

Curriculum Vitae

Name:	Dr Treena Burgess BAgSc (Hons) PhD (Biol)
Address:	School of Biological Sciences and Biotechnology Murdoch University Murdoch 6150
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Employment and Education History:

March 2003-present

Post Doctoral Fellow
Murdoch University, Perth, Western Australia

New and emerging pathogens threatening the biodiversity of Australia's eucalypts

Major Tasks:

- Conducting disease surveys of native eucalypt forests and plantations in Australia and Asia, isolating the pathogens and using classical and molecular taxonomy to identify fungi
- New species descriptions
- Collecting populations of several major pathogens and using polymorphic molecular markers to determine population structure, reproductive strategy and gene flow of these pathogens throughout the region. This information will be used to assess risk these pathogens pose to the biodiversity of Australia's eucalypts
- Running a workshop to train Asian colleagues in the isolation and classic and molecular identification of fungal pathogens (Jan 2004)
- Liaising with Government agencies and Forestry companies
- Continued collaboration with Forestry and Agriculture Institute in South Africa involving shared projects and student supervision. I am in the process of being appointed as an Adjunct Professor at the University of Pretoria
- Supervision of honours and PhD students as well as Environmental Plant Physiology projects

Jan 2002-Dec 2002

Post Doctoral Fellow
Murdoch University, Perth, Western Australia

Population genetics of *Botryosphaeria* spp associated with native and planted eucalypts in Western Australia

Major Tasks:

- Development of microsatellite markers for light spores *Botryosphaeria* sp associated with eucalypts
- Phylogenetic study of light spores *Botryosphaeria* sp associated with eucalypts and description of new species
- Collection of populations and comparison of gene flow between native eucalypt forests and plantation eucalypts
- Supervision of students on various plant pathology and forest pathology projects

Jan 2001-Dec 2001

Post Doctoral Fellow
Murdoch University, Perth, Western Australia

Investigating the role of soluble metal silicates as agricultural fungicides

Major Tasks:

- Development of glasshouse screening procedure for various host/pathogen combinations examination of phytotoxicity, efficacy, persistence and longevity of action and induced resistance of the various formulations, report writing

Jan 1999-Dec 2000

Post Doctoral Fellow
FABI, university of Pretoria, Pretoria, South Africa

Population diversity of the pine pathogen/endophyte *Sphaeropsis sapinea* and plantation disease diagnostics

Major Tasks:

- Development of polymorphic microsatellite markers for *S sapinea* and *L. theobromae*
- Markers used as a diagnostic tool to distinguish morphotypes of *S sapinea*
- Markers used to examine diversity of indigenous populations of *S sapinea* in North and Central America compared with introduced populations in the Southern hemisphere
- Markers used to examine the efficacy of quarantine in restricting the spread of forest pathogens
- Plantation disease surveys and diagnostics
- Co-supervision of four Masters and one PhD projects involved with the development of microsatellite markers for various important tree pathogens
- Supervision of a PhD project examining the role of *Phytophthora* in South African Forestry

June 1998-Dec 1998

Travelling

March 1995-June 1998

Post Doctoral Fellow,
Murdoch University, Perth, Western Australia

The role of temporary flooding and low oxygen levels on the biochemical and histological responses of *Eucalyptus marginata* to *Phytophthora cinnamomi*

Major Tasks:

- development of an aeroponics system to enable the manipulation of the gaseous environment of eucalypt roots
- design and maintenance of field trials to screen fungal isolates
- measurement of plant stress
- examination of root growth and infection development in roots inoculated with *Phytophthora cinnamomi*
- light microscopy
- protein extraction and enzyme analysis
- measurement of oxidative enzymes associated with defence induction pathways
- supervision of honours projects and undergraduate research projects (one project examined the influence of the inorganic fungicide phosphite on plant defence mechanisms - enzymes from the phenylpropanoid pathway were measured as was the accumulation and movement of salicylic acid, an indicator of systemic acquired resistance)

Sept-Dec 1994

Research Assistant
CSIRO Division of Forestry, Perth, Western Australia

Development of a rapid screening protocol to determine the pathogenicity of *Phytophthora cinnamomi* isolates.

