



NEWSLETTER

Volume 32 Issue No.4 December 2021

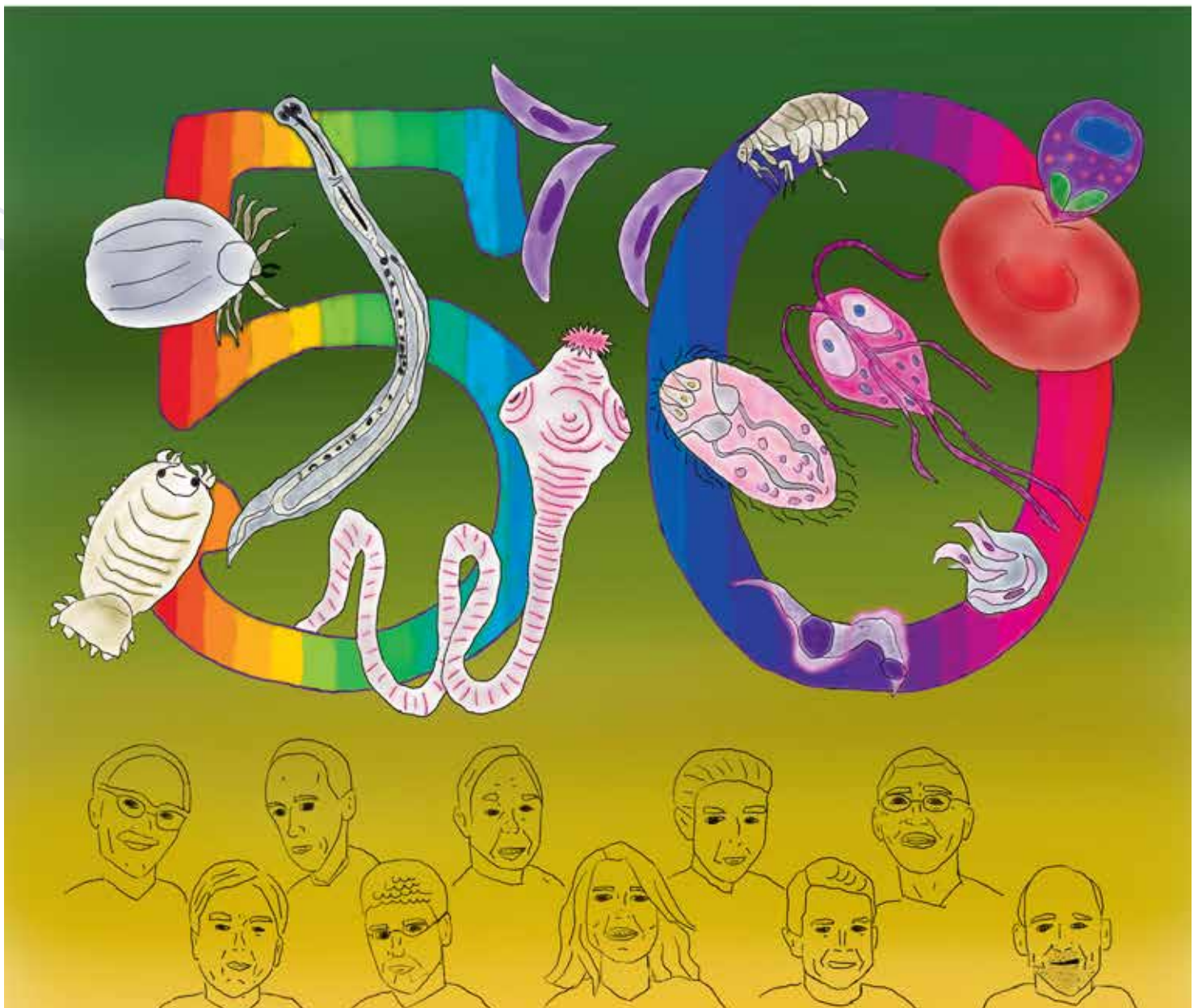


IJP

INTERNATIONAL JOURNAL FOR PARASITOLOGY

ISSN 0020-7519

VOLUME 51 ISSUE 13-14 DECEMBER 2021



ICOPA 2022

15th International Congress of Parasitology



August 21-26 | 2022

Copenhagen, Denmark

www.icopa2022.org





NEWSLETTER

Volume 32 Issue No.4 December 2021

IN THIS ISSUE

- 3 [From the President's Desk](#)
- 5 [Meet the Treasurer](#)
- 7 [Meet the Executive Secretary](#)
- 8 [Climate-Focus series](#)
- 10 [ASP Online Seminar Series](#)
- 13 [Outreach activities in WA](#)
- 16 [Outreach activities in Vic](#)
- 17 [Herminthology](#)
- 18 [Malaria in Melbourne](#)
- 19 [Herminthology](#)
- 20 [Researcher News Mark Pearson](#)
- 22 [International Journal for Parasitology](#)
- 25 [IJP:PAW](#)
- 34 [IJP:DDR](#)
- 36 [Network News](#)
- 38 [State News](#)
- 47 [ASP Council](#)

From the President's Desk

Dear Members,

As another challenging year draws to a close, we have much to reflect on and to celebrate. The current newsletter is a testament to the resilience and collegiality of our ASP members who have not only survived, but thrived in their respective areas of teaching, research, and outreach, despite the hardships faced by the pandemic, mounting workloads, and the lottery system that is competitive grants.

I would firstly like to wholeheartedly congratulate the International Journal for Parasitology on celebrating their 50th Anniversary of publishing highly influential manuscripts that have contributed to major advances in the field of parasitology. The success and longevity of the journal reflects the dedication and substantial efforts of past and present Editors, Editorial Board members, authors and reviewers. Brian Cooke, Alex Loukas, Jan Šlapeta and Maria Meuleman have put together a fitting Special 50th Anniversary Issue of inspiring invited reviews by our members to mark this special occasion, topped-off by an apt cover, hand-drawn by Thorey Kolbrun Jonsdottir.

I would also like to congratulate our many members whose achievements have recently been recognised through academic promotions and prestigious institutional awards. These include Stuart Ralph (UoM), Shokoofeh Shamsi (CSU), Abdul Jabbar (UoM) and Mike Gardner (Flinders Uni) promoted to Professor and Nathan Bott (Fed Uni) to Assoc. Professor. Alex Maier (RBS, ANU) recently received the Vice Chancellor's Award for Teaching and Educational Excellence and Clare Anstead (UoM) the David White Award for Teaching Excellence, while Kathy Andrews (Griffith) was the recipient of the Vice Chancellor's Award for Research Leadership. Last but not least, congratulations to all the recent



PhD graduates for putting in the hard yards in seeing their theses to completion!

This newsletter is packed to the brim with news on research accomplishments, outreach activities and initiatives. Mark Pearson, Alex Loukas and their team at the AITHM at JCU have produced an exceptional point-of-care diagnostic test for urogenital schistosomiasis. The biennial Malaria in Melbourne conference (online) Chaired by Lisa Ioannidis and Lee Yeoh attracted almost 300 registrants! In addition to school aged children, Rina Fu (ECU) engaged a unique audience of senior citizens in a parasitology workshop for WA's Senior week, while Michelle Power (MQ), Anushika, Sarah Preston (FU), Scott Carver (UTAS), Tana Sukee (UoM) and three MQ undergraduates (Ruth Bai, Nina Kettle and James Sammes) pulled together an outreach event in celebration of Parasite Biodiversity for the Biodiversity Conference COP15 that attracted over 1000 views! Last but not least, Nichola Calvani continues to work hard promoting 'Herminthology', a social media venture that profiles women parasitologists of all career stages.

From the President's Desk continued

I hope to see you all at the 2022 ASP Annual Conference which is planned as a face-to-face event for 4-7th July 2022 at the Shangri-La Hotel in Cairns, Queensland. In addition to receiving generous sponsorship from our loyal supporters Elsevier, Virbac and New England Biolabs, we also warmly welcome and thank Vetoquinol and Boehringer Ingelheim Animal Health Australia for coming on board!

I take this opportunity to thank the ASP Executive, the Council, Officers and to wish all of our members a safe, relaxing and joyous holiday season. See you all in the New Year!

Best regards,

Rebecca Traub

President of the ASP

www.parasite.org.au

www.facebook.com/ASParasitology

www.twitter.com/AS_Para



\$400 Undergraduate Prizes

The Australian Society for Parasitology is pleased to announce that it will be offering undergraduate student prizes of \$400 each to Australian Universities identified as offering a suitable course in parasitology, for presentation to the best undergraduate student in parasitology (highest passing mark/grade).

The course(s) must be taught by a financial member of the ASP (of more than one year standing), and must comprise at least 30% parasitology.

Requests for 2022 prizes must be made by the eligible University to the ASP Treasurer by the 30th September 2022. Please complete the online application form:

www.parasite.org.au/awards/asp-undergraduate-prizes/

Meet the Treasurer - Dr Vito Colella

At the 2021 Australian Society for Parasitology Annual General Meeting, Thursday 29 July 2021 the new ASP Executive was sworn in and we will hear now from Vito Colella, ASP Treasurer and Lecturer at the University of Melbourne.

Hi everyone,

I'm a Lecturer in Veterinary and Medical Parasitology and a McKenzie research fellow at the Melbourne Veterinary School, University of Melbourne, Australia. I work in Prof. Rebecca Traub's team where we develop and test intervention strategies to mitigate the impact of zoonotic parasites on people and animals residing in resource-limited settings. However, I haven't always been Melbourne-based. Prior to my big move 'Down Under' I lived in the southern Italian city of Bari where I first graduated in Veterinary Medicine and then obtained a PhD in Animal Health and Zoonoses.

During my research period in Italy, I was fortunate enough to have the chance to explore the epidemiology of zoonotic parasites in several European countries, including Portugal, Bosnia and Herzegovina and Italy, as well as some further afield in Asia. This culminated with an investigation into the zoonotic parasites affecting companion animals in eight different countries in East and Southeast Asia, giving me the opportunity to journey widely whilst also igniting my curiosity for regions and cultures of the



Above: Vito Colella conducting field research with his team

Asia Pacific.

As someone that grew up in one of the Mediterranean basin's main harbours, I am used to witnessing a variety of people and their cultures flocking to the coast. Most of these people faced challenging travels from some of the poorest areas of Europe, Africa and the Middle East, often suffering from little-known diseases, such as those caused by parasites.

I was always fascinated by how, regardless of the suffering they went through, they were always able to quickly adapt to the new environments they found themselves in whilst also retaining the foundations of their respective cultures. I can vividly recollect spending time with the changing travelling communities that would live for periods in the meadowed areas around Bari, seeing excited and barefooted children playing, adults cooking up their national dishes, with

dogs and all sorts of other backyard animals living alongside them. It is moments like these, seeing animals and humans existing in such close proximity that must have been the starting point for my passion of what I later learnt is the concept of One Health. Having a holistic view of the continuum between people, animals, and the environment around them, can provide clues and shine a spotlight on the variety of drivers influencing the appearance of a pathogen and its associated disease.

All these characteristics found place in the projects I'm currently leading in the Asia Pacific together with an amazing team in Melbourne. We aim to provide evidence that a One Health approach is more effective in controlling zoonotic parasites than human-focused strategies.

It is such an honour to act as treasurer of the Australian Society for Parasitology and I feel

Meet the Treasurer continued



Above: Vito Colella

lucky to have the opportunity to work closely with the Council, the Climate focus group and all the members of this fantastic Society.

More to come!

Vito

Meet the Executive Secretary - Clare Anstead

At the 2021 Australian Society for Parasitology Annual General Meeting, Thursday 29 July 2021 the new ASP Executive was sworn in and we will hear now from Clare Anstead ASP Executive Secretary and Lecturer at the University of Melbourne.

Clare is a Senior Lecturer (T&R) in the Faculty of Veterinary and Agricultural Sciences (FVAS) at the University of Melbourne. Clare attended her first ASP conference in Perth (2013) and moved to Melbourne from Canada early 2014 to work with Prof Robin Gasser as a postdoctoral researcher. Some ASP conference highlights for Clare include: celebrating her first postdoc offer/acceptance at Connections (Perth), officially being welcomed into the ASP family at Mooseheads (chilly Canberra), being awarded the ASP Early Career Researcher Award (Auckland), riding the Luna Park rollercoaster (Melbourne) and all the wonderful friendships she's made over the years. She is looking forward to seeing everyone FTF to Cairns next year!

Clare is a parasitic arthropod enthusiast and although ticks will always be her first love, she now spends most of her time working with *Lucilia cuprina*, the Australian sheep blowfly. Clare has experience in both molecular laboratory techniques and bioinformatics tools. She led the characterization of the draft genome of *L. cuprina* and defined the global molecular landscape of this fly which is now used as the foundation for her current blowfly work. She has collaborated on several internally and externally funded research projects with A/Prof Vern Bowles (FVAS) and Dr Trent Perry (Bio21) and is currently working with them on an Australian Wool Innovation Ltd funded grant 'Informed development of a flystrike vaccine' 2019-2022.

Clare is also very passionate about teaching and mentoring students and currently delivers parasitology content into 7 courses across multiple Faculties to both undergraduate and graduate students. Clare was awarded the 2020 Award for Teaching Excellence (Melbourne Veterinary School) and the 2021 David White Award (University of Melbourne) for her teaching excellence.



Above: Clare Anstead

When she's not researching, teaching or working with the amazing members of the ASP exec, Clare is a busy mom to her 3.5 year old Margot, 3 dogs, 2 cats and is expecting another little parasite in March!



Above: Clare Anstead at the 2019 ASP Annual Conference with invited speaker Max Scott (NCSU)

ASP Climate Focus Series

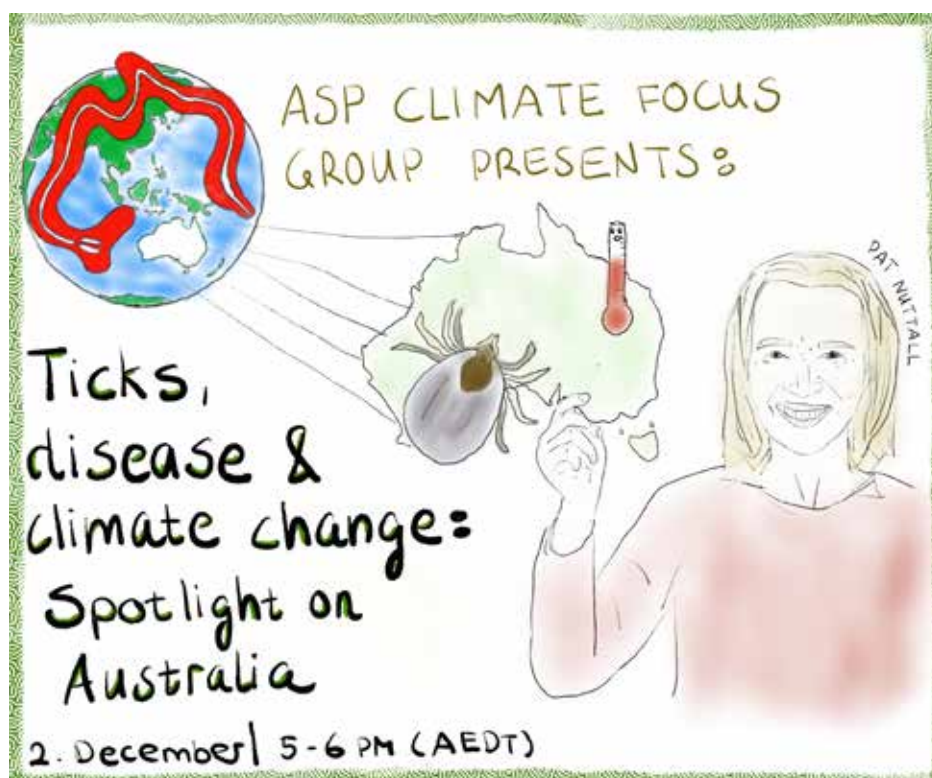


Illustration by the very talented artist Thorey Jonsdottir, PhD Candidate, Malaria Virulence and Drug Discovery Group, Burnet Institute.

The fourth seminar of a Climate-Focus series, “Ticks, Disease and Climate Change: Spotlight on Australia” with Em. Professor Pat Nuttall from the University of Oxford, UK, took place on Thursday 2nd December.

During this fascinating seminar Em. Professor Pat Nuttall addressed “Is climate change affecting parasites?” This question was considered in relation to ticks – blood-feeding ectoparasites which transmit a wide range of pathogens causing disease in humans and livestock, including Lyme borreliosis, tick-borne typhus, anaplasmosis, babesiosis, and theileriosis. If global warming is affecting ticks/tick-borne infections, signs of change should be detectable in: (i) geographical distribution, (ii) development rate of ticks, (iii) tick seasonal activity, (iv) tick phenotype/genotype, and/or (v) tick microbiota. Evidence for such signs of change will be discussed and the spotlight turned on

Australia to see what the signs are there.

