

Sanidad forestal en programas de mejoramiento y en viveros forestales

Por Carlos Alberto Rodas P.



CONFERENCIA
FORESTAL
JUL 13 -14 **2023**

ORGANIZAN



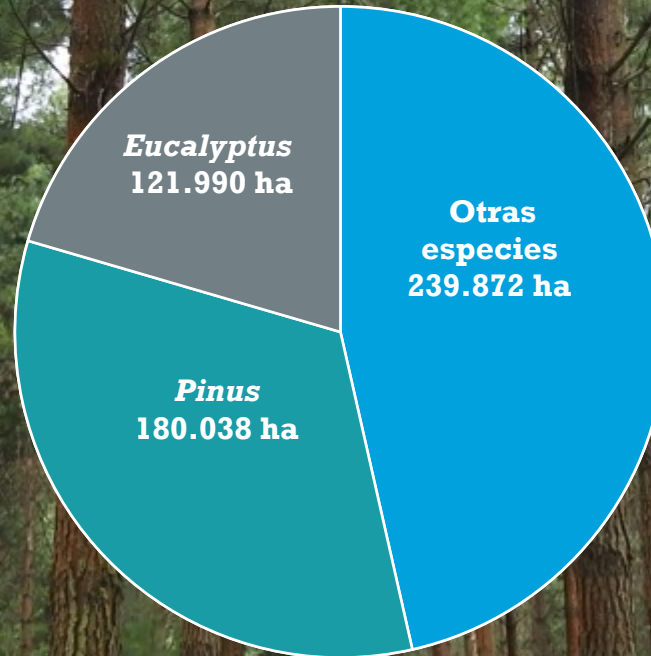
La Reforestación en Colombia

Área Total
114,0 (M)
(ha)

Bosque Natural
60,0 (M)
(ha)

Área vocación
Forestal
24,8 (M) (ha)

Reforestación
541.889 (ha)



(MADR DCAF 2022)

La Salud Forestal

La interacción de un conjunto de mecanismos que promueven un adecuado equilibrio de los ecosistemas forestales para prevenir y manejar eventos que ponen en riesgo los bosques.

Los riesgos que afectan el equilibrio biológico pueden relacionarse con agentes de tipo abiótico, biótico (Hombre - Insectos - Patógenos - otros).

La Prevención en la Salud Forestal

- Origen material de propagación
- Conocimiento y características
- Calidad proceso de propagación
- Calidad selección de sitio
- Calidad proceso establecimiento
- Calidad nutrición forestal
- Calidad manejo del cultivo
- Prevención y manejo fitosanitario

Riesgos fitosanitarios plantaciones forestales en Colombia

Introducción de especies

Riesgos

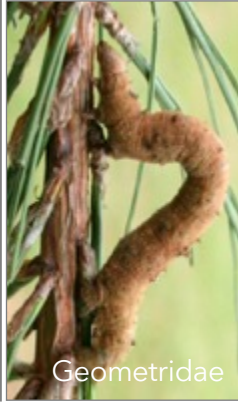
- Ambiente optimo
- Capacidad genética adaptación
- Rendimientos & Productividad

- Origen local
 - Origen externo
- ↓
- Introducción Plantas
 - Daños & Manejo

Introducción especies vs insectos locales

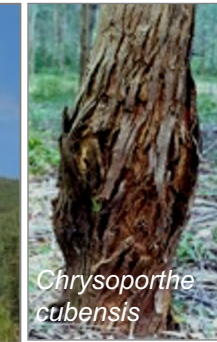


Stick insects



Geometridae

Introducción especies vs patógenos locales



Chrysosporthe cubensis



Austropuccinia psidii

Introducción especies vs patógenos externos



Dothistroma septosporum



Lecanosticta pharomachri



Fusarium circinatum

Introducciones Forestales y Riesgos Fitosanitarios en Colombia

Insectos plaga

40'- 50's Introducción especies

- *Pinus radiata*
- *Pinus patula*
- *Tectona grandis*
- *Cupressus lusitanica*
- *Eucalyptus globulus*

50's Brotos Insectos Locales

- **Lep: Geometridae**
 - *Glena bisulca*
 - *Oxydia trychiata*
 - *Cargolia arana*
 - *Chrysomima semilutearia*
- **Hymenoptera**
 - *Atta* spp.
 - *Acromyrmex* spp.
- **Phasmatodea**
 - *Planudes cortex*
 - *Litosemyle ocanae*
 - *Ceroys quadrispinosus*
 - *Heteronemia striatus*

60's - Actual Introducción especies

- **Pinus species**
 - *Pinus caribaea*
 - *P. oocarpa*
 - *P. kesiya*
 - *P. maximinoi*
 - *P. tecunumanii* HE
 - *P. tecunumanii* LE
- **Eucalyptus species**
 - *Eucalyptus grandis*
 - *E. "urograndis"*
 - *E. pellita*
 - *E. camaldulensis*
 - *E. tereticornis*
- **Otros**
 - *Gmelina arborea*
 - *Acacia mangium*

60's - Actual Brotos insectos Locales - **Externos**

- **Hemiptera**
 - *Monalonia velezangeli*
 - *Horciacisca signatus*
 - *Pineus boernerii*
 - *Glycaspis brimblecombei*
 - *Ctenarytaina eucalypti*
- **Coleoptera**
 - *Platypus* sp.
 - *Corthylus* sp.
 - *Euwalacea* sp.
 - *Xyleborus* sp.
 - *Megaplatypus* spp.
 - *Gonipterus platensis*
- **Thysanoptera**
 - *Selenoptrips rubrocinctus*
- **Acari**
 - *Oligonychus* sp.
 - *Tenuipalpus* sp.

Riesgos Fitosanitarios en Colombia

Enfermedades

Locales

Externas

50's

- Patógenos Viveros

- *Fusarium* spp.
- *Cylindrocladium* spp.
- *Rhizoctonia* sp.
- *Botrytis cinerea*
- *Colletotrichum* sp.

- Patógenos foliares

- *Diplodia sapinea*
- *Pestalotia* sp.

60's - Actual

- Patógenos Foliare

- *Dothistroma septosporum*
- *Lecanosticta pharomacri*
- *Calonectria* spp.
- *Austropuccinia psidii*
- *Teratosphaeria* spp.
- *Coniella eucalypti*
- *Pantoea rodasii*

- Patógenos vasculares

- *Fusarium circinatum*
- *Diplodia sapinea*
- *Chrysosporthe cubensis*
- *Botryosphaeria* spp.
- *Ceratocystis neglecta*
- *Ralstonia solanacearum*

Riesgos en viveros forestales

Principales riesgos fitosanitarios de *Pinus* y *Eucalyptus* en viveros

Eucalyptus spp.

Enfermedades foliares

- *Cylindrocladium spathulatum*
- *Austropuccinia psidii*
- *Teratosphaeria epicoccoides*
- *Pantoea rodasii*
- *Coniella eucalypti*
- *Aulographina eucalypti*
- *Quambalaria eucalypti*
- *Botrytis cinerea*
- *Oidium eucalypti*

Enfermedades vasculares

- *Ralstonia solanacearum*
- *Rhizoctonia solani*
- *Botryosphaeria ribis*
- *Botryosphaeria dothidea*
- *Pythium* sp.
- *Botrytis cinerea*

Insectos

- *Horciasica signatus*
- *Chalcophana* sp
- *Pineus boernerii*
- *Glycaspis brimblecombei*
- *Anomala pyropyga*
- *Selenothrips rubrocinctus*
- *Monalonion velezangeli*
- *Phyllophaga* sp.
- *Mites* (Acari; Trombidiformis)

Pinus spp.

Enfermedades foliares

- *Dothistroma septosporum*
- *Mycosphaerella dearnesii*
- *Lecanosticta pharomachri*
- *Lecanosticta* sp.cf. *L. acicola*
- *Diplodia sapinea*
- *Lophodermium* sp.

