Aina Ademola Ibukun, Ph.D.
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EDUCATION

International Institute for Tropical Agriculture (IITA), HQ
Doctor of Philosophy in Plant Genetics December 2021

University of Ibadan, Nigeria
Master of Science in Environmental Biology (Plant Genetics) October 2012

Ahmadu Bello University, Nigeria
Bachelor of Science in Agriculture (*Crop science*) April 2009

TECHNICAL SKILLS

- **Computer**: Proficient in R-programming, Python, Unix/Linux command line, and several genomic and phenomics data analytical tools and software
- **Writing:** Proficient in MS Office, Reference Manager, experience with scientific publications and reviews

RESEARCH EXPERIENCE

University of Wisconsin-Madison,
Department of Plant and Agroecosystem Sciences Madison, WI
Postdoctoral research associate in plant population and quantitative genomics June 2022 – **May 2025**

- Collaborated and led a diverse team of researchers and citizen scientists to collect and document feral hemp (*Cannabis sativa* L) populations across the US. This is the first ever attempt at creating US feral hemp germplasm ever since its prohibition nearly a century ago.
- Coordinated and led projects between faculty at the University of Minnesota and the University of Mississippi on PACE assay genotyping markers and GC-MS to analyze cannabinoids in industrial hemp germplasm (~1800 accessions) to ensure diverse and compliant germplasm (< 0.3% THC)
- Designed and led field experiments for phenotypic evaluation of 1800 feral hemp germplasm over multiple years for flowering time, seed quality, seed-nutritional composition, height and yield
- Developed cost-effective phenotyping methods for quality and yield traits in hemp
- Performed genomic DNA extraction and library preparation for genotyping by sequencing
- Analyze highly dimensional genomic and phenomics datasets using *Cannabis* pangenomes for genetic mapping of flowering time and seed quality and fiber traits
- Performed genome-wide association studies on the genetic underpinnings of cannabinoid inheritance, sex determination, and many agronomic and morphological traits
- Assist with permitting and reporting to state authorities and funding agencies
- Produced peer-reviewed publications and develop grant proposals for additional funding for research, education, and outreach publications

University of Cambridge Global Challenges Research Fund (GCRF) Project Cambridge, UK
Research Supervisor – Plant Imaging June 2019 – August 2020

- Coordinated and led project between IITA, University of Ibadan, and Sainsbury Laboratory, Cambridge
- Designed field trial experiments for phenotypic evaluation of 100 African yam bean (AYB) accessions for flowering time, photoperiodic sensitivity, and seed quality and yield related traits
- Characterized AYB tuber development and imaging in tuber-forming accessions postharvest
- Coordinated data collection and processing on the tuber, bean, and nodule yield
- Curated collected data and performed some descriptive analysis
- Monitored and documented the production and flow of plant germplasm among collaborators
- Mentored 5 African plant breeding grad students at the Pan African University
- Reported weekly in writing on activities and work plans to the project lead

International Institute of Tropical Agriculture, HQ Ibadan, NG
Graduate Research Fellow March 2015 – April 2020

- Designed field evaluation trials of 96 AYB germplasm across multiple locations for two years
- Collected and managed high-quality phenotypic data from multilocational trials using Field-book Apps
- Maintained legume identity through entire breeding stages by tracking samples from screen house/field to lab using DNA markers
- Performed regular molecular biology procedures (plant genomic DNA/RNA extraction, PCR, gel electrophoresis, and fragment analysis)
- Trained undergrads, interns, and staff on basic molecular techniques and field experimental designs
- Performed statistical analysis of genotype-phenotype data and developed manuscripts for publication

Sainsbury Laboratory, University of Cambridge Cambridge, UK
Visiting Research Scholar September 2018

- Performed plant RNA extraction and RT-PCR for detection of plant viruses
- Conducted immunodiagnostic test to identify plants infected with CMV
- Conducted marker-trait association in determining pungency in chili pepper
- Performed bioinformatics analysis of association mapping with GWASpoly in R, mapping markers and trait loci with R/QTL

University of California, Genome, and Biomedical Sciences Facility Davis, USA
Visiting Research Scholar December 2016 – July 2017

- Coordinated research projects between IITA Genetic Resources Centre and UC-Davis Genome Centre
- Established and maintained 93 accessions of AYB seedlings in germination chambers and the greenhouse of the UC-Davis Vegetable and Crop Research Station
- Performed leaf tissue sample collection, DNA extraction, quality and quantity check