Major Tasks:

- *Eucalyptus sieberi* seedlings were labelled *in vitro* with ³⁵S and the insolubilisation of wall proteins in response to the encystment of zoospores was examined

Feb 1991-Feb 1995

Doctor of Philosophy (Biology)
Murdoch University, Perth, Western Australia

Six months of the project was conducted at INRA, Nancy, France

Changes in protein biosynthesis associated with the development of *Pisolithus-Eucalyptus grandis* ectomycorrhizas

Major Tasks:

- Taxonomy of *Pisolithus* spp
- Screening of isolates for their aggressiveness in forming ectomycorrhiza
- Development of an *in vitro* system for the synthesis of eucalypt ectomycorrhiza and for ³⁵S radiolabelling of proteins
- The *in vitro* system was used to examine protein synthesis at different stages of mycorrhizal development following protein fractionation and 2D electrophoresis
- SEM and light microscopy
- 8 scientific publications based on thesis work

July 1989-Dec 1990

Travelling in Australia and Asia

June 1986-June 1989

Experimental Scientist
CSIRO Division of Forestry, Perth, Western Australia

The selection and manipulation of ectomycorrhizal fungi for plantation eucalypts in Western Australia

Major tasks:

- Fungal surveys of native and plant eucalypts
- Collection and isolation of fungi from eucalypts
- Maintenance of the culture collection
- Glasshouse screening of isolates
- Glasshouse experiments examining the effect of host genotype and environmental factors of development
- Design and maintenance of field trials to screen fungal isolates

Feb 1982-Feb 1986

Bachelor of Agricultural Science (Hons)
University of Tasmania

Awarded the Australian Institute of Agricultural Science Prize in 1985

Conferences presented at:

- ◆ 8th International Congress of Plant Pathology, Christchurch, NZ, February 2003
- ◆ 3rd Asian-Pacific Mycological Congress, Kunming, China, November 2002
- ◆ 13th Australasian Plant Pathology National Conference, Cairns, September 2001
- ◆ IUFRO Conference ' Forest Genetics for Next Millennium', Durban, October 2000
- ◆ South African Society of Plant Pathology, Grahamstown, January 2000
- ◆ 11th Australasian Plant Pathology National Conference, Perth, September 1997
- ◆ American Phytopathological Society, Indianapolis, July 1996
- ◆ 8th International Congress of Molecular Plant-Microbe Interactions, Knoxville, July 1996
- ◆ Australian Society of Plant Physiologists, Sydney, September 1995
- ◆ North American Conference on Mycorrhizae, Guelph, August 1994
- ◆ European Conference on Mycorrhizae, Prague, August 1989

Professional Development:

- ◆ Supervision of Honours, Masters and PhD students
- ◆ Senior Editor of Australasian Plant Pathology (from Dec 2003)
- ◆ Referee for plant pathology journals (Mycological Research, Australasian Plant Pathology, Plant Pathology)
- ◆ Thesis examination

Successful Grant Applications

- ◆ ARC-Discovery 2003-2006, New and emerging pathogens threatening the biodiversity of Australia's eucalypts. Chief Investigators, Burgess, Hardy, Dell and Wingfield (FABI, South Africa). I have been removed as a chief investigator as I now am paid off this grant **(\$270,000)**
- ◆ ARC-Linkage (APAI) 2003-2006, Linkage with Queensland forestry companies, Chief Investigators Burgess and Hardy **(\$120,000)**
- ◆ Crawford Foundation 2003 – funds to run a workshop on molecular identification of tree pathogens in Perth Jan 2004 with participants from China, Thailand, Philippines and Indonesia **(\$12,000)**. We will then collaborate with participant on other projects
- ◆ I am involved in two current ARC-Linkages (Tuart and Paulownia)

Teaching and Teaching Development

I have limited experience in lecturing having only given a few lectures each year in Environmental Plant Physiology at Murdoch University. However, I have had extensive experience in the preparation and presentation of talks at various conferences and I have given many seminars and held workshops. At Murdoch, I have supervised many students in ISC's and honours and they have all done well. Whilst in South Africa, I was responsible for training many African students in the basics of molecular biology and population genetics and was chosen to do this because I had the patience to do so. I feel that I am a good teacher capable of explaining complex issues simply. I can also compile and assimilate information rapidly which has been very useful as I have moved into new research areas, but would also be very useful for teaching across a variety of courses.

Referees

1. **Professor Mike Wingfield**
Forestry and Agriculture Biotechnology Institute
University of Pretoria
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South Africa
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2. **Professor Brenda Wingfield**
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3. **Dr Giles Hardy**
School of Biological Sciences
Murdoch University
Murdoch, 6150
ph 08 9360 6272 email: g-hardy@murdoch.edu.au

Publications:

1. Hardy, G E StJ, **Burgess, T**, Dell, B. (2003) Potential threats of plant pathogens to *Eucalyptus* plantations in China. In. *Eucalyptus Plantation Research, Management and Development. Proceedings of the International Symposium*. R.-P. Wei and D. Xu eds. World Scientific, Hong Kong pp. 358-368
2. de Wet, J, **Burgess, T**, Slippers, B, Wingfield, BD, Wingfield, MJ (2003) The use of multiple gene genealogies and microsatellites to describe a new species, *Diplodia scrobiculata* sp. nov. *Mycological Research*, **107**, 557-566
3. **Burgess, T**, Wingfield, MJ, Wingfield, BD (2003) Development and characterization of microsatellite loci for the tropical tree pathogen *Botryosphaeria rhodina*. *Molecular Ecology Notes* **3**, 91-94
4. **Burgess, T**, Wingfield, MJ (2002) Impact of fungi in natural forest ecosystems; A focus on *Eucalyptus*. In *Microorganisms in Plant Conservation and Biodiversity*, K Sivasithamparam, KW Dixon, RL Barrett eds Dordrecht, Kluwer Academic Publishers pp 285-306
5. **Burgess, T**, Wingfield, MJ (2002) Quarantine is important in restricting the spread of exotic seed-borne tree pathogens in the southern hemisphere *International Forestry Review*, **4**, 56-65
6. Zhou, X-D, **Burgess, T**, de Beer, ZW, Wingfield, BD, Wingfield, MJ (2002) Development of polymorphic microsatellite markers for tree pathogen and sapstain agent, *Ophiostoma ips*. *Molecular Ecology Notes*, **2**, 309-312
7. **Burgess, T**, Wingfield, MJ, Wingfield, BD (2001) Simple sequence repeat (SSR) markers distinguish between morphotypes of *Sphaeropsis sapinea*. *Applied and Environmental Microbiology*, **67**, 354-362
8. Barnes, I, Gaur, A, **Burgess, T**, Roux, J, Wingfield, BD, Wingfield, MJ (2001) Microsatellite markers and DNA sequence reflect relationships between isolates of the vascular wilt and canker pathogen *Ceratocystis fimbriata*. *Molecular Plant Pathology*, **2**, 319-327
9. Maseko, B, **Burgess, T**, Coutinho, T, Wingfield MJ (2001) First report of *Phytophthora nocotianae* associated with *Eucalyptus* die-back in South Africa. *Plant Pathology*, **50**, 413

10. **Burgess**, T, Wingfield, BD, Wingfield, MJ (2001) Comparison of genotypic diversity in native and introduced populations of *Sphaeropsis sapinea* isolated from *Pinus radiata*. *Mycological Research*, **105**, 1331-1339
11. **Burgess**, T, Wingfield, M (2001) Exotic pine forestry in the Southern Hemisphere: A brief history of establishment and quarantine practices. *South African Forestry Journal*, **192**, 79-84
12. Jackson, T, **Burgess**, T Colquhoun, I and Hardy, G E StJ (2000) Biochemical effects of the fungicide phosphite on *Eucalyptus marginata* inoculated with *Phytophthora cinnamomi*. *Plant Pathology*, **49** 147-154
13. **Burgess**, T, Hardy, G E StJ, Colquhoun, I and McComb, J A (1999) Increased susceptibility of *Eucalyptus marginata* to stem infection by *Phytophthora cinnamomi* resulting from root hypoxia. *Plant Pathology* **48**: 797-806
14. **Burgess**, T, Hardy, G E StJ, McComb, J A and Colquhoun, I (1999) Effects of hypoxia on root morphology and lesion development in *Eucalyptus marginata* infected with *Phytophthora cinnamomi*. *Plant Pathology* **48**: 786-796
15. **Burgess**, T, Collins, S, Hardy, G E StJ, Colquhoun, I and McComb, J A (1999) A survey of the frequency, duration and oxygen content of surface and sub-surface water during early vegetation rehabilitation at the Huntly minesite, Western Australia. Environmental Research Bulletin no 28, Alcoa of Australia
16. **Burgess**, T, McComb, J A, Hardy, G E StJ, and Colquhoun, I (1998) Influence of low oxygen levels in aeroponics chambers on eucalypt roots infected with *Phytophthora cinnamomi*. *Plant Disease* **82**: 368-373
17. **Burgess**, T, McComb, J, Hardy, G, (1997) Response of *Eucalyptus marginata* (Jarrah) to simulated waterlogging and *Phytophthora cinnamomi* infection. *Acta Horticulture* **447**, 401-406
18. **Burgess**, T, Dell, B and Malajczuk, N (1996) *In vitro* synthesis of *Pisolithus-Eucalyptus* ectomycorrhizas: synchronisation of lateral tip emergence and ectomycorrhizal development. *Mycorrhiza* **6**: 189-196
19. **Burgess**, T and Dell, B (1996) Changes in protein biosynthesis during the differentiation of *Pisolithus-Eucalyptus grandis* ectomycorrhizas. *Canadian Journal of Botany* **74**: 553-560
20. Martin, F, Laurent, P, de Carvalho, D, **Burgess**, T, Murphy, P, Nehls, U and Tagu, D (1995) Fungal gene expression during ectomycorrhiza formation. *Canadian Journal of Botany* **73**: S541-547
21. Martin, F, **Burgess**, T, Carnera Diaz, M E, de Carvalho, D, Laurent, P, Murphy, P, Nehls, U and Tagu, D (1995) Ectomycorrhiza morphogenesis Insights from studies of developmentally regulated genes and proteins. *In* Biotechnology of Ectomycorrhizae Stocchi, V, Bonfante, P and Nuti, M (Eds), Plenum Press, New York
22. **Burgess**, T, Laurent, P, Dell, B, Malajczuk, N and Martin, F (1995) Effect of the fungal isolate aggressiveness on the biosynthesis of symbiosis-related polypeptides in differentiating eucalypt ectomycorrhiza. *Planta* **195**: 408-417
23. **Burgess**, T, Malajczuk, N and Dell, B (1995) Variation in *Pisolithus* based on morphological and cultural characteristics and analysis of polypeptides using 1D-SDS PAGE. *Mycological Research* **99**: 1-13
24. **Burgess**, T, Dell, B and Malajczuk, N (1994) Variation in mycorrhizal development and growth stimulation of 20 *Pisolithus* isolates inoculated onto *Eucalyptus grandis* W Hill ex maiden. *New Phytologist* **127**: 731-739
25. Albrecht, C, **Burgess**, T, Dell, B and Lapeyrie, F (1994) Chitinase and peroxidase activities are induced in eucalyptus roots according to the aggressiveness of Australian ectomycorrhizal strains of *Pisolithus* sp. *New Phytologist* **127**:217-222

