Supplementary material

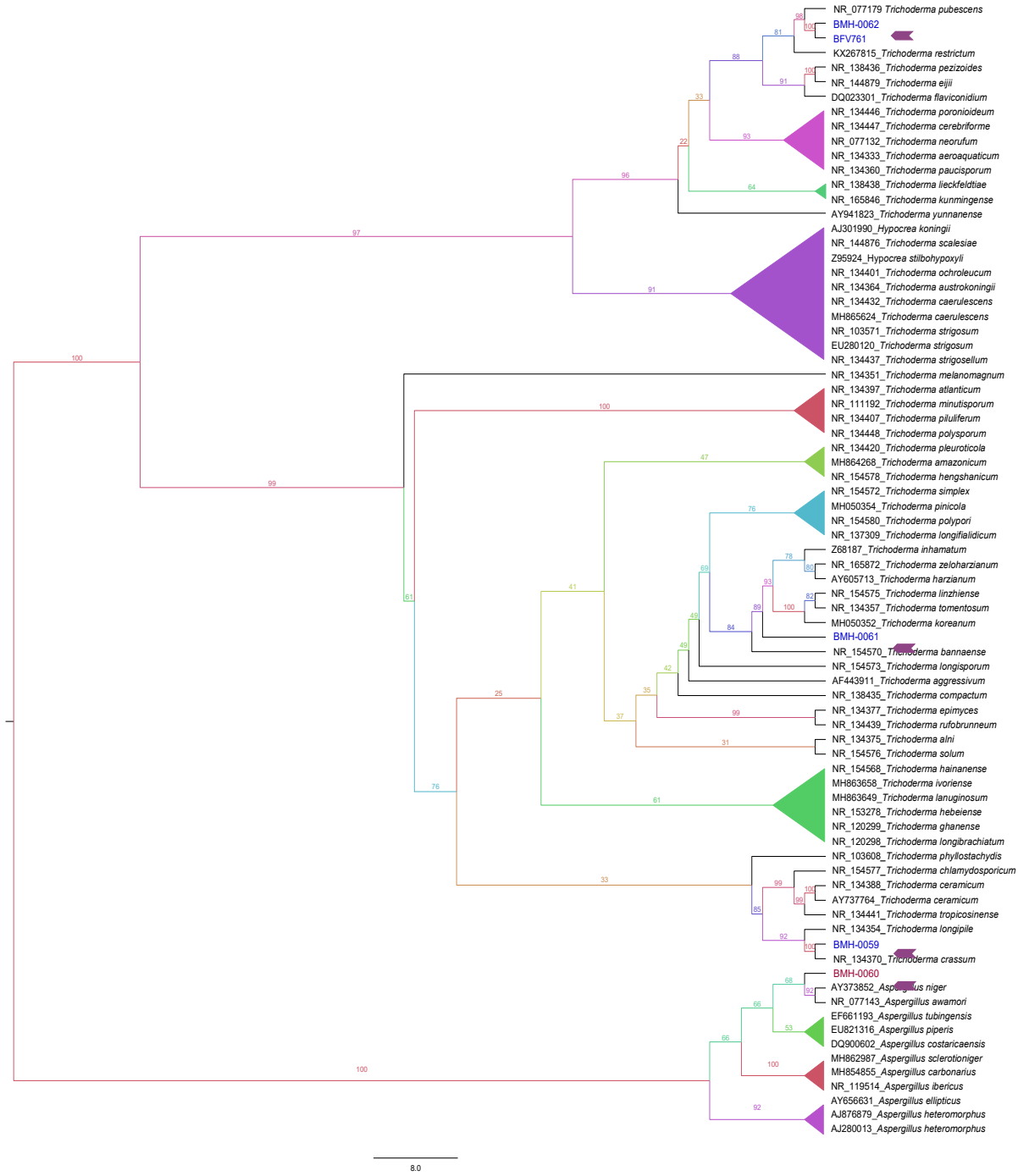

Figure S1. Phylogenetic tree generated by FastTree analysis using a MAFFT alignment of ITS nucleotide sequences obtained from the type material. The tree includes isolates related to BMH-0059, identified as *T. crassum*; BMH-0060 identified as *A. awamori*; BMH-0061 identified as *Trichoderma* sp.; and BMH-0062 identified as *T. pubescens*. Bootstrap values (> 50%) are labeled in color on the branch nodes. Color labeled triangles represent subtrees drawn as cartoon.

