

Busayo J. Babalola

Plant and Microbial Ecology Lab.,
Dept. of Plant Biology, University of Georgia,
2502 Miller Plant Sciences, Athens, GA, 30602
Website: <https://sites.google.com/view/busayo/>
Email: busayobabalola@gmail.com
Phone: (262) 693-3103

Research interest

I have a strong ability towards engaging in research focused on the study of plant-soil-microbial interactions. The goal of my research is to elucidate the plant genes that are involved with generating beneficial microbial associations in roots, including mycorrhizal fungi and plant growth promoting bacteria. Achieving this goal will help to harness natural biotic associations that improve plant nutrition. This will ultimately reduce the need for inorganic fertilizers in the cultivation of sorghum used for biofuel feedstock as well as other important agricultural crops.

Education

- 2017– 2022 **Ph.D – Microbiology**. GPA 3.76/4.0. Institute of Microbiology, University of Chinese Academy of Sciences (UCAS), Beijing. Advisor: Dr. Guo Liangdong, Title: Response of microbiomes and functions to nitrogen fertilization and irrigation reduction in a wheat field.
- 2012 – 2014 **MSc – Botany (Mycology)**, CGPA 6.6/7.0 (*Distinction*). Department of Botany, University of Ibadan, Nigeria. Advisor: Dr. Abiodun Ayodele. Title: Comparative studies of five accessions of *Abelmoschus esculentus* L. (Moench) as influenced by arbuscular mycorrhizae fungus, spent mushroom compost and poultry manure.
- 2006 – 2010 **BSc (Hons) – Botany**, CGPA 4.7/7.0 (*Upper Second-Class Honors*) Department of Botany, University of Ibadan, Nigeria. Advisor: Dr. Adesoye I. Adenubi. Title: *In-vitro* regeneration of *Parkia biglobosa* (jacq.) r. br. ex. from nodal explants.

Awards and honors

- 2023 ESA Black Ecologist Section Postdoctoral Travel Award
- 2022 Excellent International Graduate Award, UCAS
- 2017 – 2022 CAS-TWAS PhD President's Fellowship Award
- 2016 Kartlos Farms Limited Overall Best Trainee Award

Research experience

- 2023 – present University of Georgia, Athens, GA, Dept. of Plant Biology.
Postdoctoral Research Associate, Advisor: Dr. Anny Chung.
Establish AMF (arbuscular mycorrhizal fungi) cultures suitable for the DOE sorghum microbiome project for greenhouse and field experiments. Perform laboratory experiment and bioinformatics analyses to study the microbiome dynamics of woody bioenergy tree plantings. Conduct morphological analysis on fungal biomass. Analyze soil nutrient from a converted pine forest to a short-rotation woody crop using statistical methods.
- 2022– 2023 University of Wisconsin, Milwaukee, WI, Dept. of Biological Sciences.
Postdoctoral Research Associate, Advisor: Dr. Erica B. Young.

Conducted analysis to uncover the rules that govern wetland pitcher microbiome functional variation across time and space. Performed statistical investigation on the associations between host interactions and microbiome-ecosystem dynamics.

- 2017– 2022 Inst. of Microbiology, University of Chinese Academy of Sciences, Beijing, **PhD Graduate Research Assistant**, , Advisor Guo Liangdong. Designed field experiment to investigate the temporal dynamics of plant-microbiome communities in a wheat field. Performed analyses at the molecular, bioinformatics, and statistical levels to demonstrate how microbial interactions are affected when their environment is disturbed, as well as how nitrogen fertilization disrupted the temporal dynamics of microbial biomass.
- 2016– 2017 Kartlos Farm Limited, Ibadan, Nigeria **Greenhouse Project Supervisor**, , Agricultural Management, Research Project Section and Plant disease diagnosis Manager: Mr. Owolabi Osinowo.

