

Figure S1 Alpha rarefaction is the assessment of the depth of sample size. Vertical segments are 95% CI of each point.

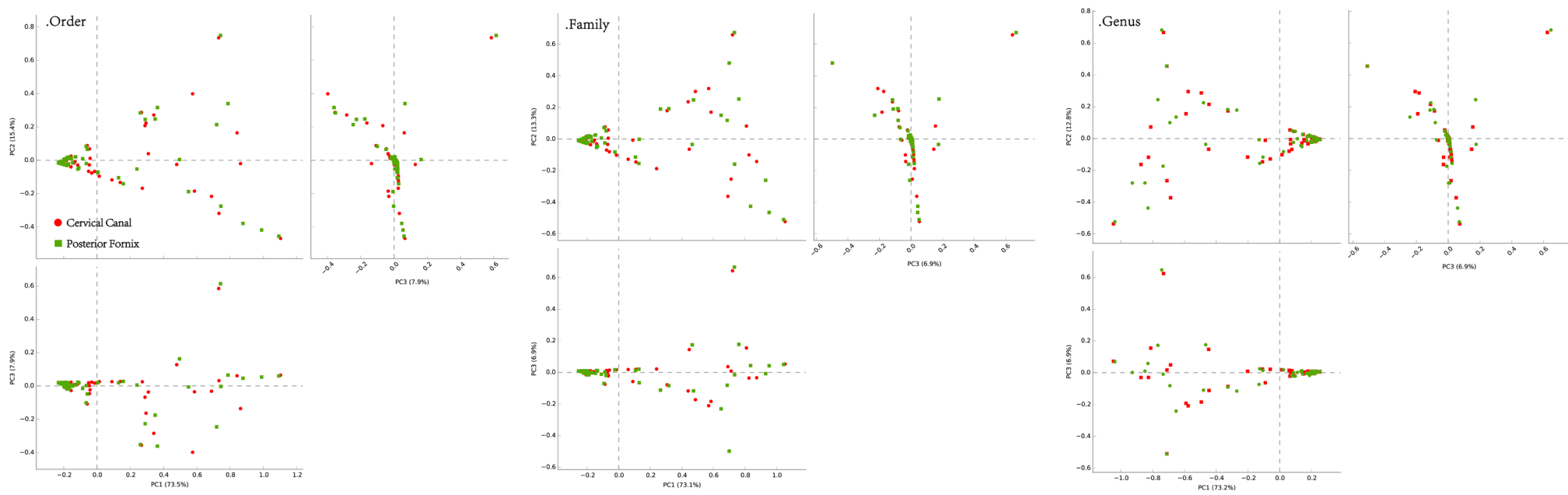


Figure S2 These three PCA plots were conducted in three different levels. Green dots represent the samples from posterior fornix of cervix and red dots represent samples from cervical canals. ASV, 100% cluster. PCA, principal component analysis.