- Performed DNA library preparation, quantification, and optimization of double digest restriction-site associated DNA sequencing protocol for high throughput genotyping
- Performed genome sequencing (RADseq) using the Illumina Hi-Seq 4000 machine
- Conducted statistical analysis in R using several packages for large genotypic NGS data analysis
- Developed manuscript for publication

IITA - Yam and Cocoa Breeding Unit - Bioscience Centre Ibadan, NG
Research Technician June 2014 – July 2014

- Designed and established a multi-locational yam (100 clones) breeding trials in Nigeria
- Maintained germplasm resources both *ex situ* and *in situ* conservation
- Conducted phenotypic data collection using digital field apps
- Performed DNA extraction, PCR, PAGE, Gel electrophoresis, and preliminary data analysis
- Performed sample preparation and validation for genotyping by sequencing (DArTseq analysis)
- Maintained laboratory equipment and proper record-keeping
- Other responsibilities as assigned by my supervisor

RESEARCH GRANTS

- £80,000 Global Challenges Research Fund: *Peas'n Chips: Enhancing Nigeria's Food Resilience and Soil Health Through Rehabilitating African Yam Bean.* (CO-I) (2019-2021). Initiated the Collaboration through the results of my Ph.D. research for this grant between three Institutes (UI, IITA, and the University of Cambridge)

- £20,000 Cambridge-Africa ALBORADA: *'Peas'n Chips Entrepreneurs: Rehabilitating African Yam Bean for Food Resilience and Soil Health in Nigeria (Bean_preneurs)' and* "*Characterizing tuber development of an underutilized Legume Crop, The African Yam bean*". (CO-I) (2018 – 2019). Initiated the Collaboration through the results of my Ph.D. research for this grant between three Institutes (UI, IITA, and the University of Cambridge)

- £5,000 Research Fellowship: Sainsbury Laboratory, University of Cambridge, England. (2018)

- $5,000 UC-Davis travel grant to Global Food Security Conference, Cape Town, South Africa. (2018)

- $35,000 Norman E. Borlaug Leadership Enhancement in Agriculture Program: USAID through UC- Davis, USA (2016-2017)

- $5,000 UC-Davis travel grant to the World Food Prize, Des Moines, Iowa (2017)

- $150,000 Global Trust Crop for a Ph.D. research fellowship, Genetic Resources Centre, International Institute of Tropical Agriculture, headquarters, Ibadan. Nigeria (2015-2018)

- $200,000 USDA NIFA-SAC grant awarded for 3 years of funding

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AWARDS

- 2018 - Promising African Ph.D. student, JR Biotek Foundation, UK
- 2017 - Excellence in communicating scientific research, Borlaug LEAP, UC-Davis, USA
- 2016 - Promising African student in the field of Agriculture, Borlaug LEAP, USAID – USA

TEACHING EXPERIENCE

- Advanced Genetics I&II (CPE 741 & 742) - Graduate course
- Cytogenetics (CPE 744) – Graduate course
- Applied Genetics (CPE 510) – Undergraduate course

Taught the above courses, experimental demonstrations, exam supervision, marking and grading assignments, quizzes, and exam scripts. Also served as a course advisor to a few students

- Guest Lecturer, Tropical Horticultural Systems (Hort 376), Department of Plant and Agroecosystems Sciences, University of Wisconsin -Madison, USA

COURSES, TRAINING AND WORKSHOPS

- 2024 – UW-Madison Genetics and Biotech Center - Linux Essentials (bash) v.5.1
- 2024 - UW-Madison Genetics and Biotech Center – Next Generation Sequence Analysis
- 2024 – BIOLEARN - Real World Bioinformatics Analysis in R
- 2024 – BIOLEARN – Cell_Line_to_Command_Line Bioinformatics
- 2024 – DIYTranscriptomics – Open-Source Tools to Analyze RNA-Seq Data
- 2023 – UW-Madison OSG Summer School – High-throughput Computing
- 2023 - University of Minnesota, St.Paul – PCR Allele Competitive Assay (PACE) Genotyping
- 2022 – Transmitting Science ForBio – Research School in Biosystematics, Barcelona, Spain *Phylogenetic Analysis Using R
- 2022 – Makerere University Regional Centre for Crop Improvement (MaRCCI), Uganda
  *Statistical Data Analysis for Post-Graduate Students and Staff Using R programming language
- 2018 - JR Biotek/University of Cambridge; Hands-on Molecular Training Workshop (For African-based Agricultural Scientists)

