and Ebook

**Publisher:** Auckland University Press, July 2019,

pp 168. ISBN 9781869408923

NZ\$49.99 + p&p

Amazon US\$39.5 + p&p

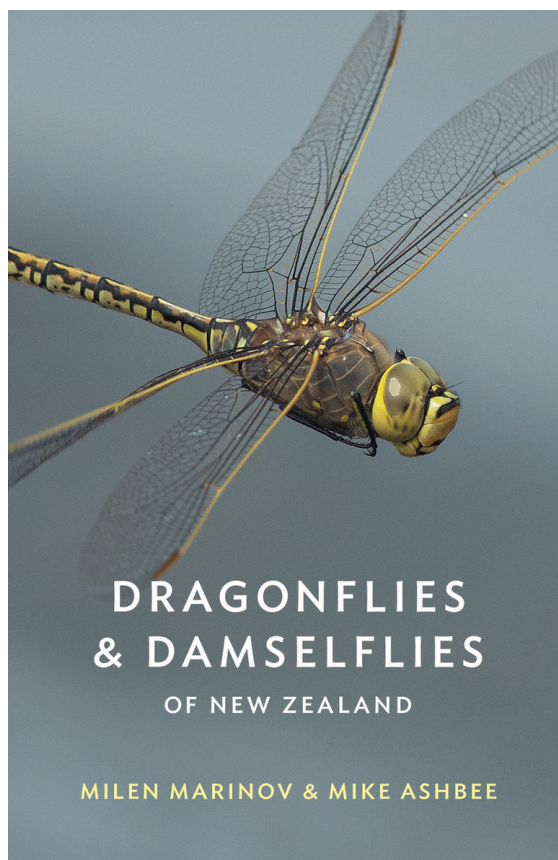
**Ebook:** Kobo £18.83; Amazon Kindle: US\$20.63

A beautifully illustrated natural history and field guide to New Zealand's extraordinary dragonflies and damselflies. Dragonflies and damselflies are among the most spectacular organisms on the planet. They have survived on earth for more than 325 million years, through a series of mass extinctions, by being exquisite examples of evolutionary adaptation: superb flyers with extraordinary vision and startling colours.

This is a natural history and field guide to New Zealand's 14 species of dragonflies and damselflies. Easy to observe around wetlands and rivers, dragonflies and damselflies are favourites of New Zealand nature lovers, and this book will be too.

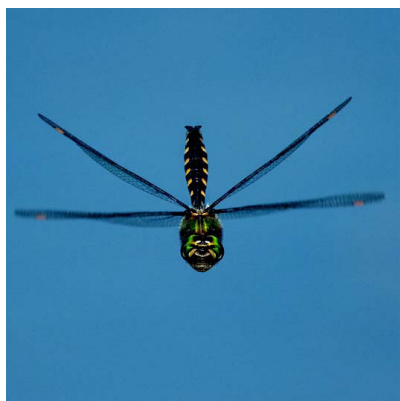
Key features include:

- Expert and up-to-date information on the 14 species breeding in New Zealand.
- Natural history of the group including an introduction to evolution, habitats, biology, behaviour, photography and conservation.
- More than 200 new photographs and hand-drawn illustrations of dragonflies and damselflies at all life stages in their environment.
- Authoritative text on each species covering identification, measurement, behaviour, breeding, flying period and where to observe the species.
- Range maps for all species.



Further information at Auckland University Press web site [\[Link\]](#)

Book extract: [\[Link\]](#)





**Die Eiszeitlibellen der Alten Welt:  
Pleistozäne Biogeographie Paläarktischer Libellen  
[Ice-Age Odonata of the Old World.  
The Pleistocene Biogeography of Palaearctic Dragonflies]**

