**Additional file 1:** Niche differentiation of microbes and their functional signatures in Assam type tea (*Camellia sinensis* var. *assamica*)



**Fig. S1.** Rarefaction curve of the Tea rhizosphere metagenome



**Fig. S2.** Rarefaction curve of the Tea root endosphere Replicate 1 metagenome



**Fig. S3.** Rarefaction curve of the Tea root endosphere Replicate 2 metagenome

**Table S1:** Additional file: Definition of the major KEGG pathways (>1.00%) in the three metagenomes

|  |  |
| --- | --- |
| Pathway | Definition |
| Glycolysis / Gluconeogenesis | ko00010 |
| Citrate cycle (TCA cycle)  | ko00020 |
| Pentose phosphate pathway  | ko00030 |
| Pentose and glucuronate interconversions  | ko00040 |
| Fructose and mannose metabolism  | ko00051 |
| Galactose metabolism  | ko00052 |
| Ascorbate and aldarate metabolism  | ko00053 |
| Fatty acid biosynthesis  | ko00061 |
| Fatty acid metabolism  | ko00071 |
| Steroid biosynthesis  | ko00100 |
| Primary bile acid biosynthesis  | ko00120 |
| Ubiquinone and other terpenoid-quinone biosynthesis  | ko00130 |
| Steroid hormone biosynthesis  | ko00140 |
| Oxidative phosphorylation  | ko00190 |
| Photosynthesis  | ko00195 |
| Purine metabolism  | ko00230 |
| Caffeine metabolism  | ko00232 |
| Pyrimidine metabolism  | ko00240 |
| Alanine, aspartate and glutamate metabolism  | ko00250 |
|  Tetracycline biosynthesis  | ko00253 |
| Glycine, serine and threonine metabolism  | ko00260 |
| Cysteine and methionine metabolism  | ko00270 |
| Valine, leucine and isoleucine degradation  | ko00280 |
| Geraniol degradation  | ko00281 |
|  Valine, leucine and isoleucine biosynthesis  | ko00290 |
| Lysine biosynthesis  | ko00300 |
| Lysine degradation  | ko00310 |
| Penicillin and cephalosporin biosynthesis  | ko00311 |
| beta-Lactam resistance  | ko00312 |
| Arginine and proline metabolism  | ko00330 |
| Histidine metabolism  | ko00340 |
| Tyrosine metabolism  | ko00350 |
| 1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane (DDT) degradation  | ko00351 |
| Phenylalanine metabolism  | ko00360 |
| Chlorocyclohexane and chlorobenzene degradation  | ko00361 |
| Bisphenol degradation  | ko00363 |
| Fluorobenzoate degradation  | ko00364 |
| Tryptophan metabolism  | ko00380 |
| Phenylalanine, tyrosine and tryptophan biosynthesis  | ko00400 |
| Taurine and hypotaurine metabolism  | ko00430 |
| Phosphonate and phosphinate metabolism  | ko00440 |
| Selenocompound metabolism  | ko00450 |
| Glutathione metabolism  | ko00480 |
| Starch and sucrose metabolism  | ko00500 |
| N-Glycan biosynthesis  | ko00510 |
| Other glycan degradation  | ko00511 |
| Various types of N-glycan biosynthesis  | ko00513 |
| Other types of O-glycan biosynthesis  | ko00514 |
| Amino sugar and nucleotide sugar metabolism  | ko00520 |
| Streptomycin biosynthesis  | ko00521 |
| Glycosaminoglycan degradation  | ko00531 |
| Glycosaminoglycan biosynthesis - chondroitin sulfate / dermatan sulfate  | ko00532 |
| Glycosaminoglycan biosynthesis - keratan sulfate  | ko00533 |
| Glycosaminoglycan biosynthesis - heparan sulfate / heparin  | ko00534 |
| Lipopolysaccharide biosynthesis  | ko00540 |
| Peptidoglycan biosynthesis  | ko00550 |
| Glycerolipid metabolism  | ko00561 |
| Inositol phosphate metabolism  | ko00562 |
| Glycosylphosphatidylinositol(GPI)-anchor biosynthesis  | ko00563 |
| Glycerophospholipid metabolism  | ko00564 |
| Ether lipid metabolism  | ko00565 |
| Arachidonic acid metabolism  | ko00590 |
| Linoleic acid metabolism  | ko00591 |
