

KEGG pathway	Enzyme	Beech	Spruce
Nitrogen metabolism		13	17
	glutamate synthase (NADPH)	0	1
	glutamate synthase (NADH)	0	1
	glutamate dehydrogenase	0	2
	glutamate dehydrogenase (NADP+)	6	2
	asparaginase	0	1
	glutamine synthase	4	6
	asparagine synthase (glutamine-hydrolysing)	0	1
Alanine, aspartate and glutamate metabolism		19	26
	glutamate dehydrogenase	6	2
	aspartate transaminase	2	3
	alanine transaminase	2	0
	glutamine synthase	4	6
	Asparaginase	0	1
Arginine and proline metabolism		20	22
	glutamate dehydrogenase	6	2
	aspartate transaminase	2	3
	glutamine synthase	4	6
	arginase	1	0
beta-Alanine metabolism		6	13
Cysteine and methionine metabolism		10	19
Glycine, serine and threonine metabolism		10	14
	threonine synthase	0	1
Histidine metabolism		4	4
Lysine biosynthesis		6	2
Lysine degradation		7	10
Phenylalanine metabolism		16	14
Phenylalanine, tyrosine and tryptophan biosynthesis		6	8
	aspartate transaminase	2	3
	anthranilate synthase	1	0
	tryptophan synthase	1	0
Tryptophan metabolism		8	12
Tyrosine metabolism		10	13
Valine, leucine and isoleucine biosynthesis		3	6
Valine, leucine and isoleucine degradation		18	15
Citrate cycle (TCA cycle)		19	29
	malate dehydrogenase	3	4
	isocitrate dehydrogenase (NAD+)	0	3
	isocitrate dehydrogenase (NADP+)	3	2
	pyruvate dehydrogenase (acetyl-transferring)	0	2
	succinate dehydrogenase	0	2
	citrate (Si)-synthase	2	2
	ATP citrate synthase	0	3
	phosphoenolpyruvate carboxykinase (ATP)	0	3

Glycolysis / Gluconeogenesis	21	48
glyceraldehyde-3-phosphate dehydrogenase	1	10
pyruvate dehydrogenase (acetyl-transferring)	0	2
hexokinase	0	1
fructose-bisphosphatase	0	2
pyruvate decarboxylase	0	1
phosphoenolpyruvate carboxykinase (ATP)	1	3
triose-phosphate isomerase	1	5
glucose-6-phosphate isomerase	0	2
phosphoglucomutase	1	3
acetate---CoA ligase	0	1
Pentose phosphate pathway	15	20
glucose-6-phosphate dehydrogenase	1	1
transketolase	3	3
fructose-bisphosphatase	0	2
fructose-bisphosphate aldolase	4	4
phosphoglucomutase	1	3
Pyruvate metabolism	20	21
malate dehydrogenase	3	4
pyruvate dehydrogenase (acetyl-transferring)	0	2
homocitrate synthase	1	1
malate synthase	1	1
phosphoenolpyruvate carboxykinase (ATP)	1	3
Galactose metabolism	4	7
hexokinase	0	1
beta-galactosidase	0	1
phosphoglucomutase	1	3
6-phosphofructokinase	1	0
Fructose and mannose metabolism	12	18
hexokinase	0	1
triose-phosphate isomerase	1	5
aldehyde reductase	1	0
Starch and sucrose metabolism	16	18
hexokinase	0	1
alpha-amylase	0	1
phosphoglucomutase	1	3
Sulfur metabolism	2	3
adenylyl-sulfate kinase	1	0
sulfate adenylyltransferase	1	1

Table S3: An illustration of some of the key enzymes identified in major KEGG metabolic pathways relevant to either C, N or S metabolism.