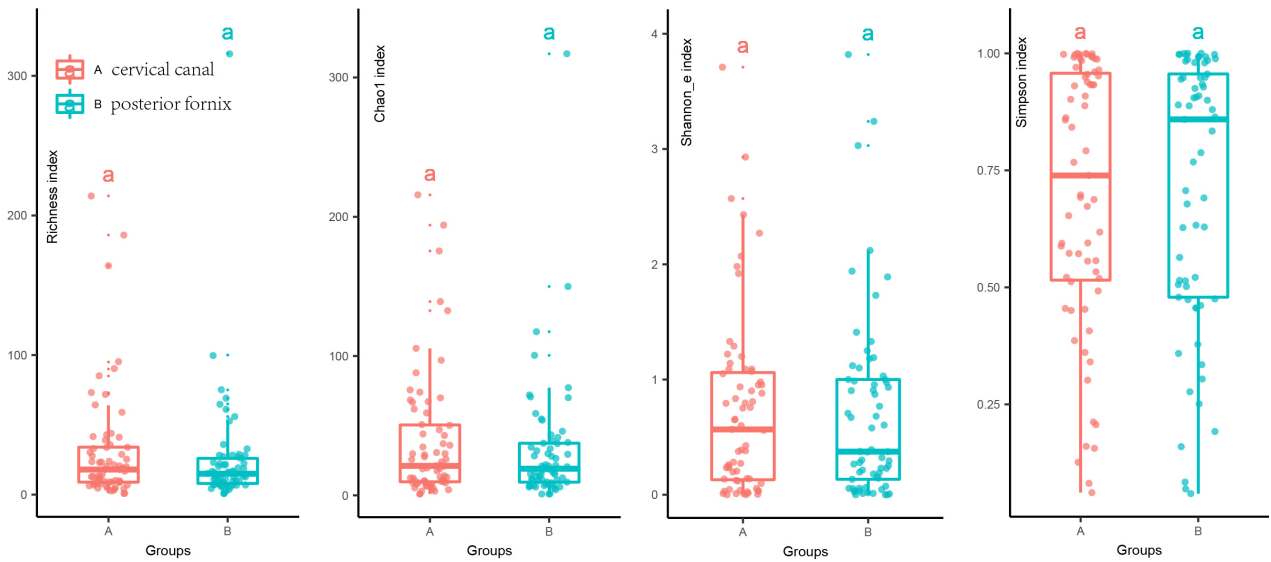


Figure S3 Four types of alpha diversity were analyzed including Chao1 index, Richness index, Shannon_e index and Simpson index. For each alpha index, four groups were analyzed and P<0.05 was identified as statistically significant. The same letters on the boxplot represent for statistical indifference (P<0.05). ASV, 100% cluster.

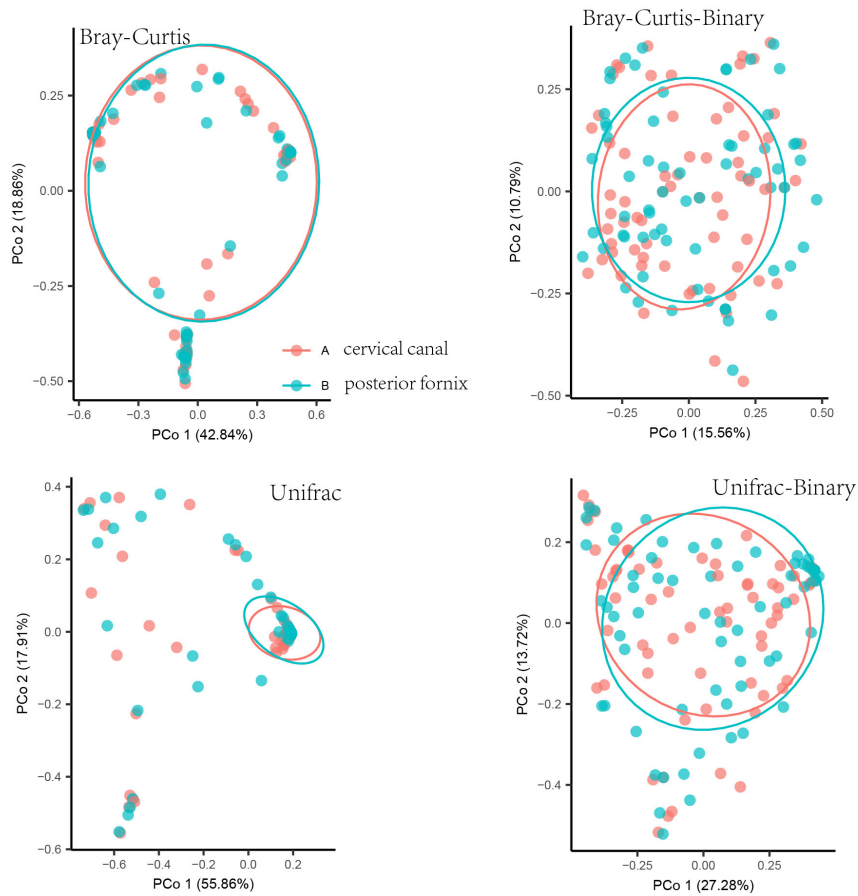


Figure S4 PCoA plots were conducted in genus levels. Green dots represent the samples from posterior fornix of cervix and red dots represent samples from cervical canals. Four PCoA distances were analyzed. The percentage of X and Y axis represent for the degree of explanation of each dimension. Statistical difference is calculated by Adonis test. ASV, 100% cluster.

