



Minette Havenga

Researcher: Plant Protection

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SKILLS AND RESEARCH EXPERTISE

Research expertise:	Fungal and bacterial identification	Tree pathogen disease identification	Pathogenicity trials
Microscopy	Disease development studies	Biological control agent assays	Phylogenetics
Molecular diagnostics	Polymerase Chain Reaction (PCR) troubleshoot	RNA and DNA extraction	Primer design
Microsatellite marker development	NGS data analyses	Genome assembly and annotation	Transcriptome assembly and annotation
Population genetics	Transcriptomics	Genomics	Gene expression profiling
Software:	Microsoft office	Geneious Prime	R (statistics)
Linux command line	Inkscape design tool	Libre office	Photoshop (basic)



EDUCATION

Ph.D. Genetics

University of Pretoria, South Africa

February 2018 - August 2021

- **Project title:** Biology and pathology of the *Eucalyptus* foliar pathogen, *Teratosphaeria destructans*
- The aggressive leaf and shoot pathogen, *Teratosphaeria destructans* causes widespread damage to *Eucalyptus* plantations in tropical and sub-tropical regions of South East Asia and most recently South Africa. Little is known regarding the biology or pathology of this pathogen.
- This study aimed to use NGS technology to investigate the mating strategy, genetic diversity, origin, dispersal pathways recombination potential, genes involved in pathogenicity and genes involved in signalling for compatible sexual partners.
- Three genomes were sequenced and used to: 1) characterise mating type locus 2) develop mating type primers 3) develop microsatellite markers 4) design a rapid diagnostic PCR tool 5) identify genes and pathways involved in pathogenicity 6) map RNAseq data and 7) explore gene expression patterns between different conditions 8) identify pheromones, pheromone receptors and G-coupled signalling.
- Peer-reviewed publications directly or indirectly from Ph.D. research: Four first-author published papers, one first-author paper submitted and three co-author publications (two published and one in press)
- Oral or poster presentations: Four international and seven local conferences



MSc Plant Pathology (Cum laude)

Stellenbosch University, South Africa

February 2015 - December 2016

- **Project title:** Occurrence of canker and wood rot pathogens in young apple trees and possible sources of inoculum
- The aim was to investigate the phytosanitary status of apple nursery trees and assess whether propagation material acts as an inoculum source for stem canker pathogens.
- Forty-five canker and wood rot pathogens were identified at high levels in all propagation material and nursery trees. Latent infections in combination with suboptimal horticultural practices led to the significant increase in young orchard deaths.
- This work included pathogenicity trials (detached shoot assays and on living apple trees)
- Publications from MSc research: One peer-reviewed paper and three popular articles
- Oral or poster presentations: One international and four local conferences

BSc (Agric) Viticulture and Plant Pathology (Final year Cum laude)

Stellenbosch University, South Africa

February 2011 - December 2014

- **Subjects:** Plant Pathology, Viticulture, Crop production, Crop protection, Oenology, Entomology, Nematology, Soil Science, Chemistry, Mathematics, Biology, Physics, Biochemistry and Biometry
- Plant Pathology thesis title: Screening of *Trichoderma* species isolates for potential biological control agents against several pathogen species that cause black foot disease on grapevines (Cum laude)
- Viticulture thesis title: Evaluating factors affecting the rooting ability and callus formation in grafted grapevines (Cum laude). Awarded best project and oral presentation for the department of Viticulture and Oenology



WORK EXPERIENCE

Researcher: Plant Protection

Agricultural Research Council: Infruitec-Nietvoorbij

December 2021 - present

Tasks/Achievements

- Fruit tree Plant Pathologist that work alongside the grapevine pathology group to expand Infruitec-Nietvoorbij's research capacity in the grapevine and fruit industries
- Initiate, conduct, coordinate and manage research project

BioExcel course facilitator

Natural Science Faculty, Stellenbosch University

January 2021 - Present

Tasks/Achievements

- Assign and manage BioExcel tutors, enroll students, manage SunLearn page, manage queries, concerns and complaints

