

Article

Genome-Assisted Characterisation of *Lactobacillus fermentum*, *Weissella cibaria*, and *Weissella confusa* Strains Isolated from Sorghum as Starters for Sourdough Fermentation

Irene Falasconi ^{1,†}, Alessandra Fontana ^{1,†}, Vania Patrone ^{1,*}, Annalisa Rebecchi ², Guillermo Duserm Garrido ¹, Laura Principato ¹, Maria Luisa Callegari ², Giorgia Spigno ¹ and Lorenzo Morelli ¹

¹ Department for Sustainable Food Process (DiSTAS), Università Cattolica del Sacro Cuore, 29122 Piacenza, Italy; irene.falasconi@unicatt.it (I.F.), alessandra.fontana@unicatt.it (A.F.), guillermo.dusermgarrido@unicatt.it (G.D.G.), laura.principato@unicatt.it (L.P.), giorgia.spigno@unicatt.it (G.S.), lorenzo.morelli@unicatt.it (L.M.)

² Biotechnological Research Centre, Università Cattolica del Sacro Cuore, 26100 Cremona, Italy; annalisa.rebecchi@unicatt.it (A.R.), marialuisa.callegari@unicatt.it (M.L.C.),

[†] These authors contributed equally to this work

* Correspondence: vania.patrone@unicatt.it

Supplementary materials

Table S1. Lactic acid bacteria detected during the back-slopping procedure in sorghum sourdoughs. In brackets, the number of strains isolated for each species.

No. of isolates	Identified species	Fermentation days					
		0	1	3	6	8	10
15	<i>Weissella paramesenteroides</i> (2)						
6	<i>Weissella cibaria</i> (3)						
39	<i>Weissella confusa</i> (5)						
58	<i>Pediococcus pentosaceus</i> (6)						
16	<i>Pediococcus acidilactici</i> (1)						
40	<i>Lactobacillus fermentum</i> (2)						
4	<i>Lactococcus taiwanensis</i> (1)						

Table S2. MIC ($\mu\text{g/mL}$) of antibiotics exhibited by the strains isolated in this study.

Microorganism	Am	Gm	Km	Sm	Em	Cl	Tc	Cm	Nm
<i>W. cibaria</i> (UC4051)	1	1	64	32	1	0.06	4	4	1
<i>W. confusa</i> (UC4052)	2	1	32	16	0.5	0.25	8	4	1
EFSA cut-off values*	2	16	32	64	1	1	8	4	-
<i>L. fermentum</i> (UC3641)	0.5	1	32	16	0.5	0.12	8	4	2
EFSA cut-off values	2	16	32	64	1	1	8	4	-

Antibiotics abbreviations: Am ampicillin, Gm gentamycin, Km kanamycin, Sm streptomycin, Em erythromycin, Cl clindamycin, Tc tetracycline, Cm chloramphenicol, Nm neomycin. *these cut offs are the ones of obligate heterofermentative lactobacilli.

Table S3. General features of the three sequenced genomes, *W. cibaria* UC4051, *W. confusa* UC4052 and *L. fermentum* UC3641, isolated from sorghum sourdough.

	<i>W. cibaria</i> UC4051	<i>W. confusa</i> UC4052	<i>L. fermentum</i> UC3641
Chromosome size (Mbp)	2.44	2.33	1.97
GC content (%)	44.74	44.54	51.70
Scaffolds	56	22	130
tRNAs	81	82	58
rRNAs	9	11	6
CDS	2,293	2,243	1,923
CRISPR	0	0	2
Prophage regions	1	2	0