

# CV

## Samwel Muiruri Kariuki, PhD

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Professional links: [ORCID](#), [Google Scholar](#)

### EDUCATION

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**University of Nairobi** Nairobi, Kenya  
*PhD in Genetics* 2015

I endeavored to develop haploid inducer lines in bananas by modification of a histone variant called Centromere Specific Histone 3 protein (*CENH3*). The mutant lines when crossed with wild type varieties are expected to produce haploids which are important in reducing time involved in developing inbred lines (pure breeding lines).

**University of Nairobi** Nairobi, Kenya  
*Master of Science in Plant Physiology and Biochemistry* 2012

I used molecular phylogenetics to position Kenyan *Dioscorea* species to other cultivated species since they are difficult to characterize morphologically due to complex morphological traits. I also used Reverse Phase High Performance Liquid Chromatography (RP-HPLC) to quantify a steroidal compound of medicinal importance called dioscin found in yams.

**University of Nairobi** Nairobi, Kenya  
*Bachelor of Science (Botany and Zoology) – First Class Honors* 2008

### EXPERIENCE

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**Kenyatta University** Nairobi, Kenya  
Lecturer, Plant Sciences Department May 2020 – To-date

**Pennsylvania State University** PA, USA  
Postdoctoral Scholar (Chemical Engineering) 2017-2020

**Embu University College and Technical University of Kenya** Nairobi, Kenya  
*Part-time Lecturer* 2016 – 2017

**International Institute of Tropical Agriculture (IITA)** Nairobi, Kenya  
*Graduate fellow (PhD project)* 2012 - 2015

**University of California at Davis** Davis, California

Junior research specialist

2013 – 2013

**International Institute of Tropical Agriculture**

**Nairobi, Kenya**

Masters Graduate Fellow

2009 – 2012

## AWARDS

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1. Fellowship (PhD) under the National Science Foundation (NSF) funded project (award #[1109882](http://www.nsf.gov/awardsearch/showAward?AWD_ID=1109882)) to develop haploid inducers in bananas ([http://www.nsf.gov/awardsearch/showAward?AWD\\_ID=1109882](http://www.nsf.gov/awardsearch/showAward?AWD_ID=1109882))
2. Five months visit to UC Davis to learn TALENs and CRISPR-Cas9 construct development for genome editing.
3. The University of Nairobi graduate scholarship to Study Master of Science in Plant Physiology and Biochemistry (2009 – 2011)
4. International Livestock Research Institute (ILRI) graduate fellowship to train on molecular biology (2009 – 2010)

## PEER REVIEWED PUBLICATIONS

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Anwar Aliya Fathima, Mary Sanitha, Leena Tripathi, **Samwel Muiruri (2022)** Cassava (*Manihot esculenta*) dual use for food and bioenergy: A review. *Food and Energy Security* (Accepted)

**Samwel K. Muiruri**, Valentine O. Ntui, Leena Tripathi, Jaindra N. Tripathi (2021) Mechanisms and approaches towards enhanced drought tolerance in cassava (*Manihot esculenta*), *Current Plant Biology*, 28,100227, 2214-6628. <https://doi.org/10.1016/j.cpb.2021.100227> .

Alice Lunardon,**Samwel Muiruri Kariuki**,Michael J. Axtell (2021) Expression and processing of polycistronic artificial microRNAs and trans-acting siRNAs from transiently introduced transgenes in *Solanum lycopersicum* and *Nicotiana benthamiana*. *Plant Journal*, 4, 106, 1087-1104. **DOI:** <https://doi.org/10.1111/tpj.15221>

Ogden, Aaron J., Jishnu J. Bhatt, Heather M. Brewer, Jack Kintigh, **Samwel M. Kariuki**, Sairam Rudrabhatla, Joshua N. Adkins, and Wayne R. Curtis 2020. "Phloem Exudate Protein Profiles during Drought and Recovery Reveal Abiotic Stress Responses in Tomato Vasculature" *International Journal of Molecular Sciences* 21, no. 12: 4461. <https://doi.org/10.3390/ijms21124461>

**Muiruri, K. S.**, Britt, A., Amugune, N. O., Nguu, E. K., Chan, S., & Tripathi, L. (2017). Expressed Centromere Specific Histone 3 (CENH3) Variants in Cultivated Triploid and Wild Diploid Bananas (*Musa* spp.). *Frontiers in plant science*, 8, 1034. **DOI:** [10.3389/fpls.2017.01034](https://doi.org/10.3389/fpls.2017.01034)

**Muiruri, K. S.**, Britt, A., Amugune, N. O., Nguu, E., Chan, S., & Tripathi, L. (2017). Dominant Allele Phylogeny and Constitutive Subgenome Haplotype Inference in Bananas Using Mitochondrial and Nuclear Markers. *Genome biology and evolution*, 9(10), 2510-2521 [10.1093/gbe/evx167](https://doi.org/10.1093/gbe/evx167).

Tripathi, J. N., Ntui, V. O., Ron, M., **Muiruri, S. K.**, Britt, A., & Tripathi, L. (2019). CRISPR/Cas9 editing of endogenous banana streak virus in the B genome of *Musa* spp. overcomes a major challenge in banana breeding. *Communications Biology*, 2(1), 46. <https://doi.org/10.1038/s42003-019-0288-7>

Tripathi, L., Tripathi, J. N., Shah, T., **Muiruri, K. S.**, & Katari, M. (2019). Molecular Basis of Disease Resistance in Banana Progenitor *Musa balbisiana* against *Xanthomonas campestris* pv. musacearum. Scientific Reports, 9(1), 7007. <https://doi.org/10.1038/s41598-019-43421-1>

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### **JOURNAL PEER REVIEWER ENGAGEMENTS**

- Current Plant Biology
- Plant Cell Reports
- Nature Communications Biology
- Scientia Horticulturae

### **Students Under Supervision**

#### **PhD Students (Ongoing)**

1. Sarah Macharia (I84/20525/2020)
2. Anastasie Musabyemungu (Registration ongoing)

#### **Masters Students (Ongoing)**

1. Rose Harriet Aketch - I56/CTY/PT/20060/2020 (Department of Biochemistry co-supervision with Prof. Richard Oduor)
2. Angelyne Abuor – University of Nairobi Department of Bioschemistry
3. Grace Wambui King'ara (I56/CE/3411/2017) – Co-supervision with Dr. Richard Cheruiyot

### **Undergraduate project supervision**

#### **Completed**

Kivivya Boniface (I90/0663/2017)  
Antony Bimuth Mungathia (I90/3708/2017)  
Natasha Muli (I90/0661/2017)

#### **Ongoing**

Daphine Shiguyenze (I90/0574/2018)  
Stanley Katasi (I20/0948/2018)

### **REFERENCES**

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