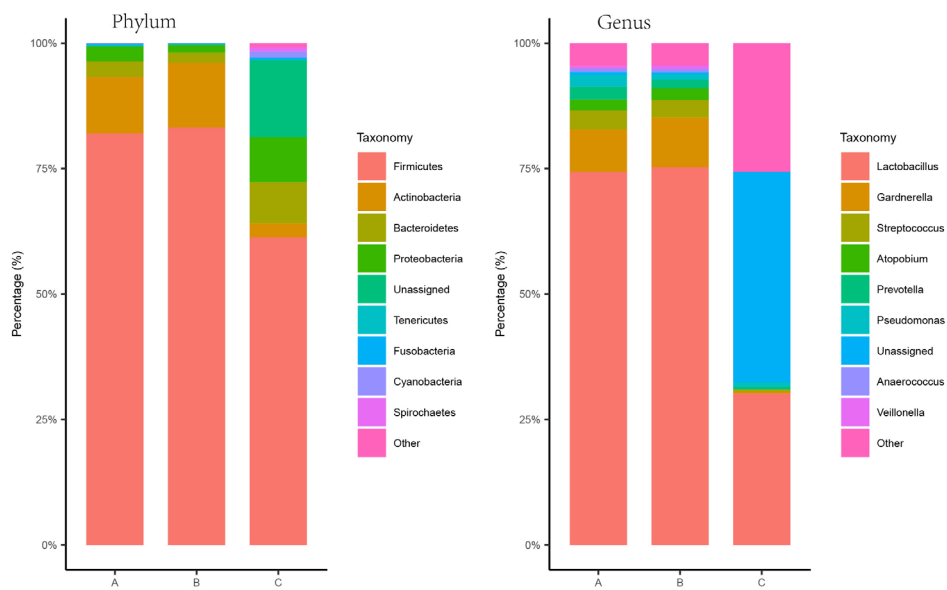


Figure S5 The proportion of different genus of microbiota in three locations. Top 10 abundance bacterial were selected.

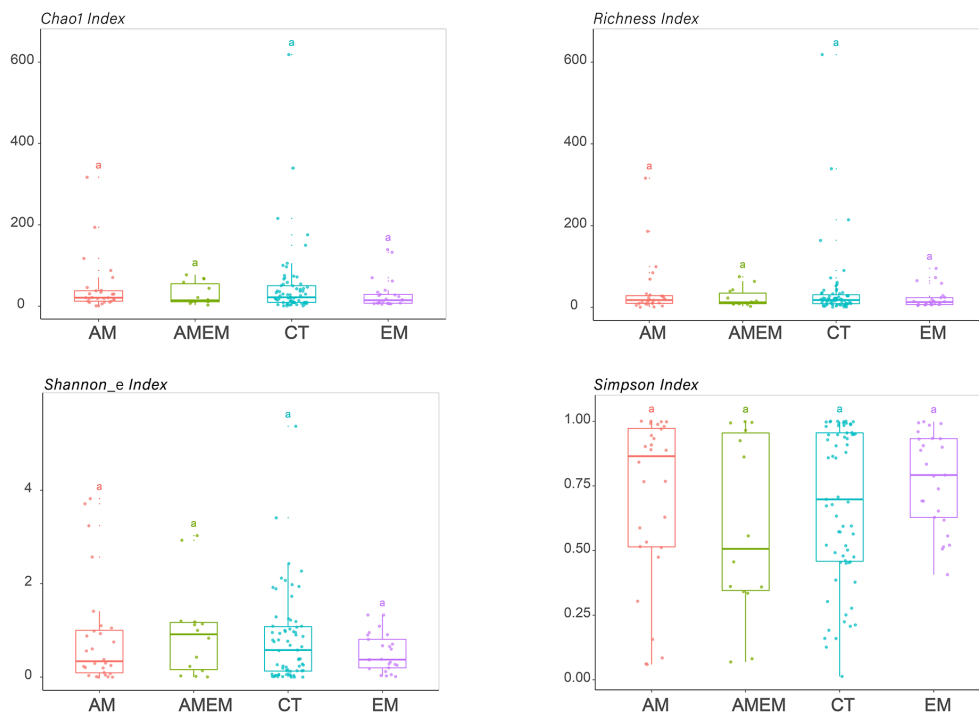


Figure S6 Four types of alpha diversity were analyzed including Chao1 index, Richness index, Shannon_e index and Simpson index. For each alpha index, four groups were analyzed and $P < 0.05$ was identified as statistically significant. The same letters on the boxplot represent for statistical indifference ($P < 0.05$). ASV, 100% cluster.

