**Supplementary Table 1 KEGG pathway classification of contigs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Pathway (Up\_regulated)** | **Number of contigs (n)** | **Pathway (Down\_regulated)** | **Number of contigs (n)** |
| Carbon metabolism | 10 | Carbon metabolism | 1 |
| 2 Oxocarboxylic acid metabolism | 1 | 2-Oxocarboxylic acid metabolism | 1 |
| Fatty acid metabolism | 3 | Fatty acid metabolism | 2 |
| Biosynthesis of amino acids | 9 | Biosynthesis of amino acids | 1 |
| Degradation of aromatic compounds; Glycolysis Gluconeogenesis | 9 | Degradation of aromatic compounds; Glycolysis Gluconeogenesis; Citrate cycle TCA cycle; Pentose phosphate pathway | 1 |
| Citrate cycle TCA cycle | 2 | Pentose and glucuronate interconversions | 2 |
| Pentose phosphate pathway | 5 | Fructose and mannose metabolism | 3 |
| Pentose and glucuronate interconversions; Fructose and mannose metabolism | 4 | Galactose metabolism; Ascorbate and aldarate metabolism; Starch and sucrose metabolism | 1 |
| Galactose metabolism | 1 | Amino sugar and nucleotide sugar metabolism | 1 |
| Ascorbate and aldarate metabolism; Starch and sucrose metabolism | 2 | Pyruvate metabolism; Glyoxylate and dicarboxylate metabolism; Propanoate metabolism; Butanoate metabolism; C5 Branched dibasic acid metabolism; Inositol phosphate metabolism | 1 |
| Amino sugar and nucleotide sugar metabolism | 3 | Oxidative phosphorylation | 1 |
| Pyruvate metabolism | 4 | Photosynthesis; Photosynthesis antenna proteins; Photosynthesis proteins; Carbon fixation in photosynthetic organisms; Carbon fixation pathways in prokaryotes; Methane metabolism; Nitrogen metabolism; Sulfur metabolism; Fatty acid biosynthesis | 1 |
| Glyoxylate and dicarboxylate metabolism | 3 | Fatty acid elongation | 2 |
| Propanoate metabolism | 1 | Fatty acid degradation; Synthesis and degradation of ketone bodies; Cutin suberine and wax biosynthesis; Steroid biosynthesis | 5 |
| Butanoate metabolism; C5 Branched dibasic acid metabolism; Inositol phosphate metabolism | 1 | Primary bile acid biosynthesis | 1 |
| Oxidative phosphorylation | 7 | Secondary bile acid biosynthesis; Steroid hormone biosynthesis | 1 |
| Photosynthesis; Photosynthesis antenna proteins; Photosynthesis proteins; Carbon fixation in photosynthetic organisms | 5 | Glycerolipid metabolism | 2 |
| Carbon fixation pathways in prokaryotes | 1 | Glycerophospholipid metabolism | 3 |
| Methane metabolism | 5 | Ether lipid metabolism | 1 |
| Nitrogen metabolism | 3 | Sphingolipid metabolism; Arachidonic acid metabolism | 5 |
| Sulfur metabolism | 1 | Linoleic acid metabolism | 1 |
| Fatty acid biosynthesis;Fatty acid elongation | 8 | alpha Linolenic acid metabolism | 1 |
| Fatty acid degradation | 1 | Biosynthesis of unsaturated fatty acids | 2 |
| Synthesis and degradation of ketone bodies; Cutin suberine and wax biosynthesis; Steroid biosynthesis; Primary bile acid biosynthesis | 1 | Lipid biosynthesis proteins; Purine metabolism | 3 |
| Secondary bile acid biosynthesis; Steroid hormone biosynthesis | 9 | Pyrimidine metabolism | 3 |
| Glycerolipid metabolism | 1 | Alanine aspartate and glutamate metabolism | 3 |
| Glycerophospholipid metabolism | 1 | Glycine serine and threonine metabolism; Cysteine and methionine metabolism | 3 |
| Ether lipid metabolism | 1 | Valine leucine and isoleucine degradation | 3 |
| Sphingolipid metabolism | 2 | Valine leucine and isoleucine biosynthesis; Lysine biosynthesis | 1 |
| Arachidonic acid metabolism | 4 | Lysine degradation | 5 |
| Linoleic acid metabolism; alpha Linolenic acid metabolism; Biosynthesis of unsaturated fatty acids | 7 | Arginine biosynthesis; Arginine and proline metabolism | 1 |