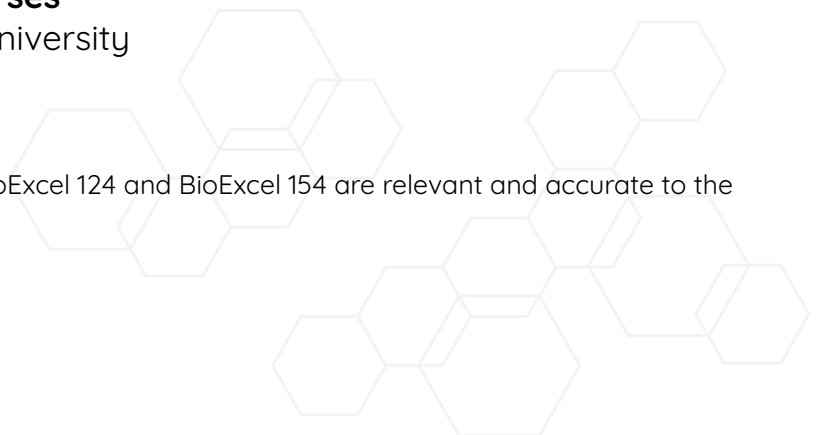
Translator and editor for Biology courses

Natural Science Faculty, Stellenbosch University

January 2020 - December 2020

Tasks/Achievements

- Assess whether study content and activities of BioExcel 124 and BioExcel 154 are relevant and accurate to the Biology curriculum
- Translate content to Afrikaans





WORK EXPERIENCE

Plant Pathologist

BioScience Research

July - November 2017

Tasks/Achievements

- Capturing field trial data for fungicide and pesticide trials and subsequent report writing

Technical research assistant

Department of Plant Pathology, Stellenbosch University

January - April 2017

Tasks/Achievements

- Assist and train new MSc and Honours students
- Basic laboratory skills: Sampling, media and buffer preparations, pathogen isolations, microscopy and laboratory etiquette
- Molecular laboratory skills: DNA extraction, PCRs, clean-up reactions, phylogenetic analyses and pathogen identification

Technical research assistant of final year Plant Pathology project

Department of Plant Pathology, Stellenbosch University

2016

Tasks/Achievements

- Train and assist five final year Plant Pathology students in their final year thesis
- Project title : Evaluating the diversity of Anthracnose pathogens found on diseased olives

Postgraduate Student Representative

Department of Plant Pathology, Stellenbosch University

January - December 2016

Tasks/Achievements

- Express postgraduate student concerns to Academic staff
- Organise all social events including year-end function

Viticulture intern

Vititec, Paarl

January - February and June - August 2014

Tasks/Achievements

- ELISA tests for grapevine leaf roll virus
- Summer months: Evaluated new table and wine grape clones for favourable characteristics, canopy managements and retrieving and counting mealy bug spore traps
- Winter months: Prepare propagation material for grafting, fungal dips and potting of plants



ACCREDITED SHORT COURSES

Bioinformatics for Molecular Biologist (Bfx 4 mol Bio)

Thermo Fisher Scientific

21-25 June 2021

Tasks/Achievements

- This hands-on training week focused on efficiently working in different coding languages/platforms that are becoming more common for molecular biologists to use
- These included Linux, MySQL, Perl and Python
- Awaiting official certificate - attached signed participation report



ACCREDITED SHORT COURSES

Learning facilitation training level 2

Centre for Teaching and Learning, Stellenbosch

April - September 2020

Tasks/Achievements

- This course is aimed at teaching how to teach higher education science
- Plan and present a science class which was prepared using the Legitimation Code Theory
- Assess teaching strategy using the Teaching Perspectives Inventory (TPI) tool
- Certificate in academic transcript

Learning facilitation training level 1

Centre for Teaching and Learning, Stellenbosch

April - September 2018

Tasks/Achievements

- This course is aimed at teaching higher education science
- Focused on different teaching styles, getting students motivated using Self Determination Theory and problem solving
- Certificate in academic transcript

Scientific article writing workshop

Centre for Teaching and Learning, Stellenbosch

November 2015

Tasks/Achievements

- How to plan, structure and write a scientific manuscript for publication
- Certificate in academic transcript