**Author: Thomas Brockhaus**

**Series: Zoologica (Schweizerbart) Volume: 163**

**145 pages, 106 illustrations, 18 tables**

**Schweizerbart Science Publishers, 2018**

**ISBN 978-3-510-55050-0**

**Language: German with bilingual summary in English and German**

**Price: 109.00 € + p&p [[Link](#)]**

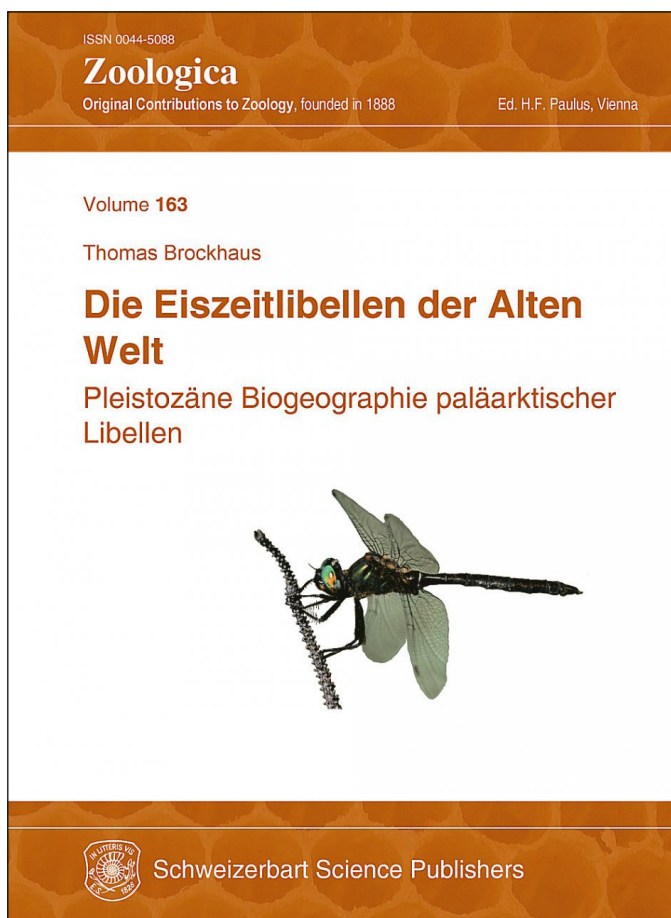
In the present volume, the author discusses the Pleistocene distribution dynamics of boreal dragonfly species in the Palaearctic. For this purpose, palaeontological, autecological and propagation dynamics findings, as well as results of Pleistocene research are combined into a synthesis to models of Pleistocene areal formation processes. As far as possible with these methods, speciation processes of dragonflies are presented. The author shows that climate change, combined with a change of whole landscapes, has probably been the trigger of evolutionary processes in some dragonfly taxa.

Amongst the listed species, two groups are distinguished: species that show strong adaptations to cold environmental conditions and species that tolerate a broad temperature range. Within these two groups the author was able to make further distinctions:

- Circumsubarctic and circumtundral species, "permafrost soil species"
- Recent boreomontane species
- Stenotope species with boreal distribution
- Recent trans Palaearctic-boreomontane species
- Eastern Palaearctic species, Siberian species found in disjointed areas
- Late glacial glacier margin species
- Western Palaearctic species
- Species with western to central Palaearctic distribution
- Species with trans Palaearctic distribution and without subspecies
- Western and Eastern Palaearctic sisters or subspecies
- Flowing water species

Distribution areas and areal histories for each of these groups are described in detail for typical species and characterized by recent, and in some cases hypothetical, cold-period distribution maps. The faunas are presented for different Palaearctic regions that still contain a more or less large proportion of cold-seasonal fauna elements.

This treatise is not only aimed at entomologists and odonatologists. This volume is also relevant for scientists who are particularly interested in recent palaeogeography, zoogeography or climate-related evolutionary processes. The results presented here are also eminently important for species protection, as we are currently experiencing a period of dynamic climate change.



## Dragonflies and Damselflies of Victoria & Tasmania

Book Review by Richard Rowe  
[richard.rowe.dragonflies@gmail.com]

Authors: Reiner Richter and Ian Endersby  
Published by the Entomological Society of Victoria, 2019  
Printed by: Impact Digital Pty Ltd  
Unit 3-4, 306 Albert Street, Brunswick, VIC 3056  
Available from Entomological Society of Victoria  
30 Aus \$ + p&p [\[Link\]](#);  
pdf ebook also available

Book sample extract: [\[Link\]](#)

The book is softback, miracle bound, and well-constructed. Although not promoted as a field guide it would easily slip into a day pack. In which case purchase two copies.

