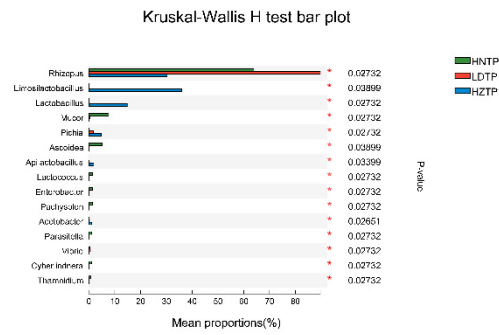
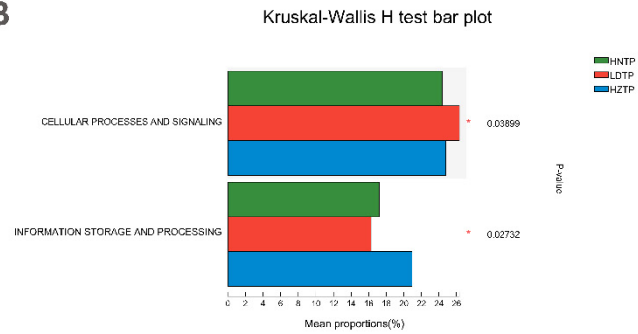


Supplementary Figure S1. Correlation among microbial taxa, functions and Tianpei properties: (A) RDA of NR; (B) RDA of COG; (C) RDA of KEGG; (D) RDA of KEGG.

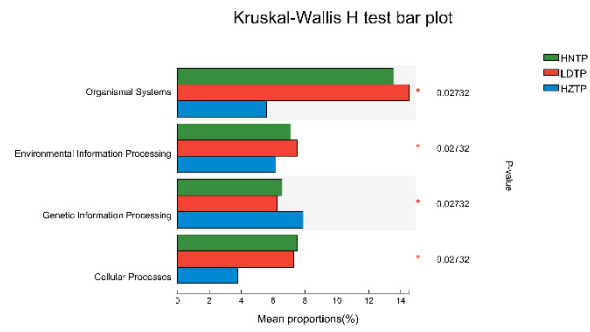
A



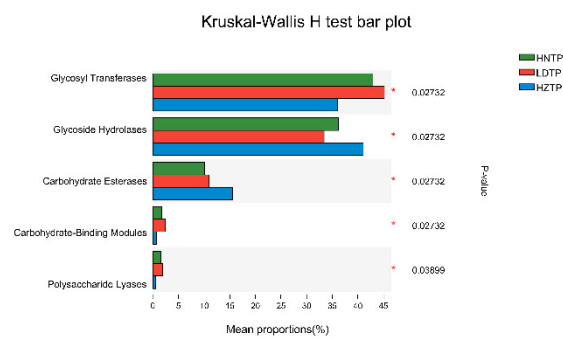
B



C



D



Supplementary Figure S2. Analysis of taxa and functional differences:
(A) NR; (B) COG; (C) KEGG; (D) KEGG.

Supplementary Table S1 Chemical properties of Tianpei samples

Sample	LA (g/L)	F (mg/g)	AA (mg/g)	P (mg/g)	S (g/100g)	C (mg/g)	FA (μmol/L)	RS (mg/g)
HNTF	38.2±0.2	4.45±0.03	26.56±0.06	162.57±0.15	51.34±0.05	16.78±0.06	223.3±0.6	226.1±0.3
LDTP	20.3±0.3	1.82±0.02	24.25±0.23	126.56±0.03	48.34±0.03	14.45±0.05	143.5±0.5	209.2±0.4
HZTP	32.4±0.2	3.56±0.02	25.08±0.15	169.42±0.25	46.45±0.06	13.59±0.02	198.6±0.5	215.2±0.5

LA—lactic acid, F—Flavonoid, AA—amino acid, P—soluble protein, S—starch, C—cellulose, FA—free fatty acid, RS—reducing sugar.

Supplementary Table S2 Analysis of QS abundance among Tianpei samples

Sample	activator	autoinducer	autoinducer_pr oducer	autoinducer_recept or	decompose	effector	regulator	repressor	transporter	unclear
HNTF	6812	168,064.7	506.6	164.7	70,544.7	44.6	54,870.6	6758	182,528	950,914.7
LDTP	3900	119,530.7	511.3	217.3	49,314.6	0	34,982.6	4048.6	108,902.7	651,814
HZTP	3554.6	601,664	246	7318	188,072.6	0	225,360.6	27,284	991,520.6	414,721.7

**Supplementary Table S3 Secretion proteins of microbial
communities among Tianpei samples**

Samples	Sec_TRUE	Sec_FALSE	TRUE_percent	Total
HNTF	9436	175,427	5.1	184,864
HZTP	4989	96,272	4.9	101,261
LDTP	4112	79,119	4.9	83,231

**Supplementary Table S4 Chemical properties of lab-made Tianpei
samples**

Sample	LA (g/L)	F (mg/g)	AA (mg/g)	P (mg/g)	S (g/100g)	C (mg/g)	FA (μmol/L)	RS (mg/g)
TP	35.8±0.3	4.52±0.02	28.06±1.02	165.35±0.18	47.45±0.06	16.89±0.05	225.2±1.08	228.3±0.6

LA—lactic acid, F—Flavonoid, AA—amino acid, P—soluble protein, S—starch, C—cellulose, FA—free fatty acid, RS—reducing sugar