

Curriculum Vitae of Wilma Nel, PhD

Post-Doctoral Research Fellow, Forestry and Agricultural Biotechnology Institute (FABI),
University of Pretoria

Personal Details

Full name: Wilma Janine Nel
Date of Birth: 22 November 1992
SA ID Number: 9211220009082

Contact Information:

Phone: +27 83 600 0469
Email: nel.wilma2@gmail.com
janine.nel@fabi.up.ac.za

Languages: English and Afrikaans
Citizenship: Dual South African/Dutch
Licence: Code B with own transport

Skills and Research Techniques

Full proficiency in English and Afrikaans – written and verbal

Full proficiency in Microsoft Office suite

Good with management of interpersonal relationships

Detail oriented and highly organized

Presentations – poster and oral

Creative – conceptualizing, writing, editing and proofreading

Molecular techniques: DNA & RNA extraction; PCR; Agarose Gel Electrophoresis; Sanger Sequencing; Basic and advanced phylogenetics.

Bioinformatics techniques: De Novo genome assembly; Genome Annotation; Gene mining and Identification; Phylogenomics; Primer design.

Mycological techniques: Primary fungal isolation; Culture purification and maintenance; Single spore techniques; Mating studies; Co-culture studies; Species identification and description.

Microscopy techniques: Cleaning and maintenance; Advanced stereo, light, DIC, and phase contrast microscopy; Familiar with multiple different software platforms; Microscopy instruction to users.

Entomology techniques: Collection, handling and storage of insect specimens; Destructive vs. non-destructive DNA extraction methods; Basic identification. In charge of Polyphagous shot hole borer rearing.

About Me

I am a young professional researcher, passionate about mycology, entomology, and insect-fungus interactions. During my time as a postgraduate student, I developed an interest in taxonomy, systematics, and microscopy. I work very well independently but am always happy to collaborate or spend time teaching students and colleagues. I am open to continuous learning and never afraid to try something new.

Education, Awards, and Bursaries

- 2021** **PhD (Microbiology)**, FABI, University of Pretoria
Thesis title: Ophiostomatoid fungi associated with fungus farming insects in South Africa
2018-2020 Recipient National Research Foundation: Freestanding PhD bursary
2018-2020 University of Pretoria: Postgraduate bursary (PhD)
- 2018** **MSc (Microbiology) (Cum Laude)**, FABI, University of Pretoria
Thesis title: Taxonomy and biology of the plant pathogenic fungus *Thielaviopsis basicola*
2018 Forestry and Agricultural Biotechnology Institute: Award for student Mentorship
2018 Mycological Society of America: Mentorship student travel award. Awarded to postgraduate students to attend the International Mycological Congress in Puerto Rico
2018 University of Pretoria: Merit certificate for academics for MSc: Microbiology
2018 South African Association of Botanists (SAAB) Conference: Best student lightning oral presentation
2016-2017 National Research Foundation: Scarce skills masters bursary
2016-2017 University of Pretoria: Postgraduate bursary (MSc)
- 2015** **BSc (Hons) Microbiology** (with 2 distinctions), FABI, University of Pretoria
- 2014** **BSc (Microbiology)**, University of Pretoria
- 2010** **National Senior Certificate** (with 1 distinction), Hoërskool Eldoraigne

Employment & Work Experience

- Jul 2021 – Present** **Post-Doctoral Research Fellow** (full-time), FABI, Department of Zoology and Entomology, University of Pretoria
Investigating biological control strategies for use against the invasive ambrosia beetle, *Euwallacea fornicatus*.
- Sept 2021 - Present** **Post-Doctoral Representative** (part-time), FABI
Facilitating a line of communication between the Postdoctoral community with management.
- Jul 2022 - Present** **Assistant Stock Manager** (part-time), FABI
Assisting with stock taking and distribution of stock items to the various labs in the institute.
- Jun 2017 - Jan 2022** **Lab Manager** (part-time), FABI
Implementation of lab rules, providing introductory training to new students, and assisting in the maintenance and reporting of equipment.
- Jan 2017 – Jul 2021** **Microscopy Administrator** (part-time), FABI

Overseeing the care and maintenance of the microscope facilities, ordering of microscopy related equipment, training of personnel in the proper use of microscopy equipment and associated computer software.

