

New Phytologist Supporting Information Tables S1–S7

Article title: A fungal endophyte helps plants to tolerate root herbivory through changes in gibberellin and jasmonate signaling

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Table S1 Primers used for Quantitative real-time PCR analyses

Gene	RGAP LOCUS	Description	F-Primers (5'...3')	R-Primers (5'...3')
<i>JAR1</i>	LOC_Os05g50890	JA synthesis	AAGGTTTGTGAACCCATCAAACAGC	AATAATACTTTGCAGCACTTGTTACG
<i>OsKS1</i>	LOC_Os04g52230	GA synthesis	GACAAGGGACCAGCTCCAGACATTGGAG	CAGGAGCAGCAATCTGCTCATCCATGGC
<i>OsACT</i>	LOC_Os03g50885	Housekeeping	TGGACAGGTTATCACCATTGGT	CCGCAGCTTCCATTCTATG

Table S2 Results of the three-way ANOVA for Exp I of the effects of the root endophyte *Piriformospora indica*, rice water weevil (RWW, *Lissorhoptrus oryzophilus*) adults, RWW larvae, and the interactions between their effects on shoot biomass FW, tiller number, root biomass FW, total root length and average root diameter of 58 d-old rice plants

Factors	df	Shoot FW		Tiller No		Root FW		Root length		Root diameter	
		<i>F</i>	<i>P</i>	<i>F</i>	<i>P</i>	<i>F</i>	<i>P</i>	<i>F</i>	<i>P</i>	<i>F</i>	<i>P</i>
Endophyte (E)	1	2,984	0,090	5,906	0,018	5,177	0,027	9,056	0,004	0,005	0,947
Adult (A)	1	0,970	0,329	0,024	0,877	0,238	0,628	1,555	0,218	0,046	0,831
Larva (L)	1	9,954	0,003	0,287	0,594	1,966	0,167	16,060	<0,001	12,295	<0,001
E x A	1	0,845	0,362	0,179	0,674	2,330	0,133	7,882	0,007	0,774	0,383
E x L	1	5,371	0,024	9,534	0,003	7,001	0,011	21,696	<0,001	0,194	0,661
A x L	1	0,097	0,756	0,389	0,535	0,126	0,724	1,128	0,293	0,389	0,535
E x A x L	1	0,017	0,897	0,055	0,816	0,621	0,434	6,176	0,016	1,315	0,256
Residuals	56										

Significant *P*-values (< 0.050) are given in bold, marginally significant *P*-values (< 0.100) are given in italic.

Table S3 Mean values of macronutrients (mg g⁻¹ DW) and micronutrients (µg g⁻¹ DW) in shoots of 58-d-old rice plants for Exp I as affected by the root endophyte *Piriformospora indica*, rice water weevil (RWW, *Lissorhoptrus oryzophilus*) adults, RWW larvae and their fully crossed combinations in comparison to the untreated control as well as the respective results of the three-way factorial ANOVA or GLM