Pat Nuttall is Emeritus Professor of Arbovirology in the Zoology Department, University of Oxford, and Fellow of Wolfson College, Oxford. Current research interests are in viruses transmitted by ticks, and how tick saliva promotes virus transmission. Prior to re-joining the University of Oxford in 2013, she was employed by the UK’s Natural Environment Research Council, becoming Director of the Institute of Virology & Environmental Microbiology in 1995 and Director of the Centre for Ecology & Hydrology in 2001. In 1993, she was a visiting scientist at CSIRO Indooroopilly where she worked with Peter Willadsen and David Kemp. Her research resulted in the first NERC spin out company, Evolutec Ltd. Distinctions include: Ivanovsky Medal for Virology, Russian Academy of Sciences; Order of the British Empire (OBE) for services to environmental sciences; LeConte Scholar, Georgia Southern University, USA; Honorary Professor, Nankai University, China; Chevalier dans l’ordre du Mérite Agricole, France; Harry Hoogstraal

medal, American Society of Tropical Medicine & Hygiene.

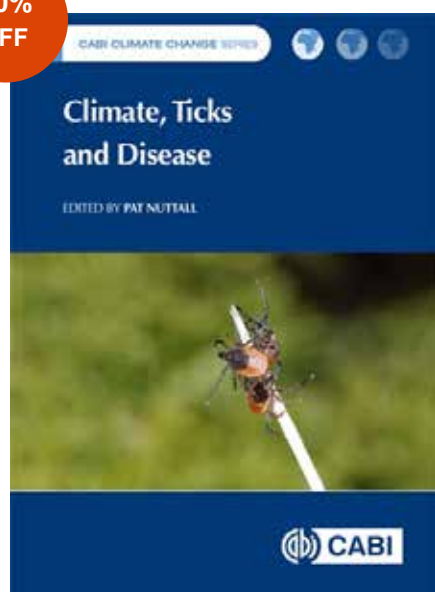
Climate, Ticks and Disease, edited by Pat Nuttall, brings together expert opinions from scientists to consider the evidence for climate change and its impacts on ticks and tick-borne infections.

ASP Members can use the code CCASP20 for 20% off individual (non-trade) orders of the print book, up to a maximum of 10 copies per customer. This offer is available until the 31st December 2022, for orders placed on the CABI Bookshop only (<https://www.cabi.org/bookshop/book/9781789249637/>). Please note that we are not able to take pre-orders on the website, and the book is currently due to publish on the 3rd December 2021.

If you missed this seminar you can watch it shortly on the ASP YouTube channel along with previous Climate Focus Seminar recordings.

<https://www.youtube.com/user/ASPParasiteNetwork>

New from CABI

20%
OFF

Climate, Ticks and Disease

Edited by **Pat Nuttall**, University of Oxford, UK

Dec 2021 | 544pp

This book brings together expert opinions from scientists to consider the evidence for climate change and its impacts on ticks and tick-borne infections, and provide predictions for the future.

www.cabi.org/bookshop/book/9781789249637

This book brings together expert opinions from scientists to consider the evidence for climate change and its impacts on ticks and tick-borne infections. It considers what is meant by 'climate change', how effective climate models are in relation to ecosystems, and provides predictions for changes in climate at global, regional and local scales relevant for ticks and tick-borne infections. It examines changes to tick distribution and the evidence that climate change is responsible. The effect of climate on the physiology and behaviour of ticks is stressed, including potentially critical impacts on the tick microbiome. Given that the notoriety of ticks derives from pathogens they transmit, the book considers whether changes in climate affect vector capacity. Ticks transmit a remarkable range of micro- and macro-parasites many of which are pathogens of humans and domesticated animals. The intimacy between a tick-borne agent and a tick vector means that any impacts of climate on a tick vector will impact tick-borne pathogens. Most obviously, such impacts will be apparent as changes in disease incidence and prevalence. The evidence that climate change is affecting diseases caused by tick-borne pathogens is considered, along with the potential to make robust predictions of future events.

This book contains:

- Expert opinions and predictions.
- Global coverage of trends in ticks and disease.
- In-depth examination of climate change and tick distribution links.

This book is suitable for researchers and students studying zoology, biological sciences, medical entomology, animal health, veterinary medicine, epidemiology, parasitology, and climate change impacts; and for those concerned with public health planning or livestock management where ticks and tick-borne pathogens pose a threat.

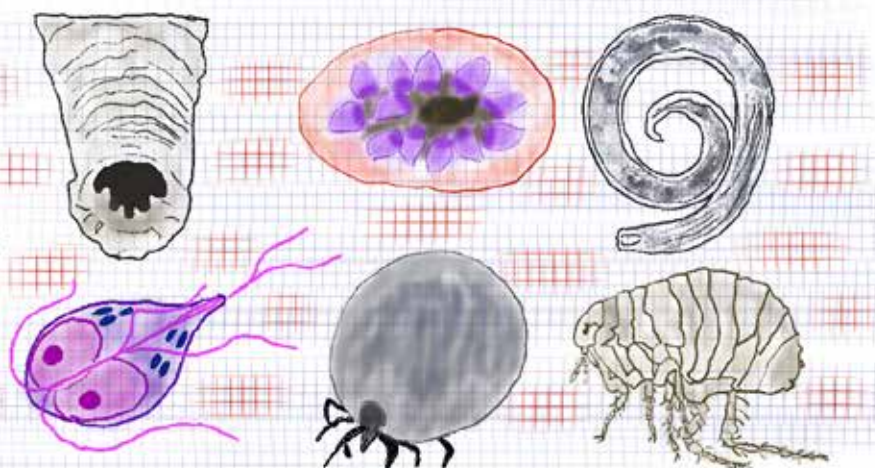
HB / 9781789249637 / ~~£150.00~~ £120.00 / ~~€175.00~~ €140.00 / ~~\$205.00~~ \$164.00

ePDF: 9781789249644 / ePub: 9781789249651

sales@cabi.org

KNOWLEDGE FOR LIFE

ASP Seminar Series



Seminar Series

The last two fabulous ASP Seminar Series events for 2021 took place online on 19 November and 10 December at 1pm AEDT. Co-hosted by Stuart Ralph and Sarah Preston, our wonderful speakers were Michelle Clark, Steven Kho, Nick Fountain-Jones and Emma Halliwell.

On 19 November 2021 Michelle Clark from WEHI spoke about “‘Unleashing’ cell death: Cellular inhibitors of apoptosis are an effective therapeutic target for the treatment of *Leishmania donovani*” and Steven Kho from Menzies Institute spoke about “A novel endosplenic *Plasmodium* lifecycle in chronic malaria”.

Michelle Clark is a final year PhD student at the Walter and Eliza Hall Institute of Medical Research (WEHI) and the University of Melbourne. Michelle has led the Leishmaniasis research program at WEHI in Prof. Marc Pellegrini’s laboratory, investigating the dynamic interplay between *Leishmania* parasites and host cell death pathways and how these pathways can be targeted therapeutically to improve treatments for this devastating disease. Steven Kho is a post-doctoral researcher at the Menzies School of Health Research and led studies that recently uncovered the

human spleen as a natural hidden reservoir for *Plasmodium* species. Dr Kho is now exploring the fundamental biology of the splenic reservoir and novel approaches to overcome splenic parasite survival to help reduce global malaria burden.

On 10 December 2021 Emma Halliwell from La Trobe University spoke about “Diagnostics for the identification of worm resistant sheep.” and Nick Fountain-Jones from The University of Tasmania spoke about “Can wildlife management impact microparasite transmission and evolution? Lessons learned from hunting big cats”.

Emma Halliwell is a current Masters student with Professor Michael Stear at Latrobe University, in the department of Animal, Plant and Soil Sciences. Emma’s work aims to improve the productivity, health and welfare of Australian Merino sheep. Gastrointestinal nematodes cost the

Australian sheep industry approximately \$436 million annually. The development of drug-resistant nematodes in response to the widespread use of anthelmintics is a major concern, and has created a need for more sustainable gastrointestinal nematode control methods. We explored the usefulness of eosinophilia as an indicator of resistance for the selective breeding of naturally GIN-resistant flocks.

Nick Fountain-Jones is a disease ecologist at the University of Tasmania in the School of Natural Sciences. I’m interested in particular in how modelling can be used to better understand parasite ecology. I work in a variety of systems but have a focus on carnivores in order to better manage disease in species in decline globally and heavily impacted by anthropogenic development. I try to bridge the gap between community ecology, network theory and phylogenetics by using one

ASP Seminar Series continued



Above: This awesome image is courtesy Ken Logan Colorado Parks and Wildlife “Meet puma M87 – one individual important in the transmission chains we quantified”.

to inform the other. I use this combined approach, for example, to explore questions related to parasite transmission, phylogeography and community assembly. In particular, I develop machine learning, network methods and Bayesian phylogenetic approaches to address these questions. Hunting can fundamentally alter wildlife population dynamics, but the consequences of hunting on parasite transmission and evolution remain poorly understood. Here we present a study that leverages a unique landscape-scale quasiexperiment coupled with parasite transmission tracing, network simulation, and phylodynamics to provide insights into how hunting shapes feline immunodeficiency virus (FIV) dynamics in puma (*Puma concolor*). We show that

removing hunting pressure enhances the role of males in transmission, increases the viral population growth rate, and increases the role of evolutionary forces on the pathogen compared to when hunting was reinstated. Changes in transmission observed with the removal of hunting could be linked to short term social changes while the male puma population increased. These findings are supported through comparison with a region with stable hunting management over the same time period. This study shows that routine wildlife management can have impacts on pathogen transmission and evolution not previously considered.

Our seminar series image was created by Thorey Jonsdottir from the Burnet Institute.

If you have ideas for speakers, themes or chairs for future ASP Seminar Series presentations please email secretary@parasite.org.au with suggestions. See the ASP website and social media channels for information about the ASP Seminar Series.


ASP Seminar Series continued



Above: Gastrointestinal nematodes image courtesy Emma Halliwell




Nematodes

- Prevalent in both animals and plants
 - 20,000 species of nematode described
- Affect all grazing ruminants
- Cost the Australian sheep industry \$436 million per annum in lost productivity



Hunting alters viral transmission and evolution

Nick Fountain-Jones



Outreach activities in Western Australia

ASP member Rina Fu has been busy with outreach activities in Western Australia!

Dec 7th 2021:

It Takes a Spark - STEAM Clough EDU Conference.

Following a powerful welcome by the St Hilda's Hanabi Taiko drummers, Dr Rina Wong (Fu) delivered her very first keynote speech, entitled 'Creativity, Critical Thinking and The Power of Yet'. Rina shared her personal journey as a migrant kid who spoke little English to becoming the scientist and artist she is today. She shared her thoughts and insights into an integrated STEAM journey. The keynote speech was delivered to a diverse audience including students from years 4 to 10, primary and secondary educators, principals, curriculum designers and industry partners. Rina took the opportunity to include a showcase of the ASP's special project - the beautiful Gula Guri Mayin painting by indigenous artist, Bernard Lee Singleton, as an example of the intergration of art and science. She couldn't resist giving the audience a good dose of parasitology from her malaria song and from the painting where she weaved in Prof. Alex Loukas's cutting edge hookworm research!

This was followed by parallel hands-on STEAM workshops including teachers's PD, engineering, coding, robotics for participants to tap into their problem solving skills for real world problems in creative ways. Many students and professionals came by Rina's book stand sharing how they felt inspired.

WA Senior's Week 9th November

To celebrate WA Senior's Week, Dr Rina Fu ran an inaugural science workshop at a public library specially designed for the elderly.

The Grand Science workshop aims to inspire, build, empower and up-skill senior's to enjoy and engage with the science world that they live in. Rina shared her research about malaria, a disease that is relatable as 'lived experience' for many veterans. Seniors were armed with cool science skills and experiments to do with their grandkids



Above: Dr Rina Fu It takes a SPARK - STEAM Clough EDU conference

Outreach activities in Western Australia

too.

'It was fun teaching grandmas how to drive a microscope!' says Rina.

'I'm very proud of the participants to get the hang of operating a complicated piece of instrument in this 'crash course' without crashing into any slides!'

The workshop was very different to the kid's workshops in terms of the pace and challenges. A 70 years old grandma mentioned that for her generation, girls were shoved out of the way by the boys at school during experiment times, and were usually left with the washing up. So experiences such as these in the past, adds to the many potential psychological obstacles seniors may have to overcome in order to participate in /enjoy science. This is in contrast to young children who are like a blank piece of paper. The morning tea included thus played a significant role in helping participants open up and be less intimidated by people in lab coats and younger people too.

It was a privilege to have Robyn Devenish, member of the Order of Australia to volunteer on the team (photo below). She is a super-grandma who received the inaugural medical scientist of the year award for her work in Cambodia and an inspiration to Rina. She praised this first time effort in making science accessible for seniors.



Above: Dr Rina Fu delivering Outreach for WA Seniors Week

Outreach activities in Western Australia

Italian Childcare Centre 2nd Nov 2021

‘Tre, Due, Uno, Sperimentare!’ shouts the little ones with Dr Rina Fu.

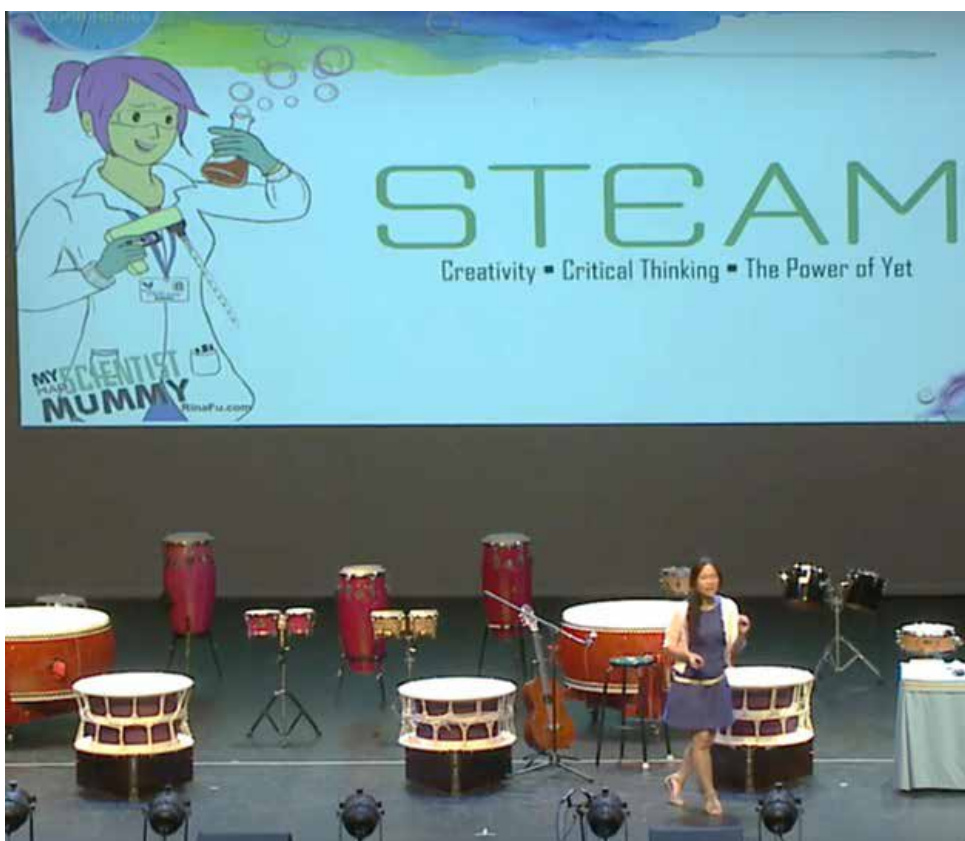
‘It’s my first time learning and using Italian in my Science Bugs Workshop!’ says Rina.

‘You’ve got a good accent’ replied the staff on duty at the Italian childcare centre.

Rina warmed up with the children by singing an Italian song she learned incidentally from her kids, who had Italian classes at school.

‘I surprised myself being able to sing-along with the kids in a foreign language – unplugged and unplanned! I must have picked up the song subconsciously from hearing my 5 year old singing it cheerfully and repeatedly at home and after school.’ The funny thing was that I didn’t know what all the words meant and couldn’t be sure if I was pronouncing things correctly, but the unplanned sing-along in Italian worked a treat as an ice-breaker as the children sang with me joyfully before we even started. It was a great bonding experience!’