- 2015-2022 Academic Tutor and Demonstrator** (part-time), University of Pretoria
Assisting with the set up of teaching venues, invigilation and marking of assignments, tests, and exams, hands on training of students during practical sessions, demonstration of various microbiological techniques.
2015-2016 MBY 161 Introductory Microbiology
2016-2017 MBY 251 Bacteriology
2018-2020 Honours Joint Techniques Course
2016-2022 MBY 261 Mycology
- 2014 Student Assistant** (part-time), University of Pretoria, Department of Microbiology and Plant Pathology.
Assisting postgraduate students with their research activities.

Teaching Experience

2020-2022 MBY 261 Practical Lectures:

Introductory lecture; Microscopic characteristics of fungi; Using DNA sequence data to identify fungi.

2021 PLG 262 Guest Practical Lecture

The invasive polyphagous shot hole borer

Research Outputs: Peer Reviewed Publications

W.J. NEL, C. RANDOLPH, T. PAAP, B.P. HURLEY, B. SLIPPERS, I. BARNES, MICHAEL J. WINGFIELD (2024) *Fusarium* species associated with *Euw Wallacea xanthopus* in South Africa, including two novel species. *Mycologia*. (In Press)

W.J. NEL, B. SLIPPERS, M.J. WINGFIELD, N. YILMAZ, B.P. HURLEY (2023) Efficacy of commercially available entomopathogenic agents against the Polyphagous Shot Hole Borer in South Africa. *Insects* 14 (361). 10.3390/insects14040361

P.W. CROUS, ... , W.J. NEL et al. (2022) Fungal Planet description sheets: 1284-1382. *Persoonia - Molecular Phylogeny and Evolution of Fungi* 47:1284-1382. 10.3767/persoonia.2021.47.06

E. VAN ROOYEN, T PAAP, Z.W. DE BEER, G TOWNSEND, S FELL, W.J. NEL, S. MORGAN, M. HILL, F. ROETS (2021) The polyphagous shot hole borer beetle: Current status of a perfect invader in South Africa. *South African Journal of Science* 117(11/12). 10.17159/sajs.2021/9736

W.J. NEL, Z.W. DE BEER, M.J. WINGFIELD, M. POULSEN, D.K. AANEN, B.D. WINGFIELD, T.A. DUONG (2021) Phylogenetic and phylogenomic analyses reveal two new genera and three new species of

ophiostomatalean fungi from termite-fungus combs. *Mycologia* 113: 1199-1217. 10.1080/00275514.2021.1950455

P.W. CROUS, ..., W.J. NEL et al. (2021) New and Interesting Fungi. 4. *Fungal Systematics and Evolution* 7:255-343. 10.3114/fuse.2021.07.13

W.J. NEL, Z.W. DE BEER, M.J. WINGFIELD, T.A. DUONG (2021) Ophiostomatalean fungi associated with wood boring beetles in South Africa including two new species. Submitted to *Antonie van Leeuwenhoek*. 114:667-686.10.1007/s10482-021-01548-0.

W.J. NEL, Z.W. DE BEER, M.J. WINGFIELD, T.A. DUONG (2020) The granulate ambrosia beetle, *Xylosandrus crassiusculus* (Coleoptera: Curculionidae, Scolytinae), and its fungal symbiont found in South Africa. *Zootaxa*, **4838**: 427-435. 10.11646/zootaxa.4838.3.7.

M PROCTER, W.J. NEL, S. MARINCOWITZ, P.W. CROUS, M.J. WINGFIELD (2020) A new species of *Raffaelea* from beetle-infested *Leucaena leucocephala*. *Fungal Systematics and Evolution*, **6**:305-314. 10.3114/fuse.2020.06.16.

W.J. NEL, T.A. DUONG, Z.W. DE BEER, M.J. WINGFIELD (2019) Black root rot: A long known but little understood disease. *Plant Pathology*, **68**: 834-842. 10.1111/ppa.13011.