Table S1. Classification, location and some physico-chemical properties of the studied soils.

Georeferencing and physico-chemical characteristics of the studied soils			
Soil	Alfisol	Andisol	Vertisol
Country	Mexico	Mexico	Mexico
State	Morelos	Morelos	Morelos
Municipality	Cuernavaca	Huitzilac	Temixco
Locality	Chamilpa	Tres Marías	Cuentepec
Coordinates	18º58'35''N 99º13'36''W, 1824 masl	19º02'18''N 99º15'11''W; 2803 masl	18º51'36''N 99º19'29''W; 1480 masl
Taxonomic order	Alfisol (Haplustalf)	Andisol (Melanudand)	Vertisol (Aquerts)
Sand (%)	38	92	56
Silt (%)	30	4	24
Clay (%)	32	4	20
Texture (Bouyoucos)	Far	A	FarA
pH (w, 1:2.5)	7.0	5.7	4.9
M.O. (Walkley-Black) (%)	5.35	11	3.0
Ca (Ammonium acetate 1M) ($cmol_c\ kg^{-1}$)	19.9	1.7	3.0
Mg (Ammonium acetate 1M) ($cmol_c\ kg^{-1}$)	7.7	0.1	1.7
K (Ammonium acetate1M) ($cmol_c\ kg^{-1}$)	0.28	0.05	0.16
Na (Ammonium acetate1M) ($cmol_c\ kg^{-1}$)	0.30	0.0	0.0
Al (KCl 1M) ($cmol_c\ kg^{-1}$)	0.0	0.0	1.6
CIC effective ($cmol_c\ kg^{-1}$)	28.2	1.85	6.5
P Bray II ($mg\ kg^{-1}$)	32	1	34
S (Calcium phosphate 0.008 M) ($mg\ kg^{-1}$)	12	6	2
Fe (Olsen-EDTA) ($mg\ kg^{-1}$)	22	64	42
Mn (Olsen-EDTA) ($mg\ kg^{-1}$)	4	1	53
Cu (Olsen-EDTA) ($mg\ kg^{-1}$)	2	1	2
Zn (Olsen-EDTA) ($mg\ kg^{-1}$)	3	1	3
B Hot water) ($mg\ kg^{-1}$)	0.6	0.1	0.14
NO_3 (Aluminum sulfate 0.025 M) ($mg\ kg^{-1}$)	45	3	1
NH_4 (KCl 1M) ($mg\ kg^{-1}$)	11	18	38

Table S2. Detection of the type and concentration of OAs in different soils with different strains. The values are the mean of the concentration of acids (µg/mL) ± SE found in the samples of four different soil samples in their interaction with microorganisms A, B, C and D (n = 4). Grey shadowed squares depict the condition in which the highest value for that particular acid was found. "Total" at the bottom of the table refers to the average of the means of the data population.

