Prepare for Life ***Department of Natural Sciences***

George N. Ude

Work Address Department of Natural Science, Bowie State University, Bowie, MD 20715
Phone: 301-860-3347; Fax: 301-860-3346;
Email:gude@bowiestate.edu

Home Address: 6430 Skyward Court, Columbia, MD 21045
Tel. 419-290-6744

Academic Training:

B.Sc., University of Ife, Ile-Ife, Nigeria (1985) - Botany

M.Sc., Obafemi Awolowo University (OAU), Ile-Ife, Nigeria (1989) - Genetics

Ph.D., University of Maryland at College Park, USA (1999). Plant Breeding and Genetics (molecular breeding)

Professional/Academic Positions:

7/2018 – Present - Chair, Department of Natural and Applied Sciences, Bowie State University
8/2018 – 6/2020 - Chair, Faculty Senate, Bowie State University
8/2018 – 5/2019 - Chair, University Council, Bowie State University
5/2015- present - Full Professor (Biology/Genetics), Dept of Natural Science, Bowie State University.
8/2009 – 2015 Associate Professor (Biology/Genetics), Dept of Natural Science, Bowie State University.
8/2003-2008 - Assistant Professor (Biology/Genetics), Dept. of Natural Science, Bowie State University.
7/2002-7/2004-Research Associate, Soybean Marker Assisted Selection, Univ. of MD
5/2002-8/2003-Resident Certified High School Teacher (Science and Geometry), Prince Georges County Public School, MD
9/1999-9/2001 Molecular Geneticist, Banana and Plantain Breeding Unit, IITA, Nig.
10/1993-2/1994-Visiting Scientist, Dept of Plant Genetic Resources and Enhancement, USDA, Beltsville, MD
3/1991-8/1994-Research Fellow (Cytogenetics), International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria.

5/1995-8/1996 -Research Trainee/Intern, Life Technologies, GIBCO BRL, Gaithersburg, MD
9/1994-3/1999 Graduate Research Assistant (Molecular Genetics), Univ. of MD, College Park
3/1999-9/1999 -Faculty Research Associate, Dept of Natural Resource Sciences and Landscape Architecture (Soybean Molecular Marker Genetics and Gene Mapping)
8/1989-2/1991-Graduate Teaching Assistant, Plant Science Dept (Plant Breeding and Genetics), OAU, Nig
8/1986-5/1989 -Graduate Research Assistant, Dept of Botany (Genetics), OAU, Nig.

Other Positions

2011- till present - Visiting Professor, Godfrey Okoye University, Enugu Nigeria
1/2005-2013 - **Adjunct Professor**, Univ of Maryland, College Park
5/2005-8/2005 - **Visiting Professor**, Institute of Microbial and Plant Genomics, Univ. of Minnesota
6/12/2006-7/30/2006 **Visiting Scholar**, Department of Ecology, Evolution, and Organismal Biology, IOWA State University.

Awards:

1. Outstanding International Outreach Award (2024)
2. Deans Outstanding Leadership Award (2024)
3. Bowie State University 20 years of service Award (2024)
4. Outstanding publication awards (2021). In recognition of outstanding achievements in research publications. Bowie State University College of Arts and Science Award.
5. Recipient of the University System of Maryland's 2016 Wilson H. Elkins Professorship award which honors recipients for teaching, research and service excellence.
6. Outstanding International Faculty Outreach Award 2015 - This award honors a faculty member who engages in significant international activities or sponsors activities that enrich the international experience of students and advance the international mission of the College.
7. Outstanding Faculty Award 2014- The highest Award in the College of Arts and Sciences. It honors a faculty member who has distinguished him/herself as an all around professional, excelling in research, teaching, service and scholarly or creative activities.
8. "**Outstanding Publications-Books**" Award 2012 - It honors a faculty member who has distinguished him/herself as an author during the academic year.
9. Outstanding Faculty Award 2011- The highest Award in the College of Arts and Sciences. It honors a faculty member who has distinguished him/herself as an all around professional, excelling in research, teaching, service and scholarly or creative activities.
10. Winner of the College of Arts and Sciences 2009 Faculty Creative Award. This award which honors a faculty member who engages in an activity that may not result in a scholarly publication, but represents an outstanding achieves in his or her profession was given to Dr. Ude for his BioMusic CD production.

11. The 2007-2008 Exemplary Mentor Award, for distinguished scholarly work and support of Science, Mathematics, Engineering and Technology (SMET) domain and the Model Institutions for Excellence Initiative MIE).
12. American Society of Plant Biologists (ASPB) Travel Recognition Award, to attend the 2008 Joint Annual Meeting of ASPB and Sociedad Mexicana de Bioquimica at Merida, Mexico, June 26-July 1, 2008.
13. American Society of Plant Biologists (ASPB) Travel Recognition Award, to attend the 2007 National Congress at Hilton, Chicago, USA, July, 7th – 11th. 2007.
14. Department of Homeland Security (DHS) Faculty student team summer fellowship Award, National Food Protection and Defense (NFPD), University of Minnesota, Summer 2005.
15. Outstanding Agronomy Graduate Student Award, University of Maryland, College Park, USA. (1998).

