Nicholas J Clark

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Homepage - GitHub - Google Scholar - ResearchGate

Career Summary

Flexible and engaging ecologist within interests in studying how pathogen communities reassemble, persist and function. Interested in working with scientists from different disciplines to develop broader skills and address challenging new questions in disease ecology.

Transferable Skills

- Strong communication skills: 16 publications in peer-reviewed journals; four presentations at international conferences
- Broad field experience: supervised teams of field researchers in both terrestrial and marine habitats
- Extensive experience using script-based programming: proficient with frequentist and probabilistic statistical analyses; regularly develop R functions to address targeted hypotheses
- Aptitude for leadership: trained four postgraduate students in bioinformatics and statistical techniques
- Proven ability to obtain funding: $52000 external funding from domestic and international organisations

Qualifications

PhD
Griffith University (Supervisors: Dr Sonya Clegg, Dr Robert Adlard, Prof. Hamish McCallum)
Thesis: *The distribution and diversity of avian malaria parasites in Australian and Southern Melanesian birds*

- Led field expeditions in diverse habitats on four islands in New Caledonia and across two Australian states
- Acquired extensive experience coding biogeographical analyses on large datasets using frequentist and Bayesian techniques
- Published ten peer-reviewed papers over four years, including six published chapters by submission of the thesis

GDipResMeth
James Cook University (Supervisors: Prof Garry Russ, Dr Lynne van Herwerden) Thesis: *Connectivity of butterflyfishes: pairing molecular methods and field observations*

- Lead volunteer divers on two field trips to conduct marine abundance and habitat complexity surveys
- Developed laboratory skills to conduct high-throughput genetic analyses
- Obtained a high distinction in a Sampling and Experimental Design course and developed key programming skills to perform ecological statistical analyses

BSc (honours)
University of North Carolina at Wilmington; North Carolina, USA

- Dean's list for academic achievement in all semesters (perfect GPA of 4.0/4.0)

Professional Experience

Postdoctoral Fellow (7/2016 - 12/18)
University of Queensland, School of Veterinary Science

- Co-supervising two PhD students in disease ecology and quantitative genetics
- Conducting research into the spatio-temporal evolution of canine parvoviruses
- Leading a National Geographic-funded project on the spread of parasites at the human-wildlife interface

Research Assistant (1/2016 - 7/16)
University of Queensland, School of Veterinary Science (Adviser: Dr Steven Kopp)

- Conducted molecular research into population genetics of canine hookworm
- Established protocols to develop next generation sequencing tools for cat fleas

Technical Laboratory Officer (fill-in for maternity leave; 9/2015 - 11/15)
Biosecurity Laboratory, Queensland Dept. Agriculture and Fisheries (Adviser: Dr Les Barker)

- Improved workflow efficiency by preparing reagents for three diagnostic laboratories
- Cultured in-house microbe strains and carried out quality control testing

Career Overview

I am a disease ecologist with expertise in molecular ecology and epidemiology. My PhD research into the distributions and community assembly patterns of parasites led to new discoveries about parasite evolution and helped steer a global surge in evolutionary avian malaria research. Following my PhD, I worked on short-term contracts as a Postdoctoral Fellow at University of Queensland, where I have expanded my expertise in parasite biogeography, taken on co-supervisory roles and gained vital experience coordinating an undergraduate course. Through this work, I developed strong links with collaborators at Deakin University's Centre for Integrative Ecology, University of Sydney's School of Veterinary Science, Queensland Museum's Biodiversity Program, Biosecurity Queensland and Griffith University's School of Environment.

My aptitude for research and disease ecology is reflected by my academic record. I have published 16 peer-reviewed papers, with four in review, including a top-cited review article that has driven development of novel pathogen biogeography hypotheses. Key contributions include producing insights into how dispersing hosts drive pathogen distributions (published in Journal of Biogeography, Oikos, Oecologia) and developing models to understand how host traits and climate affect pathogen compositions (published in Molecular Ecology, Journal of Animal Ecology, International Journal for Parasitology). My work has received international acclaim, with invitations to deliver lectures at two universities and oral presentations at two international conferences. I have trained four postgraduate students in bioinformatics and statistical techniques, and have acted as author or co-author for five successful funding proposals resulting in over $52000.

