

Wilma Nel, PhD

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

PERSONAL INFORMATION

Full name: Wilma Janine Nel
Date of Birth: 22 November 1992

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Languages: English and Afrikaans
Citizenship: Dual South African/Dutch

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EDUCATION

2011 – 2014

Bachelor of Science (BSc): Microbiology
University of Pretoria

2015

Bachelor of Science Honours (BSc Hons): Microbiology
FABI, University of Pretoria

2016-2018

Master of Science (MSc): Microbiology
Cum laude (81%)
FABI, University of Pretoria

2018-2021

Doctor of Philosophy (PhD): Microbiology
FABI, University of Pretoria

2021 – Present

Post-Doctoral Research Fellow
FABI, University of Pretoria

RESEARCH OUTPUTS: PEER REVIEWED PUBLICATIONS

P.W. CROUS, ... W.J. NEL, et al. (2021) Fungal Planet description sheets: 1284-1382. *Persoonia – Molecular Phylogeny and Evolution of Fungi*. 47: 1284-1382. 10.3767/persoonia.2021.47.06

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 *Annulohyphoxylon 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

NEL WJ, DE BEER ZW, WINGFIELD MJ, HULCR J, JOHNSON AJ, DUONG TA. A checklist of bark and ambrosia beetles occurring in South Africa. *Zootaxa*. 2022. In Prep.

FELL S, DE BEER ZW, WINGFIELD MJ, HULCR J, JOHNSON AJ, NEL WJ. A new genus and species of Ipini ambrosia beetle (Coleoptera: Scolytinae) from South Africa. *Insects*. 2022. In Prep.

RESEARCH OUTPUTS: CONFERENCE ABSTRACTS

- 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. 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 the 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.
- 2018** T. PAAP, Z.W. DE BEER, D. MIGLIORINI, W.J. NEL, M.J. WINGFIELD
First report of the polyphagous shothole borer (PHSB) and its fungal symbiont in South Africa (Oral Presentation – 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 (Oral Presentation – Presented by F. Mthunzi). South African Society for Systematic Biology (SASSB).
- 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** Z.W. DE BEER, H. DE BRUIN, W.J. NEL, B. SLIPPERS
A survey of entomopathogenic *Beauveria* spp. in South African plantations (Poster Presentation – 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* (Poster Presentation – Presented by Z.W. de Beer). XIX International Botanical Congress
- 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
Fungicolous 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

- 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

AWARDS, BURSARIES AND SCHOLARSHIPS

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| 2018 – 2020 | National Research Foundation: Freestanding PhD bursary |
| 2018 - Current | University of Pretoria: Postgraduate bursary (PhD) |
| 2018 | Forestry and Agricultural Biotechnology Institute: Mentorship award |
| 2018 | Mycological Society of America: Mentorship student travel award |
| 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 | University of Pretoria: Postgraduate bursary (MSc) |
| 2017 | National Research Foundation: Scarce skills bursary linked travel award |
| 2016 - 2017 | National Research Foundation: Scarce skills masters bursary |

MEMBERSHIPS

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| 2016 – 2021 | South African Society for Plant Pathology (SASPP) |
| 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 RELEVANT EXPERIENCE

Research Techniques

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.

Teaching & Tutoring

2016 – current: Second year Microbiology (MBY251 & MBY 261)

2018 – 2020: Honours techniques course

2015: First year Microbiology (MBY 161)

Workshops Attended

2018: Metagenomics/meta-transcriptomics Workshop

2017: GATK Workshop

2016: FABI Advanced Phylogenetics Workshop

2016: Microsatellite Workshop

Other

September 2021 – current: Post-Doc representative on FABI managing committee

2017 – Current: Lab Manager

2021: Contributor to CABI invasive species compendium datasheet on *Berkeleyomyces basicola*

2016 – 2020: FABI work experience programme

2019: Assisted and participated in NST/NRF bark beetle blitz workshop (Hosted by FABI)

2019: Fusarium inoculation and pathogenicity trials

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

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

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

2017: *Ceratocystis fimbriata* Genome annotation jamboree

2014: Mentorship student in the Department of Microbiology and Plant Pathology

ACADEMIC REFERENCES

Professor Michael Wingfield

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

Professor Wilhelm de Beer

- 📧 Associate Professor, Division Microbiology, Department of Biochemistry, Genetic and Microbiology, University of Pretoria
- ✉️ Wilhelm.debeer@fabi.up.ac.za
- ☎️ +27 12 420 6026
- 👤 Primary advisor BSc(Hons) & MSc degrees, Co-supervisor PhD degree
- 📍 FABI, University of Pretoria, Private bag X20, Hatfield, 0028, South Africa

Professor Martin Coetzee

- 📧 Associate Professor, Division Genetics, Department of Biochemistry, Genetic and Microbiology, University of Pretoria
- ✉️ Martin.coetzee@fabi.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@fabi.up.ac.za
- ☎️ +27 12 420 5827
- 👤 Line manager overseeing microscopy duties
- 📍 FABI, University of Pretoria, Private bag X20, Hatfield, 0028, South Africa