

**Supplementary Table S5** Strains and housekeeping genes locus tag information used for the phylogenetic tree construction in this study.

Strain	<i>gyrB</i>	<i>rpoD</i>	<i>rplA</i>	<i>atpD</i>	<i>holB</i>	<i>rho</i>	<i>dnaA</i>	<i>rpsA</i>
<i>Paenibacillus alvei</i> DSM 29 <sup>T</sup>	PAV_RS09320	PAV_RS15955	PAV_RS06775	PAV_RS07565	PAV_RS09385	PAV_RS10040	PAV_RS09295	PAV_RS13070
<i>Paenibacillus beijingensis</i> DSM 24997 <sup>T</sup>	VN24_10220	VN24_19405	VN24_12580	VN24_08235	VN24_10290	VN24_10930	VN24_10195	VN24_24850
<i>Paenibacillus chitinolyticus</i> NBRC 15660 <sup>T</sup>	PCH01S_RS28520	PCH01S_RS13365	PCH01S_RS27990	PCH01S_RS23965	PCH01S_RS27620	PCH01S_RS27275	PCH01S_RS28495	PCH01S_RS08855
<i>Paenibacillus ehimensis</i> NBRC 15659 <sup>T</sup>	PEH01S_RS27300	PEH01S_RS08230	PEH01S_RS20985	PEH01S_RS25465	PEH01S_RS28245	PEH01S_RS25540	PEH01S_RS27325	PEH01S_RS12040
<i>Paenibacillus elgii</i> NBRC 100335 <sup>T</sup>	PEL01S_RS23625	PEL01S_RS19625	PEL01S_RS25250	PEL01S_RS30385	PEL01S_RS30940	PEL01S_RS29105	PEL01S_RS23600	PEL01S_RS09150
<i>Paenibacillus glucanolyticus</i> DSM 5162 <sup>T</sup>	A3958_09445	A3958_17425	A3958_06690	A3958_07450	A3958_09520	A3958_10050	A3958_09420	A3958_19510
<i>Paenibacillus graminis</i> DSM 15220 <sup>T</sup>	PGRAT_00030	PGRAT_24795	PGRAT_29410	PGRAT_30150	PGRAT_00100	PGRAT_00610	PGRAT_00005	PGRAT_20965
<i>Paenibacillus helianthi</i> P26E <sup>T</sup>	A3844_RS26635	A3844_RS04815	A3844_RS20340	A3844_RS15485	A3844_RS20515	A3844_RS23100	A3844_RS26610	A3844_RS12415
<i>Paenibacillus kribbensis</i> AM49 <sup>T</sup>	B4V02_25205	B4V02_08530	B4V02_02815	B4V02_02015	B4V02_25135	B4V02_24555	B4V02_25230	B4V02_10395
<i>Paenibacillus macerans</i> NBRC 15307 <sup>T</sup>	PMA02S_RS30570	PMA02S_RS26285	PMA02S_RS16265	PMA02S_RS30935	PMA02S_RS19245	PMA02S_RS24235	PMA02S_RS30545	PMA02S_RS23730
<i>Paenibacillus pabuli</i> NBRC 13638 <sup>T</sup>	PPA03S_RS26305	PPA03S_RS23730	PPA03S_RS29985	PPA03S_RS08350	PPA03S_RS29675	PPA03S_RS30515	PPA03S_RS26330	PPA03S_RS25735
<i>Paenibacillus peoriae</i> KCTC 3763 <sup>T</sup>	KQI_RS0110920	KQI_RS0103695	KQI_RS0120930	KQI_RS0125435	KQI_RS0124435	KQI_RS0109780	KQI_RS0110945	KQI_RS0105555
<i>Paenibacillus peoriae</i> ZF390	IAQ67_00030	IAQ67_19485	IAQ67_25150	IAQ67_25910	IAQ67_00100	IAQ67_00730	IAQ67_00005	IAQ67_17705
<i>Paenibacillus polymyxa</i> DSM 36 <sup>T</sup>	G7035_08355	G7035_17095	G7035_11475	G7035_10705	G7035_08285	G7035_07695	G7035_08380	G7035_18885
<i>Paenibacillus riograndensis</i> SBR5 <sup>T</sup>	PRI0_RS00030	PRI0_RS25495	PRI0_RS30270	PRI0_RS31100	PRI0_RS00100	PRI0_RS00600	PRI0_RS00005	PRI0_RS22150
<i>Paenibacillus xylanilyticus</i> LMG 21957 <sup>T</sup>	HP552_RS03245	HP552_RS21925	HP552_RS02505	HP552_RS17300	HP552_RS05875	HP552_RS02930	HP552_RS03220	HP552_RS23540
<i>Paenibacillus yonginensis</i> DCY84 <sup>T</sup>	AWM70_RS19015	AWM70_RS05900	AWM70_RS16640	AWM70_RS17380	AWM70_RS18945	AWM70_RS18420	AWM70_RS19040	AWM70_RS09900