26. **Burgess**, T, Malajczuk, N and Grove, T S (1993) The ability of 16 isolates of ectomycorrhizal fungi to increase growth and phosphorus uptake of *Eucalyptus globulus* Labill and *E diversicolor* F Muell. *Plant and Soil* **153**: 155-164
27. Grove, T S, Malajczuk, N, **Burgess**, T, Thomson, B D and Hardy, G E StJ (1991) Growth responses of plantation eucalypts to inoculation with selected ectomycorrhizal fungi. *In* The Role of Eucalypts Proceedings IUFRO Symposium on Intensive Forestry, Durban, South Africa Pp 86-93
28. **Burgess**, T and Malajczuk, N (1990) The effect of ectomycorrhizal fungi on reducing the variation of seedling growth of *Eucalyptus globulus*. *Agriculture, Ecosystem and Environment* **28**: 41-46

In review

1. Ray, JD, **Burgess**, T, Malajczuk, N, Hardy, GEstJ First report of *Alternaria* blight of *Paulownia* spp. *Australasian Plant Pathology*
2. **Burgess**, T, Wingfield, MJ and Wingfield, BD Global distribution of the pine pathogen *Diplodia pinea* revealed by SSR markers. *Australasian Plant Pathology*
3. Slippers, B, **Burgess**, T, Wingfield, MJ and Wingfield, BD Development of microsatellite markers for light spored *Botryosphaeria* spp and their use in genotyping of species. *Molecular Ecology Notes*
4. **Burgess**, T, Gordon, T Wingfield, MJ and Wingfield, BD Native *Pinus radiata* at risk from the common pine pathogen *Diplodia pinea*. *Fungal Genetics and Biology*

In preparation

1. Barber, P, **Burgess**, T, Slippers, B, Wingfield, MJ and Hardy, GEstJ Like elephants and aardvarks; morphologically distinct fungal species with identical molecular phylogenies
2. **Burgess**, T, Slippers, B, Wingfield, MJ and Hardy, GEstJ New species of *Botryosphaeria* associated with Eucalypts in Western Australia
3. **Burgess**, T, Wingfield, MJ and Hardy, GEstJ Diversity of and gene flow between *Botryosphaeria* species associated with native forests and plantations in Western Australia
4. Taylor, A, **Burgess**, T, and Hardy, GEstJ Identification and pathogenicity of *Botryosphaeria* sp. associated with grapevines in Western Australia
5. Zhou, X-D, **Burgess**, T, de Beer, ZW, Wingfield, BD and Wingfield, MJ Microsatellite markers reveal origin of South African *Ophiostoma ips*
6. Barnes, I, **Burgess**, T, Roux, J, Wingfield, BD and Wingfield, MJ Global distribution of *Ceratocystis fimbriata*
7. Mohali, S, **Burgess**, T, de Beer, ZW, Wingfield and BD, Wingfield, MJ Origin, reproductive strategy and global distribution of *Lasidiplodia*
8. Mohali, S, **Burgess**, T, de Beer, ZW and Wingfield, MJ Three new species of *Lasidiplodia* associated with forest trees