

**Supplementary Table 1.** *Lactobacillus Plantarum* isolates and their genomes used in this study

Strain	Isolation origin(s)*	GenBank accession No.	Genome size**	No. of CDS	G+C (%)
19L3	Animal.Ovine Cheese	<a href="#">AWTS01000000</a>	3,289,268	3,259	44.4
2025	Animal.milk products	<a href="#">AVFJ02000000</a>	3,334,257	2,905	44.4
2165	Animal.milk products	<a href="#">AVFI01000000</a>	3,179,972	3,108	44.5
B21	Animal.Vietnamese fermented sausage	<a href="#">CP010528</a>	3,284,260	2,930	44.5
CMPG5300	Animal.vagina of healthy woman	<a href="#">CM002918</a> to <a href="#">CM002921</a>	3,405,428	3,091	44.3
CRL.1506	Animal.goat cheese	<a href="#">LNCP01000000</a>	3,228,096	2,922	44.6
DmCS_001	Animal.pure bacterial culture( <i>Drosophila</i> )	<a href="#">JOJT01000000</a>	3,194,687	3,077	44.5
ER	Animal.Surface sterilised adult	<a href="#">LUXL01000000</a>	3,452,791	3,422	44.3
Lp1610	Animal.teat canal	<a href="#">LDEL01000000</a>	3,298,660	2,976	44.4
Lp1612	Animal.teat canal	<a href="#">LDEM01000000</a>	3,240,520	2,899	44.4
LZ206	Animal.raw cow milk	<a href="#">CP015966</a> to <a href="#">CP015969</a>	3,263,715	3,005	44.5
LZ227	Animal.raw cow milk	<a href="#">CP015857</a> to <a href="#">CP015862</a>	3,425,292	3,170	44.4
Nizo2029	Animal.Raw cheese with rennet	<a href="#">LUWD01000000</a>	3,243,027	3,083	44.5
Nizo2258	Animal.Human urine	<a href="#">LUWG01000000</a>	3,131,331	3,053	44.4
Nizo2259	Animal.Human tooth abscess	<a href="#">LUWH01000000</a>	3,430,618	3,281	44.3
Nizo2457	Animal.Pork,pickled sausage	<a href="#">LUWM01000000</a>	3,339,139	3,172	44.4
Nizo2484	Animal.Pork pickled sausage	<a href="#">LUWO01000000</a>	3,386,056	3,252	44.2
Nizo2485	Animal.Pork pickled sausage	<a href="#">LUWP01000000</a>	3,348,559	3,220	44.3
Nizo2494	Animal.Pork pickled sausage	<a href="#">LUWQ01000000</a>	3,303,243	3,138	44.5
Nizo2776	Animal.cheese	<a href="#">LUWX01000000</a>	3,124,578	3,140	44.5
Nizo2802	Animal.cheese	<a href="#">LUWZ01000000</a>	3,372,514	3,263	44.4
Nizo2855	Animal.Pork pickled sausage	<a href="#">LUXE01000000</a>	3,223,049	3,069	44.5
Nizo2877	Animal.hot-dog	<a href="#">LKHZ01000000</a>	3,231,771	3,072	44.5
Nizo3400	Animal.milk	<a href="#">LUXH01000000</a>	3,267,429	3,211	44.4
Nizo3892	Animal.spinal fluid	<a href="#">LUXI01000000</a>	3,324,851	3,181	44.4
NL42	Animal.dairy products	<a href="#">JZSB01000000</a>	3,353,069	3,284	44.4
UCMA.3037	Animal.unpasteurized Camembert cheese	<a href="#">APHP01000000</a>	3,106,874	2,932	44.5
WCFS1	Animal.Human saliva	<a href="#">AL935263</a> and <a href="#">CR377164</a> to <a href="#">CR377166</a>	3,348,624	3,108	44.4
WLPL04	Animal.breast of healthy woman	<a href="#">LKCO01000000</a>	3,185,263	2,890	44.5
NRCC1	Animal.C1 compartment fluid of stomach	<a href="#">LUSM01000000</a>	2,995,133	2,762	44.9
19.1	Animal.Adult midgut	<a href="#">LUXM01000000</a>	3,651,069	3,594	43.9
43-3	Animal.Human feces	<a href="#">LOMH01000000</a>	3,294,478	3,059	44.4
8 RA-3	Animal.mice feces	<a href="#">LBDF01000000</a>	3,330,093	2,982	44.4

