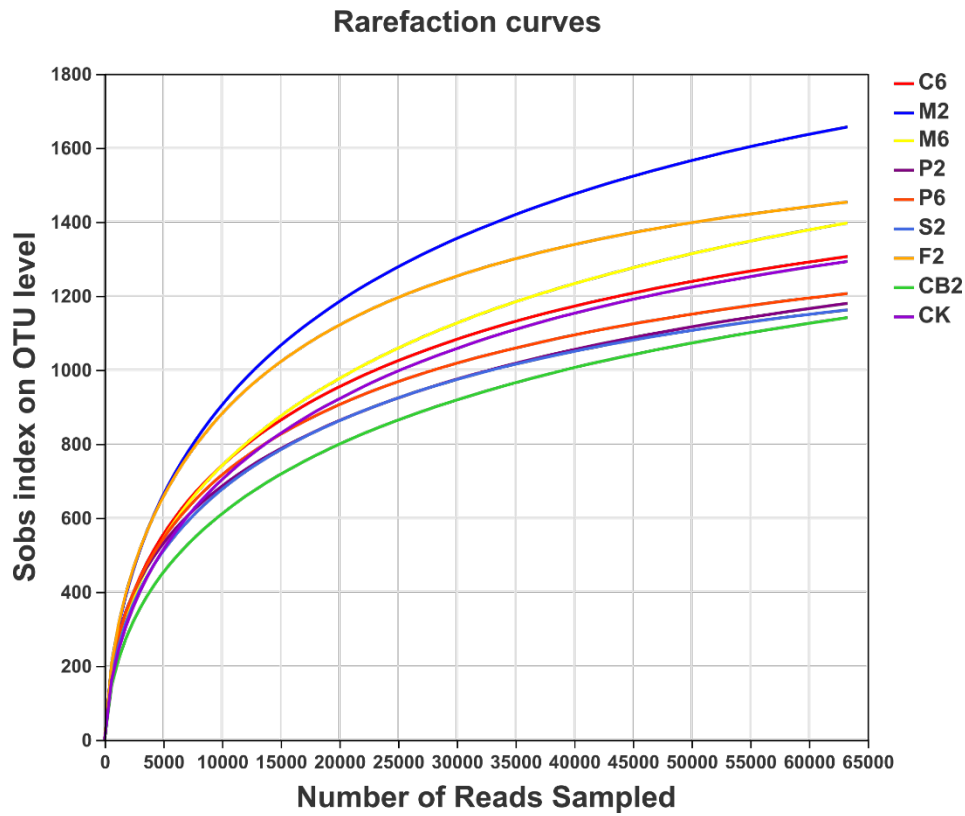


## Supplementary Material



**Figure S1.** Rarefaction curves C6, M2, M6, P2, P6, S2, F2, CB2, and CK; continuous cropping of *C. chinensis* 2- and 6-years, maize rotated fields, 2 and 6 years rotated fields *P. multiflorum*, 2 years sweet potato rotated fields, 2 years *F. thunbergii* rotated fields, 2-year cabbage rotated fields, and fallow field, respectively.

