

GABRIEL BIDEMI AKANNI (PhD)

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Biotechnology Unit
Biological science department
Mountain Top University,
Km 12, Lagos-Ibadan Expressway, Ibafo
Ogun State, Nigeria

RESEARCH INTEREST

Food Biotechnology
Surveillance of foodborne pathogens using molecular and genomic techniques
Antimicrobial Resistance
Food Safety
Microbial Risk Assessment
Fermentation

EDUCATION

- PhD** University of Pretoria, South Africa, Food Science March 2018
Dissertation: Alkaline fermentation of Bambara groundnut (*Vigna subterranean* L. Verdc.) as dawadawa-like African food condiment
Promoters: Professor Elna M. Buys and Professor Henrietta L. de Kock
- MSc** University of the Free State, South Africa, Biotechnology November 2012
Thesis: Protein enrichment of a hydrolysate of *Opuntia ficus-indica* biomass by yeast cultivation
Advisor: Professor James C. du Preez and Stephanus G. Kilian
- BSc** University of the Free State, South Africa, Biotechnology December 2008
(Hons) Thesis: The physiological role of Alcohol dehydrogenases mutants in fermentation by *Saccharomyces cerevisiae*
Advisor: Professor James C. du Preez
- BSc** Olabisi Onabanjo University, Nigeria, Microbiology May 2006
Thesis: Microbiological and physiochemical parameters of waterbodies from Ogun state, Nigeria
Advisor: Dr M. O Oni

TEACHING EXPERIENCE

- Mountain Top University, Nigeria** Feb. 2019 – present
Lecturer, Biotechnology unit, Biological Sciences Department,
 - Teaching Undergraduate students classes in Biotechnology and Microbiology from foundational to advanced level
 - Teaching Postgraduate - Masters students classes in Advanced food microbiology, Quality Assurance and Microbial biotechnology
- University of Pretoria, South Africa** May 2013 – Mar. 2018
Scientific researcher, Food Science Department
Taught Bachelor- and Master students' practical courses

PUBLICATIONS

Journal Publications

1. Fayemi, O.E., **Akanni, G.B.**, Elegbeleye, J.A., Aboaba, O.O. and Njage, P.M., (2021). Prevalence, characterization and antibiotic resistance of Shiga toxigenic *Escherichia coli* serogroups isolated from fresh beef and locally processed ready-to-eat meat products in Lagos, Nigeria. *International Journal of Food Microbiology*, 347, p.109-191.
2. **Gabriel B. Akanni**, Yvette Naudé, Henriëtte L. de Kock and Elna M. Buys (2018a). Diversity and functionality of *Bacillus* species associated with alkaline fermentation of bambara groundnut (*Vigna subterranean* L. *Verde*) into dawadawa-type African condiment. *European Food Research and Technology*. 244:7, 1147–1158. <https://doi.org/10.1007/s00217-017-3024-x>
3. **Gabriel B. Akanni**, Henriëtte L. de Kock, Yvette Naudé and Elna M. Buys (2018b). Volatile compounds produced by *Bacillus* species alkaline fermentation of bambara groundnut (*Vigna subterranean* L. *Verde*) into a dawadawa-type African food condiment using headspace solid-phase microextraction and GC x GC TOFMS. *International Journal of Food Properties*. 21:1, 929-941, <https://doi.org/10.1080/10942912.2018.1460757>
4. **Gabriel B. Akanni**, James C. du Preez, Laurinda Steyn and Stephanus G. Kilian, 2015. Protein enrichment of an *Opuntia ficus-indica* cladode hydrolysate by cultivation of *Candida utilis* and *Kluyveromyces marxianus*. *Journal of the Science of Food and Agriculture*, **95**(5):1094-102 DOI: 10.1002/jsfa.6985
5. **Akanni Gabriel**, Ntuli Victor and du Preez James C, 2014. Cactus pear biomass, a potential lignocellulose raw material for Single Cell Protein production (SCP): A Review. *International Journal of Current Microbiology and Applied Science*, **3**(7): 171-197

Book Chapter

1. Somorin, Y.M.; **Akanni, G.B.** and Anyogu A. Microbiological safety and antimicrobial resistance in fresh produce produced in Africa. *Antimicrobial Resistance and One health in Africa*. Springer (2022) (Accepted).

