

# Alistair McTaggart Curriculum Vitae

## Personal Information

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Name: Alistair Ross McTaggart

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## Profile

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I am interested in the systematics and identification of fungi, especially rust and smut fungi. I have completed post-docs on molecular barcoding, phylogenetics and phylogenomics of rust fungi at the University of Pretoria (South Africa), Louisiana State University (USA), and the University of Queensland. I have volunteered for Australian herbaria, and am experienced in plant and fungal systematics, plant disease surveys, molecular biology and have training in bioinformatics.

I have worked as a science and maths teacher in the Australian state and private education systems. I take any opportunity to be creative, and science has largely inspired my portfolio of artwork on RedBubble.

## Education

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2008–2010	<b>QUT</b> (Queensland, Australia)	PhD	Mycological systematics
2005–2007	<b>UQ</b> (Queensland, Australia)	MSc	Botany and plant pathology
2001–2004	<b>UQ</b>	BEd	Education
2001–2003	<b>UQ</b>	BSc	Biomedical science

## Employment

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**University of Pretoria**, Post Doctoral Fellow, September 2014 – present  
Forestry and Agriculture Biotechnology Institute (FABI)

I research the diversity and genomics of rust fungi in South Africa, with a focus on diseases of concern to the wattle and *Eucalyptus* industries. I used a molecular dating approach to determine rust fungi are a younger group than previously hypothesized. I resolved the lifecycle of eucalyptus rust (*Austropuccinia psidii*), and used a novel sequencing technology (Chromium10X) to sequence its genome. I led a study that showed eucalyptus rust spreads by its basidiospores. I collaborated with other postdoctoral fellows to introduce and test sequencing of fungal genomes on portable, long-read sequencing technology (Oxford NanoPore, MinION). We obtained genome data for rust on wattle, and have funding to sequence two genomes of rust fungi in South Africa through the JGI 1000 Fungal Genomes Project. I developed a Lucid key to the *Rust Fungi of Southern Africa*. I co-authored two textbook chapters on the phylogenomics and taxonomy of rust fungi, and have participated in workshops on leadership, comparative genomics, bioinformatics and phylogenomics.

**Scientific Consultant**, August 2014 – July 2015  
HAL onion rust (grant number VN13001)

I co-designed a project for identification of rust fungi on species of *Allium* that are present in and exotic to Australia. I consulted from South Africa to provide advice on the taxonomy and systematics of rust fungi. This project had direct applications for quarantine of *Allium* diseases that threaten the onion industry in Australia.

**University of Queensland**, Research Fellow, July 2012 – July 2014

Australian Biological Resources Study (ABRS) project *the Rust Fungi of Australia* (grant number RFL212-33)

I studied the taxonomy of rust fungi in Australia for an ABRS grant. Several publications arose from this work including new disease reports and publications on the systematics of unique Australian rusts. *The Lucid Guide to Australian Rust Fungi* was completed in the course of this project. I co-supervised an international PhD student, Chanintorn Doungsa-ard. I had a lab exchange to Germany, funded by the CRC for Plant Biosecurity, where Prof. Dominik Begerow trained me in transmission electron microscopy.

**Louisiana State University**, Research Associate, January 2011 – January 2012

LSU AgCenter

As a postdoc for Prof. M. Catherine Aime at LSU, I worked on the systematics and molecular barcoding of rust fungi. These fungi are obligate plant pathogens and generally difficult to work with. The data I generated were used to develop molecular barcodes for rust fungi. I constructed a local BLAST for the rusts of Louisiana that was uploaded to the AgCenter intranet. I continued my education in mycology and plant pathology, and attended advanced mycology and plant pathology classes. I was a member of the Fungal Barcoding Consortium, which proposed the ITS region of rDNA as a fungal barcode (Schoch et al. 2012).