**Table S1.** The composition of the fungal community at the family level

Family	C6	M2	M6	P2	P6	F2	S2	CB2	CK
Mortierellaceae	14.38	18.81	13.43	12.93	15.93	17.78	20.97	14.98	14.28
	%	%	%	%	%	%	%	%	%
unclassified Fungi	9.75%	8.10%	7.35%	7.85%	8.49%	10.80	5.95%	10.38	6.41%
						%		%	
unclassified Ascomycota	2.54%	6.07%	1.79%	2.12%	3.19%	1.66%	2.69%	1.21%	9.87%
Piskurozymaceae	1.92%	3.89%	2.47%	1.00%	4.36%	9.20%	6.08%	9.35%	2.94%
Nectriaceae	4.89%	6.33%	9.75%	3.61%	2.68%	6.21%	4.08%	2.99%	1.69%
Trichosporonaceae	1.29%	3.31%	8.69%	0.64%	1.02%	4.67%	0.02%	8.13%	0.83%
Trimorphomycetaceae	3.64%	1.42%	1.83%	4.13%	4.54%	2.07%	3.37%	1.87%	1.38%
Chaetomiaceae	2.49%	1.97%	2.87%	4.78%	1.30%	3.83%	1.91%	7.48%	0.77%
unclassified Rozellomycota	1.37%	3.78%	2.56%	1.61%	0.81%	3.43%	1.37%	6.42%	0.52%
unclassified Sordariomycetes	13.21	1.69%	1.17%	1.55%	0.62%	1.71%	1.05%	1.29%	0.31%
	%								
Russulaceae	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.62%	0.00%	23.50
									%
Aspergillaceae	0.40%	1.48%	4.31%	3.83%	2.18%	2.14%	0.44%	0.62%	1.09%
unclassified Helotiales	0.91%	3.91%	2.32%	2.58%	3.92%	0.77%	2.47%	0.65%	1.45%
Herpotrichiellaceae	0.34%	7.48%	4.97%	1.78%	1.54%	1.68%	0.87%	0.75%	0.14%
Didymellaceae	3.02%	2.01%	1.94%	4.99%	0.74%	1.36%	2.66%	2.14%	0.03%
Hypocreaceae	2.73%	1.28%	1.16%	2.09%	2.39%	0.89%	0.68%	2.54%	1.36%
Plectosphaerellaceae	1.04%	2.99%	2.01%	2.73%	0.07%	2.82%	1.01%	3.49%	0.09%
unclassified Archaeorhizomycetes	0.02%	0.03%	0.02%	0.03%	2.38%	0.00%	0.14%	0.00%	8.58%
unclassified Agaricomycetes	1.05%	2.12%	0.11%	0.18%	0.26%	0.76%	2.24%	0.33%	0.24%
Archaeorhizomycetaceae	0.00%	0.03%	0.01%	0.05%	2.16%	0.00%	0.33%	0.00%	1.40%
Geminibasidiaceae	0.60%	0.01%	0.03%	2.58%	3.05%	0.19%	1.43%	0.02%	0.73%
Microascaceae	2.64%	1.66%	2.72%	1.19%	0.20%	1.43%	0.03%	0.05%	0.01%
Ceratobasidiaceae	0.61%	0.04%	0.10%	1.14%	6.36%	0.36%	0.13%	1.06%	0.08%
Helotiaceae	1.02%	0.58%	0.43%	1.62%	0.67%	1.32%	2.03%	0.76%	0.35%
Helotiales_fam_Incertae_sedis	0.39%	0.37%	0.26%	1.32%	1.31%	0.67%	1.42%	0.17%	0.54%
Lasiochaeraceae	0.74%	1.53%	0.89%	1.85%	0.50%	0.82%	0.49%	1.55%	0.04%
Clavicipitaceae	1.35%	0.39%	0.64%	0.20%	1.89%	0.58%	1.62%	0.34%	0.64%
unclassified Chytridiomycota	0.24%	0.50%	2.16%	0.65%	0.21%	0.76%	0.31%	0.61%	0.36%
unclassified Mortierellomycota	0.17%	0.31%	1.11%	0.80%	1.45%	0.74%	1.07%	0.05%	0.36%
Chytridiaceae	0.07%	0.35%	0.10%	0.33%	0.09%	0.05%	0.08%	5.15%	0.03%
unclassified Basidiomycota	0.74%	0.31%	0.48%	1.39%	0.41%	0.76%	0.43%	0.36%	0.25%
Chaetosphaeriaceae	0.47%	0.23%	0.04%	1.87%	0.75%	0.81%	0.56%	0.30%	0.33%
Pleosporales_fam_Incertae_sedis	0.23%	0.77%	2.39%	1.11%	0.10%	0.17%	0.19%	0.44%	0.03%
Atheliaceae	0.02%	0.23%	0.01%	0.04%	2.45%	0.01%	0.14%	0.01%	0.05%
Pyrenomataceae	0.07%	0.60%	1.23%	0.18%	0.00%	1.09%	1.07%	0.06%	0.16%
Entolomataceae	0.05%	0.10%	0.02%	0.68%	0.68%	0.03%	2.47%	0.00%	0.09%
Pseudeurotiaceae	1.29%	0.17%	0.48%	0.14%	0.36%	0.61%	0.47%	0.17%	0.68%

