



## Press Release

### Humans and monkeys affected by the same malaria parasite in the Amazon region

**Research scientists in Tübingen discover indications that two types of parasites are actually one with several host species – this has consequences for the global battle against the disease**

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Tübingen, 25 September 2015

Tropical medicine experts from Tübingen have discovered malaria parasites of the *Plasmodium brasilianum* species in Yanomami indigenous Indians on the border between Venezuela and Brazil. These had only been found in monkeys in the past. The parasites are also described as quartan plasmodia, as they cause outbreaks of fever every four days. The infection can lead to complications and chronic sicknesses. This form of malaria is less well-known than the disease caused by the *Plasmodium falciparum* parasite, which is often serious and sometimes fatal. Nevertheless, the quartan plasmodia also represent a risk that should be taken seriously. Scientists have long suspected that quartan parasites, which cause malaria in human beings (*Plasmodium malariae*), and the plasmodia of the *Plasmodium brasilianum* species may be identical. Working with colleagues from Venezuela and the USA, Albert Lalremruata and Wolfram Metzger from Benjamin Mordmüller's working group at the Institute for Tropical Medicine at the University of Tübingen have been investigating the genetics of the malaria parasites. They have managed to establish that the plasmodia from human beings and monkeys, which had been infected in the Amazon region, are genetically identical. The new study has been published in the *EBioMedicine* specialist journal.

Malaria parasites cannot make their way directly from one mammal to another. On the contrary, the plasmodia are transferred from one host to another in blood through mosquito bites. *Plasmodium malariae* from infected human beings and *Plasmodium brasilianum* from monkeys' blood cannot be distinguished in form or configuration. "In the past, the parasites were distinguished by the host that was the source," says Wolfram Metzger.

However, a comparative analysis of 75 blood samples of Yanomami Indians infected by malaria and red howler monkeys also infected in the

same living area revealed very few genetic differences between the plasmodia. “They were not greater than what you might expect within one species,” the scientist explains. He assumes that they are dealing with just one type of plasmodium, which can, however, leap over the host boundaries. “For the very first time, we’ve provided evidence of a naturally acquired infection with *Plasmodium brasilianum* in human beings.” This is an infection, which occurs in human beings and animals and can be transferred between them – in technical jargon, we call this an anthroozoonosis.

These anthroozoonoses have increasingly become the focus of epidemiological research during the last few years. It is true that the *Plasmodium falciparum* parasite is responsible for the majority of serious and fatal malaria infections and it has strongly specialised in using human beings as its mammal host. However, in the light of the huge goal of eradicating malaria around the world, the huge reservoir of animals that use the quartan plasmodia could play a crucial role. Encouraged by the new research results, the tropical medicine experts at Tübingen are urging the scientific world to no longer neglect the quartan forms of malaria in their research.



Arrival of health service workers at a Yanomami settlement (schabono).  
Photo: Visnú Chaparro Urbina (CAICET, Puerto Ayacucho)



Preparation of the so-called thick blood smear for malaria diagnosis.

Photo: Miguel Bolivar (CAICET, Puerto Ayacucho)

**Publication:**

Albert Lalremruata, Magda Magris, Sarai Vivas-Martínez, Maike Koehler, Meral Esen, Prakasha Kempaiah, Sankarganesh Jeyaraj, Douglas Jay Perkins, Benjamin Mordmüller, Wolfram G. Metzger: Natural infection of *Plasmodium brasilianum* in humans: Man and monkey share quartan malaria parasites in the Venezuelan Amazon, *EBioMedicine* (2015), <http://dx.doi.org/10.1016/j.ebiom.2015.07.033>

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