

APPENDIX

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Table 2A Isolates of *C. parasitica* recovered from stromata collected from Ep-49('99) artificially established cankers on American chestnut trees at Paint Bank research plots

Tree no.	Canker no.	Inoculated strain	White isolates ^a	Pigmented isolates ^b	Intermediate isolates ^c	Total
1-4	3	Ep-49('99)	10	0	0	10
2-4	4	Ep-49('99)	1	0	0	1
3-4	5	Ep-49('99)	65	3	0	68
4-4	1	Ep-49('99)	7	0	0	7
5-4	2	Ep-49('99)	4	0	0	4
1-5	2	Ep-49('99)	4	7	0	11
2-5	3	Ep-49('99)	2	0	0	2
3-5	4	Ep-49('99)	4	0	0	4
4-5	5	Ep-49('99)	4	2	0	6
Total			101	12	0	113
% of total isolates			89%	11%	0%	
^a . White isolates are defined as having less than 30% yellow-orange pigment in the mycelium. ^b . Pigmented isolates are defined as having more than 70% yellow-orange pigment in the mycelium. ^c . Intermediate isolates are defined as having between 30 and 70% yellow-orange pigment in the mycelium.						

Table 2B Isolates of *C. parasitica* recovered from stromata collected from Ep-49(CM3) artificially established cankers on American chestnut trees at Paint Bank research plots

Tree no.	Canker no.	Inoculated strain	White isolates ^a	Pigmented isolates ^b	Intermediate isolates ^c	Total
3-3	1	Ep-49(CM3)	3	0	0	3
	2	Ep-49(CM3)	8	0	0	8
	3	Ep-49(CM3)	6	0	1	7
	4	Ep-49(CM3)	3	1	0	4
4-3	1	Ep-49(CM3)	4	0	0	4
	3	Ep-49(CM3)	4	0	0	4
	5	Ep-49(CM3)	3	0	0	3
3-4	3	Ep-49(CM3)	0	0	7	7
4-4	4	Ep-49(CM3)	1	1	28	30
5-4	5	Ep-49(CM3)	0	7	3	10
1-5	4	Ep-49(CM3)	4	0	0	4
4-5	2	Ep-49(CM3)	1	0	0	1
Totals			37	9	39	85
% of total isolates			44%	11%	46%	
^a . White isolates are defined as having less than 30% yellow-orange pigment in the mycelium. ^b . Pigmented isolates are defined as having more than 70% yellow-orange pigment in the mycelium. ^c . Intermediate isolates are defined as having between 30 and 70% yellow-orange pigment in the mycelium.						

Table 2C Isolates of *C. parasitica* recovered from stromata collected from Ep-51W artificially established cankers on American chestnut trees at Paint Bank research plots

Tree no.	Canker no.	Inoculated strain	White isolates ^a	Pigmented isolates ^b	Intermediate isolates ^c	Total isolates
1-4	4	Ep-51W	3	0	0	3
2-4	5	Ep-51W	1	1	2	4
3-4	1	Ep-51W	0	0	5	5
4-5	3	Ep-51W	8	0	0	0
Total			12	1	7	20
% of total isolates			60%	5%	35%	

^a. White isolates are defined as having less than 30% yellow-orange pigment in the mycelium.
^b. Pigmented isolates are defined as having more than 70% yellow-orange pigment in the mycelium.
^c. Intermediate isolates are defined as having between 30 and 70% yellow-orange pigment in the mycelium.

Table 2D Isolates of *C. parasitica* recovered from stromata collected from Ep-49(CM1) artificially established cankers on American chestnut trees at Paint Bank research plots

Tree no.	Canker no.	Inoculated strain	White isolates ^a	Pigmented isolates ^b	Intermediate isolates ^c	Total
2-4	3	Ep-49(CM1)	8	0	0	8
1-5	3	Ep-49(CM1)	2	0	0	2
Total			10	0	0	10
% of total isolates			100%			
^a . White isolates are defined as having less than 30% yellow-orange pigment in the mycelium. ^b . Pigmented isolates are defined as having more than 70% yellow-orange pigment in the mycelium. ^c . Intermediate isolates are defined as having between 30 and 70% yellow-orange pigment in the mycelium.						

