

STUDYING P. VIVAX MALARIA

Relevant for: Developmental Issues | Topic: Health & Sanitation and related issues

Important step: The improved method was developed for breeding *A. stephensi* mosquitoes in the lab. | Photo Credit: [nopparit](#)

The parasite *Plasmodium vivax*, responsible for 7.5 million malaria cases worldwide, remains understudied. Not much is known about its dormant stage in the liver. An international team has developed a system to breed these parasites in the lab and then infect cultured human liver cells with it. This can help establish a robust liver stage assay in *P. vivax*-endemic regions such as India.

Mosquitoes inject the sporozoite (spore-like) stage of the parasite into the skin when they bite, and the sporozoites travel to the liver. "Imagine some 50 parasites enter our liver, each infect one liver cell or hepatocyte and multiply enormously to 10,000 or more. These can then move out and infect blood cells," explains Varadharajan Sundaramurthy, from National Centre for Biological Sciences (NCBS), one of the corresponding authors of the work published in *Malaria Journal*.

As the number is very low in the liver, our immune system barely notices it. This was believed to be a silent stage. "The parasite can remain in the liver in a dormant stage and relapse later. So there is an urgent need to find drugs for *P. vivax* which will kill both the blood and liver stages," he adds.

Susanta Kumar Ghosh, who recently retired from ICMR-National Institute of Malaria Research, Bengaluru Centre, and is one of the corresponding authors, developed an improved method for breeding *Anopheles stephensi* mosquitoes in the lab. The females were fed with blood collected from Indian patients with the *P. vivax* infection. Two weeks later, the mature sporozoites were taken from the mosquitoes' salivary glands, added to cultured liver cells (multiple human hepatocyte platforms) and studied. This approach can be used to further study the liver stage in *P. vivax* life cycle.

"Another complication is the emergence of drug-resistant malaria parasites. Certain malaria-endemic countries have even abandoned chloroquine for *P. vivax* treatment. Fortunately chloroquine is still effective in India. But the currently used anti-relapse drug, Primaquine, has many undesirable side-effects, especially in patients with a genetic defect called G6PD deficiency. Moreover, it takes 14 days to administer this drug for radical cure... there is an urgent need for development of a new class of drugs," adds Dr. Ghosh. The researchers add that this assay could also be used to test if a specific anti-malarial drug would work for an individual, thus paving the way for individualised treatment for patients.

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