90sk	Animal.gut biopsy	<a href="#">JXAX01000000</a>	3,371,458	2,969	44.3
AG30	Animal.rumen microbiome	<a href="#">JHWA01000000</a>	3,442,875	3,348	44.3
CIP104448	Animal.human stool	<a href="#">JSUW01000000</a>	3,237,330	3,103	44.4
CNW10	Animal.Adult midgut	<a href="#">LUWN01000000</a>	3,194,687	3,081	44.5
E2C2	Animal.human stool	<a href="#">LSST01000000</a>	3,603,563	3,410	44
E2C5	Animal.stool material	<a href="#">LTCD01000000</a>	3,615,168	3,428	44
HFC8	Animal.Human Gut	<a href="#">CP012650</a> to <a href="#">CP012660</a>	3,405,709	3,002	44.3
LP91	Animal.Human gut	<a href="#">AXDQ01000000</a>	2,925,584	2,711	45
LZ95	Animal.baby stool	<a href="#">CP012122</a> to <a href="#">CP012124</a>	3,322,458	2,949	44.5
NAB1	Animal.Adult midgut	<a href="#">LUXN01000000</a>	3,454,657	3,494	44.2
NAB2	Animal.Adult midgut	<a href="#">LUXO01000000</a>	3,550,842	3,595	44.1
Nizo1837	Animal.Human colon	<a href="#">LTAU01000000</a>	3,309,714	3,140	44.4
Nizo1838	Animal.Human stool	<a href="#">LUWA01000000</a>	3,034,081	2,921	44.5
Nizo2256	Animal.Human stool	<a href="#">LUWE01000000</a>	2,997,695	2,886	44.6
Nizo2257	Animal.Human stool	<a href="#">LUWF01000000</a>	3,156,658	3,090	44.4
Nizo2260	Animal.Human intestine	<a href="#">LUWI01000000</a>	3,310,196	3,150	44.4
Nizo3893	Animal.Human stool	<a href="#">LUXJ01000000</a>	3,342,747	3,198	44.3
SNU.Lp177	Animal.Porcine feces	<a href="#">LGIM01000000</a>	3,204,772	2,912	45
TIFN101	Animal.Human stool	<a href="#">JSUX01000000</a>	3,079,349	2,997	44.5
TL2766	Animal.Healthy adult feces	<a href="#">LZXZ01000000</a>	3,303,678	3,013	44.4
WJL1	Animal.intestine	<a href="#">AUTE01000000</a>	3,477,495	3,365	44.2
WJL2	Animal.insect gut(Drosophila)	<a href="#">LKLZ01000000</a>	3,503,067	3,384	44.2
ZJ316	Animal.healthy newborn fecal sample	<a href="#">CP004082</a> and <a href="#">CP006247</a> to <a href="#">CP006249</a>	3,299,755	3,276	44.5
4_3	Plant.fermented soybean	<a href="#">AYTU01000000</a>	3,320,363	3,150	44.3
5-2	Plant.fermented soybean	<a href="#">CP009236</a>	3,237,652	3,114	44.7
CAUH2	Plant.Sichuan pickle vegetables	<a href="#">CP015126</a> to <a href="#">CP015129</a>	3,274,625	2,961	44.5
CGMCC 1.2437	Plant.pickled cabbage	<a href="#">AZEJ01000000</a>	3,208,905	2,920	44.5
DSM.16365	Plant.fermented cassava roots (fufu)	<a href="#">AZFR01000000</a>	3,186,310	2,864	45
FMNP01	Plant.Guangzhou mango	<a href="#">JPSU01000000</a>	3,312,306	3,126	44.5
IPLA88	Plant.sourdough	<a href="#">ASJE01000000</a>	3,254,055	3,116	44.4
JBE245	Plant.meju, fermented soybean paste	<a href="#">CP014780</a>	3,262,611	3,053	44.5
Lp90	Plant.wine	<a href="#">JIBX01000000</a>	3,324,076	3,155	44.3
NC8	Plant.grass silage	<a href="#">AGRI01000000</a>	3,207,224	2,868	44.6
NCU116	Plant.Chinese pickle	<a href="#">CP016071</a>	3,354,689	3,056	44.4
Nizo1839	Plant.Sour cassava	<a href="#">LUWB01000000</a>	3,196,955	3,046	45.1
Nizo1840	Plant.Fermented cereal	<a href="#">LUWC01000000</a>	3,204,420	3,108	44.9
Nizo2262	Plant.Silage	<a href="#">LUWJ01000000</a>	3,219,981	3,061	44.5
Nizo2263	Plant.Silage	<a href="#">LUWK01000000</a>	3,259,263	3,138	44.5
Nizo2264	Plant.Silage	<a href="#">LUWL01000000</a>	3,087,260	2,939	45.3
Nizo2535	Plant.Fermented orange	<a href="#">LUWR01000000</a>	3,412,849	3,278	44.2
Nizo2726	Plant.Maize ensilage	<a href="#">LUWS01000000</a>	3,179,430	3,025	44.6
Nizo2741	Plant.Cabbage kimchi	<a href="#">LUWT01000000</a>	3,346,534	3,174	44.3
Nizo2753	Plant.Fermented sourdough	<a href="#">LUWU01000000</a>	3,128,523	3,001	44.6