| Lipid biosynthesis proteins; Purine metabolism | 10 | Histidine metabolism; Tyrosine metabolism | 3 |
| Pyrimidine metabolism | 9 | Phenylalanine metabolism | 3 |
| Alanine aspartate and glutamate metabolism | 3 | Tryptophan metabolism | 4 |
| Glycine serine and threonine metabolism | 1 | Phenylalanine tyrosine and tryptophan biosynthesis | 3 |
| Cysteine and methionine metabolism | 3 | Amino acid related enzymes; beta Alanine metabolism; Taurine and hypotaurine metabolism | 3 |
| Valine leucine and isoleucine degradation; Valine leucine and isoleucine biosynthesis; Lysine biosynthesis; Lysine degradation | 2 | Phosphonate and phosphinate metabolism; Selenocompound metabolism; Cyanoamino acid metabolism | 3 |
| Arginine biosynthesis | 2 | D Glutamine and D glutamate metabolism; D Arginine and D ornithine metabolism; D Alanine metabolism; Glutathione metabolism | 3 |
| Arginine and proline metabolism | 4 | Glycosyltransferases; N Glycan biosynthesis; Various types of N glycan biosynthesis | 1 |
| Histidine metabolism; Tyrosine metabolism; Phenylalanine metabolism; Tryptophan metabolism | 3 | Mucin type O glycan biosynthesis | 1 |
| Phenylalanine tyrosine and tryptophan biosynthesis; Amino acid related enzymes; beta Alanine metabolism | 1 | Other types of O glycan biosynthesis | 2 |
| Taurine and hypotaurine metabolism | 1 | Glycosaminoglycan biosynthesis chondroitin sulfate dermatan sulfate; Glycosaminoglycan biosynthesis heparan sulfate heparin; Glycosaminoglycan biosynthesis keratan sulfate; Proteoglycans; Glycosaminoglycan binding proteins; Glycosylphosphatidylinositol GPI anchored proteins; Glycosaminoglycan degradation | 1 |
| Phosphonate and phosphinate metabolism; Selenocompound metabolism; Cyanoamino acid metabolism; D Glutamine and D glutamate metabolism; D Arginine and D ornithine metabolism; D Alanine metabolism; Glutathione metabolism | 4 | Glycosylphosphatidylinositol GPI anchor biosynthesis; Glycosphingolipid biosynthesis lacto and neolacto series | 1 |
| Glycosyltransferases; N Glycan biosynthesis; Various types of N glycan biosynthesis; Mucin type O glycan biosynthesis | 2 | Glycosphingolipid biosynthesis globo series; Glycosphingolipid biosynthesis ganglio series; Lipopolysaccharide biosynthesis; Lipopolysaccharide biosynthesis proteins; Peptidoglycan biosynthesis; Other glycan degradation; Thiamine metabolism; Riboflavin metabolism; Vitamin B6 metabolism; Nicotinate and nicotinamide metabolism | 8 |
| Other types of O glycan biosynthesis; Glycosaminoglycan biosynthesis chondroitin sulfate dermatan sulfate; Glycosaminoglycan biosynthesis heparan sulfate heparin | 1 | Pantothenate and CoA biosynthesis; Biotin metabolism | 1 |
| Glycosaminoglycan biosynthesis keratan sulfate | 1 | Lipoic acid metabolism; Folate biosynthesis; One carbon pool by folate; Retinol metabolism | 3 |
| Proteoglycans; Glycosaminoglycan binding proteins; Glycosylphosphatidylinositol GPI anchored proteins; Glycosaminoglycan degradation; Glycosylphosphatidylinositol GPI anchor biosynthesis; Glycosphingolipid biosynthesis lacto and neolacto series | 1 | Porphyrin and chlorophyll metabolism; Ubiquinone and other terpenoid quinone biosynthesis; Prenyltransferases; Terpenoid backbone biosynthesis | 1 |
| Glycosphingolipid biosynthesis globo series | 1 | Monoterpenoid biosynthesis; Sesquiterpenoid and triterpenoid biosynthesis | 1 |
