(A)

(B)

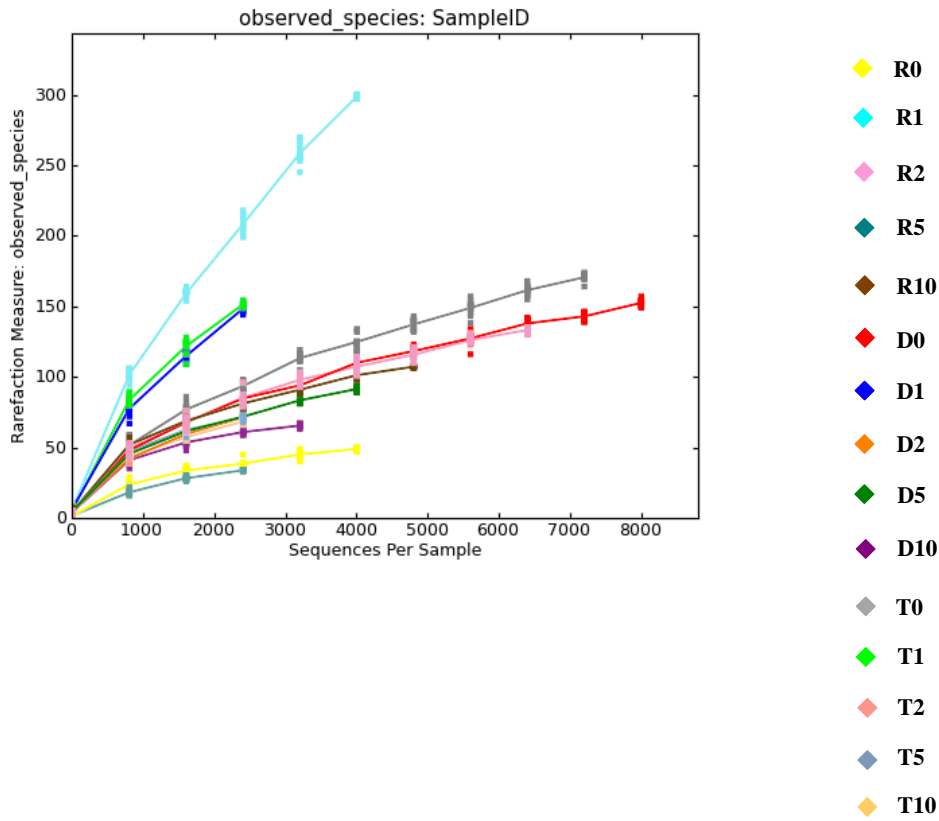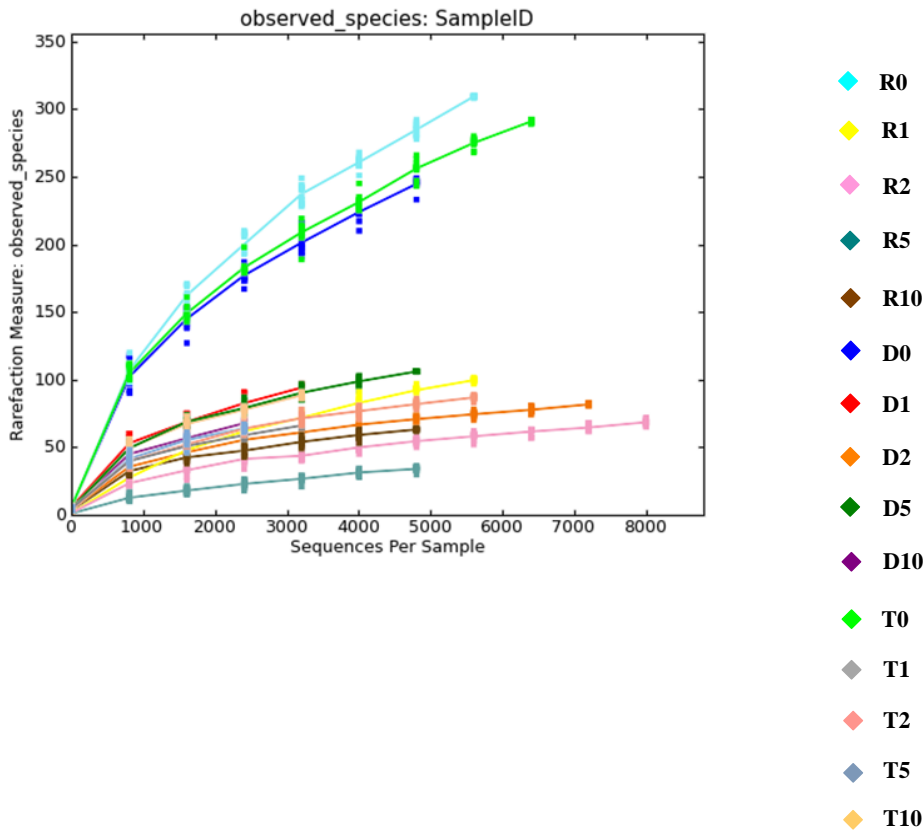**FIG S1** Rarefaction curves obtained by QIIME for DNA (A) and RNA (B) samples directly from rye (R), *Triticum durum* (D) and *Triticum aestivum* (A) doughs (prior to fermentation and before becoming sourdough) (R0, D0, and A0), and sourdough after one (R1, D1, A1), two (R2, D2, A2), five (R5, D5, A5) and ten (R10, D10, A10) days of propagation.
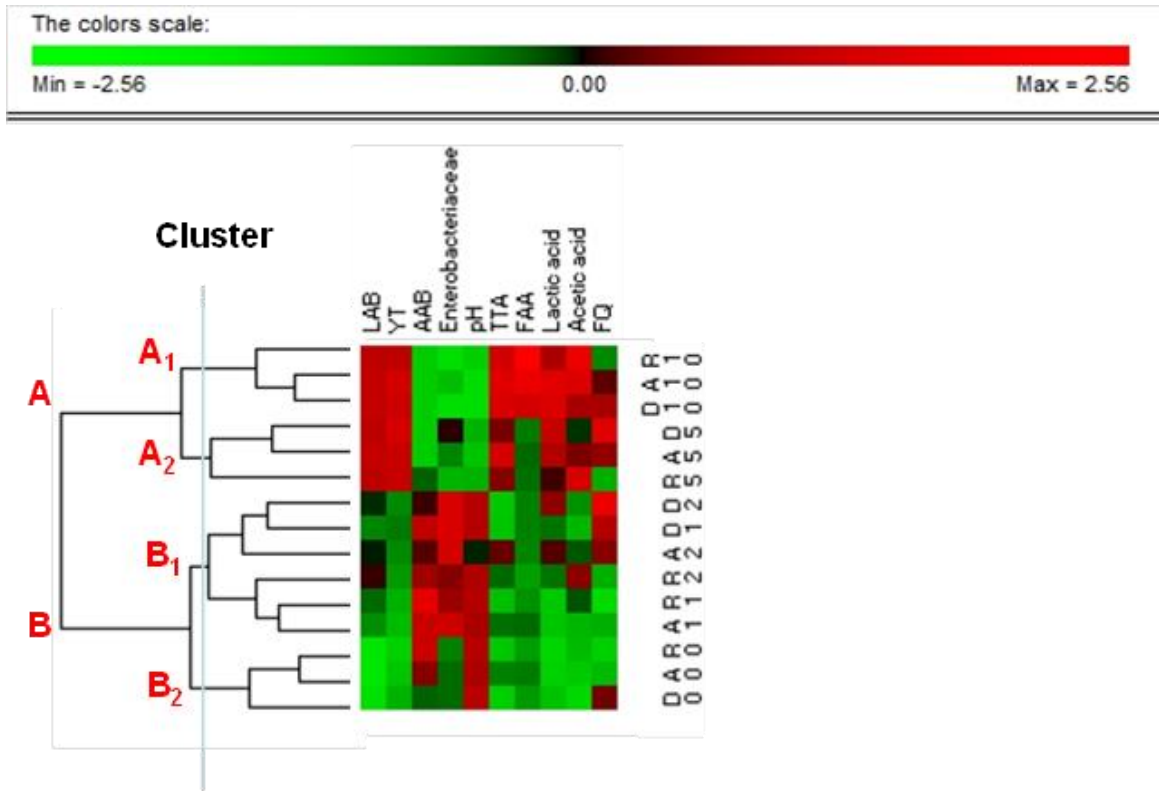