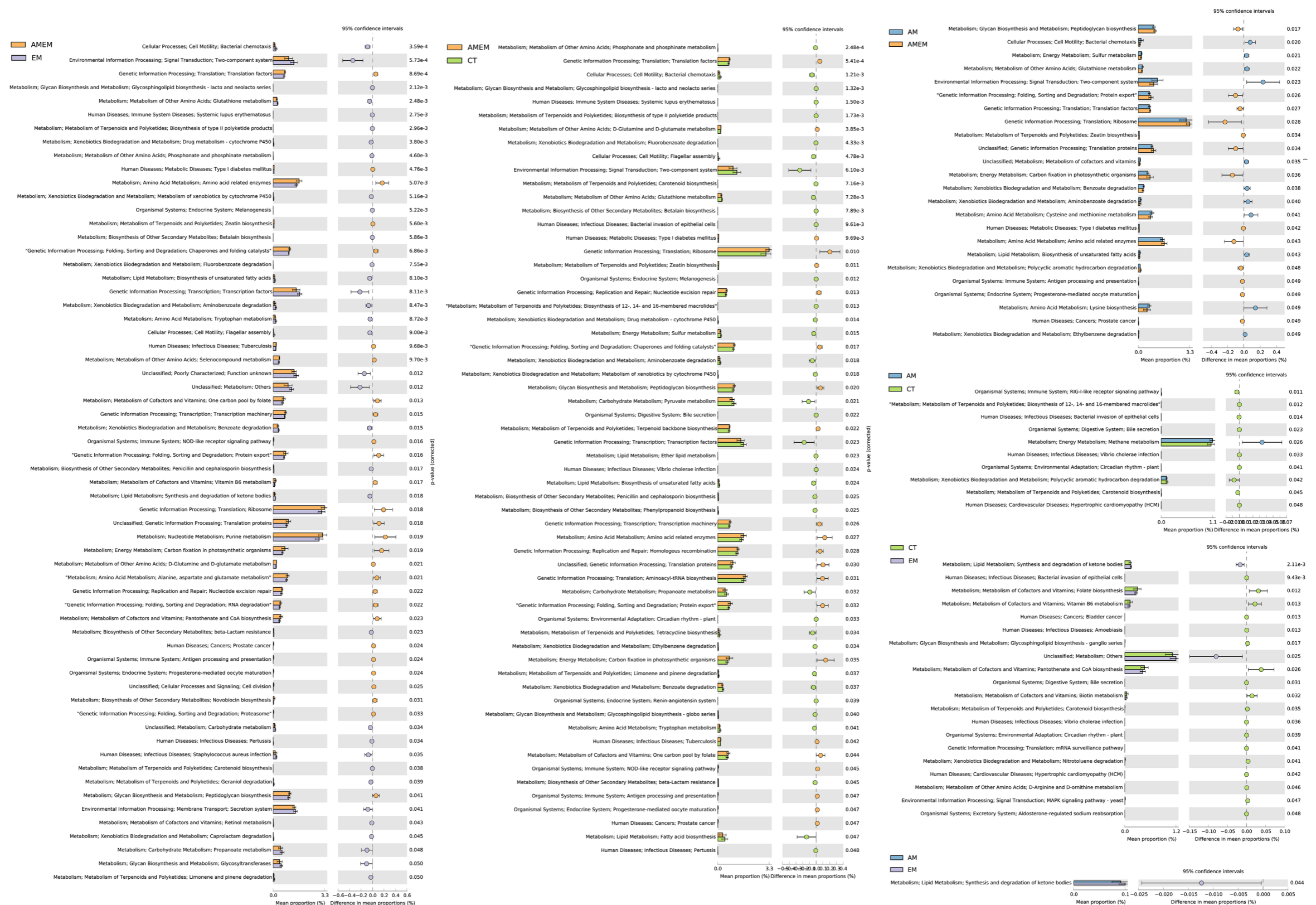


Figure S7 PICRUSt is used to predict the functions through KO3 based on metagenome. The differences of function were analyzed in two-two comparison. Some distinctive functions may take a small proportion that were hardly recognized. This identified functions were filtered with $P < 0.05$. PICRUSt, Phylogenetic Investigation of Communities by Reconstruction of Unobserved States; KO3, KEGG Orthology level 3.