W.J. NEL, T.A. DUONG, M.J. WINGFIELD, B.D. WINGFIELD, A. HAMMERBACHER, Z.W. DE BEER (2018) Heterothallism revealed in the root rot fungi *Berkeleyomyces basicola* and *B. rouxiae*. *Fungal Biology*, **122**: 1031-1040. 10.1016/j.funbio.2018.08.006.

B.D WINGFIELD, ..., W.J. NEL, et al. (2018) IMA Genome-F 9 Draft genome sequence of *Annulohyphomyces stygium*, *Aspergillus mulundensis*, *Berkeleyomyces basicola* (syn. *Thielaviopsis basicola*), *Ceratocystis smalleyi*, two *Cercospora beticola* strains, *Coleophoma cylindrospora*, *Fusarium fracticaudum*, *Phialophora cf. hyalina*, and *Morchella septimelata*. *IMA Fungus*, **9**:199-223. 10.5598/imafungus.2018.09.01.13

T. PAAP, Z.W. DE BEER, D. MIGLIORINI, W.J. NEL, M.J. WINGFIELD (2018). The polyphagous shot hole borer (PSHB) and its fungal symbiont *Fusarium euwallaceae*: a new invasion in South Africa. *Australasian Plant Pathology*, **47**: 231-237. 10.1007/s13313-018-0545-0.

W.J. NEL, T.A. DUONG, B.D. WINGFIELD, M.J. WINGFIELD, Z.W. DE BEER (2018). A new genus and species for the globally important, multi-host root pathogen *Thielaviopsis basicola*. *Plant Pathology*, **67**: 871-882. 10.1111/ppa.12803 (Cover)

Research Outputs: Publications In Prep

W.J. NEL, Z.W. DE BEER, M.J. WINGFIELD, J. HULCR, A.J. JOHNSON, T.A. DUONG. A catalogue of South African bark and ambrosia beetles. *Zootaxa*. 2024. In Prep.

Research Outputs: Conference Abstracts

- 2024** **W.J. NEL, B. SLIPPERS, L. DE VOS, M.J. WINGFIELD, I. BARNES, B.P. HURLEY**
35 years of the TPCP Diagnostics Clinic: Learning from the past to build for the future (Poster presentation).
53rd Congress of the Southern African Society of Plant Pathology, February 2024.
- 2024** **W.J. NEL, B. SLIPPERS, M.J. WINGFIELD, I. BARNES, T. PAAP, C. RANDOLPH, B.P. HURLEY**
Six species of *Fusarium* identified from *Euwallacea xanthopus* infesting *Erythrina lysistemon* trees in Durban, South Africa, including the description of two new species.
53rd Congress of the Southern African Society of Plant Pathology, February 2024.
- 2022** **W.J. NEL, B. SLIPPERS B, M.J. WINGFIELD, N. YILMAZ, B.P. HURLEY**
Entomopathogens tested for their efficacy against the invasive polyphagous shot hole borer,
Euwallacea fornicatus (Oral Presentation).
International Congress on Invertebrate Pathology and Microbial Control. 54th Annual Meeting of the Society for Invertebrate Pathology. August 2022.
- 2021** **W.J. NEL, Z.W. DE BEER, M.J. WINGFIELD, T.A. DUONG**
Using phylogenomic analyses to resolve taxonomic ambiguity and the: The description of two new genera in the Ophiostomatales (Oral Presentation).
Joint SASSB Webinar Series/FABI International Seminar Series 01.07.2021
- 2020** **W.J. NEL, Z.W. DE BEER, M.J. WINGFIELD, T.A. DUONG**
Ophiostomatoid fungi associated with ambrosia beetles in South Africa, including two new species (Virtual presentation of graphical abstract).
MSA from the Cloud, MSA virtual meeting, July 2020.
- 2019** **W.J. NEL, Z.W. DE BEER, M.J. WINGFIELD, T.A. DUONG**
Bark and ambrosia beetles from South Africa's natural forests (Poster Presentation).
IUFRO WG 7.03.12 'Biocontrol of Forest Insect Pests and Pathogens'
- 2019** **W.J. NEL, B.D. WINGFIELD, A.R. McTAGGART, M.J. WINGFIELD, Z.W. DE BEER, H.J. LIM, M.A. VAN DER NEST, T.A. DUONG**
Genomic patterns of convergently evolved bark and ambrosia beetle associated fungi reveal patterns of genome reduction and gene loss (Oral Presentation).
51st Congress of the Southern African Society for Plant Pathology (SASPP)
- 2019** **NEL, W.J., DUONG, T.A., HAMMERBACHER, A., WINGFIELD, B.D., WINGFIELD, M.J., DE BEER, Z.W. DE BEER**
Berkeleyomyces basicola and *Berkeleyomyces rouxiae*: Black root-rot pathogens of globally important crop plants (Poster Presentation).
51st Congress of the Southern African Society for Plant Pathology (SASPP).
- 2018** **W.J. NEL, B.D. WINGFIELD, A. MCTAGGART, M.J. WINGFIELD, Z.W. DE BEER, H-J. LIM, M. VAN DER NEST, T.A. DUONG**
Genomic basis of convergent evolution in beetle-associated Sordariomycete fungi (Oral Presentation)
Joint conference of the South African Society for Bioinformatics and the South African Genetics Society (SASBi/SAGS)
- 2018** **W.J. NEL, T.A. DUONG, A. HAMMERBACHER, B.D. WINGFIELD, M.J. WINGFIELD, Z.W. DE BEER**