WORKSHOPS PRESENTED AND STUDENT TRAINING

Presented the workshop: "Navigating SunLearn. A teaching tool during the pandemic"

Natural Science Faculty, Stellenbosch University

2020

- Developed and presented a zoom training workshop for BioExcel tutor in the Natural Science faculty
- Due to COVID-19, we had to move to an online teaching platform
- The workshop aimed to train Biology tutors to use Sunlearn to create learning content, quizzes, activities and information pages for first-year Biology courses

Presented a Geneious phylogenetic workshop

Department of Plant Pathology, Stellenbosch University

2020

- Developed and presented a Zoom training workshop for the Department of Plant Pathology
- An introduction course on: assessing the quality of DNA sequences; finding appropriate reference sequences; trimming poor reads; alignments and phylogenetic trees

Co-supervisor of Miss Inge Block

Department of Plant Pathology, Stellenbosch University

January 2020 - December 2020

- BSc Honours (Plant Pathology)
- Project title: *Phaeoacremonium* species and mating type characterisation



Biology tutor

Natural Science Faculty, Stellenbosch University

January 2018 - present

- BioExcel 124 and BioExcel 154 courses are aimed to bridge the gap between Highschool and First-year Biology
- In person teaching for smaller groups (30-35 students)
- Due to the pandemic, we have created online activities, additional videos and tutoring support to 40 students per tutor
- Topics discussed in sessions: Biotechnology, Cytology, Genetics, Animal science, Plant science and Evolution

Tutor and demonstrator in Plant Pathology

Department of Plant Pathology, Stellenbosch University

January - December 2015

- Teach basic laboratory techniques for introductory Plant Pathology classes PP314 and PP344
- Koch postulates, pathogen identification, inoculation trials and *in vitro* assays



PUBLICATION RECORD

Peer-review publication

Genetic response to nitrogen starvation in the aggressive *Eucalyptus* foliar pathogen *Teratosphaeria destructans*

Author(s)

Havenga, M., Wingfield, B.D., Wingfield, M.J., Dreyer, L.L., Roets, F. and Aylward, J.

Date of Publication

2021

Current Genetics DOI: doi.org/10.1007/s00294-021-01208-w

Peer-review publication

Genetic diversity of *Teratosphaeria pseudoeucalypti* in *Eucalyptus* plantations in Australia and Uruguay

Author(s)

Aylward, J., Havenga, M., Dreyer, L.L., Roets, F., Wingfield, B.D., Pérez, C.A., Ramírez-Berrutti, N., Carnegie, A.J. and Wingfield, M.J.

Date of Publication

2021

Australasian Plant Pathology DOI: <https://doi.org/10.1007/s13313-021-00800-5>

Peer-review publication

Diagnostic markers for *Teratosphaeria destructans* and closely related species.

Author(s)

Havenga, M., Wingfield, B.D., Wingfield, M.J., Dreyer, L.L., Roets, F. and Aylward, J.

Date of Publication

October 2020

Forest Pathology 50(6), e12645. DOI: <https://doi.org/10.1111/efp.12645>

Peer-review publication

First report of *Didymosphaeria rubi-ulmifolii* associated with canker and dieback of apple trees in southern Ethiopia

Author(s)

Yirgu, A., Gezahgne, A., Alemu, T., Havenga, M. and Mostert, L.

Date of Publication

2021

Phytopathologia Mediterranea 60(2): 55-62

Peer-review publication

Genetic recombination in *Teratosphaeria destructans* causing a new disease outbreak in Malaysia

Author(s)

Havenga, M., Wingfield, B.D., Wingfield, M.J., Marincowitz, S., Dreyer, L.L., Roets, F., Japarudin, Y. and Aylward, J.

Date of Publication

March 2021

Forest Pathology, e12683. DOI: <https://doi.org/10.1111/efp.12683>

Peer-review publication

Low genetic diversity and strong geographic structure in introduced populations of the *Eucalyptus* foliar pathogen *Teratosphaeria destructans*.

Author(s)

Havenga, M., Wingfield, B.D., Wingfield, M.J., Dreyer, L.L., Roets, F., Chen, S.F. and Aylward, J.

