Fulbright scholar tracks puzzling disease that strikes from soils, thorns

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Credit: University of Kansas

Mycetoma, a mysterious illness largely unknown in developed nations, has wreaked havoc on the health of farmers, herdsmen, children and others in close contact with the land in tropical and subtropical regions of our planet.

It's thought the disease is contracted by coming into contact with a microorganism that lives in the soil or on a thorn from an Acacia tree.

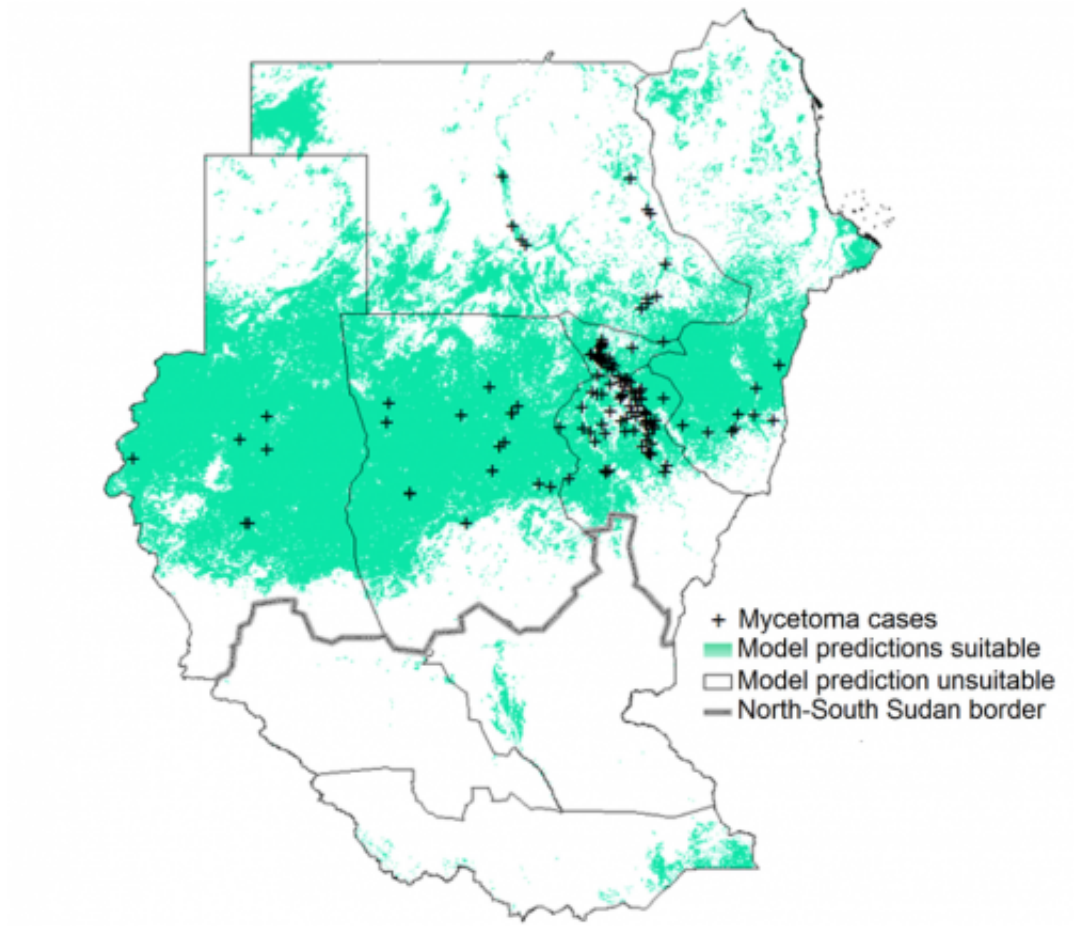
"Two forms of mycetoma are recognized—actinomycetoma caused by a group of filamentous bacteria, and eumycetoma caused by any of 30-50 species of hyaline and pigmented fungi," said Abdallah Samy, a Fulbright scholar and doctoral student at the University of Kansas' Biodiversity Institute.

Recently, for his research comparing known cases of mycetoma with Acacia tree distribution in the Sudan, using a technique dubbed "ecological niche modelling," Samy won the Young Investigator Award at the annual meeting of the American Society of Tropical Medicine and Hygiene, and he met billionaire philanthropist Bill Gates in the process.

"A few days before the meeting, I received an email informing me I was a Young Investigator Award candidate," Samy said. "I presented my information on mycetoma in a poster session, and then they asked for an oral presentation—and I was named the winner for the 2014 Young Investigator Award. Bill Gates was the keynote speaker of the ASTMH meeting, where he gave a talk about dealing with future epidemics like Ebola. He's contributed a lot to the challenge of combating neglected tropical diseases around the world through the Bill and Melinda Gates Foundation. Before we knew who won the competition, I asked to take a picture with him, and he accepted."

Samy, who is from Cairo, plans a career studying disease ecology and researching new skills to understand disease transmission and control. Working with mentor A. Townsend Peterson, University Distinguished Professor of Ecology and Evolutionary Biology, Samy hopes his scholarly work will improve human health around the world.

Peterson said the Young Investigator Award was a reflection of the hard work and detailed insights of his protégé.



Geographic distribution of mycetoma cases and Acacia trees across Sudan and South Sudan (crosses and dotted circles, respectively). Credit: University of Kansas

"I was extremely pleased to hear of this recognition of Abdallah's work and abilities, and I would say that this honor was very well-deserved," he said. "Abdallah is an extremely promising young academic from Ain Shams University in Egypt, where he expects to return after finishing his doctoral studies at KU. He is one of a small but very effective and efficient research group working in disease ecology and biogeography at KU, and it is more than a privilege to be working with him."

Indeed, Samy's work on mycetoma could eventually help health workers

to suppress the disease, which is not well-understood but can have devastating effects on people.

Dr. Ahmed Fahal, who treats Sudanese patients with mycetoma in his role as director of the Mycetoma Research Centre at Soba University Hospital in Khartoum, worked personally with Samy during his investigation there. Fahal underscored the seriousness of the disease to those who suffer its effects.

"It's still challenging and hard to treat patients with mycetoma, for which the available antifungal therapy is still not optimal," said Fahal. "In order to treat this infection, both extensive and destructive surgery and prolonged antifungal treatment are necessary. The treatment outcome is disappointing, characterized by low cure rate and frequent amputation, high patient followup dropout and high recurrence rates."

Samy said he hopes his experience modeling occurrences of mycetoma in Sudan will inform his future research on other diseases through the world. Currently, with his mentor Peterson and colleagues from Sudan, Mexico and the Netherlands, he's developing extensions of the Sudan work across Latin America and Asia.

"Public health problems are my field of interest," said the KU doctoral student. "I'm always intending to help people. Such work has the potential to change lives."

Provided by University of Kansas