Supplementary Table S1. Statistical Table of the Number of OTUs and Tags of Bacteria in Different Litter Samples

Sample	OTUs	Singleton Tags	Taxon Tags	Total.Tags	Unique.Tags
A-1	4234±231.94	24042.33±4493.61	390010±72588.44	414052.33±77032.65	183424.67±27204.95
A-2	7293±685.42	33452.67±1451.93	378220.67±23595.98	411673.33±23409.45	249550.33±10498.05
A-3	8210.67±1112.58	50982±16549.48	354838±30642.26	405820±46255.52	266082.33±39233.27

Notes:Total Tags: The number of Effective Tags; Unique Tags: Tags obtained by clustering at 100% similarity; Taxon Tags: The number of tags with species annotations; Singleton Tags: The number of singletons in the sample, where an OTU with a total tag count of 1 across all samples is termed a Singleton Tag and is considered a filtered out OTU; OTUs: The final count of operational taxonomic units (OTUs).A-1, A-2, and A-3 represent the litter layers of the undecomposed litter layer, decomposed litter layer, and humus layer, respectively.

Supplementary Table S2. Statistical Table of the Number of OTUs and Tags of Fungi in Different Litter Samples

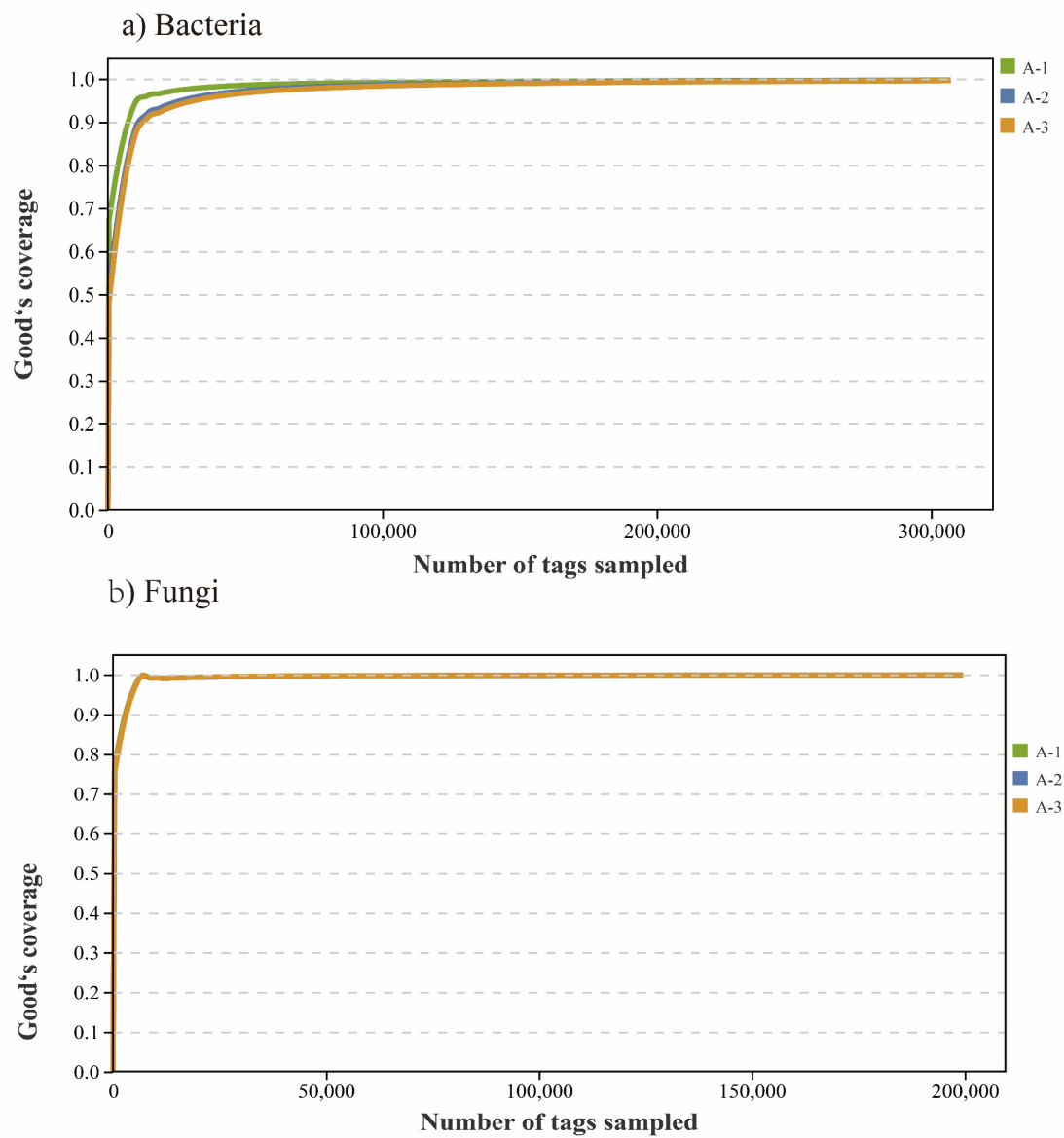| Sample	OTUs	Singleton Tags	Taxon Tags	Total Tags	Unique Tags
A-1	787±69.31	6443.333±1900.78	287780.67±36614.60	294693.67±38443.92	46627±9322.38
A-2	881±54.29	12912.67±2474.62	319625±95495.54	334257.34±95834.93	59817±11680.05
A-3	852.33±83.36	10166.33±8208.39	350279.67±134228.42	361989.67±140283.34	58169±21394.73