Enfermedades vasculares

- *Fusarium circinatum*
- *Calonectria brachiata*
- *Calonectria brassicae*

Calidad material vegetal - Salud



Riesgos: Permanencia vivero



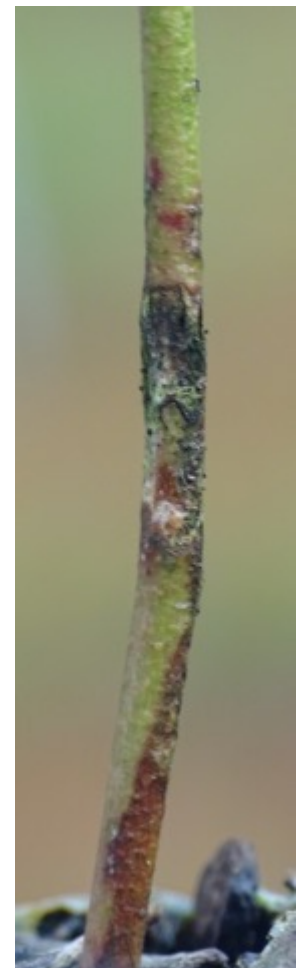
Déficit hídrico



Exceso de humedad



**Exceso de humedad =
presencia patógenos**



Nutrición y Manejo vs Riesgos fitosanitarios



Formación musgos - líquenes



Higiene vs. Riesgos fitosanitarios



Patógeno *Oidium* sp.



Nuevas enfermedades registradas en *Pinus patula* en Colombia (vivero - campo)

Plant Disease • 2022 • 106:1935-1943 • <https://doi.org/10.1094/PDIS-08-21-1759-RE>

e-Xtra*

Lecanosticta pharomachri and Its Newly Discovered Sexual State Causing a Serious Needle Disease of *Pinus* spp. in Colombia

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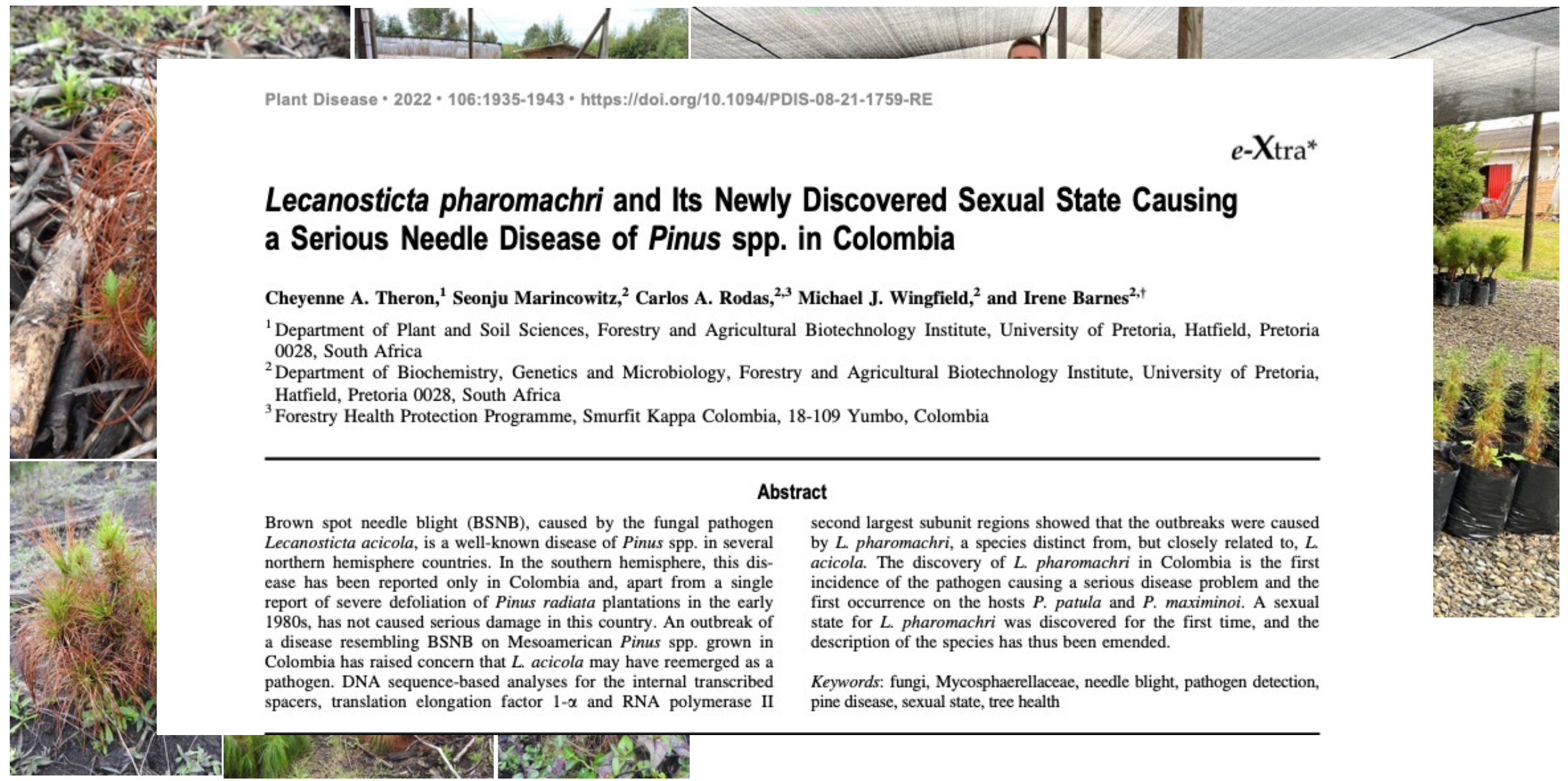
³Forestry Health Protection Programme, Smurfit Kappa Colombia, 18-109 Yumbo, Colombia

Abstract

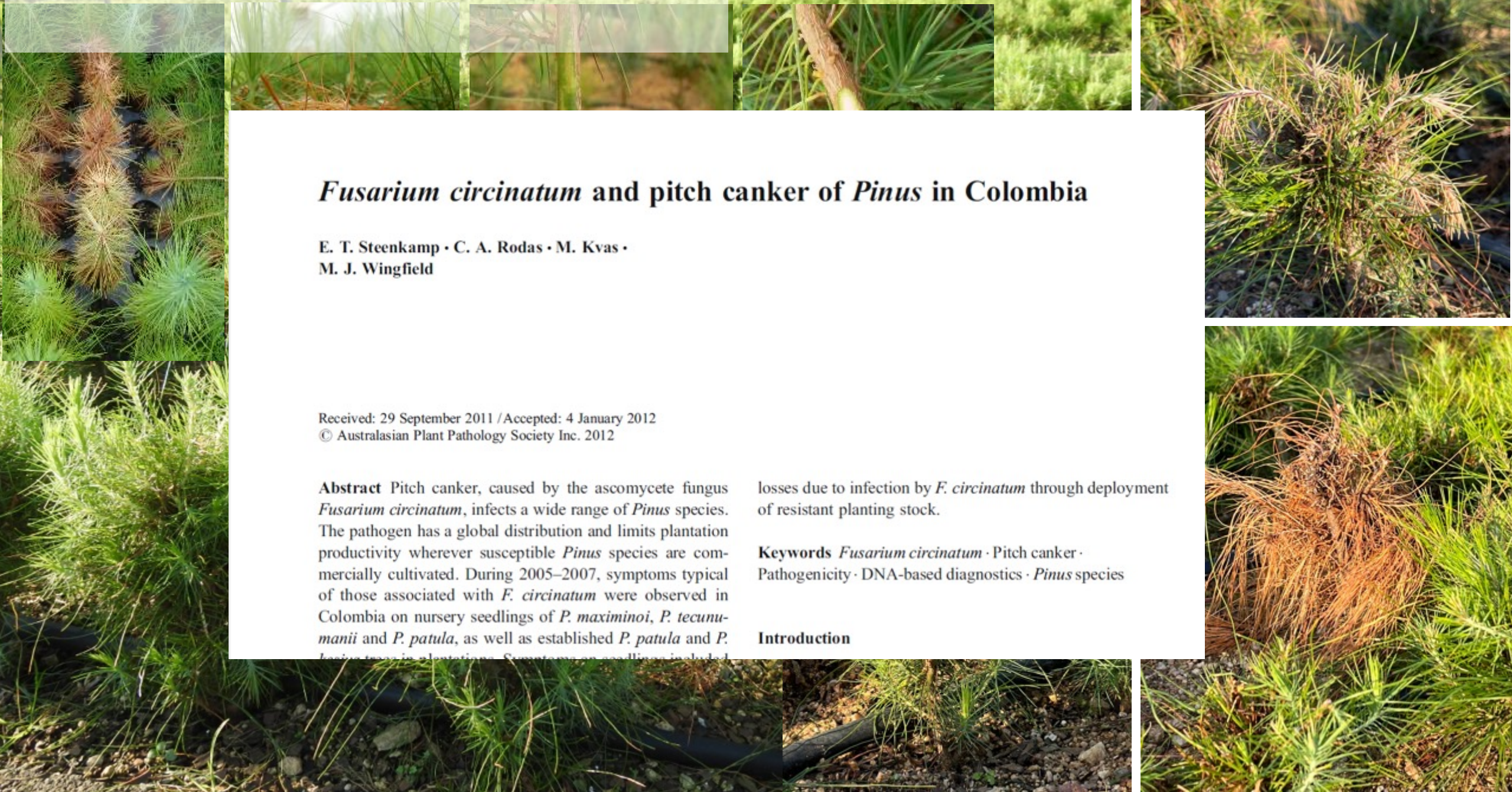
Brown spot needle blight (BSNB), caused by the fungal pathogen *Lecanosticta acicola*, is a well-known disease of *Pinus* spp. in several northern hemisphere countries. In the southern hemisphere, this disease has been reported only in Colombia and, apart from a single report of severe defoliation of *Pinus radiata* plantations in the early 1980s, has not caused serious damage in this country. An outbreak of a disease resembling BSNB on Mesoamerican *Pinus* spp. grown in Colombia has raised concern that *L. acicola* may have reemerged as a pathogen. DNA sequence-based analyses for the internal transcribed spacers, translation elongation factor 1- α and RNA polymerase II

