



Mwanaisha Mkangara
2015 AWARD Fellow

Position	MSc Student
Institution	Nelson Mandela African Institute of Science and Technology (NM-AIST)
Country	Tanzania
BSc	Education, Open University of Tanzania, 2010
Mentor	Dr. Alphaxard Manjurano, Principal Research Scientist, Parasitic Diseases, Biomedical Sciences, National Institute for Medical Research
Research Area	Development of botanical acaricides from <i>Commiphora swynnertonii</i> sap to protect livestock from tick attacks.



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Mwanaisha Mkangara is committed to helping pastoral communities in Tanzania, where many smallholder farmers lose livestock due to tick-borne diseases. After completing a BSc in Education at the Open University of Tanzania, she pursued her interest in medicinal plants and biotechnology, recently completing a master’s in Life Sciences and Engineering at NM-AIST.

Currently teaching secondary school in Mwanza, Mkangara’s next step is to move on to a research institute. “My goal is to use my biotechnology skills to help smallholder farmers raise their agricultural production,” she says. “My research interest centers on East Coast Fever, which is caused by the *Rhipicephalus appendiculatus* species. This disease attacks cows, goats, and sheep, entering the body, surrounding the heart with water, and killing the livestock.”

Communities in Tanzania are surrounded by shrubs, which attract the ticks. “I was working with the Maasai in Arusha,” she says. “To make sure their animals don’t get the disease, the first job is to destroy the ticks, which are vectors that carry pathogens.”

When testing with acaricides—chemicals used in both medicine and agriculture to kill mites and ticks—Mkangara used the botanical versions she had adapted, comparing them against the chemical ones. “The literature shows that ticks build a resistance to the commonly used chemical acaricides,” she explains. “So I looked at why the ticks behave differently when the botanical version is used. From there, I want to know the characteristics of the gene that is being mutated and determine how I can modify it so it will respond in a positive way—this is all possible thanks to biotechnology.”

Mkangara conducted this research as part of her master’s studies. She tested the leaves, stems, and roots of *Commiphora swynnertonii* and

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AWARD is a career-development program that equips top women agricultural scientists across sub-Saharan Africa to accelerate agricultural gains by strengthening their research and leadership skills through tailored fellowships. AWARD is a catalyst for innovations with high potential to contribute to the prosperity and well-being of African smallholder farmers, most of whom are women.

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extracted the resin for use against the ticks. "The plant activity differs from one part to another, and from one species of tick to another," she explains. She also visited villages near Arusha to investigate tick species, and collaborated with a tropical pesticide research institute there, where varieties of insects are being raised to test the medicinal plants against them.

Mkangara plans to begin a doctoral program in order to gain more skills in biotechnology, and has applied to NM-AIST. She is excited about the AWARD program, having already gained a lot from the initial Mentoring Orientation Workshop. "I have learned the importance of building networks by collaborating with other professionals," she says. "I want to increase my visibility in the scientific community, and will take advantage of the opportunity to access scientific publications." And her increased visibility will not end with her alone. "I feel that I'm an AWARD ambassador to my institution," she states.

Currently looking after her late brother in law's two children, Mkangara is trying to balance family responsibilities with work and research efforts. "Most women understand this delicate balance as we deal with time shortages," she acknowledges. She credits her master's supervisor at NM-AIST as her inspiration to work hard. "He's a very committed man of God," she says. "He encouraged me to keep moving ahead."

Mkangara is convinced that her work can have an impact on society, and this is what keeps her going.