Peer Reviewed Publications:

1. Igwe, D.O., Ihearahu O.C., Osano, A.A., Acquaah G., Ude, G.N., (**2022**) Assessment of genetic diversity of Musa species accessions with variable genomes using ISSR and SCoT markers. Springer Journal of Genetic Resources and Crop Evolution (Springer). https://doi.org/10.1007/s10722-021-01202-8.
2. Igwe, D.O., Ihearahu O.C., Osano, A.A., Acquaah G., Ude, G.N., (2021) Genetic Diversity and Population Assessment of Musa L. (Musaceae) Employing CDDP Markers. Plant Molecular Biology Reporter. https://doi.org/10.1007/s11105-021-01290-x
3. Igwe, D.O., Anyanwu C.B., Afiukwa, C. A., Nnamani, C. V., Nweke F. N., Ude, G. N., Ubi, B. E., (2021). Phenotypic and molecular screenings for determination of cassava mosaic disease (CMD) status in farmers' fields in Ebonyi State, Nigeria. Molecular Biology Reports 48(85):1-14.
4. Ude, G.N., Igwe, D.O., Brown C., Jackson M., Bangura, A., Ozokonkwo-Alor, O., Ihearahu, O.C., Chosen, O·, Okoro M., Ene, C., Chieze, V., Unachukwu, M., Onyia, C., Acquaah, G., Ogbonna, J., Das, A., DNA barcoding for the identification of fish species from the freshwaters of Enugu and Anambra states of Nigeria (2020). Journal of Conservative Genetic Resources, Springer, Nature - *https://doi.org/10.1007/s12686-020-01155-7*
5. Eraga, L.I, Avwioroko O.J., Aganbi E., Anigboro A.A., Obih C., Ude, G.N, Tonukari N.J., (2020) Isolation, identification and *in silico* analysis of bitter leaves (*Vernonia amygdalina*) ribulose-1,5-bisphosphate carboxylase/oxygenase gene. Gene Reports. DOI: 10.1016/j.genrep.2020.100720
6. **Ude, G.N.,** Igwe, D.O., McCormick, J., Ozokonkwo-Alor, O., Harper, J., Ballah, D., Aninweze, C., Chosen, O., Okoro, M., Ene, C., Chieze, V., Unachukwu, M., Onyia, C., Acquaah, G., Ogbonna, J. and Das, A. (2019) Genetic Diversity and DNA Barcoding of Yam Accessions from Southern Nigeria. *American Journal of Plant Sciences*, 10: 179-207.

7. Igwe D. O, Afiukwa C. A, Acquaah G, Ude G. N. (2019). Genetic diversity and structure of Capsicum annuum as revealed by Start Codon Targeted and Directed Amplified Minisatellite DNA markers. *Hereditas* volume **156**, Article number: 32 (2019).
8. Igwe DO, Afiukwa CA, Ubi BE, Ogbu KI, Ojuederie OB, Ude GN (2017). Assessment of genetic diversity in Vigna unguiculata L. (Walp) accessions using inter-simple sequence repeat (ISSR) and start codon targeted (SCoT) polymorphic Markers. BMC Genetics (2017) 18:98.
9. Ude George N, Acquaah G, Irish Brian M, and Das Aditi (2014). Targeted parallel sequencing of the Musa species: searching for an alternative model system for polyploidy studies. Africa Journal of Biotechnology. 13(41):4052-4060.
10. Shaibu AA, Okoro P, Ude G, Olukolu BA, Igelbrecht I, Tenkouano A, Ogburia MN, Moonan F, and Dimkpa C. (2013). Genotype by Environment (GxE) Modeling of the Variable Initiation of Parthenocarpy sensu strict in Musa: Elucidation of the Environment Components of Variable Expressivity of Parthenocarpy in a Facultative Apomictic Musa acuminata subspecies Microcarpa Model System. American Journal of Experimental Agriculture. 3(2):262-276.
11. Okoro P, Shaibu A.A, Ude G, Olukolu B.A, Ingelbrecht I, Tenkouano A, Ogburia M.N, Moonan F, Dimkpa C. (2011). Genetic evidence of developmental components of parthenocarpy in apomictic Musa species. Journal of Plant Breeding and Crop Science. 3:138-145.
12. Ochieng JW, Muigai AWT, **Ude GN**. (2007A). Phylogenetics in plant biotechnology: principles obstacles and opportunities for the resource poor. African Journal of Biotechnology Vol. 6 (6), pp. 639-649.
13. Ochieng JW, Muigai AWT, **Ude GN**. (2007B). Localizing genes using linkage disequilibrium in plants: integrating lessons from the medical genetics. African Journal of Biotechnology Vol. 6 (6), pp. 649.
14. Egesi CN. Asiedu R., **Ude G**., Ogunyemi S., Egunjobi JK (2006). AFLP marker diversity in water yam (Dioscorea alata L.).Plant Genetic Resources 4(3); 181–187.
15. **Ude GN**, Dimkpa CO, Anegbe PO, Shaibu AA, Tenkouanao A, M. Pillay, Tchoundjeu Z (2004) Analysis of genetic diversity in accessions of *Irvingia gabonensis* (Aubry-Lecomte Ex O'Rorke) Bail. **African Journal of Biotechnology** Vol. 5(3):219-223.
16. G. Acquaah, **G. Ude**, K. Matand, N.J. Tonukari. 2006. Agricultural Biotechnology and Developing Countries: Prospects, Challenges, and Impact. In Floriculture, Ornamental and Plant Biotechnology: advances and topical issues (1st Edition), Edited by Jaime A. Teixeira da Silva (Ed.) and published by Global Books in Japan. Pages 315-327.
7. **Ude GN**, Kenworthy W, Costa JM, Cregan PB, Alvernaz J (2003). Genetic diversity of soybean cultivars from China, Japan, North America, and North American soybean ancestral lines using amplified fragment length polymorphism (AFLP). **Crop Sci**. 43:1858-1867.

