

# Arista Fouché (nee. Fourie)

Genetics, Plant-pathogen interactions, Microbiome



## PERSONAL INFO

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### Website

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**ORCID** 0000-0003-4931-7626

### Location

Pretoria, South Africa

### Languages

English  
Afrikaans

### Date of birth

14 April 1989

## TECHNICAL SKILLS

Genomics (assembly, annotation, comparisons)

Metabarcoding and Metagenomics

Linux-based bioinformatics

Mycology

Microsatellite development, population genetics

Genome re-seq and SNP identification

Quantitative genetics

Phylogenetics

Pathogenicity trials

## Personal profile

My research interest is in unravelling the interactions between pathogens, symbionts and their host organisms, with a specific focus on the genetic and molecular foundation of these interactions. My personal goal is to use this knowledge to contribute to the improvement of plant health and ensure global food security. I am a very committed person with strong loyalty to my work and relationships. I have a passion for mentoring and investing in younger researchers. My hobbies are bird watching, hiking and other outdoor activities.

## Education

### PhD Genetics

University of Pretoria  
Graduated 2019

### MSc Genetics

University of Pretoria  
Graduated 2014

### BSc Hons Genetics

University of Pretoria  
Graduated 2011

### BSc Human Genetics

University of Pretoria  
Graduated 2010

## Experience

**Postdoc** at The Macadamia Protection Programme, FABI, University of Pretoria

August 2019 - Current

**Project: Investigating the gut content of the two-spotted stink bug to develop alternative control methods.** Developing a detection assay to detect the plant material that the insects feed on to identify alternative hosts. Secondly to determine the gut microbiome of the insects in different environments and life stages. The genomes of the bacterial symbionts were also sequenced, using metagenomics, to predict potential functional roles inside the host gut.

**PhD** at Tree Protection Co-operative program, FABI, University of Pretoria

Jun 2014 - Apr 2019

**Project: Quantitative genetics and comparative genomics of two *Ceratocystis* pathogens to determine genetic factors influencing host specificity.** This study included inheritance studies and QTL analyses from a cross between two species, pathogenic to different hosts. In addition, the genomes of the two species were compared to identify genomic differences likely contributing to distinct plant host ranges.

**Hons (BSc. Genetics) and MSc Genetics** at Tree Protection Co-operative program, FABI, University of Pretoria

2011, 2012-2014

**Project: Development of phylogenetic markers for the accurate identification of species in the *Ceratocystis sensu lato* species complex.** This was focused on evaluating the efficiency of various genetic markers as well as SNP markers to accurately distinguish between cryptic species in this species complex, on a phylogenetic basis.

## STRENGTHS

Responsibility

Truth

Thinker

Planner

Goal-focused

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## Supervision

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**Mentoring undergraduate students:** Three undergraduate students (2013, 2015, 2016) as part of a mentorship program

**Postgraduate supervision:**

Advisor and mentor: 3 BSc (Hons) students

2 MSc students (1 Genetics, 1 Forestry Sciences)

Co-supervisor: 2 BSc (Hons) students (1 Genetics, 1 Microbiology)

1 MSc Microbiology student (current)

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## Funding

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- Postdoctoral fellowship with Macadamia South Africa (SAMAC) (2019-2020)
- International Congress of Plant Pathology 2018 assistance bursary (2018)
- CHPC Introductory programming school attendance funding (2018)
- UP Postgraduate study abroad bursary (2016)
- NRF Scarce Skills Doctoral Scholarship travel grant (2016) – 3 month visit to Gent University
- NRF Scarce Skills Doctoral Scholarship (2014-2016)
- NRF Innovation Master's scholarship (2013)
- NRF Achievement bursary award (2011)

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## Workshops attended

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- The collection and preservation of insect specimens, 18-20 February 2020.
- Metagenomics training course "From structure to Function: Ecology of Microbial Communities", 3-6 June 2019.
- Centre for High Performance Computing (CHPC) Introductory Programming school, 15-20 January 2018.
- Genome annotation and comparison workshop, 13-16 November 2017.
- GATK and bioinformatics workshop, 13-15 September 2016.
- GATK workshop, 22-26 June 2015.
- RNA-seq analysis workshop: Genome analysis in the post NGS era, 4-6 Nov 2014.
- Genomics Workshop, 29 Sep- 3 Oct 2014.
- CLC Genomics workbench "Hands on" Workshop, 11-12 May 2013.
- Advanced Phylogenetics workshop, 21-25 May 2012.
- Introductory Phylogenetics Workshop, 14-17 May 2012. Presented by Dr. Jane Wright at Forestry and Agricultural Biotechnology Institute (FABI), University of Pretoria.