| Glycosphingolipid biosynthesis ganglio series | 1 | Diterpenoid biosynthesis; Carotenoid biosynthesis; Brassinosteroid biosynthesis; Insect hormone biosynthesis; Zeatin biosynthesis; Limonene and pinene degradation; Geraniol degradation; Polyketide biosynthesis proteins; Type I polyketide structures; Biosynthesis of 12 14 and 16 membered macrolides; Biosynthesis of ansamycins; Biosynthesis of type II polyketide backbone; Biosynthesis of type II polyketide products; Tetracycline biosynthesis; Polyketide sugar unit biosynthesis; Nonribosomal peptide structures; Biosynthesis of siderophore group nonribosomal peptides; Biosynthesis of vancomycin group antibiotics; Phenylpropanoid biosynthesis; Stilbenoid diarylheptanoid and gingerol biosynthesis; Flavonoid biosynthesis; Flavone and flavonol biosynthesis; Anthocyanin biosynthesis; Isoflavonoid biosynthesis; Indole alkaloid biosynthesis; Indole diterpene alkaloid biosynthesis; Isoquinoline alkaloid biosynthesis | 3 |
| Lipopolysaccharide biosynthesis; Lipopolysaccharide biosynthesis proteins; Peptidoglycan biosynthesis; Other glycan degradation; Thiamine metabolism; Riboflavin metabolism | 2 | Tropane piperidine and pyridine alkaloid biosynthesis; Acridone alkaloid biosynthesis; Caffeine metabolism; Betalain biosynthesis; Glucosinolate biosynthesis; Benzoxazinoid biosynthesis; Penicillin and cephalosporin biosynthesis; Carbapenem biosynthesis; Monobactam biosynthesis; Clavulanic acid biosynthesis; Streptomycin biosynthesis; Butirosin and neomycin biosynthesis; Puromycin biosynthesis; Novobiocin biosynthesis; Aflatoxin biosynthesis; Benzoate degradation; Aminobenzoate degradation; Fluorobenzoate degradation; Chloroalkane and chloroalkene degradation; Chlorocyclohexane and chlorobenzene degradation; Toluene degradation; Xylene degradation; Nitrotoluene degradation; Ethylbenzene degradation; Styrene degradation; Atrazine degradation; Caprolactam degradation; 1 1 1 Trichloro 2 2 bis 4 chlorophenyl ethane DDT degradation; Bisphenol degradation; Dioxin degradation; Naphthalene degradation; Polycyclic aromatic hydrocarbon degradation; Furfural degradation; Steroid degradation; Metabolism of xenobiotics by cytochrome P450; Drug metabolism cytochrome P450 | 1 |
| Vitamin B6 metabolism; Nicotinate and nicotinamide metabolism | 5 | Drug metabolism other enzymes; Enzymes; Protein kinases; Protein phosphatase and associated proteins; Peptidases; Cytochrome P450; KEGG modules in global; RNA polymerase; Basal transcription factors | 1 |
| Pantothenate and CoA biosynthesis; Biotin metabolism; Lipoic acid metabolism; Folate biosynthesis; One carbon pool by folate | 1 | Transcription factors; Transcription machinery; Spliceosome | 2 |
| Retinol metabolism | 8 | Spliceosome; Ribosome | 1 |
| Porphyrin and chlorophyll metabolism; Ubiquinone and other terpenoid quinone biosynthesis; Prenyltransferases; Terpenoid backbone biosynthesis | 1 | Ribosome; Transfer RNA biogenesis; Aminoacyl tRNA biosynthesis; RNA transport; mRNA surveillance pathway | 1 |
| Monoterpenoid biosynthesis; Sesquiterpenoid and triterpenoid biosynthesis; Diterpenoid biosynthesis; Carotenoid biosynthesis; Brassinosteroid biosynthesis; Insect hormone biosynthesis; Zeatin biosynthesis; Limonene and pinene degradation; Geraniol degradation; Polyketide biosynthesis proteins; Type I polyketide structures; Biosynthesis of 12 14 and 16 membered macrolides; Biosynthesis of ansamycins; Biosynthesis of type II polyketide backbone; Biosynthesis of type II polyketide products; Tetracycline biosynthesis; Polyketide sugar unit biosynthesis; Nonribosomal peptide structures; Biosynthesis of siderophore group nonribosomal peptides; Biosynthesis of vancomycin group antibiotics; Phenylpropanoid biosynthesis; Stilbenoid