Nizo2757	Plant.Fermented sourdough	<a href="#">LUWV01000000</a>	3,150,861	3,029	44.5
Nizo2766	Plant.Fermented sourdough	<a href="#">LUWW01000000</a>	3,169,055	3,074	44.4
Nizo2801	Plant.Turnip pickled	<a href="#">LUWY01000000</a>	3,248,009	3,147	44.4
Nizo2806	Plant.sauerkraut	<a href="#">LUXA01000000</a>	3,188,814	3,036	44.6
Nizo2814	Plant.Wine grapes	<a href="#">LUXB01000000</a>	3,352,125	3,205	44.3
Nizo2831	Plant.Grass silage	<a href="#">LUXD01000000</a>	3,232,079	3,088	44.5
Nizo2889	Plant.Fermented banana	<a href="#">LUXF01000000</a>	3,291,148	3,142	44.4
Nizo2891	Plant.Radish pickled	<a href="#">LUXG01000000</a>	3,469,171	3,329	44.1
Nizo3894	Plant.vegetables	<a href="#">LUXK01000000</a>	3,296,082	3,134	44.5
PS128	Plant.fu-tsai (a Taiwan fermented mustard product)	<a href="#">LBHS01000000</a>	3,325,806	2,966	44.4
SF2A35B	Plant.culture(Sour cassava)	<a href="#">LMVD01000000</a>	3,262,015	3,100	44.5
SRCM101060	Plant.Pepper Jangajji	<a href="#">LYUK01000000</a>	3,263,056	3,084	44.3
wikim18	Plant.kimchi	<a href="#">JMEL01000000</a>	3,352,666	3,310	44.3
ZS2058	Plant.sauerkraut	<a href="#">CP012343</a>	3,198,337	2,833	44.7
16	Unknown	<a href="#">CP006033</a> to <a href="#">CP006043</a>	3,361,015	3,088	44.3
80	Unknown	<a href="#">CBZW01000000</a>	3,224,773	3,123	44.4
ATCC 14917	Unknown	<a href="#">ACGZ02000000</a>	3,198,761	3,154	44.5
CGMCC.1.557	Unknown	<a href="#">CM003439</a>	3,220,852	2,872	44.5
DOMLa	Unknown	<a href="#">CP004406</a> to <a href="#">CP004408</a>	3,210,111	2,999	44.6
DSM.13273	Unknown	<a href="#">JQAW01000000</a>	3,439,800	3,136	44.2
FBR4	Unknown	<a href="#">LQHB01000000</a>	3,276,442	3,199	44.3
FBR5	Unknown	<a href="#">LQHC01000000</a>	3,183,959	3,034	44.5
FBR6	Unknown	<a href="#">LQHD01000000</a>	3,332,807	3,177	44.4
JCM.1149	Unknown	<a href="#">BALV01000000</a>	3,209,456	3,418	44.5
JDM1	Unknown	<a href="#">CP001617</a>	3,197,759	2,948	44.7
L31-1	Unknown	<a href="#">LEKW01000000</a>	3,216,471	2,884	44.5
Nizo2830	Unknown	<a href="#">LUXC01000000</a>	3,246,095	3,093	44.5
none1	Unknown	<a href="#">FJVL01000000</a>	3,285,094	3,111	44.4
none2	Unknown	<a href="#">FKLQ01000000</a>	3,287,673	3,095	44.4
P-8	Unknown	<a href="#">CP005942</a> to <a href="#">CP005948</a> and <a href="#">CP010527</a>	3,246,630	3,179	44.6
ST-III	Unknown	<a href="#">CP002222</a> and <a href="#">CP002223</a>	3,307,936	3,038	44.5
UC8491	Unknown	<a href="#">LSND01000000</a>	3,297,828	3,043	44.4

\*According to origins, add Animal, Plant in front of Isolation origin

Strains from dairy products and GIT of animals and humans were classified as animal-derived, whereas those from fermented foods and silage were classified as plant-derived

\*\* Total length

**Supplementary Table 3.** Genome comparisons among five origins

Parameter	Animal	Plant	Gut	Dairy	Meat	Significance**
Genome size (kb)	3,298 ± 150	3,259 ± 81	3,312 ± 196	3,260 ± 86	3,302 ± 61	NS
No. of CDS	3,125 ± 192	3,075 ± 113	3,141 ± 242	3,077 ± 144	3,122 ± 109	NS
G+C content (%)	44.4 ± 0.2	44.5 ± 0.2	44.4 ± 0.3	44.5 ± 0.1	44.4 ± 0.1	NS

\* Values are shown as means ± standard deviations.

\*\* Statistical significance was examined by ANOVA. NS indicate not significance.