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## Publications

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1. **Fourie A**, de Jonge R, van der Nest MA, Duong TA, Wingfield MJ, Wingfield BD, Barnes I. 2020. Genome comparisons suggest an association between *Ceratocystis* host adaptations and effector clusters in unique transposable element families. *Fungal Genetics and Biology* 143: 103433.
2. Roux J, Wingfield MJ, **Fourie A**, Noeth K, Barnes I. 2020. Ceratocystis wilt on Eucalyptus: first record from South Africa. *Southern Forests: A Journal of Forest Science*. 10.2989/20702620.2019.1686687
3. Li JQ, Wingfield BD, Wingfield MJ, Barnes I, **Fourie A**, Crous PW, Chen SF. 2020. Mating genes in *Calonectria* and evidence for a heterothallic ancestral state. *Persoonia - Molecular Phylogeny and Evolution of Fungi* 45: 163-176
4. Wingfield BD, **Fourie A**, Simpson MC, Bushula-Njah VS, Aylward J, Barnes I, Coetzee MPA, Dreyer LL, Duong TA, Geiser DM, Roets F, Steenkamp ET, van der Nest MA, van Heerden CJ, Wingfield MJ. 2019. IMA Genome-F 11 draft genome sequences of *Fusarium xylarioides*, *Teratosphaeria gauchensis* and *T. zuluensis* and genome annotation for *Ceratocystis fimbriata*. *IMA Fungus* 10. <https://doi.org/10.1186/s43008-019-0013-7>
5. **Fourie A**, van der Nest MA, De Vos L, Wingfield MJ, Wingfield BD, Barnes I. 2019. QTL mapping of mycelial growth and aggressiveness to distinct hosts in *Ceratocystis* pathogens. *Fungal Genetics and Biology* 131:103242.
6. Bradshaw RE, Sim AD, Chettri P, Dupont P-Y, Guo Y, Hunziker L, McDougal RL, van der Nest A, **Fourie A**, Wheeler D, Cox MP, Barnes I. (2019) Global population genomics of the forest pathogen *Dothistroma septosporum* reveal chromosome

- duplications in high dothistromin-producing strains. *Molecular Plant Pathology* 20: 784-799.
7. **Fourie A**, Wingfield MJ, Wingfield BD, Van der Nest MA, Loots MT, Barnes I. 2018. The inheritance of phenotypic traits in the progeny of a *Ceratocystis* interspecific cross. *Fungal Biology* 122:717-729.
  8. Barnes I, **Fourie A**, Wingfield MJ, Harrington TC, McNew DL, Sugiyama LS, Luiz BC, Heller WP, Keith LM. 2018. New *Ceratocystis* species associated with rapid death of *Metrosideros polymorpha* in Hawai'i. *Persoonia* 40:154–181.
  9. **Fourie A**, Wingfield MJ, Wingfield BD, Thu PQ, Barnes I. 2016. A possible centre of diversity in South East Asia for the tree pathogen, *Ceratocystis manginecans*. *Infection, Genetics and Evolution* 41:73-83.
  10. Crous PW, Wingfield MJ, Fourie A, et al. 2015. Fungal Planet description sheets: 320–370. *Persoonia* 34:167-266.
  11. **Fourie A**, Wingfield MJ, Wingfield BD, Barnes I. 2015. Molecular markers delimit cryptic species in *Ceratocystis sensu stricto*. *Mycological Progress* 14:1-18. 10.1007/s11557-014-1020-0.

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## References

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### Prof. Irene Barnes (PhD supervisor)

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University of Pretoria

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### Prof. Michael J. Wingfield (PhD co-supervisor)

Founding director: Forestry & Agricultural Biotechnology Institute &  
Tree Protection Co-operative Programme

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### Dr. Gerda Fourie (Current Postdoc advisor)

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Pretoria

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