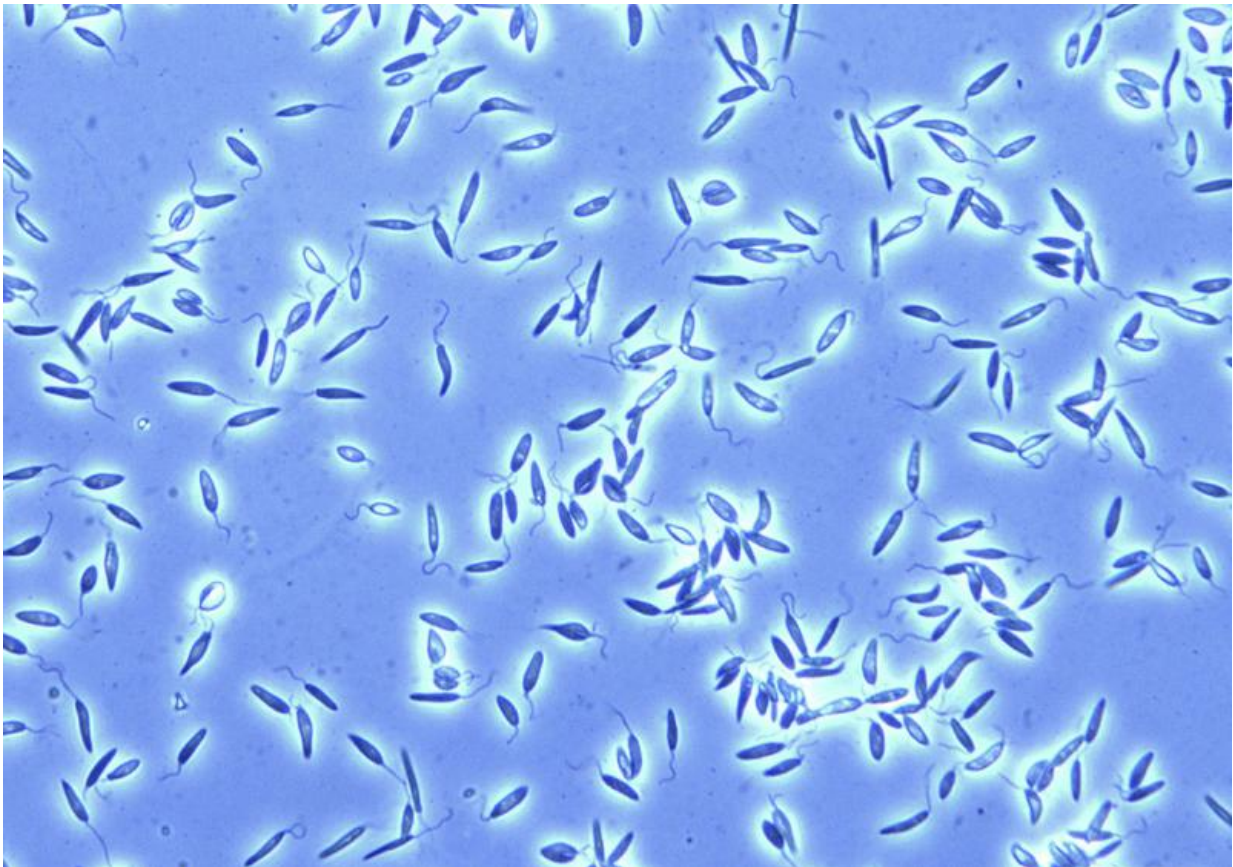


Australian parasite discovery raises concern about neglected tropical diseases

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Zelonia australiensis under the microscope. Credit: University of Technology, Sydney

A chance encounter in northern Australia with a previously undocumented parasite has allowed scientists to join important

evolutionary dots, highlighting the need for closer monitoring of exotic and neglected tropical diseases.

A study led by researchers at the University of Technology Sydney (UTS) describes for the first time a unique Australian parasite in native biting insects that shares an evolutionary ancestor with the *Leishmania* group of "flesh-eating" parasites. *Zelonia australiensis* is found in a species of black fly that bites humans and other mammals.

Research into the evolution of *Leishmania* has already shown this parasite is adaptable, has jumped between distantly related animals and spread over vast distances. The disease leishmaniasis is potentially deadly and affects humans and animals via sandfly bites.

These latest findings, published today in *PLOS Neglected Tropical Diseases*, raise questions about the potential for the establishment of exotic pathogens in Australia. Although human-infecting *Leishmania* species are not native to Australia, imported instances of leishmaniasis are being reported more frequently.

The lead author of the study, Dr Joel Barratt from the School of Life Sciences at UTS, said that while *Zelonia* probably lacks the flesh-destroying capabilities of its exotic cousins, the finding is significant.

"In conjunction with previous research, this study provides clues as to what these parasites are capable of. They have invaded new lands in the past, adapting to infect new species.

"This raises an important question: do human activities provide an increasing opportunity for human-infecting species to take up residence on Australian soil? We know this has happened for other parasites in various places. The spread of malaria from Africa to Europe and the Americas is a prime example."

Dr Barratt said the research highlights the need for local health authorities and researchers to pay more attention to neglected [parasitic diseases](#).

World Health Organisation data ranks leishmaniasis as second in global importance to malaria in terms of parasitic diseases caused by protozoa. Currently, it affects some of the poorest people on the planet, but the WHO lists climate change, urbanisation and population mobility as major risk factors for the spread of the disease.

Dr Barratt said the significance of taking an evolutionary perspective is that it "helps us recognise how adaptable life is, allowing us to mitigate future risks".

"Understanding these evolutionary relationships helps us tease out the events that led these parasites to go from infecting only insects to eventually infecting humans."

Dr Damien Stark, a co-investigator and microbiologist at St Vincent's Hospital, said the hospital's SydPath laboratory had diagnosed an increased number of leishmaniasis cases in the past decade.

"With more international tourism and migration of refugees from endemic regions, leishmaniasis has emerged as an increasingly imported infection within Australia," Dr Stark said.

"So far no cases of local transmission have been reported and it was thought Australia lacked an insect vector that might be capable of transmitting Leishmania. Our research shows that may not be the case."

Dr Stark said Australia was poorly positioned to combat not only leishmaniasis but other diseases such as Dengue, Zika virus, Japanese encephalitis, Chikungunya, SARS, MERS and even Ebola which all have

the potential to cause outbreaks in Australia.

He said the Australian Medical Association's recent call for the government to establish an Australian Centre for Disease control (CDC) echoed a 2013 recommendation from the Standing Committee on Health and Ageing.

"The lack of action is concerning – we must remain vigilant and play a role in the surveillance, research and prevention of these infectious diseases."

The Zelonia research highlights the importance of international and multidisciplinary scientific networks. Parasitologists, entomologists and molecular biologists from Australia and Canada joined forces to decipher the age and origin of Leishmania, a genus with 53 species, 20 of which cause human [leishmaniasis](#).

Dr Barratt and his collaborators are already working on the next phase of their research – sequencing the genome of the new Australian parasite to identify the differences between it and Leishmania with the aim of understanding how it made the leap to vertebrates.

More information: Joel Barratt et al. Isolation of Novel Trypanosomatid, *Zelonia australiensis* sp. nov. (Kinetoplastida: Trypanosomatidae) Provides Support for a Gondwanan Origin of Dioxenous Parasitism in the Leishmaniinae, *PLOS Neglected Tropical Diseases* (2017). [DOI: 10.1371/journal.pntd.0005215](https://doi.org/10.1371/journal.pntd.0005215)

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