LIVING CONSERVATION

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Interviews: Available with Dr. John Ewen (via skype) or Professor Tim Blackburn
High resolution images available here: https://zslondon.sharefile.com/d/s3294fd3408f48458

What it takes to be the perfect invading parasite

Characteristics of successful malaria parasites in New Zealand bird populations have been identified for the first time

Scientists from the Zoological Society of London (ZSL) are the first to document the characteristics of invading parasites, using malaria in New Zealand bird species.

The study, published today (18th July) in *Ecology Letters*, identifies the factors influencing the success of parasites unintentionally introduced to new environments.

Avian malaria is a disease caused by species of parasites, of the genus *Plasmodium*, which infects birds. Just like human malaria, it is spread by mosquitoes, and the parasites spend part of their lives in red blood cells of birds. Avian malaria is common in continental areas, but is often absent from isolated islands where mosquitoes are less prevalent.

More than 800 exotic and native host birds were studied in a range of areas across Northern New Zealand. They detected parasite infection by extracting DNA from blood and analysing it to look at specific segments of genes. They then looked in more detail at the characteristics of the parasites they found to see if they had features that made them more likely to be present in bird hosts in New Zealand.

ZSL's Dr John Ewen, who is from New Zealand himself, says: "We have found a surprisingly high diversity of malaria parasites in New Zealand, including two found nowhere else in the world. However, most parasites we found are recent arrivals, probably from infected birds released by humans. They tend to be widespread and common strains, which can infect a broad range of bird hosts. These findings will help us understand the what, when and how of exotic parasite introductions globally."

The global movement of parasites beyond their native country is an increasing problem, especially in the conservation of species. Many introduced parasites flourish in new environments and some can even be invasive. Little is known about the traits which enable parasites to survive and thrive.

ZSL's Professor Tim Blackburn added: "While we know a lot about the traits of successful vertebrate species invasions, our knowledge of the parasites they may carry is largely a blank page. This is alarming given that these co-introduced parasites can have catastrophic consequences for the natives they encounter, an example illustrated by smallpox introduced to the New World by the early European colonists."

This is the first study looking at the specific features of the exotic parasites within an isolated island bird community. New Zealand has a highly threatened bird community, sensitive to many human caused changes with exotic species being a major threat. ZSL scientists and colleagues are continuing to work on developing appropriate risk assessments for New Zealand's iconic native biodiversity and in understanding why some environments are more likely to be invaded by parasites than others.

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Editors' Notes

Images
High resolution images available here:
https://zslondon.sharefile.com/d/s3294fd3408f48458

Media Information
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ZSL
Founded in 1826, the **Zoological Society of London (ZSL)** is an international scientific, conservation and educational charity: the key role is the conservation of animals and their habitats. The Society runs ZSL London Zoo and ZSL Whipsnade Zoo, carries out scientific research in the Institute of Zoology and is actively involved in field conservation in over 50 countries worldwide. For further information please visit www.zsl.org

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Collaborating organisation

Universidad Complutense de Madrid
This study was co-led by Dr Javier Pérez-Tris of Complutense University in Madrid. For more information see the Complutense Universities Vertebrate Biology and Conservation groups please visit their webpage:
http://www.ucm.es/info/zoo/bcv_eng/index.html

Lund university, Sweden
This study made use of an open access database MalAvi (http://mbio-serv4.mbioekol.lu.se/avianmalaria/) containing thousands of global records of bird malaria parasites compiled by Prof. Staffan Bensch. For further information please visit http://www.lu.se/meel/people/senior-scientists/staffan-bensch

Monash University
Dr Rohan Clarke of Monash University in Melbourne, Australia contributed to this research. For more information see Monash University's Australian Centre for Biodiversity webpage at http://www.biolsci.monash.edu.au/research/acb/