Macronutrients mg g ⁻¹ DW	Nitrogen (N)		Phosphorus (P)		Potassium (K)		Calcium (Ca)		Magnesium (Mg)		Sulfur (S)								
	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE							
Control	29,05 ±	1,75	5,447 ±	0,082	51,22 ±	0,80	4,863 ±	0,141	2,543 ±	0,082	2,775 ±	0,079							
Adult (A)	28,92 ±	1,88	5,529 ±	0,119	52,56 ±	0,93	4,897 ±	0,193	2,591 ±	0,063	2,899 ±	0,097							
Larva (L)	28,67 ±	3,00	4,459 ±	0,281	46,08 ±	3,36	6,078 ±	0,552	2,394 ±	0,085	2,980 ±	0,198							
AL	31,08 ±	1,82	4,510 ±	0,212	50,76 ±	1,57	6,231 ±	0,193	2,492 ±	0,104	3,272 ±	0,162							
Endophyte (E)	29,89 ±	1,73	5,514 ±	0,098	52,79 ±	1,53	4,786 ±	0,094	2,439 ±	0,072	2,781 ±	0,115							
EA	26,69 ±	1,24	5,773 ±	0,079	53,12 ±	1,20	4,689 ±	0,122	2,552 ±	0,071	2,953 ±	0,129							
EL	27,90 ±	1,29	4,856 ±	0,066	50,54 ±	0,77	5,641 ±	0,208	2,545 ±	0,056	2,966 ±	0,066							
EAL	28,51 ±	1,45	4,827 ±	0,058	49,28 ±	1,15	5,297 ±	0,109	2,396 ±	0,066	2,863 ±	0,127							
Factors	GLM				GLM			GLM			GLM			ANOVA			ANOVA		
	df1	df2	F	P	df2	F	P	df2	F	P	df2	F	P	df2	F	P	df2	F	P
Endophyte	1	62	0,752	0,390	62	5,205	0,026	62	1,128	0,293	62	6,743	0,012	56	0,169	0,682	56	1,006	0,320
Adult	1	61	0,010	0,919	61	0,651	0,423	61	1,116	0,295	61	0,159	0,692	56	0,254	0,616	56	1,795	0,186
Larva	1	60	0,074	0,787	60	64,938	<0,001	60	7,353	0,009	60	39,657	<0,001	56	1,928	0,171	56	3,452	0,068
E x A	1	59	0,834	0,365	59	0,031	0,862	59	2,175	0,146	59	1,023	0,316	56	0,720	0,400	56	0,915	0,343
E x L	1	58	0,121	0,730	58	1,730	0,194	58	0,06	0,807	58	1,527	0,222	56	0,850	0,360	56	1,769	0,189
A x L	1	57	1,461	0,232	57	0,337	0,564	57	0,195	0,661	57	0,029	0,866	56	0,975	0,328	56	0,087	0,769
E x A x L	1	56	0,092	0,763	56	0,280	0,599	56	1,301	0,259	56	0,182	0,672	56	2,094	0,153	56	1,490	0,227

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(Continuation of Table S3)

Micronutrients $\mu\text{g g}^{-1}$ DW	Zinc (Zn)		Manganese (Mn)		Iron (Fe)		Copper (Cu)		Boron (B)		Molybdenum (Mo)								
	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE							
Control	117,2	± 4,45	382,1	± 10,47	286,9	± 38,26	13,78	± 0,67	9,626	± 0,287	1,953	± 0,082							
Adult (A)	120,7	± 6,19	403,7	± 14,50	257,1	± 48,01	13,51	± 0,56	9,306	± 0,213	2,040	± 0,112							
Larva (L)	130,5	± 12,04	316,8	± 40,49	261,3	± 20,36	17,96	± 4,87	11,633	± 0,876	2,249	± 0,080							
AL	116,0	± 7,67	345,6	± 27,26	316,1	± 60,82	11,75	± 0,68	12,262	± 0,835	2,370	± 0,126							
Endophyte (E)	118,6	± 3,91	401,7	± 6,75	243,2	± 18,89	13,14	± 0,80	9,678	± 0,272	2,072	± 0,097							
EA	120,1	± 4,15	396,2	± 6,11	242,3	± 28,76	13,74	± 0,82	9,625	± 0,195	2,115	± 0,105							
EL	118,7	± 4,38	365,5	± 10,12	264,0	± 28,18	13,57	± 0,26	11,306	± 0,576	2,154	± 0,057							
EAL	111,5	± 4,96	360,8	± 10,68	317,7	± 41,16	12,98	± 0,57	11,055	± 0,853	2,105	± 0,077							
Factors	ANOVA				GLM			ANOVA			GLM			GLM			ANOVA		
	df1	df2	<i>F</i>	<i>P</i>	df2	<i>F</i>	<i>P</i>	df2	<i>F</i>	<i>P</i>	df2	<i>F</i>	<i>P</i>	df2	<i>F</i>	<i>P</i>	df2	<i>F</i>	<i>P</i>
Endophyte	1	56	0,399	0,530	62	1,927	0,171	56	0,036	0,850	62	0,467	0,497	62	0,489	0,487	56	0,383	0,538
Adult	1	56	0,872	0,354	61	0,537	0,467	56	0,055	0,815	61	1,577	0,215	61	0,000	0,999	56	0,564	0,456
Larva	1	56	0,058	0,811	60	12,659	<0,001	56	1,889	0,175	60	0,156	0,695	60	23,289	<0,001	56	6,829	0,012
E x A	1	56	0,044	0,835	59	1,227	0,273	56	0,273	0,604	59	1,583	0,214	59	0,137	0,713	56	0,644	0,426
E x L	1	56	0,669	0,417	58	0,892	0,349	56	0,216	0,644	58	0,273	0,603	58	1,313	0,257	56	4,313	0,042
A x L	1	56	2,041	0,159	57	0,021	0,884	56	1,731	0,194	57	1,928	0,170	57	0,204	0,654	56	0,047	0,829
E x A x L	1	56	0,149	0,701	56	0,014	0,907	56	0,045	0,832	56	0,841	0,363	56	0,478	0,492	56	0,229	0,635

