

## A new boost to the fight against Kala Azar

By Bhavya Khullar

New Delhi, March 14 (India Science Wire): A group of scientists have come up with a new technique that could sharpen the battle against the deadly disease of Kala Azar significantly.

Kala Azar is a life threatening neglected tropical disease that affects half a million people every year across the world. In the Indian subcontinent comprising of India, Nepal and Bangladesh, the disease is caused by infection with a protozoan parasite called *Leishmania donovani*, which is transmitted by female sandflies.

There is currently a campaign to eliminate the disease. However, there are 10 known strains of the parasite in the Indian subcontinent and there is a need to regularly track the parasite populations so as to monitor the geographical spread of the disease over time. Some of the strains are resistant to known drugs and some respond to one drug better than the other.

At present, tracking the disease requires reading the whole Kala azar genome by whole genome sequencing method, which is impractical for mass screening programs because it is costly and time-consuming. The new assay finds differences in DNA sequence at a particular location on the genome of the parasite, rather than reading the whole genome, which makes it cost-effective and easy-to-perform.

Using the new method, scientists can determine the strain of kala azar affecting the patients. This would help create a map of all strains of kala azar that are present in any area. When this exercise is done after a gap of few years, it would help figure out how the disease has spread out.

A strain is a genetic variant of a microbe that differs from the parent microbe in some small regions of the genome because of which some of its characteristics such as response to drugs, and vaccines, or replication time could be different. Some strains of kala azar are known to be less sensitive or resistant to drugs. Mapping the type of strain that is prevalent in an area will help scientists use more potent drugs, uniform vaccination, and other preventive strategies in these areas. "We believe that the assay can support Kala azar control efforts in the Indian subcontinent", say scientists who devised this new technique.

Kala azar is characterized by fever, pallor, loss of appetite and weight, and dry thin scaly skin with grayish discoloration, which is often accompanied by loss of hair. India, Bangladesh, and Nepal contribute to 67% of the total cases of Kala azar globally. Together in year 2005, they launched a drive to eliminate Kala azar. To accomplish this goal, scientists need newer and better interventions.

"Tracking the disease helps in designing both preventive and curative interventions better since different strains of parasites could react differently to treatment or vary in response to vaccines when they become available", say scientists.

This new technique has been developed by researchers at the BP Koirala Institute of Health Sciences, Dharan in Nepal, West Bengal State University in West Bengal, University College of Physicians and Surgeons, New York in USA, College of Agriculture, Aksum University in Ethiopia, and Institute of Tropical Medicine in Belgium. A report on the development has been published in a recent issue of the journal *PLOS Neglected tropical diseases*.

The technique could identify seven strains of Kala azar-causing parasite *Leishmania donovani* with high specificity. It was validated in 106 samples collected from fifteen districts of Nepal from 2011-14. They used the information to map the geographic spread of one strain of Kala azar over a period of 12 years from 2002–2014 in Nepal.

This method however, could not identify newly emerging strains of the parasite, because of which, 42% of the study samples could not be classified or mapped. "Nevertheless, highly useful information

can be obtained, even by tracking half of the circulating strains, as it can provide insight into the way of spreading, and hint to invasion of new strains in a particular area”, say scientists.

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