Peer reviewed publications

Journal Articles (published)

1. Bello A, Liu W, Chang N, Erinle KO, Deng L, Egbeagu UU, **Babalola BJ**, Yue H, Sun Y, Wei Z, et al. Deciphering biochar compost co-application impact on microbial communities mediating carbon and nitrogen transformation across different stages of corn development. *Environmental Research* 2023; 219: 115123.
2. Zhang X, Wang Y, Xu Y, **Babalola BJ**, Xiang S, Ma J, Su Y, Fan Y. Stochastic processes dominate community assembly of ectomycorrhizal fungi associated with *Picea crassifolia* in the Helan Mountains, China. *Frontiers in Microbiology* 2023; 13.
3. **Babalola BJ**, Li J, Willing CE, Zheng Y, Wang YL, Gan HY, et al. Nitrogen fertilisation disrupts the temporal dynamics of arbuscular mycorrhizal fungal hyphae but not spore density and community composition in a wheat field. *New Phytologist*. 2022; 234 :2057-72.
4. Wang Y, Xu Y, Maitra P, **Babalola BJ**, Zhao Y. Temporal variations in root-associated fungal communities of *Potaninia mongolica*, an endangered relict shrub species in the semi-arid desert of Northwest China. *Frontiers in Plant Science* 2022; 13.
5. Maitra P, Zheng Y, Wang YL, Mandal D, Lü P-P, Gao C, **Babalola BJ**, et al. Phosphorus fertilization rather than nitrogen fertilization, growing season and plant successional stage structures arbuscular mycorrhizal fungal community in a subtropical forest. *Biology and Fertility of Soils*. 2021;57(5):685-97.
6. Wang Y, Zhao Y, Xu Y, Ma J, **Babalola BJ**, Fan Y. Ectomycorrhizal fungal communities associated with *Larix gemelinii* Rupr. in the Great Khingan Mountains, China. *PeerJ*. 2021;9:e11230.
7. Wang Y-L, Zhang X, Xu Y, **Babalola BJ**, Xiang SM, Zhao Y-L, et al. Fungal diversity and community assembly of ectomycorrhizal fungi associated with five pine species in Inner Mongolia, China. *Frontiers in Microbiology*. 2021;12:646821.
8. Wang YL, Gao C, Chen L, Ji N-N, Wu B-W Lü PP, Li XC, Qian X, Maitra P, **Babalola BJ**, et al. Community assembly of endophytic fungi in Ectomycorrhizae of Betulaceae plants at a regional scale. *Frontiers in Microbiology*. 2020;10:3105.