Publications – Summary Data

- Total peer-reviewed journal articles: 16 (4 currently in revision or review)
- First author journal articles: 11
- Total citations: 174 (Google Scholar)
- H-index: 7 (Google Scholar)
- i10-index: 5 (Google Scholar)

Summaries of Key Publications

Clark, NJ and Clegg, SM (2017) Integrating phylogenetic and ecological distances reveals new insights into parasite host specificity. Molecular Ecology 26(11), 3074-3086

Developed a novel phylogenetic host-specificity metric that integrates multiple sources of information, providing a more in-depth understanding of parasite infection patterns.

Clark, NJ et al. Co-infections and environmental conditions drive the distributions of blood parasites in wild birds. (2016) Journal of Animal Ecology.

Used Bayesian multivariate regressions to show that parasite interactions and biogeographical structure combine to influence malaria infection rates in wild birds. This finding was well-received, securing an invited oral presentation at the 2015 Evolutionary Ecology of Infectious Diseases Conference (Georgia, USA).

Clark, NJ et al. A review of global diversity in avian haemosporidians (*Plasmodium* and *Haemoproteus*: Haemosporida): new insights from molecular data. (2014) International Journal for Parasitology.

Conducted a systematic meta-analysis to quantify global parasite diversity patterns and generate future sampling directions. Called "a classic in the field" by a thesis examiner, this is the 2nd most cited of 135 articles published using the keyword "avian malaria" since 2014 (77 citations).

Full Publication List

2018

Clark, NJ, Seddon, JM, Kyaw-Tanner, M, Al-Alawneh, J, Harper, G, McDonagh, P, and Meers, J. Emergence of canine parvovirus subtype 2b (CPV-2b) infections in Australian dogs. Infection, Genetics and Evolution DOI: 10.1016/j.meegid.2017.12.013

Clark, NJ, Seddon, JM, Šlapeta, J, and Wells, K. Parasite spread at the domestic animal - wildlife interface: anthropogenic habitat use, phylogeny and body mass drive risk of cat and dog flea (Ctenocephalides spp.) infestation in wild mammals. Parasites & Vectors DOI: 10.1186/s13071-017-2564-z

2017

Clark, NJ, Clegg, SM, Sam, K, Goulding, W, Koane, B and Wells, K. Climate, host phylogeny and the connectivity of host communities govern regional parasite assembly. Diversity and Distributions DOI: 10.1111/ddi.12661 (IF: 4.391)

Clark, NJ and Clegg, SM (2017) Integrating phylogenetic and ecological distances reveals new insights into parasite host specificity. Molecular Ecology 26(11), 3074-3086 (IF: 5.947; Cited by 3)

McKee, J, **Clark, NJ**, Shapter, F and Simmons, G. (2017) A new look at the origins of Gibbon Ape Leukemia Virus. Virus Genes 53(2), 165-172 (IF: 1.285)

2016

Clark, NJ, Wells, K, Dimitrov, D and Clegg, SM. (2016) Co-infections and environmental conditions drive the distributions of blood parasites in wild birds. Journal of Animal Ecology 85(6), 1461-1470 (IF: 4.827; Cited by 2)

Aharon-Rotman, Y, Buchanan, KL, **Clark, NJ**, Klaassen, M and Buttemer, WA. (2016) Why fly the extra mile? Using stress biomarkers to assess wintering habitat quality in migratory shorebirds. Oecologia 182(2), 385-395 (IF: 2.902; Cited by 2)

Goulding, W, Adlard, RD, Clegg, SM and **Clark, NJ**. (2016) Molecular and morphological description of *Haemoproteus* (*Parahaemoproteus*) *bukaka* (species nova), a haemosporidian associated with the strictly Australo-Papuan host Subfamily Cracticinae. Parasitology Research 115, 3387-3400 (IF: 2.027; Parasitology: 15 of 36; Cited by 2)

