

## Supplementary material – File S1

### Community Richness and Diversity of Endophytic Fungi Associated with the Orchid *Guarianthe skinneri* Infested with “Black Blotch” in the Soconusco Region, Chiapas, Mexico

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Table S1. Sample ID, barcode, plant number, condition, tissue, sample, number of raw sequences, number of filtered sequences, number of sequences without chimeras. The samples correspond to leaves (L), pseudobulbs (P) and roots (R) of five (1-5) asymptomatic plants (AP) and five (6-10) symptomatic plants (SP) of *Guarianthe skinneri*.

SampleID	Barcode	Plant	Condition	Tissue	Sample	Raw sequences	Dada-ITSxpress	Dada-ITSx-UCHIME
T4.R1	ATCGATGC	1	AP	L	1-AP-L	215758	65453	59969
T4.R2	ATCGCCAA	2	AP	L	2-AP-L	538225	123752	119845
T4.R3	ATCGCCTT	3	AP	L	3-AP-L	213764	68544	65410
T4.R4	ATCGCGAT	4	AP	L	4-AP-L	269370	62528	62346
T4.R5	ATCGCGTA	5	AP	L	5-AP-L	151471	110646	110288
T5.R1	ATCGGCAT	1	AP	P	1-AP-P	330069	116802	106055
T5.R2	ATCGGCTA	2	AP	P	2-AP-P	393540	109719	106447
T5.R3	ATCGTACG	3	AP	P	3-AP-P	298451	78061	67188
T5.R4	ATCGTAGC	4	AP	P	4-AP-P	462846	127246	108754
T5.R5	ATCGTTCC	5	AP	P	5-AP-P	424253	98466	93898
T6.R1	ATCGTTGG	1	AP	R	1-AP-R	439851	113361	108528
T6.R2	ATGCAACC	2	AP	R	2-AP-R	444652	123270	120874
T6.R3	ATGCAAGG	3	AP	R	3-AP-R	330528	63125	60504
T6.R4	ATGCATCG	4	AP	R	4-AP-R	281130	142881	139537
T6.R5	ATGCATGC	5	AP	R	5-AP-R	663244	164519	160632
T10.R1	ATGCCGAT	6	SP	L	6-SP-L	469070	63394	59103
T10.R2	ATGCCGTA	7	SP	L	7-SP-L	313260	83043	82702
T10.R3	ATGCGCAT	8	SP	L	8- SP-L	377838	80204	77666

T10.R4	ATGCGCTA	9	SP	L	9- SP-L	717045	237646	236501
T10.R5	ATGCGGAA	10	SP	L	10-SP-L	484045	91548	88882
T11.R1	ATGCGGTT	6	SP	P	6- SP-P	301400	56875	52475
T11.R2	ATGCTACG	7	SP	P	7- SP-P	579654	63218	62069
T11.R3	ATGCTAGC	8	SP	P	8- SP-P	554395	154851	153397
T11.R4	ATGCTTCC	9	SP	P	9- SP-P	579339	102917	95973
T11.R5	ATGCTTGG	10	SP	P	10- SP-P	512337	139075	136506
T12.R1	ATGGAACG	6	SP	R	6- SP-R	408895	10463	9346
T12.R2	ATGGAAGC	7	SP	R	7- SP-R	762220	138784	131957
T12.R3	ATGGATCC	8	SP	R	8- SP-R	316132	20515	18077
T12.R4	ATGGATGG	9	SP	R	9- SP-R	656609	170886	166532
T12.R5	ATGGCCAT	10	SP	R	10-SP-R	757706	175860	172269

Table S2. Taxonomy of the composition of the fungal community. The samples correspond to leaves (L), pseudobulbs (P) and roots (R) of five (1-5) asymptomatic plants (AP) and five (6-10) symptomatic plants (SP) of *Guarianthe skinneri*.