In 170 pages I have three gripes: The first is when characterising the Zygoptera (p vii) the obligate for European and North American publications 'wings at rest held above abdomen' leads. As the damselfly fauna considered here includes four species of Argiolestidae ('Flatwings' for a reason) and two *Diphlebia* species ('Rock Masters') and the dragonflies two *Cordulephya* species ('Shutwings' for the obvious reason) this 'character' might have been given less prominence. Alternatives (such as the position of the nodus) are however, problematic, requiring rather more explanation than novice users may be comfortable with.

Recent genetic and morphological work has shown *Ischnura aurora* is an Austro-Pacific species, similar Asian forms actually belong to different species.

The *Diplacodes melanopsis* entry has fallen between two editing stools, a problem with electronic manuscript preparation.

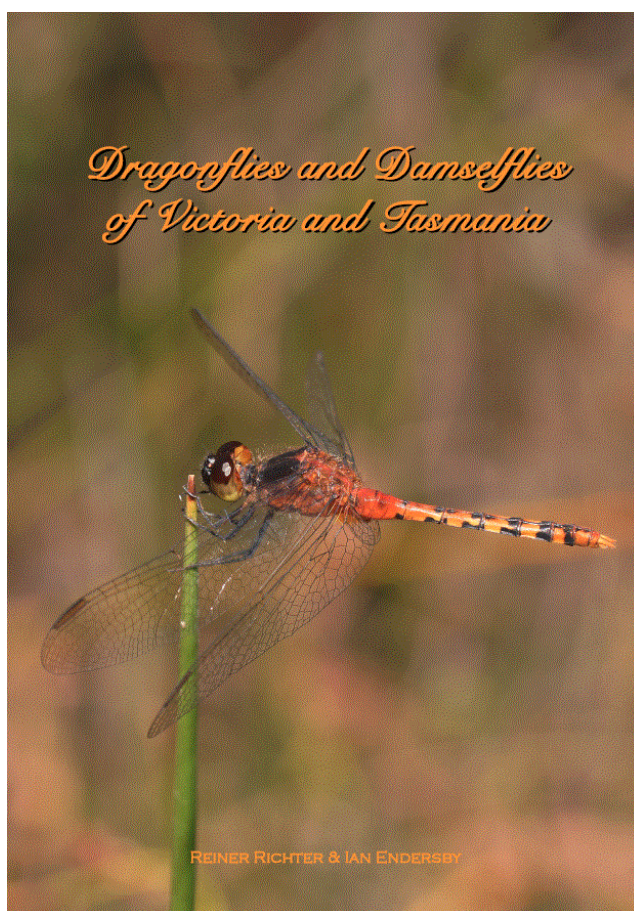
Despite the title the fauna of the state of South Australia is also covered for good measure, but without distribution maps.

The authors of this volume are serious dragonfly biologists with great 'street cred'. They are astute observers, and think about their observations.

Ian Endersby has been working on Odonata for some thirty years and in his retirement has produced a number of very worthwhile volumes, synthesising knowledge of the Odonata. Reiner Richter is an active biologist who has photographed most of the Odonata fauna of the region alive and in the field. We owe to him the discovery both of the west Victorian populations of *Hemiphlebia mirabilis* and of its real habitat. These are two dragonfly scientists who need to be listened to.

This book follows the general style of identification manuals being produced across the world. There is a double page spread for each species covered, comprising a brief species account, an indicative flight season bar chart, occurrence maps for Victoria and Tasmania and, facing, two clear colour photographs showing the male and female. Where needed additional photographs show detailed images of key identification features with each feature circled in a bold red ellipse. This contrasts with the pictures in Theischinger and Hawking's *complete field guide* which many beginning users find difficult to follow.

Reading Richter and Endersby before proceeding to the field should give people a feeling for the characters to focus on within each taxonomic group. For each species the page of habitus photographs shows the entire animal (both male and female) in an 'ordinary' situation, enough to cue in a novice or beginner, but also very useful for someone with expertise, but unfamiliar with the South East Australian fauna.



The first few pages are available for download through the entomological Society of Victoria website. Noteworthy are the very clear explanations of both biology and taxonomy.