8. **Ude G**, Ogundiwin E, Pillay M, Tenkouano A (**2003**) Genetic Diversity in an African Plantain core collection using AFLP and RAPD markers. **Theor Appl Genet**. 107:248-255.
9. **Ude GN,** Costa JM, Kenworthy WJ, Sardanelli S (2002). AFLP markers associated with a QTL for resistance to soybean cyst nematode race-3 (*Heterodera glycines* Ichinohe). J. **Genetics and Breed**. 56:213-220.
10. **Ude G**, Pillay M., Nwakanma D, Tenkouano A (2002) Analysis of genetic diversity and sectional relationships in *Musa* using AFLP markers. **Theor Appl Genet** 104:1246-1252.
11. **Ude G.**, Pillay M, Nwakanma D, Tenkouano A (2002) Genetic diversity in *Musa acuminata* Colla and *M. balbisiana* Colla and some of their natural hybrids using AFLP Markers. **Theor Appl Genet** 104:1239-1245.
12. Pillay M, Ogundiwin E, Nwakanma DC, **Ude G**, Tenkouano A (2001) Analysis of genetic diversity and relationships in East African banana germplasm. **Theor Appl Genet**: 102:965-970.
13. **Ude GN**, Devine TE, Kuykendall LD, Matthews BF, Saunders JA, Kenworthy W, Lin JJ (1999) Molecular mapping of the soybean nodulation gene, *Rj4*. **Symbiosis** 26:101-110.
14. O'Neill NR, van Berkum P, Lin JJ, Kuo J, **Ude GN**, Kenworthy W, Saunders JA (1997) Application of amplified restriction fragment length polymorphism for genetic characterization of *Colletotrichum* pathogens of alfalfa. **Phytopathology** 87 (7):745-750.
15. Lin JJ, Kuo J, Ma J, Saunders JA, Beard HS, Macdonald MH, Kenworthy W, **Ude GN**, Matthews BF (1996) Identification of molecular markers in soybean comparing RFLP, RAPD and AFLP DNA mapping techniques. **Plant Molecular Biology Reporter** 14 (2):156-169.

Journal Article Accepted for Publication

Igwe, D.O., Ihearahu O.C., Osano, A.A., Acquaah G., Ude, G.N., (2021) Assessment of genetic diversity of Musa species accessions with variable genomes using ISSR and SCoT markers. Springer Journal of Genetic Resources and Crop Evolution.

Book(s)

Michael Pillay, Ude G.N., Kole C., 2012. Genetics, Genomics and Breeding of bananas. Series on Genetics, Genomics and breeding of Crop Plants. Series Editor Chittaranjan Kole, Clemson University, Clemson, SC, USA. CRC Press, Science Publishers.

Book Chapters

1. George Nkem Ude, David Okeh Igwe, Christie Oby Onyia, Chosen Ekene Obih. (2022). Biodiversity and genetic resources conservation in Nigeria. In: Obembe, O.O., Ekundayo, E.O., Okoli, A.S., Gidado, A., Adetunji, C.O., Ibrahim, A.B., & Ubi, B.E. (Eds.) Agricultural Biotechnology, Biodiversity and Bioresources Conservation and Utilization (1st ed.). CRC Press. https://doi.org/10.1201/9781003178880.

2. Andrew Chibuzor Iloh, George Ude, and Christie Onyia (2022). Securing the Genetic Base of Indigenous Food Plants: Their role in promoting sustainable food systems. In: Obembe, O.O., Ekundayo, E.O., Okoli, A.S., Gidado, A., Adetunji, C.O., Ibrahim, A.B., & Ubi, B.E. (Eds.) Agricultural Biotechnology, Biodiversity and Bioresources Conservation and Utilization (1st ed.). CRC Press. https://doi.org/10.1201/9781003178880.

3. David Okeh Igwe, **George Nkem Ude** and George Acquaah. (2020). Use of comparative molecular markers and plant tissue culture techniques for genetic diversity assessment and rapid production of *Musa* species at Bowie State University: In Principles of plant genetics and breeding by George Acquaah, 3rd edition. Wiley-Blackwell.

4. David Okeh Igwe, **George Nkem Ude** and George Acquaah. (2020). Bioinformatics, Big Data Analytics, and Computer Simulations in Plant Breeding: In Principles of plant genetics and breeding by George Acquaah, 3rd edition. Wiley-Blackwell.

5. Ude G.N, Irish B.M., Acquaah G. (2012). Molecular marker survey of genetic diversity in the genus *Garcinia*. In chapter 20 of Principles of plant genetics and breeding by George Acquaah, 2nd edition. Wiley-Blackwell.
6. George Ude (2014). Experience with publishing online open access journals (Pages 27-31). In a book titled 'A practical guide to publishing in academe: Face time with faculty peers'. Edited by Dr. George Acquaah, Bowie State University publication, 2014.
7. Ude George, Okoro Michael, Ebiringa Chioma, Das Aditi, and Micklos Dave (2014) DNA Barcode Initiative for the Species of Eastern Nigeria. Presented at the 2nd, International Conference of Biotechnology, organized by Godfrey Okoye University at Enugu State Nigeria on Oct. 6th-13th, 2013. Accepted for publication in the proceedings of the International Conference on Biotechnology and National Development (ICOBAND). Acceptance letter is attached.
8. Okoro Michael, Ude G., Micklos D. (2013) DNA barcoding of traditional medicinal plants of Enugu State, Nigeria. Presented at the 2nd, International Conference of Biotechnology, organized by Godfrey Okoye University at Enugu State Nigeria on Oct. 6th-13th, 2013. Accepted for publication in the proceedings of the International Conference on Biotechnology and National Development (ICOBAND). Acceptance letter is attached.

Book Chapters Accepted and in Press for Publication

9. Ude, G. N., Igwe, D. O., Onyia, C. O. and Obih, C. E. (2021) Biodiversity and genetic resources conservation in Nigeria. In: Obembe, O.. et al. (eds.) Multidisciplinary Applications and Advances in Biotechnology - II: Agricultural Biotechnology, biodiversity and bio-resources conservation and Utilization, Taylor and Francis Publishers, USA (In Press)

10. Iloh, A. C., Ude, G. and Onyia, C. (2021) Securing the genetic base of indigenous food plants: their role in promoting sustainable food systems. In: Obembe, O.. et

al. (eds.) Multidisciplinary Applications and Advances in Biotechnology - II: Agricultural Biotechnology, biodiversity and bio-resources conservation and Utilization, Taylor and Francis Publishers, USA (In Press)

Other Publications

1. George Ude. 2011. Plant Biology Education Posters: Implementing Inquiry-Based Laboratory Activities Using Improved Strategies for Teaching Basic Biological Concepts. ASPB News: Vol. 38:5 (September/October - 2011).
2. George Ude. 2012. Plant Biology Education Posters: Impacting the Nation's STEM Classrooms through the Application of Plant-Based Instructional Materials and Outreach Activities. ASPB News: Vol. 39:5 (September/October - 2012).

