

DNA Barcoding Employed In Effort to Halt Tropical Disease Spread

April 29, 2009

By a GenomeWeb staff reporter

NEW YORK (GenomeWeb News) – An African research team is using DNA barcoding to help track mosquitoes that spread a debilitating condition called lymphatic filariasis, commonly known as elephantiasis.

Researchers from the University of Ghana are using DNA barcoding to identify and map the mosquitoes that spread elephantiasis-spreading parasites. The research is being funded by a Philadelphia-based grant-making agency called JRS Biodiversity Foundation. The estimated cost of the project was not disclosed.

"The scientific breakthrough of DNA barcoding, which grew explosively from a single Canadian research paper in 2003, is shedding new light on [lymphatic filariasis] — a horrific and entirely preventable health scourge in developing countries," University of Ghana biological, environmental, and occupational health sciences researcher Daniel Boakye, who is leading the research, said in a statement.

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

Lymphatic filariasis is caused by several species of tiny parasitic roundworms that infect the human lymph system and are transmitted from one person to the next by mosquitoes. As worms grow and multiply in the body, they often damage the kidneys and lymph tissue, leading to fluid accumulation in the arms and legs, breasts, or genitals — a condition referred to as elephantiasis.

The often-disfiguring disease affects more than 120 million people in 80 countries, particularly India and parts of Africa, and threatens as many as a billion people around the world. As such, world health authorities have targeted the preventable disease for eradication by 2020, using a mass drug administration approach. Merck and GlaxoSmithKline are reportedly donating compounds used in the combination drug therapy.

For their part, Boakye and his colleagues are using DNA barcoding to help determine where elephantiasis parasite-spreading *Anopheles* mosquitoes are located. They hope that by mapping these mosquitoes they will be able to identify regions in which lymphatic filariasis is endemic.

In addition, the researchers are trying to determine which *Anopheles* species, if any, can transmit lymphatic filariasis-causing parasites even when their larvae are at low levels in the human body. Since existing drugs decrease larval density, Boakye said such work may highlight particular areas that require additional interventions, such as insecticides, and others areas where insecticide use is unwarranted.

The researchers plan to present further details of the work at the e-Biosphere 09 conference in London in June.

Earlier this year, another [team of researchers](#) reported that they could generally distinguish between filaroid worm species, including those causing lymphatic filariasis, using DNA barcoding with 12S rDNA.