AWARD
African Women in Agricultural Research and Development

Profile

2014 AWARD Fellow

Gladness Elibariki Temu

Position	Assistant Lecturer
Institution	University of Dar es Salaam (UDSM)
Country	Tanzania
MSc	Molecular Biology, UDSM, 2006
Mentor	Professor Dr. Anthony Manoni Mshandete, Head and Associate Professor of Biotechnology, Department of Molecular Biology and Biotechnology College of Natural and Applied Sciences, UDSM
Research Area	Genetic improvement of cassava to reduce the incidence of cassava mosaic disease using agricultural biotechnology techniques.

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Gladness Elibariki Temu was raised on a farm in Tanzania's Kilimanjaro region, where her parents cultivated maize, banana, bean, and coffee. At that time, cassava was a minor crop, grown primarily on the edges of fields to demark boundaries. Today, it is a major staple in Temu's country, and has become a central focus of her research career.

Throughout her secondary school education, Temu had a passion for plants and a natural talent for science. At UDSM, she studied botany and biology, and was such a stellar student that the university offered her a teaching position after she graduated with her BSc.

Temu later obtained a scholarship to pursue an MSc in Molecular Biology at the same university. Her research focused on a fermented banana product commonly consumed in northeastern Tanzania. "Traditionally, people believe that fermented banana has therapeutic effects for post-partum women, and can heal upset stomachs," says Temu. She examined the science behind the fermentation process to see if there was any validity to these beliefs. She isolated the microbes involved in the fungal growth and fermentation process and found neither beneficial nor toxic effects, although she identified two yeasts associated with the process that could potentially hold antimicrobial properties.

For her PhD in Biotechnology at UDSM, Temu is studying cassava mosaic disease, one of the most pernicious threats to the crop. The disease is both viral and virulent. It repeatedly contaminates and destroys fields, even when farmers use clean planting material. "Scientists have been using conventional breeding methods for years

to develop plants that can resist the virus," she says. "At best, they have developed varieties with a higher tolerance to the disease, but even that has broken down over time."

Temu employed the tools of molecular biology and biotechnology to try to improve the genotype of the most commonly used cassava variety, so that it would develop a built-in genetic resistance to mosaic disease. She worked on isolating and cloning a gene from the virus that could then be put into and replicated as part of the cassava plant's genome. The idea is that with a copy of the virus's gene within the cassava's genetic structure, the attacking virus should be unable to replicate itself within the plant, due to the natural gene regulation of interfering RNA. The result would make the plant fully disease resistant.

"The work is long, difficult, and often tedious, and there are many unknowns all along the process," says Temu. She has nearly completed her doctoral research, but expects to continue the work to find a solution for the cassava farmers.

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Temu's goal is to rise to a senior position in academia. The skills development, mentoring, and networks that she is gaining as an AWARD Fellow are critical to helping her attract funding, publish her results, and attain a higher level of visibility. "Gaining clout, working with powerful people, and achieving senior research levels go hand-in-hand," she says. "They are key to collaboration with other scientists to integrate conventional and emerging technologies so that we can find solutions to problems across Africa."

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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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