**Supplementary** **Table 1:** Unique predictive pathways as per Piphillin and PICRUSt2 analysis based on the NFM data of Arunachal Pradesh and Sikkim, India.

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| **Piphillin unique predictive pathways (166)** | **PICRUSt2 unique predictive Pathways (22)** |
| 2-Oxocarboxylic acid metabolism, Acarbose and validamycin biosynthesis, Adipocytokine signaling pathway, Alcoholism, Alzheimer disease, Amphetamine addiction, AMPK signaling pathway, Amyotrophic lateral sclerosis, Antifolate resistance, Antigen processing and presentation, Apoptosis - fly, Apoptosis - multiple species, Arabinogalactan biosynthesis - Mycobacterium, Arginine biosynthesis, Autophagy - yeast, Biofilm formation - Escherichia coli, Biofilm formation - Pseudomonas aeruginosa, Biosynthesis of amino acids, Biosynthesis of antibiotics, Biosynthesis of secondary metabolites, Biosynthesis of terpenoids and steroids, Biosynthesis of various secondary metabolites - part 1, Bladder cancer, Caffeine metabolism, Carbapenem biosynthesis, Carbohydrate digestion and absorption, Carbon metabolism, Cationic antimicrobial peptide (CAMP) resistance, Central carbon metabolism in cancer, Chemical carcinogenesis, Cholesterol metabolism, Choline metabolism in cancer, Cocaine addiction, Colorectal cancer, Cushing syndrome, Degradation of aromatic compounds, Dopaminergic synapse, Drug metabolism - cytochrome P450, Estrogen signaling pathway, Ether lipid metabolism, Ethylbenzene degradation, Fatty acid metabolism, Ferroptosis, Flavone and flavonol biosynthesis, Fluid shear stress and atherosclerosis, FoxO signaling pathway, GABAergic synapse, Glucagon signaling pathway, Glucosinolate biosynthesis, Glutamatergic synapse, Glycosphingolipid biosynthesis - globo and isoglobo series, Hepatitis B, Hepatocellular carcinoma, Herpes simplex virus 1 infection, HIF-1 signaling pathway, Human cytomegalovirus infection, Human immunodeficiency virus 1 infection, Human papillomavirus infection, Human T-cell leukemia virus 1 infection, IL-17 signaling pathway, Influenza A, Insect hormone biosynthesis, Insulin resistance, Isoquinoline alkaloid biosynthesis, Kaposi sarcoma-associated herpesvirus infection, Lactam resistance, Legionellosis, Linolenic acid metabolism, Lipoarabinomannan (LAM) biosynthesis, Longevity regulating pathway, Longevity regulating pathway - multiple species, Longevity regulating pathway - worm, Lysosome, MAPK signaling pathway - fly, MAPK signaling pathway - plant, MAPK signaling pathway - yeast, Melanogenesis, Metabolic pathways, Microbial metabolism in diverse environments, MicroRNAs in cancer, Mineral absorption, Monobactam biosynthesis, Necroptosis, Neuroactive ligand-receptor interaction, Non-alcoholic fatty liver disease, Nonribosomal peptide structures, Novobiocin biosynthesis, p53 signaling pathway, Parathyroid hormone synthesis, secretion and action, Parkinson disease, Pertussis, Phenazine biosynthesis, Phenylpropanoid biosynthesis, Phosphatidylinositol signaling system, Phospholipase D signaling pathway, PI3K-Akt signaling pathway, Platinum drug resistance, PPAR signaling pathway, Primary immunodeficiency, Prion diseases, Prodigiosin biosynthesis, Progesterone-mediated oocyte maturation, Prolactin signaling pathway, Prostate cancer, Proteoglycans in cancer, Proximal tubule bicarbonate reclamation, Quorum sensing, Renal cell carcinoma, Retinol metabolism, RIG-I-like receptor signaling pathway, Salmonella infection, Serotonergic synapse, Shigellosis, Small cell lung cancer, Steroid degradation, Th17 cell differentiation, Thermogenesis, Thyroid hormone signaling pathway, Thyroid hormone synthesis, Toxoplasmosis, Tuberculosis, Type I diabetes mellitus, Type II diabetes mellitus, Vancomycin resistance, Viral carcinogenesis, Viral myocarditis. | Basal transcription factors, beta-Lactam resistance, Biosynthesis of 12-, 14- and 16-membered macrolides, Biosynthesis of type II polyketide backbone, Biosynthesis of type II polyketide products, Bisphenol degradation, Endocytosis, Flavonoid biosynthesis, Focal adhesion, Hypertrophic cardiomyopathy, Isoflavonoid biosynthesis, N-Glycan biosynthesis, Pathogenic Escherichia coli infection, Proteasome, Protein digestion and absorption, Renin-angiotensin system, RNA surveillance pathway, Sesquiterpenoid and triterpenoid biosynthesis, Spliceosome, Steroid biosynthesis, Tetracycline biosynthesis, Wnt signaling pathway. |