9. **Babalola BJ**, Odebode J, et al. Mycological evaluation and nutritional composition of smoked-dried fish from Igbokoda market in Ondo State, Nigeria. *Archives of Basic and Applied Medicine*. 2018;6(1):51–3.
10. Olawuyi O, Jonathan S, **Babalola BJ**, Aina D, Olowe O, Ogunsanya O. Responses of Morphological and Yield Components of Pepper in Treatments of *Glomus deserticola* Trappe, Bloss & JA Menge, *Pleurotus pulmonarius* (Fr.) Quél. compost and Poultry Manure. *Journal of Advances in Biology & Biotechnology* 2017;14(3): 1–8
11. Jonathan, SG, Ajiboye MD, Asemoloye MD, Olawuyi OJ and **Babalola BJ**. Effect of cultural conditions on the production of α -amylase from fermented cocoa beans using submerge fermentation techniques. *Journal of Biochemistry International*, 2016. pp.138-152.
12. Olawuyi OJ, Odebode AC, **Babalola BJ**, Afolayan ET, Onu CP. Potentials of arbuscular mycorrhiza fungus in tolerating drought in Maize (*Zea mays* L.). *American Journal of Plant Sciences*. 2014; 5: 779- 786
13. Olawuyi OJ, Jonathan SG, Babatunde FE, **Babalola BJ**, Yaya OOS, Agbolade JO, et al. Accession \times treatment interaction, variability and correlation studies of pepper (*Capsicum* spp.) under the influence of arbuscular mycorrhiza fungus (*Glomus clarum*) and cow dung. *American Journal of Plant Sciences*. 2014; 5: 683-690
14. Okoro-Robinson M, Olawuyi O, Bello W, **Babalola BJ**. Comparative evaluation of organic manure on growth and yield of maize. *Agricultural & Biological Research*. 2014;30(1):60–73.
15. Jonathan SG, Olawuyi OJ, **Babalola BJ**. Effect of arbuscular mycorrhizae fungus, spent mushroom compost and poultry manure on drought and leaf curl resistance of Okra (*abelmoschus esculentus*). *Nigerian Journal of Mycology*. 2014;6:37-47.
16. Oyelakin A, Fasidi I, Odebode A, Jonathan S, **Babalola BJ**. Control of pathogenic fungi on *Pleurotus tuber-regium* cultures. *World Rural Observations*. 2014;6(1):107-13.
17. Jonathan S, Nwokolo V, Ekpo E, Olawuyi O, **Babalola BJ**. Effect of phytochemical composition of agricultural wastes on yield and proximate compositions of *Pleurotus pulmonarius* (fries.) que'let. *NPAIJ*. 2013;9(4):123-32.
18. Jonathan S, Udoh E, Ojomo E, Olawuyi O, **Babalola BJ**. Efficacy of *Jatropha curcas* Linn. as fungicides in the control of *Ceratocystis paradoxa* (Chalara anamorph) IMI 501775 associated with bole rot of *Cocos nucifera* Linn. seedlings. *Report & Opinion*. 2012;4:48-60.
19. Jonathan SG, **Babalola BJ**, Olawuyi OJ, Odebode JA, Ajayi AO. Nutritional composition and fungi deterioration of canned tomato products collected from Ibadan, South-western Nigeria. *Tropical Plant Research*. 2016;3(3):642-8.
20. Jonathan SG, Olawuyi OJ, Odebode JA, **Babalola BJ** and Ajayi AO. Proximate and Microbiological evaluation of the West African dried Meat product, Kilishi sold in three major cities of Nigeria. *Academia Arena*, 2016; 8: 80-87

Manuscript (under preparation)

1. **Babalola BJ**, Chung A, Aubrey, D.P, 2023 Microbiome assembly in bioenergy plantations and implications for carbon cycling
2. **Babalola BJ**, Jing Li, Zheng Y, Wang YL, Willing CE, Gao C, Guo LD. 2023. Effects of nitrogen fertilization and watering reduction on temporal dynamics of fungal community

and multifunctionality in a wheat field *In preparation for submission to ISME Nature journal.*

3. **Babalola BJ**, Gao C, and Guo LD 2023. Temporal dynamics of soil microbial community and function in response to nitrogen fertilization and watering reduction in a wheat field. *In preparation for submission to Soil Biology and Biochemistry.*

Conference publications

1. Olawuyi O, Babatunde F, Oladejo S, Okoro-Robinson M, **Babalola BJ**, Adejumobi M. Growth response of groundnuts to the treatment of Arbuscular Mycorrhiza Fungi (AMF), Poultry Manure (PM), Heavy Metal (Pb), combinations of AMF-PM and AMF-PM-Heavy metal (Pb). *11th African Crop Science Proceedings, Sowing innovations for sustainable food and nutrition security in Africa Entebbe, Uganda*, Oct. 14-17, 2013. 2013:871–5.
2. Olawuyi O, Babatunde F, Oladejo S, Okoro-Robinson M, **Babalola BJ**, Adejumobi M. Growth response of groundnuts to the treatment of Arbuscular Mycorrhiza Fungi (AMF), Poultry Manure (PM), Heavy Metal (Pb), combinations of AMF-PM and AMF-PM-Heavy metal (Pb). *11th African Crop Science Proceedings, Sowing innovations for sustainable food and nutrition security in Africa Entebbe, Uganda*, Oct. 14-17, 2013. 2013:871–5.
3. Jonathan S, Olawuyi O, **Babalola BJ**. Evaluation of Okra accessions in treatment combinations of mycorrhiza fungus, mushroom compost and poultry manure. *Proceedings of Tropentag Conference on Agricultural Development within the Rural-Urban Continuum*; Sep. 2013 17 - 19.
4. Jonathan S, **Babalola BJ**, Utilization of agro-industrial waste for the cultivation of *Pleurotus tuber-regium* (Fries) Singer, a Nigerian Edible Mushroom. *Proceedings of Tropentag Conference on Agricultural Development within the Rural-Urban Continuum, Stuttgart-Hohenheim*; 2013.
5. Jonathan S, Olawuyi O, **Babalola BJ**, Adeola A. Morpho-agronomic variability and correlation studies of *Telfairia occidentalis* hook. f. (pumpkin) in some selected local governments of Ibadan, *Proceedings of the 47th Annual Conference of the Agricultural Society of Nigeria* || Ibadan Nigeria. 2013
6. Olawuyi O, Fawole I, **Babalola BJ** Evaluation of genetic variance and heritability of agronomic and yield traits in pigeon pea- *Cajanus cajan* (L.) Millsp. (Fabaceae), 37th Annual conference of Genetics Society of Nigeria, October, 21-24, 2013, Lafia, Nasarawa State.