**Queensland University of Technology**, PhD student, January 2008 – December 2010

- Scholarship provided by the Cooperative Research Centre for National Plant Biosecurity
- PhD submitted on the 24<sup>th</sup> December 2010 and conferred on the 2<sup>nd</sup> June 2011

I was trained as a molecular biologist and gained experience in phylogenetics and taxonomy. I was awarded the Allen Kerr Postgraduate Prize for my contributions to the field of plant pathology, based on quality of publication, as a result of my thesis.

**Department of Primary Industries and Fisheries**, Plant Pathology Herbarium (BRIP),

Volunteer, Casual and Full-time, October 2006 – December 2010

I gained a detailed knowledge of several groups of fungi, including their identification and description. I understand the importance of proper care of herbarium specimens and the principles of biological collection management.

**Secondary School Teacher** Bremer State High School (April – May 2006), Brigidine College (March 2006)

As a teacher I learnt to be adaptable, resourceful and confident with unfamiliar audiences. I sought to present lessons in an engaging and creative way. I catered for a diversity of students from a variety of backgrounds and with different learning styles.

**CSIRO, Centre for Plant Biodiversity Research and the Australian National Botanic Gardens, Canberra**, January – March 2006

- Volunteer in the Student Botanical Internship Program
- Full time voluntary placement at the Centre for Plant Biodiversity Research and the Australian National Botanic Gardens, Canberra

I received intensive training in current issues in biodiversity science, field skills and herbarium skills. I strengthened my skills in plant identification using standard floras, monographs and computer based interactive keys.

## Awards and Scholarships

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- Awarded a certificate of recognition for highest impact research published by a postdoc from FABI, 2016 (McTaggart et al. *PLoS Pathogens*)
- Senior Postdoctoral Fellowship, University of Pretoria, 2016
- Vice Chancellors postdoctoral scholarship, University of Pretoria, 2015
- Awarded a certificate of recognition for highest impact research published by a postdoc from FABI, 2015 (McTaggart et al. *New Phytologist*)
- Honoured with the name of one fungal species: *Tilletia mactaggartii*, 2014
- Recipient of a HAL early career researcher travel scholarship, 2013
- Recipient of a SHPDS Laboratory Residential program, 2013
- Awarded with the Allen Kerr Postgraduate Prize, 2011 (Australasian Plant Pathology Society)
- Recipient of a FESIN travel award, 2011
- Recipient of a QUT Grant in Aid Scholarship, 2010
- Recipient of three CRCNPB travel scholarships, 2008, 2010, 2014
- Awarded best poster presentation, CRC Science Exchange, 2009
- Awarded three Dean's commendations for high achievement in three semesters, 2006, 2007

## Professional Memberships

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- Editor of Australasian Plant Disease Notes (2013–present)
- Australasian Plant Pathological Society (2007–present) (south-east Queensland councilor 2007–2010)
- UCN Species Survival Commission Rusts & Smuts Specialist Group (2009–present)
- MSA member (2011–2013)