Clark, NJ, Clegg, SM and Klaassen, M. (2016) Migration strategy and pathogen risk: non-breeding distribution drives malaria prevalence in migratory waders. Oikos 125(9), 1358-1368 (IF: 3.586; Cited by 13)

2015
Clark, NJ, Ishtiaq, F, Olsson-Pons, S and Clegg, SM. (2015) Specialist enemies, generalist weapons and the potential spread of exotic pathogens: malaria parasites in a highly invasive bird. International Journal for Parasitology 45(14), 891-899 (Editor's choice: IF: 4.242; Cited by 8)

Olsson-Pons, S, **Clark, NJ**, Ishtiaq, F and Clegg, SM. (2015) Differences in host species relationships and biogeographical influences produce contrasting patterns of prevalence, community composition and genetic structure in two genera of avian malaria parasites in southern Melanesia. Journal of Animal Ecology 84(4), 985-998 (IF: 4.827; Cited by 20)

Clark, NJ, Adlard, RD and Clegg, SM. (2015) Molecular and morphological characterization of Haemoproteus (Parahaemoproteus) ptilotis, a parasite infecting Australian honeyeaters (Meliphagidae), with remarks on prevalence and potential cryptic speciation. Parasitology Research 114(5), 1921-1928 (IF: 2.027; Cited by 11)

Clark, NJ and Clegg, SM. (2015) The influence of vagrant hosts and weather patterns on the colonisation and persistence of blood parasites in an island bird. Journal of Biogeography 42(4), 641-651 (IF: 3.997; Cited by 14)

2014
Clark, NJ, Adlard, RD and Clegg, SM. (2014) First evidence of avian malaria in Capricorn Silvereyes (Zosterops lateralis chlorocephalus) on Heron Island. The Sunbird 44, 1-11 (no IF; Cited by 4)

Clark, NJ, Clegg, SM and Lima, MR. (2014) A review of global diversity in avian haemosporidians (Plasmodium and Haemoproteus: Haemosporida): new insights from molecular data. International Journal for Parasitology 44(5), 329-338 (IF: 4.242; Cited by 76)

2012
Clark, NJ and Russ, GR. (2012) Ontogenetic shifts in the habitat associations of butterflyfishes (F. Chaetodontidae). Environmental Biology of Fishes 94, 579-590 (IF: 1.404; Cited by 6)

Publications in Review

Lawrence, AL, Webb, CE, **Clark, NJ**, Halajian, A, Mihalca, A, Miret, J, D'Amico, G, Brown, G, Kumsa, B, Modry, D, and Šlapeta, J. Out-of-Africa origins and global climatic distribution of the common cat flea, Ctenocephalides felis: the hitchhiker's guide to world domination. Molecular Phylogenetics and Evolution (1st submission 26/11/17)

Clark, NJ, Wells, K, and Lindberg, O. Unravelling changing interspecific interactions across environmental gradients using Markov random fields. Ecology (1st submission 23/10/17)

Wells, K, Gibson, D, **Clark, NJ**, Ribas, A, Morand, S, and McCallum, H. Global spread of helminth parasites at the human-domestic animal-wildlife interface. Global Change Biology (1st revision submitted 08/07/17)

Clark, NJ. Tropical niche conservatism does not explain global diversity of avian blood parasites. Global Ecology and Biogeography (1st submission 02/11/17)

Service and Discipline Involvement

Service

- Served as panel member to mark a UQ Honour's thesis
- Contributed to teaching and assignment design for three undergraduate courses at the School of Veterinary Science
- Currently co-supervising two PhD students
- Acted as student volunteer for the 2017 Australian Society for Parasitology International Conference

Referee

- Ecology Letters
- Molecular Biology and Evolution
- Evolutionary Ecology
- Journal of Biogeography
- International Journal for Parasitology
- Journal of Parasitology
- Journal of Animal Ecology
- Infection, Genetics and Evolution
- Parasitology
- Malaria Journal
- Parasites & Vectors

Memberships

- BirdLife Australia
- Australian Society for Parasitology
- Wildlife Disease Association

Funding Support

2017
$US18,400: National Geographic Scientific Research Grant (co-authored the proposal). Tracing the spillover of fleas and paralysis ticks between wildlife and domestic pets in Australia