Sample	Phylum	Class	Order	Family	Genus	Species
1-AP-L		2	6	22	32	32
2-AP-L		2	7	17	19	20
3-AP-L		2	7	21	25	33
4-AP-L		2	6	15	19	17
5-AP-L		2	6	18	19	19
1-AP-P		2	6	20	28	28
2-AP-P		3	7	20	27	26
3-AP-P		2	11	27	32	35
4-AP-P		3	11	30	44	51
5-AP-P		3	6	27	40	43
1-AP-R		2	8	26	44	53
2-AP-R		2	7	24	27	34
3-AP-R		3	7	24	35	36
4-AP-R		2	10	22	28	27
5-AP-R		3	10	30	32	35
6-SP-L		2	7	21	25	27
7-SP-L		2	6	18	21	24
8- SP-L		2	6	23	28	32
9- SP-L		2	8	19	20	21
10- SP-L		5	17	45	57	76
6- SP-P		2	7	21	25	23

7- SP-P	3	7	26	37	42	40
8- SP-P	2	12	34	39	44	34
9- SP-P	2	6	18	20	21	22
10- SP-P	2	7	25	35	43	35
6- SP-R	3	9	27	35	35	20
7- SP-R	2	11	32	44	51	42
8- SP-R	2	7	20	25	24	17
9- SP-R	4	13	37	44	49	39
10- SP-R	3	9	30	45	48	35
Total	5	28	70	156	234	164