second largest subunit regions showed that the outbreaks were caused by *L. pharomachri*, a species distinct from, but closely related to, *L. acicola*. The discovery of *L. pharomachri* in Colombia is the first incidence of the pathogen causing a serious disease problem and the first occurrence on the hosts *P. patula* and *P. maximinoi*. A sexual state for *L. pharomachri* was discovered for the first time, and the description of the species has thus been emended.

Keywords: fungi, Mycosphaerellaceae, needle blight, pathogen detection, pine disease, sexual state, tree health



Pitch canker *Fusarium circinatum*



Fusarium circinatum and pitch canker of *Pinus* in Colombia

E. T. Steenkamp · C. A. Rodas · M. Kvas ·
M. J. Wingfield

Received: 29 September 2011 / Accepted: 4 January 2012
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Abstract Pitch canker, caused by the ascomycete fungus *Fusarium circinatum*, infects a wide range of *Pinus* species. The pathogen has a global distribution and limits plantation productivity wherever susceptible *Pinus* species are commercially cultivated. During 2005–2007, symptoms typical of those associated with *F. circinatum* were observed in Colombia on nursery seedlings of *P. maximinoi*, *P. tecunumanii* and *P. patula*, as well as established *P. patula* and *P. laricina* trees in plantations. Symptoms on seedlings included

losses due to infection by *F. circinatum* through deployment of resistant planting stock.

Keywords *Fusarium circinatum* · Pitch canker · Pathogenicity · DNA-based diagnostics · *Pinus* species

Introduction

Patógenos: *Calonectria* especies *Calonectria brachiata* – *C. brassicae*

Persoonia 23, 2009: 41–47
www.persoonia.org

RESEARCH ARTICLE

doi:10.3767/003158509X471052



Calonectria (*Cylindrocladium*) species associated with dying *Pinus* cuttings

L. Lombard¹, C.A. Rodas¹, P.W. Crous^{1,3}, B.D. Wingfield², M.J. Wingfield¹

Key words

β -tubulin
Calonectria
Cylindrocladium
histone
Pinus
root disease

Abstract *Calonectria* (*Ca.*) species and their *Cylindrocladium* (*Cy.*) anamorphs are well-known pathogens of forest nursery plants in subtropical and tropical areas of the world. An investigation of the mortality of rooted *Pinus* cuttings in a commercial forest nursery in Colombia led to the isolation of two *Cylindrocladium* anamorphs of *Calonectria* species. The aim of this study was to identify these species using DNA sequence data and morphological comparisons. Two species were identified, namely one undescribed species, and *Cy. gracile*, which is allocated to *Calonectria* as *Ca. brassicae*. The new species, *Ca. brachiatica*, resides in the *Ca. brassicae* species complex. Pathogenicity tests with *Ca. brachiatica* and *Ca. brassicae* showed that both are able to cause disease on *Pinus maximinoi* and *P. tecunumanii*. An emended key is provided to distinguish between *Calonectria* species with clavate vesicles and 1-septate macroconidia.

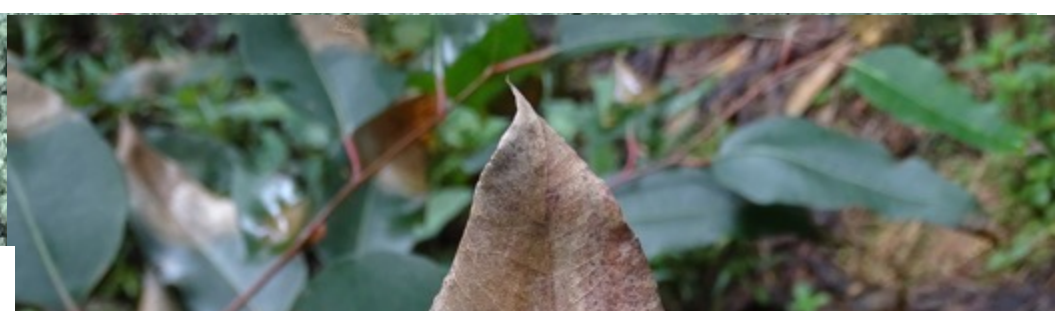
Article info Received: 8 April 2009; Accepted: 16 July 2009; Published: 12 August 2009.

INTRODUCTION

Species of *Calonectria* (anamorph *Cylindrocladium*) are plant pathogens associated with a large number of agronomic and forestry crops in temperate, subtropical and tropical climates, worldwide (Crous & Wingfield 1994, Crous 2002). Infection by

In a recent survey, wilting, collar and root rot symptoms were observed in Colombian nurseries generating *Pinus* spp. from cuttings. Isolations from these diseased plants consistently yielded *Cylindrocladium* anamorphs of *Calonectria* spp., and hence the aim of this study was to identify them, and to determine if they were the causal agents of the diseases in Colombia.

Fig. 1 Collar and root rot on *Pinus maximinoi* and *P. tecunumanii*. a. Girdled stem of *P. maximinoi*; b. exposed *P. maximinoi* root collar showing discolouration and resin exudation; c, d. exposed *P. tecunumanii* root collars showing girdling and discolouration of the cambium.