Date of Publication

June 2020

Plant Pathology 69(8):1540-1550 DOI: <https://doi.org/10.1111/ppa.13235>



Peer-review publication

Mating strategy and mating type distribution in six global populations of the Eucalyptus foliar pathogen Teratosphaeria destructans

Author(s)

Havenga, M., Chen, S., Wilken, P.M., Duong, T.A., Tatham, C.T., Dreyer, L.L., Roets, F., Wingfield, M.J., Wingfield, B.D. and Aylward, J.

Date of Publication

April 2020

Fungal Genetics and Biology 137:103350. DOI:

<https://doi.org/10.1016/j.fgb.2020.103350>

Peer-review publication

Genomic characterization of mating type loci and mating type distribution in two apparently asexual plantation tree pathogens.

Author(s)

Aylward, J., Havenga, M., Dreyer, L.L., Roets, F., Wingfield, B.D. and Wingfield, M.J.

Date of Publication

September 2019

Plant Pathology 69:28-37 DOI:

<https://doi.org/10.1111/ppa.13094>

Peer-review publication: in press

Novel mating type-associated genes and gene fragments in Mycosphaerellaceae and Teratosphaeriaceae genomes

Author(s)

Aylward, J., Havenga, M., Wingfield, B.D., Wingfield, M.J., Dreyer, L.L., Roets, F. and Steenkamp, E.T.

Date of Publication

in press

Molecular Phylogenetics & Evolution

Popular article

Kern- en steenvrugtebome huisves wingerd stamsiekte patogene.

Author(s)

Mostert, L., Damm, U., Cloete, M., Havenga, M., Halleen, F., Crous, P. and Fourie, P.

Date of Publication

October 2016

Winelands October 2016

Peer-review publication

Canker and Wood Rot Pathogens Present in Young Apple Trees and Propagation Material in the Western Cape of South Africa.

Author(s)

Havenga, M., Gatsi, G.M., Halleen, F., Spies, C.F.J., van der Merwe, R. and Mostert, L.

Date of Publication

October 2019

Plant Disease 103:3129-3141 DOI:

<https://doi.org/10.1094/PDIS-04-19-0867-RE>

Peer-review publication

Nine draft genome sequences of Claviceps purpurea s.lat., including C. arundinis, C. humidiphila, and C. cf. spartinae, pseudomolecules for the pitch canker pathogen Fusarium circinatum, draft genome of Davidsoniella eucalypti, Grosmannia galeiformis, Quambalaria eucalypti, and Teratosphaeria destructans.

Author(s)

Wingfield, B.D., Kolarik, M., Menzies, J.G., Naidoo, K., Pochopski, O., Shoukouhi, P., Santana, Q.C., Seifert, K.A., Soal, N.A., Steenkamp, E.T., Tatham, C.T., van der Nest, M.A., Havenga, M., Findlay, W., Liu, M., Nguyen, H.D.T., Lane, F.A., Morgan, S.W., de Vos, L., Wilken, P.M., Doung, T.A., Aylward, J., Coetzee, M.P.A., Dadej, K., de Beer, Z.W. and Wingfield, M.J.

Date of Publication

December 2018

IMA Fungus 9(2):401-418 DOI:

<https://doi.org/10.5598/imafungus.2018.09.02.10>

Popular article

Canker and wood rot pathogens in young apple trees and propagation material.

Author(s)

Havenga, M., Gatsi, G.M., Halleen, F., Spies, C.F.J., van der Merwe, R. and Mostert, L.

Date of Publication

April 2020

Fruit Journal 19; April/May:50-53.

<https://www.safj.co.za/publication/sa-fruit-journal>

Popular article

What is the phytosanitary status of nursery trees?

Author(s)

Mostert, L., Ferreira, J., van Zyl, F. and Havenga, M.

Date of Publication

February 2016

Fruit Journal February/March 2016





South African Society of Plant Pathology (SASPP) virtual conference (2021)

Havenga, M., Wingfield, B.D., Wingfield, M.J., Dreyer, L.L., Roets, F. and Aylward, J.

