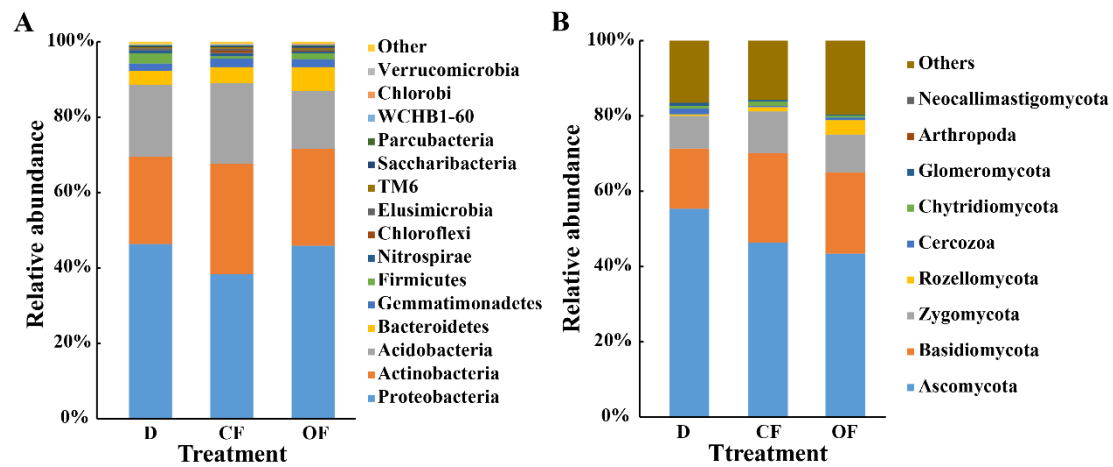


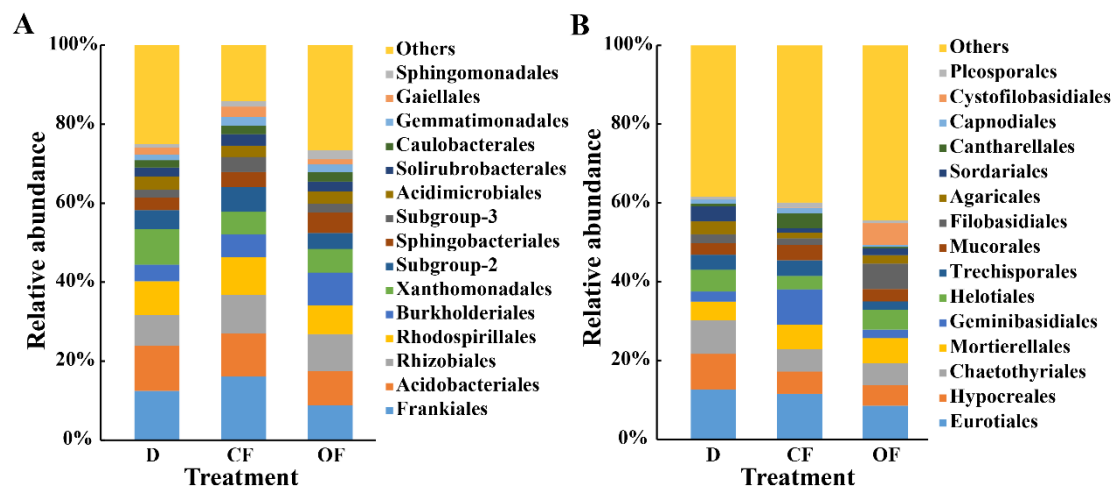
## Supplementary data

Table S1. Contribution of soil environment to bacteria and fungi taxa at the phylum level.

