Additional file 1

Description for all matrixes: The part of the matrix from the upper right corner shows differences in the number of deletions between sequence pairs; the part of the matrix from the lower left corner shows differences in the number of nucleotides between the sequence pairs. The green color indicates species pairs that differ in the lowest number of nucleotides or deletions, the red color the pairs with the highest number of nucleotide or deletion differences between sequences.

Table S1

A matrix showing the nucleotides and deletions differences between pairs of 16S rRNA gene sequences for *Streptococcus* species.

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S._acidominimus | 1 | | 22 | 8 | 4 | 0 | 8 | 1 | 9 | 4 | 0 | 11 | 16 | 0 | 7 | 8 | 8 | 2 | 8 | 4 | 10 | 8 | 4 | 13 | 2 | 8 | 10 | 4 | 0 | 13 | 8 | 2 | 8 | 11 | 13 | 8 | 2 | 8 | 11 | 10 | 2 | 0 | 0 |
| S._adjacens | 2 | 211 | | 18 | 22 | 22 | 18 | 23 | 17 | 22 | 22 | 17 | 10 | 22 | 22 | 25 | 26 | 18 | 26 | 22 | 18 | 22 | 16 | 24 | 22 | 19 | 22 | 26 | 16 | 22 | 22 | 22 | 22 | 22 | 11 | 26 | 22 | 18 | 19 | 28 | 22 | 22 | 22 |
| S._anginosus | 3 | 103 | 207 | | 10 | 8 | 0 | 9 | 1 | 10 | 8 | 3 | 8 | 8 | 7 | 8 | 8 | 8 | 0 | 10 | 2 | 8 | 10 | 5 | 8 | 8 | 6 | 2 | 10 | 8 | 10 | 8 | 8 | 8 | 13 | 8 | 8 | 0 | 8 | 3 | 10 | 8 | 8 |
| S._australis | 4 | 88 | 194 | 103 | | 4 | 10 | 5 | 11 | 0 | 4 | 13 | 18 | 4 | 4 | 9 | 6 | 10 | 6 | 2 | 10 | 0 | 12 | 10 | 0 | 13 | 2 | 6 | 12 | 0 | 4 | 0 | 4 | 4 | 15 | 6 | 2 | 10 | 13 | 8 | 2 | 4 | 4 |
| S._canis | 5 | 86 | 202 | 97 | 81 | | 8 | 1 | 9 | 4 | 0 | 11 | 16 | 0 | 0 | 7 | 8 | 8 | 8 | 2 | 8 | 4 | 10 | 8 | 4 | 13 | 2 | 8 | 10 | 4 | 0 | 4 | 0 | 0 | 13 | 8 | 2 | 8 | 11 | 10 | 2 | 0 | 0 |
| S._constellatus | 6 | 88 | 194 | 62 | 74 | 95 | | 9 | 1 | 10 | 8 | 3 | 8 | 8 | 8 | 7 | 8 | 0 | 8 | 8 | 0 | 10 | 2 | 8 | 8 | 6 | 8 | 2 | 10 | 8 | 10 | 8 | 8 | 7 | 8 | 7 | 8 | 8 | 0 | 3 | 10 | 8 | 8 |
| S._cremoris | 7 | 147 | 203 | 145 | 143 | 135 | 155 | | 10 | 5 | 1 | 12 | 17 | 1 | 1 | 8 | 9 | 9 | 9 | 3 | 9 | 5 | 11 | 9 | 5 | 14 | 3 | 9 | 11 | 5 | 1 | 5 | 1 | 1 | 14 | 9 | 3 | 9 | 12 | 11 | 3 | 1 | 1 |
| S._criceti | 8 | 98 | 216 | 90 | 119 | 89 | 111 | 153 | | 11 | 9 | 2 | 7 | 9 | 9 | 8 | 9 | 1 | 9 | 9 | 1 | 11 | 3 | 9 | 9 | 1 | 11 | 9 | 11 | 9 | 9 | 9 | 6 | 9 | 6 | 9 | 9 | 1 | 2 | 11 | 9 | 9 | 9 |
| S._cristatus | 9 | 78 | 197 | 82 | 40 | 83 | 81 | 136 | 96 | | 11 | 13 | 18 | 4 | 4 | 9 | 6 | 10 | 6 | 2 | 10 | 0 | 12 | 10 | 0 | 12 | 2 | 6 | 12 | 0 | 4 | 0 | 4 | 4 | 15 | 6 | 2 | 10 | 13 | 8 | 2 | 0 | 0 |
| S._difficilis | 10 | 84 | 198 | 108 | 82 | 55 | 88 | 125 | 107 | 84 | | 11 | 16 | 0 | 0 | 8 | 6 | 8 | 6 | 2 | 8 | 4 | 10 | 8 | 4 | 13 | 2 | 6 | 10 | 4 | 0 | 4 | 0 | 0 | 13 | 6 | 2 | 8 | 11 | 10 | 2 | 0 | 0 |
| S._downei | 11 | 117 | 210 | 97 | 112 | 101 | 93 | 161 | 86 | 101 | 109 | | 7 | 11 | 11 | 10 | 11 | 3 | 11 | 11 | 3 | 13 | 5 | 11 | 13 | 6 | 11 | 11 | 3 | 13 | 11 | 13 | 11 | 11 | 6 | 11 | 11 | 3 | 2 | 13 | 11 | 11 | 11 |
| S._durans | 12 | 191 | 97 | 176 | 173 | 185 | 165 | 182 | 185 | 174 | 172 | 184 | | 16 | 16 | 15 | 16 | 8 | 16 | 16 | 8 | 18 | 8 | 16 | 18 | 9 | 16 | 16 | 6 | 18 | 16 | 18 | 16 | 16 | 5 | 16 | 16 | 8 | 9 | 18 | 16 | 16 | 16 |
| S._dysgalactiae | 13 | 78 | 197 | 105 | 78 | 43 | 89 | 122 | 109 | 79 | 35 | 108 | 171 | | 0 | 7 | 8 | 8 | 0 | 8 | 2 | 8 | 4 | 10 | 8 | 4 | 13 | 2 | 8 | 10 | 4 | 0 | 4 | 0 | 0 | 13 | 8 | 2 | 8 | 11 | 10 | 2 | 0 |
| S._equi | 14 | 104 | 228 | 88 | 104 | 62 | 108 | 134 | 86 | 91 | 76 | 116 | 195 | 78 | | 7 | 8 | 8 | 2 | 8 | 2 | 8 | 4 | 10 | 8 | 4 | 13 | 2 | 8 | 10 | 4 | 0 | 4 | 0 | 13 | 8 | 2 | 8 | 11 | 10 | 2 | 0 | 0 |
| S._equinus | 15 | 83 | 207 | 89 | 79 | 91 | 85 | 139 | 103 | 66 | 91 | 99 | 180 | 90 | 95 | | 7 | 7 | 7 | 7 | 7 | 9 | 9 | 7 | 9 | 12 | 7 | 9 | 7 | 7 | 7 | 7 | 7 | 7 | 14 | 7 | 7 | 7 | 10 | 9 | 7 | 7 | 7 |
| S._gallolyticus | 16 | 95 | 213 | 65 | 82 | 78 | 86 | 131 | 88 | 71 | 87 | 89 | 186 | 83 | 78 | 73 | | 8 | 0 | 8 | 6 | 8 | 6 | 10 | 6 | 6 | 8 | 6 | 10 | 8 | 10 | 8 | 8 | 8 | 15 | 0 | 6 | 8 | 11 | 4 | 6 | 8 | 8 |
| S._gordonii | 17 | 88 | 197 | 62 | 53 | 83 | 59 | 153 | 92 | 48 | 91 | 91 | 187 | 89 | 101 | 80 | 74 | | 8 | 8 | 0 | 10 | 2 | 8 | 10 | 5 | 8 | 8 | 10 | 8 | 10 | 8 | 8 | 8 | 7 | 8 | 8 | 0 | 3 | 10 | 8 | 8 | 8 |
| S._infantarius | 18 | 96 | 211 | 74 | 78 | 78 | 86 | 124 | 94 | 73 | 76 | 100 | 184 | 81 | 76 | 71 | 21 | 77 | | 6 | 8 | 6 | 10 | 8 | 6 | 11 | 6 | 0 | 10 | 6 | 8 | 6 | 8 | 8 | 15 | 0 | 6 | 8 | 11 | 4 | 6 | 8 | 8 |
| S._infantis | 19 | 88 | 197 | 99 | 25 | 84 | 76 | 139 | 112 | 35 | 84 | 106 | 171 | 74 | 99 | 77 | 75 | 53 | 80 | | 8 | 2 | 10 | 8 | 2 | 13 | 0 | 6 | 10 | 2 | 2 | 2 | 2 | 2 | 13 | 6 | 0 | 8 | 11 | 8 | 0 | 2 | 2 |
| S._intermedius | 20 | 90 | 203 | 48 | 76 | 82 | 23 | 154 | 101 | 74 | 96 | 88 | 173 | 93 | 99 | 89 | 81 | 44 | 80 | 81 | | 10 | 2 | 8 | 10 | 5 | 8 | 8 | 10 | 8 | 10 | 8 | 8 | 8 | 7 | 8 | 8 | 0 | 3 | 10 | 8 | 8 | 8 |
| S._mitis | 21 | 94 | 193 | 93 | 21 | 87 | 71 | 144 | 115 | 42 | 82 | 107 | 171 | 77 | 96 | 81 | 79 | 54 | 81 | 27 | 77 | | 12 | 10 | 0 | 13 | 2 | 6 | 12 | 0 | 4 | 0 | 4 | 4 | 15 | 6 | 2 | 10 | 13 | 8 | 2 | 4 | 4 |
| S._mutans | 22 | 122 | 217 | 96 | 112 | 119 | 107 | 152 | 104 | 98 | 119 | 99 | 194 | 121 | 107 | 106 | 99 | 84 | 93 | 107 | 102 | 108 | | 8 | 12 | 5 | 10 | 10 | 2 | 12 | 10 | 12 | 10 | 10 | 7 | 10 | 10 | 2 | 5 | 12 | 10 | 10 | 10 |
| S._oligofermentans | 23 | 84 | 197 | 84 | 64 | 87 | 83 | 135 | 107 | 42 | 91 | 107 | 190 | 82 | 96 | 65 | 77 | 60 | 74 | 65 | 70 | 66 | 102 | | 10 | 13 | 8 | 8 | 10 | 10 | 8 | 10 | 8 | 8 | 15 | 8 | 8 | 8 | 11 | 10 | 8 | 8 | 8 |
| S._oralis | 24 | 88 | 182 | 94 | 18 | 84 | 72 | 141 | 114 | 41 | 79 | 105 | 188 | 73 | 97 | 80 | 78 | 49 | 78 | 24 | 74 | 6 | 106 | 65 | | 13 | 2 | 6 | 12 | 0 | 4 | 0 | 4 | 4 | 15 | 6 | 2 | 10 | 13 | 8 | 2 | 4 | 4 |
| S._ovis | 25 | 96 | 211 | 89 | 101 | 89 | 91 | 160 | 85 | 93 | 98 | 87 | 182 | 100 | 105 | 85 | 89 | 85 | 91 | 105 | 83 | 102 | 114 | 99 | 99 | | 13 | 11 | 3 | 13 | 13 | 13 | 13 | 13 | 8 | 11 | 13 | 5 | 6 | 13 | 13 | 13 | 13 |
| S._parasanguinis | 26 | 70 | 188 | 87 | 50 | 78 | 76 | 131 | 99 | 49 | 76 | 105 | 180 | 68 | 90 | 70 | 73 | 64 | 73 | 48 | 78 | 48 | 110 | 62 | 43 | 96 | | 6 | 10 | 2 | 2 | 2 | 2 | 2 | 13 | 6 | 0 | 8 | 11 | 8 | 0 | 2 | 2 |
| S._pasteurianus | 27 | 95 | 212 | 85 | 81 | 77 | 85 | 129 | 89 | 70 | 85 | 90 | 183 | 81 | 80 | 73 | 3 | 72 | 19 | 74 | 81 | 77 | 100 | 77 | 76 | 90 | 72 | | 10 | 6 | 8 | 6 | 8 | 8 | 15 | 0 | 6 | 8 | 11 | 4 | 6 | 8 | 8 |
| S._pluranimalium | 28 | 112 | 197 | 99 | 118 | 93 | 104 | 159 | 96 | 104 | 107 | 91 | 181 | 110 | 106 | 96 | 96 | 92 | 120 | 96 | 115 | 114 | 99 | 112 | 75 | 99 | 99 | 112 | | 12 | 10 | 12 | 10 | 10 | 5 | 10 | 10 | 2 | 3 | 12 | 10 | 10 | 10 |
| S._pneumoniae | 29 | 95 | 194 | 96 | 24 | 88 | 74 | 146 | 116 | 43 | 85 | 107 | 172 | 78 | 98 | 83 | 81 | 57 | 85 | 28 | 78 | 6 | 110 | 68 | 9 | 104 | 50 | 79 | 117 | | 4 | 0 | 4 | 4 | 15 | 6 | 2 | 10 | 13 | 8 | 2 | 4 | 4 |
| S._porcinus | 30 | 78 | 206 | 105 | 79 | 45 | 94 | 141 | 111 | 88 | 49 | 122 | 179 | 48 | 61 | 82 | 86 | 93 | 77 | 89 | 98 | 78 | 124 | 92 | 75 | 99 | 74 | 85 | 101 | 81 | | 4 | 0 | 0 | 13 | 8 | 2 | 8 | 11 | 10 | 2 | 0 | 4 |
| S._pseudopneumoniae | 31 | 92 | 191 | 93 | 21 | 87 | 69 | 144 | 116 | 41 | 82 | 105 | 170 | 77 | 96 | 79 | 77 | 53 | 81 | 24 | 72 | 5 | 108 | 65 | 5 | 99 | 47 | 77 | 113 | 6 | 78 | | 4 | 4 | 15 | 6 | 2 | 10 | 13 | 8 | 2 | 4 | 4 |
| S._pseudoporcinus | 32 | 80 | 208 | 113 | 85 | 55 | 100 | 145 | 113 | 88 | 50 | 125 | 181 | 52 | 67 | 83 | 93 | 100 | 89 | 89 | 104 | 87 | 128 | 92 | 85 | 110 | 74 | 93 | 107 | 87 | 31 | 85 | | 0 | 13 | 8 | 2 | 8 | 11 | 10 | 2 | 0 | 0 |
| S._pyogenes | 33 | 84 | 200 | 102 | 84 | 27 | 94 | 132 | 91 | 81 | 51 | 100 | 179 | 37 | 69 | 90 | 75 | 84 | 73 | 85 | 84 | 85 | 119 | 87 | 83 | 85 | 70 | 73 | 92 | 86 | 57 | 86 | 62 | | 13 | 8 | 2 | 8 | 11 | 10 | 2 | 0 | 0 |
| S._saccharolyticus | 34 | 188 | 110 | 175 | 171 | 179 | 165 | 186 | 187 | 172 | 170 | 179 | 51 | 167 | 199 | 177 | 178 | 184 | 177 | 165 | 169 | 166 | 191 | 177 | 154 | 178 | 163 | 175 | 179 | 167 | 180 | 165 | 179 | 175 | | 15 | 13 | 7 | 8 | 17 | 13 | 13 | 13 |
| S._salivarius | 35 | 93 | 205 | 81 | 68 | 83 | 95 | 140 | 93 | 61 | 101 | 107 | 177 | 96 | 88 | 83 | 59 | 73 | 54 | 72 | 79 | 70 | 100 | 73 | 66 | 77 | 65 | 57 | 88 | 72 | 83 | 70 | 98 | 80 | 176 | | 66 | 80 | 11 | 4 | 6 | 6 | 8 |
| S._sanguinis | 36 | 76 | 195 | 86 | 32 | 67 | 62 | 140 | 98 | 36 | 78 | 99 | 174 | 71 | 86 | 70 | 67 | 46 | 72 | 25 | 65 | 34 | 96 | 61 | 29 | 93 | 38 | 66 | 105 | 34 | 73 | 31 | 74 | 74 | 169 | 66 | | 8 | 11 | 8 | 0 | 2 | 2 |
| S._sinensis | 37 | 90 | 199 | 70 | 80 | 93 | 59 | 146 | 105 | 57 | 98 | 101 | 176 | 96 | 104 | 66 | 84 | 51 | 80 | 77 | 49 | 80 | 98 | 34 | 77 | 87 | 65 | 82 | 85 | 82 | 95 | 79 | 101 | 93 | 174 | 80 | 66 | | 3 | 10 | 8 | 8 | 8 |
| S._sobrinus | 38 | 115 | 215 | 96 | 104 | 96 | 93 | 163 | 84 | 106 | 102 | 45 | 193 | 108 | 106 | 93 | 90 | 88 | 94 | 107 | 88 | 107 | 98 | 100 | 106 | 88 | 111 | 91 | 90 | 109 | 113 | 105 | 120 | 97 | 189 | 106 | 101 | 100 | | 13 | 11 | 11 | 11 |
| S._suis | 39 | 71 | 198 | 92 | 77 | 81 | 83 | 143 | 91 | 68 | 72 | 107 | 171 | 80 | 92 | 57 | 71 | 78 | 61 | 81 | 83 | 83 | 118 | 71 | 78 | 84 | 59 | 69 | 94 | 86 | 74 | 82 | 75 | 76 | 169 | 68 | 69 | 79 | 102 | | 8 | 10 | 10 |
| S._tigurinus | 40 | 87 | 195 | 96 | 24 | 81 | 75 | 138 | 110 | 34 | 81 | 105 | 171 | 71 | 96 | 80 | 74 | 52 | 79 | 3 | 78 | 24 | 104 | 64 | 21 | 104 | 47 | 73 | 118 | 25 | 86 | 21 | 86 | 82 | 166 | 71 | 22 | 78 | 106 | 81 | | 2 | 2 |
| S._uberis | 41 | 81 | 212 | 99 | 77 | 38 | 99 | 141 | 100 | 84 | 65 | 110 | 182 | 57 | 61 | 85 | 74 | 86 | 75 | 87 | 84 | 85 | 117 | 89 | 81 | 87 | 73 | 76 | 96 | 88 | 37 | 83 | 37 | 44 | 182 | 74 | 73 | 97 | 104 | 71 | 84 | | 0 |
| S._urinalis | 42 | 86 | 200 | 100 | 83 | 38 | 94 | 142 | 104 | 86 | 56 | 98 | 185 | 55 | 73 | 87 | 69 | 82 | 67 | 86 | 84 | 88 | 122 | 85 | 84 | 81 | 73 | 68 | 90 | 90 | 60 | 86 | 61 | 42 | 179 | 82 | 74 | 92 | 100 | 70 | 87 | 48 | |