MycKeys 94: 17–35 (2022)
doi: 10.3897/mycokeys.94.96301
<https://mycokeys.pensoft.net>

RESEARCH ARTICLE

A peer-reviewed open-access journal
MycKeys
Launched to accelerate biodiversity research

Soil-borne *Calonectria* (Hypocreales, Nectriaceae) associated with *Eucalyptus* plantations in Colombia

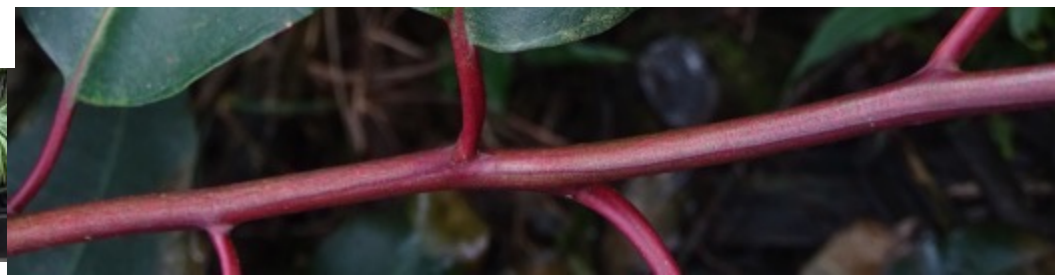
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Carlos A. Rodas^{2,5}, Michael J. Wingfield¹

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Corresponding author: Nam Q. Pham (Nam.Pham@fabi.up.ac.za)

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Citation: Pham NQ, Marincowitz S, Chen SF, Rodas CA, Wingfield MJ (2022) Soil-borne *Calonectria* (Hypocreales, Nectriaceae) associated with *Eucalyptus* plantations in Colombia. MycoKeys 94: 17–35. <https://doi.org/10.3897/mycokeys.94.96301>



Practicas Prevención y Manejo Fitosanitario Viveros

- Origen de semilla y plantulas
- Calidad genética material a propagar
- Desinfección sustrato
- Desinfección herramientas corte
- Adecuado sistema de propagación
- Manejo densidad adecuada
- Control calidad del agua
- Higiene - Sanitización
- Balance raiz – área foliar
- Manejo de riego y humedad
- Manejo condiciones contaminantes
- Efectivo plan de nutrición
- Programa de vigilancia y monitoreo
- Identificación de agentes causales
- Control inoculo primario patogenos
- Manejo brotes de insectos
- Registro historico eventos fitosanitarios
- Historia fitosanitaria areas de producción
- Etapas fenologicas y sanitaria material a plantar



A photograph of a pine forest with a blue text box overlaid in the center. The forest consists of tall, thin pine trees with green needles and brown trunks. The ground is covered with dry pine needles and small saplings. The text box is a solid blue rectangle with rounded corners, containing white text.

Riesgos fitosanitarios en programas de mejoramiento genético y su manejo

Principales riesgos fitosanitarios de *Pinus* and *Eucalyptus* en programas de mejoramiento genético

Eucalyptus spp.

Enfermedades foliares

- *Cylindrocladium spathulatum*
- *Austropuccinia psidii*
- *Teratosphaeria epicoccoides*
- *Teratosphaeria* spp.
- *Pantoea rodasii*
- *Coniella eucalypti*
- *Aulographina eucalypti*
- *Oidium eucalypti*

Enfermedades vasculares

- *Chrysosporthe cubensis*
- *Chrysosporthe doradensis*
- *Botryosphaeria ribis*
- *Ceratocystis neglecta*
- *Ralstonia solanacearum*

Insectos

- Defoliadores Geometridos
- Hormigas cortadoras
- Insectos palo
- Perforadores escolytidos
- *Pineus boernerii*
- *Glycaspis brimblecombei*
- *Monalonion velezangeli*
- *Gonipterus platensis*

Pinus spp.

Enfermedades foliares

- *Dothistroma septosporum*
- *Mycosphaerella dearnesii*
- *Lecanosticta pharomachri*
- *Lecanosticta* sp.cf. *L. acicola*
- *Diplodia sapinea*
- *Lophodermium* sp.

Enfermedades vasculares

- *Fusarium circinatum*
- *Calonectria brachiata*
- *Calonectria brassicae*

Leaf blight - *Cylindrocladium spathulatum*

CSIRO PUBLISHING

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Australasian Plant Pathology, 2005, 34, 143–149

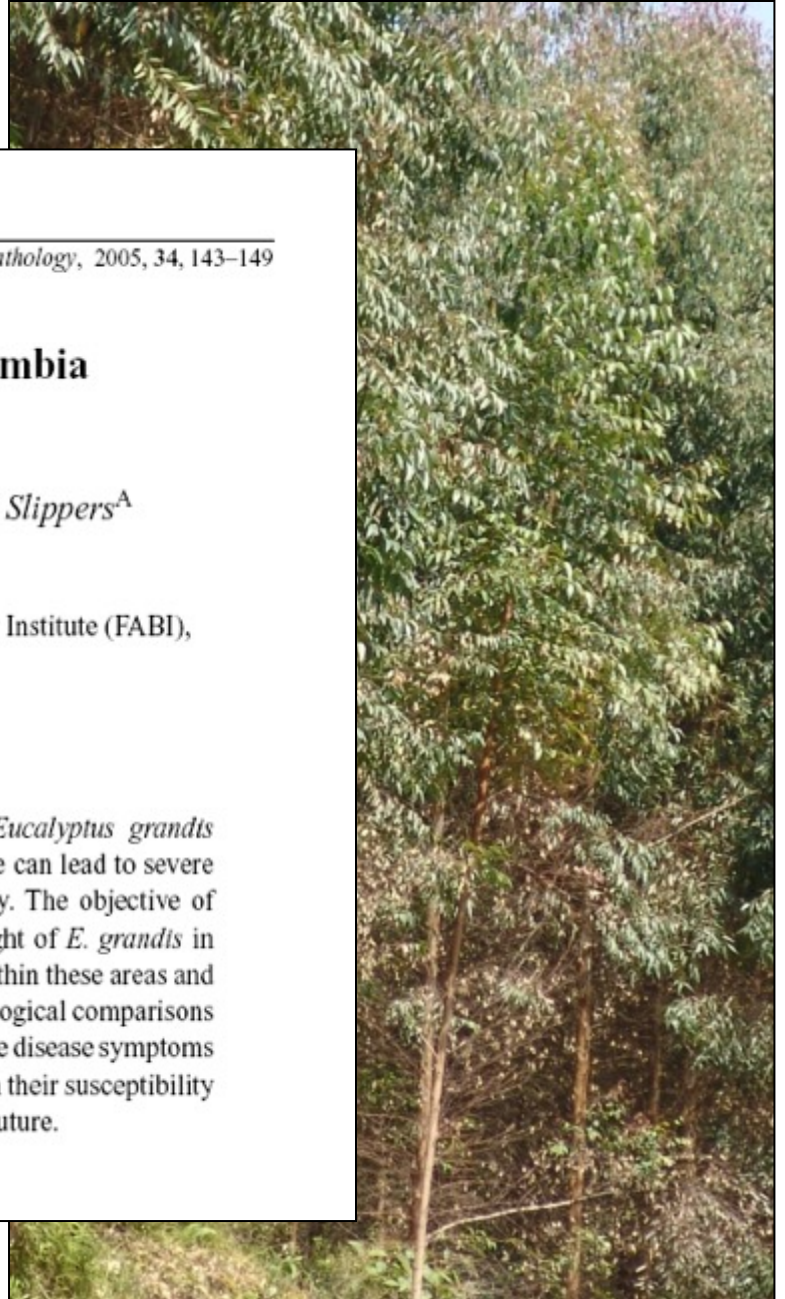
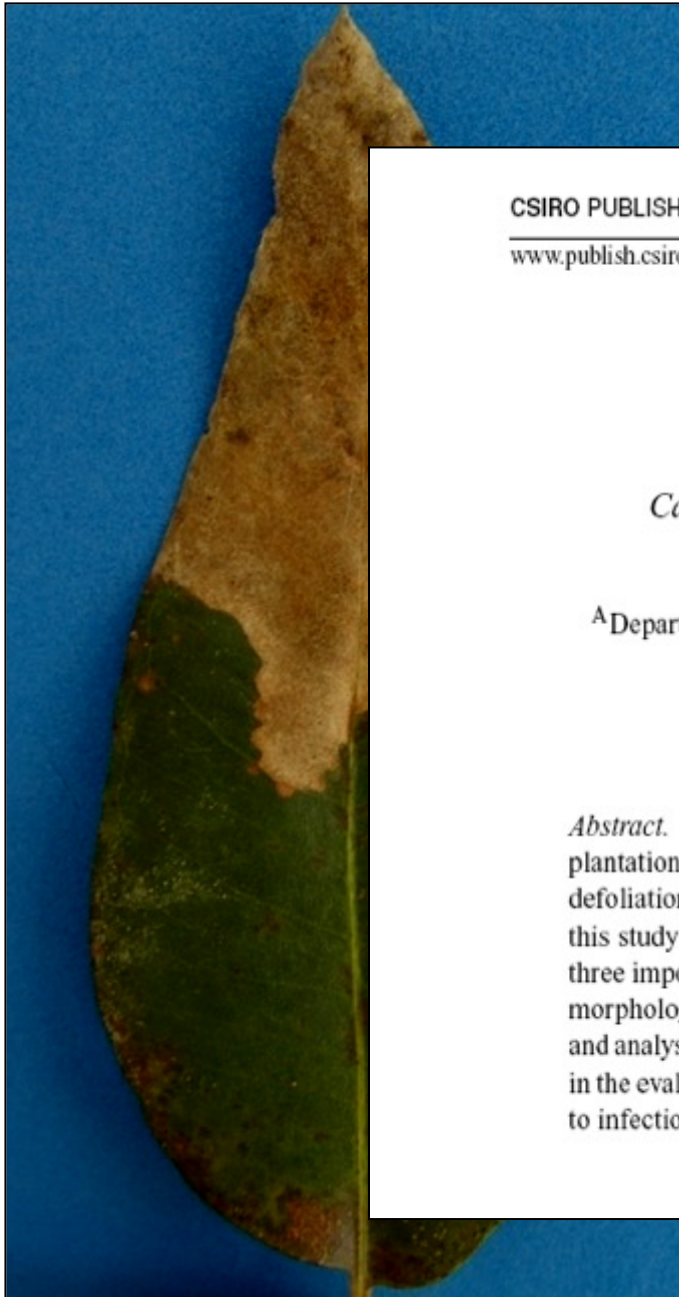
Cylindrocladium blight of *Eucalyptus grandis* in Colombia

