Table S1. The functional enzymes related to macromolecular metabolism.

EC number	Level1	Level2	Level3	Name
3.2.1.4	Hydrolases	Glycosylases	Glycosidases	cellulase
3.2.1.8	Hydrolases	Glycosylases	Glycosidases	endo-1,4-beta-xylanase
3.4.21.53	Hydrolases	Acting on peptide bonds (peptidases)	Serine endopeptidases	endopeptidase La
3.4.21.92	Hydrolases	Acting on peptide bonds (peptidases)	Serine endopeptidases	endopeptidase Clp
4.2.1.1	Lyases	Carbon-oxygen lyases	Hydro-lyases	carbonic anhydrase
5.3.1.5	Isomerases	Intramolecular oxidoreductases	Interconverting aldoses and ketoses, and related compounds	xylose isomerase
1.1.1.35	Oxidoreductases	Acting on the CH-OH group of donors	With NAD+ or NADP+ as acceptor	3-hydroxyacyl-CoA dehydrogenase
1.3.8.1	Oxidoreductases	Acting on the CH-CH group of donors	With a flavin as acceptor	short-chain acyl-CoA dehydrogenase
1.4.4.2	Oxidoreductases	Acting on the CH-NH2 group of donors	With a disulfide as acceptor	glycine dehydrogenase (aminomethyl-transferring)
2.1.2.10	Transferases	Transferring one-carbon groups	Hydroxymethyl-, formyl- and related transferases	aminomethyltransferase

Table S2. The relative abundance of functional genes and enzymes related to the nitrogen cycle or macromolecular metabolism in different sites.

Functional Genes and Enzymes	A		B		C		D	
	AVG	CV	AVG	CV	AVG	CV	AVG	CV
hao	0.0000%	1.73	0.0000%	0.79	0.0000%	1.73	0.0001%	0.36
nos	0.0004%	0.54	0.00%	0.84	0.0006%	0.63	0.0016%	0.37
nar	0.0046%	0.29	0.02%	0.69	0.0048%	0.42	0.0272%	0.46
nir	0.0401%	0.86	0.03%	0.5	0.0329%	0.65	0.0532%	0.16
nor	0.0013%	0.45	0.01%	0.8	0.0017%	0.49	0.0088%	0.47
EC 3.2.1.4	0.0742%	0.42	0.0684%	0.39	0.1218%	0.76	0.0919%	0.14
EC 3.2.1.8	0.0373%	0.46	0.0355%	0.51	0.0675%	0.86	0.0497%	0.18
EC 4.2.1.11	0.0576%	0.13	0.0487%	0.07	0.0543%	0.09	0.0518%	0.02
EC 5.3.1.5	0.0476%	0.62	0.0315%	0.35	0.0496%	0.48	0.0530%	0.31
EC 3.4.21.53	0.0179%	0.59	0.0078%	0.23	0.0171%	0.91	0.0152%	0.63
EC 1.4.4.2	0.1055%	0.23	0.1008%	0.12	0.1299%	0.46	0.0947%	0.04
EC 2.1.2.10	0.0332%	0.39	0.0325%	0.10	0.0385%	0.17	0.0356%	0.12
EC 1.1.1.35	0.0039%	0.77	0.0167%	0.20	0.0063%	1.22	0.0092%	0.77
EC 1.3.8.1	0.0236%	0.82	0.0475%	0.27	0.0128%	0.84	0.0266%	0.72

AVG is the abbreviation of average and CV is the abbreviation of coefficient of variation. Group A includes samples A1, A2, A3, and A4; Group B includes samples B1, B2, B3, and B4; Group C includes samples C1, C2, C3, and C4; Group D includes samples D1, D2, D3, and D4.