Table 2E Isolates of *C. parasitica* recovered from stromata collected from Ep-47('99) artificially established cankers on American chestnut trees at Paint Bank research plots

Tree no.	Canker no.	Inoculated strain	White isolates ^a	Pigmented isolates ^b	Intermediate isolates ^c	Total
2-4	1	Ep-47('99)	0	6	0	6
1-5	1	Ep-47('99)	0	2	0	2
2-5	2	Ep-47('99)	0	2	0	2
4-5	4	Ep-47('99)	0	3	0	3
Totals			0	13	0	13
% of total isolates						100%
^a . White isolates are defined as having less than 30% yellow-orange pigment in the mycelium. ^b . Pigmented isolates are defined as having more than 70% yellow-orange pigment in the mycelium. ^c . Intermediate isolates are defined as having between 30 and 70% yellow-orange pigment in the mycelium.						

Table 2F *C. parasitica* isolates recovered from bark cores collected from Ep-49('99) artificially established cankers on American chestnut trees at Paint Bank research plots

Tree no.	Canker no.	Inoculated strain	White isolates ^a	Pigmented isolates ^b	Intermediate isolates ^c	Total
1-4	3	Ep-49('99)	4	0	0	4
2-4	4	Ep-49('99)	2	0	0	2
3-4	5	Ep-49('99)	4	0	0	4
4-4	1	Ep-49('99)	4	0	0	4
5-4	2	Ep-49('99)	4	0	0	4
1-5	2	Ep-49('99)	4	0	0	4
2-5	3	Ep-49('99)	4	0	0	4
3-5	4	Ep-49('99)	4	0	0	4
4-5	5	Ep-49('99)	3	0	0	3
5-5	1	Ep-49('99)	3	0	0	3
Total			36			36
% total isolates			100%			

^a. White isolates are defined as having less than 30% yellow-orange pigment in the mycelium.
^b. Pigmented isolates are defined as having more than 70% yellow-orange pigment in the mycelium.
^c. Intermediate isolates are defined as having between 30 and 70% yellow-orange pigment in the mycelium.

Table 2G *C. parasitica* isolates recovered from bark cores collected from Ep-49(CM3) artificially established cankers on American chestnut trees at Paint Bank research plots

Tree no.	Canker no.	Inoculated strain	White isolates ^a	Pigmented isolates ^b	Intermediate isolates ^c	Total
1-4	1	Ep-49(CM3)	0	0	4	4
2-4	2	Ep-49(CM3)	1	0	7	8
3-4	3	Ep-49(CM3)	2	0	7	9
4-4	4	Ep-49(CM3)	0	0	7	7
5-4	5	Ep-49(CM3)	2	0	4	6
4-3	1	Ep-49(CM3)	9	2	0	11
4-3	3	Ep-49(CM3)	4	0	0	4
4-3	5	Ep-49(CM3)	8	0	0	8
4-3	2	Ep-49(CM3)	2	2	0	4
3-3	1	Ep-49(CM3)	2	0	4	6
3-3	2	Ep-49(CM3)	2	0	5	7
3-3	3	Ep-49(CM3)	5	0	5	10
3-3	4	Ep-49(CM3)	2	0	4	6
1-5	4	Ep-49(CM3)	4	0	0	4
3-5	1	Ep-49(CM3)	3	0	0	3
4-5	2	Ep-49(CM3)	4	0	0	4
Total			50	4	47	101
% of total isolates			50%	4%	47%	

^a. White isolates are defined as having less than 30% yellow-orange pigment in the mycelium.
^b. Pigmented isolates are defined as having more than 70% yellow-orange pigment in the mycelium.
^c. Intermediate isolates are defined as having between 30 and 70% yellow-orange pigment in the mycelium.

