

Table S1. Genotypes of 126 SAGs based on 16S rRNA gene amplicon sequencing and results of BLASTN analysis.

| Sample | 16S rRNA [bp] ^a | nr best BLASTN hit | | Reference species BLASTN hit ^b | | |
|--------|----------------------------|--------------------|-----------|-------------------------------------------|-----------------------------------|--------------|
| | | Identity [%] | Accession | Species in nr database | Species name | Identity [%] |
| A03 | 1353 | 99.85 | JQ746651 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.56 |
| A06 | 1357 | 99.71 | JQ746651 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.41 |
| A07 | 1352 | 99.85 | JQ746651 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.56 |
| A08 | 1336 | 99.70 | EF187247 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.18 |
| A09 | 1221 | 99.59 | HM113176 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 98.94 |
| A13 | 1357 | 100.00 | JQ673239 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.48 |
| A15 | 1346 | 99.70 | JX878306 | <i>Frischella perrara</i> | <i>Frischella perrara</i> PEB0191 | 99.70 |
| A16 | 1366 | 99.85 | JQ746651 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.56 |
| A18 | 1313 | 99.62 | HM113221 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.62 |
| A22 | 624 | 98.08 | HE613291 | <i>Acetobacteriaceae</i> sp. | n.d. | n.d. |
| A23 | 1349 | 99.93 | JQ746650 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.93 |
| B02 | 1538 | 99.22 | JQ936674 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.22 |
| B03 | 1326 | 99.77 | EF187247 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.25 |
| B05 | 1354 | 99.85 | JQ746651 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.56 |
| B06 | 1310 | 99.47 | JQ936674 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.47 |
| B09 | 1391 | 99.64 | JQ746651 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.35 |
| B11 | 1361 | 99.93 | JQ673239 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.41 |
| B15 | 1360 | 99.27 | JQ746650 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.27 |
| B18 | 1355 | 100.00 | JQ746651 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.71 |
| B23 | 1356 | 99.78 | JQ746650 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.78 |
| C02 | 1320 | 99.55 | EF187247 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.02 |
| C04 | 1534 | 99.80 | JX878306 | <i>Frischella perrara</i> | <i>Frischella perrara</i> PEB0191 | 99.80 |
| C06 | 1323 | 100.00 | JQ746650 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 100.00 |
| C08 | 1349 | 100.00 | JQ746651 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.70 |
| C10 | 624 | 100.00 | JQ582002 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.68 |
| C11 | 1276 | 99.76 | EF187247 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.29 |
| C14 | 1368 | 100.00 | JQ673239 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.49 |
| C17 | 1291 | 99.92 | JQ673239 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.46 |
| C23 | 1332 | 99.92 | HM111936 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.47 |
| D05 | 1358 | 99.78 | JQ673244 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.41 |
| D10 | 1367 | 99.56 | EF187247 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.12 |
| D14 | 1370 | 99.56 | JQ673244 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 98.91 |
| D16 | 1162 | 99.83 | JQ673234 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.40 |
| D18 | 1357 | 100.00 | JQ673239 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.48 |
| D23 | 1377 | 99.49 | EF187247 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 98.98 |
| E04 | 1343 | 99.70 | EF187248 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.48 |
| E06 | 1357 | 100.00 | JQ673239 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.48 |
| E08 | 589 | 97.79 | JQ581781 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 96.94 |
| E13 | 1321 | 99.77 | EF187248 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.39 |
| E15 | 624 | 99.52 | JQ746651 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 98.88 |
| E16 | 1318 | 99.92 | JQ746651 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.62 |
| E17 | 1280 | 99.69 | EF187247 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.14 |
| E21 | 1316 | 99.77 | EF187247 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.24 |
| F02 | 636 | 98.41 | HE613310 | <i>Lactobacillus</i> sp. | n.d. | n.d. |
| F02 | 1354 | 100.00 | JQ673239 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.48 |
| F06 | 1351 | 99.93 | JQ673239 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.41 |
| F08 | 1377 | 99.64 | EF187247 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.13 |
| F09 | 624 | 98.88 | JQ746651 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 98.24 |
| F11 | 1369 | 99.78 | EF187247 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.27 |
| F14 | 1325 | 100.00 | JQ746650 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 100.00 |
| F16 | 1361 | 99.93 | JQ746650 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.93 |
| F20 | 1366 | 99.71 | JQ746651 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.41 |
| G03 | 1333 | 100.00 | JQ673239 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.48 |
| G06 | 624 | 99.68 | JQ581781 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 98.72 |
| G07 | 620 | 99.35 | JQ581772 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 98.71 |
| G10 | 1320 | 99.70 | EF187247 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.17 |
| G11 | 1359 | 99.71 | EF187248 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.48 |
| G14 | 1346 | 100.00 | JQ673239 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.48 |
| G15 | 1322 | 99.62 | HM113221 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.62 |
| G16 | 620 | 99.19 | JQ581835 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 97.75 |
| G20 | 1277 | 99.69 | JQ673249 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.06 |
| G21 | 1361 | 99.93 | JQ746650 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.93 |

