'Barcode' shows mosquito threats

DNA "barcodes" could help prevent the spread of a disfiguring disease that affects about one billion people around the world, say scientists.

Lymphatic filariasis can cause severe disfigurement

Only certain mosquitoes spread lymphatic filariasis, otherwise known as elephantiasis, which affects people in more than 80 nations.

The barcodes are short DNA snippets that will act to "fingerprint" the species that spreads the disease.

The findings will be presented at a conference in London during June.

"The scientific breakthrough of DNA barcoding...is shedding new light on lymphatic filariasis - a horrific and entirely preventable health scourge in developing nations," said lead researcher Professor Daniel Boakye from the University of Ghana.

The disease is described as a leading cause of permanent disability.

It is caused by microscopic worms, which are spread via *Anopheles* mosquitoes.

Living within a human's blood, the larvae grow into adults, which mate and produce other larvae.

Symptoms can appear years after infection, say researchers, permanently damaging lymph systems and kidneys.

This results in the accumulation of fluid, causing swelling in arms, breasts, legs and genitals.

Officials say poor sanitation and rapid population growth in tropical regions have contributed to greater levels of infection.

Breaking the cycle

A World Health Organization-sponsored programme has been established with the aim of wiping out the threat from elephantiasis by 2020.

The partnership, which brings together pharmaceutical firms, NGOs and public health bodies, has delivered about two billion doses of the treatment.

The drugs work by reducing the amount of larvae living within the blood.

DNA barcodes are easily analysed species-specific lengths of DNA

'Science intends to tag all life'

This means that when a mosquito bites an infected person, the concentration of larvae consumed by the insect is too low to be passed on to anyone that the mosquito may go on to bite.

Researchers hope this will break the cycle of infection that this disease needs to survive.

However, scientists at the University of Ghana's Noguchi Memorial Institute for Medical Research say some species within the 430-strong genus of *Anopheles* mosquitoes are still able to transmit the disease to vaccinated people, even if their blood contains a low concentration of the larvae.

By examining these species' DNA barcode, the researchers are able to identify which continue to act as vectors for the disease.

Where these creatures are found, the drug strategy can be complemented with insecticides.

"Beyond the immediate battle against this disease in West Africa," Professor Boakye explained, "the value to human health of these important new tools will grow as the range and habitats of specific mosquito species shift."

The scheme, supported by the US-based JRS Foundation, will be one of 17 projects that will be presented at a biodiversity conference in June.

The e-Biosphere 2009 Conference will be hosted by the Natural History Museum, London, and is co-sponsored by the Encyclopedia of Life and 12 other research institutions.