Who is the book for? Obviously anyone with an interest in Odonata living in the three Australian states in question. More generally, anyone in Australia interested in Odonata, and anyone contemplating visiting Australia and who has an interest in dragonflies. Within Australia it serves as a valuable complement to Theischinger and Hawking's field guide. The photographs of living animals and the indication of key identification features will help people ramp into the field and to become familiar with the kinds of features important when identifying different kinds of dragonfly.

This is a timely and well-presented volume, and very good value for the price.



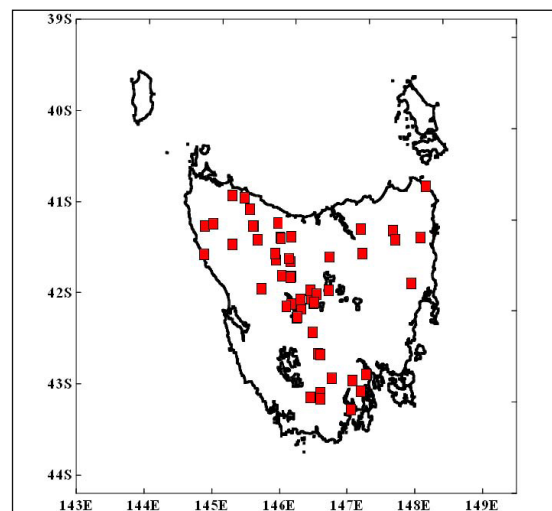
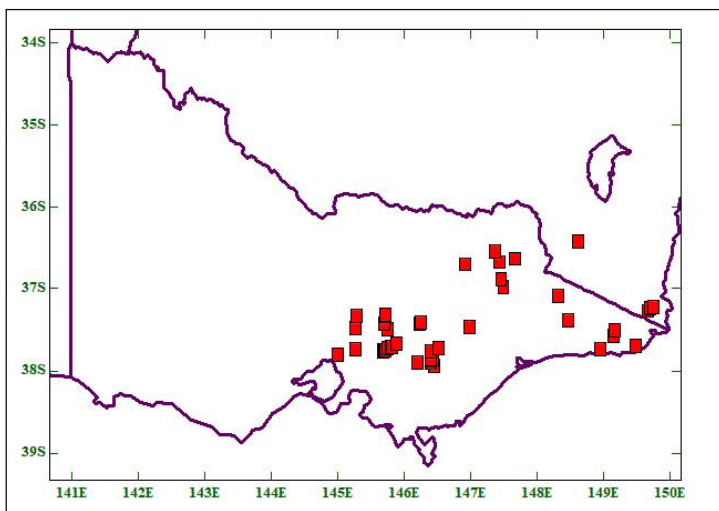
### Reference

Theischinger, G. & Hawking, J., 2006. *The complete field guide to dragonflies of Australia*. Collingwood, VIC.: CSIRO Publishing.

### Other complementary references

Endersby, I., 2006. *Bibliography of Victorian dragonflies (Insecta: Odonata)*. Heidelberg, VIC.: Arthur Rylah Institute for Environmental Research, Department of Sustainability and Environment.

Theischinger, G. & Hawking, J., 2003. *Dragonflies of Victoria: an identification guide to adult and larval dragonflies (Odonata)*. Thurgoon, N.S.W.: CRC for Freshwater Ecology.



Figures 1-4. Sample illustrations and photos from *Dragonflies and Damselflies of Victoria & Tasmania*, by Reiner Richter and Ian Endersby, 2019. (1) Whitewater Rockmaster (*Diphlebia lestoides*), Goulburn River, Jamieson VIC. (2) Tasmanian Darner (*Austroaeschna tasmanica*). (3) Whitewater Rockmaster (*Diphlebia lestoides*) distribution map. (4) Tasmanian Darner (*Austroaeschna tasmanica*) distribution map.

