Malaria parasite crossed to Man from gorilla: scientists

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Scientists have discovered that gorillas are the source of the world's deadliest form of human malaria. Image: Wikipedia.

Mosquito. Photo: MAP.

The parasite that causes the most lethal strain of malaria among humans crossed the species barrier from gorillas, scientists reported on Wednesday.

An investigation by an international consortium of scientists, including an anthropologist at Washington University in St. Louis, has discovered the origin of the world's deadliest form of human malaria, *Plasmodium falciparum*.

The findings indicate this strain of malaria, responsible for hundreds of millions of infections and more than one million deaths per year, is of gorilla origin, and not chimpanzee, bonobo or ancient human origin as originally theorized.

The findings are published in the Sept. 23 edition of the journal *Nature*.

"Chimpanzees and gorillas in Central Africa are subject to many threats, including logging and poaching," says Crickette Sanz, PhD, assistant professor of anthropology in Arts & Sciences at Washington University in St. Louis. "Not only do we risk losing our closest living ape relatives, but this also greatly compromises our ability to study the origins of such pathogens as P. falciparum."

"This research emphasizes the crucial need to continue long-term research on the health and behavior of wild apes in the remote forests of the Congo Basin," she says.

Sanz, who earned a doctorate from WUSTL in 2004, serves as co-principal investigator, with David Morgan, PhD, a researcher at Chicago's Lincoln Park Zoo, for the Goualougo Triangle Ape Project in the northern Republic of Congo in Africa.

"An important finding was that gorillas in the Goualougo Triangle

showed high prevalence of Plasmodium infection," Morgan says. "This population of gorillas is very important in terms of understanding the ecology of malaria and its relation with gorillas.

"One important question and area of further research is if current gorilla populations represent a source of recurring infection of malaria in humans," Morgan says.

Malaria is a blood infection caused exclusively by the bite of the Anopheles mosquito. Of the five types of mosquito-borne Plasmodium parasites that cause malarial infection in humans, P. falciparum causes the greatest morbidity and mortality. Its greatest impact is on children.

In Africa, a child dies every 45 seconds from malaria, according to the World Health Organization, and the disease accounts for 20 percent of all childhood deaths worldwide. By far, Africa is most impacted, accounting for more than 85 percent of the world's malaria deaths.

While much progress has been made in the treatment and prevention of malaria, the origin and reservoir of P. falciparum remained controversial until now.

"Until recently, the closest known relative of this strain of malaria was a chimpanzee parasite, which was assumed to have diverged from its human counterpart at the same time as the ancestors of chimpanzees and humans more than five million years ago," says Beatrice Hahn, MD, professor of medicine at the University of Alabama at Birmingham, the lead author of the study.

The recent findings reject that theory, and shed new light on the deadliest malaria strain.

Twenty-two researchers collaborated on the investigation, which

involved conducting DNA sequences of fecal samples collected from wild apes.

Nearly 3,000 specimens from numerous field research sites throughout Central Africa were examined. The data indicate that chimpanzees and western lowland gorillas represent substantial Plasmodium reservoirs, with P. falciparum being of western gorilla origin.

The authors were surprised to find that no Plasmodium infection was detected in eastern gorillas or bonobos, suggesting that malaria parasites are rare or absent in some wild ape communities.

Additional field studies are needed to determine if eastern gorillas and bonobos are infected with Plasmodium at other locations, or if they harbour divergent parasites not detected by current diagnostic assays.

“Studies like this can assist in developing better malaria eradication strategies as well as provide information on how Plasmodium has evolved and adapted in both apes and humans,” Morgan says.

Provided by Washington University in St. Louis