df1, degrees of freedom; df2, degrees of freedom of residuals. Significant *P*-values (< 0.050) are given in bold, marginally significant *P*-values (< 0.100) are given in italic.

Table S4 Results of the three-way GLM for Exp I of the effects of the root endophyte *Piriformospora indica*, rice water weevil (RWW, *Lissorhoptrus oryzophilus*) adults, RWW larvae and the interactions between their effects on 12-oxophytodienoic acid (OPDA), jasmonic acid (JA) and jasmonoyl-isoleucine (JA-Ile) in leaves and in roots of 58-d-old rice plants

Factors	Leaves								Roots															
	OPDA				JA				JA-Ile				OPDA				JA				JA-Ile			
	df1	df2	F	P	F	P	F	P	df2	F	P	F	P	F	P	F	P							
Endophyte (E)	1	62	0,000	0,995	0,441	0,509	0,888	0,350	59	1,040	0,312	6,048	0,017	3,155	<i>0,081</i>									
Adult (A)	1	61	4,732	0,034	6,420	0,014	5,340	0,025	58	0,336	0,565	1,524	0,222	1,513	0,224									
Larva (L)	1	60	3,483	<i>0,067</i>	4,554	0,037	3,274	<i>0,076</i>	57	0,032	0,858	7,385	0,009	14,864	<0,001									
E x A	1	59	0,237	0,628	1,662	0,203	1,424	0,238	56	0,069	0,794	0,829	0,367	0,984	0,326									
E x L	1	58	0,594	0,444	0,047	0,829	0,609	0,438	55	2,079	0,155	4,133	0,047	1,657	0,204									
A x L	1	57	0,047	0,830	2,015	0,161	1,368	0,247	54	0,196	0,660	0,588	0,447	0,024	0,877									
E x A x L	1	56	0,608	0,439	0,533	0,469	0,348	0,558	53	0,291	0,592	0,674	0,415	0,909	0,345									

df1, degrees of freedom; df2, degrees of freedom of residuals. Significant *P*-values (< 0.050) are given in bold, marginally significant *P*-values (< 0.100) are given in italic.

Table S5 Results of the three-way GLM for Exp I of the effects of the root endophyte *Piriformospora indica*, rice water weevil (RWW, *Lissorhoptrus oryzophilus*) adults, RWW larvae and the interactions between their effects on the relative transcription levels of *OsJAR1* and *OsKS1* genes in roots of 58 d-old rice plants

Factors			<i>OsJAR1</i>		<i>OsKS1</i>	
	df1	df2	<i>F</i>	<i>P</i>	<i>F</i>	<i>P</i>
Endophyte (E)	1	59	0,574	0,452	6,037	0,017
Adult (A)	1	58	0,166	0,685	0,000	0,993
Larva (L)	1	57	0,138	0,711	48,198	<0,001
E x A	1	56	0,013	0,910	1,723	0,195
E x L	1	55	3,475	<i>0,068</i>	0,768	0,385
A x L	1	54	2,436	0,125	0,109	0,743
E x A x L	1	53	0,678	0,414	3,420	<i>0,070</i>

df1, degrees of freedom; df2, degrees of freedom of residuals. Significant *P*-values (< 0.050) are given in bold, marginally significant *P*-values (< 0.100) are given in italic.

Table S6 Results of the three-way ANOVA or GLM for Exp II of the effects of the root endophyte *Piriformospora indica*, rice water weevil (RWW, *Lissorhoptrus oryzophilus*) adults, RWW larvae and the interactions between their effects on the FW of shoots, untreated root-half, and treated root-half of 58-d-old WT, *coi1-18*, and *Eui1-OX* plant lines.