**Book review**  
**The scientific names of North American dragonflies**

**Authors: Heinrich Fliedner & Ian Endersby**

**Busybird Publishing, Montmorency, Victoria, Australia**  
**x + 273 pp. 2019**

**ISBN 978-1-925949-08-7**

**Reviewed by Matti Hämäläinen [matti.hamalainen@helsinki.fi]**  
**& Rosser W. Garrison [argia.vivida@gmail.com]**

In 1997, Heinrich Fliedner published a work on the etymologies of scientific names (in current use) of the European dragonflies (Fliedner, 1997), followed by an accompanying volume of the name givers of European Odonata (Fliedner, 1998). These publications triggered a growing interest in the etymology of dragonfly names, and a flow of articles on this subject followed. In 2015, Ian Endersby's and Heinrich Fliedner's acclaimed book *The naming of Australia's dragonflies* appeared (Endersby & Fliedner, 2015). It provided etymologies of all available genus- and species-group names, including, subgenera, subspecies and all synonyms and homonyms. The book also presented brief biographies of the authors, who had given those names. The present book, by the same authors, is the third work covering the etymologies of the scientific dragonfly names on the continental basis.

At first glance this book appears very similar to the Australian one. The present book is, however, significantly more restricted in scope. The authors write: "All genus and species names that are included in this work are those in current use in the *Checklist of North American Odonata: Including English Name, Etymology, Type Locality, and Distribution* by Dennis R. Paulson and Sidney W. Dunkle (2012 and 2018 editions)".

The checklist by Paulson & Dunkle (2018) includes only the names of currently recognised 'full' species (468 spp.) and the names of the genera (90) in which these species are presently placed. It ignores 182 available species-group names of taxa (i.e. available in the terms of the Code, not counting the numerous *nomina nuda* of Hagen and others) originally described from specimens collected in the continental United States or Canada. Most of these are synonyms, but about 20 of these missing names are ranked as valid subspecies in the latest major handbooks of North American Odonata and in the synonymic list of the New World Odonata by Garrison & von Ellenrieder (2019). There are also 43 additional available genus-group names given to taxa which include North American species. These names are presently ranked either as synonyms or subgenera.

Therefore, the present book covers only ca 71 % of the names that have been given to the extant dragonfly fauna in North America (in the sense of this book, covering only Canada and the continental United States). From an historical and etymological point of view, synonymic names are as interesting as those in present use, but we can well understand why the authors did not treat these names in their book. Their original aim was just to amend, revise or correct some of the very brief etymology accounts in the checklist by Paulson & Dunkle (2018), but as often happens, the authors got carried away: "a book it had to be", they wrote in the preface.

The main text of the book starts with a brief account of the history of the taxonomic studies of North American dragonflies (6 pages), followed by a discourse on scientific names (how to interpret them), eponyms and toponyms (totalling 9 pages). Then follows a chapter of short biographies of the authors who have named valid species or genera of North American Odonata. These comprise 77 individuals covered in 65 pages and, with



four exceptions, include a photograph or hand drawn portrait. The major part of the book (154 pages) deals with the etymologies of the ca 560 species- and genus-group names, all of which are presented in alphabetical order. There are three separate reference lists, one for the sources of the individual biographies, one for references used for determining etymologies and one for references containing original descriptions or explanatory matters. Names and genera are grouped into several categories according to their meaning in an appendix.

The practice of appending etymologies to a description of a new species or genus is a recent development. Earlier authors, until about the middle of the 20<sup>th</sup> century, seldom explained the meaning of names bestowed on species. As shown in the diagram on page x, already 90 % of the names of North American Odonata were established by the 1950's. So, in most cases deducing the etymology of the names listed in this book required a careful and erudite linguistic analysis of the scientific name itself and the original description or diagnosis of the taxon. Being a noted classicist and dragonfly enthusiast, the first author of the book is surely the most qualified person for this work.

Each account includes relevant extracts from the original description, which support the chosen explanation. For most of the names a convincing explanation of the name's etymology has been presented, in a number of cases two or more alternative explanations are provided, but the definite meaning of many names remains unsolved. Explanations are couched in cautious terms, the words 'may' and 'probably' often qualifying the authors' conclusions. Many of the names given by H.A. Hagen especially, the most prolific describer with 126 names, caused problems. Some of Hagen's names do not seem to have any logical meaning. Among his names are also rather curious, if not humorous, ones. For instance, the Latin species epithet in *Lestes stulta* [later emended to *stultus*] Hagen, 1861 means 'foolish'. For this name a quite convincing explanation was presented. Hagen based his description on an imperfect specimen with a missing abdomen. One of the real pearls among the names is the species epithet of *Stylurus potulentus* (Needham, 1942). The Latin word *potulentus* means 'tipsy, rather drunk'. The collecting locality of the single specimen studied – 'Whisky Creek' in Mississippi – provided a plausible explanation for this name. This name shows an inventive mind and quite a sense of humour from its author, J.G. Needham.