Table S2

A matrix showing the nucleotides and deletions differences between pairs of 16S rRNA gene sequences for *Enterococcus* species.

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| E._avium | 1 | | 0 | 0 | 3 | 3 | 3 | 3 | 3 | 0 |
| E._casseliflavus | 2 | 22 | | 0 | 3 | 3 | 3 | 3 | 3 | 0 |
| E._cecorum | 3 | 59 | 53 | | 3 | 3 | 3 | 3 | 3 | 0 |
| E._durans | 4 | 22 | 34 | 71 | | 0 | 0 | 0 | 0 | 3 |
| E._faecium | 5 | 24 | 35 | 74 | 7 | | 0 | 0 | 0 | 3 |
| E._faecalis | 6 | 66 | 62 | 90 | 59 | 55 | | 0 | 0 | 3 |
| E._hirae | 7 | 20 | 34 | 71 | 5 | 7 | 56 | | 0 | 3 |
| E._porcinus | 8 | 27 | 35 | 75 | 16 | 14 | 63 | 13 | | 3 |
| E._raffinosus | 9 | 5 | 20 | 59 | 23 | 25 | 67 | 21 | 26 | |

# Table S3

A matrix showing the nucleotides and deletions differences between pairs of *sodA* gene sequences for *Streptococcus* species.



| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S._acidominimus | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._adjacens | 2 | 162 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._anginosus | 3 | 104 | 155 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._australis | 4 | 103 | 141 | 96 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._canis | 5 | 113 | 163 | 115 | 120 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._constellatus | 6 | 105 | 152 | 53 | 93 | 122 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._cremoris | 7 | 157 | 169 | 146 | 158 | 157 | 159 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._criceti | 8 | 105 | 174 | 116 | 110 | 98 | 123 | 163 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._cristatus | 9 | 93 | 151 | 91 | 52 | 117 | 86 | 158 | 109 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._difficilis | 10 | 98 | 168 | 103 | 109 | 102 | 100 | 155 | 103 | 104 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._downei | 11 | 110 | 172 | 115 | 114 | 101 | 121 | 184 | 62 | 112 | 103 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._durans | 12 | 165 | 138 | 156 | 147 | 155 | 153 | 176 | 155 | 151 | 160 | 161 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._dysgalactiae | 13 | 119 | 158 | 113 | 122 | 30 | 118 | 161 | 103 | 120 | 102 | 107 | 154 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._equi | 14 | 124 | 166 | 122 | 123 | 71 | 130 | 165 | 114 | 120 | 115 | 107 | 160 | 78 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._equinus | 15 | 85 | 172 | 117 | 120 | 114 | 115 | 167 | 101 | 114 | 91 | 97 | 167 | 115 | 129 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._gallolyticus | 16 | 111 | 148 | 99 | 106 | 106 | 97 | 156 | 117 | 104 | 103 | 117 | 153 | 110 | 114 | 124 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._gordonii | 17 | 98 | 138 | 79 | 71 | 115 | 72 | 149 | 105 | 67 | 93 | 118 | 146 | 119 | 129 | 102 | 103 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._infantarius | 18 | 118 | 162 | 107 | 106 | 97 | 107 | 158 | 106 | 105 | 103 | 113 | 158 | 95 | 115 | 112 | 76 | 104 | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._infantis | 19 | 99 | 153 | 95 | 34 | 120 | 91 | 185 | 105 | 54 | 109 | 114 | 151 | 121 | 124 | 113 | 115 | 73 | 109 | | | | | | | | | | | | | | | | | | | | | | | | |
| S._intermedius | 20 | 107 | 152 | 64 | 96 | 123 | 38 | 151 | 120 | 88 | 104 | 130 | 158 | 125 | 130 | 122 | 102 | 70 | 108 | 89 | | | | | | | | | | | | | | | | | | | | | | | |
| S._mitis | 21 | 97 | 145 | 90 | 29 | 116 | 84 | 156 | 106 | 49 | 105 | 115 | 145 | 117 | 126 | 106 | 101 | 66 | 103 | 24 | 83 | | | | | | | | | | | | | | | | | | | | | | |
| S._mutans | 22 | 101 | 168 | 111 | 113 | 82 | 110 | 155 | 96 | 110 | 93 | 100 | 165 | 88 | 106 | 97 | 93 | 107 | 97 | 115 | 111 | 107 | | | | | | | | | | | | | | | | | | | | | |
| S._oligofermentans | 23 | 96 | 150 | 90 | 56 | 123 | 92 | 158 | 117 | 32 | 109 | 119 | 162 | 127 | 129 | 116 | 108 | 74 | 113 | 65 | 96 | 60 | 116 | | | | | | | | | | | | | | | | | | | | |
| S._oralis | 24 | 93 | 153 | 90 | 28 | 122 | 90 | 160 | 104 | 49 | 105 | 113 | 148 | 123 | 127 | 110 | 108 | 72 | 105 | 15 | 91 | 22 | 116 | 60 | | | | | | | | | | | | | | | | | | | |
| S._ovis | 25 | 85 | 157 | 93 | 90 | 111 | 101 | 158 | 105 | 88 | 90 | 111 | 162 | 108 | 113 | 90 | 106 | 87 | 107 | 85 | 103 | 84 | 107 | 90 | 88 | | | | | | | | | | | | | | | | | | |
| S._parasanguinis | 26 | 99 | 151 | 91 | 49 | 111 | 81 | 150 | 102 | 54 | 95 | 114 | 148 | 117 | 122 | 107 | 106 | 64 | 94 | 53 | 83 | 43 | 106 | 63 | 48 | 95 | | | | | | | | | | | | | | | | | |
| S._pasteurianus | 27 | 108 | 154 | 104 | 111 | 107 | 98 | 164 | 113 | 105 | 103 | 113 | 149 | 110 | 117 | 120 | 16 | 102 | 74 | 113 | 107 | 102 | 96 | 109 | 111 | 110 | 107 | | | | | | | | | | | | | | | | |
| S._pluranimalium | 28 | 112 | 150 | 111 | 104 | 97 | 121 | 153 | 105 | 106 | 96 | 96 | 148 | 92 | 109 | 111 | 113 | 114 | 108 | 108 | 125 | 104 | 102 | 115 | 111 | 101 | 105 | 116 | | | | | | | | | | | | | | | |
| S._pneumoniae | 29 | 92 | 145 | 92 | 34 | 113 | 88 | 154 | 105 | 47 | 105 | 111 | 150 | 115 | 124 | 103 | 106 | 66 | 106 | 25 | 90 | 13 | 109 | 60 | 26 | 84 | 48 | 107 | 98 | | | | | | | | | | | | | | |
| S._porcinus | 30 | 112 | 160 | 113 | 123 | 93 | 105 | 142 | 110 | 111 | 100 | 111 | 162 | 92 | 110 | 109 | 107 | 110 | 114 | 121 | 107 | 111 | 94 | 120 | 119 | 117 | 110 | 106 | 117 | | | | | | | | | | | | | | |
| S._pseudopneumoniae | 31 | 93 | 147 | 93 | 36 | 114 | 89 | 155 | 106 | 49 | 106 | 112 | 152 | 117 | 125 | 104 | 108 | 67 | 108 | 27 | 91 | 15 | 110 | 62 | 28 | 86 | 49 | 109 | 99 | 2 | 118 | | | | | | | | | | | | |
| S._pseudoporcinus | 32 | 109 | 166 | 117 | 118 | 90 | 109 | 152 | 104 | 108 | 101 | 112 | 170 | 88 | 102 | 107 | 111 | 113 | 110 | 116 | 111 | 113 | 93 | 117 | 119 | 104 | 116 | 114 | 112 | 118 | 27 | 119 | | | | | | | | | | | |
| S._pyogenes | 33 | 118 | 159 | 114 | 123 | 31 | 119 | 162 | 102 | 121 | 103 | 106 | 155 | 1 | 79 | 114 | 111 | 120 | 96 | 122 | 126 | 118 | 87 | 128 | 124 | 109 | 118 | 111 | 93 | 114 | 93 | 116 | 88 | | | | | | | | | | |
| S._saccharolyticus | 34 | 149 | 125 | 149 | 147 | 155 | 152 | 152 | 147 | 143 | 146 | 161 | 98 | 156 | 165 | 153 | 161 | 137 | 158 | 145 | 144 | 142 | 158 | 146 | 142 | 157 | 136 | 161 | 145 | 144 | 158 | 145 | 162 | 157 | | | | | | | | | |
| S._salivarius | 35 | 97 | 151 | 105 | 86 | 96 | 100 | 158 | 95 | 96 | 93 | 99 | 156 | 94 | 109 | 106 | 88 | 89 | 88 | 92 | 105 | 84 | 82 | 102 | 90 | 84 | 101 | 92 | 96 | 88 | 102 | 90 | 97 | 95 | 162 | | | | | | | | |
| S._sanguinis | 36 | 104 | 149 | 90 | 82 | 122 | 77 | 156 | 106 | 80 | 93 | 113 | 150 | 123 | 125 | 118 | 103 | 57 | 117 | 83 | 85 | 77 | 103 | 80 | 82 | 104 | 71 | 106 | 115 | 82 | 121 | 83 | 121 | 124 | 150 | 103 | | | | | | | |
| S._sinensis | 37 | 104 | 163 | 80 | 84 | 125 | 79 | 160 | 117 | 67 | 106 | 116 | 164 | 130 | 122 | 119 | 106 | 70 | 109 | 84 | 82 | 80 | 111 | 54 | 85 | 96 | 77 | 109 | 118 | 86 | 115 | 87 | 112 | 131 | 155 | 98 | 78 | | | | | | |
| S._sobrinus | 38 | 101 | 172 | 112 | 112 | 103 | 120 | 173 | 64 | 104 | 93 | 59 | 155 | 103 | 114 | 94 | 115 | 106 | 115 | 107 | 130 | 104 | 108 | 116 | 106 | 105 | 105 | 108 | 92 | 102 | 109 | 103 | 105 | 104 | 158 | 95 | 111 | 115 | | | | | |
| S._suis | 39 | 67 | 164 | 103 | 96 | 118 | 104 | 154 | 94 | 86 | 92 | 86 | 159 | 119 | 116 | 74 | 100 | 91 | 106 | 98 | 104 | 89 | 95 | 88 | 94 | 71 | 92 | 100 | 98 | 90 | 106 | 92 | 108 | 120 | 152 | 90 | 93 | 97 | 90 | | | | |
| S._tigurinus | 40 | 96 | 146 | 95 | 34 | 122 | 86 | 161 | 109 | 50 | 113 | 117 | 147 | 122 | 128 | 112 | 105 | 74 | 107 | 22 | 90 | 21 | 116 | 65 | 17 | 93 | 55 | 109 | 109 | 25 | 119 | 27 | 121 | 123 | 146 | 92 | 82 | 85 | 111 | 98 | | | |
| S._uberis | 41 | 113 | 160 | 112 | 111 | 85 | 113 | 149 | 100 | 112 | 92 | 101 | 157 | 87 | 104 | 103 | 111 | 105 | 109 | 111 | 112 | 102 | 93 | 121 | 112 | 98 | 103 | 111 | 89 | 103 | 86 | 105 | 93 | 86 | 142 | 97 | 114 | 117 | 109 | 103 | 108 | | |
| S._urinalis | 42 | 98 | 167 | 117 | 115 | 98 | 108 | 154 | 113 | 109 | 98 | 113 | 149 | 101 | 120 | 93 | 104 | 105 | 96 | 119 | 108 | 108 | 96 | 119 | 111 | 99 | 100 | 106 | 106 | 113 | 98 | 114 | 102 | 102 | 151 | 102 | 110 | 119 | 113 | 89 | 113 | 99 | |

Table S4

A matrix showing the nucleotides and deletions differences between pairs of *sodA* gene sequences for *Enterococcus* species.