FIG S2. Differences of pH, total titratable acidity (TTA, ml of 0.1 N NaOH/10 g of dough), lactic and acetic acids (mM), free amino acids (FAA, mg kg^{-1}), and cell density (Log CFU g^{-1}) of presumptive lactic acid bacteria (LAB), yeasts (YT), and *Enterobacteriaceae* between rye (R), *Triticum durum* (D) and *Triticum aestivum* (A) doughs (prior to fermentation and before becoming sourdough) (R0, D0, and A0), and sourdoughs after one (R1, D1, A1), two (R2, D2, A2), five (R5, D5, A5) and ten (R10, D10, A10) days of propagation. Euclidean distance and McQuitty's criterion (weighted pair group method with averages) were used for clustering. Colors correspond to normalized mean data levels from low (green) to high (red). The color scale, in terms of units of standard deviation, is also shown.
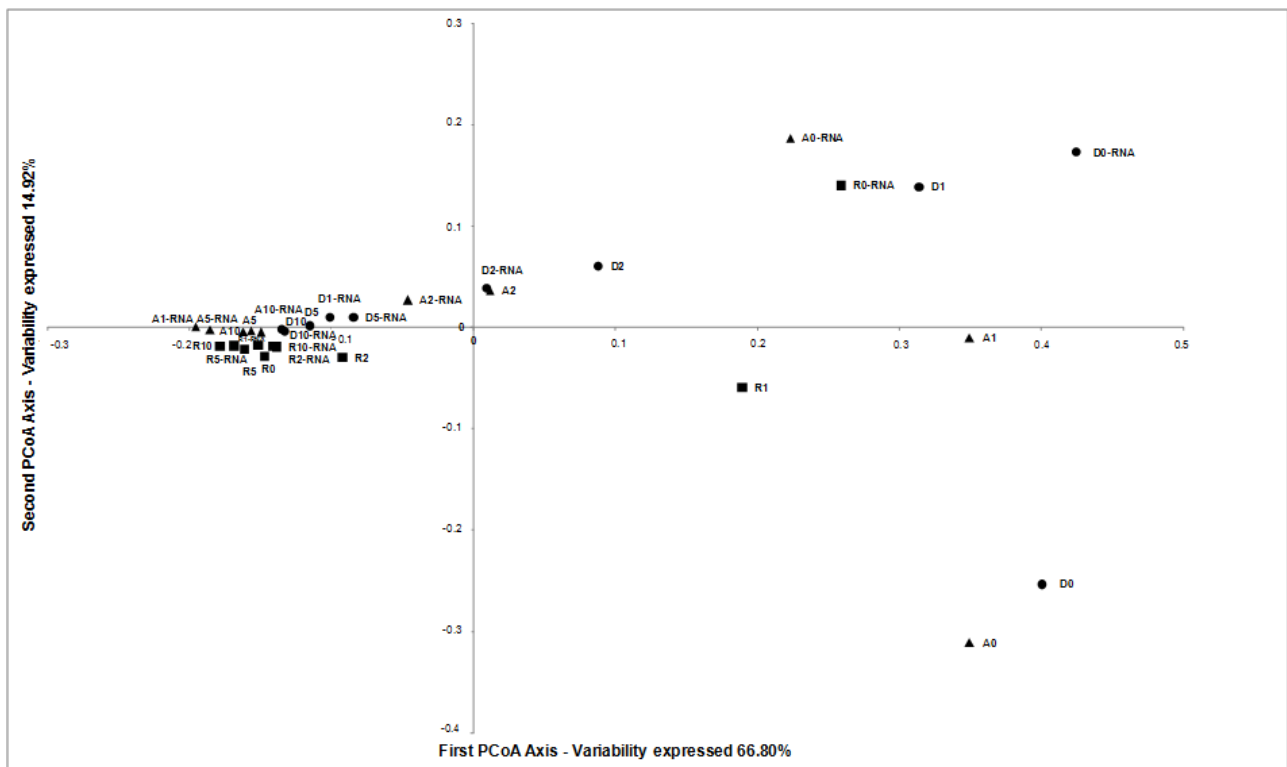
FIG S3. Principle Coordinate Analysis (PCoA) based on weighted UniFrac analysis of all DNA and RNA samples from rye (R), *Triticum durum* (D) and *Triticum aestivum* (A) dough (prior to fermentation and before becoming sourdough) (R0, D0, and A0), and sourdough after one (R1, D1, A1), two (R2, D2, A2), five (R5, D5, A5) and ten (R10, D10, A10) days of propagation.