## First Author Publications

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- McTaggart AR**, Beasley DR, Wingfield MJ, Wood AR, Pretorius ZA, Drenth A, Shivas RG, Roux J. 2017. A dynamic, web-based resource to identify rust fungi (Pucciniales) in southern Africa. *MycKeys* 26:77–83
- McTaggart AR\***, Shuey LS\*, Granados GM, du Plessis E, Fraser S, Barnes I, Naidoo S, Wingfield MJ, Roux J. 2017. Evidence that *Austropuccinia psidii* may complete its sexual life cycle on Myrtaceae. *Plant Pathology* 10.1111/ppa.12763
- McTaggart AR**, Shivas RG, Boekhout T, Oberwinkler F, Vánky K, Pennycook SR, Begerow D. 2016. *Mycosarcoma* (Ustilaginaceae), a resurrected generic name for corn smut (*Ustilago maydis*) and its close relatives with hypertrophied, tubular sori. *IMA Fungus* 7:309–315.
- McTaggart AR**, Shivas RG, Doungsa-ard C, Weese TL, Beasley DR, Hall BH, Metcalf DA, Geering ADW. 2016. Identification of rust fungi (Pucciniales) on species of *Allium* in Australia. *Australasian Plant Pathology* 10.1007/s13313-016-0445-0
- McTaggart AR\***, van der Nest MA\*, Steenkamp ET, Roux J, Slippers B, Shuey LS, Wingfield MJ, Drenth A. 2016. Fungal genomics challenges the dogma of name-based biosecurity. *PLoS Pathogens* 12(5):e1005475. 10.1371/journal.ppat.1005475
- McTaggart AR**, Roux J, Granados GM, Gafur A, Tarrigan M, Santhakumar P, Wingfield MJ. 2015. Rust (*Puccinia psidii*) recorded in Indonesia poses a threat to forests and forestry in South-East Asia. *Australasian Plant Pathology* doi: 10.1007/s13313-015-0386-z.
- McTaggart AR**, Shivas RG, van der Nest MA, Roux J, Wingfield BD, Wingfield MJ. 2015. Host jumps shaped the diversity of extant rust fungi (Pucciniales). *New Phytologist* doi: 10.1111/nph.13686.

- McTaggart AR**, Doungsa-ard C, Wingfield MJ, Roux J. 2015. *Uromycladium acaciae*, the cause of a sudden, severe disease epidemic on *Acacia mearnsii* in South Africa. *Australasian Plant Pathology* doi: 10.1007/s13313-015-0381-4.
- Maier W\*, **McTaggart AR\***, Roux J, Wingfield MJ. 2015. *Phakopsora myrtacearum* sp. nov., a newly described rust (Pucciniales) on eucalypts in eastern and southern Africa. *Plant Pathology* doi: 10.1111/ppa.12406.
- McTaggart AR**, Doungsa-ard C, Geering ADW, Aime MC, Shivas RG. 2015. A co-evolutionary relationship exists between *Endoraecium* (Pucciniales) and its *Acacia* hosts in Australia. *Persoonia* doi: 10.3767/003158515X687588.
- McTaggart AR**, Shuey LS, McKenna SR, Davis RI, Shivas RG. 2015. *Plasmopara sphagneticolae* sp. nov. (Peronosporales) on *Sphagnetocola* (Asteraceae) in Australia. *Australasian Plant Pathology* doi: 10.1007/s13313-014-0323-6.