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| E._avium | 1 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| E._casseliflavus | 2 | 96 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| E._cecorum | 3 | 119 | 114 | | 0 | 0 | 0 | 0 | 0 | 0 |
| E._durans | 4 | 112 | 98 | 121 | | 0 | 0 | 0 | 0 | 0 |
| E._faecium | 5 | 99 | 77 | 106 | 95 | | 0 | 0 | 0 | 0 |
| E._faecalis | 6 | 97 | 75 | 106 | 94 | 5 | | 0 | 0 | 0 |
| E._hirae | 7 | 96 | 80 | 105 | 62 | 78 | 80 | | 0 | 0 |
| E._porcinus | 8 | 118 | 105 | 113 | 70 | 99 | 100 | 60 | | 0 |
| E._raffinosus | 9 | 52 | 84 | 124 | 100 | 94 | 93 | 90 | 114 | |

Table S5

A matrix showing the nucleotides and deletions differences between pairs of *tuf* gene sequences for *Streptococcus* species.

| | # | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S._acidominimus | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._adjacens | 2 | 178 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._anginosus | 3 | 74 | 178 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._australis | 4 | 55 | 189 | 62 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._canis | 5 | 73 | 182 | 79 | 61 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._constellatus | 6 | 76 | 177 | 10 | 62 | 81 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._cremoris | 7 | 145 | 190 | 142 | 140 | 147 | 140 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._criceti | 8 | 77 | 195 | 82 | 82 | 99 | 82 | 154 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._cristatus | 9 | 55 | 185 | 72 | 43 | 63 | 68 | 137 | 79 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._difficilis | 10 | 64 | 178 | 67 | 59 | 57 | 66 | 148 | 85 | 52 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._downei | 11 | 83 | 199 | 78 | 88 | 106 | 82 | 160 | 25 | 80 | 80 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._durans | 12 | 176 | 103 | 186 | 181 | 168 | 187 | 187 | 199 | 183 | 176 | 204 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._dysgalactiae | 13 | 65 | 186 | 81 | 56 | 34 | 82 | 142 | 101 | 61 | 48 | 105 | 179 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._equi | 14 | 78 | 193 | 82 | 65 | 61 | 84 | 155 | 99 | 75 | 64 | 100 | 192 | 65 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._equinus | 15 | 53 | 175 | 89 | 55 | 75 | 89 | 142 | 86 | 58 | 67 | 87 | 183 | 74 | 84 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._gallolyticus | 16 | 66 | 183 | 53 | 55 | 69 | 55 | 134 | 70 | 52 | 51 | 73 | 185 | 66 | 67 | 67 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._gordonii | 17 | 54 | 176 | 65 | 37 | 64 | 67 | 131 | 81 | 34 | 58 | 84 | 179 | 61 | 72 | 61 | 48 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._infantarius | 18 | 73 | 186 | 62 | 62 | 69 | 62 | 133 | 75 | 57 | 58 | 82 | 191 | 72 | 74 | 65 | 18 | 59 | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._infantis | 19 | 59 | 185 | 64 | 35 | 62 | 66 | 136 | 84 | 42 | 61 | 88 | 178 | 57 | 66 | 65 | 56 | 47 | 65 | | | | | | | | | | | | | | | | | | | | | | | | |
| S._intermedius | 20 | 71 | 182 | 17 | 63 | 84 | 19 | 142 | 84 | 69 | 67 | 84 | 183 | 81 | 84 | 90 | 54 | 66 | 61 | 64 | | | | | | | | | | | | | | | | | | | | | | | |
| S._mitis | 21 | 61 | 186 | 64 | 24 | 65 | 66 | 134 | 88 | 45 | 63 | 93 | 176 | 58 | 75 | 60 | 58 | 37 | 65 | 30 | 63 | | | | | | | | | | | | | | | | | | | | | | |
| S._mutans | 22 | 89 | 175 | 79 | 98 | 97 | 80 | 160 | 81 | 88 | 87 | 83 | 185 | 104 | 97 | 98 | 67 | 90 | 73 | 97 | 80 | 101 | | | | | | | | | | | | | | | | | | | | | |
| S._oligofermentans | 23 | 52 | 185 | 70 | 39 | 61 | 72 | 137 | 78 | 14 | 53 | 83 | 179 | 58 | 72 | 58 | 53 | 32 | 57 | 41 | 71 | 44 | 91 | | | | | | | | | | | | | | | | | | | | | |
| S._oralis | 24 | 55 | 184 | 64 | 34 | 58 | 66 | 135 | 92 | 38 | 58 | 91 | 177 | 51 | 72 | 59 | 60 | 41 | 67 | 18 | 63 | 24 | 105 | 35 | | | | | | | | | | | | | | | | | | | | |
| S._ovis | 25 | 45 | 182 | 79 | 69 | 72 | 81 | 132 | 81 | 57 | 71 | 86 | 185 | 70 | 87 | 59 | 69 | 46 | 77 | 63 | 81 | 60 | 92 | 56 | 59 | | | | | | | | | | | | | | | | | | |
| S._parasanguinis | 26 | 50 | 176 | 63 | 39 | 60 | 65 | 145 | 76 | 44 | 54 | 77 | 179 | 57 | 66 | 57 | 50 | 38 | 56 | 45 | 66 | 49 | 89 | 38 | 44 | 60 | | | | | | | | | | | | | | | | | |
| S._pasteurianus | 27 | 66 | 185 | 56 | 57 | 71 | 58 | 139 | 70 | 51 | 51 | 71 | 185 | 67 | 73 | 66 | 10 | 55 | 23 | 58 | 56 | 63 | 68 | 53 | 61 | 76 | 54 | | | | | | | | | | | | | | | | |
| S._pluranimalium | 28 | 66 | 177 | 78 | 80 | 84 | 78 | 136 | 75 | 80 | 67 | 80 | 182 | 80 | 84 | 69 | 66 | 70 | 70 | 81 | 79 | 79 | 90 | 79 | 83 | 70 | 72 | 71 | | | | | | | | | | | | | | | |
| S._pneumoniae | 29 | 61 | 187 | 66 | 28 | 63 | 68 | 133 | 93 | 47 | 64 | 96 | 175 | 57 | 75 | 64 | 58 | 57 | 64 | 11 | 103 | 44 | 21 | 60 | 49 | 63 | 80 | 74 | 64 | | | | | | | | | | | | | | |
| S._porcinus | 30 | 63 | 184 | 77 | 59 | 60 | 79 | 148 | 93 | 64 | 51 | 92 | 184 | 47 | 71 | 76 | 70 | 68 | 76 | 58 | 79 | 66 | 91 | 62 | 55 | 71 | 63 | 68 | 74 | 64 | | | | | | | | | | | | | |
| S._pseudopneumoniae | 31 | 60 | 183 | 66 | 25 | 65 | 68 | 135 | 90 | 46 | 64 | 95 | 177 | 56 | 75 | 61 | 59 | 37 | 66 | 29 | 65 | 7 | 102 | 43 | 21 | 59 | 48 | 64 | 79 | 6 | 61 | | | | | | | | | | | | |
| S._pseudoporcinus | 32 | 62 | 183 | 78 | 62 | 53 | 79 | 147 | 93 | 64 | 47 | 91 | 180 | 39 | 70 | 75 | 71 | 68 | 79 | 58 | 76 | 60 | 95 | 63 | 51 | 68 | 58 | 71 | 73 | 59 | 24 | 60 | | | | | | | | | | | |
| S._pyogenes | 33 | 69 | 185 | 79 | 61 | 19 | 83 | 145 | 99 | 63 | 55 | 105 | 181 | 21 | 55 | 75 | 65 | 62 | 68 | 60 | 83 | 61 | 103 | 59 | 56 | 72 | 58 | 70 | 80 | 62 | 54 | 61 | 47 | | | | | | | | | | |
| S._saccharolyticus | 34 | 183 | 91 | 187 | 195 | 193 | 188 | 194 | 192 | 187 | 187 | 198 | 77 | 189 | 205 | 184 | 190 | 191 | 188 | 188 | 184 | 191 | 180 | 186 | 187 | 190 | 185 | 187 | 176 | 189 | 187 | 190 | 182 | 192 | | | | | | | | | |
| S._salivarius | 35 | 68 | 178 | 67 | 52 | 69 | 65 | 145 | 69 | 56 | 56 | 76 | 181 | 67 | 74 | 56 | 61 | 56 | 66 | 61 | 69 | 61 | 91 | 55 | 56 | 68 | 48 | 65 | 72 | 62 | 69 | 60 | 68 | 69 | 183 | | | | | | | | |
| S._sanguinis | 36 | 57 | 183 | 72 | 47 | 68 | 72 | 137 | 82 | 36 | 67 | 87 | 178 | 65 | 83 | 70 | 60 | 22 | 67 | 53 | 73 | 44 | 95 | 34 | 49 | 51 | 42 | 63 | 77 | 44 | 70 | 43 | 73 | 64 | 189 | 65 | | | | | | | |
| S._sinensis | 37 | 68 | 184 | 75 | 59 | 84 | 72 | 140 | 81 | 43 | 66 | 79 | 186 | 78 | 76 | 75 | 59 | 46 | 63 | 57 | 72 | 56 | 80 | 50 | 56 | 70 | 48 | 59 | 84 | 60 | 75 | 57 | 79 | 80 | 191 | 68 | 50 | | | | | | |
| S._sobrinus | 38 | 81 | 196 | 84 | 88 | 101 | 88 | 153 | 31 | 82 | 87 | 38 | 195 | 101 | 98 | 86 | 75 | 85 | 77 | 90 | 86 | 93 | 80 | 83 | 96 | 86 | 81 | 75 | 77 | 95 | 96 | 95 | 94 | 99 | 193 | 70 | 82 | 83 | | | | | |
| S._suis | 39 | 44 | 178 | 83 | 52 | 73 | 83 | 142 | 84 | 55 | 66 | 85 | 184 | 68 | 76 | 16 | 64 | 55 | 65 | 63 | 84 | 57 | 95 | 53 | 56 | 53 | 50 | 65 | 65 | 56 | 74 | 54 | 71 | 71 | 185 | 53 | 64 | 72 | 83 | | | | |
| S._tigurinus | 40 | 58 | 184 | 63 | 34 | 61 | 65 | 135 | 83 | 41 | 62 | 89 | 177 | 56 | 65 | 66 | 55 | 46 | 64 | 1 | 63 | 29 | 96 | 40 | 19 | 62 | 44 | 57 | 80 | 31 | 59 | 28 | 59 | 59 | 187 | 60 | 52 | 56 | 89 | 62 | | | |
| S._uberis | 41 | 61 | 177 | 72 | 57 | 40 | 73 | 146 | 93 | 54 | 54 | 94 | 184 | 41 | 73 | 65 | 65 | 63 | 66 | 54 | 71 | 59 | 100 | 52 | 50 | 70 | 51 | 61 | 75 | 57 | 50 | 58 | 41 | 45 | 185 | 61 | 68 | 71 | 97 | 63 | 53 | | |
| S._urinalis | 42 | 74 | 182 | 67 | 77 | 76 | 68 | 138 | 80 | 74 | 54 | 85 | 183 | 68 | 81 | 88 | 55 | 69 | 67 | 78 | 67 | 78 | 86 | 74 | 80 | 86 | 71 | 55 | 72 | 77 | 72 | 81 | 67 | 72 | 182 | 75 | 78 | 75 | 92 | 84 | 77 | 59 | |

Table S6

A matrix showing the nucleotides and deletions differences between pairs of *tuf* gene sequences for *Enterococcus* species.

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| E._avium | 1 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| E._casseliflavus | 2 | 70 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| E._cecorum | 3 | 71 | 76 | | 0 | 0 | 0 | 0 | 0 | 0 |
| E._durans | 4 | 80 | 75 | 72 | | 0 | 0 | 0 | 0 | 0 |
| E._faecium | 5 | 86 | 71 | 75 | 28 | | 0 | 0 | 0 | 0 |
| E._faecalis | 6 | 69 | 73 | 75 | 89 | 93 | | 0 | 0 | 0 |
| E._hirae | 7 | 80 | 73 | 70 | 10 | 26 | 87 | | 0 | 0 |
| E._porcinus | 8 | 107 | 99 | 99 | 57 | 72 | 114 | 57 | | 0 |
| E._raffinosus | 9 | 19 | 73 | 72 | 81 | 83 | 74 | 82 | 104 | |