Taxonomy and mating strategy of *Thielaviopsis basicola*, a globally important pathogen of agricultural crops (Poster Presentation).

International Mycological Congress (IMC), San Juan, Puerto Rico.

2018 **W.J. NEL, T.A. DUONG, A. HAMMERBACHER, B.D. WINGFIELD, M.J. WINGFIELD, Z.W. DE BEER**

Cryptic heterothallic mating system discovered in the important root pathogens previously known as *Thielaviopsis basicola* (Oral Presentation. **Awarded: Best lightning presentation**).

South African Association of Botanists (SAAB) Conference.

2018 **W.J. NEL, T.A. DUONG, B.D. WINGFIELD, M.J. WINGFIELD, Z.W. DE BEER**

A new genus and sister species for the globally important, multi-host root pathogen, *Thielaviopsis basicola* (Poster Presentation. **Awarded: Runner-up best poster**).

South African Association of Botanists (SAAB) Conference.

2017 **W.J. NEL, T.A. DUONG, B.D. WINGFIELD, M.J. WINGFIELD, Z.W. DE BEER**

Multigene sequence data reveals that the root rot pathogen *Thielaviopsis basicola* constitutes two sister species in a new genus (Oral Presentation).

South African Society for Systematic Biology (SASSB).

2017 **W.J. NEL, T.A. DUONG, B.D. WINGFIELD, M.J. WINGFIELD, A. HAMMERBACHER, Z.W. DE BEER**

The important root rot pathogen *Thielaviopsis basicola* shown to be heterothallic (Poster Presentation).

The 29th Fungal Genetics Conference, Asilomar, California, 14- 19 March.

2017 **W.J. NEL, T.A. DUONG, B.D. WINGFIELD, M.J. WINGFIELD, Z.W. DE BEER**

Multigene sequence analyses reveal a new genus and a new species in a globally important, multi-host root pathogen (Oral Presentation).

50th Congress of the South African Society of Plant Pathology (SASPP)

2017 **W.J. NEL, T.A. DUONG, M. POULSEN, D. AANEN, S. VREEBRUG, Z.W. DE BEER**

Fungiculous species of Ophiostomatales, including three new species from *Termitomyces* fungus combs (Poster Presentation).

50th Congress of the South African Society of Plant Pathology (SASPP)

Research Outputs: Other Communications

2024 W.J. Nel. A tiny beetle causing large problems: The polyphagous shot hole borer in South Africa (Presentation). Meeting of the Irene Garden Club, April 2024.

2023 W.J. Nel. A tiny beetle causing large problems: The polyphagous shot hole borer in South Africa (Presentation). WESSA Friends Forum AGM 2023.