- McTaggart AR**, Geering ADW, Shivas RG. 2014. *Uredinopsis pteridis* and *Desmella aneimiae*, the first rust fungi (Pucciniales) reported on ferns (Pteridophyta) in Australia. *Australasian Plant Disease Notes* doi: 10.1007/s13314-014-0149-7.
- McTaggart AR**, Geering ADW, Shivas RG. 2014. The rusts on Goodeniaceae and Stylidiaceae. *Mycological Progress* doi: 10.1007/s11557-014-0989-8.
- McTaggart AR**, Geering ADW, Shivas RG. 2013. *Thekopsora minima*, the cause of blueberry rust in Australia. *Australasian Plant Disease Notes*. Published online 21 June 2013.
- McTaggart AR**, Grice KR, Shivas RG. 2013. First report of *Vialaea minutella* in Australia, its association with mango branch dieback and systematic placement of *Vialaea* in the Xylariales. *Australasian Plant Disease Notes*. Published online 8 May 2013.
- McTaggart AR**, Shivas RG, Geering ADW, Vánky K, Scharaschkin T. 2012. A review of the *Ustilago-Sporisorium-Macalpinomyces* complex. *Persoonia* 29:55–62.
- McTaggart AR**, Shivas RG, Geering ADW, Callaghan B, Vánky K, Scharaschkin T. 2012. Soral synapomorphies are significant for the systematics of the *Ustilago-Sporisorium-Macalpinomyces* complex (*Ustilaginaceae*). *Persoonia* 29:63–77.
- McTaggart AR**, Shivas RG, Geering ADW, Vánky K, Scharaschkin T. 2012. Taxonomic revision of *Ustilago*, *Sporisorium* and *Macalpinomyces*. *Persoonia* 29:116–132.
- McTaggart AR**, Ryley MJ, Shivas RG. 2012. First report of the powdery mildew *Erysiphe diffusa* on soybean in Australia. *Australasian Plant Disease Notes* 7: 127–129.
- McTaggart AR**, Shivas RG. 2010. *Pseudocercospora adansoniae*. *Persoonia* 24:134–135.
- McTaggart AR**, Shivas RG. 2009. *Tilletia challinorae*. *Persoonia* 23:184–185. □
- McTaggart AR**, Shivas RG. 2009. *Macalpinomyces mackinlayi*. *Persoonia* 23:186–187.
- McTaggart AR**, Shivas RG. 2008. The rusts on Proteaceae, including *Puccinia grevilleae* sp. nov. from northern Australia. *Australasian Plant Pathology* 37:344–346. □
- McTaggart AR**, Ono Y, Berndt R, Shivas RG. 2008. *Maravalia* in Australia, including *Maravalia limoniformis* sp. nov. on *Austrosteenisia blackii*. *Australasian Mycologist* 27:41–44.
- McTaggart AR**, Shivas RG, Liberato JR, Wright JG, Braun U. 2008. More cercosporoid hyphomycetes from some South Pacific island countries. *Australasian Plant Pathology* 37:392–395.
- McTaggart AR**, Shivas RG, Braun U. 2007. *Annelosympodia orbiculata* gen. et sp. nov. and *Scolecostigmina flagellariae* sp. nov. from Australia. *Australasian Plant Pathology* 36:573–579.