Two Laboratory manuals (compiled and customized for my Molecular Biology Class and the Biotechnology Summer Institute).

3. George Ude (2012). Molecular Biology Lab manual (2012). This is a 214 pages lab manual that contains the laboratory experiments and procedures for the experiments that are conducted by students in my class throughout the semester. This is a compilation of published protocols which I summarized, bound into a book, printed and provided for students in my molecular biology class free of charge.
4. George Ude (2011). Laboratory manual customized for the Biotechnology Summer Institute. The manual is a 344 page document containing 8 experimental procedures in genomics and proteomics that include – Lab1: DNA Extraction; Lab2: PV92 PCR informatics; Lab3: GMO Investigator; Lab4: pGLO Bacterial transformation; Lab 5: Forensic DNA Fingerprinting; Lab 6: Green Flourescent Protein (GFP); Lab 7: Comparative Proteomics I; Lab 8: Comparative Proteomics II.

GeneBank Publications

The GenBank database is designed to provide and encourage access within the scientific community to the most up to date and comprehensive DNA sequence information. And there is evidence that most of the important tropical species are not represented in the world genebanks. My research team in collaboration with African scientists undertook to barcode African species with the goal to populate the genebank with DNA barcodes derived from those species. Unique sequence identifiers for species studied in Africa were then submitted for publication and they were reviewed for acceptance and then published in the geneBank. See the list below and also see the attached document for more detailed information about the tropical species and their references in the geneBank.

5. Okoro,M., Ebiringa,C., Ude,G., Micklos,D. and Acquaah,G.(2014). Dialium guineense isolate DNAS-60-59791 ribulose-1,5-bisphosphate carboxylase/oxygenase large subunit (rbcL) gene, partial cds; chloroplast GenBank: KJ735967.1

6. Ude,G., Micklos,D., Ogbonna,C., Das,A., Juliet,M. and Urama,F. (2014). Azadirachta indica isolate DNAS-5F-59757 ribulose-1,5-bisphosphate carboxylase/oxygenase large subunit (rbcL) gene, partial cds; chloroplast GenBank: KJ735966.1
7. Ude,G., Micklos,D., Osuji,G., Okoria,G., Ukwueze,N. and Ebiringa,C. (2014). Emilia praetermissa isolate DNAS-5D-59892 ribulose-1,5-bisphosphate carboxylase/oxygenase large subunit (rbcL) gene, partial cds; chloroplast GenBank: KJ735965.1
8. Ude,G., Micklos,D., Onyia,C., Unachukwu,M., Adegbite,A. and Poopola,J. (2014). Alternanthera sp. DNAS-5C-59883 ribulose-1,5-bisphosphate carboxylase/oxygenase large subunit (rbcL) gene, partial cds; chloroplast GenBank: KJ735964.1
9. Micklos,D., Ude,G., Onuigbo,A., Obih,C., Ogbonna,C. and Akpan,S. (2014). Afzelia africana isolate DNAS-5B-59858 ribulose-1,5-bisphosphate carboxylase/oxygenase large subunit (rbcL) gene, partial cds; chloroplast GenBank: KJ735963.1
10. Micklos,D., Ude,G., Njoku,M.G., Ebiringa,C., Onyia,C. and Okolo,M. (2014). Newbouldia laevis isolate DNAS-59-59750 ribulose-1,5-bisphosphate carboxylase/oxygenase large subunit (rbcL) gene, partial cds; chloroplast GenBank: KJ735962.1
11. Ude,G., Micklos,D., John,S., Marian,U., Ogbonna,J., Peter,O., Oladejo,S. and Anieke,C. (2014). Strophanthus preussii isolate DNAS-5A-59748 ribulose-1,5-bisphosphate carboxylase/oxygenase large subunit (rbcL) gene, partial cds; chloroplast GenBank: KJ746500.1.
12. Micklos,D., Ogbonna,C., Ude,G., Njoku,M.G., Adegoke,A., Onyia,C., Unachukwu,M., Ogbonna,J., Okolo,B. and Opara,H. (2014). Treculia africana isolate DNAS-5E-59745 ribulose-1,5-bisphosphate carboxylase/oxygenase large subunit (rbcL) gene, partial cds; chloroplast GenBank: KJ746499.1.
13. Ude,G., Micklos,D., Ramsey,P., Unachukwu,M., Njoku,M.G., Chikezie,C., Poopola,J. and Igwe,D. (2014). Ageratum conyzoides isolate DNAS-61-59791 ribulose-1,5-bisphosphate carboxylase/oxygenase large subunit (rbcL) gene, partial cds; chloroplast GenBank: KJ746498.1

BioMuSIC Project CD publication (2010)

BioMusic innovation was a project which I conceived to help me teach Biological Sciences (Biol 101) to non-biology majors. Since biology concepts are difficult for regular students to understand I thought that putting my biology curriculum into lyrics and making music out of it will make it easy for students to sing and learn simultaneously. So, I worked with two artists (one was a student) to produce 5 Music CD's. The last two which were published in 2010 in the form of rap songs were:

14. Cell Division (Meiosis and Mitosis) curriculum content lyrics (rap music)
15. Cellular Respiration curriculum content lyrics (rap music)

Conferences Attended/Abstracts:

1. L. Nuique, C. Amadi, M. Tucker, T. Dobbins, K. England, O. Ihearahu, G. Ude (2024) Biodiversity Assessment of Mushrooms in Bowie State, Maryland, and Enugu State, Nigeria. Work done by CURE students in Spring 2024. Poster presented during Bowie State University's Natural Sciences/Undergraduate Research Symposium on May 14, 2024.
2. N. Atanda, N. Beach, C. DuBose, M. Awanda, L. Ekeh, Z. Ford, K. Fritzges, M. Green, J. Johnson, J. Lee, Y. McCoy, K. McLeod, K. Morant, A. Porter, C. Providio, S. Rijal, O. Salubi, M. Seisay, J. Shaw, G. Shikwa, J. Smith, S. Smith, J. Ukay, N. Zarvas, O. Ihearahu, N. Koissi, A. Wiley, and G. Ude (2023). Genetic Analysis of the Invasive Barn Owl Species Tyto alba Through DNA Barcoding. Work done by CURE students in Fall 2023. Poster presented during Bowie State University's Natural Sciences/Undergraduate Research Symposium on December 12, 2023. Oral presentation at National Council of Undergraduate Research (NCUR) in Long Beach, CA on April 8-10, 2024
3. Ude, G. Assessing the Success of CURES." 2023 CURE Institute, July 21, 2023, Bowie State University. At the Course-based Undergraduate Research Experiences to Improve Undergraduate Student Learning." 2023 CURE Institute, July 21, 2023, Bowie State University.
4. Ude, G. "Course Deliverables and Assessments." 2023 CURE Institute, July 21, 2023, Bowie State University. At the Course-based Undergraduate Research Experiences to Improve Undergraduate Student Learning." 2023 CURE Institute, July 21, 2023, Bowie State University.
5. Ude, G. "CURE Framework - How to Get Started: Next Steps." 2023 CURE Institute, July 21, 2023, Bowie State University. At the Course-based Undergraduate Research Experiences to Improve Undergraduate Student Learning." 2023 CURE Institute, July 21, 2023, Bowie State University.
6. Ude, G. "CURE Design Template and Syllabi Modifications." 2023 CURE Institute, July 21, 2023, Bowie State University. At the Course-based Undergraduate Research Experiences to Improve Undergraduate Student Learning." 2023 CURE Institute, July 21, 2023, Bowie State University.
7. George Ude and Kwasi Agbleke (September 2-3, 2023). Organized a DNA Barcoding and Genetics Workshop. Sena Institute of Technology, Ghana.
8. George Ude (Convener) Fall 2023 and Spring 2024 Natural Sciences Day and CURE Symposium Presentations. Held at the Center for Natural Sciences, Mathematics and Nursing, Bowie State University.
9. Brown C, Bangura A, Jackson M, Aninweze C, Obih C, Okoro M, Ene C, Chieze V, Igwe D, Acquaah G, Ogbonna J, Micklos D, Das A, Ude G, (2017) DNA Barcodes of the Fish Species of South Eastern Nigeria for Dry Fish Import Protection in the United States. Poster presented at the Emerging Researchers National (ERN) Conference in STEM that was organized by the American Association for the Advancement of Science (AAAS) in Washington DC on March 2-4, 2017.

10. Ude G, Das A, Acquaah G (2016). Using comparative genomics for genetic improvement of banana Musa species (**Identification of genetic markers associated with abiotic stress responses for crop improvement in *Musa* species)**. Oral presentation made at the WGC BIT's 7th World Gene Convention on Nov. 4th, 2016 at Sheraton Shanghai W. Hotel, China
11. Das A, Davis A, Rayfield D, Ude G (2016). BSU Freshman Research Environment (FRE): The BSU FRI-like program is in the planning and development stage. Poster Presented at the Freshman Research Initiative Conference. Held at The University of Texas at Austin, March 2-4, 2016
12. Askew T, Egwuowu J, Morrow A, Marshall-Cort A, Das A, and Ude G, (2016) DNA Barcoding: Is it really whole wheat? Oral Presentation at the Emerging Researchers National (ERN) Conference in STEM. Held at the Renaissance Washington DC Hotel, February 25-27, 2016.

13. Julian McCormick, Onyinye Ozokonkwo, Johnathan Harper, Daniel Ballah (2016). DNA Barcodes of the yam species of the genus Dioscorea in Southeastern Nigeria. Faculty Advisor: Dr. George Ude. Presented at the 30th Anniversary of National Conference on Undergraduate, University of North Carolina, Ashville, April 7-9, 2016.
14. George Ude and David Micklos (2014) DNA barcoding projects used to enhance hands-on laboratory experience and undergraduate research at Bowie State University (BSU). Presented at the 2014 CUREnet Conference on Course-based Undergraduate Research Experiences. March 31-April and held at Cold Spring Harbor Laboratory , NY
15. Ude G, Okoro M, Ebiringa on laboratory experience and undergraduate research at Bowie State University (BSU), USA and Godfrey Okoye University (GOU), Nigeria. Presented at International Plant and Animal Genome XXII. January 11-15, San Diego, CA, USA.
16. Ude G, Okoro M, Ebiringa C, Micklos D (2013) DNA Barcode Initiative for the Species of Eastern Nigeria. Presented at the 2nd, International Conference of Biotechnology, organized by Godfrey Okoye University at Enugu State Nigeria on Oct. 6th-13th, 2013.
17. George Ude, Noble Egekwu (2011). Biotechnology Education: Frontiers in Developing Nations: Presented at the International Conference of Biotechnology, organized by Godfrey Okoye University at Enugu State Nigeria on July, 22nd 2011. Published in the meeting proceedings.
18. **Ude G.N.**, Irish, BM, Acquaah, G., LaShay T., Ebiringa, C., and Kenworthy, W.J. (2011) Genetic diversity in Garcinia Mangostana and related species. Paper presented at the Emerging Researchers National (ERN) Conference in STEM, held at Hilton Hotel Washinton DC, February 24-26, 2011.
19. **Ude G.N.**, Irish, BM, Acquaah, G., Ebiringa, C., Russell, F., Tata, D., Alaofin, M., Kenworthy, W.J. (2010) Random Amplified Polymorphic DNA (RAPD) marker diversity in *Garcinia mangostana* and related species. Paper presented at the **Joint Annual Meeting of the American Society of Plant Biologists & the Canadian Society of Plant Physiologists - La Société Canadienne de Physiologie Végétale, at held at Montreal Convention Center,**

Montreal, Canada, on July 31st – August 4th, 2010 (http://abstracts.aspb.org/pb2010/public/P09/P09062.html).