The children especially loved the fishy parasites activity, which was inspired by ASP member, Cindy Palermo’s research and her discovery of novel parasites in feral fish in WA.



Above: Dr Rina Fu delivering Outreach for the Italian Childcare Centre and STEAM Clough EDU Conference

Outreach activities in Victoria



Above: Sarah and Leni delivering outreach to Vietnam school students

Sarah Preston and PhD student, Leni Horner, in collaboration with the Federation University Global Professional School ran an online, live from the lab parasitology lesson to 58 student from various schools across Vietnam on Wed 1st of December. The high-school students joined in from their homes as they were home schooling due to the COVID pandemic. The class consisted of;

1. lab tour of important equipment to study biology,
2. a tour of the specimen museum,
3. show and tell of some parasites in jars

4. a live demonstration of how to detect worm eggs in horse poo including an activity where the students could count the eggs from an image using H5P (tool in Moodle).

Feel free to have a go yourselves.

https://hecate.federation.edu.au/H5P/?activity=Parasitology_Sunshine

The class was going really well until the storm hit and took out the internet for ~5 min but otherwise we received great feedback about the lesson. The students were very excited about seeing a parasitology lab in Australia and how it works. A big thanks to all involved.

Herminthology

Promoting the work of female parasitologists



Herminthology is a social media initiative demonstrating the possibilities for young women in science by profiling female parasitologists across all career stages.

If you think you, or something you know, deserves to be featured please contact herminthology@gmail.com for details.

Follow @herminthology

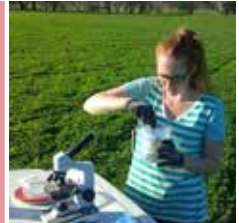


Dr Sarah Preston is an immuno-parasitologist, teaching and coordinating the Bachelor of Veterinary and Wildlife Science degree at **Federation University Australia**. Her PhD on the blood sucking worm of small ruminants, *Haemonchus contortus*, focused on immune molecules, particularly the sheep derived galectin-11. She then undertook a Postdoc at the **University of Melbourne** in genetics and genomics, where she led an anthelmintic drug screening project before taking up a position at **Federation Uni** to research and teach. After taking a year off to have a beautiful son, Sebastian, her research profile has diversified and is closely aligned to the interests of her graduate and postgraduate students. She is currently investigating worms and microbiomes of horses, IgA in worm resistant sheep, and - for something a little different - the use of virtual reality to teach concepts in parasitology.

"I grew up on a sheep/cattle/cropping farm in NSW, Australia and have always had a passion for animal health - trying to save lambs, calves, ducks, magpies... the list goes on. Despite growing up on a farm and helping dad drench the sheep, I didn't really know about worms until I began my PhD! It was the immunology that got me into parasitology. My twin brother also did a PhD involving sheep, so perhaps it was inevitable that I would end up studying sheep worms... funnily enough my dad hates sheep!"

"I'm sure many parasitologists would agree that it is hard to choose a single favourite worm, however after spending so much time growing *H. contortus* larvae from eggs into L4s, I would have to choose them. The female adults are so pretty, and I seem to have grown a motherly attachment to them!"

Sarah's interest in using VR for teaching parasitology has become especially relevant during the pandemic. Feel free to check out her VR parasitology game, which is free and downloadable on the Oculus App store (<https://www.oculus.com/experiences/quest/3656748804421439/>). She is always looking for collaborators on this project to help review and test the VR in teaching, so get in touch if you're interested!



"I grew up on a farm in Australia and always had a passion for animal health... my twin brother did a PhD involving sheep, so perhaps it was inevitable that I would end up studying their worms!"



Parasite research on the Dr. Sarah Preston



Herminthology is a social media initiative demonstrating the possibilities for young women in science by profiling female parasitologists across all career stages.

If you think you, or something you know, deserves to be featured please contact herminthology@gmail.com for details.

Follow @herminthology



Dr Di Barton, Adjunct/Honorary Professor at **Charles Sturt University**, **The Australian National University** and the **South Australian Museum**, is a wildlife parasitologist who works on helminths & pentastomes of fish, amphibians and reptiles. Her main interests are in the taxonomy & systematics of parasites, particularly of introduced parasites and their hosts, which began with her PhD on the parasites of cane toads in Australia. She is currently working on the introduced pentastomid, *Linguatula serrata*, and hopes to work out its distribution in Australia.

She is also interested in the ecology of parasites and what they tell us about their hosts. Recently, she has worked on projects using parasites as biological tags for management of fish and shark species across northern Australia. This has allowed her to collect many different parasites, most of which are new species, and to show the usefulness of parasites to a wider audience. She believes parasitologists have a responsibility to educate animal biologists and ecologists about the potential role that parasites can play in wildlife disease and ecology. Her favourite parasites are monogeneans, which were the first group of parasites she worked on, although pentastomes are a close second. The thing she loves most about parasitology is dissecting a new host and finding new parasites.

"Spending time at the microscope, examining, taking measurements, and drawing specimens are a large part of my love for parasitology. As an undergraduate student I undertook a subject in Parasitology as a "fill in". This subject changed my life and showed me the amazing array of different parasites and how they can affect their hosts. I have been extraordinarily lucky to have worked with some of the world's most eminent parasitologists and I hope that I have passed on their passions for parasites through my own research and teaching."

She feels fortunate to be working with a very passionate parasitology team that currently have a range of projects looking at snails, crayfish, fish, turtles, birds & various other animals. She believes that every project is an adventure and an opportunity to show how awesome parasites can be!

Read her recent work here: <https://doi.org/10.1071/ZO20017>



"Spending time at the microscope, examining, taking measurements, and drawing specimens are a large part of my love for parasitology."



Linguatula serrata female (left) and male (right) from the nasal cavity of a wild dog. Dr. Di Barton

Malaria in Melbourne 2021

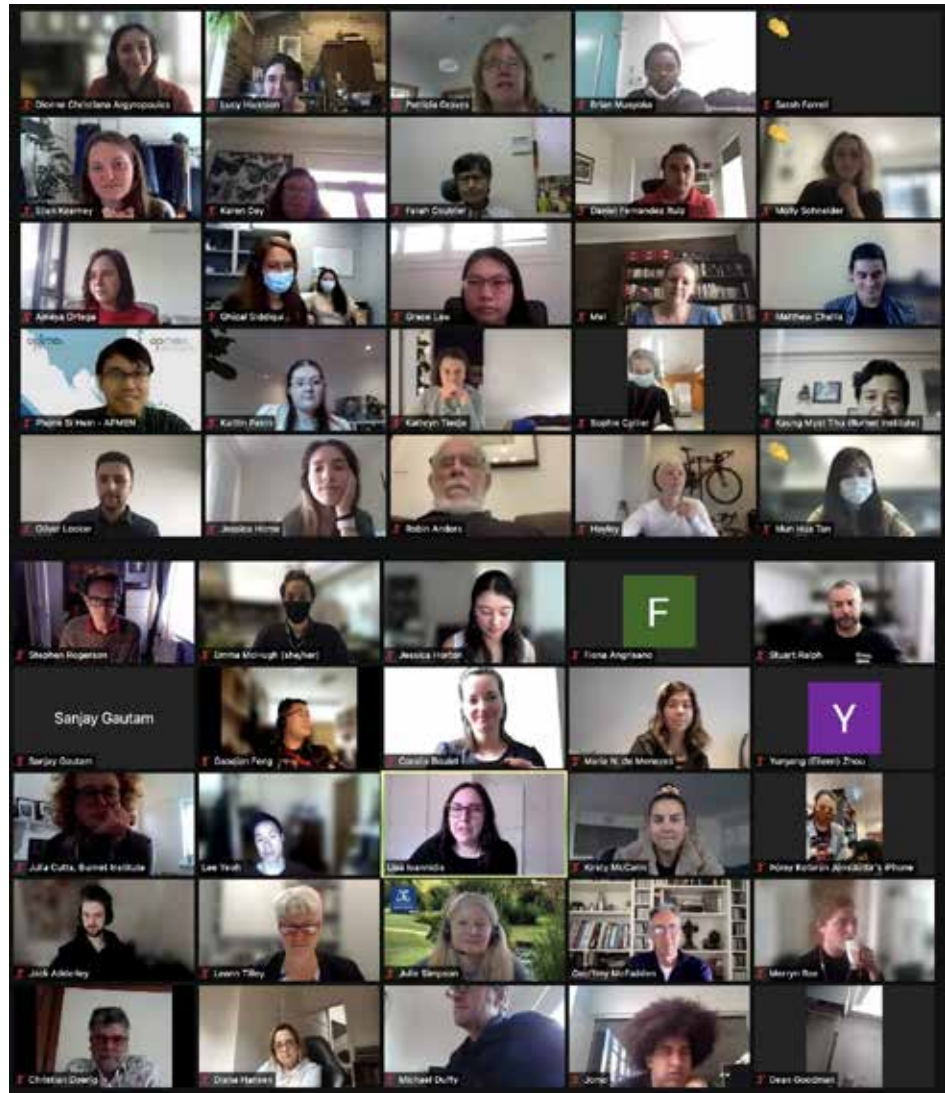
Congratulations to the MiM organising committee for another very successful Malaria in Melbourne meeting!

Malaria in Melbourne (MiM) is a biennial conference covering all aspects of malaria research, and with a particular focus on giving a platform to students and Early Career Researchers. This year, MiM took place on the 28th and 29th October. Like many other events, MiM moved online, allowing broader participation from across the globe. With nearly 300 registrants, 2 plenary sessions, 40 talks, and 27 posters, MiM was a great success! We would like to congratulate all presenters again, and in particular those who won awards: Peiyuan Luo and Anouk von Borstel (poster winners), Kael Schoffer and Dionne Argyropoulos (short talk winners), Olivia Maria Silva Carmo and Liriye Kurtovic (long talk winners), and Sanjay Gautam (ACREME award). We would also like to thank Angela Devine and Daniel Fernandez-Ruiz for their insightful plenary talks on health economics and harnessing T cell immunity respectively.

The MiM organising committee: Lisa Ioannidis and Lee Yeoh (chairs), Jack Adderley, Coralie Boulet, Kirsty McCann, Emma McHugh, and Maria Nogueira De Menezes.

You can follow MiM on Twitter:

[@MiM_Melbourne](https://twitter.com/MiM_Melbourne)



MiM 2021 participants

Herminthology

Promoting the work of female parasitologists



Herminthology is a social media initiative demonstrating the possibilities for young women in science by profiling female parasitologists across all career stages.

If you think you, or something you know, deserves to be featured please contact herminthology@gmail.com for details.

Follow @herminthology



Gemma Rush is a Doctor of Veterinary Medicine (DVM) student at the **University of Sydney**, where she also completed a bachelor's degree in Animal and Veterinary Bioscience. During her time at Sydney Uni she has completed several parasitology-based research projects in **Jan Slapeta's** lab and has fallen in love with it. Her first experience with parasitology research was during her undergraduate honour's year where she combined her passion for livestock and reproduction into a research project on *Tritrichomonas foetus* in cattle.

"As a cause of infertility in cattle, this parasite was exactly up my alley. My project in my honour's year began by trying to determine if *T. foetus* was still present in extensively-managed cattle in Australia's Northern Territory. It later evolved into one in which I created a lyophilised culture media for *T. foetus* that allowed long term storage and transportation to remote areas, increasing it's accessibility and use on extensive cattle properties."

Although it allowed her to pursue her interest in veterinary science, the first few years of her DVM took her away from parasitology research as she focussed on clinical medicine. When it came time for her third year research project she jumped at the opportunity to continue working on *T. foetus*. This time, her research focussed on *T. foetus* in small animals – specifically, the resistance of feline *T. foetus* to treatment.

Gemma wanted to know how to manage cats with refractory trichomonosis that are unable to be successfully treated with ronidazole or metronidazole. Through this project she demonstrated novel resistant feline strains collected from cats in Sydney, Australia for the first time. The project included samples collected from cats within the same household over three years, and demonstrated that over time without a change in home environment they were able to self-resolve.

"I absolutely love parasitology. There are so many avenues we have yet to explore, and so many applications into the veterinary industry that I can't wait to work on."

Read her recent paper published in Veterinary Parasitology here: <https://doi.org/10.1016/j.vetpar.2021.109609>



"I absolutely love parasitology. There are so many avenues we have yet to explore, and so many applications into the veterinary industry that I can't wait to work on."



Tritrichomonas foetus
Gemma Rush



Herminthology is a social media initiative demonstrating the possibilities for young women in science by profiling female parasitologists across all career stages.

If you think you, or something you know, deserves to be featured please contact herminthology@gmail.com for details.

Follow @herminthology



Dr Telleasha Greay is a molecular biologist specialising in microbiomes and pathogens of ticks. During her PhD, her skills in sequencing, bioinformatics and taxonomy allowed her to collaborate on microbiomes of other parasites, animals and even water. Her latest work is on helminths, specifically, introduced and novel tapeworms in fish from Western Australia and can be found here: <https://doi.org/10.1017/S0022149X21000365>.

"I started studying parasites for my undergraduate Honours project and instantly fell in love with the science of ticks. It's such an untapped field in Australia – just a small amount of sequencing revealed bacteria and parasites we never knew existed!"

Telleasha has sequenced hundreds of ticks from companion animals since and has found novel bacterial and parasitic species with pathogenic potential. The next step is to determine whether these novel agents cause illness in pets and people.

A current outbreak of the tick-borne pathogen *Ehrlichia canis* in northern Western Australia is having a devastating impact on dogs in regional and remote areas, especially pets of Indigenous Communities. Telleasha has spent much of her time studying the vector of *E. canis*, the brown dog tick (*Rhipicephalus linnei*, formerly *Rhipicephalus sanguineus sensu lato tropical lineage*), which she has identified on dogs around Australia. Brown dog ticks are abundant in tropical and subtropical regions of Australia and they transmit *Babesia vogeli* and possibly *Anaplasma platys* and *Hepatozoon canis*. The recent outbreak of canine ehrlichiosis emphasises the importance of continued surveillance for tick-borne pathogens, and for keeping an open mind for both the known and unknown.

Due to a lack of information available online for ticks in Australia, Telleasha was inspired to create the online platform "MissTick" to connect the science and latest research findings of ticks with everyone. Visit <https://www.telleashagreay.com/blog> for more.



"I started studying parasites for my undergraduate Honours project and instantly fell in love with the science of ticks. It's such an untapped field in Australia – just a small amount of sequencing revealed bacteria and parasites we never knew existed!"



Rhipicephalus linnei
Dr Telleasha Greay

Closing in on a new test for Schistosomiasis

Dr Mark Pearson, Professor Alex Loukas and their team at the Australian Institute of Tropical Health and Medicine (AITHM) at James Cook University in Cairns have made important progress towards a new diagnostic test for schistosomiasis.

The new diagnostic test for schistosomiasis could help the World Health Organisation (WHO) achieve its goal of interrupting transmission of the disease, and eventually eliminating it.

Schistosomiasis, spread by parasitic blood flukes, is prevalent in tropical and subtropical

areas.

“This is a disease of poverty,” said lead researcher Dr Mark Pearson. “Although there are effective drugs available to treat it, it becomes a serious health issue where contaminated drinking water and waterways lead to frequent re-infections.”

Urogenital schistosomiasis (one of two forms of the disease and the one addressed by this study) affects an estimated 200 million people, causing both acute and chronic illness. It is also considered a risk factor for HIV, especially for women, and is associated with bladder cancer.

“To interrupt the spread of the disease, a test needs to be sensitive enough to

identify people with low-level infections, who can still pass the parasite on to others when they might not know they’re infected themselves,” Dr Pearson said.

The team also aimed for a test that is non-invasive, can be administered at point of care – by a community health worker for example – and will deliver a quick result.

The search focused on the proteins that the parasite, *Schistosoma haematobium*, produces while resident in the human body.

“Thanks to our collaborators at the University of California, who were able to fit almost a thousand of these proteins on a chip that’s about twice the size of the



Above: Dr Mark Pearson at the AITHM laboratories James Cook University. Photo credit: Romy Bullerjahn

Schistosomiasis test continued

SIM card in your phone, we were able to work quite efficiently at identifying which proteins were the major targets of antibody responses,” Dr Pearson said.

The fluke proteins were screened for antibodies in blood and urine samples that international collaborators had collected in previous studies in Gabon, Tanzania and Zimbabwe.

“Importantly, these included samples taken from populations where we know the infection level was low. This enabled us to test whether our proteins were clearly recognised by antibodies from people with light infections, as well as those suffering heavy infections,” Dr Pearson said.