| Sample | nr best BLASTN hit | | | | Reference species BLASTN hit ^b | |
|--------|----------------------------|--------------|-----------|----------------------------|-------------------------------------------|--------------|
| | 16S rRNA [bp] ^a | Identity [%] | Accession | Species in nr database | Species name | Identity [%] |
| I03 | 1305 | 99.69 | EF187247 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.16 |
| I04 | 1320 | 98.18 | EF187250 | <i>Frischella perrara</i> | <i>Frischella perrara</i> PEB0191 | 98.11 |
| I07 | 1344 | 99.70 | JQ673249 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.03 |
| I09 | 1377 | 99.64 | EF187247 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.20 |
| I10 | 1328 | 99.55 | JQ936674 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.55 |
| I11 | 1365 | 99.56 | JQ936674 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.56 |
| I17 | 1357 | 99.78 | JX878306 | <i>Frischella perrara</i> | <i>Frischella perrara</i> PEB0191 | 99.78 |
| I19 | 1372 | 99.42 | JQ936674 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.42 |
| I20 | 1538 | 99.09 | JQ936674 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.09 |
| I22 | 1534 | 99.93 | JX878306 | <i>Frischella perrara</i> | <i>Frischella perrara</i> PEB0191 | 99.93 |
| J02 | 1319 | 99.47 | AY370192 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.32 |
| J03 | 1334 | 99.70 | EF187248 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.48 |
| J04 | 1371 | 99.93 | JQ673239 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.42 |
| J06 | 1297 | 99.92 | HM111936 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.46 |
| J08 | 1379 | 99.71 | EF187248 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.27 |
| J10 | 619 | 96.28 | JQ746651 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 95.65 |
| J17 | 619 | 100.00 | JQ581810 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.03 |
| J19 | 679 | 100.00 | JQ581937 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.85 |
| J21 | 1548 | 99.68 | JQ746650 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.68 |
| J22 | 610 | 99.67 | JQ581780 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 98.52 |
| J23 | 1369 | 99.63 | JQ746650 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.63 |
| K02 | 1306 | 99.69 | JQ746651 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.39 |
| K06 | 1332 | 99.62 | HM113280 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.33 |
| K10 | 610 | 100.00 | JQ582002 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.67 |
| K15 | 610 | 99.18 | JQ581937 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.02 |
| K17 | 608 | 96.55 | JQ581810 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 95.57 |
| K18 | 1280 | 99.77 | EF187248 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.30 |
| K18 | 608 | 99.84 | JQ581772 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.18 |
| K19 | 1332 | 99.47 | JQ673239 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.10 |
| K21 | 1361 | 99.56 | JQ936674 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.56 |
| K22 | 1321 | 99.77 | JQ673249 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.47 |
| L2 | 1359 | 99.56 | JQ936674 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.56 |
| L10 | 609 | 99.84 | JQ581772 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.18 |
| L11 | 1353 | 99.70 | EF187247 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.26 |
| L15 | 1276 | 99.84 | EF187247 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.29 |
| L16 | 1352 | 99.70 | EF187247 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.26 |
| L22 | 1305 | 99.92 | JQ746651 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.62 |
| L23 | 1324 | 99.62 | JQ746650 | <i>Gilliamella apicola</i> | <i>Snodgrassella alvi</i> wkB2 | 99.62 |
| M16 | 1361 | 99.41 | EF187248 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.04 |
| M18 | 1333 | 100.00 | JQ673239 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.48 |
| M20 | 1319 | 99.85 | EF187247 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.32 |
| N04 | 1271 | 99.76 | EF187247 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.21 |
| N05 | 1347 | 99.85 | JQ746651 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.55 |
| N06 | 636 | 99.84 | JQ581967 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.68 |
| N10 | 639 | 100.00 | JQ746651 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.38 |
| N11 | 1276 | 99.84 | EF187247 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.29 |
| N16 | 1374 | 99.93 | JQ746650 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.93 |
| N18 | 1324 | 99.85 | EF187247 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.47 |
| N22 | 1352 | 99.85 | JQ746651 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.56 |
| N23 | 1282 | 99.61 | HM113221 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.61 |
| O02 | 1547 | 99.55 | JQ746651 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.29 |
| O03 | 609 | 99.67 | JQ581770 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 98.52 |
| O05 | 609 | 98.69 | JQ581835 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 97.55 |
| O06 | 1276 | 99.92 | JQ673234 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.14 |
| O09 | 1368 | 99.71 | EF187247 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.20 |
| O10 | 1279 | 100.00 | JQ673252 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.45 |
| O11 | 1547 | 99.81 | JQ746651 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.55 |
| O15 | 614 | 99.84 | JQ581781 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 98.86 |
| O19 | 1355 | 99.70 | EF187247 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.19 |
| O22 | 1349 | 99.63 | JQ746650 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.63 |
| P04 | 1360 | 99.56 | JQ936674 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 99.56 |
| P14 | 1547 | 99.74 | JQ746651 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.48 |
| P16 | 1353 | 99.85 | JQ746651 | <i>Snodgrassella alvi</i> | <i>Snodgrassella alvi</i> wkB2 | 99.56 |
| P17 | 1538 | 98.96 | JQ936674 | <i>Gilliamella apicola</i> | <i>Gilliamella apicola</i> wkB1 | 98.96 |

^alength of sequenced 16S rRNA fragment; ^bBLASTN hit against the typing strain for described species