\*Joint first authors

## Co-authored Publications

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- Stewart JE, Ross-Davis AL, Graça RN, Alfenas AC, Peever TL, et al. 2017. Genetic diversity of the myrtle rust pathogen (*Austropuccinia psidii*) in the Americas and Hawaii: Global implications for invasive threat assessments. *Forest Pathology* doi:10.1111/efp.12378
- Fraser S, **McTaggart AR**, Wingfield MJ, Roux J. 2017. Effect of temperature, leaf wetness and the developmental stage of host tissue on infection of *Acacia mearnsii* by *Uromycladium acaciae* (Pucciniales). *Australasian Plant Pathology*. doi:10.1007/s13313-017-0503-2

- du Plessis E, **McTaggart AR**, Granados G, Wingfield M, Roux J, Pegg GS, Makinson J, Purcell M, Ali M. 2017. First report of myrtle rust caused by *Austropuccinia psidii* on *Rhodomyrtus tomentosa* (Myrtaceae) from Singapore. *Plant Disease*.  
<https://doi.org/10.1094/PDIS-04-17-0530-PDN>
- Granados GM, **McTaggart AR**, Barnes I, Rodas CA, Roux J, Wingfield MJ. 2017. The pandemic biotype of *Austropuccinia psidii* discovered in South America. *Australasian Plant Pathology* 46:267–275.
- Li Y-M, Shivas RG, **McTaggart AR**, Zhao P, Cai L. 2017. Ten new species of *Macalpinomyces* on Eriachne in northern Australia. *Mycologia*. 10.1080/00275514.2017.1330026
- Marin-Felix Y, Groenewald JZ, Cai L, Chen Q, Marincowitz S, et al. 2017. Genera of phytopathogenic fungi: GOPHY 1. *Studies in Mycology*. 86:99–216.  
 10.1016/j.simyco.2017.04.002
- Roux J, Granados GM, Shuey L, Barnes I, Wingfield MJ, **McTaggart AR**. 2016. A unique genotype of the rust pathogen, *Puccinia psidii*, on Myrtaceae in South Africa. *Australasian Plant Pathology* 10.1007/s13313-016-0447-y
- Wingfield BD, Ambler JM, Coetzee MPA, De Beer ZW, Duong TA, Joubert F, et al. 2016. IMA Genome-F 6: Draft genome sequences of *Armillaria fuscipes*, *Ceratocystiopsis minuta*, *Ceratocystis adiposa*, *Endoconidiophora laricicola*, *E. polonica* and *Penicillium freii* DAOMC 242723. *IMA Fungus* 7:217–227. 10.5598/imafungus.2016.07.01.11
- van der Nest MA, Steenkamp ET, **McTaggart AR**, Trollip C, Godlonton T, Sauerman E, Roodt D, Naidoo K, Coetzee MPA, Wilken PM, Wingfield MJ, Wingfield BD. 2015. Saprophytic and pathogenic fungi in the Ceratocystidaceae differ in their ability to metabolize plant-derived sucrose. *BMC Evolutionary Biology* 15:273.
- Rodas CA, Roux J, Maier W, Granados GM, Bolaños MD, **McTaggart AR**, Wingfield MJ. 2015. First report of *Puccinia psidii* on *Corymbia citriodora* and *Eucalyptus* in Colombia. *Forest Pathology* doi: 10.1111/efp.12223.
- Davis RI, Henderson J, Jones LM, **McTaggart AR**, O'Dwyer C, Tsatsia F, Fanai C, Rossel JB. 2015. First record of a wilt disease of banana plants associated with phytoplasmas in Solomon Islands. *Australasian Plant Disease Notes* 10:14.
- Carnegie AJ, Shuey LS, **McTaggart AR**, Shivas RG. 2015. First record of *Thryonectria pinicola* on *Pinus radiata* in Australia. *Plant Disease* 99:1182.
- Doungsa-ard C, **McTaggart AR**, Geering ADW, Dalisay TU, Ray J, Shivas RG. 2015. *Uromycladium falcatarium* sp. nov., the cause of gall rust on *Paraserianthes falcataria* in south-east Asia. *Australasian Plant Pathology* doi: 10.1007/s13313-014-0301-z.
- Shivas RG, Marney TS, Tan YP, **McTaggart AR**. 2015. Novel species of *Cercospora* and *Pseudocercospora* (Capnodiales, Mycosphaerellaceae) from Australia. *Fungal Biology* 119:362–369.
- Geering ADW, Maumus F, Copetti D, Choisine N, Zwickl DJ, Zytnicki M, **McTaggart AR**, Scalabrin S, Vezzulli S, Quesneville H, Tevcheney PY. 2014. Endogenous florendoviral elements are major components of plant genomes and hallmarks of virus evolution. *Nature Communications* doi:10.1038/ncomms6269.
- Hyde KD et al. 2014. One stop shop: backbones trees for important phytopathogenic genera: I. *Fungal Diversity* 67:21–125.
- Shivas RG, Beasley DR, **McTaggart AR**. 2014. Online identification keys to Australian smut (Ustilaginomycotina) and rust (Pucciniales) fungi. *IMA Fungus*
- Pegg GS, Giblin FR, **McTaggart AR**, Guymer GP, Taylor H, Ireland KB, Shivas RG, Perry S. 2014. *Puccinia psidii* in Queensland, Australia: disease symptoms, distribution and impact. *Plant Pathology* doi: 10.1111/ppa.12173.
- Shivas RG, Lutz M, **McTaggart AR**, Vanky K. 2013. Emended description of *Anomalomyces* (Ustilaginales), including *Anomalomyces yakirrae* sp. nov. on *Yakirra pauciflora* (Poaceae) from Australia. *Mycobiota* 1:17–24.
- Schoch CL, Seifert KA, Huhndorf S, Robert V, Spouge JL, Levesque CA, Chen W, Fungal Barcoding Consortium. 2012. Nuclear ribosomal internal transcribed spacer (ITS) region as a universal DNA barcode marker for *Fungi*. *Proceedings of the National Academy of Sciences of the United States of America* 109: 6241–6246.