The candidate proteins were also screened through ELISA (Enzyme-linked immunosorbent assay), a test developed in the 1970s to detect antibodies in the blood.

“Between the high-tech chips and the old-school approach using ELISA, we narrowed our options down from 992 proteins to just five lead candidates, from which we chose the two that showed the greatest sensitivity,” Dr Pearson said.

The result is a point-of-care test strip, not unlike a pregnancy test, that carries recombinant versions of the chosen proteins, and can detect even low-intensity schistosomiasis infections.

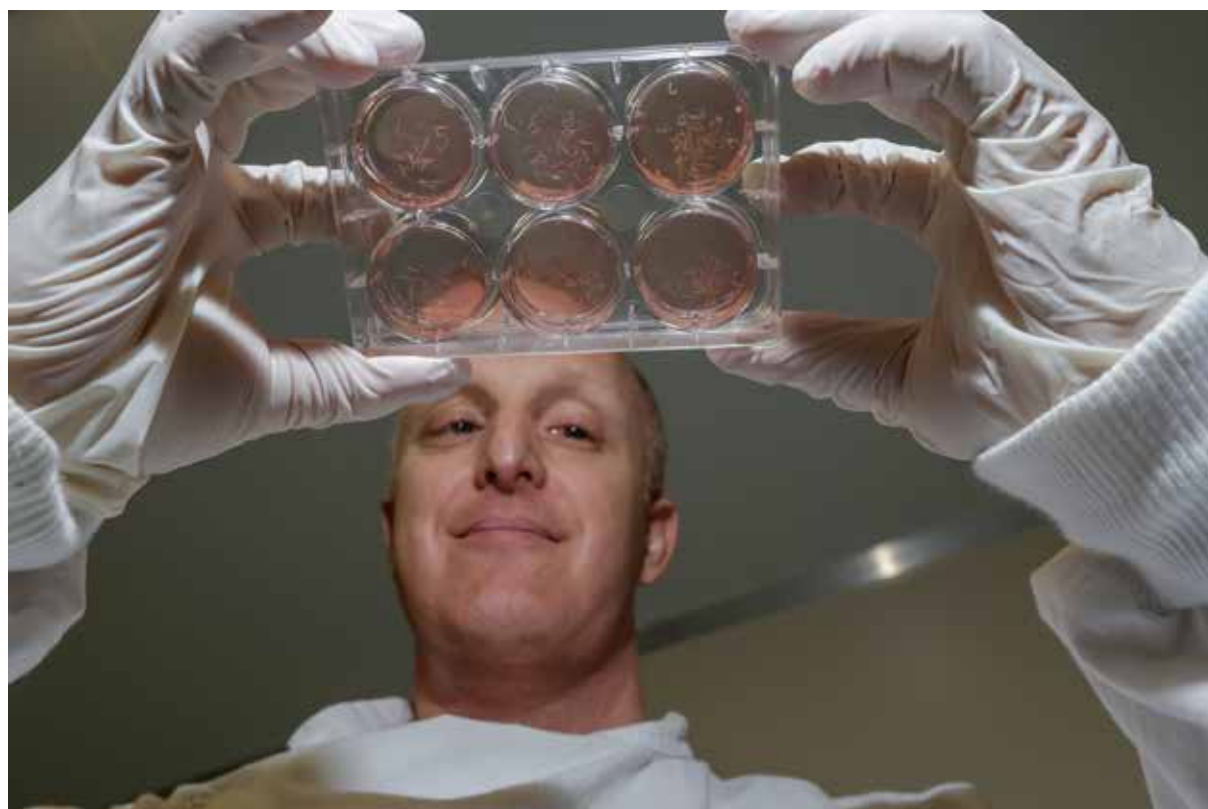
“This ticks most of our boxes,” Dr Pearson said. “It works on serum – blood – and we’re optimistic about the next step, which would be to refine it for use as a urine test.

“This was an international effort, involving researchers from across Africa and Europe, as well as in Australia, the United States and Thailand. It represents an important

step forward in protecting vulnerable communities from a tiny parasite that does a great deal of harm.”

The research was supported by the Australian Trade and Investment Commission and Merck Global Health Institute. The findings are reported in The Lancet Microbe here: [https://doi.org/10.1016/S2666-5247\(21\)00150-6](https://doi.org/10.1016/S2666-5247(21)00150-6)

Below: Mark Pearson, AIITHM laboratories James Cook University. Photo credit: Romy Bullerjahn



IJP

INTERNATIONAL JOURNAL FOR PARASITOLOGY

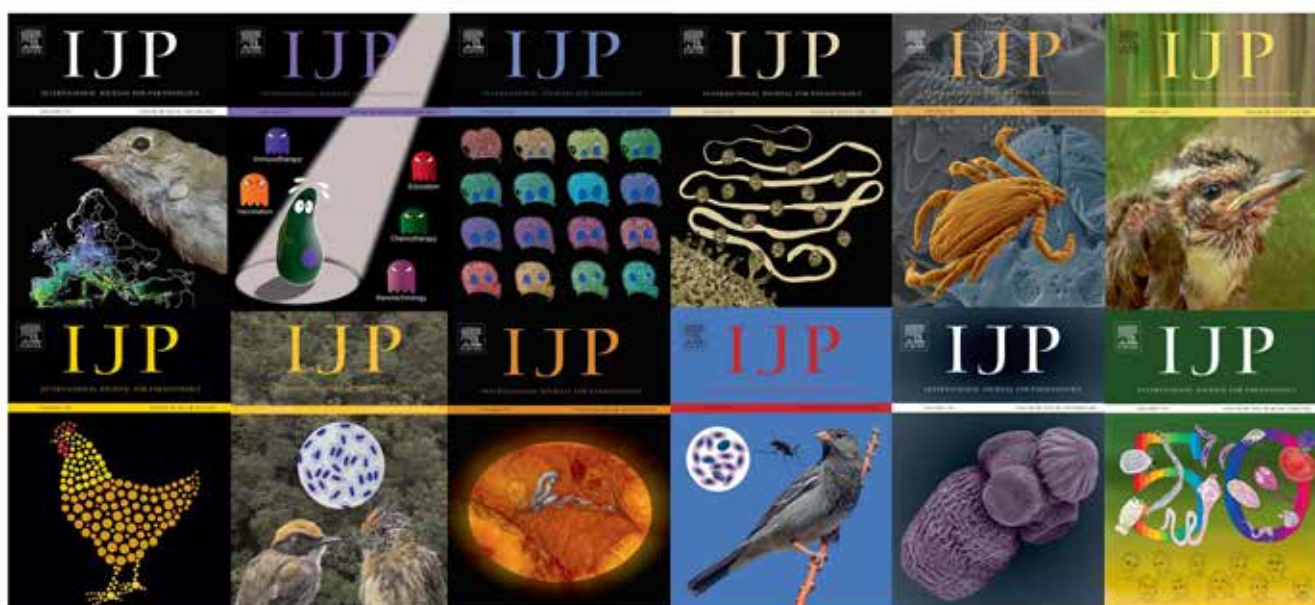
www.journals.elsevier.com/international-journal-for-parasitology

Editor In Chief: Brian Cooke

Facebook: www.facebook.com/IJPara

Twitter: @IJPara

Instagram: ijpara



*Season's Greetings from IJP.
Wishing you a happy and successful 2022.
Brian, Alex, Jan and Maria*

International Journal for Parasitology continued

IJP

INTERNATIONAL JOURNAL FOR PARASITOLOGY

[IJP 50th Anniversary Special Issue](#)

[December 2021 \(51:13/14\)](#)

[Editorial: The IJP has become a quinquagenarian](#)

[Obituary: Alan Donald, past IJP Editor](#)

Invited Reviews

[The rise of ecological parasitology: twelve landmark advances that changed its history](#)

Robert Poulin

[The biodiversity of marine trematodes: then, now and in the future](#)

Thomas H. Cribb, Scott C. Cutmore,
Rodney A. Bray

[Taxonomy and molecular epidemiology of *Cryptosporidium* and *Giardia* – a 50 year perspective \(1971-2021\)](#)

Una M Ryan, Yaoyu Feng, Ronald Fayer ,
Lihua Xiao

[Macrocytic lactone resistance in *Dirofilaria immitis*: risks for prevention of heartworm disease](#)

Roger K. Prichard

[A journey through 50 years of research relevant to the control of gastrointestinal nematodes of ruminant livestock](#)

John S. Gilleard, Andrew Kotze, Dave Leathwick, Alasdair J. Nisbetd Tom N. McNeilly, Brown Besier



[Strongyloides genotyping: a review of methods and application in public health and population genetics](#)

Richard S. Bradbury, Barbora Pafčo, Eva Nosková, Hideo Hasegawa

[Advances in the treatment, diagnosis, control and scientific understanding of taeniid cestode parasite infections over the past 50 years](#)

Marshall W. Lightowlers, Robin B. Gasser, Andrew Hemphill, Thomas Romig, Francesca Tamarozzi, Peter Deplazes, Paul R. Torgerson, Hector H. Garcia, Peter Kern

[Nanos gigantium humeris insidentes: old papers informing new research into Toxoplasma gondii](#)

Melissa B. Lodoen, Nicholas C. Smith, Dominique Soldati-Favre, David J. P. Ferguson, Giel G. van Dooren

[Fifty years of the schistosome tegument: discoveries, controversies, and outstanding questions](#)

R. Alan Wilson, Malcolm K. Jones

[Zoonotic hookworms of dogs and cats – lessons from the past to inform current knowledge and future directions of research](#)

Rebecca J. Traub, Patsy A. Zendejas-Heredia, Luca Massetti, Vito Colella

[The yin and yang of human soil-transmitted helminth infections](#)

Alex Loukas, Rick M. Maizels, Peter J. Hotez

[Malaria research in Australia: looking through the lens of the past towards the future](#)

Denise L. Doolan

[How diseases caused by parasites allowed a wider understanding of disease in general](#)

Ian A Clark

<https://www.sciencedirect.com/journal/international-journal-for-parasitology/vol/51/issue/13>

VOLUME 51 ISSUE 13-14 INTERNATIONAL JOURNAL FOR PARASITOLOGY 2021

CONTENTS

Editorial	
The IJP has become a quinquagenarian	1069
Obituary	
Alan David Donald AM BVSc PhD FASFP FRSB (UK) FTSE MANZCVS Editor, IJP, 1993–1997	1071
N. Sangster	
Invited Reviews	
The rise of ecological parasitology: twelve landmark advances that changed its history	1073
R. Poulin	
The biodiversity of marine trematodes: then, now and in the future	1085
T.H. Cribb, S.C. Cutmore, R.A. Bray	
Taxonomy and molecular epidemiology of <i>Cryptosporidium</i> and <i>Giardia</i> – a 50 year perspective (1971–2021)	1099
U.M. Ryan, Y. Feng, R. Fayer, L. Xiao	
Macrocyclic lactone resistance in <i>Dirofilaria immitis</i> : risks for prevention of heartworm disease	1121
R.K. Pinard	
A journey through 50 years of research relevant to the control of gastrointestinal nematodes in ruminant livestock and thoughts on future directions	1133
J.S. Gillard, A.C. Kotze, D. Leathwick, A.J. Nisbet, T.N. McNeill, B. Besser	
<i>Strongyloides</i> genotyping: a review of methods and application in public health and population genetics	1153
R.S. Bradbury, B. Pafčo, E. Nosková, H. Hasegawa	
Advances in the treatment, diagnosis, control and scientific understanding of taeniid cestode parasite infections over the past 50 years	1167
M.W. Lightowlers, R.B. Gasser, A. Hemphill, T. Romig, F. Tamarozzi, P. Deplazes, P.R. Torgerson, H.H. Garcia, P. Kern	
<i>Nanos gigantium humeris insidentes</i> : old papers informing new research into <i>Toxoplasma gondii</i>	1193
M.B. Lodoen, N.C. Smith, D. Soldati-Favre, D.J.P. Ferguson, G.G. van Dooren	
Fifty years of the schistosome tegument: discoveries, controversies, and outstanding questions	1213
R. A. Wilson, M.K. Jones	
Zoonotic hookworms of dogs and cats – lessons from the past to inform current knowledge and future directions of research	1233
R.J. Traub, P.A. Zendejas-Heredia, L. Massetti, V. Colella	
The yin and yang of human soil-transmitted helminth infections	1243
A. Loukas, R.M. Maizels, P.J. Hotez	
Malaria research in Australia: looking through the lens of the past towards the future	1255
D.L. Doolan	
How diseases caused by parasites allowed a wider understanding of disease in general: my encounters with parasitology in Australia and elsewhere over the last 50 years	1265
I.A. Clark	
Volume Contents	i
Author Index	vii
Keyword Index	xi

Cover Figure Caption:
Looking through the lens of time: 50 years and counting. The background portrays the long-used IJP green and gold theme that changed and evolved over many years. At the bottom, are sketches of the Journal's Editors and Editorial Assistants over the past 50 years. The rainbow coloured '50' and the different parasites encapsulate the diversity of the parasitology research published, past, present and emerging, and the commitment of the journal to equality, diversity and inclusion over the next 50 years and beyond. The cover was hand-drawn by Thorey Kolbrun Jonsdottir (PhD student at the Burnet Institute and the University of Melbourne, Australia).

Available online at www.sciencedirect.com

ScienceDirect

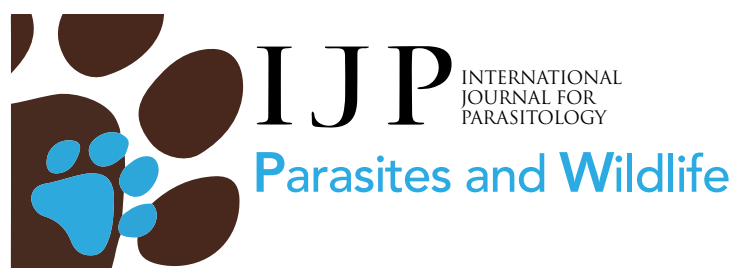
Indexed/Abstracted in: EMBASE/Excerpta Medica, Current Contents, Index Medicus, MEDLINE, Elsevier BIOBASE/Current Awareness in Biological Sciences, BIOSIS Database, PASCAL/CNRS Database, Com. Sci. Abstr., Chem. Abstr. Service, FO: VM Also covered in the abstract and citation database Scopus®. Full text available on ScienceDirect®.



0950-2688(202112)51:13-14;1-L

ISSN 0950-2688





www.journals.elsevier.com/international-journal-for-parasitology-parasites-and-wildlife/

Editor: R.C. Andrew Thompson

Facebook: www.facebook.com/IJPPAW/

A message from the Editor of IJP:Parasites and Wildlife, R.C. Andrew Thompson.

2021 has been a great year for IJP:PAW. To date we have received over 200 submissions on a diversity of topics that even includes a recent paper on the parasites of venomous spiders!

Our impact factor went up to 2.7 and profits to the ASP continue to climb.

We published a special issue for which Nico Smit was Guest Editor "A smorgasbord of firsts: Taxonomy, Morphology, and Ecology of Parasites in Wildlife", and we are now receiving invited submissions for a special issue on diseases of bees, with Peter Graystock from Imperial College in London as Guest Editor.

As interest in our journal continues to grow and submissions increase, our publication speed remains very competitive compared to other journals. This is a credit to our Reviewers who are the backbone of IJP:PAW. Thank you!

Please enjoy a selection of recent IJP:PAW articles and stunning images.

Elizabeth Browne, Michael M. Driessen, Robert Ross, Michael Roach, Scott Carver, Environmental suitability of bare-nosed wombat burrows for *Sarcoptes scabiei*, International Journal for Parasitology: Parasites and Wildlife, Volume 16, 2021, Pages 37-47, ISSN 2213-2244, <https://doi.org/10.1016/j.ijppaw.2021.08.003>.