Soil environment	Contribution at the bacterial phylum level (%)	Contribution at the fungal phylum level (%)
pH	3.2	1.4
Organic Matter	5.6	8.6
Alkali-hydrolyzable nitrogen	14.2	0.3
Available Phosphorus	7.1	8.4
Exchangeable calcium	11.2	5.3
Exchangeable magnesium	11.2	1.1

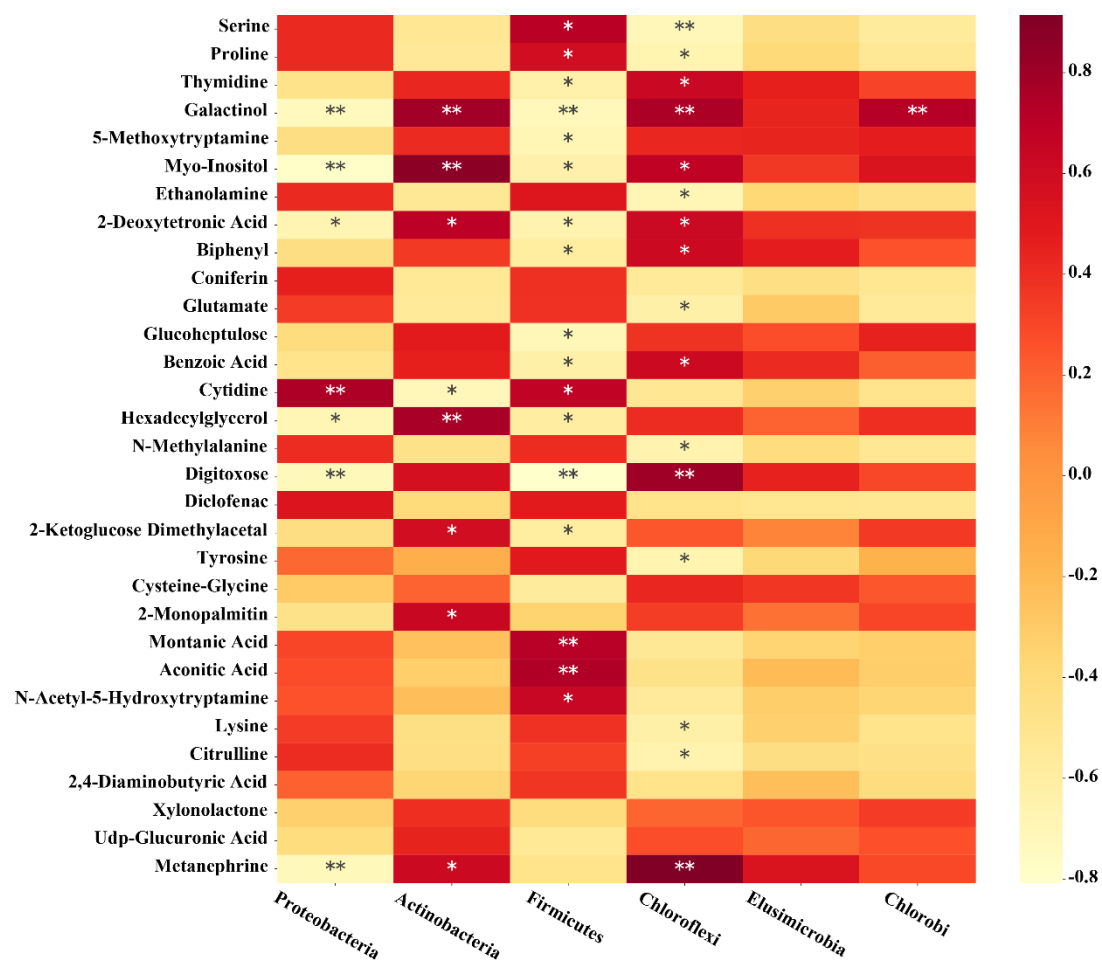


**Figure S1.** Relative abundance of bacteria (A) and fungi (B) at the phylum level. D, CF, and OF represented decline diseased trees, in combination with either compound fertilizer or bio-organic fertilizer, respectively.