2023 W.J. Nel, A. Hammerbacher. Can tiny beetles kill big trees? An emerging problem in South Africa (Popular Science Communication). University of Pretoria, Faculty of Natural and Agricultural Sciences News. [Can tiny beetles kill big trees? An emerging problem in South Africa | University of Pretoria \(up.ac.za\)](https://www.up.ac.za/news/2023/04/27/can-tiny-beetles-kill-big-trees-an-emerging-problem-in-south-africa/)

2017 **W.J. NEL, T.A. DUONG, A. HAMMERBACHER, B.D. WINGFIELD, M.J. WINGFIELD, Z.W. DE BEER**

Genome sequencing reveals the root pathogens, previously known as *Thielaviopsis basicola*, to possess the genes required for heterothallic mating (Poster). University of Pretoria Genome Research Institute (GRI) Symposium

Research Outputs: Co-authored Conference Contributions

- 2018 T. PAAP, Z.W. DE BEER, D. MIGLIORINI, W.J. NEL, M.J. WINGFIELD**
First report of the polyphagous shot hole borer (PHSB) and its fungal symbiont in South Africa (Presented by T. Paap). South African Society for Systematic Biology (SASSB).
- 2017 F. MTHUNZI, R. CHANG, W.J. NEL, Z.W. DE BEER**
Subspecies of the Dutch Elm Disease fungus cannot be distinguished based on multigene sequences (Presented by F. Mthunzi).
South African Society for Systematic Biology (SASSB).
- 2017 Z.W. DE BEER, H. DE BRUIN, W.J. NEL, B. SLIPPERS**
A survey of entomopathogenic *Beauveria* spp. in South African plantations (Presented by Z.W. de Beer).
Combined Congress of the Entomological and Zoological Societies of Southern Africa (ESSA/ZSSA).
- 2017 W.J. NEL, T.A. DUONG, B.D. WINGFIELD, M.J. WINGFIELD, Z.W. DE BEER**
A new genus and sister species described for the globally important, multi-host root pathogen, *Thielaviopsis basicola* (Presented by Z.W. de Beer).
XIX International Botanical Congress

Society Memberships

- 2016 – Present** South African Society for Plant Pathology (SASPP)
2022 Society for Invertebrate Pathology (SIP)
2020 Mycological Society of America (MSA)
2018 - 2019 FABI Social Club
2018 South African Association of Botanists (SAAB)
2018 African Mycological Association (AMA)
2017 - Present South African Society for Systematic Biology (SASSB)
2017 Mycological Society of America (MSA)
2016 – 2017 FABI Social Club

Other Experience

- Workshops Attended**
2022: Bark beetle academy (Hosted at the University of Florida, USA)
2018: Metagenomics/meta-transcriptomics Workshop
2017: GATK Workshop
2016: FABI Advanced Phylogenetics Workshop
2016: Microsatellite Workshop
- Other**
2021: Contributor to CABI invasive species compendium datasheet on *Berkeleyomyces basicola*
2019: Assisted with *Fusarium* inoculations and pathogenicity screening trials
2019: Assisted and participated in NST/NRF bark beetle blitz workshop (Hosted by FABI)

2018: Assisted with Polyphagous shot hole borer workshop (hosted by FABI/CABI)

2018: Mentor in the Centre of Excellence in Tree Health Biotechnology (CTHB) mentorship program at FABI

2017 – 2019: Chaperone (Local and International guests during FABI events)

References

Professor Michael Wingfield

- ✉ Advisor to the Executive, University of Pretoria
- ✉ mike.wingfield@fab.up.ac.za
- ☎ +27 12 420 3939
- 👤 Co-supervisor of MSc, PhD and Post-Doctoral Fellowship
- 📍 FABI, University of Pretoria, Private bag X20, Hatfield, 0028, South Africa

Professor Martin Coetzee

- ✉ Associate Professor, Division Genetics, Department of Biochemistry, Genetics and Microbiology, University of Pretoria
- ✉ Martin.coetzee@fab.up.ac.za
- ☎ +27 12 420 4826
- 👤 Line manager overseeing Lab manager duties
- 📍 FABI, University of Pretoria, Private bag X20, Hatfield, 0028, South Africa

Dr. Seonju Marincowitz

- ✉ Forestry and Agricultural Biotechnology Institute Culture Collections Curator
- ✉ Seonju.marincowitz@fab.up.ac.za
- ☎ +27 12 420 5827
- 👤 Line manager overseeing microscopy duties
- 📍 FABI, University of Pretoria, Private bag X20, Hatfield, 0028, South Africa