Notes: Total Tags: The number of effective tags; Unique Tags: Tags obtained by clustering at 100% similarity; Taxon Tags: The number of tags with species annotations; Singleton Tags: The number of singletons in the sample, where an OTU with a total tag count of 1 across all samples is termed a Singleton Tag and is considered a filtered out OTU; OTUs: The final count of operational taxonomic units (OTUs).A-1, A-2, and A-3 represent the litter layers of the undecomposed litter layer, decomposed litter layer, and humus layer, respectively.

Supplementary Table S3. Significant Litter Traits in the Redundancy Analysis (RDA) of the Bacterial Community

Bacteria	r2	p-value
WSP	0.720623	0.047
Cellulose	0.912939	0.001
Hemicellulose	0.921104	0.001
Total carbon	0.882147	0.001
Total carbon / Total nitrogen	0.931063	0.001
Cellulose/N	0.927948	0.002
pH	0.840991	0.003

Supplementary Table S4. Significant Litter Traits in the Redundancy Analysis (RDA) of the Fungal Community
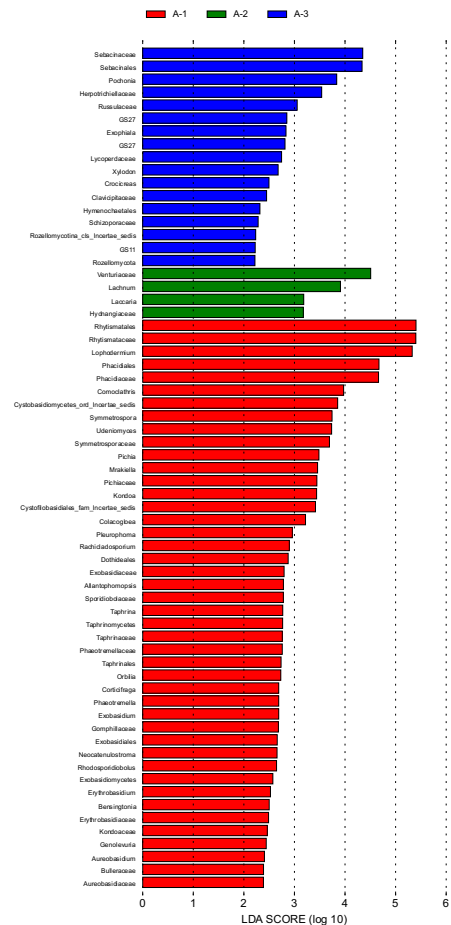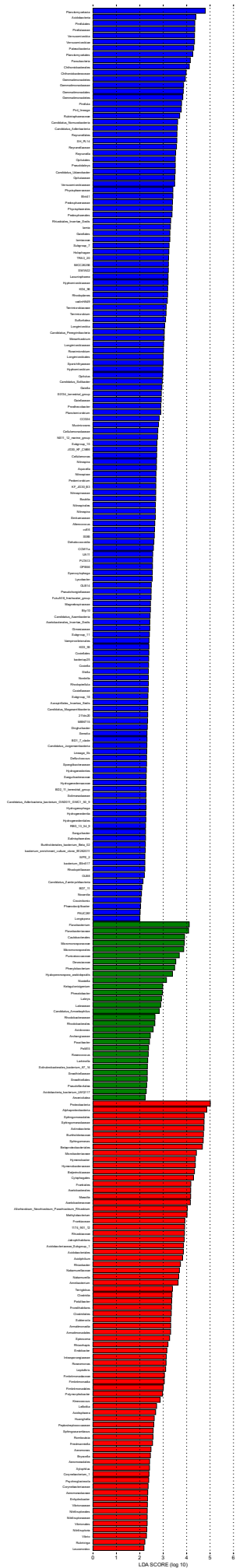
Fungi	r2	p-value
Cellulose	0.843061	0.006
Hemicellulose	0.887155	0.002
Starch	0.896014	0.003
Total sugar	0.849827	0.005
Total carbon	0.912497	0.001
Total nitrogen	0.861327	0.006
Total carbon / Total nitrogen	0.982515	0.001
pH	0.947342	0.002

a) Bacteria

b) Fungi

Supplementary Figure S1. The rarefaction curves of litter bacteria (a) and fungi (b). (A-1, A-2 and A-3 represent the litter layers of undecomposed litter layer, decomposed litter layer and humous layer, respectively).