# Table S7

A matrix showing the nucleotides and deletions differences between pairs of *rpoB* gene sequences for *Streptococcus* species.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S._acidominimus (1) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._adjacens (2) | 172 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._anginosus (3) | 113 | 172 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._australis (4) | 91 | 165 | 103 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._canis (5) | 109 | 160 | 108 | 99 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._constellatus (6) | 110 | 175 | 58 | 109 | 112 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._cremoris (7) | 134 | 140 | 148 | 133 | 132 | 153 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._criceti (8) | 113 | 178 | 132 | 122 | 114 | 140 | 156 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._cristatus (9) | 97 | 175 | 104 | 78 | 91 | 106 | 136 | 112 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._difficilis (10) | 113 | 165 | 105 | 100 | 84 | 113 | 127 | 123 | 119 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._downei (11) | 117 | 180 | 138 | 129 | 111 | 139 | 167 | 70 | 115 | 130 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._durans (12) | 153 | 123 | 149 | 148 | 140 | 149 | 139 | 154 | 141 | 142 | 163 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._dysgalactiae (13) | 107 | 167 | 93 | 86 | 47 | 103 | 136 | 108 | 94 | 96 | 107 | 144 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._equi (14) | 121 | 180 | 120 | 119 | 95 | 117 | 154 | 112 | 108 | 104 | 118 | 154 | 90 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._equinus (15) | 103 | 182 | 111 | 96 | 87 | 111 | 148 | 129 | 97 | 103 | 129 | 157 | 97 | 115 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._gallolyticus (16) | 108 | 161 | 88 | 76 | 82 | 94 | 127 | 121 | 84 | 99 | 123 | 139 | 75 | 104 | 104 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._gordonii (17) | 100 | 172 | 110 | 88 | 100 | 113 | 141 | 111 | 69 | 109 | 117 | 154 | 91 | 103 | 96 | 97 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._infantarius (18) | 102 | 158 | 96 | 72 | 77 | 106 | 122 | 116 | 90 | 98 | 118 | 139 | 79 | 113 | 97 | 46 | 108 | | | | | | | | | | | | | | | | | | | | | | | | | |
| S._infantis (19) | 101 | 170 | 111 | 51 | 103 | 113 | 135 | 123 | 71 | 110 | 118 | 151 | 94 | 115 | 94 | 90 | 91 | 82 | | | | | | | | | | | | | | | | | | | | | | | | |
| S._intermedius (20) | 116 | 179 | 77 | 118 | 127 | 81 | 151 | 135 | 112 | 116 | 147 | 155 | 121 | 131 | 122 | 102 | 120 | 104 | 122 | | | | | | | | | | | | | | | | | | | | | | | |
| S._mitis (21) | 89 | 170 | 103 | 48 | 98 | 101 | 128 | 118 | 70 | 100 | 120 | 141 | 89 | 110 | 93 | 80 | 87 | 80 | 37 | 122 | | | | | | | | | | | | | | | | | | | | | | |
| S._mutans (22) | 116 | 167 | 114 | 112 | 101 | 121 | 145 | 118 | 115 | 98 | 123 | 154 | 92 | 92 | 101 | 109 | 111 | 105 | 113 | 127 | 113 | | | | | | | | | | | | | | | | | | | | | |
| S._oligofermentans (23) | 102 | 178 | 109 | 71 | 91 | 107 | 140 | 126 | 53 | 119 | 122 | 150 | 84 | 110 | 99 | 90 | 66 | 96 | 72 | 124 | 65 | 120 | | | | | | | | | | | | | | | | | | | | |
| S._oralis (24) | 102 | 166 | 112 | 47 | 94 | 102 | 135 | 121 | 76 | 110 | 122 | 148 | 86 | 107 | 99 | 84 | 83 | 80 | 33 | 119 | 43 | 109 | 63 | | | | | | | | | | | | | | | | | | | |
| S._ovis (25) | 99 | 181 | 119 | 92 | 107 | 111 | 151 | 114 | 93 | 106 | 119 | 164 | 106 | 110 | 94 | 102 | 98 | 106 | 97 | 120 | 96 | 118 | 100 | 97 | | | | | | | | | | | | | | | | | | |
| S._parasanguinis (26) | 101 | 177 | 96 | 90 | 96 | 92 | 138 | 128 | 82 | 105 | 130 | 142 | 96 | 112 | 97 | 82 | 82 | 85 | 92 | 99 | 86 | 128 | 92 | 84 | 90 | | | | | | | | | | | | | | | | | |
| S._pasteurianus (27) | 109 | 162 | 87 | 77 | 83 | 93 | 125 | 123 | 85 | 96 | 122 | 140 | 76 | 106 | 103 | 3 | 98 | 43 | 89 | 99 | 81 | 108 | 91 | 85 | 104 | 79 | | | | | | | | | | | | | | | | |
| S._pluranimalium (28) | 102 | 161 | 108 | 88 | 73 | 115 | 130 | 115 | 103 | 91 | 123 | 142 | 75 | 91 | 95 | 84 | 109 | 82 | 103 | 114 | 97 | 90 | 106 | 97 | 104 | 98 | 84 | | | | | | | | | | | | | | | |
| S._pneumoniae (29) | 92 | 169 | 110 | 50 | 97 | 107 | 128 | 121 | 74 | 104 | 120 | 143 | 88 | 114 | 91 | 83 | 93 | 77 | 39 | 123 | 32 | 110 | 69 | 39 | 100 | 92 | 82 | 90 | | | | | | | | | | | | | | |
| S._porcinus (30) | 108 | 157 | 124 | 97 | 97 | 129 | 124 | 118 | 111 | 108 | 124 | 142 | 104 | 116 | 117 | 87 | 112 | 88 | 112 | 126 | 106 | 108 | 113 | 102 | 113 | 108 | 89 | 100 | 104 | | | | | | | | | | | | | |
| S._pseudopneumoniae (31) | 91 | 160 | 107 | 43 | 100 | 103 | 129 | 124 | 75 | 101 | 126 | 139 | 90 | 114 | 98 | 78 | 92 | 78 | 36 | 124 | 26 | 106 | 69 | 37 | 97 | 88 | 79 | 96 | 37 | 105 | | | | | | | | | | | | |
| S._pseudoporcinus (32) | 100 | 158 | 117 | 101 | 93 | 122 | 120 | 119 | 99 | 96 | 117 | 148 | 97 | 114 | 107 | 93 | 105 | 102 | 106 | 121 | 106 | 104 | 104 | 102 | 105 | 108 | 94 | 96 | 98 | 76 | 106 | | | | | | | | | | | |
| S._pyogenes (33) | 120 | 174 | 97 | 96 | 63 | 103 | 146 | 110 | 98 | 103 | 112 | 147 | 39 | 88 | 106 | 75 | 103 | 84 | 104 | 121 | 98 | 100 | 98 | 95 | 108 | 104 | 77 | 83 | 97 | 102 | 103 | 101 | | | | | | | | | | |
| S._saccharolyticus (34) | 156 | 121 | 165 | 165 | 144 | 173 | 153 | 169 | 160 | 159 | 180 | 98 | 150 | 165 | 165 | 148 | 167 | 146 | 168 | 173 | 171 | 167 | 168 | 166 | 181 | 164 | 150 | 151 | 164 | 143 | 170 | 150 | 157 | | | | | | | | | |
| S._salivarius (35) | 93 | 154 | 92 | 67 | 73 | 92 | 131 | 112 | 76 | 85 | 112 | 140 | 71 | 91 | 88 | 55 | 90 | 59 | 75 | 102 | 70 | 107 | 81 | 64 | 90 | 67 | 56 | 66 | 69 | 93 | 72 | 94 | 72 | 151 | | | | | | | | |
| S._sanguinis (36) | 96 | 182 | 110 | 95 | 108 | 114 | 140 | 117 | 74 | 111 | 120 | 160 | 106 | 118 | 98 | 100 | 61 | 109 | 99 | 112 | 101 | 123 | 72 | 97 | 91 | 91 | 101 | 114 | 96 | 117 | 106 | 98 | 113 | 170 | 92 | | | | | | | |
| S._sinensis (37) | 98 | 177 | 113 | 92 | 107 | 111 | 143 | 115 | 70 | 115 | 120 | 147 | 103 | 120 | 97 | 102 | 61 | 112 | 89 | 117 | 88 | 127 | 66 | 93 | 85 | 86 | 105 | 124 | 98 | 114 | 99 | 100 | 104 | 170 | 94 | 47 | | | | | | |
| S._sobrinus (38) | 112 | 182 | 139 | 116 | 112 | 135 | 150 | 73 | 100 | 124 | 66 | 163 | 114 | 109 | 125 | 118 | 113 | 117 | 116 | 142 | 115 | 119 | 112 | 113 | 111 | 116 | 120 | 114 | 117 | 115 | 118 | 110 | 117 | 167 | 104 | 114 | 115 | | | | | |
| S._suis (39) | 107 | 163 | 114 | 95 | 82 | 111 | 152 | 128 | 94 | 100 | 123 | 150 | 90 | 114 | 17 | 104 | 96 | 96 | 87 | 117 | 94 | 106 | 100 | 92 | 92 | 92 | 103 | 90 | 86 | 120 | 97 | 104 | 101 | 159 | 80 | 94 | 95 | 121 | | | | |
| S._tigurinus (40) | 100 | 166 | 114 | 46 | 89 | 106 | 132 | 121 | 74 | 101 | 118 | 146 | 80 | 114 | 98 | 89 | 84 | 83 | 30 | 124 | 43 | 111 | 64 | 37 | 92 | 93 | 88 | 95 | 43 | 113 | 38 | 102 | 94 | 168 | 73 | 89 | 85 | 114 | 89 | | | |
| S._uberis (41) | 115 | 149 | 128 | 113 | 115 | 121 | 131 | 123 | 119 | 110 | 140 | 147 | 117 | 115 | 121 | 104 | 113 | 113 | 113 | 122 | 110 | 112 | 115 | 106 | 123 | 119 | 104 | 103 | 111 | 96 | 110 | 97 | 119 | 149 | 107 | 119 | 122 | 131 | 124 | 111 | | |
| S._urinalis (42) | 110 | 145 | 107 | 106 | 98 | 116 | 132 | 118 | 110 | 91 | 126 | 132 | 97 | 111 | 110 | 91 | 117 | 92 | 111 | 117 | 104 | 110 | 112 | 107 | 111 | 109 | 92 | 96 | 110 | 94 | 108 | 98 | 101 | 146 | 93 | 120 | 116 | 116 | 115 | 109 | 95 | |

Table S8

A matrix showing the nucleotides and deletions differences between pairs of *rpoB* gene sequences for *Enterococcus* species.

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| E._avium | 1 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| E._casseliflavus | 2 | 118 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| E._cecorum | 3 | 113 | 110 | | 0 | 0 | 0 | 0 | 0 | 0 |
| E._durans | 4 | 108 | 98 | 98 | | 0 | 0 | 0 | 0 | 0 |
| E._faecium | 5 | 114 | 99 | 101 | 62 | | 0 | 0 | 0 | 0 |
| E._faecalis | 6 | 103 | 94 | 94 | 99 | 92 | | 0 | 0 | 0 |
| E._hirae | 7 | 116 | 115 | 94 | 69 | 71 | 104 | | 0 | 0 |
| E._porcinus | 8 | 114 | 113 | 94 | 83 | 77 | 83 | 71 | | 0 |
| E._raffinosus | 9 | 64 | 102 | 113 | 103 | 118 | 92 | 117 | 109 | |

Table S9

A matrix showing the nucleotides and deletions differences between pairs of 16S-23S rRNA region sequences for *Streptococcus* species.