In some names, such as *anceps* (*Argia*), *Tanypteryx* and *talaria* (*Cordulegaster*) linguistic errors have been pointed out, but of course these do not affect their nomenclature. Also, the earlier explanation of the etymology of the name *Macromia* is corrected; rather than referring to the equally long tarsal nails, the name refers to a character in venation.

Often it is an unwelcome but nevertheless expected task of a reviewer to locate and point out any perceived errors and weaknesses in the publication he or she reviews. In an undertaking of this magnitude some errors are inevitable. For example, as noted above, in some cases the authors provide two or more explanations as to how a certain name was given. In the names *lentulus* (p. 174) and *vinosa* (p. 240) the second alternative, which concerns behaviour, can be ruled out, since the authors never saw the species alive.

The etymology of the genus name *Tauriphila* Kirby, 1889 (p. 229) is probably incorrect. It is explained as follows "Gr. ταῦρος= bull + -φιλος -η -ον (in compounds) = loving. This name might be a reference to feeding near cattle, but nothing about that is mentioned by Kirby." The same explanation was previously given by Paulson & Dunkle (2018, and in earlier versions of that publication). However, rather than meaning 'bull loving' the name surely originates from Greek mythology. Kirby (1889) designated '*Tramea iphigenia*, Hag.' [synonym of *Tauriphila australis* (Hagen, 1867)] as the type species of his new genus. It seems likely that the name *Tauriphila* comes from the drama 'Iphigenia among the Taurians' (Ἰφιγένεια ἐν Ταύροις) written by Euripides between 414 BC and 412 BC. In Greek mythology Iphigenia was the daughter of King Agamemnon. The Taurians lived in the Crimean peninsula. Given the multilingual W.F. Kirby's passionate enthusiasm for mythology, on which topic he wrote several books, this seems the obvious interpretation.

The biographies of the 53 authors, who have named the taxa treated in this book make for interesting reading. The individual accounts are of variable length and since they have been compiled from various sources (the sources being carefully defined) they differ in their contents. Many of the early describers of the North American taxa also have biographies in the Australian book (Endersby & Fliedner, 2015). It is a positive that the accounts in the two volumes are far from identical. Some of the accounts of the leading, late, North American odonatologists, including those of P. P. Calvert, J. G. Needham and E. B. Williamson, are short and meagre regarding their odonatological achievements. Unlike its equivalent in the Australian book, the account of Friedrich Förster lacks information on his American connections, such as the acquisition of Förster's valuable Odonata collection, with numerous type specimens, by the UMMZ at Ann Arbor. It is unfortunate that the book *Eponym dictionary of Odonata* by Beolens (2018) apparently arrived too late (in September 2018) to provide a major source of reference while compiling the biographies of the odonatologists naming North American taxa for this book. Exceptions are the biographies of González-Soriano and Hodges, in which Beolens's book has been referred as a source (p. 85 and p. 87, respectively).

It would had been good to reference Beolens's book in the Eponym accounts (on pages 8–13), since it provides accounts (of variable length) of all individuals honoured in the names of North American taxa.

The brief account on the history of the taxonomic studies of North American Odonata on pages 1–6 includes a table showing the number of (valid) genera and species named by the individual authors. The explanation (p. 3) “The headings in parentheses indicate species that have been synonymised or subspecies raised to full species rank.” is misleading. In fact, the figures in the ‘(Species)-column’ refer to species that are presently placed in a different genus to that in the original description. Thus, they are not synonyms in the taxonomic sense.

Notwithstanding these errors and some other shortcomings not mentioned in this review, we warmly commend this volume to anyone interested in acquiring the derivation of the scientific names, and for those who are curious to read of the lives of the zoologists who introduced these names.

A PDF of the book is freely available on internet at [[https://www.researchgate.net/publication/334046392\\_The\\_Scientific\\_Names\\_of\\_North\\_American\\_Dragonflies](https://www.researchgate.net/publication/334046392_The_Scientific_Names_of_North_American_Dragonflies)].