- Kaur R, **McTaggart AR**, Ferrin DM, Aime MC. 2012. First report of *Uromyces plumbarius*, rust of *Gaura*, in Louisiana and a new host, *Guara lindheimeri*. *Plant Disease* 96: 590.3.
- Melanson RA, Sanderlin RS, **McTaggart AR**, Ham JH. 2012. A systematic study of the 16S-23S intergenic transcribed spacer rRNA region, pgIA, and ERIC-PCR and REP-PCR fingerprints reveals that *Xylella fastidiosa* strains from pecan are part of *X. fastidiosa* subsp. multiplex. *Plant Disease* 96(8): 1123–1134.
- Minnis AM, **McTaggart AR**, Rossman AY, Aime MC. 2012. Taxonomy of mayapple rust: the genus *Allodus* resurrected. *Mycologia* 104:942–950.
- Shivas RG, **McTaggart AR**, Young AY, Crous PW. 2010. *Zasmidium scaevolicola*. *Persoonia* 24:132–133.
- Shivas RG, **McTaggart AR**, Ryley MJ, Scharaschkin T, Gambley CF. 2010. First report of the smut fungus *Ustanciosporium appendiculatum* in Australia. *Australasian Plant Disease Notes* 5:17–18.
- Shivas RG, **McTaggart AR**. 2009. Three new species of *Tilletia* on native grasses from northern Australia. *Australasian Plant Pathology* 38:128–131.
- Shivas RG, Barrett MD, Barrett RL, **McTaggart AR**. 2009. *Tilletia micrairae*. *Persoonia* 22:170–171.
- Ray JD, **McTaggart AR**, Shivas RG. 2008. First record of *Cryptosporiopsis citri* on lime in Australia. *Australasian Plant Disease Notes* 3(1):158–159.
- Shivas RG, **McTaggart AR**, Vanky K. 2007. Six new smut fungi (Ustilaginomycotina) from Australia. *Mycotaxon* 101:349–360.
- Shivas RG, **McTaggart AR**, Vánky K. 2007. *Macalpinomyces viridans* sp. nov. (Ustilaginomycotina) on *Sporobolus* (Poaceae) from Australia. *Mycologia Balcanica* 4 (3):147–149.

## Plant Disease Surveys

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- April 2007: Kimberley region (Western Australia), smut fungi
- April 2007: Northern Territory, smut fungi
- May 2007: northern Queensland, entomopathogenic fungi
- December 2007: Thailand, smut fungi
- April 2008: Kimberley region and Northern Territory, smut fungi
- April 2009: Bolivia, smut fungi
- May 2009: Mitchell Plateau (Western Australia), smut fungi
- September 2009: northern Queensland, entomopathogenic fungi, ascomycetes
- August 2010: northern Queensland, entomopathogenic fungi
- October 2010: northern Queensland, entomopathogenic fungi
- September 2011: China, rust and smut fungi
- April 2012: northern Queensland, rust fungi
- April 2012: Kimberley region (Western Australia), rust fungi
- July 2012: Philippines, rust fungi
- October 2012: south Western Australia, rust fungi
- December 2012: Vietnam, rust fungi
- August 2013: United States, rust and smut fungi
- October 2013: Norfolk Island, plant pathogens
- December 2013: Tasmania, rust and smut fungi
- April 2014: northern Queensland peninsular, Northern Australian Quarantine Strategy survey
- April 2014: Kimberley region (Western Australia), rust and smut fungi
- August 2014: Europe (Albania, Greece, Germany, Macedonia, Montenegro, Netherlands, Turkey) rust fungi on species of *Allium*
- September 2014: Pietermaritzburg, South Africa, *Uromycladium acaciae* survey and ICFR field day
- January 2015: Wolkberg range, Limpopo Province, South Africa, *Puccinia psidii* survey
- March 2015–December 2015: Monthly field monitoring of *P. psidii* in Limpopo, South Africa
- January 2016–April 2017: Monthly field monitoring of *Uromycladium acaciae* in Mpumalanga

## Referees

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