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S_acidominimus | 1 | | 425 | 111 | 244 | 279 | 170 | 287 | 235 | 236 | 287 | 236 | 322 | 279 | 167 | 258 | 292 | 247 | 270 | 240 | 217 | 240 | 182 | 235 | 238 | 283 | 237 | 262 | 290 | 240 | 182 | 242 | 168 | 150 | 405 | 269 | 223 | 242 | 250 | 390 | 241 | 274 | 290 |
| S_adjacens | 2 | 1055 | | 372 | 241 | 274 | 301 | 266 | 554 | 259 | 274 | 479 | 143 | 274 | 384 | 547 | 215 | 244 | 219 | 239 | 256 | 237 | 359 | 256 | 237 | 298 | 244 | 213 | 275 | 237 | 455 | 237 | 417 | 399 | 42 | 216 | 248 | 251 | 371 | 343 | 238 | 329 | 273 |
| S_anginosus | 3 | 415 | 991 | | 167 | 258 | 79 | 234 | 292 | 159 | 288 | 301 | 267 | 258 | 86 | 343 | 203 | 152 | 205 | 163 | 128 | 169 | 101 | 158 | 165 | 260 | 162 | 201 | 281 | 167 | 185 | 165 | 153 | 119 | 346 | 204 | 166 | 149 | 319 | 385 | 164 | 253 | 267 |
| S_australis | 4 | 495 | 830 | 391 | | 157 | 94 | 95 | 435 | 30 | 159 | 352 | 166 | 157 | 223 | 492 | 58 | 35 | 60 | 4 | 51 | 10 | 202 | 29 | 6 | 163 | 13 | 56 | 164 | 10 | 332 | 8 | 294 | 262 | 210 | 55 | 39 | 38 | 262 | 280 | 5 | 204 | 164 |
| S_canis | 5 | 570 | 870 | 519 | 392 | | 209 | 202 | 414 | 165 | 14 | 363 | 187 | 2 | 264 | 451 | 139 | 158 | 129 | 153 | 180 | 159 | 257 | 160 | 155 | 108 | 158 | 135 | 39 | 157 | 265 | 155 | 203 | 147 | 242 | 136 | 160 | 161 | 227 | 195 | 152 | 65 | 17 |
| S_constellatus | 6 | 456 | 905 | 248 | 292 | 474 | | 161 | 355 | 90 | 213 | 288 | 202 | 209 | 155 | 406 | 128 | 81 | 132 | 90 | 53 | 96 | 132 | 91 | 92 | 205 | 89 | 126 | 210 | 96 | 252 | 94 | 222 | 190 | 275 | 129 | 101 | 82 | 260 | 326 | 91 | 238 | 216 |
| S_cremoris | 7 | 814 | 951 | 740 | 588 | 682 | 666 | | 434 | 101 | 204 | 355 | 177 | 204 | 282 | 439 | 123 | 110 | 125 | 91 | 122 | 93 | 263 | 100 | 93 | 220 | 94 | 121 | 213 | 95 | 293 | 93 | 259 | 303 | 244 | 126 | 92 | 109 | 269 | 303 | 92 | 207 | 211 |
| S_criceti | 8 | 717 | 1208 | 714 | 784 | 782 | 753 | 983 | | 441 | 418 | 115 | 421 | 412 | 258 | 251 | 403 | 428 | 403 | 433 | 408 | 433 | 263 | 442 | 437 | 400 | 426 | 407 | 399 | 439 | 183 | 437 | 239 | 277 | 524 | 400 | 430 | 433 | 241 | 525 | 432 | 363 | 421 |
| S_cristatus | 9 | 456 | 841 | 349 | 178 | 407 | 272 | 592 | 782 | | 169 | 350 | 182 | 165 | 219 | 486 | 72 | 23 | 72 | 26 | 47 | 32 | 200 | 5 | 28 | 161 | 29 | 70 | 176 | 32 | 324 | 30 | 292 | 260 | 235 | 69 | 23 | 12 | 272 | 273 | 25 | 204 | 172 |
| S_difficilis | 10 | 574 | 883 | 549 | 382 | 211 | 482 | 683 | 793 | 404 | | 367 | 189 | 14 | 288 | 457 | 145 | 164 | 135 | 155 | 182 | 161 | 263 | 164 | 157 | 104 | 160 | 141 | 33 | 159 | 271 | 157 | 209 | 153 | 242 | 138 | 162 | 165 | 231 | 197 | 154 | 71 | 13 |
| S_downei | 11 | 694 | 1124 | 678 | 662 | 719 | 640 | 915 | 419 | 656 | 710 | | 356 | 361 | 281 | 266 | 328 | 341 | 328 | 350 | 325 | 356 | 270 | 351 | 354 | 327 | 343 | 332 | 348 | 356 | 204 | 354 | 266 | 300 | 449 | 331 | 341 | 342 | 146 | 458 | 349 | 320 | 370 |
| S_durans | 12 | 923 | 573 | 848 | 680 | 751 | 775 | 797 | 1067 | 712 | 738 | 985 | | 187 | 279 | 430 | 138 | 165 | 136 | 162 | 177 | 162 | 258 | 179 | 162 | 219 | 167 | 136 | 182 | 162 | 334 | 162 | 298 | 298 | 115 | 135 | 171 | 172 | 250 | 284 | 161 | 234 | 192 |
| S_dysgalactiae | 13 | 563 | 881 | 538 | 381 | 101 | 482 | 660 | 798 | 408 | 175 | 729 | 743 | | 286 | 451 | 141 | 160 | 131 | 153 | 180 | 159 | 257 | 160 | 155 | 108 | 156 | 137 | 39 | 157 | 267 | 155 | 205 | 145 | 242 | 136 | 160 | 161 | 225 | 195 | 152 | 67 | 15 |
| S_equi | 14 | 556 | 1000 | 423 | 500 | 493 | 501 | 770 | 697 | 504 | 521 | 692 | 860 | 520 | | 355 | 149 | 228 | 195 | 221 | 206 | 225 | 83 | 220 | 221 | 272 | 218 | 197 | 257 | 225 | 189 | 225 | 159 | 123 | 300 | 208 | 228 | 227 | 331 | 397 | 220 | 261 | 267 |
| S_equinus | 15 | 595 | 1194 | 643 | 714 | 728 | 712 | 968 | 817 | 712 | 740 | 781 | 1047 | 721 | 723 | | 482 | 481 | 462 | 488 | 453 | 486 | 378 | 483 | 486 | 457 | 485 | 462 | 452 | 486 | 198 | 488 | 258 | 318 | 531 | 459 | 473 | 476 | 328 | 324 | 487 | 404 | 464 |
| S_gallolyticus | 16 | 542 | 851 | 432 | 293 | 361 | 395 | 601 | 745 | 305 | 363 | 651 | 700 | 371 | 439 | 711 | | 71 | 10 | 56 | 85 | 62 | 184 | 73 | 58 | 149 | 53 | 4 | 146 | 62 | 306 | 62 | 268 | 248 | 195 | 19 | 75 | 80 | 238 | 256 | 55 | 176 | 148 |
| S_gordonii | 17 | 478 | 834 | 331 | 174 | 402 | 273 | 625 | 764 | 132 | 394 | 636 | 689 | 403 | 495 | 725 | 298 | | 71 | 31 | 36 | 37 | 191 | 24 | 33 | 156 | 34 | 71 | 161 | 37 | 325 | 35 | 293 | 265 | 218 | 72 | 38 | 15 | 253 | 279 | 30 | 199 | 167 |
| S_infantarius | 18 | 553 | 838 | 445 | 281 | 352 | 399 | 589 | 748 | 336 | 659 | 698 | 358 | 437 | 706 | | 61 | 301 | | 58 | 89 | 64 | 192 | 71 | 60 | 141 | 55 | 10 | 138 | 64 | 304 | 64 | 266 | 238 | 191 | 17 | 77 | 78 | 236 | 250 | 57 | 170 | 138 |
| S_infantis | 19 | 490 | 832 | 381 | 45 | 388 | 289 | 584 | 781 | 171 | 383 | 656 | 680 | 377 | 491 | 717 | 285 | 172 | 284 | | 47 | 8 | 198 | 25 | 4 | 161 | 11 | 54 | 162 | 8 | 328 | 6 | 290 | 258 | 215 | 55 | 35 | 34 | 260 | 276 | 1 | 200 | 160 |
| S_intermedius | 20 | 477 | 866 | 270 | 239 | 427 | 157 | 626 | 770 | 224 | 444 | 645 | 732 | 448 | 511 | 733 | 333 | 195 | 335 | 240 | | 49 | 175 | 46 | 45 | 164 | 44 | 83 | 183 | 47 | 301 | 49 | 271 | 241 | 230 | 84 | 54 | 37 | 267 | 285 | 48 | 217 | 185 |
| S_mitis | 21 | 501 | 827 | 386 | 52 | 397 | 294 | 584 | 779 | 182 | 385 | 660 | 678 | 383 | 490 | 712 | 294 | 186 | 291 | 58 | 248 | | 206 | 31 | 4 | 165 | 17 | 60 | 168 | 2 | 334 | 4 | 296 | 264 | 215 | 61 | 41 | 40 | 262 | 272 | 9 | 206 | 166 |
| S_mutans | 22 | 665 | 1002 | 510 | 548 | 638 | 537 | 823 | 740 | 544 | 637 | 709 | 892 | 645 | 514 | 847 | 531 | 523 | 535 | 542 | 540 | 555 | | 201 | 202 | 265 | 197 | 188 | 248 | 206 | 220 | 204 | 190 | 164 | 335 | 195 | 209 | 154 | 292 | 394 | 197 | 270 | 262 |
| S_oligofermentans | 23 | 464 | 844 | 357 | 190 | 405 | 285 | 589 | 797 | 49 | 405 | 669 | 718 | 404 | 507 | 710 | 314 | 151 | 305 | 192 | 226 | 202 | 554 | | 27 | 160 | 30 | 69 | 175 | 29 | 318 | 27 | 287 | 255 | 232 | 68 | 22 | 9 | 273 | 277 | 24 | 199 | 167 |
| S_oralis | 24 | 492 | 823 | 388 | 48 | 384 | 292 | 587 | 783 | 178 | 380 | 655 | 678 | 370 | 487 | 705 | 292 | 179 | 285 | 53 | 239 | 27 | 553 | 197 | | 163 | 15 | 56 | 164 | 6 | 330 | 6 | 292 | 260 | 215 | 57 | 37 | 36 | 260 | 274 | 5 | 202 | 162 |
| S_ovis | 25 | 567 | 877 | 520 | 373 | 352 | 455 | 708 | 739 | 386 | 374 | 647 | 761 | 356 | 549 | 651 | 388 | 374 | 380 | 374 | 415 | 379 | 642 | 393 | 378 | | 154 | 147 | 97 | 163 | 315 | 161 | 201 | 264 | 142 | 150 | 151 | 228 | 161 | 160 | 143 | 143 | 113 |
| S_parasanguinis | 26 | 486 | 833 | 381 | 156 | 384 | 299 | 574 | 754 | 210 | 385 | 654 | 680 | 379 | 477 | 715 | 268 | 222 | 270 | 154 | 234 | 166 | 557 | 221 | 166 | 381 | | 51 | 165 | 19 | 326 | 17 | 291 | 257 | 220 | 52 | 34 | 37 | 257 | 271 | 12 | 201 | 163 |
| S_pasteurianus | 27 | 543 | 844 | 431 | 285 | 359 | 393 | 597 | 751 | 300 | 358 | 659 | 689 | 367 | 442 | 708 | 28 | 297 | 59 | 280 | 331 | 289 | 537 | 312 | 285 | 391 | 267 | | 144 | 60 | 304 | 60 | 266 | 242 | 193 | 15 | 73 | 76 | 242 | 256 | 53 | 178 | 144 |
| S_pluranimalium | 28 | 585 | 891 | 541 | 432 | 271 | 493 | 706 | 764 | 416 | 275 | 688 | 759 | 281 | 545 | 747 | 377 | 406 | 363 | 431 | 449 | 427 | 634 | 410 | 422 | 353 | 408 | 378 | | 168 | 294 | 166 | 234 | 176 | 241 | 141 | 171 | 168 | 212 | 204 | 161 | 100 | 40 |
| S_pneumoniae | 29 | 502 | 830 | 386 | 63 | 394 | 299 | 589 | 784 | 188 | 387 | 661 | 681 | 387 | 486 | 717 | 296 | 189 | 297 | 62 | 249 | 22 | 558 | 207 | 35 | 381 | 179 | 291 | 433 | | 332 | 2 | 294 | 262 | 215 | 61 | 39 | 38 | 262 | 272 | 9 | 204 | 164 |
| S_porcinus | 30 | 580 | 1088 | 551 | 622 | 428 | 599 | 847 | 760 | 610 | 502 | 728 | 945 | 455 | 541 | 633 | 593 | 614 | 577 | 624 | 626 | 614 | 711 | 612 | 605 | 610 | 612 | 587 | 554 | 613 | | 330 | 64 | 130 | 425 | 307 | 319 | 320 | 264 | 408 | 327 | 210 | 274 |
| S_pseudopneumoniae | 31 | 503 | 828 | 385 | 57 | 394 | 291 | 587 | 780 | 183 | 384 | 657 | 683 | 383 | 488 | 717 | 295 | 187 | 295 | 56 | 248 | 18 | 556 | 202 | 33 | 375 | 167 | 291 | 429 | 20 | 610 | | 292 | 260 | 215 | 61 | 37 | 36 | 264 | 274 | 7 | 202 | 162 |
| S_pseudoporcinus | 32 | 539 | 1058 | 513 | 572 | 384 | 568 | 806 | 769 | 561 | 431 | 751 | 898 | 393 | 504 | 652 | 547 | 567 | 540 | 571 | 591 | 566 | 670 | 559 | 565 | 557 | 557 | 544 | 500 | 562 | 148 | 562 | | 70 | 335 | 269 | 265 | 288 | 272 | 346 | 289 | 148 | 214 |
| S_pyogenes | 33 | 525 | 1008 | 486 | 509 | 265 | 525 | 804 | 735 | 522 | 317 | 709 | 876 | 254 | 457 | 696 | 478 | 513 | 467 | 513 | 517 | 520 | 633 | 520 | 508 | 456 | 498 | 472 | 410 | 516 | 389 | 516 | 330 | | 365 | 243 | 255 | 256 | 306 | 298 | 257 | 144 | 150 |
| S_saccharolyticus | 34 | 689 | 500 | 909 | 734 | 795 | 835 | 870 | 1144 | 761 | 780 | 1055 | 274 | 786 | 936 | 1123 | 739 | 743 | 731 | 733 | 787 | 733 | 960 | 769 | 729 | 803 | 739 | 727 | 808 | 735 | 1018 | 737 | 976 | 930 | | 192 | 224 | 225 | 339 | 327 | 214 | 299 | 245 |
| S_salivarius | 35 | 533 | 829 | 451 | 243 | 362 | 399 | 594 | 726 | 280 | 347 | 649 | 676 | 365 | 451 | 684 | 169 | 279 | 156 | 249 | 321 | 256 | 546 | 286 | 246 | 354 | 242 | 166 | 350 | 259 | 587 | 254 | 554 | 461 | 728 | | 74 | 75 | 238 | 249 | 54 | 179 | 143 |
| S_sanguinis | 36 | 467 | 856 | 362 | 191 | 408 | 260 | 596 | 784 | 133 | 415 | 663 | 714 | 415 | 511 | 730 | 312 | 153 | 311 | 180 | 199 | 197 | 521 | 149 | 193 | 401 | 196 | 310 | 424 | 197 | 615 | 194 | 567 | 530 | 769 | 299 | | 29 | 261 | 269 | 36 | 205 | 167 |
| S_sinensis | 37 | 474 | 853 | 346 | 219 | 413 | 264 | 605 | 800 | 89 | 417 | 661 | 725 | 426 | 519 | 714 | 327 | 149 | 317 | 213 | 207 | 228 | 549 | 63 | 225 | 381 | 238 | 321 | 402 | 233 | 613 | 225 | 566 | 530 | 777 | 303 | 164 | | 264 | 274 | 33 | 200 | 168 |
| S_sobrinus | 38 | 672 | 1022 | 648 | 549 | 560 | 588 | 818 | 534 | 574 | 546 | 317 | 677 | 571 | 659 | 783 | 553 | 534 | 551 | 552 | 567 | 556 | 693 | 572 | 552 | 537 | 551 | 557 | 556 | 553 | 707 | 554 | 695 | 645 | 947 | 541 | 564 | 569 | | 352 | 259 | 230 | 234 |
| S_suis | 39 | 635 | 945 | 641 | 478 | 453 | 580 | 792 | 886 | 476 | 449 | 820 | 837 | 432 | 669 | 429 | 475 | 487 | 459 | 484 | 535 | 472 | 772 | 480 | 470 | 343 | 466 | 470 | 479 | 474 | 701 | 475 | 622 | 561 | 875 | 437 | 494 | 498 | 697 | | 279 | 228 | 206 |
| S_tigurinus | 40 | 495 | 830 | 384 | 45 | 385 | 291 | 581 | 780 | 167 | 378 | 653 | 680 | 370 | 489 | 717 | 280 | 170 | 278 | 13 | 236 | 56 | 537 | 190 | 48 | 371 | 156 | 277 | 427 | 62 | 620 | 56 | 569 | 506 | 732 | 246 | 178 | 214 | 549 | 480 | | 199 | 159 |
| S_uberis | 41 | 594 | 943 | 542 | 439 | 236 | 524 | 721 | 784 | 455 | 308 | 712 | 806 | 270 | 542 | 721 | 394 | 442 | 391 | 444 | 475 | 440 | 662 | 447 | 438 | 407 | 435 | 403 | 333 | 447 | 340 | 439 | 290 | 360 | 866 | 401 | 462 | 458 | 604 | 497 | 440 | | 76 |
| S_urinalis | 42 | 598 | 875 | 541 | 409 | 188 | 481 | 684 | 781 | 422 | 187 | 705 | 758 | 189 | 519 | 739 | 352 | 402 | 344 | 407 | 426 | 411 | 636 | 418 | 404 | 365 | 374 | 350 | 262 | 411 | 494 | 408 | 434 | 303 | 796 | 363 | 411 | 428 | 566 | 457 | 406 | 267 | |

Table S10

A matrix showing the nucleotides and deletions differences between pairs of 16S-23S rRNA region sequences for *Enterococcus* species.

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| E._avium | 1 | | 55 | 77 | 148 | 160 | 47 | 149 | 135 | 29 |
| E._casseliflavus | 2 | 238 | | 62 | 115 | 125 | 28 | 116 | 102 | 32 |
| E._cecorum | 3 | 333 | 294 | | 159 | 167 | 58 | 156 | 142 | 58 |
| E._durans | 4 | 332 | 280 | 416 | | 70 | 115 | 55 | 35 | 125 |
| E._faecium | 5 | 336 | 279 | 416 | 204 | | 123 | 17 | 37 | 137 |
| E._faecalis | 6 | 289 | 261 | 354 | 333 | 307 | | 110 | 96 | 24 |
| E._hirae | 7 | 349 | 295 | 431 | 104 | 180 | 348 | | 22 | 126 |
| E._porcinus | 8 | 341 | 271 | 418 | 114 | 193 | 336 | 103 | | 112 |
| E._raffinosus | 9 | 62 | 199 | 307 | 294 | 295 | 252 | 309 | 302 | |

Table S11

The length of 16S-23S rRNA region, 16S rRNA gene, intergenic spacer region and 23S rRNA region for all *Streptococcus* and *Enterococcus* species.

| Species | 16S-23S rRNA region length (bp) | 16S rRNA gene length (bp) | Intergenic spacer region length (bp) | 23S rRNA gene length (bp) |
|---|---|---|---|---|
| *Streptococcus acidominimus* | 4486 | 1523 | 468 | 2495 |
| *Streptococcus adjacens* | 4251 | 1525 | 218 | 2508 |
| *Streptococcus anginosus* | 4411 | 1531 | 387 | 2493 |
| *Streptococcus australis* | 4254 | 1521 | 240 | 2493 |
| *Streptococcus canis* | 4301 | 1524 | 283 | 2494 |
| *Streptococcus constellatus* | 4340 | 1531 | 315 | 2494 |
| *Streptococcus cremoris* | 4317 | 1522 | 300 | 2495 |
| *Streptococcus criceti* | 4649 | 1532 | 625 | 2492 |
| *Streptococcus cristatus* | 4260 | 1522 | 248 | 2490 |
| *Streptococcus difficilis* | 4295 | 1524 | 277 | 2494 |
| *Streptococcus downei* | 4564 | 1533 | 538 | 2493 |
| *Streptococcus durans* | 4366 | 1535 | 326 | 2505 |
| *Streptococcus dysgalactiae* | 4301 | 1524 | 283 | 2494 |
| *Streptococcus equi* | 4429 | 1524 | 414 | 2491 |
| *Streptococcus equinus* | 4732 | 1531 | 708 | 2493 |
| *Streptococcus gallolyticus* | 4284 | 1524 | 270 | 2490 |
| *Streptococcus gordonii* | 4267 | 1532 | 243 | 2492 |
| *Streptococcus infantarius* | 4284 | 1524 | 269 | 2491 |
| *Streptococcus infantis* | 4258 | 1523 | 242 | 2493 |
| *Streptococcus intermedius* | 4291 | 1531 | 267 | 2493 |
| *Streptococcus mitis* | 4258 | 1521 | 244 | 2493 |
| *Streptococcus mutans* | 4408 | 1532 | 384 | 2492 |
| *Streptococcus oligofermentans* | 4263 | 1524 | 249 | 2490 |
| *Streptococcus oralis* | 4256 | 1522 | 242 | 2492 |
| *Streptococcus ovis* | 4295 | 1533 | 265 | 2497 |
| *Streptococcus parasanguinis* | 4261 | 1523 | 245 | 2493 |
| *Streptococcus pasteurianus* | 4284 | 1524 | 268 | 2492 |
| *Streptococcus pluranimalium* | 4304 | 1534 | 276 | 2494 |
| *Streptococcus pneumoniae* | 4258 | 1521 | 244 | 2493 |
| *Streptococcus porcinus* | 4558 | 1524 | 538 | 2496 |
| *Streptococcus pseudopneumoniae* | 4260 | 1521 | 244 | 2495 |
| *Streptococcus pseudoporcinus* | 4498 | 1524 | 478 | 2496 |
| *Streptococcus pyogenes* | 4436 | 1524 | 418 | 2494 |
| *Streptococcus saccharolyticus* | 4263 | 1533 | 224 | 2506 |
| *Streptococcus salivarius* | 4283 | 1523 | 269 | 2491 |
| *Streptococcus sanguinis* | 4275 | 1523 | 260 | 2492 |
| *Streptococcus sinensis* | 4270 | 1532 | 248 | 2490 |
| *Streptococcus sobrinus* | 4424 | 1532 | 403 | 2489 |

| Species | 16S-23S rRNA region length (bp) | 16S rRNA gene length (bp) | Intergenic spacer region length (bp) | 23S rRNA gene length (bp) |
|---|---|---|---|---|
| *Streptococcus suis* | 4420 | 1524 | 401 | 2495 |
| *Streptococcus tigurinus* | 4259 | 1524 | 242 | 2493 |
| *Streptococcus uberis* | 4352 | 1524 | 336 | 2492 |
| *Streptococcus urinalis* | 4292 | 1524 | 273 | 2495 |
| *Enterococcus avium* | 4273 | 1540 | 231 | 2502 |
| *Enterococcus casseliflavus* | 4266 | 1541 | 220 | 2505 |
| *Enterococcus cecorum* | 4224 | 1540 | 182 | 2502 |
| *Enterococcus durans* | 4313 | 1541 | 268 | 2504 |
| *Enterococcus faecium* | 4381 | 1541 | 335 | 2505 |
| *Enterococcus faecalis* | 4262 | 1542 | 217 | 2503 |
| *Enterococcus hirae* | 4366 | 1541 | 321 | 2504 |
| *Enterococcus porcinus* | 4346 | 1541 | 301 | 2504 |
| *Enterococcus raffinosus* | 4258 | 1540 | 215 | 2503 |