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Abstract. *Cylindrocladium* leaf blight is one of the most important diseases affecting *Eucalyptus grandis* plantations in Colombia. Disease symptoms include both leaf blotch and shoot blight and these can lead to severe defoliation. This reduces the productivity of *E. grandis* in forestry zones with high humidity. The objective of this study was to identify the *Cylindrocladium* spp. associated with *Cylindrocladium* leaf blight of *E. grandis* in three important forestry regions of Colombia. Isolates were obtained from samples collected within these areas and morphology as well as DNA sequence data were used for identification. Results of both morphological comparisons and analysis of β -tubulin gene sequences showed that only *C. spathulatum* was associated with the disease symptoms in the evaluated areas. Evaluation of a *Eucalyptus* clonal trial showed that clones differ greatly in their susceptibility to infection by *C. spathulatum*. This presents excellent opportunities for disease avoidance in future.



Cancer Basal – *Chrysoporthe* spp.



Plant Pathology (2005) 54, 460–470

Doi: 10.1111/j.1365-3059.2005.01223.x

Discovery of the *Eucalyptus* canker pathogen *Chrysoporthe cubensis* on native *Miconia* (Melastomataceae) in Colombia

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Chrysoporthe cubensis is one of the most serious canker pathogens on commercially grown *Eucalyptus* species in the tropics and subtropics. During recent surveys for native hosts of *C. cubensis* in Colombia, fungi with fruiting structures similar to those of *C. cubensis* were found on native *Miconia theaezans* and *Miconia rubiginosa*, both members of the Melastomataceae. These fungi were identified based on morphology and DNA sequences of the ITS1/ITS2 region of the rDNA operon and the β -tubulin genes. The majority of isolates from *M. theaezans* and *M. rubiginosa* grouped together with South American *C. cubensis* isolates from *Eucalyptus* species and *Syzygium aromaticum* (clove). However, some of the isolates from *M. theaezans* grouped with isolates of *Chrysoporthella hodgesiana*, another anamorph species linked to *Chrysoporthe*, from *Tibouchina* spp. in Colombia. Pathogenicity of these fungi was assessed on various Melastomataceae. *Miconia rubiginosa* was more susceptible to infection by *C. cubensis* than two *Eucalyptus* clones. Isolates of *C. cubensis* and *Chrysop. hodgesiana* were mildly pathogenic on the various hosts included in the pathogenicity trials, and most pathogenic on *Tibouchina urvilleana* and *Tibouchina lepidota*.



Ceratocystis neglecta sp. nov., infecting *Eucalyptus* trees in Colombia

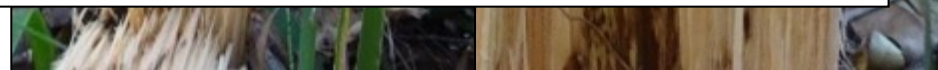
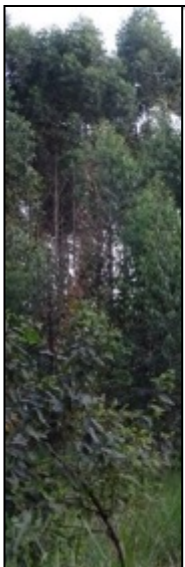
Rodas, C.A.¹, Roux, J.^{1*}, van Wyk, M.¹, Wingfield, B.D.¹ and Wingfield, M.J.¹

¹Department of Microbiology and Plant Pathology, Tree Protection Co-operative Programme (TPCP), Forestry and Agricultural Biotechnology Institute, University of Pretoria, Pretoria 0002, South Africa.

Rodas, C.A., Roux, J., van Wyk, M., Wingfield, B.D. and Wingfield, M.J. (2008). *Ceratocystis neglecta* sp. nov., infecting *Eucalyptus* trees in Colombia. *Fungal Diversity* 28: 73-84.

Commercial plantation forestry utilising species of non-native *Eucalyptus* trees forms an important industry in Colombia. These trees are, however, threatened by fungal diseases. In recent years a number of reports of *Ceratocystis fimbriata sensu lato*, causing wilt and death of *Eucalyptus* spp. have emerged from African and South American countries. In Colombia, the fungus is a serious pathogen of coffee, cacao and citrus where it enters wounds and causes a severe canker stain disease. *Ceratocystis fimbriata* has, however, not been found on *Eucalyptus* spp. in Colombia and the aim of this study was to consider whether it might infect wounds on these trees in the country. *Eucalyptus grandis* trees were artificially wounded in three different geographic zones of Colombia and a *Ceratocystis* sp. was commonly isolated from these wounds. Isolates of the fungus were identified based on morphology and through comparisons of sequences for the ITS regions of the rDNA operon. Morphological and DNA sequence comparisons showed that isolates from *E. grandis* in Colombia represent a new species of *Ceratocystis*, closely resembling *C. fimbriata sensu stricto* and for which the name *C. neglecta* sp. nov. is given. To determine the possible impact of *C. neglecta* on commercial forestry operations, two isolates were used in field pathogenicity trials on different clones of *E. grandis*. Isolates were shown to differ in their ability to cause lesions on *E. grandis*, with one isolate being highly pathogenic. The different clones of *E. grandis* also differed in their susceptibility to infection by the fungus.

Key words: fungal disease, plantation forestry, wounds



For. Path. 39 (2009) 110–123

doi: 10.1111/j.1439-0329.2008.00569.x

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Botryosphaeriaceae associated with *Eucalyptus* canker diseases in Colombia

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Summary

The identities of Botryosphaeriaceae causing cankers on *Eucalyptus* in Colombia were investigated using morphological and DNA sequence comparisons. The pathogenicity of the species was also assessed on 42 *Eucalyptus grandis* clones planted at four different sites. Two species of the Botryosphaeriaceae were found to occur on *E. grandis* in Colombia. *Neofusicoccum ribis* was the more common species, and also the most pathogenic. *Botryosphaeria dothidea* was found only in one zone of Colombia, and was also less pathogenic than *N. ribis*. These two species could be distinguished easily based on DNA sequences of the ITS1/ITS2 rDNA region and EF1- α , in addition to conidial sizes. Significant differences in resistance of clones to these pathogens were also evident from the various trials.