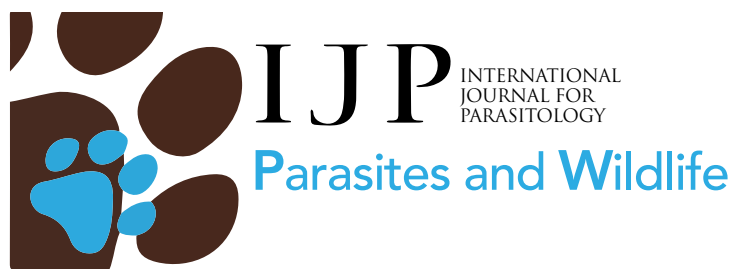
(<https://www.sciencedirect.com/science/article/pii/S2213224421000869>)

Some of the most important pathogens affecting wildlife are transmitted indirectly via the environment. Yet the environmental stages of pathogens are often poorly understood, relative to infection in the host, making this an important research frontier. Sarcoptic mange is a globally widespread disease caused by the parasitic mite *Sarcoptes scabiei*. The bare-nosed wombat (*Vombatus ursinus*) is particularly susceptible, and their solitary nature and overlapping use of burrows strongly indicate the importance of environmental transmission. However, due to the challenge of accessing and monitoring within wombat burrows, there has been limited research into their suitability for off-host mite survival and environmental transmission (i.e., to serve as a fomite). We created a model using published laboratory data to predict mite survival times based on temperature and humidity. We then implemented innovative technologies (ground-penetrating radar and a tele-operated robotic vehicle) to map and access wombat burrows to record temperature and relative humidity. We found that the stable conditions within burrows were conducive for off-host survival of *S. scabiei*, particularly in winter (estimated mite survival of 16.41 ± 0.34 days) and less so in warmer and drier months (summer estimated survival of 5.96 ± 0.37 days). We also compared two areas with higher and lower average mange prevalence in wombats (13.35% and 4.65%, respectively), finding estimated mite survival was slightly higher in the low prevalence area (10.10 and 12.12 days, respectively), contrary to our expectations, suggesting other factors are also important for population prevalence. Our study is the first to demonstrate the suitability of the bare-nosed wombat burrow for off-host mite survival and environmental transmission. Our findings have implications for understanding observed

patterns of mange, disease dynamics and disease management for not only bare-nosed wombats, but also other burrow or den-obligate species exposed to *S. scabiei* via environmental transmission.

Renáta Kopena, José Martín, Pilar López, Igor Majláth, Viktória Majláthová, Lack of evidence of vertical transmission of *Karyolysus* blood parasites in Iberian green lizards (*Lacerta schreiberi*), International Journal for Parasitology: Parasites and Wildlife, Volume 16, 2021, Pages 95-98, ISSN 2213-2244, <https://doi.org/10.1016/j.ijppaw.2021.08.008>. (<https://www.sciencedirect.com/science/article/pii/S2213224421000912>)

To understand the spread of parasite and the persistence of infection in an ecological environment, it is essential to investigate their transmission possibilities. Vertical transmission of pathogens from mother to offspring is a fundamental opportunity, notwithstanding a relatively under-researched topic, especially in wildlife animals. We studied whether there is vertical transmission of a haemogregarinid blood parasite of Iberian green lizard (*Lacerta schreiberi*). To study infection of mothers, embryos and freshly hatched juveniles, their blood smears and molecular analyses of their tail tissue were used. Examining blood smears, seventy-one percent of females were found to be infected, but molecular analyses of all mothers showed positive results for the blood parasite. Based on molecular data the parasite was identified as a *Karyolysus* species. In contrast, no parasite was found in the blood smears of the freshly hatched juveniles, and we could not detect *Karyolysus* in the embryos or tail tissue of offspring using molecular methods either. Based on our results, vertical transmission of *Karyolysus* blood parasites is unlikely in the Iberian green lizard.



www.journals.elsevier.com/international-journal-for-parasitology-parasites-and-wildlife/

Editor: R.C. Andrew Thompson

Facebook: www.facebook.com/IJPPAW/



Above: Elizabeth Browne et al. Environmental suitability of bare-nosed wombat burrows for *Sarcoptes scabiei* 16:37-47

Below: Sophie Lund Rasmussen et al. An investigation of endoparasites and the determinants of parasite infection in European hedgehogs (*Erinaceus europaeus*) from Denmark 16:217-227 Photo credit: Pia Burmøller Hansen



Below: Renata Kopena et al. Lack of evidence of vertical transmission of *Karyolysus* blood parasites in Iberian green lizards (*Lacerta schreiberi*) 16:95-98





www.journals.elsevier.com/international-journal-for-parasitology-parasites-and-wildlife/

Editor: R.C. Andrew Thompson

Facebook: www.facebook.com/IJPPAW/

Sophie Lund Rasmussen, Jakob Hallig, Rien E. van Wijk, Heidi Huus Petersen, An investigation of endoparasites and the determinants of parasite infection in European hedgehogs (*Erinaceus europaeus*) from Denmark, International Journal for Parasitology: Parasites and Wildlife, Volume 16, 2021, Pages 217–227, ISSN 2213-2244, <https://doi.org/10.1016/j.ijppaw.2021.10.005>. (<https://www.sciencedirect.com/science/article/pii/S2213224421001073>)

The European hedgehog population is declining in Europe. It is therefore important to investigate the causes for the decline and monitor the general health of the species. We investigated the endoparasite occurrence in 299 dead European hedgehogs. Of these, endoparasites were detected in 69% of the individuals tested. We identified *Crenosoma striatum*, *Capillaria aerophila* (syn. *Eucolus aerophilus*), *Capillaria* spp., coccidia, *Cryptosporidium* spp., *Brachylaemus* spp. and *Capillaria hepatica*. We also examined the hedgehogs for *Giardia* spp. and *Echinococcus multilocularis* but all were negative. Coccidia (n = 7, 2.5%) and *Cryptosporidium* spp. (n = 14, 5.2%) were only detected in individuals from Zealand, Lolland and Jutland south of the Limfjord. Single cases of *Brachylaemus* spp. (n = 1, 0.4%) and *Capillaria hepatica* (n = 1, 1.1%) were exclusively discovered in Jutland south and north of the Limfjord, respectively. These results indicate a regional difference in endoparasite species carried by European hedgehogs in Denmark. This stresses the need for hedgehogs to be cared for locally when admitted to wildlife rehabilitation centres, and to be released within their area of origin, to prevent spread of endoparasite infections among hedgehogs. Additionally, we explored the following possible determinants of parasite infection in the

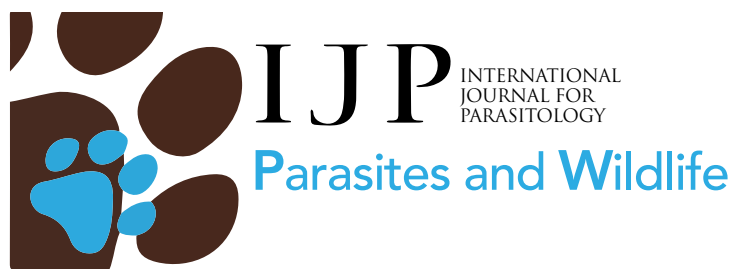
hedgehogs: sex, age, mortality category (in-care, natural and roadkill), infection with MRSA, genetic heterozygosity, month of death, geographical location and habitat type, and found that only age had a statistically significant effect on endoparasite prevalence, as we detected a lower occurrence of endoparasites in juvenile hedgehogs (<1 year) compared to the other age classes. However, pairwise comparisons of geographical regions did show significant differences in endoparasite occurrence: Zealand vs. Jutland south of the Limfjord and Zealand vs. Falster. We conclude that, in line with previous studies of European hedgehogs throughout their range in Western Europe, endoparasite infections are common and a natural part of their ecology.

Andrew Ramey et al. Negligible evidence for detrimental effects of *Leucocytozoon* infections among Emperor Geese (*Anser canagicus*) breeding on the Yukon-Kuskokwim Delta, Alaska 16: 103–112 <https://www.sciencedirect.com/science/article/pii/S2213224421000894>

Emperor Geese (*Anser canagicus*) are iconic waterfowl endemic to Alaska and adjacent areas of northeastern Russia that are considered to be near threatened by the International Union for Conservation. This species has been identified as harboring diverse viruses and parasites which have, at times, been associated with disease in other avian taxa. To better assess if disease represents a vulnerability for Emperor Geese breeding on the Yukon-Kuskokwim Delta, Alaska, we evaluated if haemosporidian parasites were associated with decreased mass or survival among adult female nesting birds captured during 2006–2016. Through molecular analyses, we detected genetically diverse *Leucocytozoon*, *Haemoproteus*, and *Plasmodium* parasites in 28%, 1%, and 1%

of 607 blood samples screened in triplicate, respectively. Using regression analysis, we found evidence for a small effect of *Leucocytozoon* infection on the mass of incubating adult female Emperor Geese. The estimated mass of infected individuals was approximately 43 g (95% CI: 20–67 g), or approximately 2%, less than uninfected birds when captured during the second half of incubation (days 11–25). We did not, however, find support for an effect of *Leucocytozoon* infection on survival of adult female nesting Emperor Geese using a multi-state hidden Markov framework to analyze mark-resight and recapture data. Using parasite mitochondrial DNA cytochrome b sequences, we identified 23 haplotypes among infected Emperor Geese. *Leucocytozoon* haplotypes clustered into three phylogenetically supported clades designated as ‘*L. simondi* clade A’, ‘*L. simondi* clade B’, and ‘other *Leucocytozoon*’. We did not find evidence that parasites assigned to any of these clades were associated with differential mass measures among nesting adult female Emperor Geese. Collectively, our results provide negligible evidence for *Leucocytozoon* parasites as causing detrimental effects to adult female Emperor Geese breeding on the Yukon-Kuskokwim Delta.

Chantelle Pretorius, Nico J. Smit, Bjoern C. Schaeffner, Courtney A. Cook, The neglected diversity: Description and molecular characterisation of *Trypanosoma haploblephari* Yeld and Smit, 2006 from endemic catsharks (Scyliorhinidae) in South Africa, the first trypanosome sequence data from sharks globally, International Journal for Parasitology: Parasites and Wildlife, Volume 15, 2021, Pages 143–152, ISSN 2213-2244, <https://doi.org/10.1016/j.ijppaw.2021.04.008>. (<https://www.sciencedirect.com/science/article/pii/S2213224421000535>)



www.journals.elsevier.com/international-journal-for-parasitology-parasites-and-wildlife/

Editor: R.C. Andrew Thompson

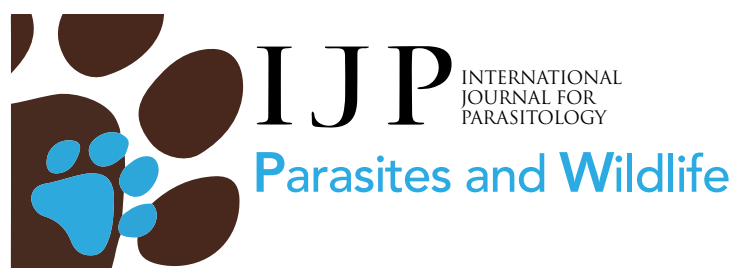
Facebook: www.facebook.com/IJPPAW/



Above and Right: Andrew Ramey et al. Negligible evidence for detrimental effects of *Leucocytozoon* infections among Emperor Geese (*Anser canagicus*) breeding on the Yukon-Kuskokwim Delta, Alaska 16: 103-112

Below: The neglected diversity: Description and molecular characterisation of *Trypanosoma haploblephari* Yeld and Smit, 2006 from endemic catsharks (*Scyliorhinidae*) in South Africa, the first trypanosome sequence data from sharks globally 15: 143-152





www.journals.elsevier.com/international-journal-for-parasitology-parasites-and-wildlife/

Editor: R.C. Andrew Thompson

Facebook: www.facebook.com/IJPPAW/

With over 200 species of sharks reported from South African waters, the potential of discovering new blood parasites is very high. Unfortunately, this remains a poorly explored area of research, particularly in this biogeographical region. To date, only a single trypanosome species, *Trypanosoma haploblephari* Yeld and Smit, 2006, has been described from elasmobranchs off the coast of South Africa infecting the catsharks *Haploblepharus pictus* (Müller & Henle) and *Haploblepharus edwardsii* (Schinz). With only a single trypanosome species described and absence of molecular information, a study was conducted to provide further morphological and molecular information on *T. haploblephari*, a species considered not to demonstrate any pleomorphism. Thin blood smears were prepared, and blood was collected in molecular-grade ethanol from the caudal vein of two shark species, *H. pictus* and *Poroderma pantherinum* (Müller & Henle). Trypanosomes were morphologically described and molecularly characterised based on analysis of fragments of the 18S ribosomal gene. The presence of *T. haploblephari* in *H. pictus* was confirmed using the original description based on morphology, type host and locality, which allowed for the molecular characterisation of the species. In addition, this species was found parasitising *P. pantherinum*, its morphology considerably different in this host species as compared to that in the species of *Haploblepharus*, demonstrating that *T. haploblephari* may show extreme pleomorphism. This paper provides both morphological and molecular data for both morphotypes of *T. haploblephari*, with molecular comparisons to the only two other elasmobranch species of trypanosome for which sequence data is available. To elucidate the relationship of trypanosomes from aquatic hosts in general, more efforts need to be placed on elasmobranchs, as current phylogenetic studies are predominantly focused on

trypanosomes infecting freshwater fishes.

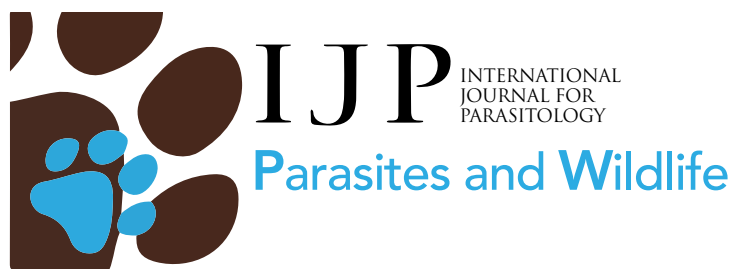
Hannah S. Tiffin, Michael J. Skvarla, Erika T. Machtinger, Tick abundance and life-stage segregation on the American black bear (*Ursus americanus*), International Journal for Parasitology: Parasites and Wildlife, Volume 16, 2021, Pages 208-216, ISSN 2213-2244, <https://doi.org/10.1016/j.ijppaw.2021.10.004>, (<https://www.sciencedirect.com/science/article/pii/S2213224421001061>)

Tick abundance and diagnosed cases of tick-borne diseases have been increasing in the United States. American black bear (*Ursus americanus*) populations have also been increasing in the eastern United States. As a competent host of several species of ticks and a mammal capable of traveling long distances, the role of black bears as hosts for ticks requires further evaluation. Ectoparasite surveys were conducted on black bears in Pennsylvania to evaluate tick presence, abundance, spatial distribution, and association with *Sarcoptes scabiei*, the etiological agent of sarcoptic mange, on bears to better understand their role in tick ecology and to improve on-host surveillance techniques. Tick burden was evaluated using standard area sampling (10.16 × 10.16 cm squares) on pre-designated body regions on black bears from June 2018–December 2019. In total, 278 unique individual black bears were evaluated, with all ticks identified as *Ixodes scapularis* (n = 1976; 76.7% adults, 23.3% immatures). Tick presence differed by body region on bears, with the highest percentage of tick observations located on bear ears and muzzle. Ticks also partitioned on black bears by life-stage, with immature ticks primarily recorded on the lower extremities of bears and adult ticks primarily recorded on the front-quarters of bears. This includes the first known record of *I. scapularis* larvae parasitizing black bears, and observations of all three

mobile life-stages concurrently parasitizing bears. Tick abundance was also statistically significant dependent on season, with the highest abundance of ticks recorded in spring and lowest abundance in fall. Adult ticks were less likely to be present on bears with mange. These data reveal the important role black bears may serve in tick ecology and dispersal as all three mobile life-stages of *I. scapularis* were found parasitizing a mammal capable of traveling far distances in a region with high numbers of Lyme disease cases.

