# STUDIES OF CAMELLIA FLOWER BLIGHT

## (*Ciborinia camelliae*)

## IN NEW ZEALAND

A thesis presented in partial fulfilment of the requirements for the degree of Master of Applied Science in Plant Health at Massey University, Palmerston North, New Zealand.

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# ABSTRACT

Camellias are popular ornamental plants grown for their verdant evergreen foliage and spectacular flowers, which come in many colours, sizes and forms. The fungal pathogen (*Ciborinia camelliae*), which causes camellia flower blight, is considered the most serious disease of the camellia genus as it attacks the flowers, causing them to turn brown and fall early. The pathogen was described in Japan in 1919, spread to the USA in 1938 and was discovered in New Zealand in 1993. Relatively little research has been done on the pathogen or the disease that it causes. Chemical and cultural control methods have not proved particularly effective.

The fungus was isolated from sclerotial medulla and isolates grew significantly better on Camellia Petal PDA, Oxoid PDA, Difco PDA and Oxoid MEA than on Homemade PDA, expired Oxoid PDA and Merck PDA. Cultures were maintained on Difco PDA and optimum temperatures for growth and sclerotial formation were between 15°C and 20°C.

Surveys of the North Island in 1997 and both North and South Island in 1998 found the pathogen was more widely distributed than previously thought. It is widespread in the central, western and lower North Island and present in the north of the South Island and Christchurch. Although the outbreaks in Auckland and in Christchurch were probably the result of the transfer of infected material, dispersal by windborne ascospores appears to be the main method of spread.

Conditions that stimulate sclerotial germination out of season were investigated using both protocols established for other fungi and novel methods that involved incubation at various temperatures, combinations of temperatures, and light. Artificial stimulation of germination was not achieved.

Infection of petals was investigated using agar plug inoculation and, during the disease season, ascospores. Wounding was required for infection from plug inoculum but not from ascospores. Younger buds appeared to have more resistance to both types of inoculum. Ascospore inoculations of species and varieties showed that there were levels of resistance within the genus but this was not quantified.

Several potential biocontrol agents, effective against the ascospore stage, were isolated but could not be evaluated due to the limited ascospore production season.

Further research is required to study the pathogen/host interaction, the infection process, levels of resistance and mechanisms of resistance. Breeding for resistance appears to be possible and offers the best long term prospects for the control of this disease.

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Finally, I would like to dedicate this thesis to Nana, Aunty Janet and Cousin Bell.

Joyce Taylor, 5.5.1916 – 22.7.1998

Isabel McCallum 22.12.1915 – 14.9.1998

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# TABLE OF CONTENTS

**Abstract**.....i

**Acknowledgements**.....iii

**Table of Contents**.....iv-vii

**List of Figures**.....viii-ix

**List of Tables**.....x

**CHAPTER ONE - INTRODUCTION AND LITERATURE REVIEW**.....1

1.1 Introduction to the Genus *Camellia* .....1

1.2 Introduction to *Ciborinia camelliae* .....3

1.2.1 Classification .....4

1.2.2 Description of *C. camelliae* .....4

1.2.3 Life Cycle of *Ciborinia camelliae* .....8

1.2.4 Origin and Distribution.....8

1.3 Control.....11

1.3.1 Prevention.....12

1.3.2 Management .....12

1.3.3 Chemical Control .....14

1.3.4 Biological Control .....19

1.4 Summary.....19

1.5 Research Aims.....20

**CHAPTER TWO - ISOLATION AND CULTURE OF *C. CAMELLIAE*** .....21

2.1 Introduction .....21

2.2 Objectives .....22

2.3 Materials and Methods .....23

2.3.1 Isolation of *C. camelliae* from Petals and Sclerotia .....23

2.3.2 Effect of Temperature and Growth Medium on Growth of *C. camelliae* .23

2.3.2.1 Experiment 1 - Growth of four isolates, on six media at six temperatures. .....23

2.3.2.2 Experiment 2 - Growth of four isolates, on six media at five temperatures .....25

2.3.3 Effect of Age of Agar on Growth of *C. camelliae* .....25

2.3.4 Effect of Camellia Petal or Iron Supplements on Growth of *C. camelliae* .....26

2.3.5 Effect of Repeated Sub-Culturing on Pathogenicity .....27

2.4 Results .....28

2.4.1 Isolation of *C. camelliae* from Petals and Sclerotia .....28

2.4.2 Effect of Temperature and Growth Medium on Growth of *C. camelliae* .29
2.4.3 Effect of Age of Agar on Growth of *C. camelliae* .....34
2.4.4 Effect of Camellia Petals or Iron Supplements on Growth of *C. camelliae* .....35
2.4.5 Effect of Repeated Sub-Culturing on Pathogenicity .....40
2.5 Discussion .....43

**CHAPTER THREE - DISEASE SURVEY IN NEW ZEALAND .....48**
3.1 Introduction .....48
3.2 Materials and Methods .....49
3.3 Results .....51
3.4 Discussion .....56
3.4.1 Methods of Spread.....56
3.4.2 Rate of Spread .....58
3.4.3 New Zealand and United States Experience Similar.....59
3.4.4 Conclusion.....59