Table 2H *C. parasitica* isolates recovered from bark cores collected from Ep-51W artificially established cankers on American chestnut trees at Paint Bank research plots

Tree no.	Canker no.	Inoculated strain	White isolates ^a	Pigmented isolates ^b	Intermediate isolates ^c	Total
1-4	4	Ep-51W	4	0	0	4
2-4	5	Ep-51W	1	1	0	2
3-4	1	Ep-51W	3	1	0	4
4-4	2	Ep-51W	4	0	0	4
5-4	3	Ep-51W	4	0	0	4
1-5	5	Ep-51W	4	0	0	4
2-5	1	Ep-51W	3	0	0	3
3-5	2	Ep-51W	4	0	0	4
4-5	3	Ep-51W	4	0	0	4
5-5	4	Ep-51W	4	0	0	4
Total			35	2		37
% of total isolates			95%	5%		
^a . White isolates are defined as having less than 30% yellow-orange pigment in the mycelium. ^b . Pigmented isolates are defined as having more than 70% yellow-orange pigment in the mycelium. ^c . Intermediate isolates are defined as having between 30 and 70% yellow-orange pigment in the mycelium.						

Table 2I *C. parasitica* isolates recovered from bark cores collected from Ep-49(CM1) artificially established cankers on American chestnut trees at Paint Bank research plots

Tree no.	Canker no.	Inoculated strain	White isolates ^a	Pigmented isolates ^b	Intermediate isolates ^c	Total
1-4	2	Ep-49(CM1)	3	0	0	3
2-4	3	Ep-49(CM1)	1	4	1	6
3-4	4	Ep-49(CM1)	4	0	0	4
4-4	5	Ep-49(CM1)	1	1	0	2
5-4	1	Ep-49(CM1)	2	1	0	3
1-5	3	Ep-49(CM1)	4	0	0	4
2-5	4	Ep-49(CM1)	3	0	1	4
3-5	5	Ep-49(CM1)	3	1	0	4
4-5	1	Ep-49(CM1)	3	1	0	4
Total			24	8	2	34
% of total isolates			70%	24%	6%	
^a . White isolates are defined as having less than 30% yellow-orange pigment in the mycelium. ^b . Pigmented isolates are defined as having more than 70% yellow-orange pigment in the mycelium. ^c . Intermediate isolates are defined as having between 30 and 70% yellow-orange pigment in the mycelium.						

Table 2J *C. parasitica* isolates recovered from bark cores collected from Ep-47('99) artificially established cankers on American chestnut trees at Paint Bank research plots

Tree no.	Canker no.	Inoculated strain	White isolates ^a	Pigmented isolates ^b	Intermediate isolates ^c	Total
1-4	5	Ep-47('99)	2	2	0	4
2-4	1	Ep-47('99)	0	4	0	4
3-4	2	Ep-47('99)	0	4	0	4
4-4	3	Ep-47('99)	1	1	0	2
5-4	4	Ep-47('99)	2	0	1	3
1-5	1	Ep-47('99)	0	4	0	4
2-5	2	Ep-47('99)	0	4	0	4
3-5	3	Ep-47('99)	0	3	0	3
4-5	4	Ep-47('99)	0	2	0	2
Total			5	24	1	30
% of total isolates			16.7%	80%	3.3%	
^a . White isolates are defined as having less than 30% yellow-orange pigment in the mycelium. ^b . Pigmented isolates are defined as having more than 70% yellow-orange pigment in the mycelium. ^c . Intermediate isolates are defined as having between 30 and 70% yellow-orange pigment in the mycelium.						