Conference/workshop presentations

- | | |
|------|---|
| 2023 | Effect of nitrogen fertilizer and reduced watering on the succession of fungal community and functions Ecological Society of America Annual Meeting, Portland, OR. |
| 2021 | Temporal dynamics of soil enzyme activities in response to nitrogen fertilization and watering reduction in a wheat field. Virtual conference of the Kiel Plant Centre (KPC) summer school, Christian-Albrechts-Universität zu Kiel, Germany. |
| 2021 | Effects of nitrogen fertilization and watering reduction on temporal dynamics of soil multifunctionality. Annual seminar of State Key Laboratory of Mycology, Institute of Microbiology, Chinese Academy of Sciences, Beijing, China. |

- 2021 Virtual Global Symposium on Soil Biodiversity (GSOBI20) hosted by FAO at its Headquarters in Rome, Italy.
- 2020 Training Workshop on Green Technology Chinese Academy of Sciences, Beijing, China.
- 2019 Effects of nitrogen fertilization and watering reduction on temporal dynamics of wheat associated microbiomes. Annual seminar of State Key Laboratory of Mycology, Institute of Microbiology, Chinese Academy of Sciences, Beijing, China.
- 2018 Agricultural practices disruption of plant-microbe interactions. Annual seminar of State Key Laboratory of Mycology, Institute of Microbiology, Chinese Academy of Sciences, Beijing, China.
- 2018 Synthetic Biotechnology Training Course for Developing Countries Biotechnology organized by CAS- TWAS Centre of Excellence for Biotechnology, Beijing China.
- 2013 The induction of roots on multiple shoots of in vitro *Parkia biglobosa* (jacq.) R br. Ex. Don nodal explants. Faculty of Science, University of Ibadan International conference
- 2013 Conference on Agricultural development within the rural-urban continuum in Tropentag, Stuttgart- Hohenheim.
- 2013 6th Annual Conference of Mycological Society of Nigeria Nnamdi Azikiwe University, Akwa, Anambra state, Nigeria.

Reviewer

BMC Plant Biology, BMC Microbiology, Frontiers in Plant Sciences, iMeta, Microbiology Spectrum, Symbiosis, Phytolife.

Teaching experience

Undergraduate Classes taught at Virginia Polytechnic Institute and State University (2023; F=Fall semester); University of Ibadan, Nigeria (2012 - 2014; F=First semester, S=Second semester):