WT		Shoot				Untreated root-half			Treated root-half		
Factors	df1	ANOVA		GLM			GLM				
		df2	F	P	df2	F	P	df2	F	P	
Endophyte (E)	1	56	4,738	0,034	62	3,290	<i>0,075</i>	62	5,223	0,026	
Adult (A)	1	56	0,197	0,659	61	0,486	0,488	61	0,354	0,554	
Larva (L)	1	56	0,620	0,434	60	0,217	0,643	60	4,030	0,049	
E x A	1	56	0,014	0,906	59	0,003	0,959	59	0,020	0,887	
E x L	1	56	0,219	0,642	58	1,178	0,282	58	0,720	0,400	
A x L	1	56	1,842	0,180	57	0,810	0,372	57	3,234	<i>0,078</i>	
E x A x L	1	56	0,179	0,674	56	0,220	0,641	56	0,950	0,334	

<i>coi1-18</i>		Shoot				Untreated root-half			Treated root-half		
Factors	df1	GLM		GLM			GLM				
		df2	F	P	df2	F	P	df2	F	P	
Endophyte (E)	1	61	16,305	<0,001	61	19,430	<0,001	61	17,243	<0,001	
Adult (A)	1	60	2,295	0,136	60	1,870	0,177	60	1,609	0,210	
Larva (L)	1	59	0,140	0,710	59	0,028	0,869	59	0,666	0,418	
E x A	1	58	0,263	0,610	58	0,352	0,556	58	0,791	0,378	
E x L	1	57	0,558	0,458	57	1,121	0,294	57	0,019	0,892	
A x L	1	56	0,242	0,625	56	0,524	0,472	56	0,720	0,400	
E x A x L	1	55	0,000	0,997	55	0,979	0,327	55	0,323	0,572	

<i>Eui1-OX</i>		Shoot				Untreated root-half			Treated root-half		
Factors	df1	GLM		GLM			GLM				
		df2	F	P	df2	F	P	df2	F	P	
Endophyte (E)	1	57	2,155	0,148	57	2,599	0,113	57	0,581	0,449	
Adult (A)	1	56	0,975	0,328	56	0,861	0,358	56	0,578	0,451	
Larva (L)	1	55	5,612	0,022	55	2,505	0,120	55	5,789	0,020	
E x A	1	54	0,703	0,406	54	1,018	0,318	54	0,480	0,492	
E x L	1	53	0,212	0,647	53	0,000	0,999	53	0,002	0,963	
A x L	1	52	0,279	0,600	52	1,267	0,266	52	0,567	0,455	
E x A x L	1	51	1,203	0,278	51	0,226	0,637	51	0,252	0,618	

df1, degrees of freedom; df2, degrees of freedom of residuals. Significant *P*-values (< 0.050) are given in bold, marginally significant *P*-values (< 0.100) are given in italic.

Table S7 Results of the two-way ANOVA or GLM for Exp II of the effects of the root endophyte *Piriformospora indica*, rice water weevil (RWW, *Lissorhoptrus oryzophilus*) adults, and the interaction between their effects on survival and growth of RWW larvae 28 d after neonate infestation in roots of 58-d-old WT, *coi1-18* or *Eui1-OX* plant lines

Factors	df1	WT						<i>coi1-18</i>						<i>Eui1-OX</i>					
		Survival			Growth			Survival			Growth			Survival			Growth		
		GLM			GLM			ANOVA			GLM			ANOVA			GLM		
		df2	F	P	df2	F	P	df2	F	P	df2	F	P	df2	F	P	df2	F	P
Endophyte (E)	1	30	0,131	0,721	27	1,085	0,308	28	9,048	0,006	29	0,083	0,775	28	0,688	0,414	22	0,161	0,693
Adults (A)	1	29	0,066	0,799	26	0,071	0,792	28	0,692	0,412	28	0,072	0,791	28	0,199	0,659	21	4,122	<i>0,056</i>
E x A	1	28	0,237	0,630	25	0,035	0,854	28	1,479	0,234	27	0,005	0,944	28	0,066	0,799	20	0,016	0,900

WT, wild type; df1, degrees of freedom; df2, degrees of freedom of residuals. Significant *P*-values (< 0.050) are given in bold, marginally significant *P*-values (< 0.100) are given in italic.