Table S1 The number of sequences, bases (bp), and average length (bp) of each sample

#Sample	Sequences	Bases (bp)	Average length (bp)
Gj122702B	49,742.00	20,752,799.00	417.21
Gj122302A	52,360.00	21,855,373.00	417.41
Gj122302B	55,892.00	23,392,088.00	418.52
Gj122702A	51,567.00	21,621,683.00	419.29
Gj010202A	56,502.00	23,847,660.00	422.07
Gj010202B	61,442.00	26,030,947.00	423.67
Gj010302A	45,120.00	19,300,478.00	427.76
Gj010301B	58,149.00	24,891,418.00	428.06
Gj122602A	45,892.00	19,669,439.00	428.60
Gj010302B	43,395.00	18,599,663.00	428.61
Gj122602B	49,264.00	21,122,290.00	428.76
Gj122301A	49,720.00	21,319,524.00	428.79
Gj010205A	49,049.00	21,032,296.00	428.80
Gj010203A	56,661.00	24,299,008.00	428.85
Gj010201A	52,002.00	22,301,784.00	428.86
Gj010301A	48,767.00	20,914,308.00	428.86
Gj122301B	48,684.00	20,879,818.00	428.88
Gj010303A	54,383.00	23,324,082.00	428.89
Gj122401A	46,513.00	19,950,244.00	428.92
Gj122601A	47,394.00	20,328,753.00	428.93
Gj010304A	56,694.00	24,318,921.00	428.95
Gj010304B	53,199.00	22,820,315.00	428.96
Gj010203B	51,749.00	22,198,089.00	428.96
Gj010204B	47,455.00	20,356,246.00	428.96
Gj010303B	54,178.00	23,240,770.00	428.97
Gj010205B	52,864.00	22,677,027.00	428.97
Gj122401B	44,987.00	19,297,850.00	428.97
Gj122603A	56,132.00	24,079,576.00	428.98
Gj010204A	48,024.00	20,601,421.00	428.98
Gj122001B	46,685.00	20,026,977.00	428.98
Gj122601B	56,157.00	24,090,712.00	428.99
Gj122603B	50,920.00	21,844,085.00	428.99
Gj051101A	47,395.00	20,428,712.00	431.03
Yd051101B	59,028.00	25,477,996.00	431.63
Yd050801B	66,421.00	28,752,606.00	432.88
Yd061501B	65,743.00	28,469,353.00	433.04
Gj061501A	62,079.00	26,887,375.00	433.12
Gj050801A	63,491.00	27,501,926.00	433.16
T18129839	72,574.00	31,472,290.00	433.66
Gj052902A	74,220.00	32,210,323.00	433.98
Yd052902B	52,560.00	22,810,695.00	433.99
T18129834	72,563.00	31,557,484.00	434.90
Gj112904B	43,086.00	18,794,373.00	436.21
Yd062201B	57,848.00	25,266,089.00	436.77
T18129817	69,044.00	30,183,498.00	437.16
T18129816	74,940.00	32,772,986.00	437.32
Gj112904A	45,521.00	19,914,377.00	437.48
Yd060502B	50,518.00	22,107,995.00	437.63
T18129831	72,802.00	31,873,881.00	437.82
Gj062201A	113,739.00	49,811,632.00	437.95
Gj060502A	68,525.00	30,142,140.00	439.87
T18129833	74,303.00	32,705,375.00	440.16
Gj120602A	31,308.00	13,783,581.00	440.26
T18129838	72,430.00	31,922,111.00	440.73
T18129814	53,565.00	23,699,533.00	442.44
Yd050802B	58,704.00	26,010,454.00	443.08
Yd052502B	56,025.00	24,874,617.00	443.99
Yd051102B	56,824.00	25,269,015.00	444.69
Gj050802A	54,686.00	24,323,988.00	444.79
Gj052502A	60,473.00	26,900,475.00	444.83
Gj120201A	40,565.00	18,078,406.00	445.67
T18129828	62,137.00	27,714,550.00	446.02
Gj120201B	40,645.00	18,132,251.00	446.11
T18129805	61,606.00	27,521,619.00	446.74
Gj040303A	63,773.00	28,571,189.00	448.01