**CHAPTER FOUR - SCLEROTIAL GERMINATION.....60**
4.1 Introduction .....60
4.2 Factors Involved in Sclerotial Germination.....61
4.2.1 Dormancy .....61
4.2.2 Temperature and Temperature-Cycling.....62
4.2.3 Light .....63
4.2.4 Water .....63
4.2.5 Exogenous Nutrients or Signals .....63
4.2.6 Other Factors .....64
4.3 Sclerotia of *C. camelliae* and the Importance of Producing the Sexual Stage .64
4.4 Aims .....65
4.5 Materials and Methods .....65
4.5.1 Adaptation of Hawthorne's (1973) Method for *S. minor* .....65
4.5.2 Adaptation of Sansford & Coley-Smith's (1992) Method for *S. sclerotiorum*.....66
4.5.3 Adaptation of Batra & Korf's (1959) Method for *C. erythronii* .....66
4.5.4 Adaptation of Groves & Bowerman's (1955) Method for *C. pseudobifrons* .....67
4.5.5 Novel Overwintering Conditioning Treatments (1) .....68
4.5.6 Novel Overwintering Conditioning Treatments (2) .....70
4.5.7 Naturally Conditioned Sclerotia .....71
4.5.8 Immature Apothecia .....72
4.5.9 Natural Conditioning of Cultured Sclerotia .....74
4.6 Results .....75
4.6.1 Hawthorne's (1973) Method for *S. minor* .....75
4.6.2 Sansford & Coley-Smith's (1992) Method for *S. sclerotiorum* .....75
4.6.3 Batra & Korf's (1959) Method for *C. erythronii*.....75
4.6.4 Groves & Bowerman's (1955) Method for *C. pseudobifrons* .....75
4.6.5 Novel Overwintering Conditioning Treatments (1) .....76
4.6.6 Novel Overwintering Conditioning Treatments (2) .....76
4.6.7 Naturally Conditioned Sclerotia .....76

4.6.8 Immature Apothecia ..... 77
4.6.9 Natural Conditioning of Cultured Sclerotia ..... 77
4.7 Discussion ..... 78

**CHAPTER FIVE - INFECTION STUDIES ..... 83**
5.1 Introduction ..... 83
5.1.1 The Phylloplane and the Infection Process ..... 84
5.1.2 Stimulation of Germination ..... 85
5.1.3 Inhibition of Germination ..... 85
5.1.4 Effect of Temperature, Humidity and Free Water on Germination and Growth ..... 85
5.1.5 Plant Resistance ..... 86
5.1.6 Infection and Resistance to *C. camelliae* ..... 87
5.2 Aims ..... 88
5.3 Materials and Methods ..... 88
5.3.2 Stages in Bud Burst of Camellia Flowers ..... 96
5.3.3 Mycelial Plug Infection ..... 96
5.3.4 Ascospore Infections ..... 98
5.4 Results ..... 99
5.4.1 Possible Non-Ascospore Sources of Infection ..... 99
5.4.2 Stages in Bud Burst of Camellia Flowers ..... 101
5.4.3 Mycelial Plug Infections ..... 102
5.4.4 Ascospore Infection ..... 105
5.5 Discussion ..... 108
5.5.1 Other Means of Spread ..... 108
5.5.2 Mycelial vs. Ascospore Inoculum ..... 109
5.5.3 Resistance Screening ..... 110

**CHAPTER SIX - PRELIMINARY BIOLOGICAL CONTROL INVESTIGATION ..... 113**
6.1 Introduction ..... 113
6.1.1 Advantages of Biocontrol ..... 113
6.1.2 Disadvantages of Biocontrol ..... 114
6.2 Biological Control of Plant Pathogens ..... 114
6.3 Aims ..... 115
6.4 Materials and Methods ..... 115
6.4.1 Collection of Potential Biocontrol Agents ..... 115
6.4.2 Extraction of Potential Biocontrol Agents ..... 115
6.4.3 Co-Incubation of Potential Biocontrol Agents and *C. camelliae* ..... 116
6.4.4 Wash Procedure ..... 116
6.4.5 Culture of Potential Biocontrol Agents ..... 116
6.4.6 Spore Suspensions ..... 118
6.4.7 *In vivo* Assay for Biocontrol ..... 119
6.5 Results ..... 119
6.6 Discussion ..... 121

**CHAPTER SEVEN - GENERAL DISCUSSION.....122**
7.1 Overview.....122
7.2 Disease Distribution and Spread.....122
7.2.1 New Zealand.....122
7.2.2 *C. camelliae* in Australia and Europe.....123
7.3 Study of Resistance Through Infection.....124
7.3.1 Camellia Development of Resistant Camellia.....124
7.4 Artificial Production of Ascospores.....125
7.5 Molecular Aspects.....126
7.6 Conclusion.....128