Hyaloscyphaceae	0.66%	0.04%	0.04%	0.13%	0.30%	0.10%	2.16%	0.15%	1.12%
Mrakiaceae	0.15%	0.18%	0.31%	0.52%	0.18%	1.61%	1.48%	0.24%	0.09%
Dipodascaceae	0.00%	0.34%	3.16%	0.17%	0.00%	0.07%	0.02%	0.60%	0.00%
Sebacinaceae	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.04%	0.00%	2.30%
Trichocomaceae	0.16%	0.23%	0.28%	2.38%	0.42%	0.19%	0.29%	0.03%	0.07%
Phaeosphaeriaceae	0.24%	0.82%	1.10%	0.38%	0.12%	0.49%	0.25%	0.38%	0.04%
Leotiaceae	0.21%	0.07%	0.02%	0.56%	0.98%	0.14%	1.02%	0.19%	0.24%
unclassified Agaricales	1.34%	0.03%	0.09%	0.08%	0.60%	0.14%	0.16%	0.04%	0.52%
unclassified Trechisporales	0.24%	0.17%	0.01%	1.12%	1.47%	0.01%	0.17%	0.21%	0.00%
Cordycipitaceae	0.65%	0.10%	1.12%	0.84%	0.14%	0.05%	0.06%	0.08%	0.64%
Magnaporthaceae	0.05%	0.00%	0.00%	0.01%	0.49%	0.00%	2.76%	0.00%	0.00%
Bolbitiaceae	0.02%	0.07%	0.02%	0.14%	0.02%	0.04%	0.00%	0.02%	0.09%
unclassified Leotiomyces	0.03%	0.02%	0.04%	1.15%	0.55%	0.01%	0.18%	0.79%	0.00%
unclassified GS33	0.00%	0.01%	0.00%	0.02%	0.30%	0.00%	0.00%	0.00%	0.01%
Clavariaceae	0.11%	0.01%	0.00%	0.02%	0.35%	0.01%	0.02%	0.00%	0.87%
Phaffomycetaceae	0.00%	0.08%	0.01%	0.01%	0.01%	0.10%	2.72%	0.02%	0.00%
Olpidiaceae	0.01%	0.07%	0.09%	0.05%	0.01%	0.43%	0.12%	1.87%	0.00%
Bulleribasidiaceae	0.05%	1.21%	0.31%	0.14%	0.01%	0.12%	0.12%	0.34%	0.01%
Myxotrichaceae	0.06%	0.06%	0.03%	0.51%	0.21%	0.10%	0.21%	0.08%	0.03%
unclassified Xylariales	0.22%	0.04%	0.11%	1.33%	0.10%	0.02%	0.12%	0.03%	0.27%
Melanommataceae	0.05%	0.02%	0.05%	0.11%	0.32%	1.07%	0.09%	0.01%	0.26%
Saccharomycetales_fam_Incertae_sedis	0.00%	0.24%	0.09%	0.00%	0.00%	0.07%	0.19%	1.17%	0.01%
Stephanosporaceae	1.82%	0.00%	0.00%	0.00%	0.04%	0.06%	0.00%	0.00%	0.00%
Myrmecridiaceae	0.01%	0.19%	1.52%	0.05%	0.00%	0.10%	0.00%	0.01%	0.00%
Glomerellaceae	0.03%	0.02%	0.04%	1.52%	0.02%	0.05%	0.09%	0.02%	0.00%
Gloniaceae	0.00%	0.00%	0.00%	0.00%	0.07%	0.00%	0.00%	0.00%	1.76%
unclassified GS25	0.02%	0.00%	0.00%	0.20%	1.32%	0.00%	0.04%	0.00%	0.03%
Omphalotaceae	0.03%	0.00%	0.00%	0.04%	0.01%	0.00%	0.00%	0.00%	0.00%
Dictyosporiaceae	1.32%	0.02%	0.01%	0.00%	0.01%	0.02%	0.05%	0.00%	0.00%
Inocybaceae	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%	1.14%
unclassified GS02	1.01%	0.02%	0.01%	0.00%	0.00%	0.06%	0.00%	0.02%	0.00%
others	15.83	11.08	9.69%	12.89	12.85	12.72	12.74	7.99%	8.86%
	%	%		%	%	%	%		

