

Complex relationships inside the microbial communities of natural whey starters used for Parmigiano Reggiano cheese production revealed by culture-dependent and 16S rRNA metabarcoding portrait

Laura Sola¹, Emanuele Quadu¹, Elena Bortolazzo², Loris Bertoldi³, Cinzia L Randazzo^{4,5}, Valentina Pizzamiglio⁶, Lisa Solieri^{1*}

¹Department of Life Sciences, University of Modena and Reggio Emilia, Reggio Emilia, 42122, Italy

²Centro Ricerche Produzioni Animali, Reggio Emilia, 42121, Italy

³BMR Genomics srl, Padua, 35131, Italy

⁴Department of Agriculture, Food and Environment, University of Catania, Catania, 95123 Italy

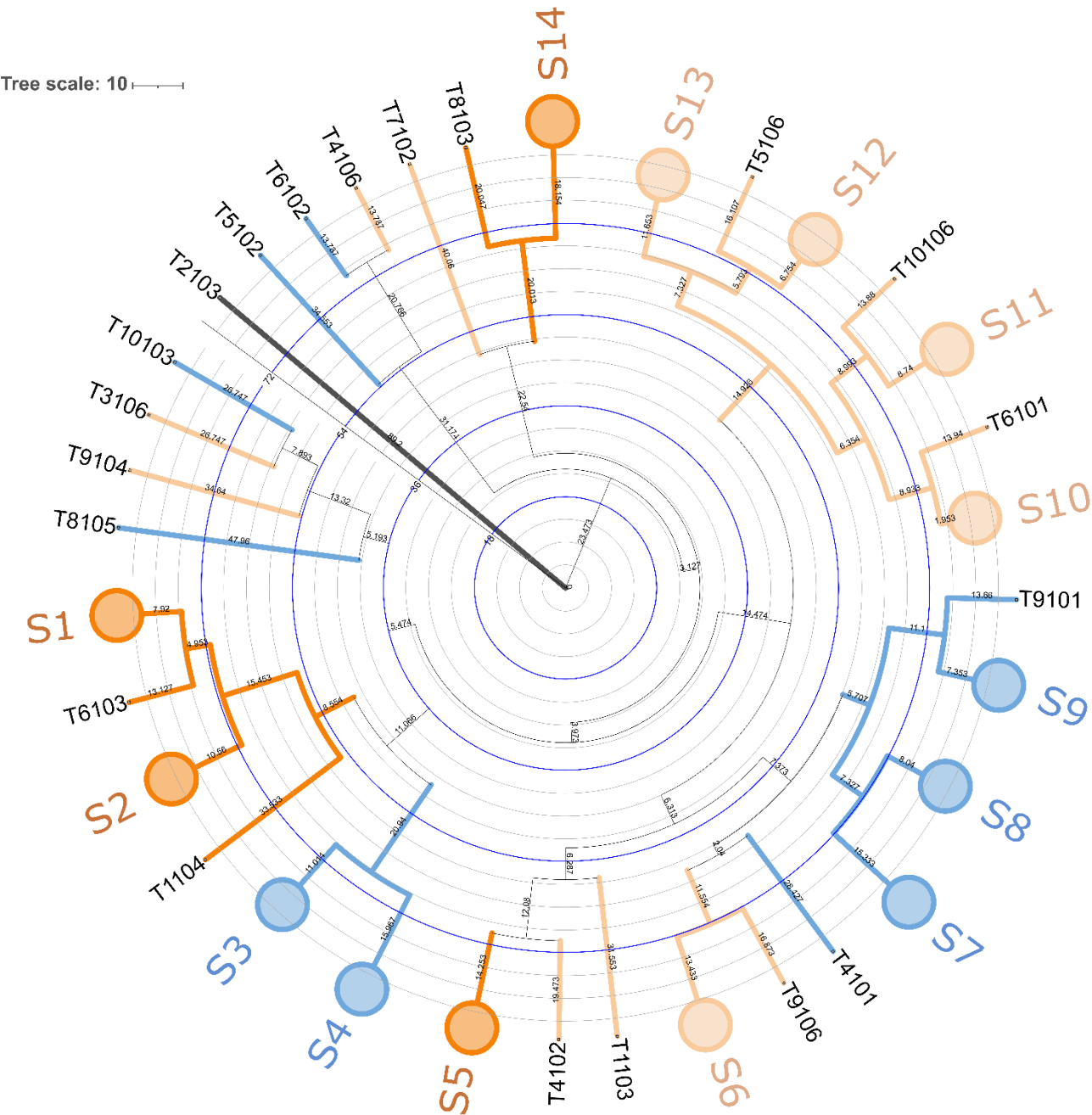
⁵ProBioEtna srl, Catania, 95123 Italy

⁶Consorzio del Formaggio Parmigiano Reggiano, 42124 Reggio Emilia, Italy

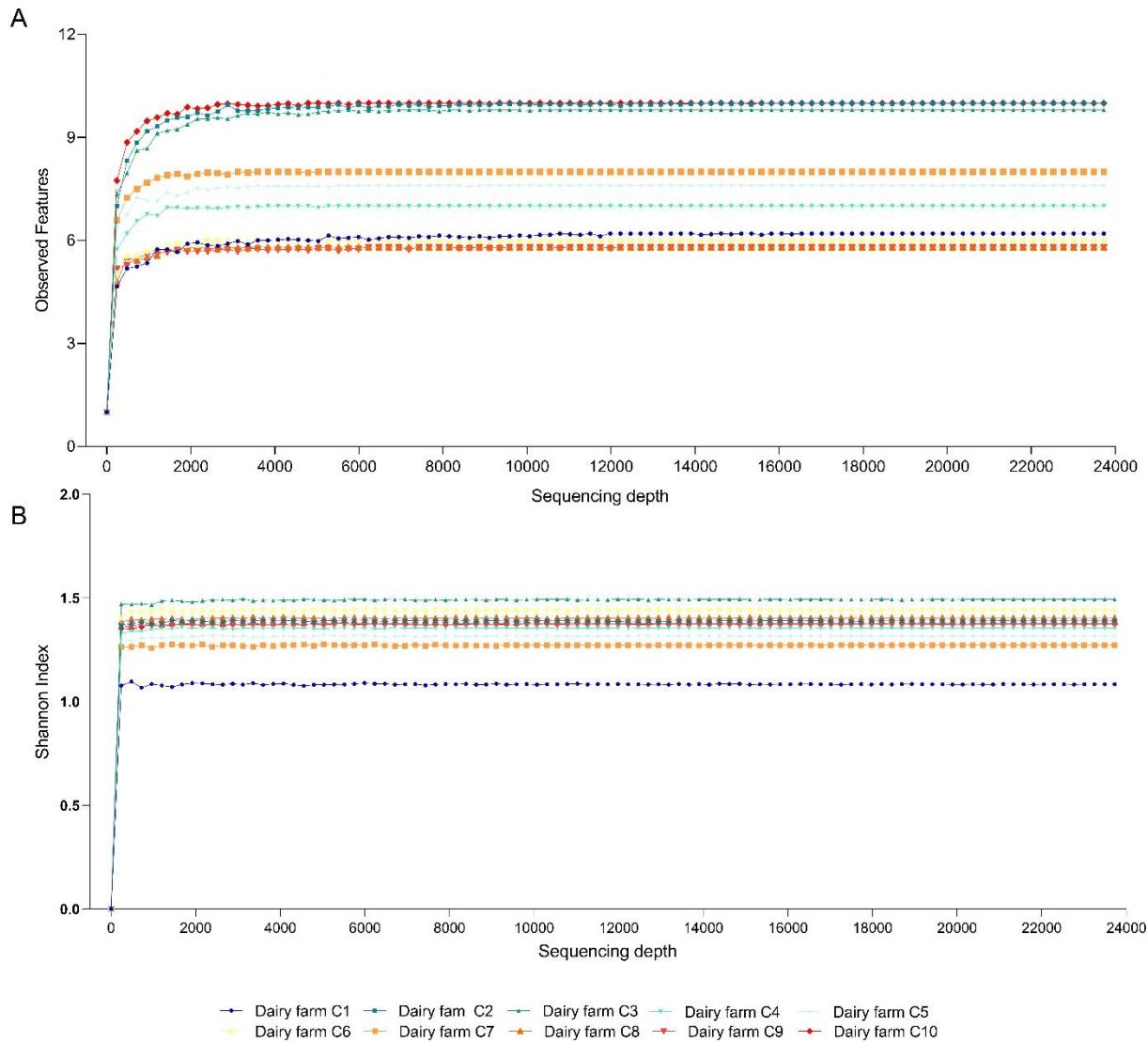
*Corresponding author: lisa.solieri@unimore.it

Supplementary Figures

1 **Supplementary Figure S1. Dendrogram obtained through UPGMA analysis of the (GTG)₅**
 2 **REP PCR profiles of 57 strains isolated from PR NWS samples using the Pearson's**
 3 **correlation coefficient.** The similarity value above 88% was used to discriminate biotypes
 4 numbered from S1 to S14. Each knot shows the length of the arms. The colors have been
 5 attributed to species, as follows: blue, *L. helveticus*; orange, *L. delbrueckii* subsp. *lactis*; yellow, *St.*
 6 *thermophilus*; grey, *S. capitis*. The tree was visualized with ITOL [1].



Supplementary Figure S2. Rarefaction curves showing the number of observed features (A) and Shannon index (B) as functions of the number of sequenced reads in PR NWS samples. The minimum sample size (23,726) achieved over the studied NWS samples was used.



Supplementary Reference

1. Letunic, I. & Bork, P. Interactive Tree of Life v2: online annotation and display of phylogenetic trees made easy. *Nucleic Acids Res.* W475–W478 (2011).