Patógenos vasculares:
Ralstonia solanacearum



Myrtle rust - *Austropuccinia psidii*

Forest Pathology



For. Path.
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doi: 10.1111/efp.12223

SHORT COMMUNICATION

First report of *Puccinia psidii* on *Corymbia citriodora* and *Eucalyptus* in Colombia

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Summary

A rust disease was observed during routine disease surveys of Eucalypt species in Colombia. The cause of the disease was identified, using morphology and DNA sequence data, as the myrtle rust pathogen, *Puccinia psidii*. We evaluated the susceptibility of *Eucalyptus grandis* and the hybrid *Eucalyptus urograndis* to *P. psidii*. This is the first report of this pathogen on *Corymbia citriodora* and *Eucalyptus* species in Colombia.

Australian Plant Pathol.
DOI 10.1007/s13313-017-0488-x



ORIGINAL PAPER

The pandemic biotype of *Austropuccinia psidii* discovered in South America

G. M. Granados¹ · A. R. McTaggart¹ · I. Barnes² ·
C. A. Rodas¹ · J. Roux¹ · M. J. Wingfield¹

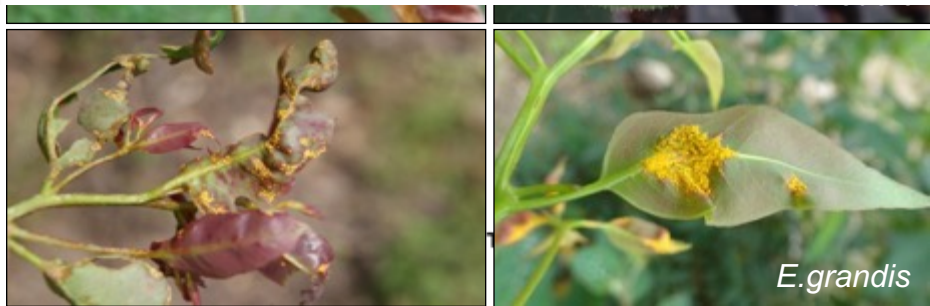
Received: 3 March 2017 / Accepted: 28 April 2017
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Abstract The rust fungus *Austropuccinia psidii* was recently reported from ornamental *Corymbia citriodora* and plantations of *Eucalyptus* in Colombia. It is unknown whether the genotypic diversity of the pathogen in Colombia reflects that of other countries in South America or if unique genotypes occur. Multilocus genotypes (MLG) were determined for collections of *A. psidii* from four host genera, *Corymbia*, *Eucalyptus*, *Psidium* and *Syzygium* in Colombia and compared to collections from Australia, Brazil, Indonesia, Paraguay and South Africa. The genotypic diversity of 58 samples on 15 genera of Myrtaceae was determined using seven microsatellite markers. Two lineages of *A. psidii* were detected among Colombian samples. These included a previously unknown genotype on *Psidium guajava*, different to those sampled from Brazil, as well as the pandemic biotype, which has spread to Pacific countries such as Australia,

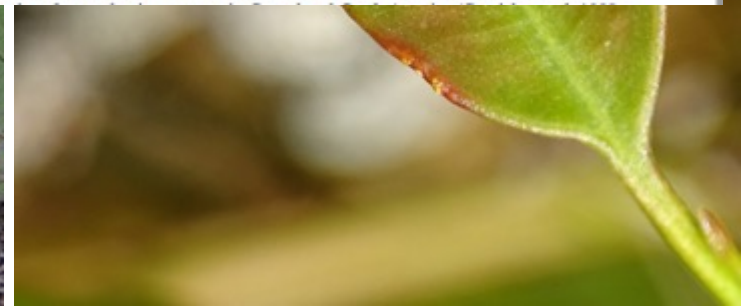
Keywords Biosecurity · Long distance dispersal · Host adaptation · Myrtaceae · Myrtle rust · Pucciniales

Introduction

Austropuccinia psidii (Sphaerophragmiaceae, Pucciniales) causes rust on approximately 73 genera and 460 species of Myrtaceae (Giblin and Carnegie 2014; Carnegie et al. 2016; Roux et al. 2016). It was formerly known as *Puccinia psidii*, however its familial and generic position has recently been resolved in the Pucciniales (McTaggart et al. 2016b; Boenken 2017). The disease caused by *A. psidii* is commonly referred to as eucalyptus, guava, myrtle or ohia rust. *Austropuccinia psidii* has spread globally, expanding its host



E. grandis



Dothistroma Needle Blight:

Dothistroma septosporum



Plant Pathology (2015)

Doi: 10.1111/ppa.12389

Dothistroma needle blight: an emerging epidemic caused by *Dothistroma septosporum* in Colombia

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Plantation forestry in Colombia is based mainly on non-native species of *Pinus* and *Eucalyptus*. Since 2008, a disease with symptoms similar to those of dothistroma needle blight (DNB) has been found affecting large areas planted to *Pinus* spp. The aim of this study was to identify the causal pathogen as well as to document the levels of disease incidence and severity. Isolates from each of three forestry zones, collected from different host species, were compared based on rDNA sequence of the ITS regions. These were conclusively identified as *Dothistroma septosporum*, one of two *Dothistroma* spp. known to cause DNB. Susceptibility was greatest on low elevation *Pinus tecunumanii* followed by *Pinus kesiya* and *Pinus oocarpa*. *Pinus maximinoi* and high elevation *P. tecunumanii* showed tolerance to *D. septo-*

Pitch canker: *Fusarium circinatum*



Fusarium circinatum and pitch canker of *Pinus* in Colombia

E. T. Steenkamp · C. A. Rodas · M. Kvas ·
M. J. Wingfield

Received: 29 September 2011 / Accepted: 4 January 2012
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Abstract Pitch canker, caused by the ascomycete fungus *Fusarium circinatum*, infects a wide range of *Pinus* species. The pathogen has a global distribution and limits plantation productivity wherever susceptible *Pinus* species are commercially cultivated. During 2005–2007, symptoms typical of those associated with *F. circinatum* were observed in Colombia on nursery seedlings of *P. maximinoi*, *P. tecunumanii* and *P. patula*, as well as established *P. patula* and *P. leiostemonia* plantations. Susceptible seedlings included

losses due to infection by *F. circinatum* through deployment of resistant planting stock.

Keywords *Fusarium circinatum* · Pitch canker · Pathogenicity · DNA-based diagnostics · *Pinus* species

Introduction



Indicadores presencia de *F. circinatum*

Malformación raíz



Indicadores presencia de *Fusarium circinatum*

Profundidad de siembra



➤ Riesgos externos de importancia para la reforestación en Colombia

Patogenos e Insectos

- *Eucalyptus*

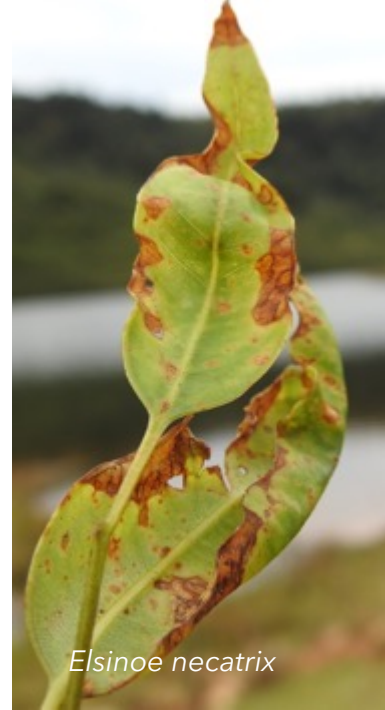
- *Teratosphaeria destructans*
- *Elsinoe necatrix* sp. nov
- *Teratosphaeria zuluensis*
- *Glycaspis brimblecombei*
- *Gonipterus platensis*
- *Spondyliapsis* sp.
- *Thaumastocoris peregrinus*

- *Pinus*

- *Dothistroma septosporum*
- *Lacanosticta pharomachri*
- *Lophodermium* spp.
- *Sirex noctilio*
- *Pineus boernerii*
-



T. destructans



Elsinoe necatrix



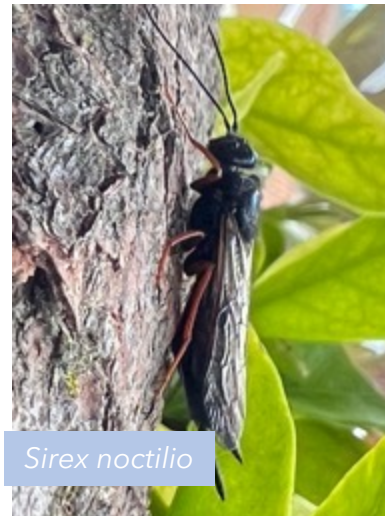
T. zuluensis



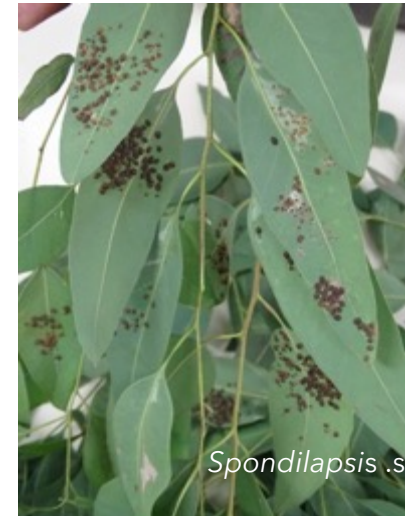
L. pharomachri



Leptocybe invasa



Sirex noctilio



Spondylapsis sp.