Conference Papers

(Abstract-Reviewed)

6. **Gabriel B. Akanni**, Henriette de Kock and Elna Buys (2016). The Microbiological Quality of Alkaline fermented Bambara Groundnut into 'dawadawa'-type African Food Condiments using *Bacillus* species Starter Cultures. FOODMICRO 2016 – 25TH international ICFMH conference, University College Dublin, Ireland. **July 19 – 22, 2016**:
7. **Gabriel Akanni**, Elna Buys and Henriette de Kock (2016). Sensory characteristics and related flavour compound profiles of 'dawadawa'-type African food condiments using *Bacillus* species starter cultures. 14TH Annual South African Association of the Flavour and Fragrance Industry (SAFFI) 1-Day Seminar and Workshop, 3 March, Bytes Conference Centre, Midrand, South Africa <https://www.b2bcentral.co.za/countdown-to-saafi-seminar-has-begun/>

8. **Gabriel B. Akanni**, Elna Buys and Henriette de Kock (2015). Sensory characteristics and related flavour compound profiles of alkaline fermented African food condiments using *Bacillus* species starter cultures. 1STAfroSense Conference, STIAS, Stellenbosch University, South Africa. **November 23 – 26, 2015:**
9. **Gabriel Akanni**, Henriette de Kock, Amanda Minnaar and Elna Buys (2015). Molecular characterization of *Bacillus* species and flavour compound profile of alkaline fermented African food condiments. 21STSAAFoST BIENNIAL INTERNATIONAL CONGRESS & EXHIBITION 7 - 9 September, Marine Parade, Durban, South Africa. https://www.saafo.org.za/wp-content/uploads/2018/12/2015_congress_programme.pdf
10. **Gabriel B. Akanni**, Henriette de Kock, Amanda Minnaar and Elna Buys (2015). The Microbial Diversity and Characterization of *Bacillus* Species for the Enhanced Fermentation of Bambara Groundnut in the Production of African Food Condiments. Annual meeting of International Association of Food Protection, Portland, OR, USA. **July 25 – 28, 2015:**
11. **Gabriel B. Akanni**, Henriette de Kock, Amanda Minnaar and Elna Buys (2014). Microbial diversity and characterisation of *Bacillus* species for the improved fermentation of bambara groundnut in the production of African food condiments. **September 1 – 4, 2014:** FOOD MICRO 2014 Conference, Nantes, France
12. **Gabriel B. Akanni**, Henriette de Kock, Amanda Minnaar and Elna Buys (2013). Diversity and characterization of *Bacillus* species for the improved alkaline fermentation of bambara groundnut in the production of African food condiments. 20THSAAFoST BIENNIAL INTERNATIONAL CONGRESS & EXHIBITION, CSIR Convention Centre, Pretoria, South Africa **October 7 –9, 2013:**
13. **Gabriel B. Akanni**, Steyn Laurinda, Kilian Stephanus and James du Preez (2011). Evaluation of yeast single cell protein production using a hydrolysate of *Opuntia ficus-indica* (prickly pear) biomass as carbon feedstock. South African Society for Microbiology (SASM) conference 2011, Cape Town, South Africa. **November 5 – 11, 2011:**

RESEARCH EXPERIENCE

Postdoctoral Fellow

Biotechnology laboratory, Mountain Top University, Nigeria

2019-Present

Project: FOCAL (Foodborne Disease Epidemiology, Surveillance and Control in African LMIC). FOCAL is a multi-partner, multi-study project co-funded by the Bill and Melinda Gates Foundation and the Foreign, Commonwealth & Development Office (FCDO) of the United Kingdom Government [Grant Agreement Investment ID OPP1195617]

Principal Investigator: Professor Tine Hald (Technical University of Denmark)

Country PI: Dr. Olanrewaju E. Fayemi (Mountain Top University)

- Surveillance of foodborne diarrheagenic *E. coli*, *Salmonella*, *Shigella* and *Campylobacter* species in samples from diarrheic children under 5 years using molecular and genomic techniques
- Source-tracking of pathogens
- Population survey and epidemiology
- Antimicrobial resistance profile of isolated pathogens
- WGS and Metagenomics