2015
$AU4,975: Birds Queensland Research Award (co-authored the proposal). The role of invasive birds as carriers of exotic pathogens; implications for co-occurring native birds

$AU3,125: BirdLife Australia Stuart Leslie Bird Research Award (authored the proposal). Enemy release or novel weapons: malaria's role in the spread of the invasive Indian Myna

2014
$AU2,000: Griffith University Environmental fund for impactful publications

2013
$US20,250: National Geographic Scientific Research Grant (co-authored the proposal). Avian malaria in southern Melanesian birds

2012
$AU3,750: BirdLife Australia Stuart Leslie Bird Research Award (authored the proposal). Avian malaria lineage distribution, diversity and host specificity in southeast Queensland

$AU5,000: Birds Queensland Research Award (authored the proposal). The prevalence, distribution and diversity of avian malaria parasites in southeast Queensland

$AU78,000: Griffith University International Postgraduate Research Award

Teaching Contributions

2017
University of Queensland, Gatton Campus: Ecological and Disease Genetics (Course Coordinator) Undergraduate (3rd year Science), semester 1

- Planned learning objectives; wrote the electronic course profile (ECP) and all assignments
- Delivered flexible, interactive lectures and tutorials that were well-received by students
- Achieved overwhelmingly positive feedback on student evaluations, including scores of 'Outstanding' for teacher ratings

- SECaTs available at: VETS3042/Ecological and Disease Genetics/6720/23028

University of Queensland, Gatton Campus: Animal Breeding and Genetics (Course Coordinator)
Undergraduate (Bachelor of Veterinary Medicine), semester 2

- Planned learning objectives; contributed to preparation of assignments and end of semester exam
- Independently lead theory-based genetics tutorials
- Nominated for a 'Golden Speculum' Best Lecturer award for 2017

2016 - 17
University of Queensland, Gatton Campus: Molecular and Quantitative Plant Genetics; Molecular and Quantitative Animal Genetics (Lead tutor)
Undergraduate (2nd year Science and 2nd year Agriculture), semester 2

- Independently lead laboratory and theory tutorials
- Marked assignments and liaised with course coordinators to enhance curriculums

2015 - 17
University of Queensland, Gatton Campus: Animal Breeding and Molecular Genetics; Animal Pathogens and Immunity; Principles of Disease (Assistant tutor)
Undergraduate (2nd year Veterinary Science), semesters 1 and 2

- Collaborated with fellow tutors to lead laboratory and theory tutorials
- Marked assignments

2013
Griffith University, Gold Coast Campus: Ecology; Earth Sciences (Assistant tutor)
Undergraduate (2nd year Science), semester 2

- Independently lead laboratory and theory tutorials

Mentoring And Research Training

2017 - present
Co-supervising UQ PhD student (A. McGowan), studying population genomics of dugongs. This student is developing novel landscape genetics analyses and recently qualified for Faculty-level heats in the UQ Three Minute Thesis competition

2016 - present
Co-supervising UQ PhD student (T. Proboste), studying population genomics and host-parasite interactions in paralysis ticks. This student is adapting social science methods to study host-pathogen interactions, and has already presented at two conferences

2014 - 16
Trained UQ PhD student (W. Goulding) in molecular techniques and aided project design, resulting in two collaborative papers (both in Parasitology Research) and one successful co-authored grant proposal (Birds Queensland; $AU4975)

2014
Trained Deakin University PhD student (Y. Aharon-Rotman) in Bayesian phylogenetic modelling, resulting in one collaborative paper (Oecologia)

2012 - 13
Trained Griffith University honour's student (S. Olsson-Pons) in bioinformatics, resulting in two collaborative papers (Journal of Animal Ecology; International Journal for Parasitology)

Presentations and Societal Impacts

2017
Oral presentation: Australian Society for Parasitology Conference, Leura, Australia

2016
Research used to frame a Question Without Notice in NSW Parliament, from Shooters and Fishers Party MP to the Minister for Primary Industries