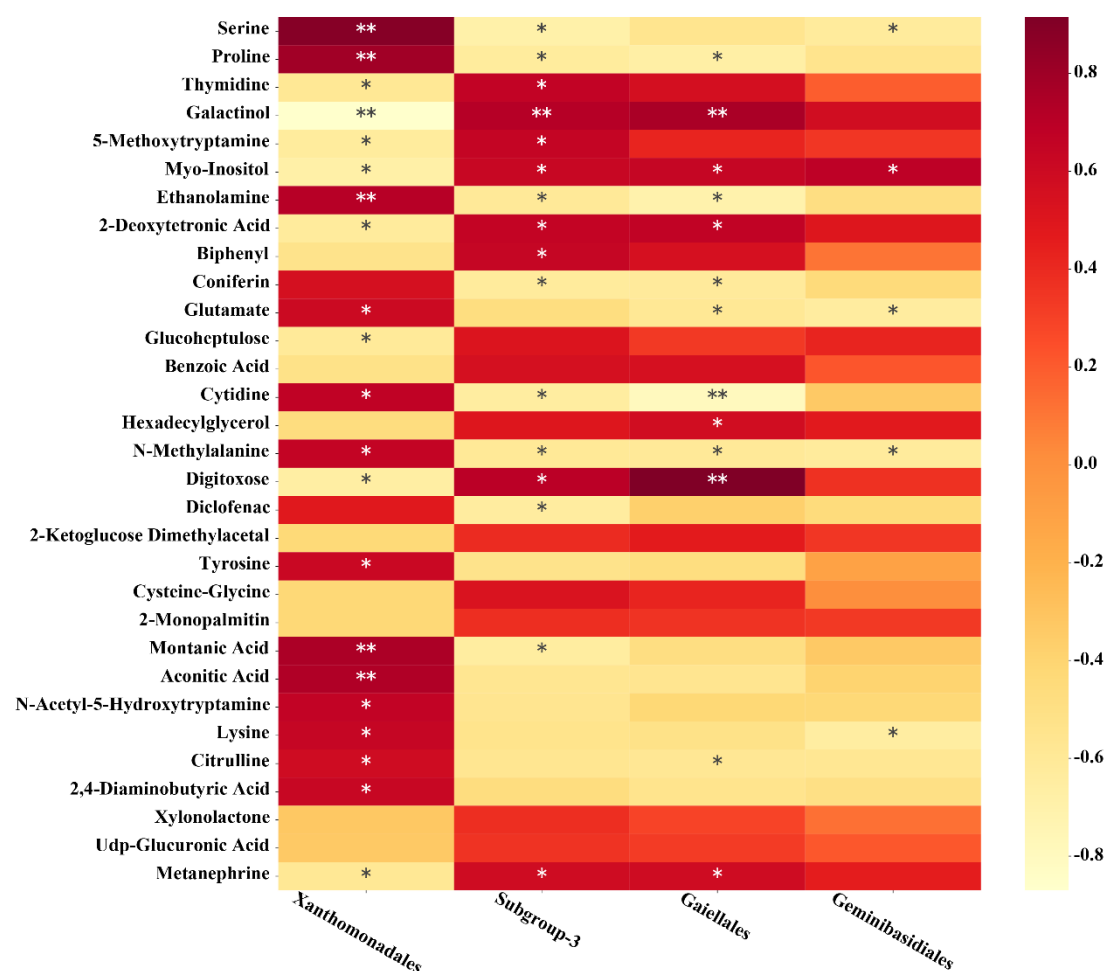


**Figure S2.** Relative abundance of bacteria (A) and fungi (B) at the order level. D, CF, and OF represented decline diseased trees, in combination with either compound fertilizer or bio-organic fertilizer, respectively.

