**Table S1.** Lactic acid bacteria strains used in the conducted experiments.

| Isolates from honeybee environment | Source of isolation | Collection strains | Source of isolation |
|---|---|---|---|
| *P. acidilactici* 1/4 | Large Indian cress (*Tropaeolum majus* L.) | *L. plantarum* ŁOCK 0981 | Fermented cucumbers |
| *P. acidilactici* 2/1 | Peony (*Peonia officinalis* L.) | *L. plantarum* ŁOCK 0982 | Sourdough for sour rye soup |
| *L. plantarum* 2/2 | | *L. brevis* ŁOCK 0983 | Fermented cucumbers |
| *L. plantarum* 3/1 | European smoketree (*Cotinus coggygria* L.) | *L. brevis* ŁOCK 0984 | Fermented cabbage |
| *P. acidilactici* 4/1 | Black locust (*Robinia pseudoaccacia* L.) | *L. paracasei* ŁOCK 0985 | Fermented cow milk |
| *L. plantarum* 5/1 | Weigela (*Weigela florida* DC.) | *L. delbrueckii* ŁOCK 0987 | Infant faces |
| *P. acidilactici* 5/2 | | *L. plantarum* ŁOCK 0989 | Fermented cucumbers |
| *P. acidilactici* 6/1 | Brown knapweed (*Centaurea jacea* L.) | *L. plantarum* ŁOCK 0990 | Fermented cucumbers |
| *P. pentosaceus* 6/3 | | *L. plantarum* ŁOCK 0991 | Fermented cucumbers |
| *P. acidilactici* 7/1 | Flanders poppy (*Papaver rhoeas* L.) | *L. paracasei* ŁOCK 0993 | Fermented cow milk |
| *P. acidilactici* 8/1 | Wild mustard (*Sinapis arvensis* L.) | *L. plantarum* ŁOCK 0995 | Fermented cucumbers |
| *P. pentosaceus* 8/2 | | *L. plantarum* ŁOCK 0996 | Fermented cucumbers |
| *L. plantarum* 8/4 | | *L. rhamnosus* ŁOCK 0997 | Infant faces |
| *P. acidilactici* 9/1 | Red clover (*Trifolium pratense* L.) | *L. plantarum* 7AN | Chicken faces with dust litter |
| *P. pentosaceus* 9/3 | | *L. plantarum* 8AN | Chicken faces with dust litter |
| *P. pentosaceus* 10/1 | Elderberry (*Sambucus nigra* L.) | *L. salivarius* 9AN | Chicken faces with dust litter |
| *L. plantarum* 10/2 | | *L. coryniformis* 10AN | Fermented cabbage |
| *L. plantarum* 11/1 | Mock orange (*Philadelphus coronaries* L.) | *L. coryniformis* 11AN | Fermented cabbage |
| *P. pentosaceus* 11/3 | | *P. parvulus* OK-S | Fermented cucumbers |
| *P. pentosaceus* 12/1 | Small-leaved lime 1 (*Tilia cordata* L.) | *L. plantarum* OK-B | Fermented cucumbers |
| *P. pentosaceus* 13/2 | Small-leaved lime 2 (*T. cordata* L.) | *L. brevis* KKA | Fermented cabbage |
| *P. pentosaceus* 14/1 | Common lavender (*Lavandula augustifolia* L.) | *L. plantarum* 145 | Vegetable silage |
| *L. plantarum* 14/3 | | *L. brevis* W81 | Sugar beet pulp |
| *P. pentosaceus* 15/1 | Catalpa (*Catalpa* Scop.) | *L. rhamnosus* PL53A | nd * |
| *L. plantarum* 15/2 | | *L. mesenteroides* T7 | Jerusalem artichoke |
| *P. pentosaceus* 16/1 | Honeybee pollen | *L. plantarum* AXG KT751285 | Vegetable silage |
| *P. acidilactici* 16/4 | | *L. mesenteroides* T5 | Jerusalem artichoke |
| *L. plantarum* 17/1 | Common lavender (*L. augustifolia* L.) | *L. brevis* 1 | Jerusalem artichoke |
| *P. pentosaceus* 17/3 | | *L. brevis* P162 | Sugar beet silage |
| *L. plantarum* 18/1 | Butterfly bush (*Buddleja davidii* L.) | *L. farraginis* T6 | Jerusalem artichoke |
| *P. pentosaceus* 19/1 | Heather (*Calluna vulgaris* L.) | *L. plantarum* W12A | Sugar beet pulp |
| *L. plantarum* 20/1 | Honey with the addition of other honeybee products | *L. plantarum* W | Bakery sourdough |

| | | | |
|---|---|---|---|
| *L. plantarum* 21/1 | Freshly harvested *L. plantarum* 18/1 fermented honey | *L. brevis* P147 | Sugar beet silage |
| *P. acidilactici* 22/2 | Royal jelly | *L. plantarum* 127 | Vegetable silage |
| *P. acidilactici* 23/1 | Honeybee bread | *L. casei* ŁOCK 0906 | Human faces |
| *P. acidilactici* 24/1 | Honeydew honey | *L. plantarum* W12 | Sugar beet pulp |
| *P. acidilactici* 25/1 | Heather-nectar honey | *L. plantarum* 118 | Vegetable silage |
| *P. pentosaceus* 26/1 | Cornflower honey | *L. brevis* P1648.2 | Sugar beet silage |
| *P. acidilactici* 27/1 | Dandelion honey | *L. plantarum* ATCC 8014 | nd |
| *P. pentosaceus* 28/1 | Phacelia honey | *L. brevis* W3A | Sugar beet pulp |
| *L. plantarum* 29/1 | Hawthorn honey | *L. plantarum* 150 | Vegetable silage |
| *P. pentosaceus* 30/1 | Forest honey | *L. plantarum* AXD KT751284 | Vegetable silage |
| *P. pentosaceus* 31/1 | Meadow marsh honey | *L. casei* 12AN | Human faces |
| *P. pentosaceus* 32/1 | Spring honey | *L. plantarum* 120 | Vegetable silage |
| *L. plantarum* 33/1 | Clover honey | *L. plantarum* 113 | Vegetable silage |
| *P. pentosaceus* 34/1 | Lime honey | *L. acidophilus* 573 | nd |
| *P. acidilactici* 35/1 | Goldenrod honey | *L. plantarum* 124 | Vegetable silage |
| *P. acidilactici* 36/1 | Nectar honey | *L. acidophilus* LA-5 | Starter culture Chr. Hansen |
| *P. acidilactici* 37/1 | Coniferous honeydew honey | *L. paracasei* ŁOCK 0916 | Human faces |
| *P. pentosaceus* 38/1 | Melilot and meadow honey | *L. plantarum* 155 | Vegetable silage |
| *P. pentosaceus* 39/1 | Rape (*Brassica napus* L.) | *L. fermentum* 57A | nd |
| | | *A. kunkeei* DSM 12361 | Honeybee gut |

* nd – no data