Table S1 The fertility status of the initial soil

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Index | pH | AN (mg/kg) | AP (mg/kg) | AK (mg/kg) | SOM (g/kg) |
| Soil | 5.38 | 60.71 | 41.35 | 156.72 | 19.85 |

Table S2 The datasheet for environmental factors in RDA analysis

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Index | | Bacterium | | | | Fungus | | | |
| RDA1 | RDA2 | R2 | P\_value | RDA1 | RDA2 | R2 | P\_value |
| RS | AN | -0.994 | 0.107 | 0.243 | 0.127 | 0.995 | -0.101 | 0.399 | **0.025** |
| AP | 0.770 | -0.638 | 0.546 | **0.003** | -0.999 | -0.035 | 0.193 | 0.198 |
| AK | 0.925 | -0.381 | 0.389 | **0.027** | -0.825 | 0.565 | 0.084 | 0.516 |
| PH | -0.899 | 0.439 | 0.586 | **0.001** | 0.956 | 0.295 | 0.287 | 0.077 |
| SOM | 0.787 | 0.617 | 0.178 | 0.242 | 0.487 | -0.874 | 0.183 | 0.214 |
| RGS | AN | 0.959 | -0.284 | 0.350 | **0.045** | 0.950 | -0.312 | 0.525 | **0.010** |
| AP | 0.970 | -0.243 | 0.378 | **0.016** | 0.636 | 0.772 | 0.537 | **0.003** |
| AK | -0.874 | 0.486 | 0.136 | 0.339 | -0.463 | -0.887 | 0.102 | 0.473 |
| PH | -0.725 | 0.689 | 0.330 | **0.045** | -0.963 | -0.268 | 0.267 | 0.083 |
| SOM | 0.754 | -0.657 | 0.216 | 0.164 | 0.949 | 0.314 | 0.331 | 0.069 |
| MS | AN | 0.496 | 0.868 | 0.324 | 0.053 | -0.834 | -0.552 | 0.137 | 0.326 |
| AP | 0.434 | -0.901 | 0.128 | 0.349 | 0.945 | 0.327 | 0.131 | 0.353 |
| AK | -0.696 | 0.718 | 0.015 | 0.899 | -0.825 | -0.565 | 0.354 | **0.044** |
| PH | -0.563 | 0.827 | 0.385 | **0.023** | -0.993 | -0.119 | 0.472 | **0.004** |
| SOM | 0.913 | -0.407 | 0.577 | **0.001** | 0.929 | -0.370 | 0.539 | **0.003** |



Figure S1 The results of Veen analysis of soil bacterium (A-C) and fungus (D-F) under different treatments. RS, RGS and MS were rosette stage, rapid growth stage and mature stage.



Figure.S2 The results of α-diversity of soil bacterium (A-C) and fungus (D-F) under different treatments. RS, RGS and MS were rosette stage, rapid growth stage and mature stage.



Figure.S3 The Procrustes analysis between soil environment and microorganism (soil bacterium (A-C) and fungus (D-F)). RS, RGS and MS were rosette stage, rapid growth stage and mature stage.



Figure.S4 The correlation analysis between soil environment and microorganism (soil bacterium (A-C) and fungus (D-F)). RS, RGS and MS were rosette stage, rapid growth stage and mature stage.