| alpha-Linolenic acid metabolism  | ko00592 |
| Sphingolipid metabolism  | ko00600 |
| Glycosphingolipid biosynthesis - lacto and neolacto series  | ko00601 |
| Pyruvate metabolism  | ko00620 |
| Dioxin degradation  | ko00621 |
| Xylene degradation  | ko00621 |
| Polycyclic aromatic hydrocarbon degradation  | ko00624 |
| Chloroalkane and chloroalkene degradation  | ko00625 |
| Aminobenzoate degradation  | ko00627 |
| Glyoxylate and dicarboxylate metabolism  | ko00630 |
| Nitrotoluene degradation  | ko00633 |
| Propanoate metabolism  | ko00640 |
| Ethylbenzene degradation  | ko00642 |
| Styrene degradation  | ko00643 |
| Butanoate metabolism  | ko00650 |
| C5-Branched dibasic acid metabolism  | ko00660 |
| One carbon pool by folate  | ko00670 |
| Methane metabolism  | ko00680 |
| Carbon fixation pathways in prokaryotes  | ko00720 |
| Thiamine metabolism  | ko00730 |
| Riboflavin metabolism  | ko00740 |
| Vitamin B6 metabolism  | ko00750 |
| Nicotinate and nicotinamide metabolism  | ko00760 |
| Pantothenate and CoA biosynthesis  | ko00770 |
| Biotin metabolism  | ko00780 |
| Lipoic acid metabolism  | ko00785 |
| Folate biosynthesis  | ko00790 |
| Atrazine degradation  | ko00791 |
| Retinol metabolism  | ko00830 |
| Porphyrin and chlorophyll metabolism  | ko00860 |
| Terpenoid backbone biosynthesis  | ko00900 |
| Diterpenoid biosynthesis  | ko00904 |
| Carotenoid biosynthesis  | ko00906 |
| Zeatin biosynthesis  | ko00908 |
| Sesquiterpenoid and triterpenoid biosynthesis  | ko00909 |
| Nitrogen metabolism  | ko00910 |
| Sulfur metabolism  | ko00920 |
| Caprolactam degradation  | ko00930 |
| Phenylpropanoid biosynthesis  | ko00940 |
| Flavonoid biosynthesis  | ko00941 |
| Isoflavonoid biosynthesis  | ko00943 |
| Flavone and flavonol biosynthesis  | ko00944 |
| Stilbenoid, diarylheptanoid and gingerol biosynthesis  | ko00945 |
| Tropane, piperidine and pyridine alkaloid biosynthesis  | ko00960 |
| Glucosinolate biosynthesis  | ko00966 |
| Aminoacyl-tRNA biosynthesis  | ko00970 |
| Insect hormone biosynthesis  | ko00981 |
| Drug metabolism - other enzymes  | ko00983 |
| Steroid degradation  | ko00984 |
| Biosynthesis of unsaturated fatty acids  | ko01040 |
| Biosynthesis of siderophore group nonribosomal peptides  | ko01053 |
| Biosynthesis of type II polyketide backbone  | ko01056 |
| ABC transporters  | ko02010 |
| Two-component system  | ko02020 |
| Bacterial chemotaxis  | ko02030 |
| Flagellar assembly  | ko02040 |
| Phosphotransferase system (PTS)  | ko02060 |
| Ribosome biogenesis in eukaryotes  | ko03008 |
| Ribosome  | ko03010 |
| RNA transport  | ko03013 |
| mRNA surveillance pathway  | ko03015 |
| RNA degradation  | ko03018 |
| RNA polymerase  | ko03020 |
| Basal transcription factors  | ko03022 |
| DNA replication  | ko03030 |
|  Spliceosome  | ko03040 |
| Proteasome  | ko03050 |
| Protein export  | ko03060 |
| Bacterial secretion system  | ko03070 |
| PPAR signaling pathway  | ko03320 |
| Base excision repair  | ko03410 |
| Nucleotide excision repair  | ko03420 |
| Mismatch repair  | ko03430 |
| Homologous recombination  | ko03440 |
| Non-homologous end-joining  | ko03450 |
| MAPK signaling pathway  | ko04010 |
| MAPK signaling pathway - yeast  | ko04011 |
| ErbB signaling pathway  | ko04012 |
| MAPK signaling pathway - fly  | ko04013 |
| Calcium signaling pathway  | ko04020 |
| NF-kappa B signaling pathway  | ko04064 |
| HIF-1 signaling pathway  | ko04066 |
| Phosphatidylinositol signaling system  | ko04070 |