diarylheptanoid and gingerol biosynthesis; Flavonoid biosynthesis; Flavone and flavonol biosynthesis; Anthocyanin biosynthesis; Isoflavonoid biosynthesis; Indole alkaloid biosynthesis; Indole diterpene alkaloid biosynthesis; Isoquinoline alkaloid biosynthesis; Tropane piperidine and pyridine alkaloid biosynthesis; Acridone alkaloid biosynthesis; Caffeine metabolism; Betalain biosynthesis; Glucosinolate biosynthesis; Benzoxazinoid biosynthesis; Penicillin and cephalosporin biosynthesis; Carbapenem biosynthesis; Monobactam biosynthesis; Clavulanic acid biosynthesis; Streptomycin biosynthesis | 1 | Messenger RNA Biogenesis; Ribosome biogenesis in eukaryotes; Ribosome biogenesis; Mitochondrial biogenesis; Translation factors; Chaperones and folding catalysts; Protein export | 1 |
| Butirosin and neomycin biosynthesis; Puromycin biosynthesis; Novobiocin biosynthesis; Aflatoxin biosynthesis; Benzoate degradation | 1 | Protein processing in endoplasmic reticulum | 3 |
| Aminobenzoate degradation; Fluorobenzoate degradation; Chloroalkane and chloroalkene degradation; Chlorocyclohexane and chlorobenzene degradation; Toluene degradation; Xylene degradation; Nitrotoluene degradation; Ethylbenzene degradation; Styrene degradation; Atrazine degradation; Caprolactam degradation; 1 1 1 Trichloro 2 2 bis 4 chlorophenyl ethane DDT degradation; Bisphenol degradation; Dioxin degradation; Naphthalene degradation; Polycyclic aromatic hydrocarbon degradation; Furfural degradation; Steroid degradation; Metabolism of xenobiotics by cytochrome P450 | 6 | SNARE interactions in vesicular transport; SNAREs; Ubiquitin mediated proteolysis | 4 |
| Drug metabolism cytochrome P450 | 4 | Ubiquitin system; Sulfur relay system; Proteasome | 3 |
| Drug metabolism other enzymes;Enzymes; Protein kinases;Protein phosphatase and associated proteins; Peptidases; Cytochrome P450; KEGG modules in global; RNA polymerase; Basal transcription factors | 1 | Proteasome; RNA degradation; DNA replication | 6 |
| Transcription factors; Transcription machinery; Spliceosome | 4 | DNA replication proteins; Chromosome and associated proteins; Base excision repair | 2 |
| Spliceosome; Ribosome | 1 | Nucleotide excision repair | 1 |
| Ribosome; Transfer RNA biogenesis; Aminoacyl tRNA biosynthesis; RNA transport | 2 | Mismatch repair; Homologous recombination; Non homologous end joining; Fanconi anemia pathway | 1 |
| mRNA surveillance pathway | 1 | DNA repair and recombination proteins; Non coding RNAs; Transporters; ABC transporters; Phosphotransferase system PTS; Bacterial secretion system; Secretion system; Two component system; Two component system; Ras signaling pathway | 5 |
| Messenger RNA Biogenesis; Ribosome biogenesis in eukaryotes; Ribosome biogenesis; Mitochondrial biogenesis; Translation factors; Chaperones and folding catalysts; Protein export; Protein processing in endoplasmic reticulum | 8 | Rap1 signaling pathway | 7 |
| SNARE interactions in vesicular transport; SNAREs; Ubiquitin mediated proteolysis | 2 | MAPK signaling pathway | 9 |
| Ubiquitin system; Sulfur relay system; Proteasome | 1 | MAPK signaling pathway yeast | 1 |
| Proteasome; RNA degradation | 4 | ErbB signaling pathway | 7 |
| DNA replication; DNA replication proteins; Chromosome and associated proteins; Base excision repair; Nucleotide excision repair; Mismatch repair; Homologous recombination; Non homologous end joining; Fanconi anemia pathway; DNA repair and recombination proteins; Non coding RNAs; Transporters; ABC transporters; Phosphotransferase system PTS; Bacterial secretion system; Secretion system; Two component system | 3 | Wnt signaling pathway | 10 |