- Title of oral presentation: Diagnostic markers for *Teratosphaeria destructans* and closely related species
- South Africa, virtual conference

National Symposium on Biological Invasions (2021)

Havenga, M., Wingfield, B.D., Wingfield, M.J., Dreyer, L.L., Roets, F. and Aylward, J.

- Title poster presentation: Population biology of the exotic foliar pathogen *Teratosphaeria destructans* in South Africa and South East Asia
- South Africa, virtual conference

Young Systematists' Forum (2020)

Havenga, M., Wingfield, B.D., Wingfield, M.J., Dreyer, L.L., Roets, F. and Aylward, J.

- Title of oral presentation: Association among global populations of the *Eucalyptus* foliar pathogen *Teratosphaeria destructans*
- UK, virtual conference

30th Fungal Genetics Conference (2019)

Havenga, M., Roets, F., Dreyer, L.L., Wingfield, B.D., Wingfield, M.J. and Aylward, J.

- Title of poster presentation: Mating strategy and mating type distribution of economically important *Teratosphaeria* pathogens
- Pacific Grove, California, USA

DST-NRF Centre of Excellence in Tree Health Biotechnology (CTHB) (2019)

Havenga, M., Dreyer, L.L., Roets, F., Wingfield, B.D., Wingfield, M.J., Aylward, J.

- Title of oral presentation: *Teratosphaeria destructans* genomes, mating types and global populations. What do we know thus far?
- Pretoria, South Africa

Australasian Plant Pathology Society Conference 2019 (2019)

Aylward, J., Havenga, M., Wingfield, B.D., Roets, F., Dreyer, L.L. and Wingfield, M.J.

- Title of oral presentation: Mating types of *Teratosphaeria* leaf and stem pathogens of plantation-grown *Eucalyptus*
- Melbourne, Australia

50th Anniversary Congress of the Southern African Society for Plant Pathology (2017)

Havenga, M., Mostert, L. and Halleen, F.

- Title of oral presentation: Occurrence of stem canker and wood rot pathogens in young apple trees and possible inoculum sources.
- Runner-up for best oral presentation at the conference
- Drakensberg, South Africa

32th Annual meeting of the Tree Protection Co-operative programme (TPCP) and the DST-NRF centre of excellence in plant health biotechnology (CPHB) hybrid meeting (2021)

Aylward, J. and Havenga, M.

- Title of oral presentation: The importance of considering population genetics of tree pathogens: A *Teratosphaeria destructans* perspective
- South Africa, virtual conference

South African Society for Bioinformatics (SASBi) Student Council Online Student Symposium (2020)

Havenga, M., Wingfield, B.D., Wingfield, M.J., Dreyer, L.L., Roets, F. and Aylward, J.

- Title of oral presentation: Reproductive biology of a globally important *Eucalyptus* foliar pathogen
- Runner-up best presentation at conference
- South Africa, virtual conference

Mycological Society of America (MSA): Mycology from the Cloud (2020)

Havenga, M., Wingfield, B.D., Wingfield, M.J., Dreyer, L.L., Roets, F. and Aylward, J.

- Title of poster presentation: Reproductive strategy of the *Eucalyptus* foliar pathogen *Teratosphaeria destructans*
- Mycological Society of America's Virtual Meeting

51st Congress of the Southern African Society of Plant Pathology (SASPP) (2019)

Havenga, M., Roets, F., Dreyer, L.L., Wingfield, B.D., Wingfield, M.J. and Aylward, J.

- Title of oral presentation: Elucidation of the mating strategy and mating type distribution of the *Eucalyptus* leaf pathogen *Teratosphaeria destructans* from six countries
- Third place for best presentation at the conference
- Langebaan, South Africa

30th Annual meeting of the Tree Protection Co-operative programme (TPCP) and the DST-NRF centre of excellence in tree health biotechnology (CTHB) (2019)

Aylward, J. and Havenga, M.

- Title of oral presentation: Understanding the biology of *Teratosphaeria destructans*
- Pretoria, South Africa

International Congress of Plant Pathology (ICPP) 2018: Plant Health in a Global Economy (2018)

Havenga, M., Gatsi, G., Halleen, F., Spies, C., Van der Merwe, R. and Mostert, L.