Yoenten Phuentshok, Kinley Choden, Cristian A. Alvarez Rojas, Peter Deplazes, Sonam Wangdi, Kuenzang Gyeltshen, Karma Rinzin, Nirmal Kumar Thapa, Tenzinla Tenzinla, Dechen Dorjee, Marc Valitutto, Martin Gilbert, Boripat Siriaronrat, Waleemas Jairak, Chutchai Piewbang, Puspa Maya Sharma, Tshewang Dema, Ratna Bahadur Gurung, Cerebral cysticercosis in a wild Bengal tiger (*Panthera tigris tigris*) in Bhutan: A first report in non-domestic felids, International Journal for Parasitology: Parasites and Wildlife, Volume 14, 2021, Pages 150-156, ISSN 2213-2244, <https://doi.org/10.1016/j.ijppaw.2021.02.003>, (<https://www.sciencedirect.com/science/article/pii/S2213224421000171>)

The endangered Bengal tiger (*Panthera tigris tigris*) is a keystone species playing an essential role in ecology as well as in the social and spiritual lives of the Himalayan people. The latest estimate of the Bengal tiger population in Bhutan accounts for 103 individuals. Infectious organisms, including zoonotic parasites causing high burden in human health, have received little attention as a cause of mortality in tigers. Taeniosis/cysticercosis, caused by the cestode *Taenia solium*, is considered one of the major neglected tropical diseases in Southeast Asia. We present here a case of neurocysticercosis in a Bengal tiger



www.journals.elsevier.com/international-journal-for-parasitology-parasites-and-wildlife/

Editor: R.C. Andrew Thompson

Facebook: www.facebook.com/IJPPAW/

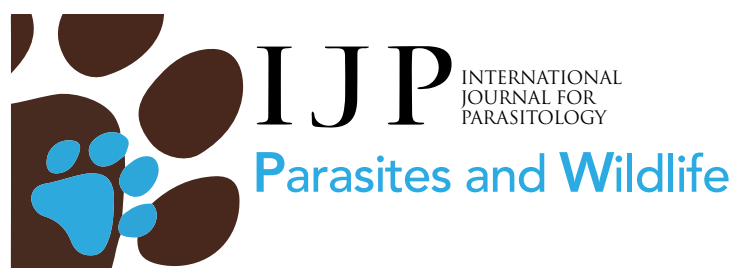


Left: Yoenten Phuentshok et al. Cerebral cysticercosis in a wild Bengal tiger (*Panthera tigris tigris*) in Bhutan: A first report in non-domestic felids 14:150-156



Hannah Tiffin et al. Tick abundance and life-stage segregation on the American black bear (*Ursus americanus*) 16: 208-216





www.journals.elsevier.com/international-journal-for-parasitology-parasites-and-wildlife/

Editor: R.C. Andrew Thompson

Facebook: www.facebook.com/IJPPAW/

showing advanced neurological disease outside Thimphu, the capital city of Bhutan. After palliative care, the animal died, and necropsy revealed multiple small cysts in the brain. Here we show the presence of two genetic variants of *T. solium* in the parasite material collected based on PCR and sequencing of the complete *cox1* and *cytB* genes. The sequences form a discrete branch within the Asia plus Madagascar cluster of the parasite. On other hand, tests for feline morbillivirus, feline calicivirus, canine distemper virus, Nipah, rabies, Japanese encephalitis, feline leukaemia and feline immunodeficiency virus were negative. In contrast, PCR for feline herpesvirus was positive and a latex agglutination test revealed an elevated antibody titer against *Toxoplasma gondii* (titer 1:256). The molecular examination of taeniid eggs isolated from the tiger faeces produced sequences for which the highest homology in GenBank is between 92% and 94% with *T. regis* and *T. hydatigena*. This fatal case of *T. solium* neurocysticercosis, a disease previously unrecorded in tigers or other non-domestic felids, demonstrates an anthropogenically driven transmission of a deadly pathogen which could become a serious threat to the tiger population.

Kristina Lehnert, Lonneke L. IJsseldijk, May Li Uy, Joy Ometere Boyi, Linde van Schalkwijk, Eveline A.P. Tollenaar, Andrea Gröne, Peter Wohlsein, Ursula Siebert, Whale lice (*Isocyamus deltobranchium* & *Isocyamus delphinii*; Cyamidae) prevalence in odontocetes off the German and Dutch coasts – morphological and molecular characterization and health implications, International Journal for Parasitology: Parasites and Wildlife, Volume 15, 2021, Pages 22-30, ISSN 2213-2244, <https://doi.org/10.1016/j.ijppaw.2021.02.015>, (<https://www.sciencedirect.com/science/article/pii/S2213224421000298>)

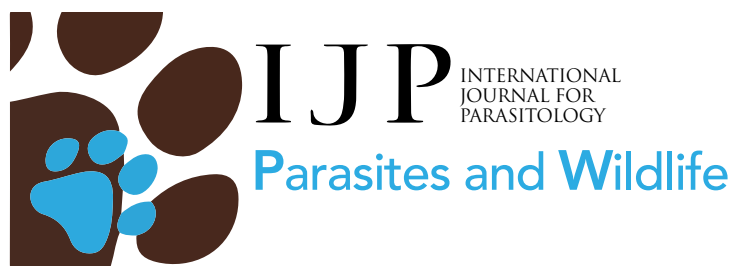
Whale lice (Cyamidae; *Amphipoda*) are

ectoparasitic crustaceans adapted to the marine environment with cetaceans as their host. There are few reports of cyamids occurring in odontocetes from the North Sea, and long-term studies are lacking. Marine mammal health was monitored along the German and Dutch coasts in the past decades, with extensive post mortem investigations conducted. The aim of this study was to analyse archived ectoparasite samples from stranded cetaceans from the North Sea (2010–2019), to determine species, prevalence and impact of ectoparasite infection. Ectoparasites were found on two cetacean species – harbour porpoises (*Phocoena phocoena*), as the most abundant cetacean species in the North Sea, and on a pilot whale (*Globicephala melas*), as a rare species here. Prevalence of ectoparasitic crustaceans in cetaceans was low: 7.6% in porpoises stranded in the Netherlands (n = 608) and 1.6% in porpoises stranded in Germany (n = 122). All whale lice infections were found on hosts with skin lesions characterised by ulcerations. Morphological investigations revealed characteristic differences between the cyamid species *Isocyamus (I.) delphinii* and *I. deltobranchium* identified. *Isocyamus deltobranchium* was determined in all infected harbour porpoises. *I. delphinii* was identified on only the pilot whale. Molecular analyses showed 88% similarity of mtDNA COI sequences of *I. delphinii* with *I. deltobranchium* supporting them as separate species. Phylogenetic analyses of additional gene loci are required to fully assess the diversity and exchange of whale lice species between geographical regions as well as host specificity. Differing whale lice prevalences in porpoises stranded in the Netherlands and Germany could indicate a difference in severity of skin lesions between these areas. It should be further investigated if more inter- or intraspecific contact, e.g., due to a higher density of porpoises or contact with other cetaceans, or a poorer health status of

porpoises in the southern North Sea could explain these differences.

Chloe Steventon, Anson V. Koehler, Elizabeth Dobson, Leanne Wicker, Alistair R. Legione, Joanne M. Devlin, Dan Harley, Robin B. Gasser, Detection of *Breinlia* sp. (Nematoda) in the Leadbeater's possum (*Gymnobelideus leadbeateri*), International Journal for Parasitology: Parasites and Wildlife, Volume 15, 2021, Pages 249-254, ISSN 2213-2244, <https://doi.org/10.1016/j.ijppaw.2021.06.002>, (<https://www.sciencedirect.com/science/article/pii/S2213224421000687>)

The Leadbeater's possum (*Gymnobelideus leadbeateri*) is a critically endangered marsupial in south-eastern Australia. Among other conservation efforts, free-ranging animals in the two remaining geographically separate populations (highland and lowland) have been extensively studied; however, little is known about their health and mortality. Although some wild populations are frequently monitored, cadavers are rarely recovered for post mortem examination. In June 2019, a recently deceased, wild, adult male lowland Leadbeater's possum was collected from a nest box and a comprehensive post mortem examination was conducted. Microfilariae of a filarioid nematode were observed in testes, liver, lung and skin samples in tissue impression smears and upon histopathological examination. No gross or histological changes were seen associated with the parasites, except for a focal area of tissue damage in the skin, suggesting that the possum is a natural host. Using a PCR-coupled sequencing method the filarioid was identified as a species of *Breinlia*. Species of *Breinlia* occur in other Australian marsupials and rodents.



www.journals.elsevier.com/international-journal-for-parasitology-parasites-and-wildlife/

Editor: R.C. Andrew Thompson

Facebook: www.facebook.com/IJPPAW/

Right: Chloe Steventon et al. Detection of *Breinlia* sp. (Nematoda) in the Leadbeater's possum (*Gymnobelideus leadbeateri*) 15:249-254



Right: Kristina Lehnert et al. Whale lice (*Isocyamus deltobranchium* & *Isocyamus delphinii*; Cyamidae) prevalence in odontocetes* off the German and Dutch coasts – morphological and molecular characterization and health implications 15:22-30 *image of a porpoise





www.journals.elsevier.com/international-journal-for-parasitology-parasites-and-wildlife/

Editor: R.C. Andrew Thompson

Facebook: www.facebook.com/IJPPAW/

Shyun Chou, Nobumoto Izawa, Kazunori Ike, Toshihiro Tokiwa, Detection of *Eumonospora henryae* (Apicomplexa: Sarcocystidae) from *Falco columbarius* (Falconiformes: Aves): Comparison of host–parasite phylogram and comments on the family Sarcocystidae Poche, 1913, International Journal for Parasitology: Parasites and Wildlife, Volume 14, 2021, Pages 75–83, ISSN 2213–2244, <https://doi.org/10.1016/j.ijppaw.2021.01.002>. (<https://www.sciencedirect.com/science/article/pii/S221322442100002X>)

The genus *Eumonospora* Allen, 1933 (Apicomplexa: Sarcocystidae), an avian coccidia, is characterized by monosporocystic and octasporozoic oocysts without Stieda and substieda bodies. Some members of *Eumonospora*, which infect several raptor species, exhibit high levels of pathogenicity, making eumonosporiosis the leading cause of death in captive-bred raptors. The host specificity of these species appears to be mesostenoxenous, as evidenced by unsuccessful transmission between different orders of avian hosts. However, several studies have detected *Eumonospora* spp. in taxonomically distant avian hosts, indicating that some of these species may be euryxenous. In the current study, diarrheic fecal examination of a captive-bred juvenile merlin (Falconiformes: Aves) in Tokyo, Japan, was conducted, and a large number of oocysts were morphologically and molecularly identified as *E. henryae* (Yakimoff and Matschulsky, 1932), a coccidia species reported only in Strigiformes. This is a new recorded host for this coccidia. Phylogenetic analyses via Bayesian inference and maximum likelihood methods using concatenated genomic datasets consisting of nuclear 18S rDNA, nuclear 28S rDNA and mitochondrial cytochrome C oxidase subunit 1 gene, revealed a well-supported monophyletic clade of *Eumonospora* spp. belonging to the family Sarcocystidae Poche 1913,



which largely corresponded to the avian host phylogram. Therefore, based on distinguishable oocyst morphology, a new subfamily, *Eumonosporinae*, within the family Sarcocystidae, is proposed, and a reconsideration of the definition of Sarcocystidae is suggested. Further molecular characterization of this emerging pathogen, as well as clarification of its complete life cycle, including cyst-forming ability, is required for more appropriate generic assessment.

Shyun Chou et al. Toshihiro Tokiwa* Detection of *Eumonospora henryae* (Apicomplexa: Sarcocystidae) from *Falco columbarius* (Falconiformes: Aves): Comparison of host–parasite phylogram and comments on the family Sarcocystidae Poche, 1913 14:75–83 *
Photo credit: Toshihiro Tokiwa



IJP INTERNATIONAL
JOURNAL FOR
PARASITOLOGY

Drugs and Drug Resistance

www.journals.elsevier.com/international-journal-for-parasitology-drugs-and-drug-resistance/

Editors In Chief: Andrew Kotze & Kevin Saliba

Facebook: www.facebook.com/IJPPDDR/

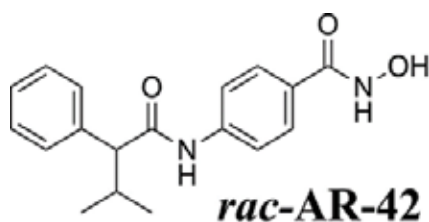
Recent IJP DDR article, Drugs and Drug Resistance, from ASP Members in the December 2021 issue of the journal.

Chua MJ, Tng J, Hesping E, Fisher GM, Goodman CD, Skinner-Adams T, Do D, Lucke AJ, Reid RC, Fairlie DP, Andrews KT. 2021. Histone deacetylase inhibitor AR-42 and achiral analogues kill malaria parasites *in vitro* and in mice. *Int J Parasitol Drugs Drug Resist.* 17:118-127

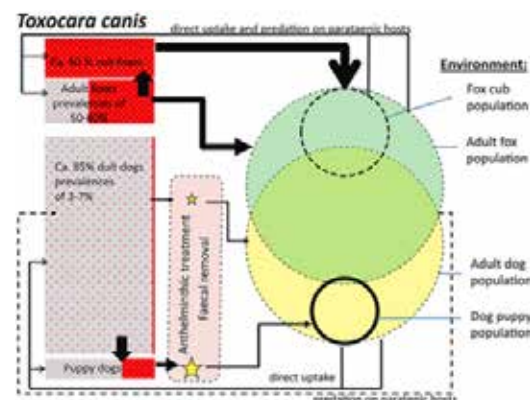
<https://doi.org/10.1016/j.ijpddr.2021.08.006>

Malaria is caused by infection with *Plasmodium* parasites and results in significant health and economic impacts. Malaria eradication is hampered by parasite resistance to current drugs and the lack of a widely effective vaccine. Compounds that target epigenetic regulatory proteins, such as histone deacetylases (HDACs), may lead to new therapeutic agents with a different mechanism of action, thereby avoiding resistance mechanisms to current antimalarial drugs. The anticancer HDAC inhibitor AR-42, as its racemate (rac-AR-42), and 36 analogues were investigated for *in vitro* activity against *P. falciparum*. Rac-AR-42 and

selected compounds were assessed for cytotoxicity against human cells, histone hyperacetylation, human HDAC1 inhibition and oral activity in a murine malaria model. Rac-AR-42 was tested for *ex vivo* asexual and *in vitro* exoerythrocytic stage activity against *P. berghei* murine malaria parasites. Rac-AR-42 and 13 achiral analogues were potent inhibitors of asexual intraerythrocytic stage *P. falciparum* 3D7 growth *in vitro* (IC₅₀ 5–50 nM), with four of these compounds having >50-fold selectivity for *P. falciparum* versus human cells (selectivity index 56–118). Rac-AR-42 induced *in situ* hyperacetylation of *P. falciparum* histone H4, consistent with PfHDAC(s) inhibition. Furthermore, rac-AR-42 potently inhibited *P. berghei* infected erythrocyte growth *ex vivo* (IC₅₀ 40 nM) and *P. berghei* exoerythrocytic forms in hepatocytes (IC₅₀ 1 nM). Oral administration of rac-AR-42 and two achiral analogues inhibited *P. berghei* growth in mice, with rac-AR-42 (50 mg/kg/day single dose for four days) curing all infections. These findings demonstrate curative properties for HDAC inhibitors in the oral treatment of experimental mouse malaria.



P. falciparum 3D7 IC₅₀ 22 nM



von Samson-Himmelstjerna G, Thompson RA, Krücken J, Grant W, Bowman DD, Schnyder M, Deplazes P. 2021. Spread of anthelmintic resistance in intestinal helminths of dogs and cats is currently less pronounced than in ruminants and horses - Yet it is of major concern. *Int J Parasitol Drugs Drug Resist.* 17:36-45

<https://doi.org/10.1016/j.ijpddr.2021.07.003>

Anthelmintic resistance (AR) has thus far only rarely been reported for intestinal helminths of dogs and cats, in contrast to parasites of livestock and horses. We highlight possible reasons for this striking and important discrepancy, including ecological, biological and genetic factors and/or intervention regimens of key intestinal helminths concerning both host groups. In view of the current knowledge related to the genetics, mechanisms and principles of AR development, we point at issues which in our view contribute to a comparatively lower risk of AR development in intestinal helminths of dogs and cats. Finally, we specify research needs and provide recommendations by which, based on the available information about AR in ruminant and equine helminths, the development of AR in dog and cat helminths may best be documented, prevented or at least



IJP

INTERNATIONAL
JOURNAL FOR
PARASITOLOGY

Drugs and Drug Resistance

www.journals.elsevier.com/international-journal-for-parasitology-drugs-and-drug-resistance/

Editors In Chief: Andrew Kotze & Kevin Saliba

Facebook: www.facebook.com/IJPD/

postponed.



Marfurt J, Wirjanata G, Prayoga P, Chalfein F, Leonardo L, Sebayang BF, Apriyanti D, Sihombing MAEM, Trianty L, Suwanarusk R, Brockman A, Piera KA, Luo I, Rumaseb A, MacHunter B, Auburn S, Anstey NM, Kenangalem E, Noviyanti R, Russell B, Poespoprodjo JR, Price RN. 2021. Longitudinal ex vivo and molecular trends of chloroquine and piperazine activity against *Plasmodium falciparum* and *P. vivax* before and after introduction of artemisinin-based combination therapy in Papua, Indonesia. *Int J Parasitol Drugs Drug Resist.* 17:46-56

<https://doi.org/10.1016/j.ijpddr.2021.06.002>

Drug resistant *Plasmodium* parasites are a major threat to malaria control and elimination. After reports of high levels of multidrug resistant *P. falciparum* and *P. vivax* in Indonesia, in 2005, the national first-line treatment policy for uncomplicated malaria was changed in March 2006, to dihydroartemisinin-piperazine against all species.