Yd051501B	57,645.00	25,826,871.00	448.03
Gj051501A	52,202.00	23,388,768.00	448.04
Yd040303B	61,633.00	27,659,457.00	448.78
Gj120502B	34,929.00	15,680,378.00	448.92
T18129804	50,627.00	22,736,790.00	449.10
Yd062601B	45,170.00	20,287,115.00	449.13
Gj051102A	50,280.00	22,584,168.00	449.17
Gj120305A	34,375.00	15,449,080.00	449.43
Gj120501A	32,530.00	14,620,762.00	449.45
Gj120304A	36,820.00	16,549,303.00	449.47
T18129811	72,282.00	32,491,090.00	449.50
Gj120501B	33,785.00	15,187,910.00	449.55
Gj120304B	39,846.00	17,913,457.00	449.57
Gj120502A	35,221.00	15,835,414.00	449.60
Gj040305A	41,045.00	18,454,516.00	449.62
Gj120305B	35,966.00	16,172,220.00	449.65
Gj112902A	31,161.00	14,013,590.00	449.72
Yd040302B	88,188.00	39,665,574.00	449.78
Yd061502B	56,639.00	25,476,423.00	449.80
Gj062601A	40,384.00	18,164,992.00	449.81
Gj061502A	49,222.00	22,141,076.00	449.82
T18129808	68,033.00	30,603,407.00	449.83
Gj040301A	62,302.00	28,025,345.00	449.83
T18129832	72,136.00	32,449,483.00	449.84
T18129829	71,833.00	32,313,207.00	449.84
Gj112902B	32,371.00	14,561,781.00	449.84
Gj112901A	34,542.00	15,539,532.00	449.87
Gj120601B	33,054.00	14,870,037.00	449.87
T18129815	59,038.00	26,560,291.00	449.88
T18129812	69,065.00	31,071,692.00	449.89
T18129821	63,597.00	28,611,520.00	449.89
T18129810	57,820.00	26,012,882.00	449.89
T18129822	68,128.00	30,651,027.00	449.90
Yd040305B	51,071.00	22,976,725.00	449.90
Gj040302A	79,592.00	35,809,022.00	449.91
Yd040301B	68,526.00	30,830,509.00	449.91
T18129809	56,487.00	25,414,107.00	449.91
Gj052901A	65,607.00	29,518,162.00	449.92
T18129813	65,547.00	29,490,965.00	449.92
T18129827	66,024.00	29,706,336.00	449.93
Gj050401A	61,036.00	27,461,927.00	449.93
Yd060501B	56,600.00	25,465,857.00	449.93
Gj120503B	30,084.00	13,535,566.00	449.93
Gj050803A	92,443.00	41,593,828.00	449.94
T18129818	72,101.00	32,441,366.00	449.94
Yd052901B	71,814.00	32,311,847.00	449.94
T18129830	65,852.00	29,629,699.00	449.94
Gj060501A	56,228.00	25,299,159.00	449.94
Gj120601A	37,461.00	16,855,354.00	449.94
T18129837	70,982.00	31,938,316.00	449.95
Gj120303B	36,934.00	16,618,408.00	449.95
Gj120302B	33,720.00	15,172,406.00	449.95
T18129825	58,088.00	26,137,197.00	449.96
Gj120302A	37,861.00	17,036,118.00	449.96
Gj120504A	35,547.00	15,994,597.00	449.96
T18129835	71,975.00	32,386,773.00	449.97
T18129820	66,999.00	30,147,423.00	449.97
T18129823	64,952.00	29,226,255.00	449.97
Yd050401B	62,075.00	27,931,798.00	449.97
Gj060101A	58,411.00	26,283,329.00	449.97
Gj052501A	52,248.00	23,509,956.00	449.97
Gj120303A	39,126.00	17,605,518.00	449.97
Gj112901B	38,588.00	17,363,610.00	449.97
Gj120504B	35,549.00	15,996,078.00	449.97
Gj120503A	33,386.00	15,022,711.00	449.97
Yd050803B	64,608.00	29,072,171.00	449.98
Yd060101B	62,589.00	28,163,997.00	449.98
Yd052501B	48,954.00	22,028,330.00	449.98
T18129806	50,028.00	22,511,907.00	449.99