(a) Bacteria   (b) Fungi
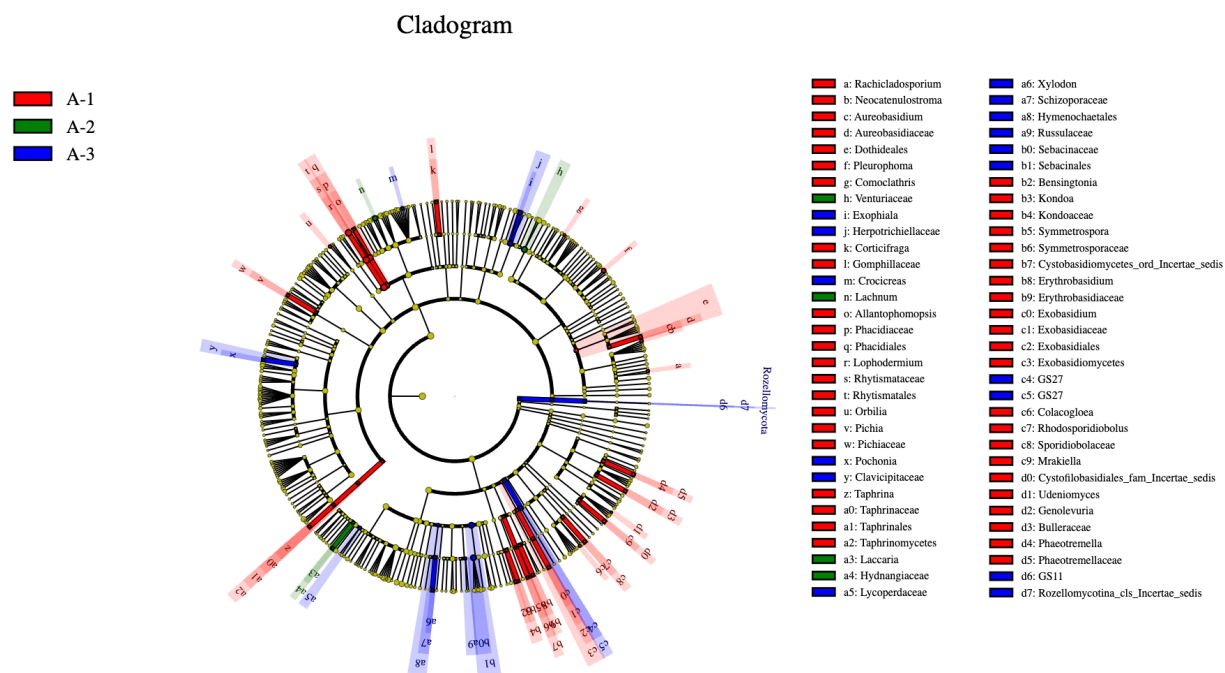
LDA SCORE (log 10)