- Title of poster presentation: A diversity of canker and wood rot pathogens associated with young apple trees and propagation material in South Africa
- Boston, United States of America

HORTGRO Science Technical Symposium (2016)

Mostert, L., Havenga, M., Coertze, S., Jensen, T. and Wessel, B.

- Title of oral presentation: What is the status of stem cankers on our nursery trees, how does it compare to other industries and can we do anything about it?
- Simondium, South Africa



CONFERENCE OUTPUTS

SASEV International Conference (2016)

Mostert, L., Damm U., Cloete, M., Havenga, M. and Halleen, F.

- Title of poster presentation: Pome and stone fruit trees harbour grapevine trunk disease pathogens
- Somerset west, South Africa

Hortgro Science. The Technology Collective, Technical Symposium (2015)

Mostert, L., Havenga, M., Coertze, S., Jensen, T. and Wessel, B.

- Title of oral presentation: New study on stem cankers in young apple orchards
- Simondium, South Africa



AWARDS

Runner-up best presentation at SASBi conference (2020)

South African Society for Bioinformatics (SASBi)

- Title of oral presentation: Reproductive biology of a globally important *Eucalyptus* foliar pathogen

Runner-up for best presentation at SASPP conference (2017)

50th Anniversary Congress of the Southern African Society for Plant Pathology

- Title of oral presentation: Occurrence of stem canker and wood rot pathogens in young apple trees and possible inoculum sources.

Best Viticulture project (2014)

Viticulture and Oenology Department, Stellenbosch University

- Awarded for the best undergraduate final year project in Viticulture.
- For the project: Evaluating factors affecting the rooting ability and callus formation in grafted grapevines.

Golden Key Honour Society (2011 - Present)

Name of the institution that issued/awarded it

- Rewarded to the top 15% academic performing students

Third place for best presentation at SASPP conference (2019)

51st Congress of the Southern African Society of Plant Pathology (SASPP)

- Title of oral presentation: Elucidation of the mating strategy and mating type distribution of the *Eucalyptus* leaf pathogen *Teratosphaeria destructans* from six countries

Presentation of the year (2015)

Department of Plant Pathology, Stellenbosch University

- Awarded to one postgraduate student for the best oral presentation given in the year 2015.
- Title of presentation: Investigating stem cankers and dieback of young apple trees and possible inoculum sources.

Best final year project presentation (2014)

Viticulture and Oenology Department, Stellenbosch University

- Awarded for the best undergraduate oral presentation in Viticulture or Oenology.
- Title of presentation: Evaluating factors affecting the rooting ability and callus formation in grafted grapevines.



ORGANIZATIONS

South African Society of Plant Pathology (SASPP) (2015 - Present)

South African Society of Plant Pathology - Graduate and Early Career Researcher (ECR) Chapter (2021 - Present)

A few young researchers from across South Africa decided to start a early career researcher chapter to promote plant pathology as a subject area and support young researchers through skill development and networking. The chapter has not been launched yet but has been proposed to the SASPP board.

The American Phytopathological Society (APS) African Division (2021 - Present)

South Africa Society of Bioinformatics (SASBi) (2020)

Mycological Society of America (MSA) (2020)

Genetic Society of America (GSA) (2019 - 2020)



LANGUAGES

English and Afrikaans

Full Professional Proficiency



Dr. Janneke Aylward

"Senior Postdoctoral Research Fellow at the Department of Biochemistry, Microbiology and Genetics at the University of Pretoria. Dr. Aylward is my primary Ph.D. supervisor"

Contact : janneke@sun.ac.za / janneke.aylward@fabi.up.ac.za - +27 76 948 2033

Prof. Lizel Mostert

"Professor and Department head at the Department of Plant Pathology, Stellenbosch University"

Contact : lmst@sun.ac.za - +27 21 808 3397

Prof. Mike Wingfield

"Founding Director of Forestry and Agricultural Biotechnology Institute (FABI) at University of Pretoria"

Contact : mike.wingfield@up.ac.za - + 27 12 420 3938

Prof. Leanné Dreyer

"Professor at Department of Botany and Zoology, Stellenbosch University"

Contact : ld@sun.ac.za - +27 82 894 3338