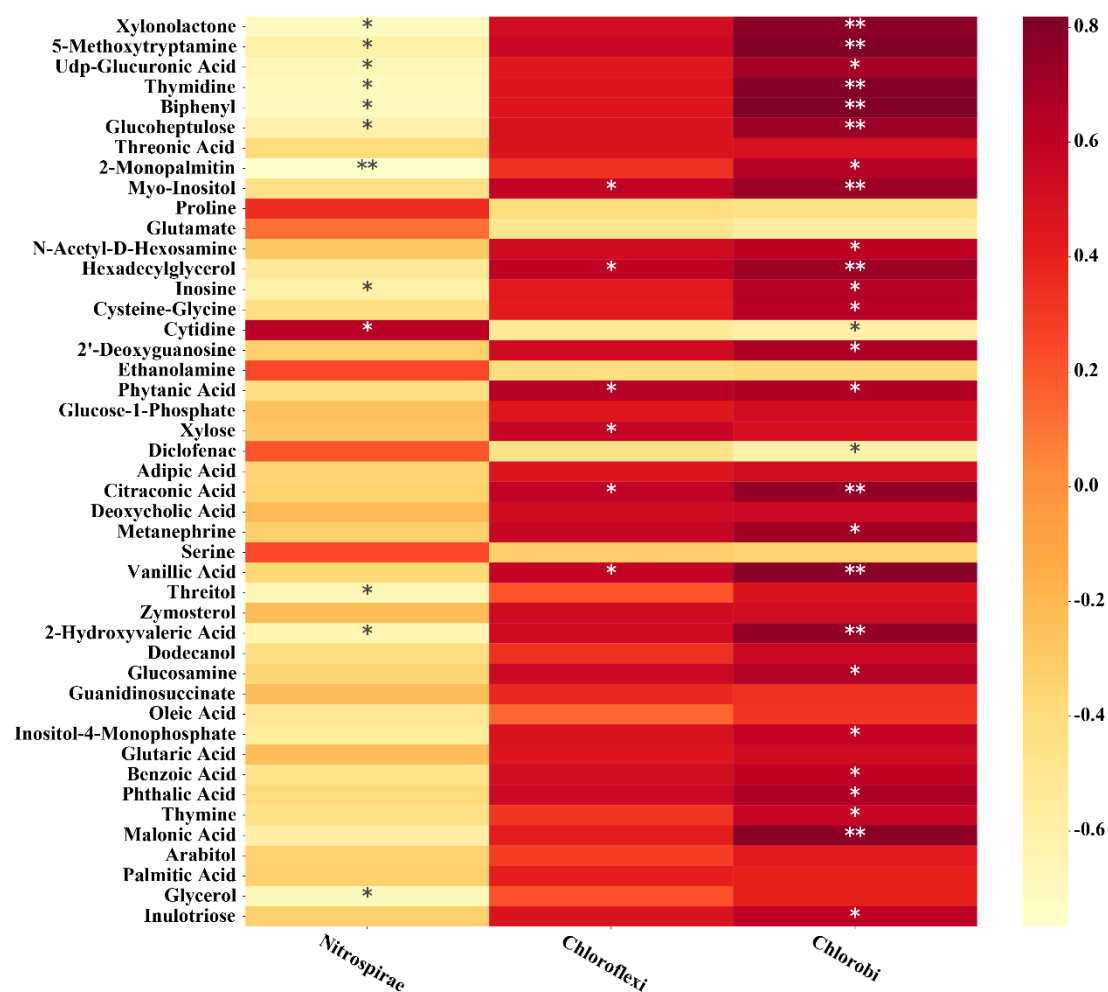




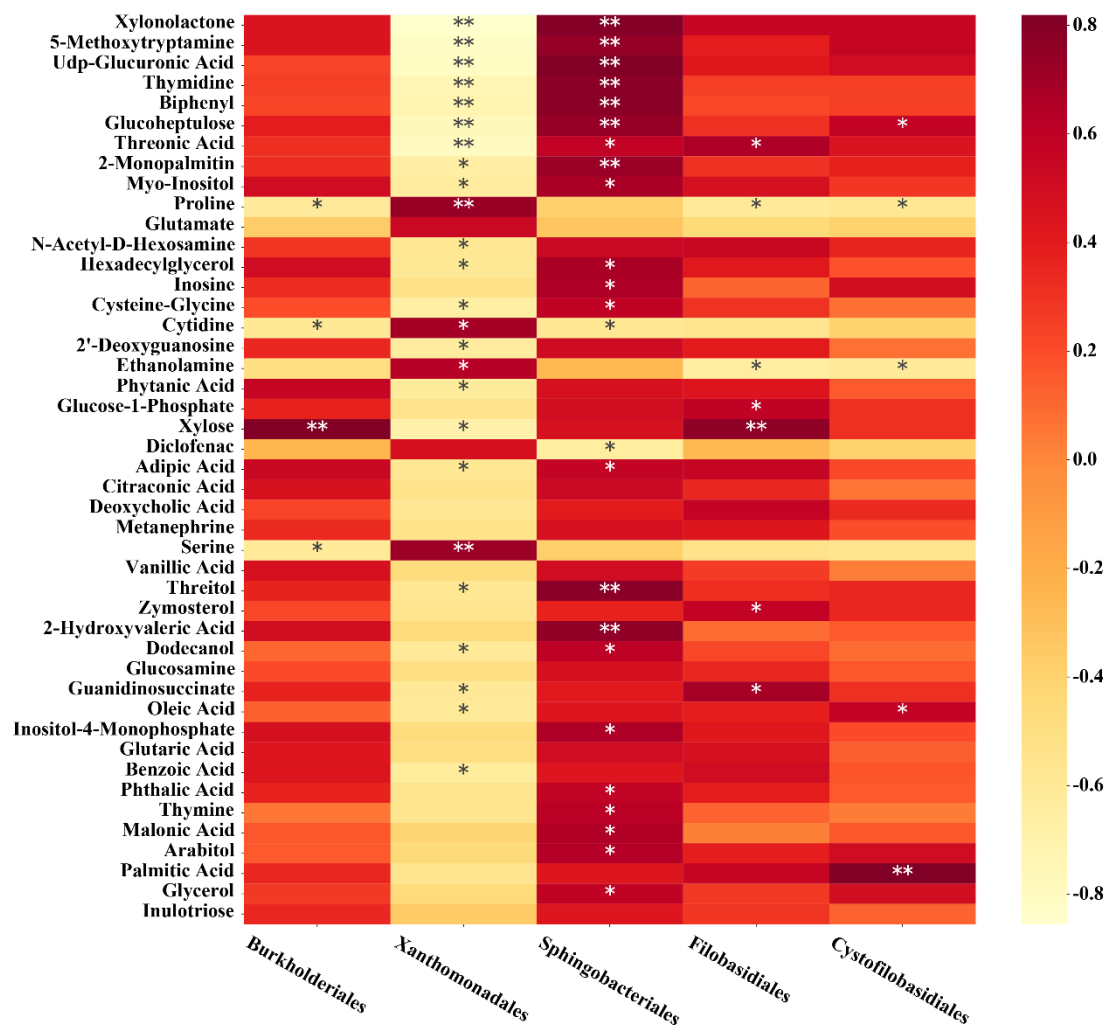
**Figure S4.** Heatmap of correlation analysis between the microorganism relative abundances at phylum level and the metabolite relative contents of the compound fertilizer treatment. \* and \*\* indicate a significant correlation at  $P < 0.05$  and  $P < 0.01$ , respectively. The depth of the orange scale represents the magnitude of the correlation coefficient, the darker color is the greater positive correlation, the lighter color is the greater negative correlation.



**Figure S5.** Heatmap of correlation analysis between the microorganism relative abundances at order level and the metabolite relative contents of the compound fertilizer treatment. \* and \*\* indicate a significant correlation at  $P < 0.05$  and  $P < 0.01$ , respectively. The depth of the orange scale represents the magnitude of the correlation coefficient, the darker color is the greater positive correlation, the lighter color is the greater negative correlation.



**Figure S6.** Heatmap of correlation analysis between the microorganism relative abundances at phylum level and the metabolite relative contents of the bio-organic fertilizer treatment. \* and \*\* indicate a significant correlation at  $P < 0.05$  and  $P < 0.01$ , respectively. The depth of the orange scale represents the magnitude of the correlation coefficient, the darker color is the greater positive correlation, the lighter color is the greater negative correlation.



**Figure S7.** Heatmap of correlation analysis between the microorganism relative abundances at order level and the metabolite relative contents of the bio-organic fertilizer treatment. \* and \*\* indicate a significant correlation at  $P < 0.05$  and  $P < 0.01$ , respectively. The depth of the orange scale represents the magnitude of the correlation coefficient, the darker color is the greater positive correlation, the lighter color is the greater negative correlation.