| Two component system; Ras signaling pathway | 4 | Notch signaling pathway | 2 |
| Rap1 signaling pathway | 6 | Hedgehog signaling pathway | 2 |
| MAPK signaling pathway | 7 | TGF beta signaling pathway | 3 |
| ErbB signaling pathway | 3 | Hippo signaling pathway | 7 |
| Wnt signaling pathway | 2 | VEGF signaling pathway | 1 |
| Notch signaling pathway; Hedgehog signaling pathway; TGF beta signaling pathway | 2 | Jak STAT signaling pathway | 6 |
| Hippo signaling pathway | 3 | NF kappa B signaling pathway | 5 |
| VEGF signaling pathway | 2 | TNF signaling pathway | 7 |
| Jak STAT signaling pathway | 3 | HIF 1 signaling pathway | 3 |
| NF kappa B signaling pathway | 2 | FoxO signaling pathway | 4 |
| TNF signaling pathway | 4 | Calcium signaling pathway | 11 |
| HIF 1 signaling pathway | 4 | Phosphatidylinositol signaling system | 5 |
| FoxO signaling pathway | 4 | Phospholipase D signaling pathway | 11 |
| Calcium signaling pathway | 8 | Sphingolipid signaling pathway | 3 |
| Phosphatidylinositol signaling system | 1 | cAMP signaling pathway | 10 |
| Phospholipase D signaling pathway | 2 | cGMP PKG signaling pathway | 4 |
| Sphingolipid signaling pathway | 3 | PI3K Akt signaling pathway | 23 |
| cAMP signaling pathway | 2 | AMPK signaling pathway | 9 |
| cGMP PKG signaling pathway | 5 | mTOR signaling pathway | 5 |
| PI3K Akt signaling pathway | 7 | Cytokine cytokine receptor interaction | 10 |
| AMPK signaling pathway | 3 | Cytokines; ECM receptor interaction | 5 |
| mTOR signaling pathway | 3 | Cell adhesion molecules CAMs | 13 |
| Plant hormone signal transduction; G protein coupled receptors; Enzyme linked receptors; Cytokine receptors; Nuclear receptors; Ion channels; GTP binding proteins; Neuroactive ligand receptor interaction | 2 | Cell adhesion molecules and their ligands; CD Molecules; Lectins; Bacterial toxins; Endocytosis | 14 |
| Cytokine cytokine receptor interaction | 7 | Exosome; Phagosome | 12 |
| Cytokines; ECM receptor interaction | 1 | Lysosome | 2 |
| Cell adhesion molecules CAMs | 5 | Peroxisome | 2 |
| Cell adhesion molecules and their ligands; CD Molecules; Lectins; Bacterial toxins; Endocytosis | 9 | Regulation of autophagy; Regulation of mitophagy yeast; Prokaryotic Defense System; Bacterial chemotaxis; Bacterial motility proteins; Flagellar assembly; Regulation of actin cytoskeleton | 6 |
| Exosome; Phagosome | 8 | Cytoskeleton proteins; Cell cycle | 9 |
| Lysosome | 1 | Cell cycle yeast | 4 |
| Peroxisome | 2 | Cell cycle Caulobacter; Meiosis yeast | 4 |
| Regulation of autophagy; Regulation of mitophagy yeast; Prokaryotic Defense System; Bacterial chemotaxis; Bacterial motility proteins; Flagellar assembly; Regulation of actin cytoskeleton | 6 | Oocyte meiosis | 3 |
| Cytoskeleton proteins; Cell cycle | 3 | Apoptosis | 12 |
| Cell cycle yeast; Cell cycle Caulobacter; Meiosis yeast; Oocyte meiosis; Apoptosis | 8 | p53 signaling pathway | 2 |
| p53 signaling pathway | 3 |  |  |
| Focal adhesion | 7 |  |  |
| Adherens junction | 3 |  |  |
| Tight junction | 9 |  |  |
| Gap junction | 2 |  |  |
| Signaling pathways regulating pluripotency of stem cells; Hematopoietic cell lineage | 4 |  |  |
| Complement and coagulation cascades | 4 |  |  |
| Platelet activation | 2 |  |  |
| Toll like receptor signaling pathway | 3 |  |  |
| NOD like receptor signaling pathway | 7 |  |  |
| RIG I like receptor signaling pathway | 3 |  |  |
| Cytosolic DNA sensing pathway | 1 |  |  |
| Natural killer cell mediated cytotoxicity | 4 |  |  |
| Antigen processing and presentation | 11 |  |  |