Doctoral Short-Training

Evidence-Based Decision making in Food Safety

International training program in food safety, quality assurance and risk analysis

Ghent University, Belgium

August 15 – December 14, 2018

Doctoral Fellow

University of Pretoria, South Africa

2012-2018

Alkaline fermentation of Bambara groundnut (*Vigna subterranean* L. Verdc.) as dawadawa-like African food condiment

Supervisor: Professor Elna M. Buys, Prof H.L. de Kock

- Molecular typing of *Bacillus* species for alkaline fermentation
- Performed DNA extractions from *Bacillus* species
- DNA sequencing of *Bacillus* species starter cultures
- MALDI-TOF MS identification of *Bacillus* species
- Optimization of fermentation parameters
- Descriptive sensory analysis of dawadawa-like condiments

Graduate student

University of the Free State, South Africa

2009-2012

Protein enrichment of a hydrolysate of *Opuntia ficus-indica* biomass by yeast cultivation

Supervisor: Professor James C. du Preez

- Bioreactor cultivation of yeast and fermentation optimization
- Chemostat cultivation
- HPLC and GC analysis of sugars, ethanol, ethyl acetate and other by-products
- Amino acids determination

Technical Assistant

University of the Free State, South Africa

2008

The physiological role of Alcohol dehydrogenases mutants in fermentation by *Saccharomyces cerevisiae*

Supervisor: Professor James C. du Preez

- Bioreactor cultivation of yeast
- Analyzed mutants for secondary metabolites profiling
- HPLC and GC analysis

HONOURS AND AWARDS

- VLIR-UOS scholarship award for training in Evidence-Based Decision making in food Safety, Ghent University, Belgium (2018)
- Awarded the International Committee for Food Microbiology and Hygiene (ICFMH) Sponsorship of Young Scientists from Developing Countries (2016)
- Awarded the University of the Free State Research Cluster: Technologies for Sustainable Crop Industries in Semi-arid Regions bursary, South Africa (2009 – 2012)
- Awarded the Academic Merit award for academic achievement by the University of the Free State, South Africa (2009)
- Awarded the Golden Key Honor International award, South Africa Branch (2009)

PROFESSIONAL DEVELOPMENT TRAINING

Workshop

Short course on XLSTAT, Hands-on training, Statistical package, May 24-27, 2016, University of Pretoria, South Africa.

Trained Sensory panelist and researcher with the Sensory analysis unit, Department of Food Science, University of Pretoria, South Africa. January 2013 – December 2016.

Introductory Phylogenetics Workshop organized by InqabaBiotec in collaboration with The University of Pretoria, South Africa, 15 April – 26 April 2014.

PROFESSIONAL AFFILIATIONS

South African Council for Natural Scientific Professions (SACNASP) Professional Natural Scientist	2014-Present
International Association of Food Protection (IAFP)	2015-Present
Society of Toxicology (SOT)	2016-Present
South African Association for Food Science and Technology (SAAFoST)	2013-Present
International Food Safety and Quality Network (IFSQN) - Member	2012-Present
South African Society for Microbiology (SASM)	2009-Present
American Society for Microbiology (ASM)	2007-Present

LANGUAGES

English: Native Language, Distinguished levels in Listening, Speaking, Reading, and Writing.

Afrikaans: Intermediate levels in in Listening, Speaking, Reading, and Writing.

WORK EXPERIENCE

Sun African Products, Cold meat processing, Free State, South Africa Nov. 2017 – Aug. 2018
Food Safety Manager (*Affiliated with University of Pretoria*)

- Implementation of Food Safety Management Systems (HACCP, FSSC 22000, ISO 22000)
- Prevention and control of *Listeria monocytogenes* contamination in the meat processing plant
- Implementation of food safety criteria in accordance to South African food safety regulations

OTHER SKILLS AND COMPETENCES

Mentoring students on career paths and public speaking

OTHERS

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<https://www.scopus.com/authid/detail.uri?authorId=56541707200>

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<https://publons.com/researcher/2959806/gabriel-akanni/>

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