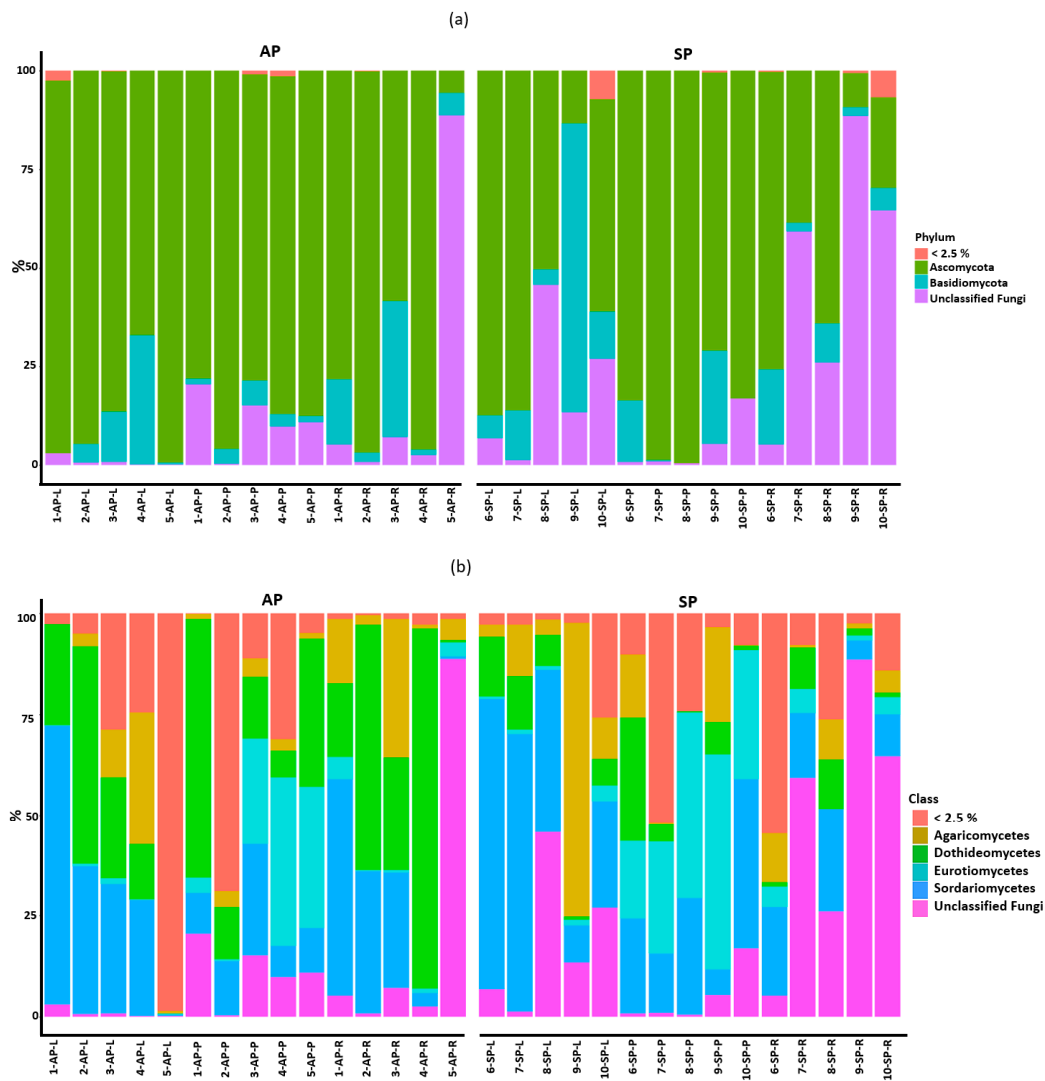


Figure S1. Relative frequency of Phylum (a) and Class (b) assigned to endophytic fungi associated with *Guarianthe skinneri* asymptomatic and symptomatic plants. The samples correspond to the leaves (L), pseudobulbs (P) and roots (R) of five (1-5) asymptomatic plants (AP) and five (6-10) symptomatic plants (SP).

Table S3. PERMANOVA analysis. The samples correspond to leaves (L), pseudobulbs (P) and roots (R) of symptomatic and asymptomatic plants of *Guarianthe skinneri*.

Method name	PERMANOVA		
Test statistic name	Pseudo-F		
Group	L vs P	L vs R	P vs R
Simple size	20	19	19
Number of groups	2	2	2
Test statistic	1.62578	1.54544	1.11884
p-value	0.001	0.001	0.079
q-value	0.0015	0.0015	0.079
Number of permutations	999	999	999

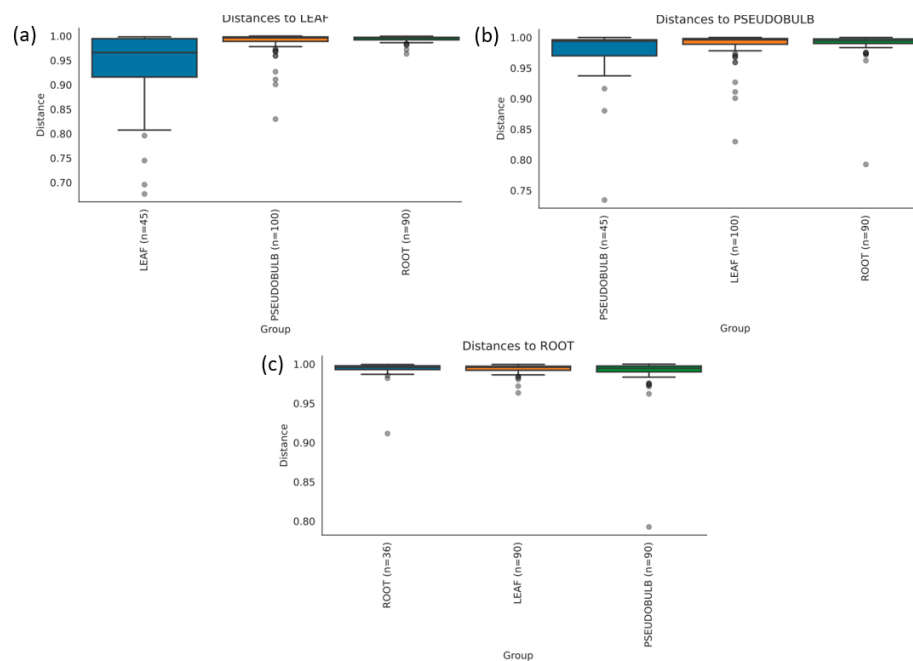


Figure S2. Associations by tissue using Bray-Curtis distances, calculated with Qiime2, based on the data set including all taxa detected in leaves (a), pseudobulbs (b) and roots (c) of symptomatic and asymptomatic plants of *Guarianthe skinneri*.