Table 3A Gel electrophoresis band intensity of intermediate *C. parasitica* isolates recovered from bark-cores, stromata or laboratory cultures

Colony type	Isolate	% pigmented	dsRNA band intensity
I-CR	TH. Str 70	70	-
I-CR	RM. Str 130a	70	++
I-CR	T 2-4. C 1. Str c	70	-
Mottled	T 4-4. C 4 Cor III	70	+
CM3 ^a	T 4-4. C 4. Str t	70	-
I-D	T 3-3. C 1. Cor I	70	++++
I-CR	T 3-4. C 1. Str d	65	++
I-CR	RM. Str 62a	65	+
CM3	Ep-49 #4 ss1	65	-
I-CR	TH Str 165a	60	+
I-CR	RM. Str 61b	60	++
I-CR	RM. Str 34a	60	+
Mottled	T 5-4. C 5. Str d	60	-
CM3 ^a	RM. Str 61a	60	+
CM3	Ep-49 ATCC ss1	60	+
I-CR	RM. Str 135	55	-
Mottled	T 4-4. C 4. Cor a	55	+++
Mottled	T 4-4. C 4. Str 2	55	-
Mottled	Ep-49 #7	55	+
CM3	Ep-49 #6 ss1	55	+
CM3	Ep-49 #7 ss1	55	-
I-CR	RM. Str 35a	50	+++
Mottled	T 5-4. C 5. Cor a	50	-
CM3	Ep-49 #7 ss2	50	-
CM3 ^a	TH. Str 162a	50	++
I-CR	TH. Str 108	45	++
Mottled	T 5-4. C 5. Cor d	45	-
CM3	Ep-49#5 ss1	45	++++
CM3	Ep-49 #4 ss2	45	++++
I-CR	Ep-49 #6	40	++++
CM3	Ep-49 #6 ss2	35	++++
I-CR	TH. Str 119	30	-
I-D	T 3-3. C 2. Cor I	30	++++

^a. CM3 “type” isolate. Isolate is not a single spore but it has the phenotype of a single-spore CM3 colony (Hogan and Griffin 2002)

+ = very faint band intensity
 ++ = faint band intensity
 +++ = moderate band intensity
 ++++ = bright band intensity
 - = no gel electrophoresis band observed

Table 3B Dates on which the average temperature was -10°C or lower between December 20, 2004 and Feb 18, 2005 at Paint Bank and Horton Center research plots

Date	Paint Bank ($^{\circ}\text{C}$) ^a	Horton Center($^{\circ}\text{C}$) ^a
12/20	-11.0^b	
1/5	-12.7	
1/6	-15.0	
1/7	-12.2	
1/10	-15.5	-13.4
1/11	-0.95	-2.35
1/12		-0.7
1/13		-5.05
1/14		-4.0
1/15		-11.7
1/16	-8.6	-6.5
1/17	-5.1	-3.5
1/18	-11.6	-10.0
1/19	-12.7	-12.6
1/20	-13.6	-11.2
1/22		-14.0
1/23		-5.9
1/24		-9.7
1/25		-11.0
1/26		-5.4
1/27		-12.3
1/28	-8.9	-7.5
1/29	-12.9	-6.6
1/30	-19.7	-18.6
1/31	-11.4	-8.7
2/1	-6.8	-5.5
2/2	-3.9	-2.6
2/3	-4.8	
2/12		-2.2
2/13		-0.7
2/14		-1.3
2/15		-5.5
2/16		-6.9
2/17		-4.3
2/18		-0.9

^a Elevation of Paint Bank Research Plots in Craig Co is 947 m. and elevation of Horton Center in Giles Co. is 975 m

^b Bold number indicates a temperature of -10°C or lower

VITA

In 1997 Eric Hogan earned his B.S. degree in Biology from James Madison University. He enrolled at Virginia Tech in 1998 and in 2001 earned his M.S. in Plant Pathology studying biological control of chestnut blight. Findings from his Masters work lead to the dissertation here. In 2006 he earned his Ph.D. in Plant Pathology Physiology and Weed Science from Virginia Tech. His time at Blacksburg was filled with learning, teaching, joy, struggle, new-found talents, youth ministry, many new friends, numerous classes, two degrees, and one soul mate.