

# A plethora of *Fusarium* species in grassland biome soils

**M. Mavhunga**<sup>1,2</sup>,

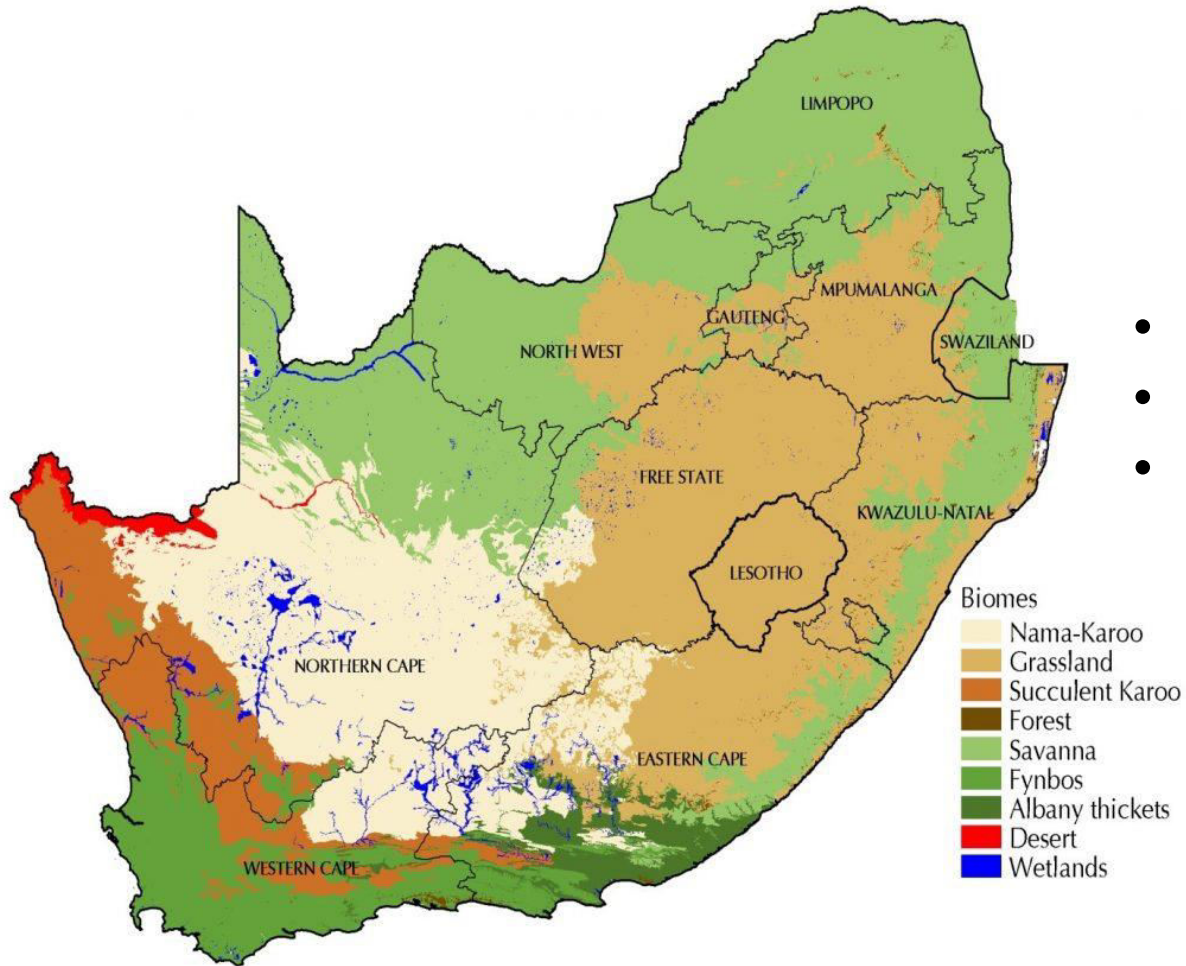
A. Jacobs<sup>1</sup>, L. Mojela<sup>2</sup>, B.A. Summerell<sup>3</sup> & E. Venter<sup>2</sup>

<sup>1</sup>*ARC-Plant Health and Protection  
, Private Bag X134, Queenswood, Pretoria, 0121, South Africa.*

<sup>2</sup>*Department of Botany and Plant Biotechnology, University of Johannesburg, PO Box 523, Auckland  
Park, 2006, South Africa,*

<sup>3</sup>*Royal Botanic Gardens & Domain Trust Sydney, Mrs Macquaries Road, Sydney NSW 2000,  
Australia*

# Status quo



- Limited data
- Changing rapidly
- Threatened ecosystem



# Background information

- *Fusarium* Link, 1809 ~ *Fusisporum*
- Plasticity:
  - Pathogens, saprobes and endophytes
  - Agricultural vs natural populations
  - Cosmopolitan or specific climatic regions
- >70 species with morphological description – (See Leslie and Summerell, 2006)
- 1:2 plant pathogen association
- 300 phylogenetically distinct species; 20 Species Complexes; 9 monotypic species