TABLE 1S. Values of pH, total titratable acidity (TTA, ml of 0.1 N NaOH/10 g of dough), lactic and acetic acids (mM), and free amino acids (FAA, mg/kg), of rye, and wheat dough (after mixing and before fermentation) (R0, D0, and A0), and sourdough after one (R1, D1, A1), two (R2, D2, A2), five (R5, D5, A5) and ten (R10, D10, A10) days of propagation.

Samples	pH	TTA (ml of 0.1 N NaOH)	Lactic acid (mM)	Acetic acid (mM)	FAA (mg/kg)
R0	5.91 ± 0.02^a	2.2 ± 0.3^e	14 ± 4^j	9 ± 2^{fg}	516 ± 17^{gh}
R1	5.90 ± 0.02^{ab}	2.4 ± 0.5^e	21 ± 2^h	16 ± 1^d	538 ± 31^{efgh}
R2	5.87 ± 0.02^b	3.8 ± 0.3^d	48 ± 5^f	22 ± 2^b	509 ± 14^h
R5	4.67 ± 0.02^f	5.3 ± 0.2^b	64 ± 4^e	29 ± 2^a	594 ± 41^d
R10	4.41 ± 0.03^h	6.8 ± 0.2^a	88 ± 5^c	33 ± 3^a	1332 ± 16^a
D0	5.94 ± 0.01^a	2 ± 0.4^e	24 ± 1^g	6 ± 1^f	521 ± 24^{fgh}
D1	5.91 ± 0.02^c	2.3 ± 0.5^e	48 ± 2^f	10 ± 3^{efg}	570 ± 13^{defg}
D2	5.91 ± 0.03^{abc}	2.2 ± 0.2^e	79 ± 3^d	13 ± 1^e	569 ± 29^{defg}
D5	4.67 ± 0.04^f	5.1 ± 0.1^b	99 ± 3^b	17 ± 1^{cd}	577 ± 32^d
D10	4.25 ± 0.04^k	7 ± 0.3^a	110 ± 3^a	24 ± 4^b	1002 ± 14^c
A0	5.84 ± 0.02^d	3.5 ± 0.4^c	16 ± 5^k	8 ± 2^{fg}	576 ± 19^{def}
A1	5.82 ± 0.02^d	3.7 ± 0.4^{dc}	22 ± 1^g	10 ± 2^{eg}	602 ± 37^{defgh}
A2	5.25 ± 0.02^e	4.9 ± 0.3^b	67 ± 4^e	16 ± 3^{cd}	564 ± 12^{defgh}
A5	4.53 ± 0.02^g	6.9 ± 0.2^a	90 ± 3^c	21 ± 3^{bc}	604 ± 26^d
A10	4.26 ± 0.03^k	7.3 ± 0.4^a	114 ± 6^a	30 ± 1^a	1127 ± 24^b

Technology parameters used for daily sourdough back slopping are reported in material and methods. Values are means ± standard deviation of three batches analyzed in duplicate (n = 6). Values within a column with different superscript letters are significantly different ($P<0.05$).