Table S4. PERMANOVA analysis of asymptomatic plants of *Guarianthe skinneri*. The samples correspond to leaves (L), pseudobulbs (P) and roots (R).

Method name		PERMANOVA	
Test statistic name		Pseudo-F	
Group	L vs P	L vs R	P vs R
Simple size	10	10	10
Number of groups	2	2	2
Test statistic	1.52	1.36	1.08
p-value	0.005	0.097	0.105
q-value	0.015	0.015	0.015
Number of permutations	999	999	999

Table S5. PERMANOVA analysis of symptomatic plants of *Guarianthe skinneri*. The samples correspond to leaves (L), pseudobulbs (P) and roots (R).

Method name		PERMANOVA	
Test statistic name		Pseudo-F	
Group	L vs P	L vs R	P vs R
Simple size	10	9	9
Number of groups	2	2	2
Test statistic	1.35	1.34	1.28
p-value	0.02	0.01	0.02
q-value	0.02	0.02	0.02
Number of permutations	999	999	999

Table S8. Total occurrence of ASVs associated with *Guarianthe skinneri*, classified by Trophic Mode and Guild. Bold type corresponds to guild labeled with endophyte type.

Trophic Mode	Total ASVs	Percentage %	Guild	ASVs	Percentage %
Saprotroph	304	16.37	Undefined Saprotroph	244	13.1
			Wood Saprotroph	26	1.4
			Soil Saprotroph	10	0.5
			Plant Pathogen-Undefined Saprotroph	6	0.3
			Dung Saprotroph	4	0.2
			Dung Saprotroph-Plant Saprotroph-Wood Saprotroph	4	0.2
			Dung Saprotroph-Undefined Saprotroph-Wood Saprotroph	4	0.2
			Dung Saprotroph-Wood Saprotroph	2	0.1
			Litter Saprotroph-Soil Saprotroph-Wood Saprotroph	2	0.1
			Litter Saprotroph	1	0.1
			Plant Saprotroph-Wood Saprotroph	1	0.1
Pathotroph-Saprotroph	170	9.15	Animal Pathogen-Undefined Saprotroph	39	2.1
			Animal Pathogen-Plant Pathogen-Undefined Saprotroph	36	1.9
			Plant Pathogen-Undefined Saprotroph	28	1.5
			<b>Endophyte-Plant Pathogen-Wood Saprotroph</b>	22	1.2
			Animal Pathogen-Fungal Parasite-Undefined Saprotroph	18	1.0
			Plant Pathogen-Wood Saprotroph	14	0.8
			Plant Pathogen	8	0.4
			<b>Endophyte-Lichen Parasite-Plant Pathogen-Undefined Saprotroph</b>	2	0.1