CONFERENCES ATTENDED

- 2024 – Botany 2024 Invited Speaker on the topic “Research Priorities for Traditional African Crops” Grand Rapids, MI
- 2024 – Plant and Animal Genome Conference, gave a presentation on “Genotypic and Chemotypic Diversity of American Feral Germplasm” Town and Country Resorts, San Diego, California
- 2020 - Cambridge Science Festival, University of Cambridge, UK
  *****Poster presentation and showcase of the African yam bean crop
- 2018 – 21st Annual Symposium of the International Association of Research Scholars and Fellows, International Institute of Tropical Agriculture, Ibadan, Nigeria
  *Oral presentation: Next-generation sequencing of African yam bean using Restriction-associated DNA sequencing
- 2018 – Annual Conference and Stakeholders Forum on African yam bean and other Underutilized legumes. Biotechnology Center, Covenant University, Nigeria**.**
  *****Presentation: Genetic Diversity of African Yam Bean Accessions using Cowpea-derived Simple Sequence Repeat Markers

- 2018 - UK-Africa Food Security Symposium. Sainsbury Laboratory, University of Cambridge
  *Presentation: Bio-innovation for Africa pitching Competition; e-science molecular hub for connecting students with potential supervisors in the field of molecular biology
- 2017 - 3rd International Conference on Global Food Security. Cape Town, South- Africa
  *Poster presentation: Next Generation Sequencing of African yam bean Accessions
- 2017 - World Food Prize delegate as a Borlaug LEAP Fellow. Des Moines, Iowa, USA
  *Presentation: Next-Generation of African yam bean accessions

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PUBLICATIONS (In review/published)

1. Ford, Tori, **Ademola Aina**, Shelby Ellison, Tyler Gordon, and Zachary Stansell. "Utilizing digitized occurrence records of Midwestern feral *Cannabis sativa* to develop ecological niche models." *Ecology and Evolution* 14, no. 7 (2024): e11325.
2. **Ademola Aina**, Jonathan P.W, Joseph S, Eliot S, George D.W, Shelby E (2024) Genetic diversity, population structure, and chemical variation of US feral (*Cannabis sativa* L.) germplasm. Cannabis Research, *Scientific reports* (near submission ready)
3. Ndenum Shitta, Abebe Abush, Eliot Stanton **Ademola Aina** (2024) Genome wide association mapping of nutritional traits for developing improved African yan bean varieties. *Scientific reports* (In prep)
4. **Ademola Aina**, Jillian Abendroth, Shelby Ellison (2024) Association mapping in industrial hemp (*Cannabis sativa*) identifies loci associated with agronomic and grain nutritional traits. BMC Genomics (In prep)
5. Eric Agoye, John Atoyebi, Ukoabasi Ekanem, **Ademola Aina** (2024) Genomics aided research for the improvement of Bambara and Kersting's groundnut. *Frontiers in Plant Science, section Genomics of plants and the Phtyoecosystem* (In prep)
6. Oluwole, O. O., Aworunse, O. S., **Aina, A. I**., Oyesola, O. L., Popoola, J. O., Oyatomi, O. A., ... & Obembe, O. O. (2021). A review of biotechnological approaches towards crop improvement in African yam bean (Sphenostylis stenocarpa Hochst. Ex A. Rich.). *Heliyon*, *7*(11), e08481. https://doi.org/10.1016/j.heliyon.2021.e08481.
7. **Aina, A**., Garcia-Oliveira, A.L., Ilori, C. *et al*. Predictive genotype-phenotype relations using genetic diversity in African Yam Bean (*Sphenostylis stenocarpa* (Hochst. ex. A. Rich) Harms). *BMC Plant Biol* 21, 547 (2021). https://doi.org/10.1186/s12870-021-03302-0.
8. **Aina, A.I.,** Ilori, C.O., Ekanem, U.O**.** *et al*. Morphological Characterisation and Variability Analysis of African Yam Bean (Sphenostylis stenocarpa Hochst. ex. A. Rich) Harms. *International Journal of Plant Research*. 2020; doi:10.5923/j.plant.20201003.01.
9. **A. Aina**, C. Ilori, D. Potter, N. Carrasquilla-Garcia, P. Chang, M. Abberton. (2017). Next generation sequencing of African yam bean accessions: *In the proceeding of the book of abstracts of the 3rd International Conference on Global Food Security*. Cape Town, South Africa.
10. **A. Aina**, C. Ilori, M. Abberton, D. Potter, O. Oyatomi, N.S. Shitta. (2018). Genetic diversity study of African yam bean using Cowpea-derived SSR markers. *In the book of proceedings of the Society for underutilized legumes, Covenant University and International Institute of Tropical Agriculture*. Ogun, Nigeria.

REFERENCES

1. Shelby Ellison
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2. Daniel Potter
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3. George Weiblen
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