Table S12

The intraspecies polymorphism of 16S-23S rRNA region sequence within *Streptococcus* and *Enterococcus* genera[a].

| Species | The lowest intraspecies nucleotide difference compared to GenBank sequences | The highest intraspecies nucleotide difference compared to GenBank sequences | Amount of complete genome sequences/genome assembly/ 16S-23S rRNA region (GenBank) |
|---|---|---|---|
| *Streptococcus acidominimus* | - | - | 0/1 |
| *Streptococcus anginosus* | 0 (0%) | 49 (1.11%) | 6/1 |
| *Streptococcus australis* | 111 (2.6%) | 111 (2.6%) | 0/1 |
| *Streptococcus canis* | 3 (0.07%) | 3 (0.07%) | 0/1 |
| *Streptococcus constellatus* | 0 (0%) | 18 (0.41%) | 3/0 |
| *Streptococcus cremoris* | 0 (0%) | 18 (0.42%) | 14/0 |
| *Streptococcus criceti* | 0 (0%) | 1 (0.02%) | 0/0/3 |
| *Streptococcus durans* | 0 (0%) | 73 (2.74%) | 3/0 |
| *Streptococcus dysgalactiae* | 0 (0%) | 39 (0.91%) | 6/7 |
| *Streptococcus equi* | 0 (0%) | 67 (1.51%) | 6/9 |
| *Streptococcus equinus* | - | - | 0/4 |
| *Streptococcus gallolyticus* | 0 (0%) | 7 (0.16%) | 5/1 |
| *Streptococcus gordonii* | 0 (0%) | 21 (0.49%) | 5/3 |
| *Streptococcus infantarius* | 0 (0%) | 40 (0.93%) | 2/0 |
| *Streptococcus intermedius* | 0 (0%) | 20 (0.47%) | 6/1 |
| *Streptococcus mitis* | 0 (0%) | 37 (0.87%) | 5/0 |
| *Streptococcus mutans* | 0 (0%) | 20 (0.45%) | 9/2/3 |
| *Streptococcus oligofermentans* | 0 (0%) | 4 (0.09%) | 1/2 |
| *Streptococcus oralis* | 0 (0%) | 55 (1.29%) | 4/1 |
| *Streptococcus parasanguinis* | 0 (0%) | 40 (0.94%) | 2/0 |
| *Streptococcus pasteurianus* | 0 (0%) | 2 (0.05%) | 2/1 |
| *Streptococcus pluranimalium* | 0 (0%) | 16 (0.37%) | 2/0 |
| *Streptococcus pneumoniae* | 0 (0%) | 496 (11.65%) | 52/83 |
| *Streptococcus porcinus* | 0 (0%) | 0 (0%) | 0/1 |
| *Streptococcus pseudopneumoniae* | 16 (0.4%) | 16 (0.4%) | 1/0 |
| *Streptococcus pseudoporcinus* | 0 (0%) | 0 (0%) | 0/1 |
| *Streptococcus pyogenes* | 0 (0%) | 98 (2.2%) | 136/65 |
| *Streptococcus salivarius* | 0 (0%) | 33 (0.77%) | 9/2 |
| *Streptococcus sanguinis* | 7 (0.16%) | 31 (0.72%) | 1/5 |
| *Streptococcus sobrinus* | 0 (0%) | 15 (0.34%) | 4/2 |
| *Streptococcus suis* | 0 (0%) | 58 (1.31%) | 43/2 |
| *Streptococcus tigurinus* | 38 (0.9%) | 38 (0.9%) | 1/0 |
| *Streptococcus uberis* | 0 (0%) | 5 (0.11%) | 2/2 |
| *Streptococcus urinalis* | 0 (0%) | 0 (0%) | 0/1 |
| *Enterococcus casseliflavus* | 1 (0.02%) | 4 (0.09%) | 2/0 |
| *Enterococcus cecorum* | 1 (0.02%) | 28 (0.66%) | 6/1 |

| Species | The lowest intraspecies nucleotide difference compared to GenBank sequences | The highest intraspecies nucleotide difference compared to GenBank sequences | Amount of complete genome sequences/genome assembly/ 16S-23S rRNA region (GenBank) |
|---|---|---|---|
| *Enterococcus durans* | 0 (0%) | 42 (0.97%) | 3/0 |
| *Enterococcus faecium* | 0 (0%) | 102 (2.33%) | 70/58 |
| *Enterococcus faecalis* | 0 (0%) | 17 (0.4%) | 31/1 |
| *Enterococcus hirae* | 0 (0%) | 71 (2.67%) | 3/1 |

[a] For species not included in a Table (*Streptococcus adjacens, Streptococcus cristatus, Streptococcus difficilis, Streptococcus downei, Streptococcus infantis, Streptococcus ovis, Streptococcus saccharolyticus, Streptococcus sinensis, Enterococcus avium, Enterococcus porcinus, Enterococcus raffinosus*), there are no reference genomes available.

Figure S1

The comparison between phylogenetic trees based on 16S-23S rRNA region and 16S rRNA, *rpoB*, *sodA* and *tuf* genes for both *Streptococcus* and *Enterococcus* species.

The thicker branches reflect a low topological score and result from different positions on the compared trees.

*Streptococcus*

16S rRNA gene vs 16S-23S rRNA region

Overall topological score = 72.4 %
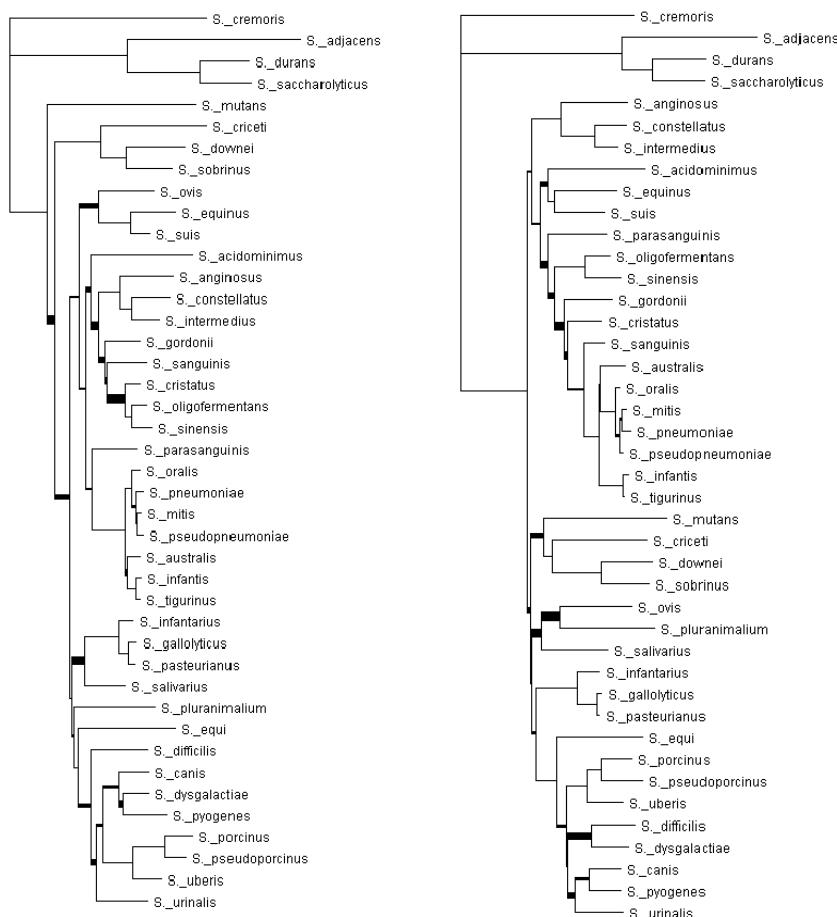
*rpoB* gene vs 16S-23S rRNA region

Overall topological score = 71.6 %
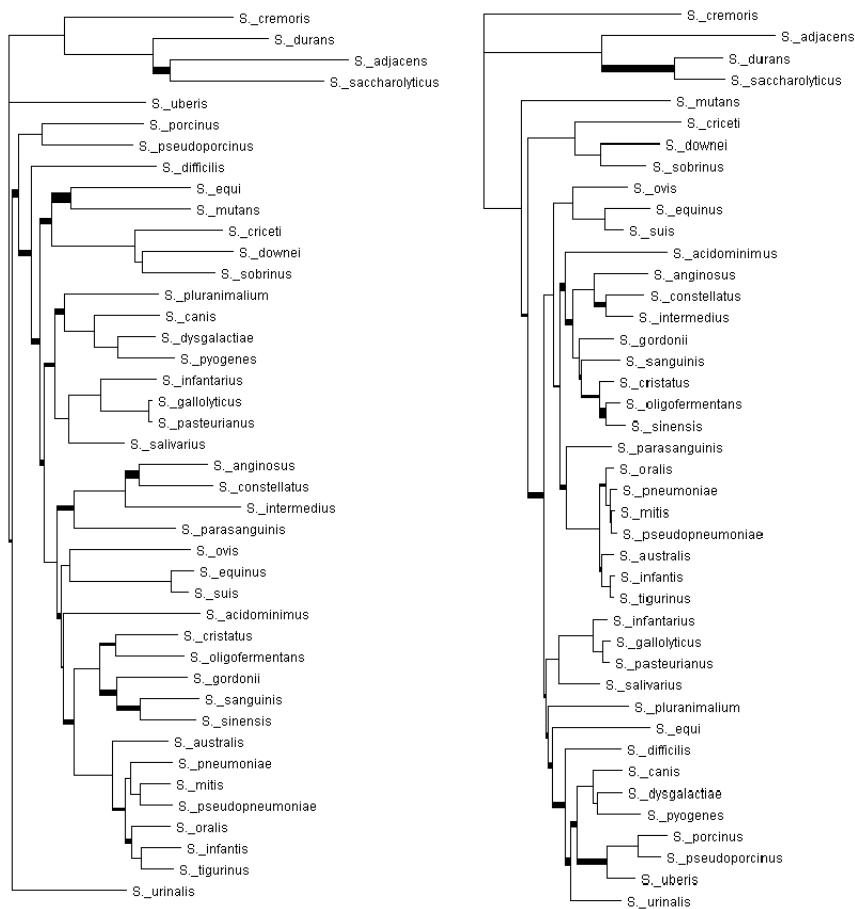
*sodA* gene vs 16S-23S rRNA region

Overall topological score = 70.4 %
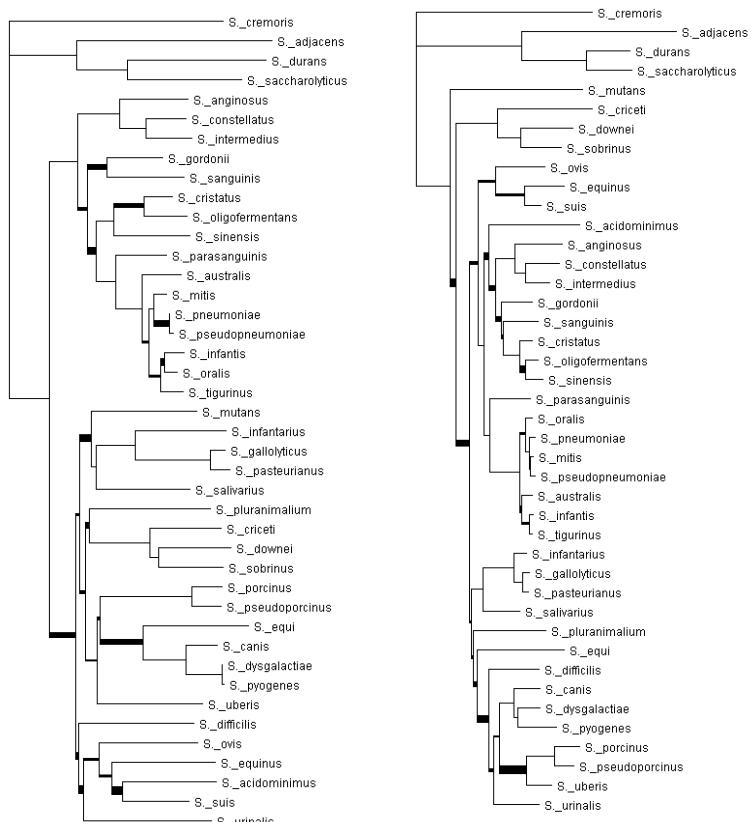
*tuf* gene vs 16S-23S rRNA region

Overall topological score = 70 %
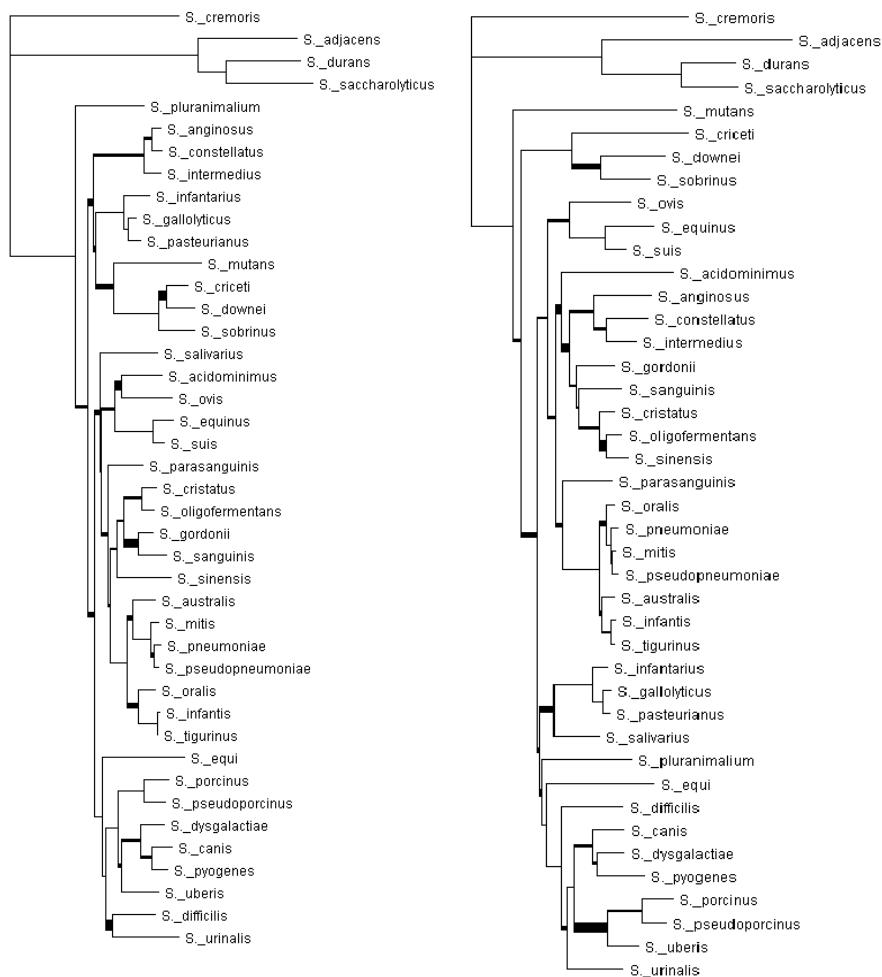
*Enterococcus*

