

Parasite competition offers new insight into malaria

15 February 2011, by Adele Rackley

Scientists have gained a new understanding into malaria, showing how parasites change behaviour when confronted by other strains of the malaria infection in their host.

The study, led by University of Edinburgh scientists, shows how the malaria parasite focuses on producing cells that replicate quickly to cause infection, rather than cells that can be taken up by a feeding mosquito and spreading the disease.

Since malaria infections usually consist of multiple, competing strains of the parasite, this attack strategy is the best way to beat the competition.

Explaining how parasites behave inside their host helps us understand the severity of a disease and how it will spread – particularly important for Malaria which kills about a million people each year and threatens half the world's population.

'If the mechanisms underlying these behavioural changes in malaria parasites can be identified,' say the researchers, 'it may be possible to manipulate their behaviour in clinically beneficial ways.'



A male transmission stage malaria parasite

Malaria is caused by single-celled parasites which replicate in the red blood cells of their host, and are taken up and spread by mosquitoes. Malaria parasites replicate asexually in the host but must reproduce sexually to move between them.

All organisms must balance resources between the different activities they need to stay alive – for example between finding food and reproducing. In malaria's case this means a trade-off between replicating within one host or spreading to a new one.

The international team of researchers studied the malaria parasite *Plasmodium chabaudi*, which affects rodents. They watched how different genetic strains – genotypes – of the parasite behaved when they were the only one present and what happened when another genotype was introduced.

They found that the parasites changed their survival strategy in the face of competition, so when more than one genotype was present they would invest more energy in replicating within the host, and less in spreading.

'We found that when parasites compete with each other, they respond with a sophisticated strategy to safeguard their long-term survival,' said Laura Pollitt of the University of Edinburgh's School of Biological Sciences, who led the study.

'They opt to fight it out in the bloodstream rather than risk everything on the chance of infecting mosquitoes in the short term.'

The study is published in *American Naturalist*.

Laura C Pollitt, Nicole Mideo, Damien R Drew, Petra Schneider, Nick Colegrave, Sarah E Reece (2011), Competition and the Evolution of Reproductive Restraint in Malaria Parasites. *American Naturalist* Published online 28 January 2011

Interesting? Spread the word using the 'tools' menu on the right.

Your comments

[Post a comment](#)

There are no comments at this time. Be the first to comment on this news story.

© Copyright Natural Environment Research Council 2008



Mosquito *Anopheles stephensi*.