Those who prefer to have a hard copy should search the nearest regional Amazon.com supplier.

Amazon US [<https://www.amazon.com/Scientific-Names-North-American-Dragonflies/dp/1925949087/>]

Amazon AUS [<https://www.amazon.com.au/Scientific-Names-North-American-Dragonflies/dp/1925949087/>]

Amazon UK [<https://www.amazon.co.uk/Scientific-Names-North-American-Dragonflies/dp/1925949087/>].

Book Depository [<https://www.bookdepository.com/Scientific-Names-North-American-Dragonflies-Ian-Endersby/9781925949087?ref=grid-view&qid=1568333627840&sr=1-1>].

## References

Beolens, B. 2018. *Eponym dictionary of Odonata*. Whittles Publishing, Caithness, Scotland, UK.

Endersby, I. & H. Fliedner, 2015. *The naming of Australia's dragonflies*. Busybird Publishing, Eltham, Victoria, Australia. [[https://www.researchgate.net/publication/283318421\\_The\\_Naming\\_of\\_Australia's\\_Dragonflies](https://www.researchgate.net/publication/283318421_The_Naming_of_Australia's_Dragonflies)].

Fliedner, H., 1997. Die Bedeutung der wissenschaftlichen Namen europäischer Libellen. *Libellula*, Supplement 1: 1-111.

Fliedner, H., 1998. Die Namengeber der europäischen Libellen. Privately published by the author, Bremen.

Garrison, R.W. & N. von Ellenrieder, 2019. A synonymic list of New World Odonata. Version 22 December 2019. Available at [<https://www.odonatacentral.org/docs/NWOL.pdf>].

Kirby, W. F., 1889. A revision of the subfamily Libellulinae, with descriptions of new genera and species. *Transactions of the Zoological Society of London* 12: 249-348, pls. 51-57 excl. [<https://www.biodiversitylibrary.org/item/97233#page/393/mode/1up>].

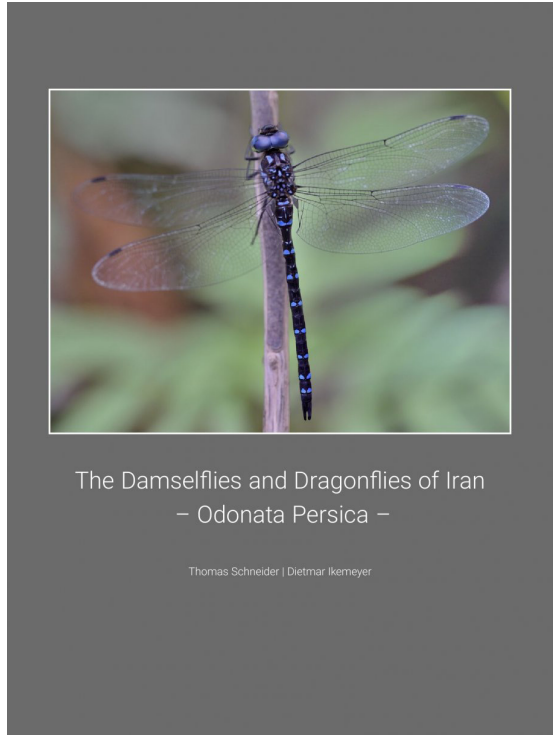
Paulson, D. R. & S.W. Dunkle, 2018. *A checklist of North American Odonata including English name, etymology, type Locality, and distribution*. Available at [[https://www.odonatacentral.org/docs/NA\\_Odonata\\_Checklist.pdf](https://www.odonatacentral.org/docs/NA_Odonata_Checklist.pdf)].

## The Damselflies and Dragonflies of Iran

**Authors: Thomas Schneider and Dietmar Ikemeyer**  
**250 pages, 430 colour photos, colour distribution maps**  
**Due December 2019 - available for pre-order from NHBS [Link]**  
**Publisher: Natur in Buch und Kunst**

Within a period of six years, from 2013 to 2018, the authors travelled 16 times to almost every Iranian province to investigate the indigenous dragonfly fauna. As a result one dragonfly could be described as a new species, *Aeshna vercanica*, and other dragonflies were recorded in Iran for the first time. These are: *Lestes dryas*, *Lestes macrostigma*, *Platycnemis kervillei*, *Coenagrion puella*, *Coenagrion pulchellum*, *Coenagrion ponticum*, *Coenagrion lunulatum*, *Crocothemis sanguinolenta*, *Brachythemis contaminata*, *Trithemis pallidinervis* and *Calopteryx s. tschaldirica*.