# Approach

Soil sampling  
15 x 15 m  
transect

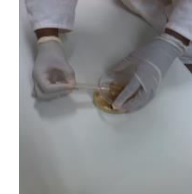
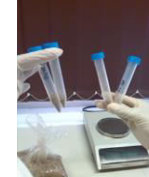
Transport cold in  
paper bags



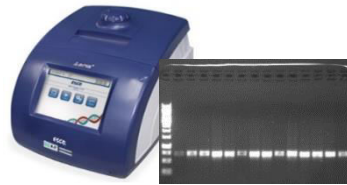
5g of soil weighed off (3  
biological reps)



Separated into two fractions with a 450  
µm sieve



Plated on *Fusarium* selective media  
(Leslie and Summerell, 2006)



PCR



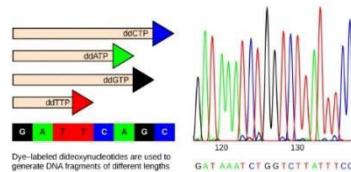
Fungal DNA extraction



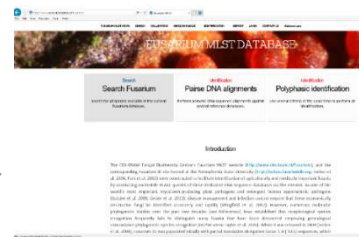
Single spore isolation



Incubated at 12h light  
dark cycles at 25°C



Sanger sequencing

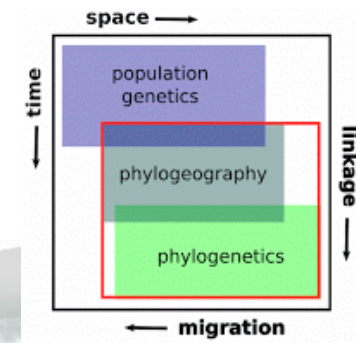


Fusarium MLST  
([www.cbs.knaw.nl/Fusarium](http://www.cbs.knaw.nl/Fusarium))  
(O'Donnell, 2010)



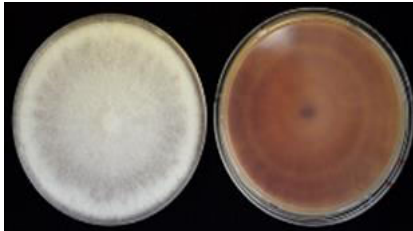
Fusarium ID ([isolate.fusariumdb.org](http://isolate.fusariumdb.org))  
(Geiser *et al.*, 2004)

Pairwise alignment  
Identifications

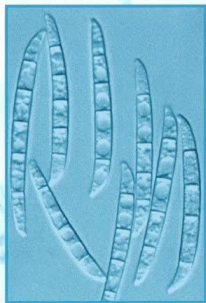


UNIVERSITY  
OF  
JOHANNESBURG

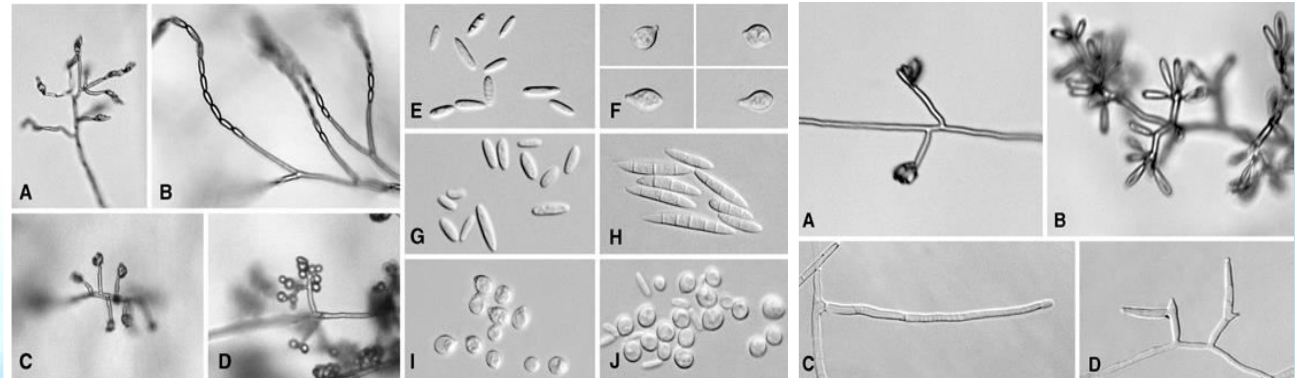
# Morphological Species Recognition (MSR)