Ophelimus



Nuevas especies de *Chrysoporthe doradensis* y *C. colombiana* reportadas en *Henriettea semammii* en Colombia

Mycological Progress (2023) 22:44
<https://doi.org/10.1007/s11557-023-01891-8>



ORIGINAL ARTICLE



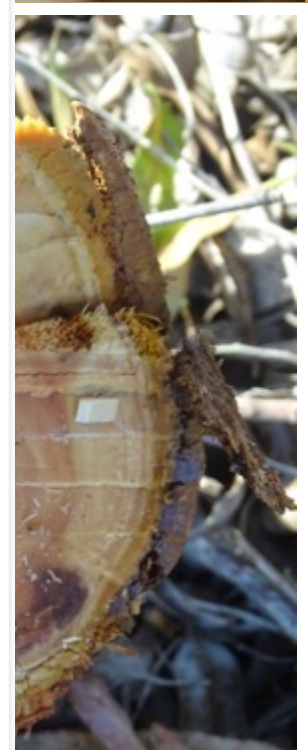
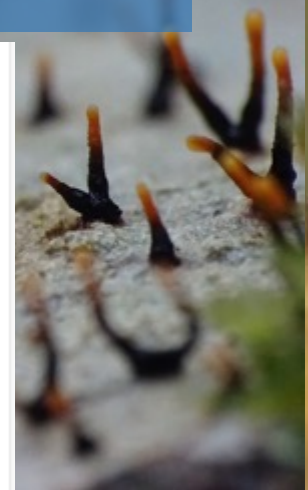
First report of two *Chrysoporthe* species, *Chrysoporthe doradensis* and *Chrysoporthe colombiana* sp. nov. from *Henriettea seemannii* pathogenic to *Eucalyptus* in Colombia

H. Suzuki^{1,2} · S. Marincowitz¹ · C. A. Rodas^{1,3} · B. D. Wingfield¹ · M. J. Wingfield¹

Received: 16 November 2022 / Revised: 16 April 2023 / Accepted: 17 April 2023
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Abstract

Fungi in the *Cryphonectriaceae* include some of the most serious pathogens of trees globally. Amongst these, species of *Chrysoporthe*, previously identified as *Cryphonectria*, are well known and important pathogens of *Eucalyptus* propagated in plantations for the production of various wood products. This study considered *Cryphonectriaceae* isolates collected from stem cankers on *Eucalyptus* and the native tree, *Henriettea seemannii* (*Melastomataceae*) in Colombia. Isolates were identified based on analyses of DNA sequence data and morphology. These were resolved as *Chrysoporthe cubensis*, *C. doradensis* and a new species described here as *Chrysoporthe colombiana*. All three fungi were found on *H. seemannii*, whereas *C. doradensis* was found on *Eucalyptus*. A pathogenicity test on *Eucalyptus* showed that the three *Chrysoporthe* spp. could cause disease on these trees, with *C. doradensis* being the most aggressive. This study provides another interesting example of tree pathogens in the *Cryphonectriaceae* occurring on native *Melastomataceae* and infecting *Eucalyptus* propagated in plantations.



Nuevas enfermedades registradas recientemente en *P. patula* and *P. tecunumanii* HE en Colombia

Pinus tecunumanii HE

Pinus patula

Plant Disease • 2022 • 106:1935-1943 • <https://doi.org/10.1094/PDIS-08-21-1759-RE>

e-Xtra*

***Lecanosticta pharomachri* and Its Newly Discovered Sexual State Causing a Serious Needle Disease of *Pinus* spp. in Colombia**

Cheyenne A. Theron,¹ Seonju Marincowitz,² Carlos A. Rodas,^{2,3} Michael J. Wingfield,² and Irene Barnes^{2,†}

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³Forestry Health Protection Programme, Smurfit Kappa Colombia, 18-109 Yumbo, Colombia

Abstract

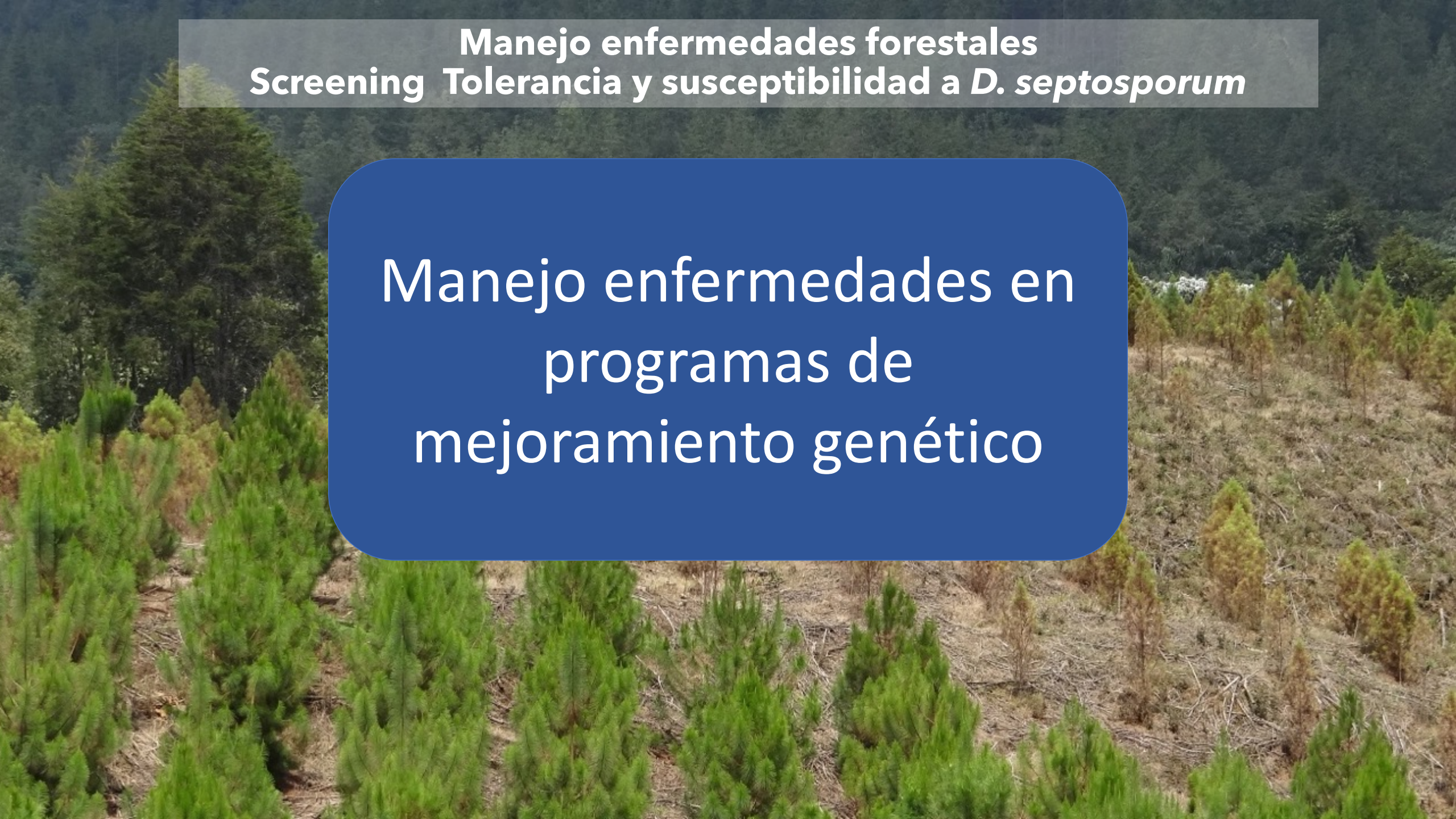
Brown spot needle blight (BSNB), caused by the fungal pathogen *Lecanosticta acicola*, is a well-known disease of *Pinus* spp. in several northern hemisphere countries. In the southern hemisphere, this disease has been reported only in Colombia and, apart from a single report of severe defoliation of *Pinus radiata* plantations in the early 1980s, has not caused serious damage in this country. An outbreak of a disease resembling BSNB on Mesoamerican *Pinus* spp. grown in Colombia has raised concern that *L. acicola* may have reemerged as a pathogen. DNA sequence-based analyses for the internal transcribed spacers, translation elongation factor 1- α and RNA polymerase II