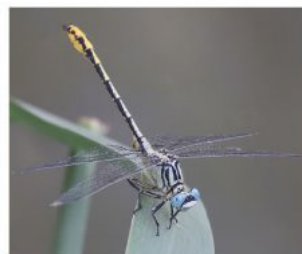
In total 103 species have been illustrated by photographs. For detailed distribution maps data from formerly published literature and available unpublished data about Iranian dragonflies were screened up to the end of 2018 and entered in a database. Further information on biometric data, identification, habitat and taxonomy is given. One of the key objectives of this book is to help preserving the heritage of the Iranian dragonfly fauna which is gravely endangered by the water crisis and all its repercussions.



### Gomphidae

#### *Gomphus kinzelbachi* (Schneider, 1984) | Eastern Clubtail

*Gomphus kinzelbachi* is a relatively unknown Middle Eastern species known from Iraq and Iran. It was described on the basis of a single teneral male (Schneider 1984) captured by Sage (1960) in some scrubs along the Alwand River in eastern Iraq on 06.VI.1958. Since then, one other male specimen was reported by Lohmann (1992) which was captured by Kaiser 1937 on the Sezar River near Bisheh in Iran. The third record was made near Ahvaz and was reported by Sadeghi & Mohammadalizadeh (2009). Recently, we have discovered large populations along several different river systems including the Karkah, Marun, Zohreh and Dalaki in SW Iran (Schneider et al. 2017a, 2017b).



Habitat of *G. kinzelbachi*, Karkah River near Ghods, Khuzestân Province, 27.IV.2016. At this location the species was rediscovered in 2016 (Schneider et al. 2017).



### Gomphidae



**Description and identification**  
 Overall, *G. kinzelbachi* is quite similar to the closely related *G. davidi*, but appears a little smaller. Its total length lies between 43 to 50 mm, its abdomen length ranges between 32 to 36 mm and its hindwing length is between 27 to 35 mm. The distinctive characteristics of the primary and secondary genitalia of the male teneralis of *G. kinzelbachi*, given in the species description by Schneider (1984), have recently been confirmed for another fourteen mature male specimens from Iran (Schneider et al. 2017a). In contrast to *G. davidi*, the tips of the inferior anal appendages are not visible if viewed from above. The superior appendages of *G. kinzelbachi*, viewed from above, are short tapered and stout just before the tip, while they are slender, long and tapered in *G. davidi*. Viewed from the side, the superior appendages of *G. kinzelbachi* have a

small, subapical denticle overtopped by a bulge behind it, whereas it is just a pronounced and single denticle in *G. davidi*. The apical part of the posterior hamule of *G. kinzelbachi* shows a more acute and pronounced tip than that of *G. davidi*. The anterior hamule is longer in *G. kinzelbachi* compared to *G. davidi*. The anterior hamule is nearly half as long as the posterior hamule and has only one third of the length of the posterior hamule of *G. davidi*. The female has only been described recently (Schneider et al. 2016). The thorax has a similar ornamental pattern to *G. davidi*, but from a lateral view, the black pattern in *G. kinzelbachi* is fainter than that of *G. davidi*. The colouration of the head appears broader in *G. davidi* than in *G. kinzelbachi*. The frontal occipital region between the eyes is straight or concave in *G. kinzelbachi*, but more convex in *G. davidi*. From a ven-

tral view, the female vulvar lamina is distally more deeply incised and the outer ends more pointed than those of *G. davidi*. From a lateral view, the vulvar lamina of *G. kinzelbachi* is almost straight, while that of *G. davidi* is strongly curved. Compared to *G. schneideri*, *G. kinzelbachi* is usually lighter in colouration. Also, the central yellow markings on the abdomen are much broader in *G. kinzelbachi*, especially on segments 8 and 9, compared to *G. schneideri*.