F' 4064/5064G	Soil Microbiology (invited to teach students on the molecular and morphological characterization of arbuscular mycorrhizal fungi by the Virginia Tech Future Faculty Diversity Program 2023)
F' BOT121	Introductory Biology of Phanerogams (gives student a crash course in the ecology of plants that produce seeds in ecosystems all around the world). IDEA Ratings: 4.8/5.0
F'BOT141	Basic Principles in Botany (includes lab and field work) IDEA Ratings: 4.5/5.0.
F'BOT111	Cryptogamic Botany (includes field trip course). IDEA Ratings: 4.6/5.0
S'BIO212	Introductory Ecology (includes lab course) IDEA Ratings: : 4.6/5.0
S'BOT211, '241	General Botany (includes lab course) IDEA Ratings: S'211 4.4/5.0, S'241: 4.6/5.0
S'BOT321, '421	Mycology, Advanced Mycology: (includes lab course) IDEA Ratings: S'321: 4.9/5.0; S'421: 4.8/5.0
F'351, '451	Host Pathogen Relations and Plant Disease Management (includes lab

F'MIC221, '324	course): IDEA Ratings: F'351 4.5/5.0, F'451: 4.5/5.0 Introductory Microbiology, Environmental Microbiology (includes lab course): F'221: 4.7/5.0, 324: 4.7/5.0
F'BIO212, '312	General Ecology (includes lab course): IDEA Ratings: F'212 4.6/5.0, F'312: 4.7/5.0
F'BIO211	Introductory Genetics and Cell Biology (includes lab course) IDEA Ratings: F'211 4.7/5.0

University service

2014	Contributed to the coordination of master's degree program admissions at the departmental level.
2013-Present	Adviser for orientation and volunteer speaker for fresh undergraduate students
2012-2014	Host email for industrial training announcements for students in the botany, microbiology, and sustainability majors
2013	Young guidance for the Undergraduate student; a developmental pipeline specifically for talented, and students from educationally less developed states.
2007-2014	Member of the National Botany Association Biodiversity Committee
2012-2014	Research adviser for the National student of Botany Student Association

Community service

2017 – Present	Community development of sustainable agricultural practices, including development of nature-based solutions
2009	Arranged for a retired naval officer and tribal elder of the Niger-Delta confederation to speak with University of Ibadan students about environmental justice.
2012-2014	Conducted six visits to village high schools (primarily underrepresented minority populations) in western Nigeria to discuss college life and opportunities. Participated in the STEM Career Day at New Era High School, Ijare, Ondo state, Nigeria.

Professional development

2022– Present	American Society for Microbiology- Global Outreach ASM ID: 100002996
2022– Present	Ecological Society of America ESA ID 219278
2022– Present	Society for Ecological Restoration SER ID 71088568
2022– Present	Mycological Society of America
2022– Present	Global Soil Biodiversity Initiative (GSBI)
2013– Present	Mycological Society of Nigeria
2013– Present	Genetics Society of Nigeria

Certification

2023– Present	Certified Associate Ecologist, Ecological Society of America
2022– Present	Python Basics for Data Science and Python Essentials, edX
2016– Present	Greenhouse Vegetable Production, University of Ghana,

Media

2020	Press related to sustainable agricultural practices: https://www.hortidaily.com/article/6034323/nigeria-kartlos-farms-opens-enviroidome-project/
------	---

<https://www.hortidaily.com/article/6035248/nigerians-invests-in-greenhouses-and-local-communities/>

Referees

Prof Anny Chung,
Dept. of Plant Biology and Plant
Pathology, University of Georgia, Athens,
GA, 30602, Tel: ,706-542-4170
Email: yyachung@uga.edu
Relationship: Postdoc Advisor

Prof. Liang Dong Guo,
Institute of Microbiology,
Chinese Academy of Sciences,
Beijing, China.
Tel: +86-10-6480-7510
Email: guold@im.ac.cn
Relationship - PhD Advisor

Regents' Prof. Nancy Collins Johnson
Dept. of Biological Sciences,
Northern Arizona University, Flagstaff AZ
Tel: (928) 523-6473
Email: Nancy.Johnson@nau.edu
Relationship: co-Postdoc Advisor

Prof. Ayodele Abiodun Emmanuel
Department of Botany, University of Ibadan
Nigeria, Tel:+2348034131184
Email: ae.ayodele@ui.edu.ng
Relationship – BSc and MSc advisor