

Scientists pave way for advanced medication to combat malaria

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Pune: Scientists from National Chemical Laboratory and the International Centre for Genetic Engineering and Biotechnology (ICGEB) have achieved a potential breakthrough in anti-malarial research.

Three research groups, each led by NCL's D Srinivasa Reddy and Dhanasekaran Shanmugam, and Amit Sharma of ICGEB, have identified fungal-metabolite molecules as an anti-malarial drug.

Their findings were published recently in the American Chemical Society's 'Journal of Medicinal Chemistry'.

As a part of the research, Reddy said, scientists have combined chemistry and biology to isolate a molecule — Cladosporin — from a fungus called *Aspergillus flavus*.

Aspergillus flavus is a saprotrophic and pathogenic fungus that colonizes in cereal grains, legumes, and tree nuts.

Saprotrophic applies to any organism — especially a

NEW BREAKTHROUGH

- Scientists from NCL and ICGEB have synthesized a molecule found in a fungus called *Aspergillus flavus*
- The molecule, called Cladosporin, is a natural anti-malarial agent
- According to the findings, malarial parasites are becoming resistant to the existing anti-malarial molecules
- The new mechanism of action could pave the way for new anti-malarial drugs



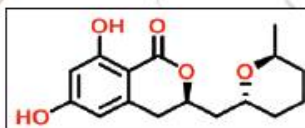
THE SOURCE



Aspergillus flavus is a disease-causing fungus that infects cereal grains, legumes, and tree nuts

THE EXPERIMENT

- The scientists isolated Cladosporin from the fungus
- They synthesized it into eight compounds, called cladologs
- The cladologs were tested against malarial parasites
- A few were found to be potent
- Enzyme and structure-based studies were done to monitor the drug interactions



fungus or bacterium — that lives and feeds on dead organic matter, while a pathogen causes disease. Cladosporin is naturally present in *Aspergillus flavus*.

"We synthesized the molecule into eight compounds in a laboratory," Reddy said.

The compounds are called cladologs. "We found that a few compounds were potent against malarial activity," Reddy said, explaining: "This

is a very important finding. It will take us many years to reach the drug stage, but this is a very important indicator."

According to Reddy, malarial parasites are becoming resistant to the existing mechanisms of action. "This is a new mechanism. The parasites are developing resistance to molecules in existence. In this scenario, the lab results are important," Reddy said.

After the successful syn-

thesis of all eight cladologs, the teams tested them against malaria parasites to check their potency. Enzyme and structure-based studies were done to address details of the drug interactions.

Reddy said, "We will now carry out experiments on animals. They will be infected with malarial parasites. We will then see if this mechanism is able to kill the parasites just as in the lab."