			Fungal Parasite-Plant Pathogen-Plant Saprotroph	2	0.1
Pathotroph- Saprotroph- Symbiotroph	168	9.05	Animal Pathogen- Endophyte-Fungal Parasite-Lichen Parasite- Plant Pathogen-Wood Saprotroph Animal Pathogen- Endophyte-Lichen Parasite-Plant Pathogen- Soil Saprotroph-Wood Saprotroph Animal Pathogen- Endophyte-Endosymbiont- Epiphyte-Soil Saprotroph- Undefined Saprotroph Dung Saprotroph- Endophyte-Plant Pathogen-Undefined Saprotroph Animal Pathogen- Endophyte-Fungal Parasite-Plant Pathogen- Wood Saprotroph Endophyte-Lichen Parasite-Plant Pathogen- Undefined Saprotroph Animal Pathogen-Dung Saprotroph-Endophyte- Lichen Parasite-Plant Pathogen-Undefined Saprotroph Animal Pathogen- Endophyte-Epiphyte-Plant Pathogen-Undefined Saprotroph Animal Pathogen- Endophyte-Plant Pathogen-Wood Saprotroph Endophyte-Plant Pathogen-Wood Saprotroph Animal Pathogen- Endophyte-Epiphyte- Fungal Parasite-Plant Pathogen-Wood Saprotroph	47	2.5
				30	1.6
				23	1.2
				21	1.1
				11	0.6
				5	0.3
				5	0.3
				4	0.2
				3	0.2
				3	0.2
				2	0.1

			Bryophyte Parasite-Dung	2	0.1
			Saprotroph-		
			Ectomycorrhizal-Fungal		
			Parasite-Leaf Saprotroph-		
			Plant Parasite-Undefined		
			Saprotroph-Wood		
			Saprotroph		
			<b>Animal Pathogen-</b>	2	0.1
			<b>Endophyte-Ericoid</b>		
			<b>Mycorrhizal-Plant</b>		
			<b>Pathogen-Wood</b>		
			<b>Saprotroph</b>		
			<b>Endophyte-Lichen</b>	2	0.1
			<b>Parasite-Undefined</b>		
			<b>Saprotroph</b>		
			<b>Endophyte-Plant</b>	2	0.1
			<b>Pathogen-Plant Saprotroph</b>		
			<b>Animal Pathogen-</b>	1	0.1
			<b>Endophyte-Epiphyte-</b>		
			<b>Undefined Saprotroph</b>		
			Animal Pathogen-Soil	1	0.1
			Saprotroph		
			Animal Endosymbiont-	1	0.1
			Animal Pathogen-Plant		
			Pathogen-Undefined		
			Saprotroph		
			<b>Ectomycorrhizal-</b>	1	0.1
			<b>Endophyte-Plant</b>		
			<b>Pathogen-Wood</b>		
			<b>Saprotroph</b>		
			Endomycorrhizal-Plant	1	0.1
			Pathogen-Undefined		
			Saprotroph		
			<b>Endophyte-Fungal</b>	1	0.1
			<b>Parasite-Lichen Parasite-</b>		
			<b>Plant Pathogen-Wood</b>		
			<b>Saprotroph</b>		
Pathotroph-Symbiotroph	117	6.30	<b>Endophyte-Plant Pathogen</b>	112	6.0
			<b>Endophyte-Epiphyte-</b>	3	0.2
			<b>Fungal Parasite-Insect</b>		
			<b>Parasite</b>		
			Animal Pathogen-Animal	2	0.1
			Endosymbiont		
Pathotroph	104	5.60	Plant Pathogen	94	5.1
			Animal Pathogen	5	0.3
			Fungal Parasite	4	0.2



			Litter Saprotroph-Plant Pathogen	1	0.1
Saprotroph- Symbiotroph	67	3.61	<b>Endophyte-Undefined Saprotroph-Wood Saprotroph Endophyte-Litter Saprotroph-Soil Saprotroph-Undefined Saprotroph Dung Saprotroph- Endophyte-Litter Saprotroph-Undefined Saprotroph Dung Saprotroph- Ectomycorrhizal-Litter Saprotroph-Undefined Saprotroph Endophyte-Undefined Saprotroph</b>	54	2.9
				8	0.4
				3	0.2
				2	0.1
				1	0.1
Symbiotroph	12	0.65	Epiphyte	5	0.3
			Arbuscular Mycorrhizal	3	0.2
			Ectomycorrhizal	3	0.2
			<b>Endophyte</b>	1	0.1
Total	942	50.7		942	50.7