second largest subunit regions showed that the outbreaks were caused by *L. pharomachri*, a species distinct from, but closely related to, *L. acicola*. The discovery of *L. pharomachri* in Colombia is the first incidence of the pathogen causing a serious disease problem and the first occurrence on the hosts *P. patula* and *P. maximinoi*. A sexual state for *L. pharomachri* was discovered for the first time, and the description of the species has thus been emended.

Keywords: fungi, Mycosphaerellaceae, needle blight, pathogen detection, pine disease, sexual state, tree health

Manejo enfermedades forestales
Screening Tolerancia y susceptibilidad a *D. septosporum*

Manejo enfermedades en
programas de
mejoramiento genético



Manejo de enfermedades

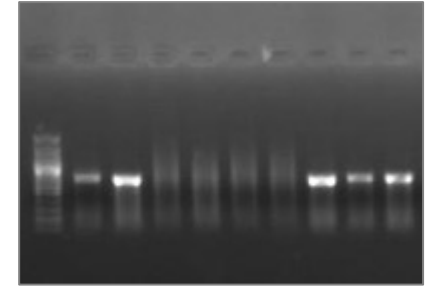
Evaluación y muestreo



Aislamiento, y diagnóstico



Identificación
morfológica y molecular



Screening susceptibilidad / tolerancia
(Estudios de Inoculación)



Screening materiales genéticos
(greenhouse)



Sistema Vigilancia y
Monitoreo



Estudios de
genética



Toma de
desiciones

- Selección de sitio
- Selección especie
- Adaptación genética



Screening materiales genéticos *Eucalyptus* spp. Inoculación de hongos



Lesiones *Chrysosporthe*



Lesiones *Chrysosporthe*



Lesiones *Botryosphaeria ribis*

Lesiones *Ceratocystis neglecta*

Screening materiales genéticos *Pinus* spp. a *Fusarium circinatum* Inoculación de hongos



Materiales genéticos: Tolerancia y Susceptibilidad a *D. septosporum*



Manejo de enfermedades

Resultados Screening para susceptibilidad especies

Pinus

| Patógenos | Hospedero Susceptible | Hospederos Tolerante |
|---------------------------------|---|---|
| <i>Dothistroma septosporum</i> | <i>P. tecunumanii</i> LE <i>P. kesiya</i> <i>P. oocarpa</i> | <i>P. tecunumanii</i> HE <i>P. patula</i> <i>P. maximinoi</i> |
| <i>Fusarium circinatum</i> | <i>P. patula</i> <i>P. tecunumanii</i> HE <i>P. kesiya</i> | <i>P. tecunumanii</i> LE <i>P. patula</i> <i>P. maximinoi</i> |
| <i>Diplodia sapinea</i> | <i>P. patula</i> <i>P. tecunumanii</i> HE | <i>P. tecunumanii</i> LE <i>P. maximinoi</i> |
| <i>Lecanosticta pharomachri</i> | <i>P. maximinoi</i> <i>P. patula</i> <i>P. tecunumanii</i> HE | <i>P. tecunumanii</i> LE |
| <i>Calonectria brachiata</i> | <i>P. maximinoi</i> <i>P. tecunumanii</i> LE | <i>P. patula</i> <i>P. tecunumanii</i> HE |

Eucalyptus

| Patógeno | Hospedero Susceptibles | Hospederos Tolerantes |
|-------------------------------|--|--|
| <i>Botryosphaeria ribis</i> | <i>E. grandis</i> Clones / semillas | <i>E. grandis</i> Clones / semillas |
| <i>Chrysosporthe cubensis</i> | <i>E. grandis</i> Clones / semillas | <i>E. "urograndis"</i> Clones/ Híbridos |
| <i>Austropuccinia psidii</i> | <i>E. grandis</i> Clones / semillas | <i>E. "urograndis"</i> Clones/ Híbridos |
| <i>Ceratocystis neglecta</i> | <i>E. grandis</i> Clones / semillas | <i>E. "urograndis"</i> Clones/ Híbridos |



Scientific Publications:



Southern Forests: a Journal of Forest Science



ISSN: 2070-2620 (Print) 2070-2639 (Online) Journal homepage: <http://www.tandfonline.com/loi/tsyfs20>

Biology of *Litosemyle ocaenae* in Colombian *Pinus patula* plantations

Carlos A Rodas, Brett P Hurley, María D Bolaños, Ginna M Granados & Michael J Wingfield

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To link to this article: <http://dx.doi.org/10.2989/20702620.2017.1334175>

Southern Forests 2015: 1–7

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SOUTHERN FORESTS

ISSN 2070-2620 EISSN 2070-2639

<http://dx.doi.org/10.2989/20702620.2014.1001682>

Biology, incidence and host susceptibility of *Pineus boernerii* (Hemiptera: Adelgidae) in Colombian pine plantations

Carlos A Rodas¹, Rubén Serna², María D Bolaños¹, Ginna M Granados¹, Michael J Wingfield³ and Brett P Hurley^{3*}

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37
Scientific
publications

30
Forest
Pathology

7
Forest
Entomology

1
Book



Smurfit Kappa
Open the future

IMPORTANT INSECT PESTS AND DISEASES of *Pinus* and *Eucalyptus* in Colombia

Carlos A.
Rodas Peláez

Michael J.
Wingfield

PAPER | PACKAGING | SOLUTIONS

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the hybrid *Eucalyptus argyranthus* to *P. pinus*. This is the first report of this pathogen on *Corymbium citricolora* and *Eucalyptus* species in Colombia

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- **CONCLUSIONES**

- El impacto de las plagas y las enfermedades que afectan las plantaciones forestales en Colombia se han incrementado sustancialmente en los últimos años.
- En el caso de los insectos, el daño más importante está representado por las especies locales. Sin embargo, en los últimos años se ha registrado una notable incidencia de especies externas. (*Gonipterus*, *Pineus*, *Ophelimus*, *Glycaspis*).
- Los daños más serios causados recientemente por hongos se atribuyen a patógenos externos. Esta es una tendencia que parece seguir creciendo en el futuro (*Dothistroma*, *Lecanosticta*).
- El futuro de las plantaciones forestales en Colombia dependerá de una gran inversión en la creación de una cultura fitosanitaria forestal y de la protección de los bosques, incluidas la gestión integrada de las plagas y patógenos más importantes, y de una cuarentena rigurosa para reducir las introducciones accidentales.
- Condiciones de estrés causadas por agentes de tipo abiótico y/o biótico son factores que favorecen la incidencia de plagas y enfermedades.
- La sanidad de los bosques debe ser considerada una prioridad en los proyectos forestales, con partidas presupuestales que permitan establecer programas de prevención fitosanitaria.

Agradecimientos



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UNIVERSITY OF PRETORIA
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