Soil	Microorganism	Pyruvic µg/mL	Fumaric µg/mL	Tartaric µg/mL	Succinic µg/mL	Malic µg/mL	Oxalic µg/mL	Citric µg/mL	Concentration P mg/L
Andisol	**BMH-0059**	**0.076** ± 0.015	**0.002** ± 0.000	**0.170** ± 0.057	**0.038** ± 0.022	**0.017** ± 0.016	**0.003** ± 0.002	**0.019** ± 0.007	**4.605** ± 0.072
	BMH-0060	**0.236** ± 0.081	**0.002** ± 0.000	**0.070** ± 0.040	**0.034** ± 0.019	**0.354** ± 0.240	**0.057** ± 0.020	**0.033** ± 0.004	**22.072** ± 2.73
	BMH-0061	**0.422** ± 0.142	**0.002** ± 0.001	**0.496** ± 0.049	**0.002** ± 0.001	**0.058** ± 0.043	**0.006** ± 0.001	**0.003** ± 0.002	**29.187** ± 0.400
	BMH-0062	**0.122** ± 0.070	**0.014** ± 0.001	**0.404** ± 0.238	**0.124** ± 0.041	**0.007** ± 0.014	**0.005** ± 0.000	0.000	**35.217** ± 0.0800
Alfisol	**BMH-0059**	**0.021** ± 0.001	**0.004** ± 0.000	**0.003** ± 0.000	**0.054** ± 0.008	**0.003** ± 0.002	**0.002** ± 0.001	**0.001** ± 0.000	**2.143** ± 0.011
	BMH-0060	**4.126** ± 0.026	**0.028** ± 0.003	0.000	**0.000** ± 0.000	**0.006** ± 0.001	**0.032** ± 0.014	**0.393** ± 0.044	**24.185** ± 0.385
	BMH-0061	**0.027** ± 0.026	**0.007** ± 0.000	**0.014** ± 0.008	**0.002** ± 0.000	**0.003** ± 0.003	**0.008** ± 0.001	**0.010** ± 0.001	**34.652** ± 0.255
	BMH-0062	**0.056** ± 0.032	**0.037** ± 0.008	**3.126** ± 0.221	**0.010** ± 0.005	**0.002** ± 0.003	**0.023** ± 0.002	**0.020** ± 0.006	**27.693** ± 0.714
Vertisol	**BMH-0059**	**0.141** ± 0.023	**0.003** ± 0.000	**0.059** ± 0.003	**0.014** ± 0.004	**0.003** ± 0.002	**0.007** ± 0.000	**0.050** ± 0.024	**8.689** ± 0.237
	BMH-0060	**0.170** ± 0.011	**0.004** ± 0.001	**5.765** ± 0.219	**0.013** ± 0.004	**0.005** ± 0.004	**0.014** ± 0.002	**0.031** ± 0.001	**31.215** ± 0.351
	BMH-0061	**0.063** ± 0.008	**0.010** ± 0.000	**0.032** ± 0.019	**0.028** ± 0.003	**0.014** ± 0.003	**0.023** ± 0.001	**0.005** ± 0.000	**34.240** ± 0.209
	BMH-0062	**0.049** ± 0.028	**0.052** ± 0.000	**1.834** ± 0.004	0.000	**0.024** ± 0.006	**0.062** ± 0.009	**0.005** ± 0.001	**36.369** ± 0.711
Without Soil	**BMH-0059**	0.000	**0.001** ± 0.000	0.000	**0.092** ± 0.002	0.000	**0.171** ± 0.001	0.000	**12.191** ± 0.569
	BMH-0060	0.000	**0.001** ± 0.000	0.000	**0.002** ± 0.000	**0.003** ± 0.001	**0.022** ± 0.004	0.000	**31.188** ± 0.240
	BMH-0061	0.000	**0.001** ± 0.000	0.000	0.000	**0.004** ± 0.003	**0.050** ± 0.032	0.000	**40.615** ± 0.883
	BMH-0062	0.000	**0.002** ± 0.001	0.000	**0.036** ± 0.012	**0.032** ± 0.046	**0.005** ± 0.001	0.000	**37.505** ± 0.350
TOTAL		**0.344**	**0.011 ± 0.001**	**0.748 ± 0.195**	**0.028 ± 0.005**	**0.033 ± 0.101**	**0.030 ± 0.005**	**0.036**	**25.735** ± 1.507

Table S3. Coefficient of correlation and percentage of contribution of each variable (OAs) to the total length of the PC1 and PC2. In bold those OAs whose percentage with contribution > 10% to the eigen value length.

Acid	Correlation PC 1	Variable contribution PC1	Correlation PC 2	Variable contribution PC2
Pyruvic	**-0.93**	**39.83**	-0.29	5.86
Fumaric	-0.51	**12.01**	0.43	**13.08**
Tartaric	-0.06	0.17	**0.75**	**39.27**
Succinic	0.40	7.49	-0.45	**13.87**
Malic	0.13	0.75	-0.41	**11.59**
Oxalic	0.08	0.32	-0.39	**10.73**
Citric	**-0.93**	**39.43**	-0.28	5.59

Table S4: GLM table of the effect of soil type factors and microorganism on phosphorus, having the PC 1 and PC2 as covariates.

Source of variation	SS	Degr. Of	MS	F	P
Intercept	42387.51	1	42387.51	55341.55	**0.000000**
Soil	421.23	3	140.41	183.32	**0.000000**
Microorganism	4414.77	3	1471.59	1921.32	**0.000000**
"PC1"	0.31	1	0.31	0.40	0.529736
"PC2"	0.01	1	0.01	0.02	0.893958
Soil*Microorganism	258.64	9	28.74	37.52	**0.000000**
Error	35.23	46	0.77		**0.000000**