**Table S2.** The composition of the fungal community at the phylum level.

Phyla	C6	M2	M6	P2	P6	F2	S2	CB2	CK
<i>Ascomycota</i>	52.94%	51.77%	56.38%	58.31%	40.13%	40.81%	44.65%	36.14%	38.10%
<i>Basidiomycota</i>	16.26%	15.36%	15.94%	16.13%	30.45%	24.10%	23.92%	23.83%	38.37%
<i>Mortierellomycota</i>	14.55%	19.12%	14.54%	13.74%	17.38%	18.52%	22.04%	15.04%	14.64%
Unclassified Fungi	9.75%	8.10%	7.35%	7.85%	8.49%	10.80%	5.95%	10.38%	6.41%
<i>Rozellomycota</i>	2.69%	3.98%	2.74%	1.82%	0.86%	3.82%	1.58%	6.52%	1.08%
<i>Chytridiomycota</i>	0.66%	1.23%	2.76%	1.15%	0.49%	1.10%	0.52%	6.03%	0.44%
<i>Glomeromycota</i>	2.80%	0.22%	0.14%	0.34%	1.22%	0.05%	0.21%	0.09%	0.74%
<i>Olpidiomycota</i>	0.01%	0.07%	0.09%	0.05%	0.01%	0.45%	0.14%	1.87%	0.02%
others	0.33%	0.16%	0.06%	0.61%	0.97%	0.35%	0.98%	0.11%	0.20%

C6, M2, M6, P2, P6, S2, F2, CB2, and CK; continuous cropping of *C. chinensis* 2- and 6-years, maize rotated fields, 2 and 6 years rotated fields *P. multiflorum*, 2 years sweet potato rotated fields, 2 years *F. thunbergii* rotated fields, 2-year cabbage rotated fields, and fallow field, respectively.

**Table S3.** Spearmen correlation analysis of soil fungal phyla and soil physicochemical properties.

<b>Fungal phyla</b>	<b>pH</b>	<b>AN</b>	<b>TN</b>	<b>OP</b>	<b>TP</b>	<b>AK</b>	<b>TK</b>	<b>OM</b>	<b>AB</b>
<i>Ascomycota</i>	0.3900	-0.1058	-0.0953	-0.0323	0.0458	0.0624	0.0475	0.0713	0.0011
<i>Basidiomycota</i>	-0.3294	0.0142	0.1021	-0.2326	-0.2802	-0.3063	-0.2479	0.0221	-0.3042
<i>Mortierellomycota</i>	0.0289	0.3191	0.3528	0.4233	0.5196	0.1342	-0.0023	0.3141	0.3730
Unclassified Fungi	0.0594	-0.3492	-0.3069	-0.0300	-0.0498	-0.0338	-0.0074	-0.3396	-0.0037
<i>Rozellomycota</i>	0.1896	0.1486	0.0655	0.5071	0.4584	0.5849	0.6379	-0.1341	0.5197
<i>Chytridiomycota</i>	0.1539	0.0312	-0.0043	0.1941	0.1913	0.5176	0.6707	-0.2247	0.3798
<i>Glomeromycota</i>	-0.1092	-0.0224	-0.1457	-0.3934	-0.4330	-0.2646	-0.4624	0.1817	-0.5474
<i>Olpidiomycota</i>	0.0421	0.1090	0.2164	0.3818	0.3650	0.2569	0.5230	-0.1739	0.4147
<i>Mucoromycota</i>	-0.5061	-0.2586	-0.0439	-0.2676	-0.3682	-0.8098	-0.6344	-0.0547	-0.6068
<i>Zoopagomycota</i>	-0.2236	0.0443	0.0289	0.5440	0.4905	-0.0918	-0.3371	0.0824	0.3244

PH, AN, TN, OP, TP, AK, TK, OM, and AB; power of hydrogen, Available nitrogen, Total content of Nitrogen, Available phosphorus, Total content of phosphorus, Available potassium, Total content of potassium, Organic matter, and Available boron, respectively.