This study assessed the temporal trends in ex vivo drug susceptibility to chloroquine (CQ) and piperazine (PIP) for both *P.*

falciparum and *P. vivax* clinical isolates collected between 2004 and 2018, by using schizont maturation assays, and genotyped a subset of isolates for known and putative molecular markers of CQ and PIP resistance by using Sanger and next generation whole genome sequencing.

The median CQ IC50 values varied significantly between years in both *Plasmodium* species, but there was no significant trend over time. In contrast, there was a significant trend for increasing PIP IC50s in both *Plasmodium* species from 2010 onwards. Whereas the South American CQ resistant 7G8 pfcr1 SVMNT isoform has been fixed since 2005 in the study area, the pfmdr1 86Y allele frequencies decreased and became fixed at the wild-type allele in 2015. In *P. vivax* isolates, putative markers of CQ resistance (no pvcrt-o AAG (K10) insertion and pvmdr1 Y967F and F1076L) were fixed at the mutant alleles since 2005. None of the putative PIP resistance markers were detected in *P. falciparum*.

The ex vivo drug susceptibility and molecular analysis of CQ and PIP efficacy for *P. falciparum* and *P. vivax* after 12 years of intense drug pressure with DHP suggests that whilst the degree of CQ resistance appears to have been sustained, there has been a slight decline in PIP susceptibility, although this does not appear to have reached clinically significant levels. The observed decreasing trend in ex vivo PIP susceptibility highlights the importance of ongoing surveillance.

News from the ASP Network for Parasitology

Travel Awards

The ASP Researcher Exchange, Travel and Training Award including a JD Smyth Postgraduate Travel Award scheme has re-opened. **The next deadline for applications is 11th March 2022.**

In light of the COVID-19 outbreak worldwide we have updated the Travel Award guidelines and the application form, so please ensure that you read the updated guidelines before applying for an ASP Travel Award. <https://www.parasite.org.au/awards/jd-smyth-postgraduate-travel-awards/>

Network Mentorship Scheme

Network Mentorship Scheme Early career researchers are encouraged to apply to the Network Convenor (nick.smith@parasite.org.au), in strict confidence, for funding to participate in the Network Mentorship Scheme. The scheme allows young investigators to be paired with experienced, successful academics to discuss, plan, prioritise and set targets for their career. Arrangements for professional development and progress to be reviewed by the pair annually can also be arranged. Importantly, mentors need not be from an individual's home institution but can be drawn from across the Network. The scheme has proved very valuable for several young researchers and their mentors already and covers mentorship across all aspects of working in parasitology including research, teaching, leadership, communication and outreach and other areas of professional development. In light of the COVID-19 outbreak worldwide travel may not be possible however the Network will still be able to introduce ECR researchers to mentors and they will be able to meet virtually during the COVID19 pandemic.

Conference News

ICOPA 2022 abstract submission is open!
www.icopa2022.org

The ISFP program at ICOPA 2022

15th International Congress of Parasitology - ICOPA 2022 fish parasitology sessions under ISFP

Day 1:

Session 1 with 6 lectures (15 min each) Climate change and fish parasites

Session 2 with 6 lectures (15 min each)

Biodiversity, Evolution, Ecology

Session 3 with 6 lectures (15 min each) Fishborne zoonotic parasites

Day 2:

Session 4 with 6 lectures (15 min each) Parasitic helminths in wild and cultured fish

Session 5 with 6 lectures (15 min each)

Crustacean parasites in wild and cultured fish

Session 6 with 6 lectures (15 min each)

Myxozoans in wild and cultured fish

Day 3:

Session 7 with 6 lectures (15 min each) Control of parasitic infections in fish

Session 8 with 6 lectures (15 min each)

Fish host-parasite interactions

Session 9 with 6 lectures (15 min each)

Fish immune responses to parasites

ASP Conference

We hope to see you all at the 2022 ASP Annual Conference which is planned as a face-to-face event for 4-7 July 2022 at the Shangri-La Hotel in Cairns, Queensland.

It has been exciting to start planning for the 2022 ASP Conference 2022. We are thrilled to announce our 2022 ASP Conference sponsors.

Elsevier Parasitology, International Journal for Parasitology (IJP), IJPDDR & IJPPAW

Vetoquinol Australia

Virbac

Boehringer Ingelheim Animal Health Australia

New England Biolabs

The conference website will be launched in the new year.

With best wishes,

Nick and Lisa

www.youtube.com/user/ASPParasiteNetwork

www.parasite.org.au

www.facebook.com/ASPParasitology

Closing dates

ASP Fellowships
1 January 2022

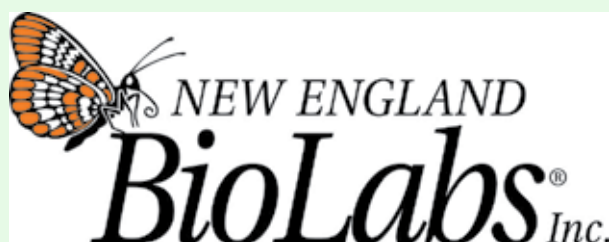
ASP Researcher Exchange, Travel and Training Awards & JD Smyth
11 March 2022

John Frederick Adrian Sprent Prize
30 September 2022

Bancroft-Mackerras Medal for Excellence
30 September 2022

More information
www.parasite.org.au

ASP Annual Conference Sponsors



State News

New South Wales

University of Sydney

Laboratory of Veterinary Parasitology @ McMaster Building

You surely remember that we recently farewelled **Dr Nichola Calvani**. I will dare to promote her recent work from Ireland that is nicely taking off and gains momentum globally. Nichola does like to talk a lot LOL, but she does not just talk does as well! Her latest venture is what is now known as herminthology. <https://twitter.com/herminthology> (and sure you can find it on Instagram and Facebook). Her profile of woman leaders and upcoming young woman leaders is a great inspiration for both seasoned parasitologist as well as any newbies or aspiring scientists! What a thrill Nichola!

And so it is the end of 2021. Sure, we need to say something about teaching. We reinvented ourselves again twice this year during the DVM course. In the first semester we had a blast bringing back students back to classroom after >12 month. We not just dealt with parasitises – we dealt with paradollars (P\$) so student had to think twice before using a test/s to resolve a case as the clients budget was limited.

We called this teaching “Clinical Veterinary Parasitology in Practice”. Did students like it? Hell yeh: 84% said it was extremely effective and 16% that it was very effective. Success I say! Here is one comment “You are all so great - the “parasite boys” as my friends call you (**Jan, David and Graeme**) make the content so fun and easy to understand, and you all make us feel super comfortable asking questions and bantering. Never change! The practicals online were well organised and worked super well considering the circumstances, and the in person POAD practical was great putting those skills into practice.

The PhD students were wonderful and knowledgeable too. Thanks everyone!”

Mid-year the Delta came and all went virtual again. We tried to retain the authenticity and streamed the pracs from the lab. We hope we made the best out of the bad situation. What follows is a word clous of the feedback we got from students:

A new PhD student joined us – **Phoebe**

School of Veterinary Science Research conference at the University of Sydney. There were only 3 prizes given and 2 went our way!

Two new students joined the group as well. **Hanna Zecevik** is undertaking a Master program while also doing the small animal residency at the hospital. **Elijah Klaebe** is Honours student who has just won the funding from the Australian Wool



We called this teaching “Clinical Veterinary Parasitology in Practice”.

Rivory to work on *Angiostrongylus* (rat lungworms) in Australia. And together with PhD students **Emily Francis** and **Rose Power** were busy even during the lockdown. In fact, they work has been rewarded – Rose has won 'Specially Commended Talk by an ASP Student Member' at the 2021 ASP Online Conference, for her talk "Investigating macrocyclic lactone resistance in *Dirofilaria immitis* from Australia". This was Rose's first conference and we are super proud of her! What an amazing outcome. Phoebe and Emily won the prizes for their respective categories (early and mid- candidature, respectively) during the recent Sydney

State News continued

Education Trust - AWET Undergraduate Project Scholarship for 2022.

We always super proud of our DVM3 student undertaking their cap stone experience while working on the research

don't know, fleas & ticks are the most common ectoparasites on dogs. Anna reflected: "I became interested in ticks and fleas while studying about them in

history, because this is exactly what Gracy illuminated in her 2021 study. I cannot reveal the discovery as you will need to wait when its 'hopefully' accepted in the journal where it is under review right now. Regardless, it was fantastic to explore one of the dogmas we veterinary parasitologists talk about with Gracy!



and enquiry project. Despite all the COVID-19 restriction, the DVM3 students **Gemma, Anna and Gracy's** achievements should be celebrated. **Gemma Rush** has delivered another milestone for cats suffering from the pesky *Trichomonas foetus*! Trichomonosis in cats is the cause of a conundrum in veterinary clinics, whereby cats remain refractory to treatment with both ronidazole and metronidazole. So, the questions remained – are they resistant? And, what do you do with the cats when treatment doesn't work? Gemma got the answers! Using cultures from local cats in which ronidazole hasn't worked, we have demonstrated in vitro resistance to ronidazole and metronidazole, this is the first time this has been shown in Sydney cats ever (well Australia)! AND, we've demonstrated that they can self-resolve without a change in their home environment! Big congrats from us all and all the best with the rest of DVM. Read Gemma's paper now published in Veterinary Parasitology: "Evidence of self-resolution of feline trichomonosis in a pair of single household cats due to ronidazole-resistant *Trichomonas foetus*" (<https://doi.org/10.1016/j.vetpar.2021.109609>). Similarly, **Anna Regina Angela Marquez** has embarked onto research the usual suspects from her home in Manila. If you

DVM year 2. This gradually evolved into a curiosity on what zoonotic diseases ticks and fleas from Manila carry. Investigating this was a great opportunity to learn more about vector-borne diseases from back home, and really drove home the importance of anti-parasitocides for both animal and human health and welfare." It enabled Anna to be connected with her family and vet friends back home when sourcing the material during closed borders in 2021. So what did Anna find? Well, it was the usual brown dog tick and cat fleas that were found on the dogs from Manila. Well done Anna! Read more about her study in Parasitologia: "Vector-Borne Pathogens in Ticks and Fleas of Client-Owned Dogs in Metro Manila, Philippines" (<https://doi.org/10.3390/parasitologia1040026>). Last but not least Gracy Hon has worked on the usual roundworms, as pet owners you tend to be bombarded by dogmatic statements around antiparasiticide treatment aka 'worming'. One time in 2020, while Jan had a lecture on vertical transmission, puppies and roundworms (*Toxocara*) and rumbled about unknowns, Gracy approached him and asked what is actually the prevalence in these latent carriers such as adult dogs that rarely shed eggs? Well the rest is a

Last but not least, COVID-19 and all other troubles have made it even more clear we need to look after each other. **Jan Šlapeta** and **Mark Westman** from the vet school (mark is now at DPI NSW) have stratd 10K VET RUN late last year and sure they gave it a go again. This time with **Bonnie Blaxall** from CVE (Centre for Veterinary Education) they set up a fundraiser and raised >\$2000 for Beyond Blue. The sky was blue and sun was rising – perfect Sydney weather. The morning run across the Anzac bridge and back thru Glebe to vet school was a highlight (see picture of **Mark, Anna, Igna, Bonnie and Jan**).

Cheers everyone and wishing you a great holiday break! From Jan Šlapeta, Sydney

UNSW

Professor Jake Baum will be joining UNSW Sydney in January to take up a new role as Head of School, School of Medical Sciences, Faculty of Medicine. Jake, a long-standing member of ASP when formerly with the WEHI in Melbourne, has spent the last 8 years in the UK at Imperial College London as both Professor of Cell Biology & Infectious Disease and, more recently, co-Director of the Institute of Infection there (<https://www.imperial.ac.uk/institute-of-infection>). His lab (<https://www.baumlab.com>) has a keen interest in the cell biology of malaria parasites, their transmission through the mosquito, cell motility and cell imaging and in the last 5 years has developed a translational research program aimed at delivering next generation malaria vaccines and point-of-care diagnostics for malaria and other febrile diseases.

State News continued

Macquarie University

The lab has been pretty busy after emerging from lockdown and getting our Master of Research and project students across the line. **Anushika Herath (Postdoc)** and **Joe Shin (MRes)** have been busy processing possum samples for *Cryptosporidium* and *Giardia*. **Jeevi Mahalinham (Masters project student)** has been busy processing flying fox samples for blood parasites with **Ammara Sajjad (Postdoc)**, a project that is advancing the non-viral pathogens in flying foxes study with Juliane Schaer (Humboldt University). Congratulations to **Fiona McDougall (Postdoc)** who received an MQ COVID Fellowship to continue her research on bat pathogens, Fiona was also awarded her PhD early in 2021. Fiona will also continue her work on antimicrobial resistance in fire-affected koalas. **Nadine Samy (MRes)** recently submitted her thesis on antimicrobial resistance

monotremes, a collaboration with Taronga Wildlife Hospital. **Mariel Fulham (USYD PhD student based at MQ)** has managed to keep the sealion samples coming in and investigating the relationship between hookworm and other symbionts in pups.

Michelle Power, Anushika, Sarah Preston (Federation), Scott Carver (UTAS), Tana Sukee (UMELB) and three MQ undergraduates (Ruth Bai, Nina Kettle and James Sammes) pulled together an outreach event in celebration of Parasite Biodiversity for the Biodiversity Conference COP15. The initiative was led by **CiP Alumnus Chenhua Li**. The event comprised eight sessions covering parasites in an array of hosts and received >1088 views with an average view time of ~43 minutes – that is over 800 hours of parasite diversity showcased to audiences watching from 93 countries. Registrations comprised ~31% faculty, ~26% grad students, ~15% undergrad students, and ~28% public. You can watch it all here:

<https://www.youtube.com/channel/UCipOrVFVSOCWmjwXTQvez5A/videos>.

Charles Sturt University Wagga Wagga

Congratulations to our past-ASP Executive Secretary **Shokoofeh Shamsi** from CSU who was recently promoted to Professor.



Mark, Anna, Igna,
Bonnie and Jan on the
10K VET RUN

State News continued

Victoria

RMIT

Congratulations to our past-ASP Treasurer **Nathan Bott, from RMIT who was recently promoted to Associate Professor.**

Burnet Institute

From the Gilson-Crabb lab: Mikha Gabriela and Madeline Dans have recently successfully completed their PhD. Congratulations also to **Thorey Jonsdottir** who successfully completed her PhD, thesis title: Elucidating the essential role of PTEX during the asexual blood stage of *Plasmodium falciparum*. Supervisors: **Brendan Crabb, Paul Gilson and Hayley Bullen**, Burnet Institute. The next steps for Thorey will be "starting a postdoc position in Sweden in malaria research, continuing my journey unraveling the unknowns of host cell modification in the rodent malaria parasite *Plasmodium berghei*." We will miss Thorey and her amazing contributions to the ASP and wish her all the best! Make sure to check out the IJP 50th Anniversary edition, illustrated by Thorey!

The Malaria Program Seminar & Malaria in Melbourne 2021 (MiM2021) organised a face-to-face drinks & dinner following the last malaria seminar of the year.

University of Melbourne

Congratulations to **ASP Education committee convenor, Abdul Jabbar from The University of Melbourne who was recently promoted to Professor.**

Stanley Xie from the Tilley lab was first another on a very nice paper in PNAS using cryoEM to help develop a new antimalarial proteasome inhibitor - <https://doi.org/10.1073/pnas.2107213118>

That work (and others) was recognised by the award to Stanley of an FAOBMB Young Scientist Award.

<https://faobmb.com/2021/07/15/winner-of-2021-faobmb-young-scientist-award-male/>

Lucas Huggins has just submitted his final PhD thesis on the epidemiology and chemoprevention of canine vector-borne pathogens in the Asia-Pacific region using novel molecular diagnostics, an exciting project that has involved substantial amounts of fieldwork in Cambodia that continue to this day. His thesis submission follows on from the recent publication of his fifth paper completed over his PhD entitled 'A multipronged next-generation sequencing metabarcoding approach unearths hyperdiverse and abundant dog pathogen communities in Cambodia' in the journal *Transboundary and Emerging Diseases*. We are glad that Lucas will be able to continue in the Melbourne Veterinary School with a postdoctoral position working on **Prof Rebecca Traub's** ARC Future Fellowship project, developing a novel and portable, clinical metabarcoding diagnostic capable of characterising a diverse range of canine and feline vector-borne pathogens.

Federation University

Congratulations to Victoria Chew who was awarded an Honours scholarship from the Australian Wool Education Trust to the value of \$7000 to work on her project investigating the use of sensors to monitor worm infections in sheep.