20. George N. Ude, Michael Pillay , Abdou Tenkouano· 2006. Subspecies Specific Markers For Identifying A and B Genomes In The Natural Edible Musa Hybrids. 2006 . Paper Presented at the International Conference of the 'Plant and Animal Genome XIV' held at the Town and Country Hotel, San Diego, California, Jan. 14th – 18th, 2006.
21. **Ude G**, Dimkpa C, Anegbe P, Shaibu A, Tenkouanao A, Tchoundjeu Z (2004) Analysis of genetic diversity in accessions of *Irvingia gabonensis* (Aubry-Lecomte Ex O'Rorke) Bail. Paper presented at the **Plant and Animal Genome XII (the international conference on the status of plant and animal genome research) held on January 10-14, 2004, at TOWN And Country Hotel, San Diego, California, USA.**
22. **Ude G**, Pillay M, Nwakanma D, Tenkouano A (2001) Application of molecular markers in *Musa* germplasm enhancement and utilization. Paper presented at the **5th African Crop Science Society Conference, 21st – 26th October, 2001, Eko Le Meridian Hotel, Lagos, Nigeria**.
23. **Ude GN**, Tenkouano A, Pillay M (2001) Biotechnology in Horticulture. Paper presented at the 19th Annual Conference of the **Horticultural Society of Nigeria (HORTSON)**, May 28th to June 1st, 2001, Faculty of Agriculture, University of Nigeria, Nsukka, Enugu State, Nigeria.
24. **Ude GN**, Ogundiwin EA, Pillay M, Tenkouano A (2001). Genetic diversity of the West African plantains (*Musa* AAB genome) identified by AFLP and RAPD. Abstract for a poster presented at the **Plant and Animal Genome IX, January 13-17, 2001, Town and Country Hotel, San Diego, CA.**
25. **Ude GN**, Pillay M, Tenkouano A (2000) Analysis of genetic diversity in *Musa* L. germplasm assessed with AFLP. Abstract for a poster presented at the **2nd International Symposium on the molecular and cellular biology of Banana,** 29th October to 3rd November, 2000, Bayron Bay Beach Club, Bayron Bay, Australia.
26. **Ude GN,** Kenworthy WJ, Costa JM, Cregan PB (1999) Identification of AFLP markers for resistance to cyst nematode in soybean. A poster for the ASA meeting (1999) at Salt Lake City.
27. **Ude GN,** Kenworthy WJ, Costa JM, Alvernaz J, Boerma H, Cregan PB, Nelson RL, Carter TE, Orf JH, Sneller CH (1998) AFLP analysis of Chinese, Japanese, U.S. elite and ancestral soybean germplasm. A poster for the **ASA meeting** in October (1998) at Baltimore.
28. **Ude GN,** Kenworthy WJ, Costa JM, Sardanelli S (1998) Identification of AFLP markers for resistance to cyst nematode (*Heterodera glycines*) in soybean. This is Poster number 84 (page 98 of the book of abstracts) presented at **The International Conference on Plant and Animal Genome VI at San Diego CA. Jan. 18-22, 1998.**
29. Matthews B, Weisemann J, Beard H, Devine T, McDonald M, Park Y, Maiti R, Lin J, Kuo J, **Ude G,** Kenworthy W, Saunders JA (1996) A genetic map of soybean (*Glycine max*) incorporating RFLP, RAPD and AFLP markers. This is a paper presented at the **1996 Spring meeting of the Washington Area Section, American Society of Plant Physiologists (May 9 and 10, 1996).**

30. Lin JJ, Kuo J, Ma J, Saunders JA, Beard H, McDonald M, Kenworthy W, **Ude G,** Matthews BF (1996) Identification of Molecular markers in soybean using RFLP, RAPD and AFLP DNA mapping techniques. **Sixth Biennial Soybean Conference, 1996.**
31. **Ude GN,** Saunders JA, Kenworthy W (1996) DNA fingerprinting of *Papaver* sp. Using AFLP: preliminary studies (poster presented in April 17, 1996, spring meeting of the **National Capital Area Tissue Culture Society**).
32. Saunders JA, **Ude GN**, Kenworthy WJ (1996) Use of DNA analysis for cultivar identification in opium poppy. A paper for the August 10 to 14 (1996) meeting of the **Phytochemical Society of North America.**
33. **Ude GN,** Saunders JA, Kenworthy W, Pedroni M, Lin JJ (1996) DNA fingerprinting of *Papaver* sp. using AFLP. **A poster for the ASA meeting in November (1996) at Indianapolis.**

Other Presentations:

34. George Ude (Keynote Speaker) (2014) – "A New Biology: Increasingly Important Role of Interdisciplinary Teams". Presented at the College of Arts and Sciences Scholars Forum. CLT 102, Bowie State University. March 6th, 2013.
35. George Ude (2014) - Why do you need a mentor and how do you get one? Presented at the program organized by the BSU Office of Undergraduate Research on Feb. 12th, 2014.
36. George Ude (2013) DNA barcoding. Oral presentation made at the Natural Science Department Brown Bag Seminar Series that was held on February 27th, 2013, in the Room 077, Library Building at the Bowie State University.
37. George Ude, Michael Okoro, Chioma Ebiringa and David Micklos (2013). DNA Barcode Initiative for the Species of Eastern Nigeria. Poster presented at the Sixth Annual Grants Expo and Research Day, April 10th, 2013.

MEETINGS ATTENDED WITHOUT ABSTRACTS

1. Attended the Joint Annual Meeting of the American Society of Plant Biologists & the Canadian Society of Plant Physiologists - La Société Canadienne de Physiologie Végétale, held at Montreal Convention Center, Montreal, Canada, on July 31st – August 4th, 2010. I worked with the education committee of American Society of Plant Biologists in the exhibit booth of the organization throughout the meeting period.
2. Attended the American Society of Plant Biologists Annual Plant Biology Meeting. 2011. Held at Minneapolis Convention Center, Minneapolis, Minnesota on August 6 through 10, 2011. I worked with the education committee of American Society of Plant Biologists in the exhibit booth of the organization throughout the meeting period as a volunteer.
3. Attended the American Society of Plant Biologists Annual Plant Biology Meeting. 2012. Held at the Convention Center, Austin, Texas on July 20 – 24th, 2012. I worked with the education committee of American Society of Plant

Biologists in the exhibit booth of the organization throughout the meeting period as a volunteer.