**References.....129**

**Appendix I.....143**

**Appendix II.....146**

**Appendix III.....148**

**Appendix IV.....175**

**Appendix V.....181**

**Appendix VI.....182**

# LIST OF FIGURES

Figure 1.1 Life cycle of *Ciborinia camelliae* ..... 8
Figure 1.2 Signs and symptoms of *C. camelliae* infection. There is a white ring of mycelium where the calyx has been removed and a brown rot is spreading from the base of the flower..... 9
Figure 1.3 Black sclerotia at the base of an infected flower..... 9
Figure 2.1 Mean isolate growth over all temperatures on each medium..... 30
Figure 2.2 Mean isolate growth over all media at each temperature..... 30
Figure 2.3 Mean isolate growth on each medium at each temperature ..... 31
Figure 2.4 Mean isolate growth over all media at each temperature..... 33
Figure 2.5 Mean isolate growth over all temperatures on each medium..... 33
Figure 2.6 Mean isolate growth on each medium at each temperature ..... 34
Figure 2.7 Mean isolate growth over both camellia species by isolate ..... 36
Figure 2.8 Mean isolate growth on petal agars of *C. japonica*..... 36
Figure 2.9 Mean isolate growth on petal agars of *C. sasanqua*..... 37
Figure 2.10 Comparison of mean isolate growth on camellia agars and control... 37
Figure 2.11 Isolate Cc1 on non-supplemented Difco PDA ..... 38
Figure 2.12 Mean isolate growth over all media at each temperature..... 40
Figure 2.13 Mean isolate growth over all temperatures on each medium..... 41
Figure 2.14 Mean isolate growth on each medium at each temperature ..... 41
Figure 2.15 Atypical colony colour of *C. camelliae* grown on Difco PDA at 20°C... ..... 42
Figure 2.16 Typical features of colonies of *C. camelliae*..... 43
Figure 2.17 Colonies of *C. camelliae* isolate Cc5 grown on Difco PDA at five temperatures for 14 ..... 45
Figure 3.1 Distribution of *C. camelliae* in the North Island 1997..... 52
Figure 3.2 Distribution of *C. camelliae* in the North Island 1998..... 53
Figure 3.3 Distribution of *C. camelliae* in the South Island 1998..... 54
Figure 4.1 *C. camelliae* stipes after 11 weeks storage at 5°C ..... 72
Figure 4.2 Newly formed stipes from sclerotia stored at 5°C for 11 weeks..... 72
Figure 4.3 Stipes produced by sclerotia stored at 10°C..... 75
Figure 4.4 Stipes matured into apothecia after 10 d in 10°C/15°C 12 h light/12 h dark... ..... 76
Figure 5.1 Ascospore inoculation apparatus..... 89
Figure 5.2 Diagrammatic representation of the 8 petal-to-petal treatments ..... 92
Figure 5.3 Inoculation method of camellia leaves with agar plugs... ..... 93
Figure 5.4 Stages in bud development of *C. sasanqua* 'Crimson King' ..... 100
Figure 5.5 Effect of wounding camellia petals on infection by ascospores ..... 105
Figure 5.6 Pitting of the petal surface in susceptible *C. japonica* 'Mary Agnes Patin' ..... 107

Figure 5.7 A resistance test of 'Spring Mist' which was resistant and 'Adorable' which was susceptible.... .....109
Figure 5.8 Petals from 'Zhangjia' and 'Warwick Berg' two days after inoculation using the ascospore settling chamber .....111
Figure 7.1 Camellia leaf collected in Wellington Botanic Gardens with a suspected *C. camelliae* sclerotium embedded in leaf tissue.....127

# LIST OF TABLES

Table 1.1 Summary of features found in *Ciborinia* species ..... 4
Table 1.2 Summary of fungicide trials against sclerotia of *C. camelliae* ..... 14
Table 1.3 Summary of fungicide trials against infection of camellia flowers or prevention of sclerotial formation by *C. camelliae* ..... 16
Table 2.1 Duncan's test for significant differences between isolates and media of *C. camelliae* grown on Difco PDA of Six Agars ..... 34
Table 2.2 Fluorescence of *C. camelliae* isolates by agars amended with ferric iron ..... 39
Table 4.1 Germination experiment using sclerotia cultured on various agars ..... 73
Table 5.1 Camellia varieties used for assessing petal-to-petal infection ..... 34
Table 5.2 List of materials and treatments used in agar plug inoculation of leaves ..... 94
Table 5.3 Inoculation of bud burst stages ..... 96
Table 5.4 List of petal wounding and water treatments used in ascospore infections ..... 97
Table 5.5 Infection of camellia varieties petal-to-petal ..... 99
Table 5.6 Infection of petals at each bud burst stage ..... 102
Table 5.7 Total number of petals infected by *C. camelliae* in each stage of bud burst ..... 103
Table 5.8 Total number of petals infected by *C. camelliae* ascospores in each stage of bud burst ..... 104
Table 5.9 Summary of resistance screening of camellia with ascospores ..... 106
Table 5.10 Distribution of resistance and susceptibility in the genus camellia ..... 110
Table 6.1 Site and source of potential biocontrol agents obtained in wash procedure ..... 117
Table 6.2 *In vivo* assay for biocontrol on camellia petals ..... 119