The *Fusarium*  
Laboratory Manual

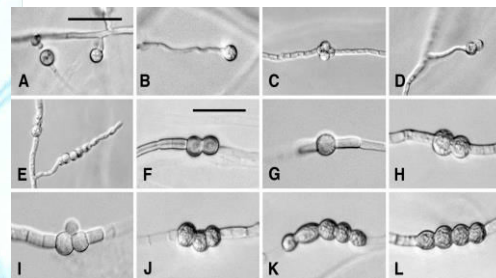


John F. Leslie  
Brett A. Summerell  
photographs by  
Suzanne Bullock

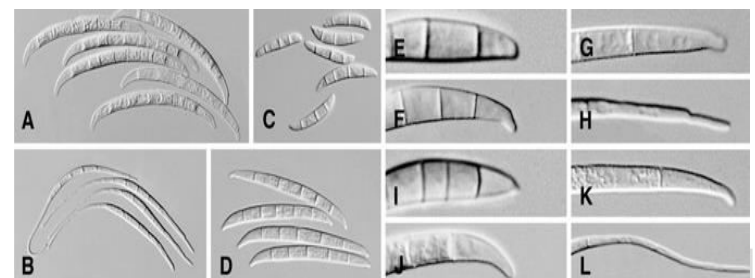


Microconidia

Conidiogenous cells



Chlamydospores



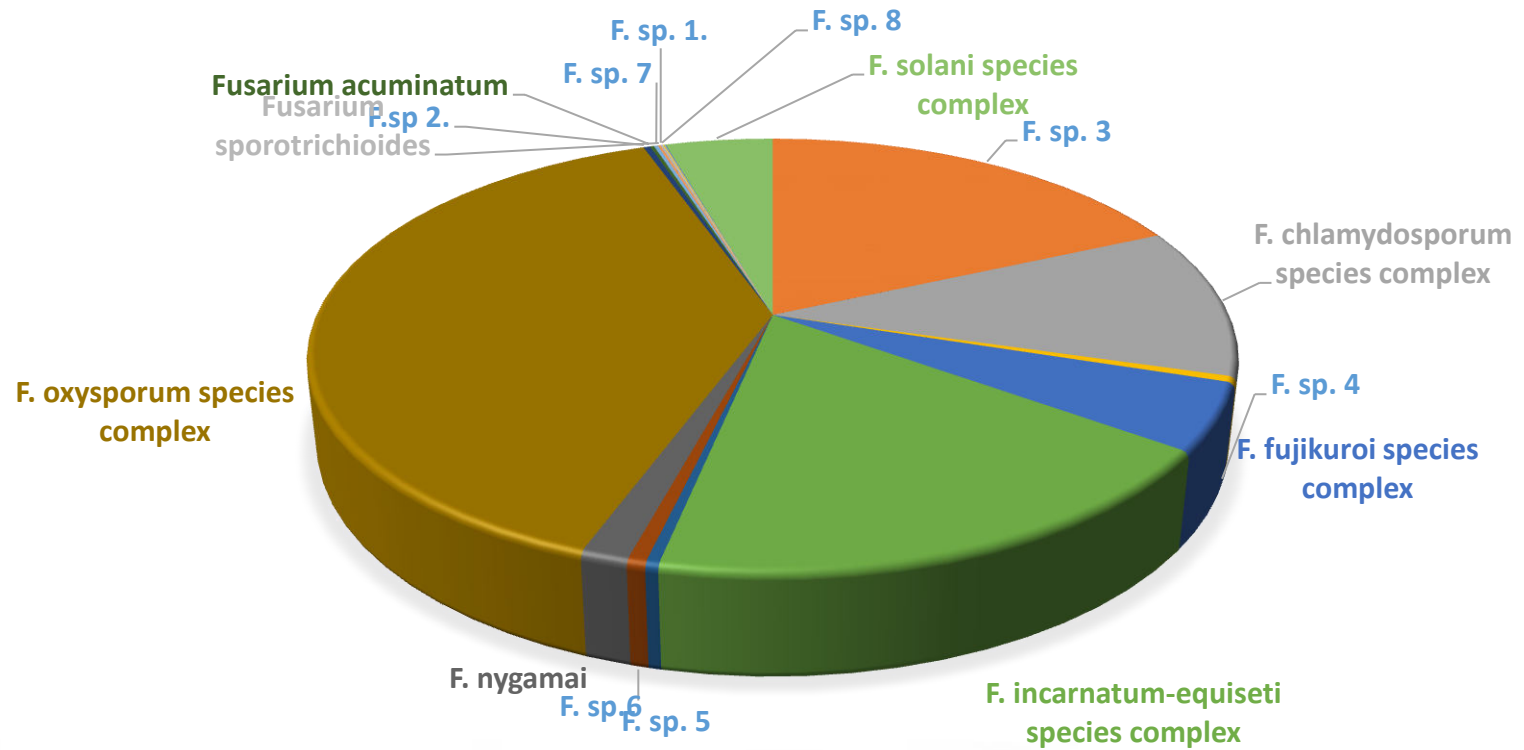
Macroconidia



UNIVERSITY  
OF  
JOHANNESBURG



# Results



# Highlights

- Novel species in five species complexes
- First report (s) for South Africa and the continent
- Mapping local distribution patterns for undisturbed

# Highlights