| Plant hormone signal transduction  | ko04075 |
| Neuroactive ligand-receptor interaction  | ko04080 |
| Cell cycle  | ko04110 |
| Cell cycle - yeast  | ko04111 |
| Cell cycle - Caulobacter  | ko04112 |
| Meiosis - yeast  | ko04113 |
| Oocyte meiosis  | ko04114 |
| p53 signaling pathway  | ko04115 |
| Ubiquitin mediated proteolysis  | ko04120 |
| Sulfur relay system  | ko04122 |
| SNARE interactions in vesicular transport  | ko04130 |
| Regulation of autophagy  | ko04140 |
| Protein processing in endoplasmic reticulum  | ko04141 |
| Lysosome  | ko04142 |
| Endocytosis  | ko04144 |
| Phagosome  | ko04145 |
| Peroxisome  | ko04146 |
| mTOR signaling pathway  | ko04150 |
| PI3K-Akt signaling pathway  | ko04151 |
| Apoptosis  | ko04210 |
| Cardiac muscle contraction  | ko04260 |
| Wnt signaling pathway  | ko04310 |
| Dorso-ventral axis formation  | ko04320 |
| Notch signaling pathway  | ko04330 |
| Hedgehog signaling pathway  | ko04340 |
| Axon guidance  | ko04360 |
| Osteoclast differentiation  | ko04380 |
| Focal adhesion  | ko04510 |
| Cell adhesion molecules (CAMs)  | ko04514 |
| Adherens junction  | ko04520 |
| Tight junction  | ko04530 |
| Gap junction  | ko04540 |
| Antigen processing and presentation  | ko04612 |
| Renin-angiotensin system  | ko04614 |
| NOD-like receptor signaling pathway  | ko04621 |
| RIG-I-like receptor signaling pathway  | ko04622 |
| Plant-pathogen interaction  | ko04626 |
| Jak-STAT signaling pathway  | ko04630 |
| Leukocyte transendothelial migration  | ko04670 |
| Circadian rhythm - fly  | ko04711 |
| Neurotrophin signaling pathway  | ko04722 |
| Retrograde endocannabinoid signaling  | ko04723 |
| Phototransduction - fly  | ko04745 |
| Regulation of actin cytoskeleton  | ko04810 |
| Insulin signaling pathway  | ko04910 |
| Adipocytokine signaling pathway  | ko04920 |
| Type I diabetes mellitus  | ko04940 |
| Maturity onset diabetes of the young  | ko04950 |
| Vasopressin-regulated water reabsorption  | ko04962 |
| Proximal tubule bicarbonate reclamation  | ko04964 |
| Pancreatic secretion  | ko04972 |
| Protein digestion and absorption  | ko04974 |
| Fat digestion and absorption  | ko04975 |
| Bile secretion  | ko04976 |
| Alzheimer's disease  | ko05010 |
| Parkinson's disease  | ko05012 |
| Amyotrophic lateral sclerosis (ALS)  | ko05014 |
| Huntington's disease  | ko05016 |
| Prion diseases  | ko05020 |
| Cocaine addiction  | ko05030 |
| Morphine addiction  | ko05032 |
| Alcoholism  | ko05034 |
| Bacterial invasion of epithelial cells  | ko05100 |
| Vibrio cholerae infection  | ko05110 |
| Vibrio cholerae pathogenic cycle  | ko05111 |
| Epithelial cell signaling in Helicobacter pylori infection  | ko05120 |
| Pathogenic Escherichia coli infection  | ko05130 |
| Salmonella infection  | ko05132 |
| Legionellosis  | ko05134 |
| Leishmaniasis  | ko05140 |
| Chagas disease (American trypanosomiasis)  | ko05142 |
| African trypanosomiasis  | ko05143 |
| Malaria  | ko05144 |
| Amoebiasis  | ko05146 |
| Staphylococcus aureus infection  | ko05150 |
| Tuberculosis  | ko05152 |
| Influenza A  | ko05164 |
| Epstein-Barr virus infection  | ko05169 |
| Pathways in cancer  | ko05200 |
| Transcriptional misregulation in cancers  | ko05202 |
| Viral carcinogenesis  | ko05203 |
| Chemical carcinogenesis  | ko05204 |
| Bladder cancer  | ko05219 |
| Small cell lung cancer  | ko05222 |
| Systemic lupus erythematosus  | ko05322 |
| Primary immunodeficiency  | ko05340 |
| Hypertrophic cardiomyopathy (HCM)  | ko05410 |