Oral presentation: Griffith University Wildlife Disease Ecology Group, Brisbane, Australia

2015
Interviewed on ABC Radio National and ABC Radio Gold Coast regarding research on exotic malaria strains spread by invasive birds

Interviewed for feature stories in the Australian Society for Parasitology quarterly newsletter and in Australian Birdlife regarding research on avian malaria in Australian birds

Oral presentation: University of Queensland ARC Cavity Nesting Group, Brisbane, Australia

Oral presentation: Evolutionary Ecology of Infectious Diseases Conference, Athens, USA

Oral presentation: Griffith University Wildlife Disease Ecology Group, Brisbane, Australia

Poster presentation: Wildlife Disease Association Conference, Sunshine Coast, Australia

2014
Oral presentation: Queensland Ornithological Society, Brisbane, Australia

Oral presentation: Australian Society for Parasitology Concepts in Parasitology Workshop, Canberra, Australia.

Taught diagnostic techniques to students in a Parasitology High School Outreach Program at Ulladulla High School, Ulladulla, NSW, Australia

2013
Oral presentation: Centre for Integrative Ecology, Deakin University, Geelong, Australia

Poster presentation: Malaria and Related Haemosporidians of Wildlife International Conference, Vilnius, Lithuania

Honours and Awards

2017
Invited to act as co-chair for a Wildlife Parasitology session at the Australian Society for Parasitology Conference, Leura, Australia

2016
Research article featured on the cover and on the Editor's Choice list at International Journal for Parasitology

2014
1st place oral presentation; Griffith University School of Environment Student Symposium

2014
Accepted for competitive placement with travel funds; Australian Society for Parasitology Concepts in Parasitology Workshop, Canberra, Australia

2012
2nd place oral presentation; Griffith University School of Environment Student Symposium

2012
Accepted for competitive placement with travel funds; Malaria RCN Student Workshop, Virginia, USA

Relative to Opportunity

I completed my undergraduate degree (Bachelor of Science with a perfect GPA of 4.0) in 2009 and completed a Graduate Diploma by Research Methods in 2011 with a High Distinction average. From this work I published my first peer-reviewed journal article in 2012 (Environmental Biology of Fishes: IF: 1.255; 58/105 for Marine and Freshwater Biology). I began my PhD in February 2012 and completed the program in April 2016, delivering a thesis with six published chapters and two published appendices. My PhD work provided a comprehensive understanding of the mechanisms driving the distributions and epidemiology of blood parasites in wild birds, providing the first evidence that interspecific parasite interactions influence infection rates and delivering new tools for identifying evolutionary drivers of parasite biogeography patterns.

Despite only completing my PhD in the last 18 months, I have published 15 peer-reviewed journal articles (ten as first author), with another four currently in revision at Global Change Biology, Global Ecology and Biogeography, Ecology and Infection, Genetics and Evolution. The quality and significance of this work is reflected by my exemplary publication record in some of the top journals in the fields of Parasitology and Ecology, including Molecular Ecology (IF: 6.086; 9/153 for Ecology), Parasitology Research (IF: 2.329; 17/36 for Parasitology), Journal of Animal Ecology (IF: 4.474; 25/153 for Ecology), and Journal of Biogeography (IF: 4.248; 26/153 for Ecology). I have published two papers in International Journal for Parasitology (IF: 3.73; 7/36 for Parasitology), including a review that has acquired 76 citations (the second most cited article from this journal since 2014) and an Editor's choice article that featured on the cover and reached the highest altmetric score of any article published in this journal (December 2015). Recently, I was invited to present my work on new statistical tools to study parasite host specificity at the Australian Society for Parasitology's 2017 International Conference, where I was also invited to act as co-chair for a wildlife parasitology session.

Referees

- A/Prof Jennifer Seddon, UQ Gatton Campus; j.seddon1@uq.edu.au
- Dr Robert Adlard, Queensland Museum; robert.adlard@qm.qld.gov.au
- Dr Sonya Clegg, Oxford University; sonya.clegg@zoo.ox.ac.uk
- Prof Marcel Klaassen, Deakin University; marcel.klaassen@deakin.edu.au