16S rRNA gene vs 16S-23S rRNA region

Overall topological score = 76.7 %
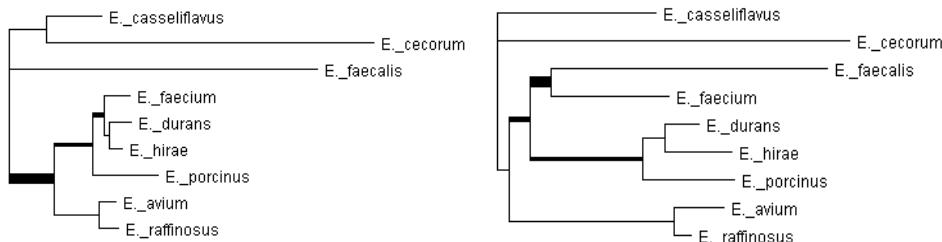


*rpoB* gene vs 16S-23S rRNA region

Overall topological score = 62.5 %
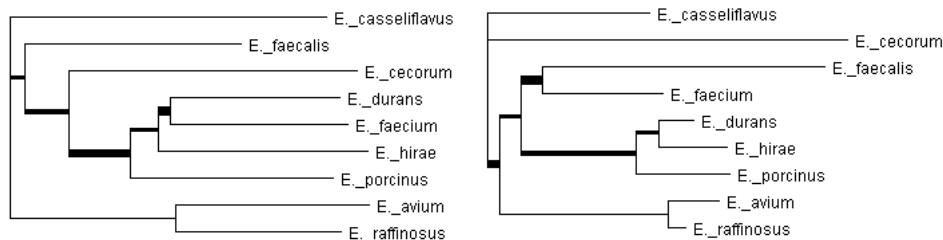


*sodA* gene vs 16S-23S rRNA region

Overall topological score = 75.6 %
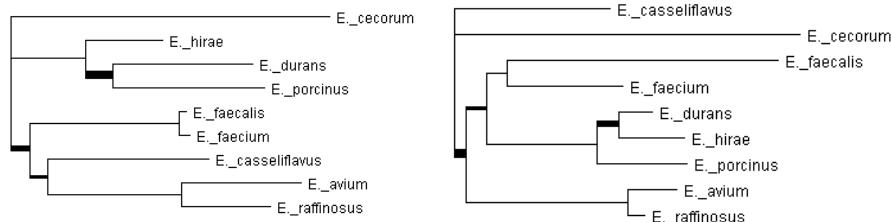


*tuf* gene vs 16S-23S rRNA region

Overall topological score = 66.4 %
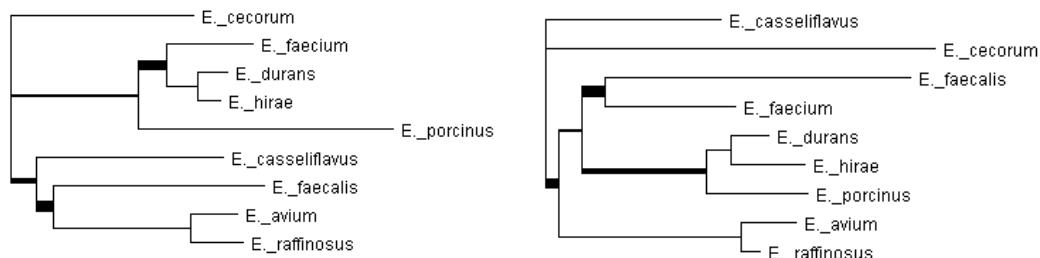
*Streptococcus*

16S rRNA gene vs *sodA* gene

Overall topological score = 66.5 %
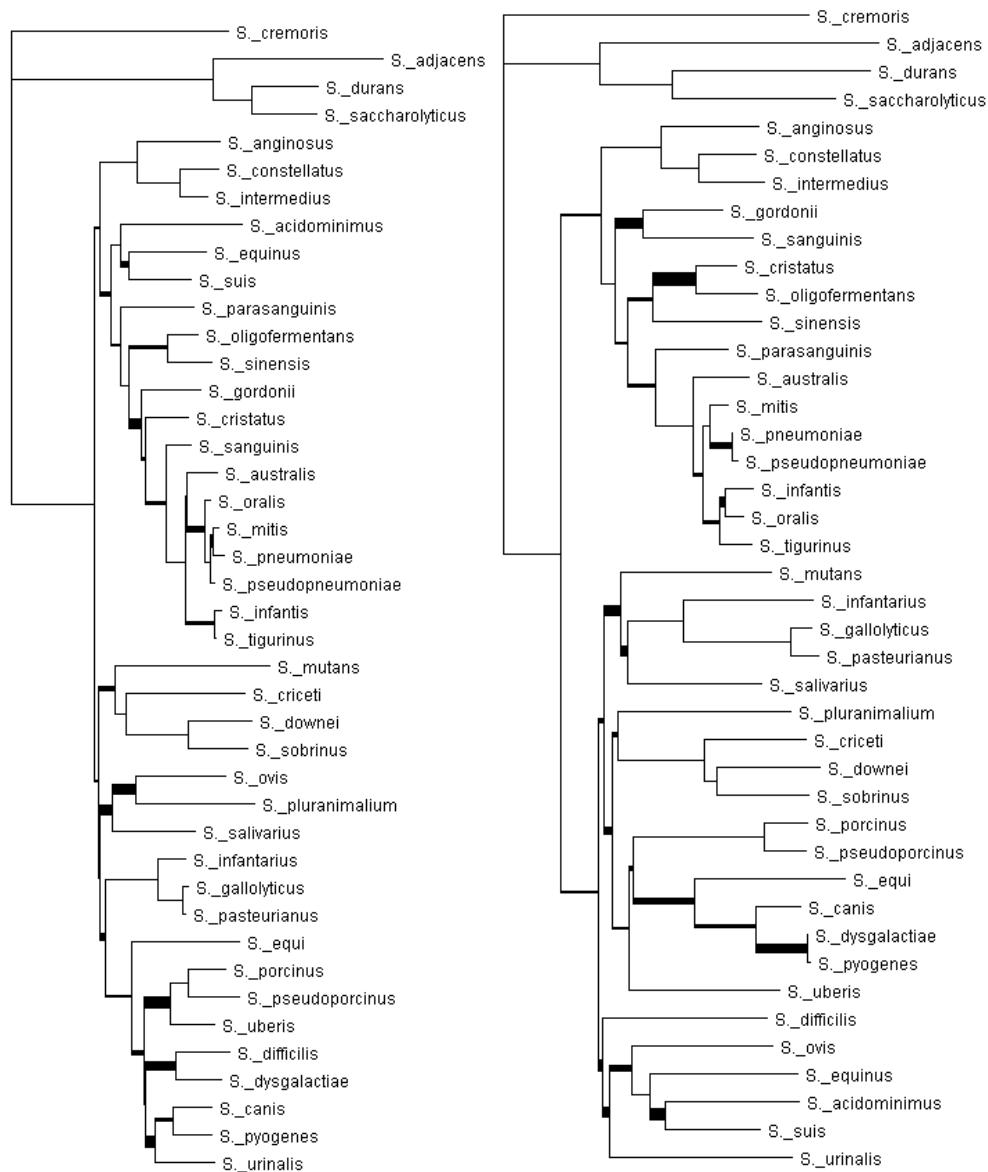
*Streptococcus*

16S rRNA gene vs *rpoB* gene

Overall topological score = 61.7 %
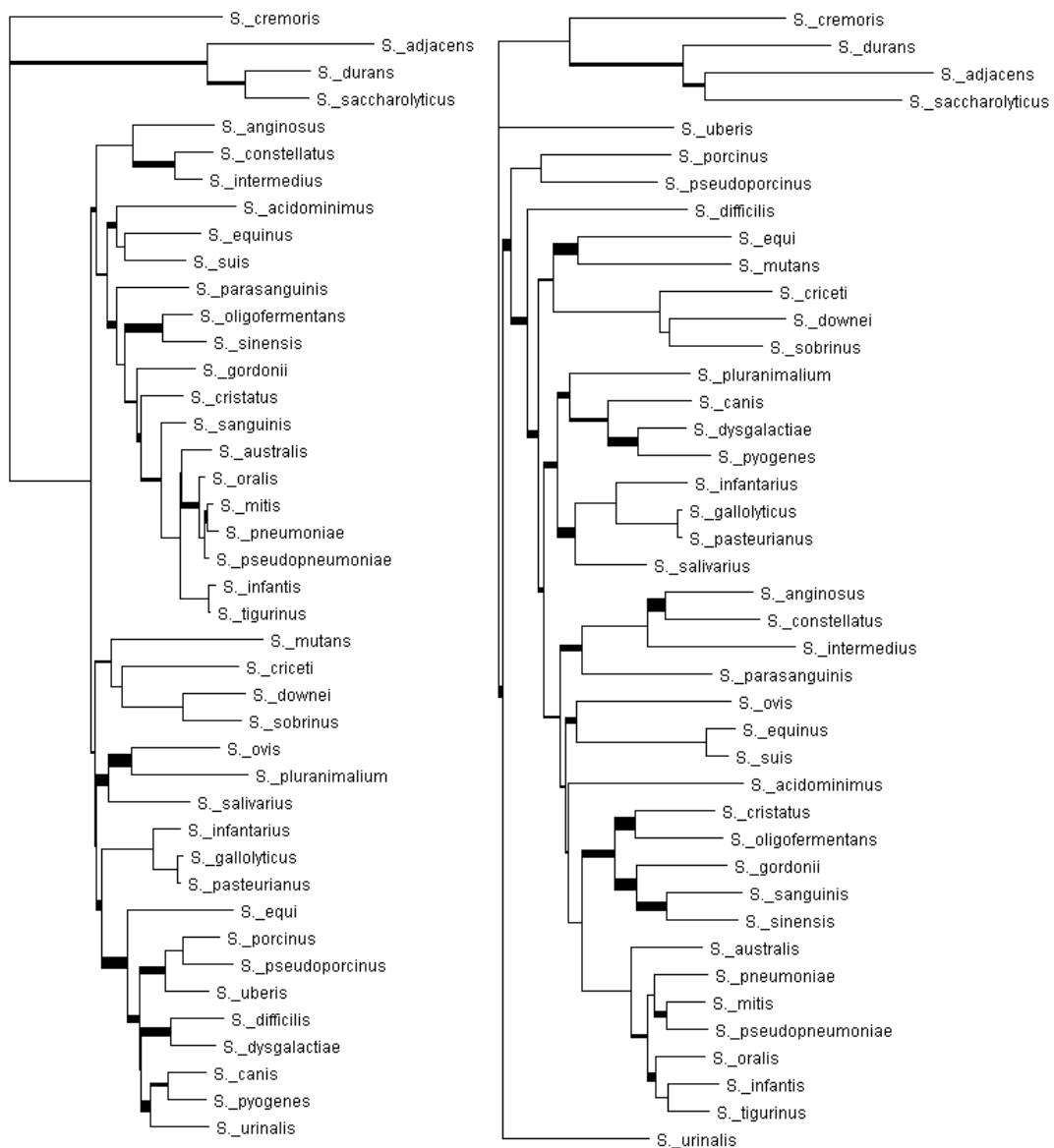
*Streptococcus*

16S rRNA gene vs *tuf* gene

Overall topological score = 69.1 %
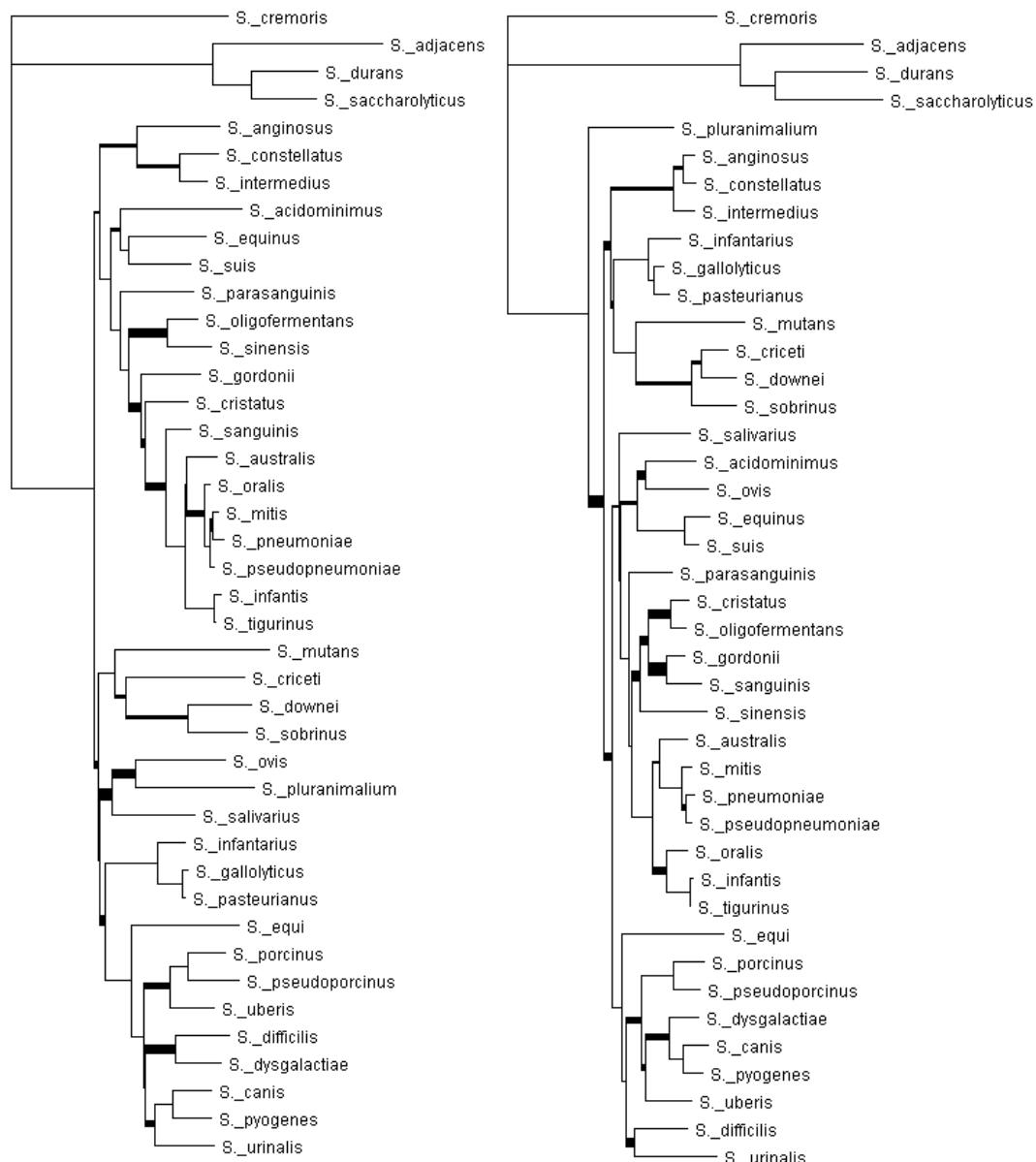
*Enterococcus*

16S rRNA gene vs *sodA* gene

Overall topological score = 56.4 %
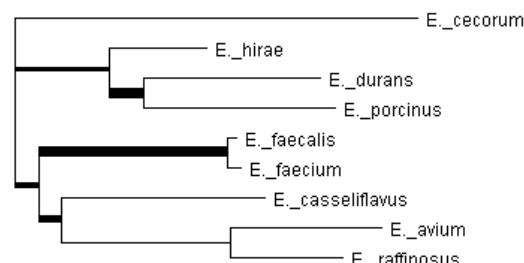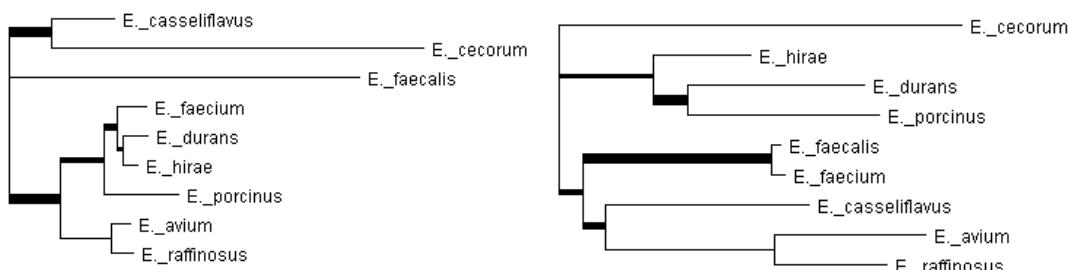