**Supplementary Table 6.** The number of Strains and Statistics for Habitat-Cluster Association

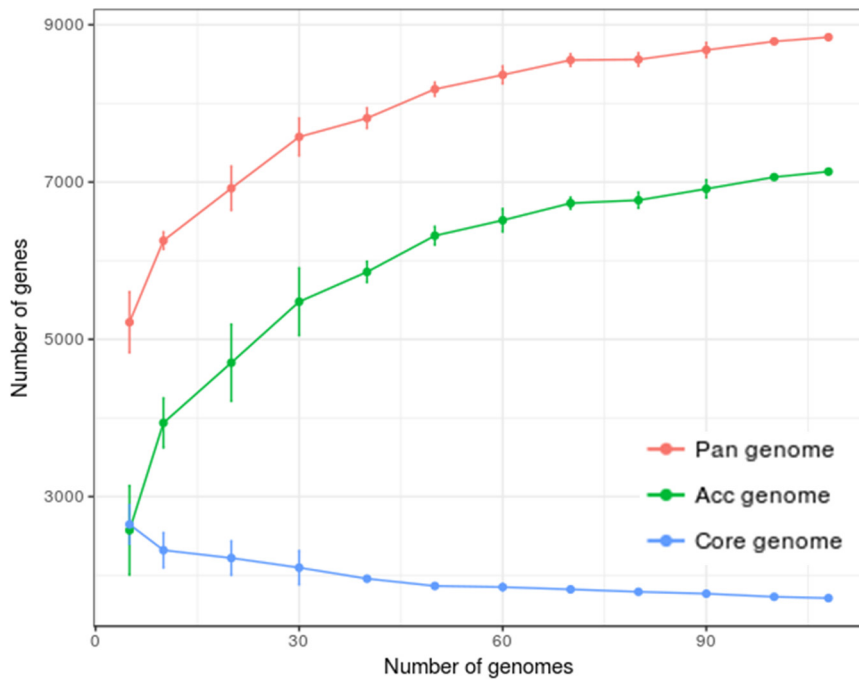
Origins	G1	G2	G3	G4	G5	All Strains
Total (No. of Strains)	38	18	11	8	23	108
Animal	20 ( <i>P</i> = 1.00)	9 ( <i>P</i> = 1.00)	4 ( <i>P</i> = 0.78)	5 ( <i>P</i> = 0.78)	12 ( <i>P</i> = 1.00)	57
Plant	13 ( <i>P</i> = 1.00)	6 ( <i>P</i> = 1.00)	7 ( <i>P</i> = 0.27)	3 ( <i>P</i> = 1.00)	7 ( <i>P</i> = 0.82)	38
Gut	11 ( <i>P</i> = 0.69)	3 ( <i>P</i> = 0.77)	3 ( <i>P</i> = 1.00)	3 ( <i>P</i> = 0.70)	3 ( <i>P</i> = 0.42)	27
Dairy Product and Breast	4 ( <i>P</i> = 0.78)	1 ( <i>P</i> = 0.47)	1 ( <i>P</i> = 1.00)	2 ( <i>P</i> = 0.62)	6 ( <i>P</i> = 0.38)	16
Meat Product	4 ( <i>P</i> = 0.49)	3 ( <i>P</i> = 0.19)	0 ( <i>P</i> = 1.0)	0 ( <i>P</i> = 1.0)	0 ( <i>P</i> = 1.0)	7

\* Animal origins include human or animal bodies, dairy products, meat products, etc. Plant origins include plant resources and fermented cereals/vegetables/fruits. Gut origins include feces, intestine, rumen, etc. Origins for dairy products and the breast include cheese, milk, teat canal, etc. Origins for meat products include pickled sausage and hot dog. P values were calculated by Fisher's Exact test.

**Supplementary Table 7.** The Number of Habitat-Specific Enriched or Depleted Genes

<b>Origins</b>	<b>Animal</b>	<b>Plant</b>	<b>Gut</b>	<b>Dairy</b>	<b>Meat</b>	<b>Others</b>	<b>Sum</b>
<b>Enriched Genes</b>							
- Total	0	0	21	7	40	9	77
- Phage-Associated	0	0	5	2	7	5	19
- PTS family	0	0	0	0	0	0	0
<b>Depleted Genes</b>							
- Total	0	4	6	1	1	1	13
- Phage-Associated	0	1	0	1	0	0	2
- PTS family	0	0	4	0	0	0	4

\* Significance was examined at  $P < 0.05$  by Fisher's Exact test. For origins, refer to the Table S6. For more information on the genes. Refer to the Table S8.



**Supplementary Figure 1. Pan-genome analysis of *L. plantarum*.** Pan-genome and core genome profiles. The number of pan-genome, core genes, and accessory genes are plotted against the number of genomes added. Each value indicates the average of 10 subsampled observations.