Supplementary Figure S2. Linear Discriminant Analysis (LDA) analysis of the abundance of (a) bacteria and (b) fungi at different in the different litter layers of *Picea crassifolia* forest. (A-1, A-2 and A-3 represent the litter layers of undecomposed litter layer, decomposed litter layer and humous layer, respectively).
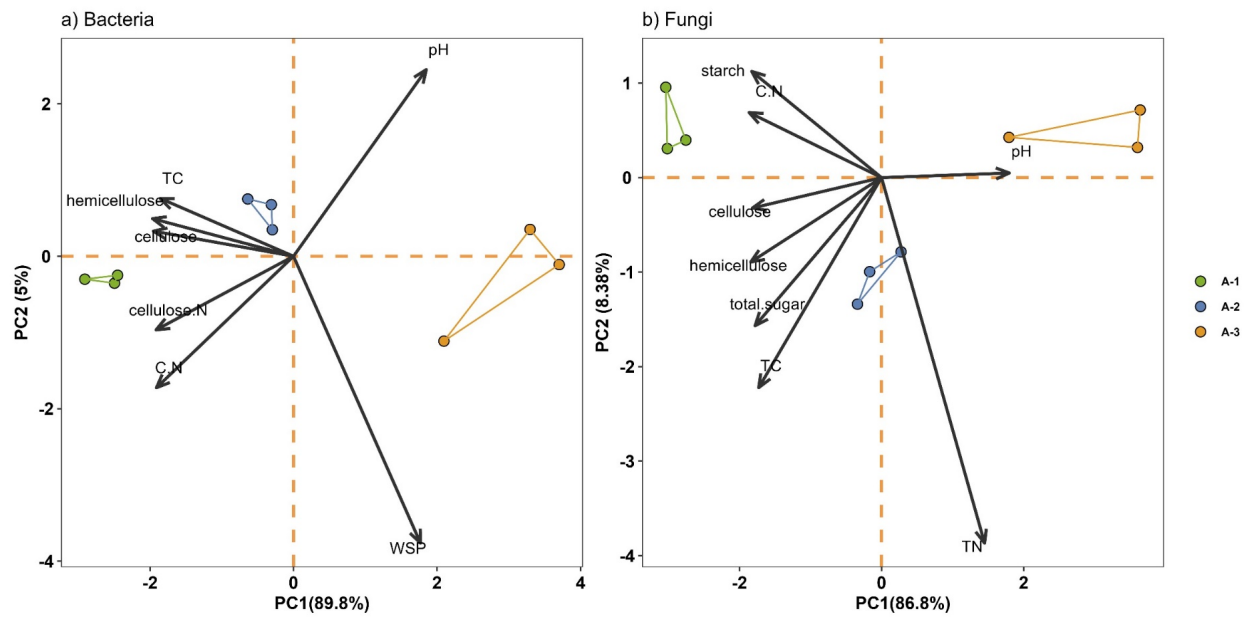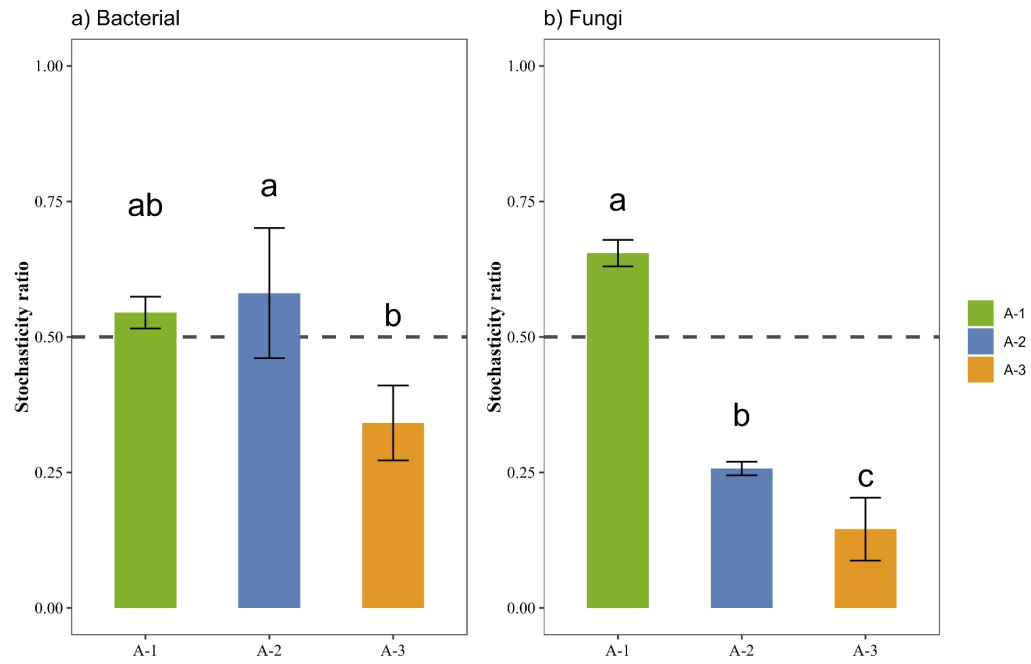
(a) Bacteria

(b) Fungi

Supplementary Figure S3. LEfSe analysis of the abundance of (a) bacteria and (b) fungi at different in the different litter layers of *Picea crassifolia* forest. (A-1, A-2 and A-3 represent the litter layers of undecomposed litter layer, decomposed litter layer and humous layer, respectively).

Supplementary Figure S4. Principal Component Analysis (PCA) Based on Litter Traits Significantly Affecting Bacterial and Fungal Communities. (A-1, A-2 and A-3 represent the litter layers of undecomposed litter layer, decomposed litter layer and humous layer, respectively).

Supplementary Figure S5. Community assembly analysis is based on the Standardized Effect Size of Mean Nearest Taxon Distance (ST) for bacterial and fungal communities. (The range of ST values is from 0 to 1: when ST is less than 0.5, deterministic processes dominate; when ST is greater than 0.5, stochastic processes dominate. A-1, A-2, and A-3 represent the litter layers of the undecomposed litter layer, decomposed litter layer, and humus layer, respectively; Note: different lowercase letters indicate differences between groups).