4. Represented Bowie State University at the National Science Foundation workshop for Historically Black Colleges and Universities held at Xavier University on January 24, 2011. New Orleans, LA.
5. Attended the AAAS 2011 Annual Meeting held in downtown Washington, DC at the Walter E. Washington Convention Center where I volunteered as an Exhibitor in the exhibit booth of the American Society of Plant Biologists (ASPB). February 17th - 21st, 2011.
6. Attended the year 2011 planning meeting of the Education Committee of the American Society of Plant Biologists on March 4th, at the ASPB headquarters, Monona Drive, Rockville, Maryland.
7. Attended the Summit on Retention Conference at Ocean City Maryland March 4 – 6, 2010).
8. Attended all meeting of the American Society of Plant Biologists International Conferences and worked in the Educational booth of the organization as an exhibitor (have attended every year since 2009).

PROFESSIONAL MEETINGS I INITIATED, ORGANIZED AND HOSTED

1. International CURE Conference (Hybrid) - (November 30th, 2023). Organized by George Ude, Bowie State University, Maryland, U.S.A.
2. DNA Barcoding 101 Workshop at Godfrey Okoye University, Enugu, Nigeria, **June 2-3, 2014**. Organized by Dave Micklos, Cold Spring Harbor Laboratory, New York, U.S.A and George Ude, Bowie State University, Maryland, U.S.A.
3. DNA Barcoding 101 Workshop at Godfrey Okoye University, **January 4-5, 2013**. Dave Micklos, Cold Spring Harbor Laboratory, New York, U.S.A George Ude, Bowie State University, Maryland, U.S.A
4. DNA Subway Workshop (DNA Subway, Fast Track to Gene Annotation and Genome Analysis). iPlant Faculty Workshop, Bowie State University, Bowie, MD - May 6-7, 2011. Sponsored Dolan DNA Learning Center, Cold Spring Harbor Laboratory.
5. ISABB Community Health Outreach 2011 Medical missions to Nigeria. July 17th- 29th, 2011. Outreach Sites: Gwagwalada in Abuja, Jos in Plateau State, and Etiti Obeleagu Umana in Enugu State. Nigeria.
6. Mid Atlantic Regional Meeting of the American Society of Plant Biologists held on March 25-26, 2010, at Bowie State University.

Grants (Submitted and/or funded):

Funded

a. Grant Title: STEM Diversity in Research Opportunities Collaboration. Awarded September 1, 2023 to August 31, 2026. Amount -

$1,500,000.00. National Institute on Standards and Technology (NIST) - 60NANB23D215.

b. Grant Title: Space Food Production: Artificial intelligence infused comparative assessment of photosynthetic efficiency, transcriptome, metabolome and microbiome of hydroponically grown Kale (Brassica oleracea) under microgravity Simulation. Awarded – 2023 - $1 million. NASA - 80NSSC22K0869NASA.
c. Grant Title: Implementing DNA Barcoding for Course-Based Undergraduate Research Experience. Awarded – 08/23/2018 - $1,999,566.00. BSU's subcontract - $187,234.00. Award # - 1821657. NSF
d. Grant Title: RCN-UBE: Course-based Undergraduate Research Network 2 - $499,925.00. Award #1730273, NSF. Award date - 07/24/2017. BSU is subcontracting on this grant. This grant is on no cost extension.
e. Received NSF subaward for the establishment of a genomic facility and training of minority undergraduate science students and high school teachers and students in biotechnology ($559,664.00). This grant which was awarded in 2009 was a four year grant which ended in 2013 and has a one year no cost extension till August 31st, 2014. It is part of a $3, 919,872.00 awarded to UMCP. BSU Subaward **($559,664.00)**
f. WORKSHOP: Building Links between North American Plant Biologists andCrop Scientists from Sub-Saharan Africa at ASPB 2012 to be held July 20-24, 2012 in Austin, TX. Awarded **-$44,566.00.**
g. Principal Investigator (PI): Bowie State University Applied Biotechnology Initiatives. NSF Proposal Number: 1438902. **$399,729.** Awarded September 1st, 2014 till August 31st, 2017.
h. Co-PI: MRI: Acquisition of a High-Performance Instrument for Interdisciplinary Computational Science Source of Support: DOD Total Award Amount: $445,449.80

Proposals Submitted (Not funded)

i. PI: BSU MARC Undergraduate Student Training in Academic Research (U-STAR) – NIH. $1,896,375.00. Proposal submitted in 2014 and still under review. 06/01/2015 to 5/31/2020.
j. PI: NSF REU Site: Research Experiences for Underrepresented Minority Undergraduates in Biotechnology (REU-Bio). $349,973. 2015-2018. Under review.

Grants Funded before 2010:

1. George Ude (October, **2008**) Enhancing Undergraduate Biotechnology Research Experience for Minority Students. HBCU –UP Better Mini Grant Award. 2009 - $15000.00.
2. Anne Osano and George Ude (October, **2008**) Inventory of Trees on the Bowie State University Campus. HBCU –UP Better Mini. Grant Award. 2009 - $15000.00.