**Table S4.** Spearman correlation p-value for soil physicochemical properties and fungal phyla.

<b>Fungal Phyla</b>	<b>pH</b>	<b>AN</b>	<b>TN</b>	<b>OP</b>	<b>TP</b>	<b>AK</b>	<b>TK</b>	<b>OM</b>	<b>AB</b>
<i>Ascomycota</i>	<b>0.009</b>	0.494	0.538	0.835	0.768	0.687	0.759	0.646	0.994
<i>Basidiomycota</i>	<b>0.029</b>	0.927	0.510	0.129	0.065	<b>0.043</b>	0.105	0.887	<b>0.045</b>
<i>Mortierellomycota</i>	0.852	<b>0.035</b>	<b>0.019</b>	<b>0.004</b>	<b>0.000</b>	0.385	0.988	<b>0.038</b>	<b>0.013</b>
Unclassified Fungi	0.702	<b>0.020</b>	<b>0.043</b>	0.847	0.748	0.828	0.962	<b>0.024</b>	0.981
<i>Rozellomycota</i>	0.218	0.336	0.673	<b>0.000</b>	<b>0.002</b>	<b>0.000</b>	<b>0.000</b>	0.385	<b>0.000</b>
<i>Chytridiomycota</i>	0.318	0.841	0.978	0.207	0.214	<b>0.000</b>	<b>0.000</b>	0.143	<b>0.011</b>
<i>Glomeromycota</i>	0.480	0.885	0.345	<b>0.008</b>	<b>0.003</b>	0.083	<b>0.002</b>	0.238	<b>0.000</b>
<i>Olpidiomycota</i>	0.786	0.481	0.158	<b>0.011</b>	<b>0.015</b>	0.092	<b>0.000</b>	0.259	<b>0.005</b>
<i>Mucoromycota</i>	<b>0.000</b>	0.090	0.777	0.079	<b>0.014</b>	<b>0.000</b>	<b>0.000</b>	0.725	<b>0.000</b>
<i>Zoopagomycota</i>	0.145	0.775	0.852	<b>0.000</b>	<b>0.001</b>	0.554	<b>0.025</b>	0.595	<b>0.032</b>

PH, AN, TN, OP, TP, AK, TK, OM, and AB; power of hydrogen, Available nitrogen, Total content of Nitrogen, Available phosphorus, Total content of phosphorus, Available potassium, Total content of potassium, Organic matter, and Available boron, respectively. The digits in bold show the significant correlation.

**Table S5.** Spearman correlation analysis soil physicochemical properties and fungal phyla.

Fungal Phyla	Spearman correlation indices			<i>p-value</i>		
	S_UE	S_SC	S_ACP	S_UE	S_SC	S_ACP
<i>Ascomycota</i>	−0.0447	0.6163	0.2671	0.773	<b>0.000</b>	0.080
<i>Basidiomycota</i>	0.0311	−0.3928	−0.0973	0.841	<b>0.008</b>	0.530
<i>Mortierellomycota</i>	0.1726	−0.2564	−0.3583	0.262	0.093	<b>0.017</b>
<i>unclassified Fungi</i>	−0.2043	−0.0577	0.1805	0.183	0.710	0.241
<i>Rozellomycota</i>	0.2388	−0.2434	−0.0849	0.118	0.111	0.584
<i>Chytridiomycota</i>	0.4381	0.0175	0.0860	<b>0.003</b>	0.910	0.579
<i>Glomeromycota</i>	−0.3600	0.4197	−0.0289	<b>0.016</b>	<b>0.005</b>	0.852
<i>Olpidiomycota</i>	0.3652	−0.3675	0.0043	<b>0.015</b>	<b>0.014</b>	0.978
<i>Mucoromycota</i>	−0.2875	−0.0014	−0.2996	0.058	0.993	<b>0.048</b>
<i>Zoopagomycota</i>	−0.4588	−0.3054	−0.5964	<b>0.002</b>	<b>0.044</b>	<b>0.000</b>

S\_UE, S\_SC, and S\_ACP; Urease activity, Sucrase activity, and Phosphatase activity, respectively. The digits in bold show the significant correlation.