Congratulations to Tanjina Bari who passed her PhD examination titled the Applicability of LAMP as a field diagnostic test for *Haemonchus contortus* and *Fasciola hepatica* infection. Her proud supervisors were **Professor David Piedrafita and A/Prof Andrew Greenhill.**

WEHI

An Update from WEHI Parasitologists

The parasitologists at WEHI this year have been working extremely hard and a number of laboratories would like to give an update to ASP on current projects in their laboratories as well as recent publications!

The Mueller laboratory

The Mueller Laboratory is investigating how malaria parasites and human hosts interact and developing novel tools and interventions to aid malaria elimination in the Asia-Pacific. A special focus of our research is the control and elimination of *P. vivax*.

Particular aims of our research are to understand:

- Which people in malaria-affected communities are getting infected with *Plasmodium* parasites?
- Who among these people are at high risk of getting sick with malaria and what factors contribute to getting sick with malaria?
- Who contributes most to the onwards transmission of the parasites to the mosquitoes?
- How does *P. vivax* relapse contribute to the burden of *vivax* infection, morbidity and transmission?
- Is it possible to identify people at highest risk of *vivax* relapses and if yes, can we prevent these relapses by administering preventative radical cure?

We are using this knowledge to monitor the impact of malaria control, and to develop new interventions to treat malaria, prevent new infections and identify and target areas of high malaria transmission risk. In particular, we are developing serological markers of recent exposure to *P. vivax* infections in order to aid elimination of this disease. We are doing so via the measurement of antibody responses in

State News continued

samples from cohort studies conducted in various malaria endemic regions around the world, along with the development of specialised diagnostic algorithms.

The Hansen Laboratory

My laboratory is running a systems immunology approach to identify features predicting susceptibility and immunity to malaria. Our approach includes assessment of antibody and cytokine responses, functional assays, deep immunophenotyping by CyTOF and RNA-sequencing.

Recent Publications:

Ioannidis, et al., High dimensional mass cytometry identifies T cell and B cell signatures associated with reduced risk of *Plasmodium vivax* malaria, JCI insight, (2021), 6: e148086.

This is the first study in the literature that applies single cell mass cytometry and machine learning approaches to identify correlates of immunity to *Plasmodium vivax*. The study uncovered a critical role for CD4+ T cells in the control of asymptomatic infection of low parasitemia.

Studniberg, et al. Integrated systems approach identifies profiles of clinical immunity and an immunosuppressive transcriptional signature in asymptomatic *Plasmodium falciparum* malaria, (under review)

Using an integrated systems immunology approach, this study revealed that asymptomatic *Plasmodium falciparum* malaria induces a strong immunosuppressive transcriptional signature in peripheral blood, providing paradigm-shift evidence that these infections of low parasitemia are not benign and providing a framework to consider screening and treatment of asymptomatic malaria.

The Tonkin laboratory

The Tonkin laboratory, which has focused on *Toxoplasma gondii* for a number of years, has also established *Cryptosporidium* genetic manipulation and is now pursuing new areas of research to find vaccines and drugs against this parasite.

Recent Publications:

Simona Seizova, after a 2 year battle, got her paper accepted into Cell Host and Microbe. This herculean effort demonstrates that latent *Toxoplasma* manipulates its host cell transcriptional program and exported proteins protect against programmed cell death

Simona is now doing her postdoc at the Wellcome Centre for Anti-Infectives Research in Dundee, Scotland where she is studying *Cryptosporidium*.

The Bahlo Laboratory

The Bahlo laboratory has been working on the following projects:

Computational short tandem repeat genotyping in *Plasmodium* whole genome sequencing from field samples (led by PhD student Jiru Han, with research assistant **Jacob Munro, in collaboration with Alyssa Barry**)

Recent Publications:

Development of a long-read amplicon analysis pipeline with a focus on CYP2D6 (led by **Jacob Munro, work with Ivo Mueller and Shazia Ruybal**) (under review)

Development of short-read amplicon analysis pipeline with a focus on *P. vivax* (co-led by **Jacob Munro, Jiru Han, in collaboration with Ivo Mueller & Shazia Ruybal**) (under review)

The Pellegrini Laboratory

The Pellegrini Laboratory has only one parasitologist, **Michelle Clark**, who has just submitted her PhD thesis! Her work focused on new therapeutics for the treatment of Leishmaniasis, especially those that manipulate host cell death pathways. She is hoping to start an overseas post doc in the new year, so fingers crossed international borders stay open!

ACT

Australian National University

Congratulations to **Prof. Alex Maier** (RSB-ANU) has been awarded the 2021 Vice-Chancellor's Award for Teaching Excellence and the 2021 Vice-Chancellor's Award for Educational Excellence. The awards recognise the University's most outstanding educators in their fields, who have made a broad and deep contribution to enhancing the quality of learning and teaching in higher education at the Australian National University.

Congratulations to ACT State Representative **Cibelly Goulart** who has a new position at the Office of the Gene Technology Regulator OGTR. Cibelly will continue as the ACT representative until the 2022 ASP AGM.

State News continued

SA

Flinders University

This year saw **Bonnie Derne** get her PhD in my lab as well and **Gerrut Norval** submitted and will hear back before Xmas. Also **Ruby McKenna** started her PhD looking at the Rickettsia hypothesis as a potential explanation for the tick boundary.

Congratulations to SA State Representative Mike Gardner who has been promoted to full Professor. Mike and his team have a lovely christmas decoration on their door which has a parasitology theme (of course)! Merry "tick" Christmas!

University of Adelaide

Isabelle Henshall recently completed her PhD at the University of Adelaide under supervision of Dr Danny Wilson. Her thesis is titled "Characterisation of the Function and Vaccine Potential of Surface Exposed Antigens Required for Malaria Parasite Invasion of Human Host Cells". She recently moved to Hamburg, Germany for a postdoctoral position at the Bernhard Nocht Institute for Tropical Medicine.



All I want for Christmas is my Two Front Ticks
Door decoration by Mike Gardner and his team at Flinders.

State News continued

QLD

Griffith Institute for Drug Discovery

Prof Katherine Andrews, Director of the Griffith Institute for Drug Discovery (GRIDD), has been awarded the 2021 Vice Chancellors Excellence Award for Research Leadership. **PhD candidates Yunan Qian and Jacinta Macdonald**, supervised by **Prof Katherine Andrews, A/Prof Tina Skinner-Adams**, and **Dr Gillian Fisher**, have been awarded \$1,000 professional development awards from the GRIDD Directors Circle. A big congratulations also goes to **Keely Fayd'Herbe** (supervised by **A/Prof Tina Skinner-Adams**) and **Ellis Joch** (supervised by **Gillian Fisher** and **A/Prof Tina Skinner-Adams**) for achieving First Class Honours Awards and securing PhD Scholarships, commencing 2022.



University of Queensland

Awards for Animal BioTicknology Group

PhD students of Animal BioTicknology Group at QAAFI, UQ won different prizes at QAAFI's End of Year Annual Awards, **Muhammad Noman Naseem** won outstanding student contributor; **Chian Teng Ong** was Highly commended outstanding student contributor, and **Muhammad Kamran** won the social butterfly award for his contribution to social sports.

Muhammad Noman Naseem also won the best oral presentation award at QAAFI Student Association Symposium.

From top: **Prof Katherine Andrews** receiving Vice Chancellors Excellence Award for Research Leadership

Andrews and Skinner-Adams Christmas Lab Photo

Animal BioTicknology group at QAAFI End of Year Celebrations

State News continued

Publications from Animal BioTechnology group:

1. Tabor AE, De Miranda Santos IKF, Boulanger N (2021) Editorial: Ticks and Host Immunity–New Strategies for Controlling Ticks and Tick-Borne Pathogens. *Frontiers in Immunology*, 4797
2. Rodriguez-Valle M, McAlister S, Moolhuijzen PM, Booth M, Agnew K, Ellenberger C, Knowles AG, Vanhoff K, Bellgard MI and Tabor AE. Immunomic Investigation of Holocyclotoxins to Produce the First Protective Anti-Venom Vaccine Against the Australian Paralysis Tick, *Ixodes holocyclus*. *Frontiers in Immunology* 12 (2021): 4091.
3. Tabor AE. A Review of Australian Tick Vaccine Research. *Vaccines*. 2021; 9(9):1030. <https://doi.org/10.3390/vaccines9091030>
4. Naseem MN, Raza A, Allavena R, McGowan M, Morgan JAT, Constantinoiu C, Tabor AE, James P. Development and Validation of Novel PCR Assays for the Diagnosis of Bovine Stephanofilariasis and Detection of *Stephanofilaria* sp. Nematodes in Vector Flies. *Pathogens*. 2021; 10(9):1211. <https://doi.org/10.3390/pathogens10091211>
5. Raza A, Schulz BL, Nouwens A, Jackson LA, Piper EK, James P, Jonsson NN, Tabor AE. (2021) Serum proteomes of Santa Gertrudis cattle before and after infestation with *Rhipicephalus australis* ticks. *Parasite Immunol*. 2021; 43:e12836. <https://doi.org/10.1111/pim.12836>
6. Jonsson NN, Cox DK, Piper EK, Valdivieso EFM, Constantinoiu C, Jackson LA, Stear MJ, Ross EM, Tabor AE. Allelic Variation in Protein Tyrosine Phosphatase Receptor Type-C in Cattle Influences Erythrocyte, Leukocyte and Humoral Responses to Infestation With the Cattle Tick *Rhipicephalus australis*. *Frontiers in Immunology* 12 (2021): 2544 <https://www.frontiersin.org/article/10.3389/fimmu.2021.675979>

NT

Menzies School of Health Research

At the Menzies School of Health Research, malaria research continues to produce significant and surprising results. **Steven Kho** has been building on the work from his PhD with two important publications this year- one in the *New England Journal of Medicine* and the other in *PLoS Medicine*. His work with **Nick Anstey** at Menzies, collaborators including Professor Pierre Buffet at the University of Paris, and partners in Indonesia, showed that the spleen can be a significant reservoir of both *Plasmodium falciparum* and *P. vivax* parasites, with hundreds to thousands of times higher concentrations of parasites in the spleen compared with the circulating blood. They also found that spleens, which were obtained from patients undergoing splenectomy usually as a result of trauma, harboured large numbers of reticulocytes, making it favourable for *P. vivax* replication. These new findings raise a large number of new questions including about the mechanisms involved and the potential contribution to anaemia in malaria patients, which are sure to keep Steven and the team busy in the next few years. The results also have implications for the success of malaria elimination programs which largely rely on testing of peripheral blood and only treating those with detectable parasitemia. Congratulations to Steven, Nick, and the rest of the team on this important work.

Kho S, Qotrunnada L, Leonardo L, Andries B, Wardani PAI, Fricot A, Henry B, Hardy D, Margyaningsih NI, Apriyanti D, Puspitasari AM, Prayoga P, Trianty L, Kenangalem E, Chretien F, Safeukui I, Del Portillo HA, Fernandez-Becerra C, Meibalan E, Marti M, Price RN, Woodberry T, Ndour PA, Russell BM, Yeo TW, Minigo G, Noviyanti R, Poespoprodjo JR, Siregar NC, Buffet PA, Anstey NM.

Hidden biomass of intact malaria parasites in the human spleen.

New England Journal of Medicine, 384(21): 2067-2069. doi: 10.1056/NEJMc2023884.

Kho S, Qotrunnada L, Leonardo L, Andries B, Wardani PAI, Fricot A, Henry B, Hardy D, Margyaningsih NI, Apriyanti D, Puspitasari AM, Prayoga P, Trianty L, Kenangalem E, Chretien F, Brousse V, Safeukui I, Del Portillo HA, Fernandez-Becerra C, Meibalan E, Marti M, Price RN, Woodberry T, Ndour PA, Russell BM, Yeo TW, Minigo G, Noviyanti R, Poespoprodjo JR, Siregar NC, Buffet PA, Anstey NM.

Evaluation of splenic accumulation and colocalization of immature reticulocytes and *Plasmodium vivax* in asymptomatic malaria: A prospective human splenectomy study

PLoS Medicine, 18(5): e1003632. doi: 10.1371/journal.pmed.1003632.

Tasmania

University of Tasmania

Congratulations to **Jemma Hudson** who submitted her Masters thesis on the use of coldwater treatment against Amoebic Gill Disease, we farewelled Jemma and wished her good luck at the ASP end of the year dinner/outreach activity in Hobart in early December.

Congratulations to **Sam Seah** for her first class Honours she is currently working at Bonorong Wildlife Sanctuary and planning to study veterinary science.

Victoria Valdenegro returned to Tasmania earlier this year after postdoc in Denmark and job with in Norway, which is now continuing in Tasmania. Welcome to **Eleanor Steller** who completed Honours with **Shokoofeh Shamsi**, then worked for Bayer and is now working for the aquaculture industry in Tasmania.

Victoria Valdenegro, Mai Dang and Barbara Nowak gave virtual presentations at International Gill Health Conference in October. **Barbara Nowak** gave virtual presentation on Management of Parasitic Diseases in Australia as Visiting Professor's Lecture at Aquaculture Department, Diponegoro University, Indonesia on 21 October and an invited virtual keynote on Fish, parasites and feeding the world at Agriculture and Food Security Conference in Abu Dhabi on 24 November.

State News continued



ASP end of the year dinner in Hobart in early December. Pictured from left: Eleanor Steller, Elise Ringwaldt, Barbara Nowak, Jade Laurenson, Petra Quezada, Sam Seah, Jemma Hudson, Em Khattapan Jantawongsri, Silvana Bettiol, Nicholas Fountain-Jones, Scott Carver



Christmas catch-up in Perth for Murdoch University parasitologists!

WA

Murdoch University

News from WA

John Karlsson has officially retired from the Department of Primary Industries and Regional Development (DPIRD) and is still collaborating in research publications such as JC Greeff, AC Schlink, LJE Karlsson, PE Vercoe and AR Gilmour, Humidity and temperature differ in the breech of Merino sheep that are resistant or susceptible to breech strike. He has also shifted his farm from Bridgetown Shire to York Shire where he breeds Merino sheep for worm and fly resistance.

Narelle Dybing, ASP WA rep, has started a new job working as a program support officer for the National Feral Pig Action Plan. She is also an honorary research associate at Murdoch University and the Harry Butler Institute working on multiple projects looking at wild dog and red fox parasites.

As Christmas time is approaching Christmas Parties and catchup's are a go. Murdoch University's parasitology caught up for morning tea at Sir Walters café on campus and at Dr **Charlotte Oskams** for lunch.

WA hope everyone has a great Christmas, New Year and holiday!

Council of the Australian Society for Parasitology Inc.

Executive

**President**

Rebecca Traub
University of Melbourne
president@parasite.org.au

**Vice-President**

Barbara Nowak
University of Tasmania
president@parasite.org.au

**Treasurer**

Vito Colella
University of Melbourne
treasurer@parasite.org.au

**Executive Secretary**

Clare Anstead
University of Melbourne
secretary@parasite.org.au

ASP Council continued

State Councillors



ACT
Cibelly Goulart
Australian National University



NSW
Michelle Power
Macquarie University



NT
Deborah Holt
Menzies School of Health
Research



QLD
Ali Raza
University of Queensland



SA
Mike Gardner
Flinders University



TAS
Nick Fountain-Jones
University of Tasmania



VIC
Sarah Preston
Federation University



WA
Narelle Dybing
Murdoch University

Fellows & Student Representatives



**Fellows
Representative**
Ian Beveridge
University of Melbourne

**Student
Representative**
Jill Chmielewski
University of Adelaide



ASP Council continued

Other Members of Council



IJP Editor

Brian Cooke
James Cook University,
editor@IJP.org.au



Bancroft-Mackerras Medal Convenor

Leanne Tilley
University of Melbourne
ltalley@unimelb.edu.au



IJP:DDR Editor

Andrew Kotze
CSIRO Animal, Food and
Health Sciences
andrew.kotze@csiro.au



IJP:PAW Editor

Andrew Thompson
Murdoch University
(08) 9360 2466
a.thompson@murdoch.edu.au



ASP Network Convenor

Nick Smith
University of
Technology Sydney
nick.smith@parasite.org.au



CiP Course Coordinator

Stuart Ralph
University of Melbourne



IJP:DDR Editor

Kevin Saliba
Australian National University
kevin.saliba@anu.edu.au



ASP Secretary and ASP Executive Officer

Lisa Jones
ASP Network for Parasitology,
James Cook University
(07) 4232 1311
lisa.jones1@jcu.edu.au



Archivist

Haylee Weaver
Australian Biological
Resources Study
(02) 2 6250 9434
Haylee.Weaver@environment.gov.au



ASP Education Committee Convenor

Abdul Jabbar
University of Melbourne
(03) 9731 2022
jabbara@unimelb.edu.au