3. DNA MARKERS AND THE GENOMIC COMPOSITION OF BANANAS A Research Opportunity Award proposal to NSF by George N. Ude, Bowie State University, and Jonathan Wendel, Iowa State University. Total Amount Requested = $47,981 The focus of this proposal is to study the phylogeny of the diploid primitive bananas and the edible polyploidy derivatives using special edible molecular techniques.
4. Exploring the production of **BioMusic** and assessment of its impact on student's performance in a general biology course (Biol. 101). BSU Faculty/Staff Summer Fellow, Summer **2007** submitted to the BSU Center for Learning and Technology. $2000.00.
5. Production of **BioMusic** and assessment of its impact on student's performance in a general biology course (Biol. 101). BSU Faculty/Staff Summer Fellow, Summer **2007** submitted to the BSU Center for Learning and Technology. Funded – $13000.00. The purpose of this grant was to make a rap song out of lyrics derived from the GNED biology curriculum derived from the standard college textbook for the course here at BSU. Four CD's (songs with biology curriculum lyrics) were produced from this effort).
6. Identification of Amplified Fragment Length Polymorphism (AFLP) DNA Based Markers for the A and B genomes in the genus *Musa* (Plantains and Bananas). Bowie State University, Better Grant. $15,000.00. Funded.
7. Establishment of Random Amplified Polymorphic DNA (RAPD) and Amplified Fragment Length Polymorphism (AFLP) Marker Systems for Gene Mapping and DNA Fingerprinting. Model Institution for Excellence Initiative (MIE) – Mini Grant Award – $10,000.00.
9. Enhancing Undergraduate Biotechnology Research Experience for Minority Students. $15,000. 2008.
10. Analysis of Genetic Diversity among the accessions of the fruit species *Garcinia mangostana* and other related species in the genus *Garcinia*. $23,000.00. 2009.

Organizational Activities and Services:

1. Member of the American Society of Plant Biologists (ASPB 2005 till present)
    a. Member of two committees of ASPB
        i. K – 12 Education committee of ASPB (2009 – 2013)
        ii. International Education Committee (2011 – 2014)
2. Founder and President of the International Society of African Bioscientists and Biotechnologists (ISABB) 2006 to present (www.isabbio.org).
3. CEO, National Science and Maths Plus Academy Inc (NMASPA INC.) – 2006 – 2012.
4. Bethel Fellowship Church member and Pastor, 1994 till date.
5. Coordinator of evangelical activities for the North American District of Bethel Fellowship Church, 2005 till date.
6. National Director and Founder of the Bethel Campus Fellowship Ministry Inc. (www.bethelcampusfellowship.org)

BOWIE STAE UNIVERSITY (SERVICES)

Departmental

1. Departmental Library Liason (Natural Sci. Dept. –2005-Present).
2. Departmental Grievance Committee (2004 – Present – by invitation from chair)
3. Coordinator, Departmental Biological Waste Disposal Committee (2013–Present)
4. Chair, Faculty Recruitment Committee, Natural Science Department (2013/2016)

College of Arts and Science CAS

5. Faculty Election Committee (2009 – 2012)

University

6. University: Univ. GNED Committee (2004 – 2015)
7. Faculty Coordinator for the BSU Undergraduate Research Program (2013 to present)

Other University Services

1. Coordinates the MOU between Bowie State University and Godfrey Okoye University in Enugu, Nigeria and traveled to attend the first Convocation ceremony in December of 2013 in the company of other faculty members from Bowie State University.
2. Organizer of the 'Bowie State University Annual Biotechnology Symposium Series' which invites guest speakers from outside and prepares the molecular biology class to complete and present their semester project to the BSU community and the general public (2006 till present).
3. Organizer of the 'Bowie State University Biotechnology Summer Institute', an NSF grant funded project to teach minority undergrads and High school teachers biotechnology research skills. We have trained 90 participants to date (2009 till present).
4. Visited NIH with the Applied Biotechnology class (Biol 423) of Fall 2011 on November 22nd, 2011. We were hosted by Dr. Faith Harrow (NIH/NHGRI), to tour her labs and those of the scientists working under her. It was an awesome experience for me and the students.

List public and International Services

1. Editor In-Chief of the African Journal of Biotechnology (2002 till present)

2. Founder and Associate Editor of three Scientific Journals (http://www.academicjournals.org/ajb/):

   a. ISABB Journal of Food and Agricultural Sciences (http://www.academicjournals.org/journal/ISABB-JFAS)

   b. ISABB Journal of Health and Environmental Sciences (http://www.academicjournals.org/journal/ISABB-JHE)

   c. ISABB Journal of Biotechnology and Bioinformatics (http://www.academicjournals.org/journal/ISABB-JBB

3. Facilitates the MOU between Bowie State University and two Universities in Nigeria: Godfrey Okoye University (GOU), Enugu State Nigeria and Joseph Babalola University, Osun State, Nigeria.

4. Established International Research collaboration between Godfrey Okoye University, Nigeria, DNA Learning Center, Cold Spring Harbor Laboratory, NYC and Bowie State University, MD, to DNA Barcode the tropical species of Eastern Nigeria.

5. I have been involved in helping Godfrey Okoye University, Nigeria, to establish a model biotechnology program and laboratory. I supported the accreditation process to see their biotechnology program accredited by the National University Commission. Finally, GOU biotechnology program was accredited in 2012.

6. Participated in the White House 2011 Easter Egg Roll Initiative where I worked as a plant scientist and an exhibitor at the American Society of Plant Biologists Booth. The theme of the 2011 Egg Roll was 'Get Up and Go". April 25th, 2011.
7. Participated in the White House 2012 Easther Egg Roll Initiative where I worked as a plant scientist and an exhibitor at the American Society of Plant Biologists Booth. The theme of the 2012 Egg Roll was 'Let's Go, Let's Play, Let's Move'. April 9th, 2012.
8. Participated in the White House 2013 Easther Egg Roll Initiative where I worked as a plant scientist and an exhibitor at the American Society of Plant Biologists Booth. We talked to kids about growing indoor plants. The theme of the 2013 Egg Roll was 'Be Healthy, Be Active, Be You'. April 1st, 2013.

International Organizations Founded by Dr. George Ude (While serving at Bowie State University)

1. International Society of African Bioscientists and Biotechnologists (ISABB) – founded in 2007.

2. Bethel Campus Fellowship (BCF) which is a student organization I founded in 2005 while serving at Bowie State University is now chattered in 37 schools in three countries – England, Denmark and USA.

Professional Development Scientific Trainings Attended

A. - DNA Science workshop at CSHL, NY, June 28th – July 3rd, 2015
B. - Genome Science workshop at CSHL, NY, July 6th - 10th, 2015
C. – Backyard barcoding workshop at CSHL, NY, July 13th – July 17th, 2015