*Enterococcus*

16S rRNA gene vs *rpoB* gene

Overall topological score =  67.0 %
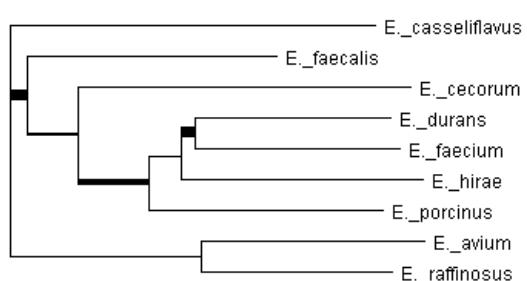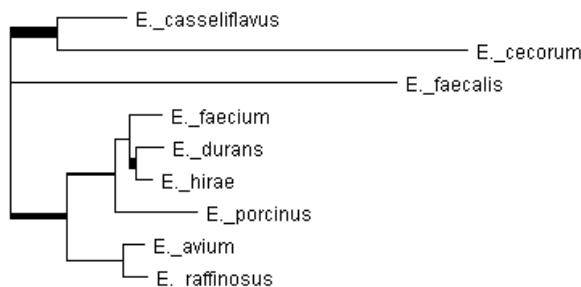


*Enterococcus*

16S rRNA gene vs *tuf* gene

Overall topological score = 78.9 %
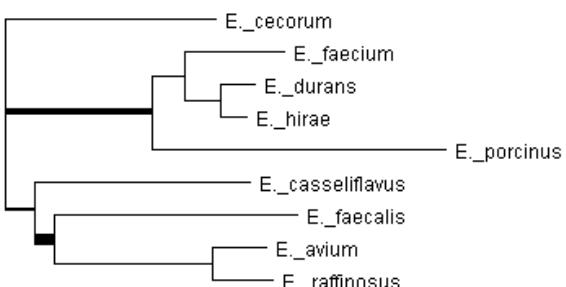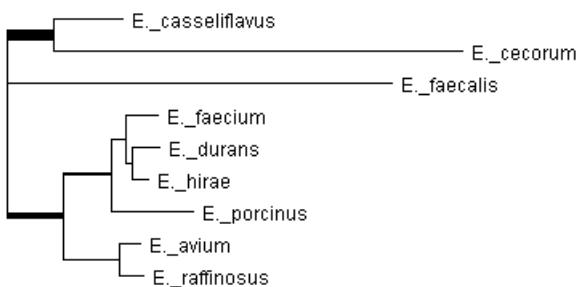
*Streptococcus*

*tuf* gene vs *sodA* gene

Overall topological score = 70.4 %
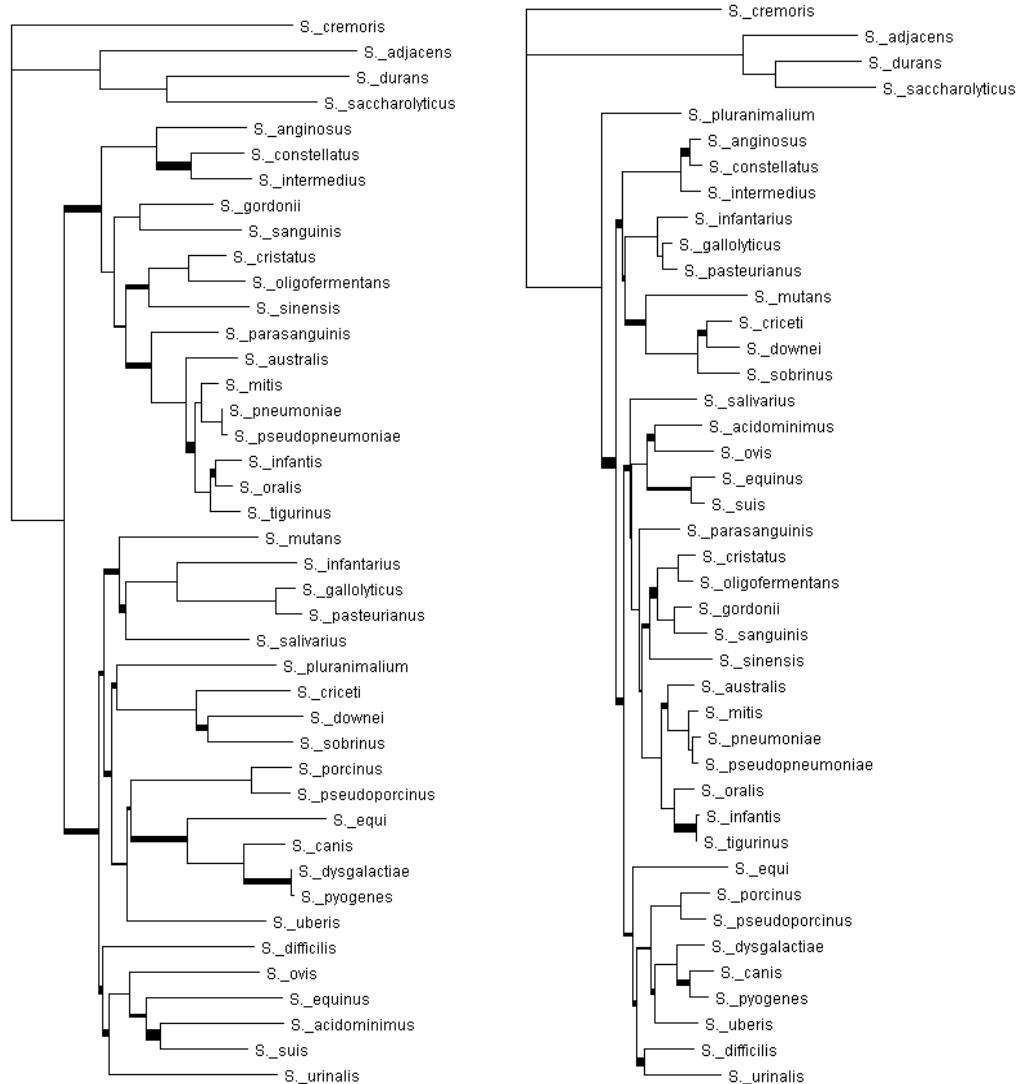
*Streptococcus*

*rpoB* gene vs *tuf* gene

Overall topological score = 70.3 %
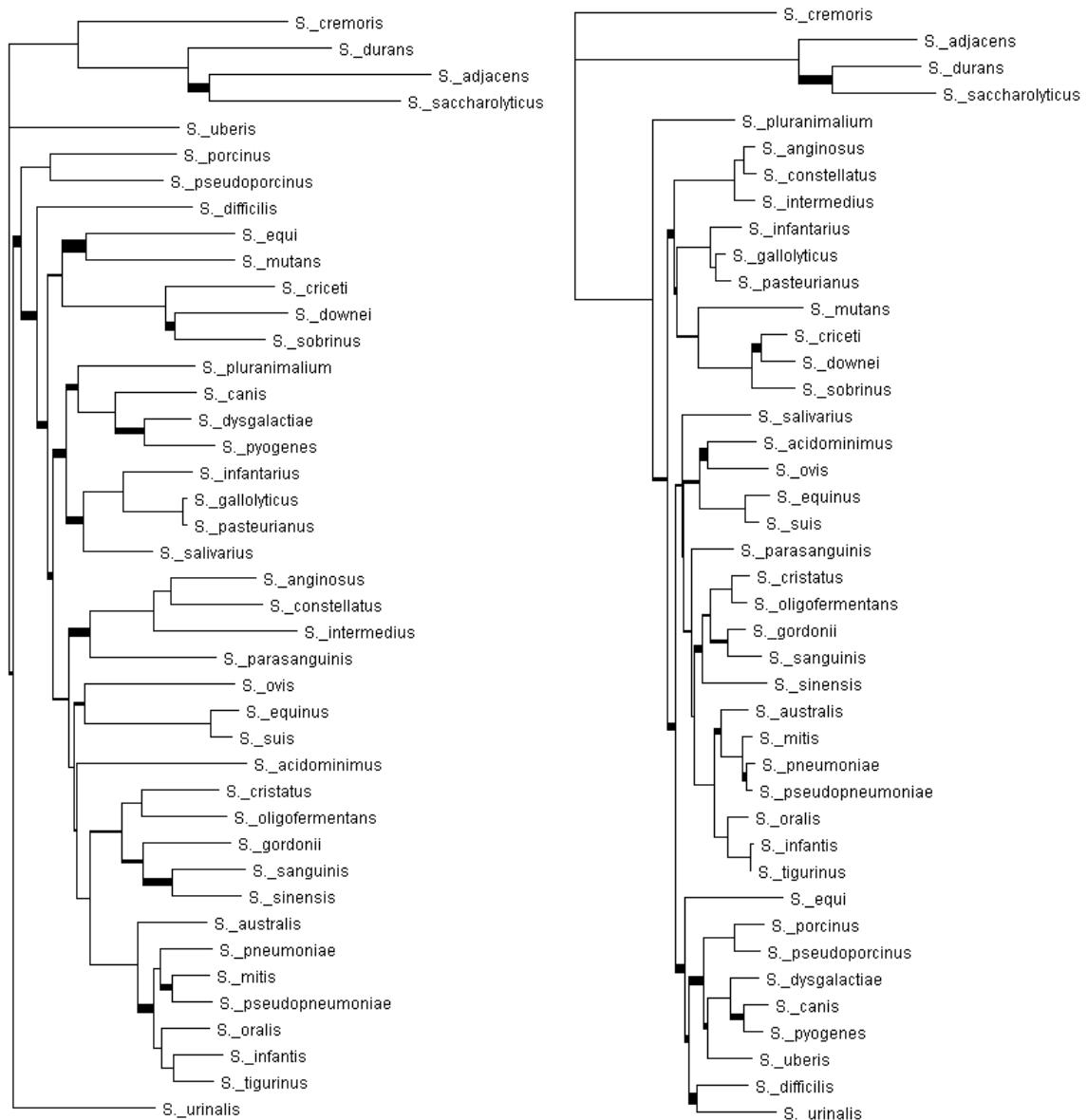
*Streptococcus*

*rpoB* gene vs *sodA* gene

Overall topological score = 67.3 %
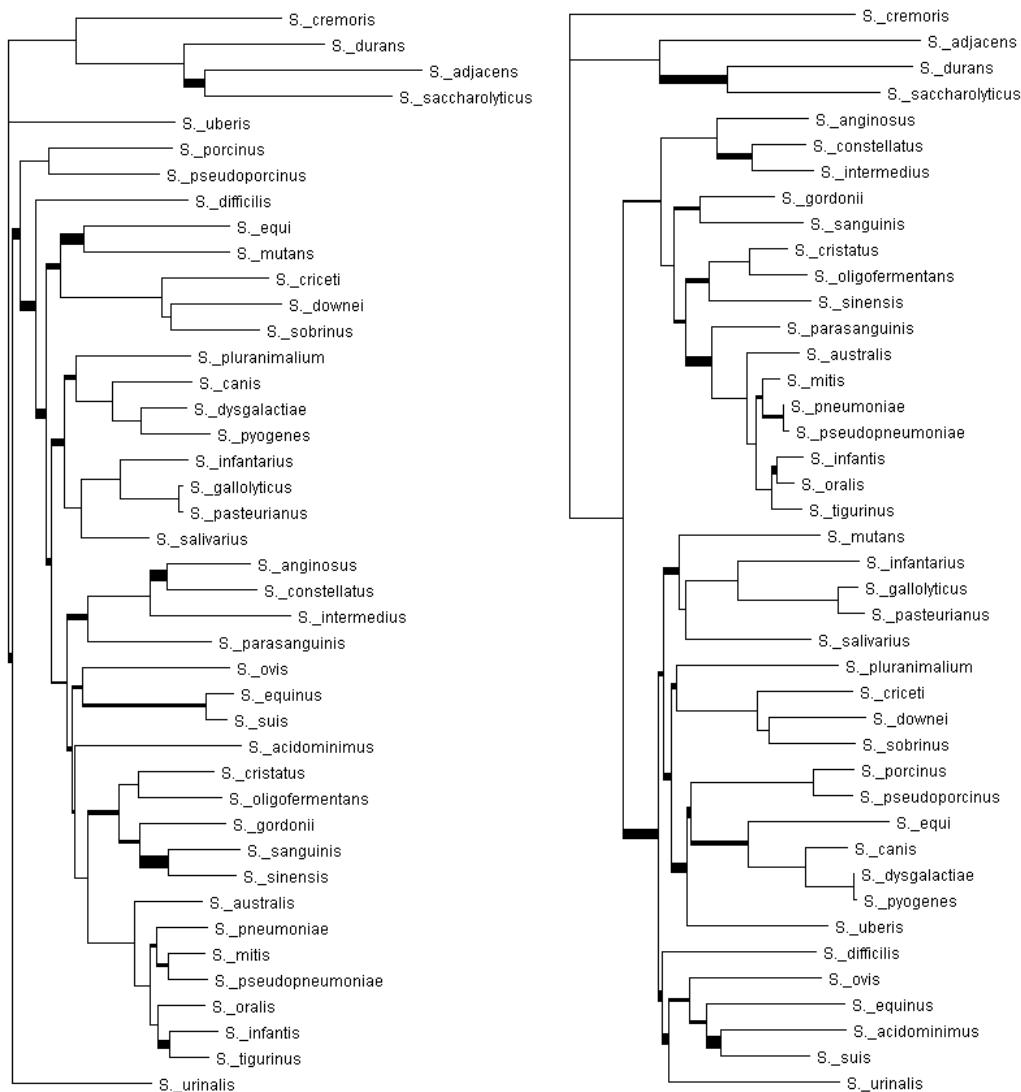
*Enterococcus*
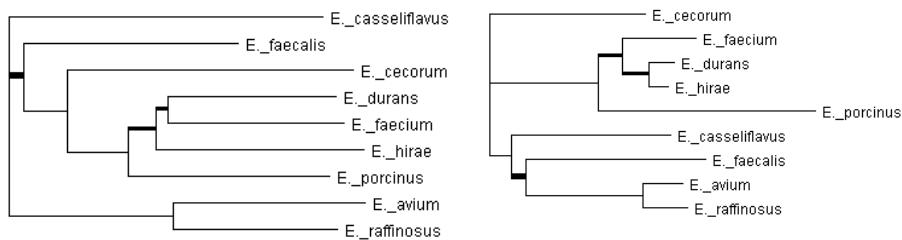
*tuf* gene vs *sodA* gene

Overall topological score = 62.8 %
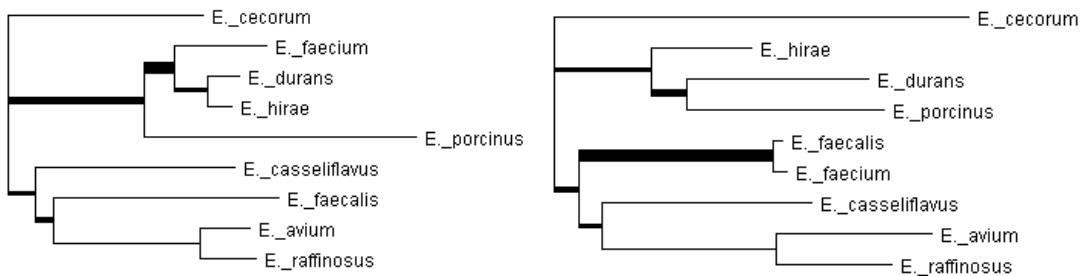


*Enterococcus*

*rpoB* gene vs *tuf* gene

Overall topological score = 80.6 %



*Enterococcus*

*rpoB* gene vs *sodA* gene

Overall topological score = 68.9 %